HOWARD UNIVERSITY

RESEARCH SYMPOSIUM

April 12, 2019

ABSTRACT BOOK

HOWARD UNIVERSITY

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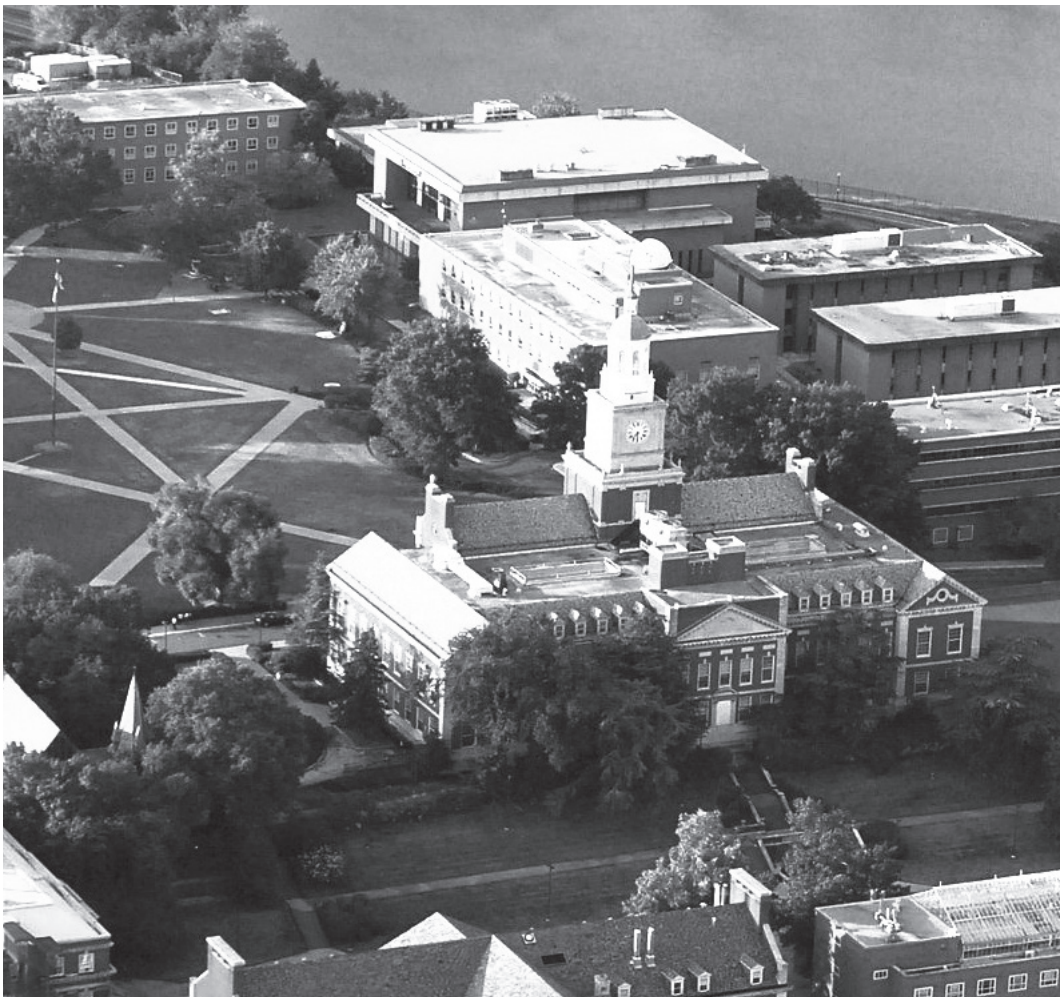

Abstract Book

APRIL 12, 2019

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Biological & Biomedical Sciences

Reducing Binge Alcohol Drinking in Rats

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Among different patterns of alcohol intake, binge drinking (BD) is most common in the U.S. Mechanistically, BD is characterized by long-term reduction in dopamine (DA) signaling within the reward pathway. We postulated here, that restoring DA homeostasis in the mesocorticolimbic system via a nutraceutical supplement, Synaptamine (SYN), could reduce motivation to seek and consume ethanol. Using genetically alcohol-preferring (P) adult male (n=9) and female (n=12) rats trained to lever press for 10% ethanol in an operant chamber, we examined the effectiveness of human equivalent doses of SYN (3.4 mL/Kg) in reducing BD and evaluated the most efficient route of administration: Subcutaneous (S.C.), oral (P.O.) and intraperitoneal (I.P.). The I.P. and S.C., but not P.O. administration of SYN led to immediate marked decrease in lever presses (a measure of motivation to drink ethanol) by both male and female P rats. P.O. administration took at least 3 days to decrease lever pressing in both male and female rats, suggesting a slower metabolism and delayed effect on the brain by P.O. Likewise, with I.P. and S.C., there was an immediate reduction in ethanol intake in both male and female P rats, whereas, after 3 days by P.O., SYN resulted in a modest reduction in ethanol intake by both sexes. Furthermore, elevated activity in the open field was significantly reduced, and risk-taking behavior was moderately reduced. Overall, this data suggests that SYN attenuates drinking behavior in P rats, and the mode of administration impacts its efficacy in reducing craving behavior and motivation to drink.

Messenger RNA Capture with Designer DNA Nanoparticles

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Glioblastoma is the most common, most aggressive brain cancer. Though considered a potential universal treatment for genetic diseases, messenger RNA (mRNA) therapeutics are limited by mRNA's difficulty diffusing through cell membranes due to its relatively large size and instability due to nucleic acid vulnerability to nuclease degradation. This study aimed to develop a systemic delivery approach in which the mRNA is enclosed and transported to the tumor site in a tunable, biocompatible DNA nanoparticle (DNA NP) by demonstrating capture of mRNA by a DNA NP and the translational efficiency of the mRNA post-capture. After the DNA NP was modeled and modified for mRNA capture computationally, the mRNA and DNA NP were synthesized in vitro, bound by thermal annealing, and characterized via ultraviolet-visible spectroscopy (UV-Vis), gel electrophoresis (GE), and quantitative polymerase chain reaction (qPCR). While UV-Vis and GE suggest control mRNA synthesis at ~800 nt and DNA bait conjugation, preliminary tests do not strongly indicate post-capture translation. Also, while early UV-Vis and GE data suggest successful therapeutic mRNA synthesis at ~1300 nt, further work is needed to synthesize mRNA fully equipped for translational testing. Finally, GE results indicate successfully folded as well as partially folded nanoparticles. Once successful mRNA and DNA NP synthesis, binding, and translational testing are soundly achieved, future studies will aim to modify the DNA NP vehicle for targeted transport and release of mRNA at glioblastoma sites.

The purification and isolation of a bacteriophage's DNA

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Bacteriophages are viruses that infect bacteria. Discovering new bacteriophages can lead to advancements in medicine. This is especially important now with the rise of antibiotic resistance. Mycobacterium smegmatis (mc2155) is the host cell for this research. Other species within this genus include M. leprae and M. tuberculosis. These other species commonly infect humans and can have detrimental effects. Studying bacteriophages that infect this host will help find treatments to species in the same genus that affect humans. The bacteriophage Duffy was isolated and purified from a soil sample on Howard University's campus. The soil sample was collected outside of the biology building under an Oak tree, with coordinates 38°5517 N 77°0108 W. The phage then went through a series of experiments to be isolated and purified. These experiments include spot tests and plaque purification assays. Next the phage went through empirical testing to determine the titer of the lysate. Then the phage DNA was run

through gel electrophoresis and restriction enzyme digest. Through these experiments it is evident that Duffy produces clear circular plaques with a diameter of 1mm and the titer of the lysate was found to be 1.29 x 1011 pfu/ml. The extracted DNA had a concentration of 151.4 ng/ml and a purity of 1.79 (l260/280). The phage has recently gone through a lysogenic spot test and was able to produce mesas. However, it did not produce any potential lysogen, so it will not move forward and go through further experimentation.

Exploring the Morphology of a Chimpanzee Head: A Cadaveric Study of the Muscles, Nerves, Arteries, and Veins

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Introduction: Chimpanzees have yielded great insights to human muscular anatomy, in that they are our closest human relatives. The vascular and nervous system have not been extensively studied, due to lack of viable specimens. By exploring these unknowns through dissection, we hypothesize that the similarities and differences amongst structure of humans and chimpanzees can elucidate information about evolutionary development of various structures. Methods: A chimpanzee head stored in 9% formaldehyde and 23% ethanol (300 mL 37% formaldehyde, 900 mL 70% ethanol, 1.8 L 100% water) is being dissected. The skin was carefully removed from the specimen. Superficial muscles of facial expression (innervated by the seventh cranial nerve, the facial nerve) were dissected and removed. Underlying branches of the trigeminal and facial nerve were dissected, along with the muscles of mastication (innervated by the fifth cranial nerve, the trigeminal nerve). Lastly, the internal carotid artery and its branches are currently being dissected. Summary: Muscular attachments and nerve placements have been consistent with human anatomy. The risorius muscle, rarely found in chimpanzee dissections, was visualized. The internal carotid artery seems to have less branches or branches that diverged at different points than the human counterpart, which raises questions of how distal structures received blood flow. Conclusions: As dissections continue, similarities and differences among chimpanzee structures and human structures will be noted. A 3D reconstruction of the chimpanzee head will also be created for future research.

Socioeconomic Predictors of Utilizing Chronic Disease Management Services Provded by Community Pharmacies: A Cross-Sectional Study

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Background: Studies have demonstrated community pharmacists are able to improve clinical outcomes for chronic diseases through the provision of medication therapy management services. However these services are currently underutilized. **Objective**: The objective of this research is to determine what sociodemographic characteristics are predictive of patients being willing to utilize chronic disease management services offered in a community pharmacy. **Methods**: A cross-sectional study was conducted using the 2015 National Consumer Survey on the Medication Experience and Pharmacist's Roles. The survey elicited responses from over 26,000 respondents that hailed from all 5o states and Washington D.C. Predictor variables included gender, age, ethnicity, household income, education, and prescription drug states. Multivariate logistic regression models were developed to determine which of these factors helped to predict whether patients would definitely be willing to accept pharmacists help them to prevent chronic disease and manage chronic disease. **Results**: After adjusting for other factors, females had 1.07 to 1.17 times greater odds of definitely being willing to accept pharmacist intervention in assisting with chronic diseases. Households with incomes over $61,000 had lower odds of being willing to accept pharmacist intervention when compared to households where the income was $20,000 or less. Having prescription drug insurance was predictive of 1.12 to 1.15 times greater odds of having a favorable attitude towards community pharmacy provision of chronic disease services. **Conclusion**: Populations with less favorable attitudes towards community pharmacy intervention with chronic disease include males, high income households, and those without prescription drug insurance.

Isolation and Characterization of the phage Sunrose at Howard University

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The genus Mycobacterium is made of many species, one being Mycobacterium smegmatis. M. smegmatis, along with human-related bacterial diseases such as M. tuberculosis (tuberculosis) and M.leprae (leprosy). Because of its easy access, M. smegmatis is commonly used as an environmental sample. These environmental samples help us understand how bacteriophages function and how they can be used to further scientific research on anti-resistant bacteria. Sunrose was collected on "The Yard" beside the Fredrick Douglass Building on Howard University campus (38°5514 N, 77°0112 W 348m). The phage then went through a series of spot tests, purifications assays, then to empirical testing in order to calculate the titer. The phage DNA then went through Gel electrophoresis, restriction enzyme digest, and transmission electron microscopy for characterization. Work is now being conducted to determine whether Sunrose is a lysogenic or lytic phage through streak tests and patch assays. Sunrose has a titer of 1.21 * 107 pfu/mL, a DNA concentration of 51.8 ng/mL and purity of 2.18. Though Sunrose is not being annotated, there is still the possibility of learning something new and important about this phage.ôø

Isolation and Characterization of the phage Oracle at Howard University

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A bacteriophage is a virus that infects bacteria. Phages have two different life cycles: lytic and lysogenic. In the lysogenic cycle, a phage attaches to a bacterial cell and injects its own DNA into the cell. The bacteria is now is called a lysogen. In the lytic cycle, the lysing of a bacterium will result in a plaque, also known as a clearing in a bacterial lawn. A soil sample was collected on Howard's campus. It was isolated using the direct plating method. Several rounds of serial dilutions were performed to isolate a single phage population. Once a single population was isolated, a full plate titer was performed to determine the titer. The next step was to generate a mesa, a bacterial overgrowth over plaques. Plates were streaked and a patch assay was performed to determine whether the phage was a potential lysogen. Oracle's plaques were small and tended to be clustered together, overlapping. The titer was determined to be 3.4 x 10^-9. Oracle's DNA was unable to be extracted due to a lack of time. Oracle also was determined not to be a potential lysogen. Oracle appeared to be a lytic phage, with very clear plaques, but a mesa was formed. Oracle was not a potential lysogen. Oracle will be further researched, to determine its ability to infect other phages.

Abstract

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Mycobacterium smegmatis is one of many species of bacteriophages from the genus Mycobacterium. By using lab techniques to study the genetic makeup and mechanisms of M. smegmatis, this information can then be applied to related species such as M. tuberculosis and M. leprae, which are pathogenic to humans. The sample Fullsend was collected from a soil sample on the Howard University campus, under the tree directly in front of the main entrance to the Ernest Just Hall Biology Building(38°55'06"N, 77°01'08"W). The soil sample was made into a lysate in result of filtration, then underwent spot tests and multiple plaque purification assays to calculate the titer of the lysate. DNA was then isolated from the lysate and run through restriction enzyme digests and gel electrophoresis, however it has not been sequenced. Beginning from direct isolation, the phage Fullsend appeared to be a moderately growing phage, with the high titer lysate calculated at 4 X 10*9 pfu/ml. Following DNA isolation, Fullsend was shown to have a concentration of 146.6 ng/ml. Currently, streaking protocols are being used to determine if the phage Fullsend is a lysogenic or temperate bacteriophage.

Thermoreversible Tenofovir Nano Gel for HIV Drug Delivery

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Background: HIV is primarily transmitted as a sexually transmitted disease. The objective of the study is to develop a buffered thermoreversible gel containing tenofovir (TFR) loaded copolymer poly(lactic-coglycolic acid (PLGA) nanoparticles for prolonged protection against human immunodeficiency virus (HIV) sexual transmission. Methods: Optimized buffered formulation containing TFR loaded PLGA nanoparticles was in sol (solution) form at 2-8°C and converted to a gel matrix at ≥25°C. PLGA nanoparticles were prepared by: (a) Solvent diffusion method and, (b) Emulsification solvent evaporation. The particle size was measured using dynamic light scattering (DLS). Morphology of the particles was analysed by scanning electron microscope (SEM). Cytotoxicity of formulation components was evaluated using (MTS) assay. In vitro release of TFR from was performed in simulated vaginal fluid (pH ~4.2). Results: The effective diameter range of nanoparticles prepared by both methods were 94.3-228 nm

and 265-413 nm, respectively; micro-image showed smooth and spherical shaped nanoparticles. Solvent diffusion method with a non-ionic surfactant (Triton®X-100) effectively reduced the particle size of nanoparticles. Emulsification solvent evaporation method resulted in improved drug encapsulation (1.43-10.78%) and drug loading values (0.25-1.18%) for nanoparticles. The formulation components were non cytotoxic from the 24 hr MTS assay. The formulation demonstrated a sustained drug release with a drug release of ~61% in 8 hrs and ~67.75% in 24 hrs. Drug release mechanism was diffusion controlled.Conclusions: Both preparation methods were found efficient to prepare PLGA nanoparticles. Results demonstrated a successful development and characterization of vaginal nano gel formulation for prolonged protection against HIV sexual transmission.

Novel HIV-1 Transcription Inhibitors Targeting TAR RNA

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Current approved HIV-1 medications have targeted different steps in HIV-1 life cycle. However, none of these drugs targets transcription which is essential step in HIV-1 replication and reactivation of latent HIV-1 provirus. HIV-1 Tat protein interacts with TAR RNA and recruits CDK9/cyclin T1 and other factors to induce HIV-1 transcription. In search for a novel compound targeting Tat, a pharmacophore model was created using a crystal structure of TAR RNA and Enamine database was used to select 21,343 compounds that were docked to the pharmacophore model using QXP software. The resulting 2300 compounds were evaluated for HIV-1 transcription inhibition in 293T cells. Compounds were also tested for toxicity using MTT assay. Selected 177 compounds were further tested for inhibition of one round HIV-1 infection of CEM T cells with VSVg- pseudotyped HIV-1 virus. Two compounds, T0512 (IC50 = 2.3 µM) and T606 (IC50 = 1.2 µM) were selected. Then, 293T cells were transfected with HIV-1 Luciferase vectors and a Tat expressing vector and treated with the compounds. We observed strong inhibition of Tat-dependent HIV-1 transcription by T606 (~5-fold inhibition) and T0512 (~3-fold inhibition) in comparison to the vehicle control. We also found moderate effect for the compounds on recombinant CDK9/cyclin T1 which resulted in ~ 2-fold decrease of Rb-CTF phosphorylation in comparison to CDK9 inhibitor control. In future, we will test the compounds effects on Tat-TAR RNA and Tat-CDK9/cyclin T1 interaction. Taken together, our study identified novel compounds that target HIV-1 transcription and may help to develop novel anti-HIV-1 therapeutics.

Acquired Amegakaryocytic Thrombocytopenia in Relation to Pernicious Anemia: a Case Report

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Introduction: Acquired amegakaryocytic thrombocytopenia (AAT) is a rare autoimmune disorder that usually presents with thrombocytopenia and bleeding. Here we present a case of AAT in a patient with pernicious anemia. **Case Presentation:** A 78 years old Caucasian female with a known past medical history of type 2 diabetes mellitus, hypothyroidism, hypertension, and chronic kidney disease was admitted for lower gastrointestinal bleeding. Laboratory studies showed significant thrombocytopenia with platelet count of 5 x103 mm3, hemoglobin (Hgb) of 7.7 gm/dl, serum B12 level of 239 pg/ml, serum folate of 8.09 ng/ml, serum ferritin of 145.2 ng/ml, and TSH of 3.41 mU/ml. Additional studies included negative antinuclear antibody, normal serum protein electrophoresis, negative anti-parietal antibodies and positive intrinsic factor antibodies. CT scan of the chest and abdomen was negative for signs of lymphoma or thymoma. Peripheral blood smear showed severe thrombocytopenia, anemia with polymorphic RBCs, and neutrophils with toxic granulations. Bone marrow biopsy showed moderate marrow hypercellularity with erythroid hyperplasia, and megakaryocytic hypoplasia. Flow cytometry reveals no evidence of atypical immunophenotypic findings. Patient was diagnosed with acquired amegakaryocytic thrombocytopenia. She did not respond to therapy with high dose prednisone and IVIG and was transferred to a facility with expertise on aplastic anemia and bone marrow transplant for a plan to start treatment with rituximab. **Discussion:** Similar to pernicious anemia, AAT is associated with other autoimmune processes such as systemic lupus erythematosus. The exact pathophysiology of AAT is not known but both humeral and cell-mediated immunity are speculated to play a role.

The Role of Epigenetic Changes in Pancreatic Beta Cells in the Etiology of Diabetes

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Diabetes mellitus is a condition in which either the pancreas does not produce enough insulin, or the cells of the body

do not respond properly to the insulin produced, resulting in high levels of sugar in the bloodstream. We hypothesized that epigenetic changes in pancreatic beta cells in the pancreas, the main insulin-producing cells in the body, may contribute to the etiology of diabetes. To test this hypothesis, we treated human pancreatic beta cells derived from induced pluripotent stem cells (iPSCs) with either high (20 mmol) or low (2 mmol) glucose for 14 days. We found epigenetic changes in several hundred genes, including those involved in many signaling pathways, especially glucose metabolism and insulin secretion. Other pathways affected were those involved in oxytocin metabolism, gastric acid secretion, calcium signaling, and adrenergic signaling. Our study suggests that diabetes may, at least in part, be caused by epigenetic changes in pancreatic beta cells.

Using the Cobb Collections to Understand Historical TB Infections in African-Americans

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Tuberculosis (TB), a microbial disease caused by the pathogen M. tuberculosis, was one of the leading causes of death in the United States prior to 1882. In 2015, a total number of 9,557 TB cases were reported in the United States with African-Americans disproportionately impacted by TB. Nearly 21% of all people with TB nationally are African- American. TB affects the respiratory system and sequesters itself in soft tissue nodules in the lungs. This has made examinations of historical population challenging when they no longer have soft tissue associated with cadaveric remains. Skeletal remains represent a historical window into the lives of individuals. Individuals (N=4) from the W. Montague Cobb Skeletal Collection were surveyed for TB disease status. Samples (N=7) were extracted from dental and petrous bone regions and DNA was extracted using ancient DNA (aDNA) protocols. Sequencing libraries were constructed and sequencing was undertaken using an Illumina HiSeq platform. High throughput sequencing data was then analyzed for microbial community abundance and diversity with a specific focus on M. tuberculosis community membership using Qiime 2, Burrows-Wheeler Aligner (BWA), (SAM) tools, MetaPhlan, and Krona analysis. We found evidence of M. tuberculosis in the petrous and dental remains of individuals in the W. Montague Cobb Skeletal Collection. Microbial communities varied in abundance and diversity from sample to sample. CC individuals who died of TB demonstrated unique microbial communities in their petrous and/or dental remains. This project is including the identified microbial content with clinical evidence of disease.

Role of E4orf3 in Cell Cycle Progression

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DNA damage and or continued DNA damage signals lead to cells with DNA content greater than G2/M (DNA >4n). Exactly how these cells override cellular DNA damage checkpoints, learn to tolerate the chromosomal abnormality, and progress through the cell cycle with instable genome is not clear. Our goal is to developing an improved understanding of how cancer cells increase their genome content. We aim to use this knowledge to imagine improve cancer treatments. Here, we show that Adenovirus (Ad) early region 4 (E4) open reading frame 3 (E4orf3) disrupts the function of the MRN complex by redistributing NBS1. Using flow cytometry, we show that cells with functional NBS1 show normal cell cycle profile, while those without NBS1 show DNA content >G2/M. We show that cells with E4orf3 have higher cellular DNA >4n than those without E4orf3. We use immunofluorescence microscopy to show that viruses with E4orf3 re-localize NBS1 away from viral replication centers. Viruses lacking E4orf3 do not. Thus, disruption of NBS1 by E4orf3 supports the accumulation of cellular DNA >4n. NBS1 translates DNA damage signals through PML which acts on NF-kB. Accordingly, we quantify the cellular distribution of nuclear factor-kapa beta (NF-kB). We found that Ad E4orf3 enhances nuclear translocation of NF-kB leading to DNA content >4n. What is more, pharmacological inhibitors to NF-kB significantly undo the increase in DNA content. This posits that disruption of NBS1 allows for enhanced nuclear translocation of NF-kB which enables cells to override the cell cycle checkpoints and increase their DNA content.

Qualitative analysis of generalized Volterra` models "two preys-one predator" by the Newton polyhendron method

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Here we study an important generalization of the classical Volterra` model "two preys-one predator". The model has complicated equilibrium O; different complex behaviors are possible in different areas of a vicinity of O that determine the qualitative behavior of the model as a whole. We constructed bifurcation diagram of the model and show that all three populations can coexist in stable equilibrium or

oscillations. In order to provide this analysis we develop the Newton polyhedron method that can be applied to analysis 3-dimensional dynamical systems. The developed method is a generalization of a known Newton diagram method, which gives a powerful tool for studying plane dynamical systems. We analyze asymptotics of trajectories in a vicinity of isolated equilibrium O of a polynomial 3-dimensional vector field V defined by the system of ordinary differential equations of Kolmogorov' type. We found the asymptotics of orbits of the vector field and proved that the asymptotic have a power form. We apply these results to bifurcation analysis of the generalized Volterra' models. We believe that the developed mathematical tools will be very useful for analyze of complex biological and bio-medical models.

Ravenrwd Abstract

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Background: Bacteriophages are viruses that use bacteria as hosts in order to survive and reproduce. Mycobacterium is a genus that contains Mycobacterium smegmatis as studied in this course along other more dangerous strains such as M. Tuberculosis. M. smegmatis is harmless to humans and commonly found in environmental samples which makes this a viable host to research. Using environmental samples, researchers are able to further characterize phages along with effects certain hosts have, leading to a possible breakthrough in fighting drug-resistant bacteria. Methodology: Ravenrwd was named because it was collected outside of the Health Sciences Library (38", 55", 12" N . 77",110" W) next to my car which is rear-wheel drive and named Raven. It was put through many trials, including spot tests, several purification assays (4 redos) and empirical testing. All trials were conducted with the goal of isolating and further characterizing the phage. After calculating titer, the DNA of the phage was used in gel electrophoresis and electron microscopy. Currently, streaking laboratory experiments and patch assays are being conducted to test if Ravenrwd is a lysogenic or lytic phage. Conclusion/Results: Ravenrwd was a difficult phage to work with from the start, with a very unique morphology. Ravenrwd had a large yet cloudy morphology (possibly caused by being a lysogenic phage). It showed pfu that were approximately 6mm in diameter with a titer of 5.67 x 10^-4 pfu/ml. Currently, Ravenrwd is not being annotated but is being streaked and analyzed for lytic vs lysogenic characterization.

Isolation and Characterizaion of Midoriya

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Background: Bacteriophages are microorganisms that are capable of infecting bacteria. The bacteriophage population is vast and only about 3,000 of the estimated 1031 phage particles in the biosphere have been characterized genomically. They have characteristics like all viruses such as needing a host to reproduce. Phages can undergo certain life cycles, the lytic cycle or lysogenic cycle, to reproduce. A clear plaque in a petri dish indicates a lytic phage whereas a turbid plaque indicates the phage is temperate. **Methodology**: Midoriya was collected from a soil sample from under a tree near the School of Social Work at Howard University. Mycobacterium smegmatis mc2 155 was added to the soil sample to increase the number of phage through enrichment and direct plating experiments. These plates were then flooded with phage buffer producing a lysate whose titer was calculated through empirical testing. Currently, streaking and patch assays are being conducted to determine the life cycle of the phage. **Results/Conclusions**: From the patch assay Midoriya was shown to have produced a mesa, an overgrowth of bacterial cells surrounded by an area of clearing caused by phage lysis, which concludes the phage to be lysogenic. Akiria Anderson, Benedict Quagraine, Adrian Allen, Ayele Gugssa, Courtney Robinson, Winston Anderson, and Mary Ayuk

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Isolation, purification, and characterization of phage Crysydy

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Phage Hunters Advancing Genomics and Evolutionary Science (PHAGES) program consist of the isolation, purification, and amplification of a new phage from environmental samples by using a specific bacterial host. In the experiment, *Mycobacterium smegmatis* MC^2 155 used as the host for the phage. This project is important because discovering and sequencing new phages means that we can contribute to the detection, specific identification and treatment of bacterial diseases. Through the isolation and purification of the phage *Crysydy* in the experiment, a lysate was collected with a titer of 7.0146×10^9 pfu/ml. The phage *Crysydy* is a lytic phage with two morphologies ranging from 0.5mm and 2mm, but the phage was still pure as proven by the serial dilution experiment as part of purification. This semester the same lysate was used for a spot test and streaking to find a lysogen however because it is lytic, this could not happen. While phage *Crysydy* may have reached its peak in the experiment, the

characterization of it continues. The experiment in the class also continues as classmates, and I am annotating the genomic sequence of the phage *Cactojaque*.

Comparative Antimicrobial Activity of Lactic Acid Bacteria against Food Spoilage and Pathogenic Microorganisms

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There has currently been continued interest in bacteriocins from an applied perspective as bacteriocins have potentials to be used for natural bio-preservation. Microbial spoilage is a great threat to the quality and safety of the food we consume causing problems such as unpleasant smell, adverse change in taste and bad appearance. Infectious diseases are caused by resistant pathogenic microorganisms which are accountable for increased rate of morbidity and mortality. Nine lactic acid bacteria (LAB) strains previously isolated from yoghurt and cheese were tested against food spoilage and pathogenic microorganisms by disk diffusion method and subjected to comparative analyses. All LAB isolates produced antimicrobial compounds indicating either a clear inhibition zone, turbid zones or both kinds of zones against all thirteen indicator strains made up of Pseudomonas spp, Proteus spp, Micrococcus luteus, Serratia marcescens, Enterococcus spp Streptocccus spp, Acinetobacter baumanni, Salmonella typhimurium, Klebsiella pneumoniae. All LAB isolates inhibited a high percentage of the indicator strains showing varying activity with 41% for Proteus spp, 35% for Micrococcus luteus, 26% for Salmonella typhimurium, 25% for Pseudomonas spp and 16% for Acinetobacter baumanni, the zone of inhibition for all indicator strains ranged from (11-37mm). Four of the LAB strains 2A, 3A, AS and CE1 were recorded to show the highest inhibitory properties producing high zone of inhibition on the indicator strains. The results show the potential application of the LAB isolates as bio-preservative. Key words: Lactic acid bacteria, food spoilage, bio-preservation, pathogenic, bacteriocin

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Phage Finding: Hangry at Howard University

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Background: Although some bacteria are necessary for human health, many directly threaten it. Examples of harmful bacteria are Mycobacterium tuberculosis and Mycobacterium leprae. Bacteriophages, often referred to as phages, are viruses that infect bacteria and can be used to fight harmful bacteria when antibiotics are resisted. We study M. smegmatis MC²155 because it's related to more harmful bacteria but is non-harmful to humans and reproduces rapidly. Studying the bacteriophages that can infect M. smegmatis contributes to our understanding of phages and their potential benefits. **Methodology**: Soil containing the phage Hangry was collected from a tree directly in front of the E. E. Just Hall entrance at Howard University (38˚55'16" N, 77˚01'08" W). The amount of phages present was increased through enrichment and direct plating before the phages were isolated in a series of spot tests, plaque purification assays, and empirical tests meant to attain a single phage population. The DNA obtained from the lysate created was then quantified and qualified through gel electrophoresis, restriction enzyme digests, and transmission electron microscopy. **Results/Conclusions**: Hangry appeared to be a fast-growing phage and presented many plaques while plating for a medium-titer lysate. However, the high-titer lysate for Hangry produced far fewer isolated plaques and resulted in very little DNA presented when isolated. Hangry was a candidate for sequencing but having a DNA concentration of only 87.6ng/µl and purity of 1.76(®260/280) disqualified Hangry from eligibility. Hangry is currently undergoing streaking and patch assays to determine whether the phage is temperate or lysogenic.

Finding Kboogie

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Mycobacterium smegmatis is a species in the genus Mycobacterium within the phylum of Actinobacteria. Many species within the genus of Mycobacterium, such as M. tuberculosis and M. leprae cause infectious diseases, but M. smegmatis is considered to be non-pathogenic and is commonly found within everyday environmental samples, such as dirt below a bush. Finding bacteriophages capable of lysing M. smegmatis could help provide a treatment in the near future for more infectious species within the same genus. Kboogie was collected from a soil sample below a large tree behind the Academic

Support Building A (38° 55' 22" N 77° 01'07" W 407 ft) on September 10, 2018. Kboogie went through multiple spot tests, four plaque purification assays, and empirical tests to calculate the the titer of the phage lysate to be 5.3 x 10®pfu/mL and isolated plaques were 1 mm in diameter. Kboogie, along with other phages collected, was used in gel electrophoresis, restriction enzyme digests, and transmission electron microscopy (TEM). Kboogie was sequenced, and it was found to be a lytic phage in the C1 subcluster of the C cluster. Several streaking protocols, patch assays, and annotations are currently underway. The concentration was 101.7 ng/µL and a purity of 1.73. Currently, Kboogie is being annotated to find the function of its genes. Using sources such as NCBI Blast, phagesdb, PEECAN, and HHPred, Kboogie will be compared to the characteristics of already annotated phages.

Pseudoexfoliation Syndrome in Patients of Ethiopian Descent - An Initial Report

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Purpose: Pseudoexfoliation syndrome (PXS) presents unique challenges in the management and treatment of many associated ocular pathologies, including glaucoma. Glaucoma is the second leading cause of blindness among African Americans, and data suggests that Ethiopians may also be at an increased risk of developing pseudoexfoliative glaucoma. The following is an ongoing case series of Ethiopian patients seen at the Howard University Hospital Ophthalmology clinic with PXS. Methods: We are analyzing the health records of Ethiopian PXS patients at the Howard University Hospital from 2016 to 2018. Collected data includes demographic information, medications, ocular surgical history, initial and final visual acuity (VA) and intraocular pressure (IOP) measurements. We categorized VA ≥ 20/40 as mild visual loss (MVL), VA between 20/40 and 20/200 as moderate visual loss (MdVL), and VA < 20/200 as severe visual loss (SVL).
Conclusions: The Washington, D.C. area is home to the second largest population of Ethiopians outside of Ethiopia. This is the first study to explore the prevalence of this ocular pathology in this patient subset. Overall, VA and IOP improved or remained stable in our case series. Approximately, half of our subjects were managed with glaucoma medications and most of them underwent glaucoma surgery.

Identifying the Functions of ETR-1 in Male Fertility and in the Engulfment of Physiological Germline Apoptosis in Caenorhabditis elegans

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ETR-1 is a conserved ELAV-type RNA-binding protein in C. elegans that has been identified by our lab as functioning during reproduction, specifically in the engulfment of germline apoptotic cells. Animals depleted of ETR-1 exhibit a reduced brood size and an increase in germline apoptotic cell corpses. Co-depletion via RNAi of ETR-1 and CED-1, an established member of the engulfment pathway, rescues the phenotypes associated with ETR-1 depletion alone. This suggests that ETR-1 could play a role in engulfment through either one of the three established engulfment pathways or a novel engulfment pathway. The goal of our research is to investigate where ETR-1 functions during physiological germline apoptosis to ensure normal germ line function. We generated double mutants of etr-1(tm6221) and various available engulfment mutants and analyzed their fertility and quantified the number of germline apoptotic cells using Differential Interference Contrast microscopy. We also identified that ETR-1 functions in the male for normal male fertility levels. RNAi depletion of ETR-1 in male animals causes a reduced brood size, defects in spermatozoa movement, and abnormal male tails. Through antibody staining we show that ETR-1 co-localizes in the male germline with ICB4, a plasma membrane marker. Combined, our data suggests that ETR-1 is a new player in the engulfment of apoptotic cells and that it plays a significant role in male fertility in C. elegans.

Collecting Mouthrinse Samples to Test Different Human Papillomavirus (HPV) Primers

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We were able to conduct research about Human Papillomavirus (HPV). HPV has over 100 subtypes, making HPV the most common sexually transmitted infections. There are two subcategories of HPV: low-risk HPV (HPV-6 and HPV-11) and high-risk HPV (HPV-16 and HPV-18). HPV is transmitted through the mouth and genitalia. Recently, scientists have discovered that high-risk HPV can lead to oral cancer, which

sparked many scientists to complete more research on HPV. Our focus was the importance of oral HPV and finding different ways to test for HPV. First, we collected nine different mouth rinse samples to test for positivity of HPV. Secondly, we completed a normal PCR test to confirm there was DNA in the samples collected. Afterwards, we mixed multiple subtypes of HPV to make a primer to test against an older primer from 2015. Once completed, we nested PCR tests and gel electrophoresis tests to compare DNA bands from the mouth rinse samples to the old and new primers. If the DNA bands from the mouth rinse samples matched the DNA bands from the old and new primers, then that sample tested positive for HPV. After numerous nesting PCR tests and gel electrophoresis tests, we successfully compared mouth rinse samples to a successive positive control (HPV-16). None of the samples collected had matching DNA bands to the positive control; therefore, none of the people's collected mouth rinse samples have HPV-16. To conclude, collecting mouth rinse samples from patients is reliable way to test for HPV.

The Caging of Phage Kajamane

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Bacteriophages, viruses that infect bacteria and utilize their host's machinery to reproduce, have been utilized in medicine for many years. The head of a bacteriophage contains the DNA and tail fibers (if present) are used for attachment onto its host. The project's goal was to isolate and characterize a phage that is specific to the host Mycobacterium smegmatis mc 2 155. Phage Kajamane was isolated from soil collected from "the yard", Howard University (38.9225 N, 2 77.020556 W), enriched with direct and enrichment culturing, purified by plaque assay, and empirical testing used to generate a high titer lysate. A lytic phage was observed with an average plaque size of 2.2 mm. DNA was extracted from HTL, quantified and the purity evaluated using the NanoDrop 2000 and restriction enzymes used to characterize DNA. Phage Kajamane was archived at the University of Pittsburgh. Experiments are underway to evaluate whether phage Kajamane produces lysogens of M. smegmatis mc 2 155. The concentration of the DNA was low, which was inferred from the small size of DNA from gel electrophoresis and restriction digest results were inconclusive. The titer results were 19.5 × 10 pfu/mL and the average concentration was 34.9 ng/µl. The average purity of the DNA was 1.85. A true lysogen will possibly be confirmed and the data from Kajamane can be utilized to reveal similarities between identified phages but also differences that will give insights into the evolution of viruses.

Development of Novel Small Molecule Inhibitors of Ebola Virus Infection

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Despite the extensive research, efficient therapeutics for the treatment or prevention of Ebola virus (EBOV) infections remain an unmet challenge. EBOV transcription is facilitated by host Ser/Thr protein phosphatases, PP1 and PP2A, that dephosphorylate EBOV VP30 protein and switch activity of the polymerase complex toward replication. . Here, we developed a new EBOV inhibitor, HU-06, that potently inhibits EBOV replication and displays significantly improved metabolic stability when compared to previously described 1E7-03. We utilized 1E7-03, that we previously reported to be efficient EBOV inhibitor and conducted its iterative structural alterations. This process led to the development of HU-06, a molecule with strong anti-EBOV inhibitory activity and improved stability in vivo. HU-06 structure can be divided into two distinct regions, its tricyclic core and the side chain. Our initial structure-activity relationship studies established that the tricyclic core was critical for its biological activity. Therefore, our recent research is focused on developing a series of HU-06 analogs by systematically varying its side chain. Approximately 60 HU-06 analogs have been synthesized, characterized, and screened for their anti-EBOV activity using in vitro and in vivo systems. We will present our results describing the impact of these structural changes on the biological activity, plasma stability, and toxicity.

Assessment of risk of developing Pancreatic risk with ATM gene mutation based on the genetics of hereditary pancreatitis by using Saliva: A Multi-Center evaluation

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Objective: To evaluate the genetics of hereditary pancreatitis (HP) in adult patients with Chronic pancreatitis, and heterozygous mutations of ATM gene. Methods: This outpatient study was conducted on 200 Patients. We examined the patients and their parents for Hereditary Pancreatitis. HP defined as those with trypsinogen gene (PRSS1) mutation on the long arm of chromosome seven (7q35), and Heterozygous ATM

mutation was defined with those with 1 or more mutations in our panel [(8 variants) 5762ins137, 5762-1050A>G,E1978*, Q1970*, R2506Tfs*3, R35*, c.3576G>A, c.7638_7646del9, p.H1082Lfs*14). Patients were also categorized in groups of having the mutation in their ATM gene DNA was extracted from peripheral blood leukocytes, and exons 2 and 3 of the gene of PSSR2 and exon 2-6 of ATM were individually amplified ed by a polymerase chain reaction and sequenced by NGS. Results: Of 200 adult patients with pancreatitis (median age 55), 64 (32%) were diagnosed with adult onset of HP. From the 64 patient with positive mutation on the trypsinogen (PRSS1) gene, 34 of them had one parent with the mutation of the trypsinogen gene (PRSS1). From the 34 adult patients who had parents with the mutations of the trypsinogen gene (PRSS1), and 37 (19%) were heteroz, for ATM gene mutation, 39 (61%) recalled of their babies or young children, with having been diagnosed with epigastric pain, severe vomiting and nausea both after birth and during early childhood. Conclusions: Patients with HP who have a heterozygous mutation of the ATM gene have a higher incident of developing Pancreatic Cancer.

Tracking Alzheimer's Progression Through the Morris Water Maze (Kela Bakari and Juan-Pablo Palavicini)
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Alzheimer's disease has three major anatomical markers: a shriveled cortex, enlarged ventricles, and a shrunken hippocampus. In most cases, ®amyloid peptide plaques (or A® plaques) form in the brain as well, disrupting cellular activities and aggregating in large masses in the brain. Microglia and astrocyte inflammation in the cortex, another effect of this disease, produces apoE, a lipid transport protein to which sulfatide (a class of glycolipids) binds exclusively. Cerebroside sulfo-transferase, or CST, is an enzyme which catalyzes the last step in sulfatide synthesis. In this experiment, 2 kinds of mice (wild-type mice and transgenic mice which produced the human variation of apoE) were analyzed for the memory-related impacts of reduced CST/apoE levels in neurons using the Morris Water Maze (MWM). Each mouse went through an acclimation phase, an acquisition phase, a reversal phase, and a variable phase, a "probe" which was only conducted on even days. In the two cohorts of mice which were tested, 10-12 month old mice and 20-22 month old mice, a marked loss in memory capacity and spatial recognition was noted in the transgenic mice as compared to the wild-type individuals: 30% loss in wild-types, and 40-50% in transgenics. In the future, more than one type of cognitive test should be used in order to reinforce results and further evaluate spatial-retention abilities in the experimental animals in different spaces.

FBXO32 and FOXO1 are coordinately expressed in a one-to-one stoichiometric pattern at baseline, during exercise and in both gender in elderly African American with MCI
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In this study, we tested the hypothesis that fitness adaptation can enhance cellular ability to repair damaged DNA and clearance system, and therefore, mitigate much of the harm that accumulates in the cell during aging by increasing expression of FBXO32, TRIM63, and FOXO1. To test this hypothesis, we used TaqMan gene expression analysis to investigate component of UPS and FOXOs and to assess the expression pattern at base line, during exercise, and in men and women. We report that only FBXO32 but not TRIM63 were expressed in a sample obtained from elderly AAs with MCI. During initial assessment, a 3-month exercise intervention increased levels of FBXO32 compared with baseline. In our attempt to evaluate the differential effects of exercise-related changes by gender, we observed that levels of FBXO32 increased significantly in men but not in women. However, levels of FBXO32 was higher in women than in men at baseline. Finally, to gain mechanistic insight, we compared expression level of FOXO1 and FBXO32 at base line, during exercise, and in both genders. Accordingly, both genes were coordinately expressed in a one-to-one stoichiometric pattern suggesting FOXO1 can regulate FBXO32, and FBXO32 can feedback FOXO1 to maintain a one-to-one stoichiometric expression pattern. Our results demonstrate the existence of a co-regulatory mechanism between FBXO32 and FOXO1 in elderly AA MCI participants. Given the significance of FBX032 and FOXO1 in neurodegeneration, our findings, may at least in part, explain the advantageous effects of exercise on memory. We will further inform this observation in future analyses.

The infection of Mycobacterium spp. by phage Kaleidoscopic
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Bacteriophage (phage), a virus which infects bacteria, vary in shape, size and genetic material; however, all phages consist of a head, and most a tail, and tail fibers. This study is significant since it will add data to Phagesdb.org and highlight the phylogenetic relationship of this phage to others. Soil samples were obtained near College Hall South at Howard University

(38°55'14" N, 77°1'4" W). Both direct and enrichment isolation were done to prove Mycobacterium smegmatis mc2155 as a host for potential phage. Kaleidoscopic produced lytic plaques with an average diameter of 1 mm. Several procedures which include purification, empirical testing, high titer lysate generation, DNA extraction, and restriction digest were utilized to characterize phage Kaleidoscopic. The results, including gel electrophoresis were inconclusive; however, it is hoped that the presence of a lysogen will soon be confirmed. The bacteriophage Kaleidoscopic, will eventually be sequenced and might be added to a common database PhagesDB.

The Isolation, Purification, Amplification, and Characterization of Bacteriophage Abinghost and its Effect on Mycobacterium smegamtis MC^2 155

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Mycobacterium smegmatis MC2155 is a species in the phylum Actinobacteria and the genus Mycobacterium that was used as a host bacteria for the series of experiments conducted. Abinghost is a bacteriophage that has effects on M. smegmatis, which is important because M. smegmatis has a direct relation to the bacteria M. tuberculosis and M. leper. By better understanding the way Abinghost causes lysis in M. smegmatis, there can be a better understanding of the lysis with M. tuberculosis and M. leper as well as other similar bacteria. There would also be a deeper comprehension of the way bacteriophages similar to Abinghost are characterized and function. Abinghost was discovered, isolated, purified, amplified, and characterized through the experiments conducted this year. Abinghost was found in a soil sample in the Howard University yard at the side of the Frederick Douglass Building (coordinates: 38°55'19"N, 79°1'12"W). It was then isolated and purified through a series of plaque assays, spot tests and full plate titers. The titer lysate calculation of Abinghost was determined an Abinghost was amplified. It has a titer of 2.6e9 pfu/mL and a DNA concentration of 94.1 ng/µL. Abinghost was then characterized using gel electrophoresis, restriction enzyme digest, and electron microscopy. Abinghost DNA was sent to Pittsburgh where it was sequenced and determined to be a lytic phage. A SEA-PHAGES laboratory class at Howard University is currently annotating Abinghost.

Leishmania parasites suppress Allograft Inflammatory Factor-1 in macrophages as a mechanism for immune escape

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Leishmania is a genus of obligate intracellular parasites that cause Leishmaniasis, a neglected tropical disease that effects millions of people in poor and developing countries worldwide. When injected into the host bloodstream via bites from infected sandlfy vectors, the parasite is phagocytized by macrophages and other immune cells. The parasite reproduces within the macrophages which then burst, spreading the parasites throughout the bloodstream. The full mechanisms by which Leishmania parasites are able to evade immune destruction within macrophages are currently unclear. Allograft inflammatory Factor-1 (AIF1) is a cytoplasmic scaffold protein that plays a vital role in immune response. However, no study has clearly delineated the role of AIF1 in governing macrophage ability to control infectious diseases. Therefore, the role of AIF1 in macrophage response to Leishmaniasis has been assessed in this study. Results demonstrate that Leishmania infection corresponds with a decrease of AIF1 expression in macrophages in vitro. Also, knockdown of AIF1 in bone marrow-derived macrophages results in altered cytokine profiles similar to those of Leishmania-infected cells. These altered cytokine levels (particularly increased IL10) correspond with anti-inflammatory M2 macrophage polarization favorable for parasite proliferation. These results suggest that macrophage AIF1 is vital to Leishmania immune escape.

Transcriptome-Guided Investigation of RECQ1 in Breast Cancer Tumorigenesis

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RECQ1 is a DNA helicase that plays an essential role in maintaining genomic stability. Our lab has demonstrated that in addition to its role in DNA repair, RECQ1 also modulates gene expression in breast cancer cells. Recent studies show that inactivating mutations in RECQ1 increase susceptibility to developing breast cancer. However, the molecular role of RECQ1 in breast tumorigenesis is yet unknown. We hypothesize that RECQ1 regulates the expression of specific genes and pathways critical for tumorigenesis. To investigate RECQ1-regulated transcriptome, we performed RNA- Sequencing from CRISPR/Cas9-derived isogenic pair of RECQ1- wild-type

and RECQ1-knockout MDA-MB-231 breast cancer cells. Using an arbitrary cut-off of 2-fold change in gene expression and adjusted p<0.05, we performed bioinformatic analysis for functional profiling of genes and pathways up and down-regulated by RECQ1. Then, we have validated RECQ1-target genes by real-time quantitative PCR and Western Blotting, as well as by performing genetic rescue experiments. Our the transcriptomic data shows that RECQ1 significantly affects genes important for cell migration, invasion and proliferation. These results are complemented by functional assays using in vitro cell culture as well as in xenograft studies done in mice in vivo. In conclusion, these results significantly advance our understanding of the molecular role of RECQ1 in breast cancer tumorigenesis. The Mechanistic understanding of gene regulation by RECQ1 in breast cancer development and progression is important to develop better strategies for the diagnosis and treatment of breast cancer patient.

The Isolation and Characterization of Ashe, a Bacteriophage that Infects Mycobacterium smegmatis mc2 155

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Background: Bacteriophages are viruses that infect specific bacterial hosts and are unable to replicate on their own. They replicate in their hosts by hijacking the hosts cell's machinery and undergo lytic and/or lysogenic life cycles. The objective of the research was to isolate bacteriophages that infect the bacterium Mycobacterium smegmatis mc2 155. Mycobacterium smegmatis is a non-pathogenic, saprophyte bacterium that is found in soil, water, and compost. Methods: The mycobacteriophage, Ashe, was collected in a soil sample in front of Quad Residence Hall at Howard University (38.921667 N, 77.018056 W). After the phage was isolated through an enriched isolation, the phage underwent a series of plaque purification assays to ensure that a clonal phage population was generated. Following empirical testing, which determined the high titer lysate of Ashe, the phage's DNA was quantified using spectrophotometry and gel electrophoresis and characterized by completing restriction enzyme digests, transmission electron micrographs, and gene sequencing. Results and Conclusion: To determine if the phage has the ability to integrate its genome into the host's genome through lysogeny, potential lysogens will be verified through multiple rounds of streaking and patch assays. The titer of the phage lysate was 3.1 x10-9 pfu/ml. The concentration of the phage DNA was 103.6 ng/µl and the purity was 1.70. The extracted DNA is currently being annotated and blasted to find similarities between proteins of other phages in order to determine its associated functions.

Motor-Driven (passage) Cycling on Cerebral Blood Flow and Mood Response

Presenter's Name: Imani Boykin
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Coauthors: Krishna Kumar

Effects from active and passive exercise are known to alter cerebral blood flow (CBF). Unlike active exercise, which is proven to manipulate cognitive function, the effect of passive exercise on cognitive function or mood response is still unidentified. The objective of this pilot study was to determine if the CBF and mood response of passive exercise and unloaded active exercise was significantly different. Data was collected from five volunteers (4 males, 1 female; mean age, 21.8+/-0.86yr). Each volunteer was instructed to complete one session of passive exercise followed by a session of unloaded active exercise. Measurements were extracted from the Pioneer transcranial 2020 Doppler for CBF, Max II Phiso-dyne metabolic cart for oxygen uptake, and the Capnomic II for the end tidal CO2. In addition, thirty minutes cycling of lower extremities active work and passive manipulation was completed on the MOTOmed, and a 65 items profile on mood state assessment of cognitive function was used on completion of the volunteers' active and passive cycling series. The peak CBF during active exercise (mean 86.6+/-12.8) was higher than that during passive exercise (mean 79.2+/-13.7), but not significant (P=0.6, paired t-test). Nonessential differences of the mood response between passive (mean 3.2+/-8.9) and active exercise (mean 21.8+/-11) were not significant (P=0.3, paired t-test). End tidal CO2 following passive (mean 3.9+/-0.2) and active (mean 4.0+/-0.2) exercise produced an insignificant statistical difference (P=0.4, paired t-test). In conclusion, lower extremities unloaded active and passive exercise demonstrate an insignificant difference in their CBF and mood response.

Characterizing vet expression in Caenorhabditis elegans utilizing RNA in situ hybridization of dissected gonads and a GFP reporter strain

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An essential aspect of embryogenesis in all species is the activation of the embryonic genome after an initial period of

embryonic transcriptional quiescence, a process termed Embryonic Gene Activation (EGA). EGA is characterized by the transcriptional activation of early embryonic mRNA transcripts. In the nematode Caenorhabditis elegans, the first zygotically transcribed genes appear in the 4-cell embryo and are the very early transcript (vet) genes: vet-1, vet-4, and vet-6. Our laboratory's previous work demonstrated that RNAi depletion of WEE-1.3, an inhibitory kinase of meiosis, causes precocious oocyte maturation and the WEE-1.3-depleted gonads exhibited higher mRNA levels of vet-1 and vet-4 than control-depleted gonads. This suggests that the gonads might be undergoing precocious EGA. However, it remains unknown exactly where in the gonad of the WEE-1.3-depleted animals the vet genes are expressed. The goal of our research is to identify the spatial expression pattern of vet-1, vet-4, and vet-6 in wee-1.3(RNAi) gonads through in situ hybridization (ISH) experiments. We hypothesize that vet expression will be in the precocious oocytes of the wee-1.3(RNAi) animals. Currently we have generated RNA probes to wee-1.3, vet-1, vet-4 and vet-6. We are in the process of performing ISH utilizing the probes on dissected gonads from control-depleted and WEE-1.3-depleted animals. Utilizing a VET-4::GFP reporter strain, we will show that the VET-4 protein is not observed in the precocious oocytes of WEE-1.3-depleted animals. Combined our experiments will provide us with a deeper characterization of very early transcripts and the effects of their expression in relation to wee-1.3.

Sequencing and Annotating of *Phage Labreaux* host specific to the host bacterium *Mycobacterium Smegmatis*

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Mycobacterium Smegmatis MC2 155 is a bacterium belonging to the genus Mycobacterium. *Mycobacterium Smegmatis* shares most of the same behavior and traits with *Mycobacterium Tuberculosis*, which is beneficial to biomedical research. *M.smeg* is used for laboratory experiments as an alternative to *M.tuberculosis* because it is too dangerous to humans. For our experiments, we collected a soil sample and enriched to get a phage filtrate from the soil which was spot tested against *Mycobacterium Smegmatis*. The putative phage from the plaque was purified multiple rounds using serial dilution followed with high and medium titer lysate. Phage Labreaux DNA was isolated using a regular procedure, and the concentration and purity determined before proceeding with restriction enzyme digest. *Labreaux* sample from the filtrate was prepared for electron microscopy to determine the size and shape of *Labreaux*. We are now working to characterize our phages through DNA sequencing and annotation. My particular phage, *Labreaux*, was a lytic phage, but it was not sequenced because our class chose to share the phage *Cactojaque*. After DNA sequencing of *Cactojaque*, we learned that it is a part of the C1 cluster, it has 229 genes and over 150,000 nucleotides. We are now in the process of annotating *Cactojaque* on DNA Master and PECAAN software. The annotation will allow us to determine the function of every protein present in the phage. This step is one of the tools to characterize *Cactojaque* apart from other techniques we use. While characterizing *Cactojaque*, we are also comparing our phage to other annotated phages from the database to find similarities and differences. In conclusion, these experiments will further our knowledge of phages and their role in science. Phages are beneficial to biomedical research in terms of phage therapy, epidemiology, phage diversity, and molecular contributions and our newly discovered phages will have.

A Look at the Isolation and Analysis of Jellybean114 Bacteriophage

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Background: Bacteriophages (Phages) are viruses that infect bacterial host. Phages inhabit the same areas that bacteria are found, and bacteria are found everywhere in our world. Phages are dependent on a host bacterium for reproduction and survival. The host bacteria used in the Howard University labs is Mycobacterium smegmatis mc2155, because it is closely related to another virulent microbial organism such as Mycobacterium tuberculosis. Methods and Results: The goal of this study is to discover phages that has the unique ability to infect M. smegmatis. The researcher collected a soil sample on Howard's campus (38°55'18"N, 77°01'05"W, 229ft). Isolation required multiple spot tests and plaque assays to obtain one phage. A phage titer for Jellybean114 was calculated to be 3.3 x 108. A DNA extraction was performed and produced a concentration of 113.2ng. Next, gel electrophoresis was performed to gain a better understanding of the phage's DNA size and approximate weight. Restriction enzyme digest produced one division. Currently, Jellybean114 is being analyzed by various microbial techniques to determine if it is a lytic or lysogenic bacteriophage. Results thus far, have shown that Jellybean114 is most likely a lysogeny phage. This is due to the presence of mesa plaques on the initial spot test. Conclusion: This research should lead towards better understanding of treatment for bacterial infections and genome sequencing. Annotation of the phage will be helpful in determining functions of any of the genes of the phage, and its usefulness.

Genetic mapping and immunological profiling of red blood cell alloimmunization in adults with sickle cell disease

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Sickle cell disease (SCD) is the most common genetic disease in the United States, affecting 100,000 people. One treatment modality for sickle cell disease (SCD) is red blood cell transfusion therapy. A major complication of transfusion therapy in SCD patients is alloimmunization to red blood cell minor blood group antigens of donor cells, which limits use of this therapy. In the general population, red blood cell alloimmunization is rare, however, its prevalence is significantly higher, affecting 30% of individuals with sickle cell disease. The mechanism by which this occurs has not been identified, but genetic susceptibility has been proposed. We hypothesized that the biologic basis for this phenomenon may involve population differences and that admixture mapping, immunological profiling and gene expression profiling could identify susceptibility loci. We have used regression analysis, genome wide admixture mapping, and genetic enrichment analysis approaches to test this hypothesis. The prevalence of red cell alloimmunization was 27.6% in the tested cohort. Regression analysis identified an Amerindian ancestry association, which suggests further evidence for a genetic component to alloimmunization. Genome wide admixture mapping identified a strong association at chromosome 5q21.3-5q31.1, containing 209 genes and 4 microRNAs. Preliminary pathway analysis of genes within this region further suggests involvement in hematopoiesis and the immune response. Future strategies include immunological and gene expression profiling to fine map alloimmunization susceptibility variants within specific genes that underlies this association with chromosome 5.

Identification and Characterization of Mycobacteriophage Kbreezy from the Environment

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A bacteriophage is a virus that infects bacteria and replicates within the bacteria. Bacteriophages are ubiquitous in soil, water, and several food products. There are two types of bacteriophages: lytic, which is virulent, and temperate. The "virulent" and "temperate" phages differ in their mode of action. A lytic bacteriophage only goes through the lytic cycle, but temperate phages integrate their genetic material into the chromosome of the host cell, which replicates along with the host cell genome (prophage). There is a need to study bacteriophages for their vast role in medicine and molecular biology applications. Mycobacteriophages have been used in phage therapy, in epidemiology as phage typing, and development of antibiotics. Mycobacteriophage Kbreezy was isolated from an enriched soil sample collected from the valley on Howard University's campus. A spot test was done using the bacteriophage filtrate against Mycobacterium smegmatis Mc^2, and the clear plaques result indicated that Kbreezy is a lytic mycobacteriophage. The mycobacteriophage putative plaques were purified further using subsequent titration and medium/high titer lysates (MTL/HTL) with plaque forming units (8.3 x 1010 pfu/ml) were collected. DNA of Kbreezy was isolated using a Promega kit, and the purity and concentration (60.9 ng/ul) of the DNA was checked using NanoDrop and gel electrophoresis before proceeding to restriction enzyme digest and sequencing for further characterization of Kbreezy. The future studies on mycobacteriophage Kbreezy will be sequencing for annotation of the genes, transmission electron microscopy to identify the size and morphology, and few molecular biologies works like PCR.

Group Housing of Male Mice Causes a Significant Decrease in Day to Night Time Mean Arterial Pressure Change and is Indicative of Hypertension and Cardiovascular Disease

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Changes in day - night time mean arterial pressure (MAP) predicts hypertension and cardiovascular diseases. When there is a decrease in day to night time MAP changes, the chances of hypertension and cardiovascular diseases increase significantly. Our hypothesis is that socialization of male mice causes a decrease in the day to night time changes in MAP and heart rate (HR). Male mice, 6 – 8 weeks of age, were implanted with a biotelemetry device from Data Sciences (male mouse in a single cage) or TSE (multiple male mice in a single cage). Day and Night MAP for Data Science mice were 131 +/- 0.5 and 157 +/- 1.5 mmHg, respectively. Day and Night MAP for TSE mice were 114 +/- 7.0 and 124 +/- 3.6 mmHg, respectively. The change in day and night MAP were 26 +/- 2.2 mmHg in Data Science and 8.4 +/- 4.0 mmHg in TSE mice. Day and Night time HR for Data Science mice were 482 +/- 6 bpm and 505 +/- 5.4, respectively. The change in day and night time HR were 36 +/- 6 mmHg in Data Science and 51 +/- 12 bpm in TSE mice . Data Science mice had a higher MAP than TSE mice, the change in day to night time MAP was less than TSE mice. Therefore, socialization of mice decreas-

es day to night change in MAP and are indicative of hypertension and cardiovascular diseases.

The Quest for a West Nile Virus Vaccine

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West Nile Virus is a mosquito-borne neuropathogen from the Flavivirus genus that is widely distributed throughout the world and is naturally maintained by an avian-mosquito life cycle. It was first isolated in 1937 from a Ugandan woman's blood. West Nile Virus' greatest human impact occurred in 1999 when there was an outbreak in New York City. That led to the deaths of seven infected individuals. West Nile Virus is known to cause meningitis, poliomyelitis, and encephalitis in severe cases. There is currently no vaccine for this virus, so only the symptoms of infected individuals can be treated. This research paper serves to outline the steps taken to build a full-length clone of the virus' genome. This is the first stage in a project that aims to create a vaccine for West Nile Virus. This vaccine will contain a mutated genome of the virus so that it cannot grow in mammalian cells, but still possess the antigen needed to stimulate an immune response in humans. This ensures that the vaccine is safe and reliable, and the use of insect cells in its creation ensures that the vaccine will be affordable.

Isolation and Characterization of Bacteriophage Esther

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Background: Bacteriophages (Phages), viruses that infect and reproduce within a host bacterium, have been the basis for the study of viral functionality since their discovery. Interest in bacteriophages has risen as the population multi-antibiotic-resistant bacteria increases. Phages, which can be found in any environment where there are bacteria, not only have their benefits in the medical world, they have long since been apart of carbon cycling in the ocean. The goal of the project is to isolate a phage that infects Mycobacterium smegmatis mc2155. Methods and results: Bacteriophage Esther was isolated from the soil sample in front of Howard University's Ernest Just Hall Building (38.9216667N, -77.018333W). The phage particles were amplified through enrichment and purified from other possible components found in the soil sample (i.e bacteria and other microorganisms). Bacteriophage Esther was then isolated from other phages through plaque assays. Once Esther was isolated a high-titer lysate was achieved and the titer was calculated (2.08 x 108 pfu/ml). DNA extraction experiment was performed, and the concentration was 95.2 ng/µLs. DNA was used for gel electrophoresis and a restriction digestion was performed on the phage. Testing for lysogeny using plaque assays and streaking demonstrated no lysogenic phase for phage Esther. Conclusion: Since the phage was determined to have no lysogenic life cycle, no further experiments will be done on this phage. Phage Synergy X will be used for all further experiments.

From bank to bedside - Neutrophil extracellular traps and Type 1 Interferons contribute to immune dysregulation in Hidradenitis Suppurativa

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Hidradenitis suppurativa (HS), is a skin disorder of unknown etiology manifested as abscess-like nodules resulting in tissue scarring as it progresses from Hurley Stage I to III. Given that neutrophils are the predominant leukocyte infiltrate in HS lesions, the role of neutrophil extracellular traps (NETs) in the induction of local and systemic immune dysregulation in this disease was examined. Immunofluorescence microscopy was performed in HS lesions and detected the prominent presence of NETs. Elevated NET complexes significantly correlated with disease severity. HS peripheral blood neutrophils also displayed enhanced spontaneous NET formation when compared to healthy control neutrophils. Sera from HS patients recognized antigens present in NETs while total IgG was significantly elevated. Furthermore, HS patients were found to display positivity to antibodies to citrullinated peptides. Tissue analysis demonstrated that peptidylarginine deiminases (PADs) 1-4, enzymes involved in citrullination, were differentially expressed in HS tissue when compared to controls. In addition, HS tissue displayed co-existence of NETs with plasmacytoid dendritic cells in association with an elevated type I interferon (IFN) gene signature and activation of key regulators of the IFN pathway, such as IRF3 and IRF7, in HS lesions. These data underlie an unreported aspect of neutrophils in the pathogenesis of HS, whereby enhanced

NET formation and immune responses to neutrophil and NET-related antigens may promote immune dysregulation and contribute to inflammation. This, along with evidence of tissue upregulation of the type I IFN pathway, suggests that these components of the innate immune system may play important pathogenic roles in

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Aniella

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Mycobacterium smegmatis (mc2155) is a nonpathogenic species of Actinobacteria that replicates quickly and is commonly found within the environment. Because this species serves as a host for a wide variety of different phages and is not pathogenic to humans, it's used in the lab to study bacteriophages. The ability of bacteriophages to attach to a specific host and take over the DNA replication machinery of the cell and in the end lyse the cell makes them eligible candidates for scientific studies. Different bacteriophages are being studied to determine their effectiveness in combating the antibiotic resistant of bacteria in the medical field. The phage Aniella, collected from The Yard on campus at Howard University at 38.9227 N, 77.0209 W, was taken to the lab to be isolated through its enrichment. Once the phage was isolated, the phage was purified through rounds of serial dilutions, spot tests, and plaque assays. After purification, a webbed plate was produced and flooded to produce a medium titer lysate for which a titer and a Pfumaxweb were calculated and empirical testing was performed to generate a High Titer Lysate (HTL).The calculated titer was 7.1 x 108 pfu/mL. The HTL was used to extract the phage DNA which was then characterized by a spectrometer, restriction enzyme digest, gel electrophoresis, and visualized using Transmission Electron Microscopy (TEM). Aniella was found to have a valid DNA concentration of 67.7 ng/ uL when it ran on the gel, making it eligible to be sequenced.

Extraction of Bacteriophage Gracie

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Background: Mycobacterium smegmatis mc2 155 is a mycobacterium and the one we used throughout our experiment in isolation the phages we found. Mycobacterium smegmatis a species that makes up the genus of mycobacterium. Other species of mycobacterium are M. tuberculosis and M. leprae. M. smegmatis is mostly found in environmental samples like soil. We can use the samples to study the phages and how they can help with antibiotic resistance. It can also help in understanding the diversity of phages. Methodology: On September 17th, the soil sample was collected outside of the social work building. The coordinates from where the sample was collected are 38.931223 N -77.017454 W. It was 76 degrees outside. The sample was collected 3 inches into the ground and was mostly dry. It then underwent spot tests, purification assays and serial dilutions to get a high titer lysate and calculate the titer. It wasn't sequenced but it went through gel electrophoresis using DNA, restriction enzyme digestion and transition electron microscopy. Currently, we are working to see if it is lysogenic or lytic. Results/ Conclusions :From the beginning, Gracie was a difficult phage and it took a lot of purification assays to isolate phages or like morphology.The phage Gracie produced small plaques all throughout the experiments. It produced plaques of 1 mm i diameter and the titer was 3.5 x 109 pfu/mL. Gracie has not been annotated. Its HTL titer calvulaton is 4.7 x 109 pfu/mL.

Characterization of Delaneub, A Phage Isolated From Soil Collected on Howard University's Campus

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Bacteriophages are viruses that infect bacterial hosts specific to that type of phage. The overall objective of this experiment was to isolate and study phages specific to Mycobacterium smegmatis mc2155. The phage Delaneub was isolated from soil at the Howard University School of Social Work (38.55.22 N, 77.1.17 W). After multiple rounds of purification, followed by empirical testing, a high titer lysate was generated with titer 3.9 × 108 pfu/mL. Delaneub's plaques had an average diameter of 6.3 mm. Based on the plaques that were produced from multiple rounds of purification, this is lytic phage. Similarly, the HTL was used for archiving and the preparation of DNA. DNA concentration levels and purity were determined using Nanodrop and gel electrophoresis. The Nanodrop showed that the nucleic acid was 15.5 ng/µl with A260/280 ratio of 2.0. Further studies are underway to determine whether this phage can illicit lysogen formation. Additional data is being generated for Delaneub.

Isolation of Phage Bananafish, a Mycobacterium Discovered on Howard University Campus

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The Science Education Alliance: Phage Hunters Advancing Genomic and Evolutionary Science (SEA-PHAGES) program focuses on discovering phages to contribute to an Actinobacteriophage database. A bacteriophage, which can be lytic or lysogenic, is a virus that infects bacteria. The lysogen, a bacterium that contains a prophage, replicates and lyses when an induction event occurs, which releases phages for further infection. Research on phages advances progress in phage therapy, which focuses on utilizing phages to kill bacterial cells. A phage population was isolated from a soil sample via enrichment and plaque assays. Spot titers and full-plate titers were performed, and lysates were collected by flooding webbed plates. Meseas, or overgrowths of bacterial cells surrounded by zones of clearing, indicate the existence of temperate phages, while clear plaques, or clearings, are indicative of lytic phages in agar plates. The DNA of the phage Bananafish was extracted and sequenced for further characterization. The phage Bananafish has a Siphoviridae morphotype and a lysate titer of 3.0 x 10^12 pfu/ml according to spot titer. Illumina Sequencing indicates that Bananafish is in Subcluster B2 and is a lytic phage. The concentration of the sample of DNA was 110.17 ng/µl according to a Nanodrop spectrophotometer. Bananafish produces clear plaques and is supported as a lytic phage according to Illumina Sequencing. Thus, no mesas and lysogens were produced. Future experimentation will focus on determining the phage Onyinye's ability to superinfect other phages' lysogens and annotating Bananafish using bioanalytics tools.

Discovery, Isolation, and Characterization of bacteriophage, Harold11

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Through SEA-PHAGES, Howard University students are able to study bacteriophages. Bacteriophages or phages are special viruses that infect only bacteria cells. The use of phage therapymakes the study of phages important. Bacteria have evolved to be resistant to antibiotics, making themharder to kill. But because phages infect a specific bacteria cell, phages can be used an alternative methodof treatment. A soil sample was collected from the side of Carnegie Building on the Yard of Howard's campus at. After enrichment isolation, serial dilutions were performed in order to isolate one singlepopulation of phage particles, using Mycobacterium smegmatis mc^2 155 as a host cell. Following serial dilutions and single phage population is isolated, the phage DNA was extracted and analyzed using aspectrophotometer and gel electrophoresis to characterize the phage further. The titer of Harold11 was calculated to be 7.0x10^11 pfu/mL by a spot titer. Using a Nanodrop spectrophotometer, the average concentration of DNA was 132.4 ng/µl. Harold11 was concluded to be a lytic phage because it produced clear plaques and no mesas formed on the spot test; Therefore, Harold11 cannot produce any lysogens. Future directions include creating a lysogen from a temperate phage, which will be used to test the sensitivity of a phage.

Can Improved Access to Neuroimaging Help Decrease Disparities in Stroke Treatment?

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BACKGROUND: New stroke guidelines highlight radiology's crucial role in triaging patients into different treatment pathways, which can significantly impact treatment outcome. As with many other aspects of medicine, there are racial, insurance, and community/geographic based disparities in imaging utilization, treatment, and outcome of stroke patients. The study's goal is to review current stroke treatment disparities and address the potential role of radiology and neuroimaging in improving a more universal access to appropriate treatment. METHODS: A review of the world literature was conducted to identify racial, insurance, and community/geographic based disparities in access to neuroimaging and subsequent treatment and identify how healthcare systems address this disparity. National Stroke triage and treatment recommendations were reviewed as to ease of integration, implementation, and use. A review was also conducted about access to advanced neuroimaging in the emergency depart-

ment and its downstream impact on access to stroke care. RESULTS: African-Americans, uninsured, or rural patients were less likely to receive appropriate neuroimaging and care compared to those who were white, insured, or lived in urban communities. African-Americans' door-to-CT time (≤ 25 minutes) was lower than whites' (OR= 0.85), uninsured patients received fewer MRIs (OR = 0.77) compared to insured patients, and rural hospitals' tissue plasminogen activator (tPA) usage was one-fourth of urban hospitals. CONCLUSION: The time-to-radiology and the appropriate neuroimaging significantly influence the triaging of stroke patients. More work needs to be done to guarantee access to appropriate neuroimaging and subsequent stroke treatment independent of racial, insurance, and community/geographic based disparities.

Lower Socioeconomic Status May Increase the Risk of Pediatric Osteomyelitis

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Recent epidemiological analysis of pediatric osteomyelitis in the United States suggests that both non-white patients and children who reside in areas of lower socioeconomic status are more likely to be hospitalized for osteomyelitis. Methods: The New York Statewide Planning and Research Cooperative System (SPARCS) database was used to identify all patients ages 0-18 who were discharged from a hospital in New York State with a diagnosis of osteomyelitis between 2004 -2013. The 50 zip codes with the highest incidence of osteomyelitis were selected for further analysis. Socioeconomic status (SES), quantified using median household income, and population density in Zip Code Tabulation Areas (ZCTAs) were gathered from the 2010 census. Results: The top 50 zip codes with the highest rates of osteomyelitis accounted for 2202 of the 6791 pediatric patients treated for osteomyelitis. Of these studied patients, 60.7% were male. Although children under the age of 1 accounted for 8.0% of cases, 40.9% of cases were observed in children ages 12-18 years old. Non-white patients accounted for 56.5% of cases, and the largest proportion (24.1%) of these patients identified as black. Increased incidence of osteomyelitis was correlated with increased population density (R = 0.3653, p = 0.008). Higher SES was associated with decreased incidence of osteomyelitis (R = -0.4223, p = 0.002). Discussion and Conclusion: Pediatric patients residing in zip codes of with lower SES and higher population density exhibit higher rates of osteomyelitis.

Geospatial distributions of trace metals found in 17th and 18th Century New York African Burial Ground grave soil samples using XRF technology

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The W. Montague Cobb Research laboratory at Howard University currently houses a collection of New York African Burial Ground (NYABG) soil samples. It consists of 92 samples derived from 59- cadaver associated burials interred during the 17th and 18th centuries in lower Manhattan. In this study, we undertake trace metal and geospatial analyses to explore the range of factors that influence the lifestyles and the environmental factors of this historic NYABG population. X-ray fluorescence (XRF), a non-destructive, semi-quantitative technology allows us to identify between 15 and 19 elements per sample. Due to limitations of control data or standard reference material we confidently report findings for calcium, strontium, arsenic, zinc, and copper. Combinations of these elements further our understanding of West African cultural practices, diets, and local 18th century pottery factories. Our data show elevated levels of strontium (>7x) in burial samples potentially indicating a heavy vegetative diet of individuals. The observed decrease in copper concentrations as depth increases (R2= 0.703) suggests the source is a post burial contaminant. We also see prominent trendlines in copper, arsenic and zinc concentrations which can be discerned using our geospatial data. With geographical information systems (GIS) we determine the importance of increased concentrations in cluster burials and increasing/ decreasing trends across the burial ground site. Typically, XRF is used in archaeological research, making this work the first of its kind to use the technology to support human existence in burial soil. Here, we aim to introduce the effective use of XRF in bioanthropological studies.

Bone Density of Aquatic and Semiaquatic Animals Correlates to their Ecological and Dietary Specializations

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Variation of bone density is one critical adaptation of animals reintroduced to an aquatic environment. Marine mammals and marine reptiles exhibit changes in bone density

that correlate to their habitat (ecological niche) and dietary specializations. Increased bone density (either pachyostosis, osteosclerosis, or pachyosteosclerosis) occurred early in the transition of terrestrial taxa to marine environments. Early cetaceans and sirenians exhibited these adaptive features and retained many terrestrial characters (hind limbs) and behaviors (paddle swimming). Increased bone density is a more energetically efficient hydrostatic mechanism for buoyancy for marine mammals with enlarged lungs. Taxa became more specialized for marine environments both morphologically (evolving fins, flippers, and flukes) and behaviorally (evolving an oscillating swimming mechanism), with bone density correlating with their ecological niche. Modern sirenians retain increased bone density, allowing these large-sized mammals to remain submerged in shallow waters to feed on sea grasses. The bone density in modern cetaceans became more osteoporotic, allowing them to dive deeper and swim faster. Pinnipeds live in a wide range of habitats (from cold to warm waters) and demonstrate varying feeding mechanisms, ranging from filter feeding to bottom feeding to catching fast prey. Bone density is one vital character that can be used to predict the specific ecological niche and feeding preference for pinnipeds. Some early hominids have been shown to have an increase in bone density. Heavier bones would make it easier for early Homo to hunt in waters for littoral food sources and would compensate for the lack of stability from bipedalism.

Analyzing the Relationship between Diet and Mood among Howard University Students

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In the past few decades, mental health has become an increasingly widespread topic of discussion. Mental health is defined as an individual's emotional, psychological, and social well-being. Another massive national discussion centers around food: how much of it should we eat? What kinds are best for optimizing our health? Between the meat-based Paleo and Atkins diets and the plant-based vegan and vegetarian diets, Americans are being bombarded with conflicting information and a dilemma of overchoice. This research paper seeks to explore the relationship between diet and health; more specifically, the relationship between diet and mental health/mood. This research question takes a more holistic approach by comparing three diet groups among the students on campus: 1) the plant-based vegan group, 2) the ketogenic/paleo group, and 3) the unrestricted diet group, which will include those that do not limit or restrict any food items, such as gluten, meat, and dairy products. A survey-style research method will compare the overall emotional well-being of the students within these groups. This method hopes to draw useful conclusions based on which group reports the highest level of well-being in health and mood. This investigation of certain diets effects on mental health is a small, but significant step in the right direction towards understanding nutrition as Americans and just how much food affects mood.

Impact of Duration of Physical Activity on Glycated Hemoglobin (A1C) in Adults with Type 2 Diabetes Mellitus

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Introduction: Diabetes is among the leading causes of death in the US. Although an A1C level of ≤ 7% has been associated with fewer microvascular complications, this level may be difficult to achieve. Strong evidence suggests an inverse association between frequency, intensity, time, and type of physical activity (PA) and risk of disease progression among adults with type 2 diabetes mellitus (T2DM). However, research is not abundant particularly regarding duration of PA in relation to A1C. Objective: This review aims to explore the available literature and identify the effect that duration (number of weeks) of PA has on the reduction of A1C. Methods: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards guided our systematic review. We searched research databases including PubMed and Cochrane, from January 2010 to present for peer-reviewed articles involving human, adult subjects with T2DM, male and female. PA interventions at minimum: three days/week, moderate intensity,150 minutes/week, and combination aerobic and resistance-type exercise were reviewed. Results: The initial search yielded 1104 articles. After applying filters, and screening protocols, thirty studies met the selection criteria. The majority of the studies were randomized control trials, reporting an inverse relationship between duration of PA and A1C. We found an average reduction of 0.4 to 1% among participants involved in approximately 26 weeks of PA compared to shorter durations. Conclusions: Preliminary results indicate that PA exerts a cumulative effect on A1C and should be considered as an effective adjunct therapy for achieving and maintaining A1C targets.

Development and Nicotine Regulation of α7-containing nAChRs in Respiratory Centers of the Brainstem

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Nicotinic acetylcholine receptors (nAChRs) are abundantly expressed in respiratory neurons within the caudal dorsomedial medulla (CDMM), the lateral tegmentum of the pons (LTP) and the ventrolateral medulla (VLM) in the rat brainstem. In particular, α7-containing receptors are expressed in respiratory neurons and mediate excitatory neurotransmission in these areas. This study examined if prenatal nicotine exposure regulation the levels α7 or α7-containing receptor expression and distribution in the three major respiratory control centers of the brainstem throughout development. We used western blot analysis to determine the levels of expression of the receptors and receptor binding autoradiography with [125I]®bungarotoxin ([125I]®BTX)to determine their distribution and gather a site specific semi-quantitative measurement of the amount of receptors present in each area in adjacent slices. During development there was a distinct region and age-dependent increase of [125I]®BTX sites in all three respiratory control areas. [125I]®BTX binding was confined to the medial and lateral parabrachial nuclei of the LTP, the rostral area compacta of the nucleus ambiguus in the VLM, the ventral nucleus of the tractus solitarius (NTS) and dorsal motor nucleus of the vagus (DMV) in the CDMM. In summary, prenatal nicotine exposure had no significant long-term effect on the levels of expression of the α7 or on the α7-containing receptors in any of the regions examined compared to previous studies showing α4-containing receptors are upregulated.

Exploring the life of Davis, a Bacteriophage isolated from soil

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The SEA-PHAGES program has been exploring the Actinobacteriophage population and discovering the evolutionary mechanisms that gave rise to the diverse array of viruses. The platform has two primary components: the isolation, purification, and amplification of new phages. The new phages were isolated from soil taken from the Yard at Howard University (38.919664 N, 77.018667) using the bacterial host Myobacterium smegmatis mc 2 155. Subsequently, empirical testing was used to generate a medium and high titer lysate. DNA was extracted from the HTL, quantified using Nanodrop and the stability and purity evaluated using electrophoresis. DNA was further characterized using restriction enzyme digest in order to cut phage genome into multiple fragments based on DNA sequence. Davis produced plaques sized 0.42 mm in diameter with a HTL titer of 2.3 × 10 7 pfu/mL. Phage Davis did not produce lysogens. This was confirmed by using a patch assay, so the phage is therefore a lytic phage.

Presence of Rib Notching as an Indicator of Cardiovascular Disease in a historic African American skeletal population

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Cardiovascular diseases (CVD) are responsible for over 17.3 million deaths per year and are among the leading causes of death in the world. A plethora of scientific findings portray African Americans with the highest rates of CVD in comparison with any other racial/ethnic group in the United States. Associated with a wide range of congenital and chronic cardiac disorders, rib notching is a pathognomonic diagnostic marker used in today's medical practice. Unfortunately, rib notching has not been studied in a human skeletal collection, and furthermore, a historical African American (AA) collection. This presents a unique opportunity to evaluate rib notching in the Cobb Collection (CC), originally comprised of 987 de-fleshed human cadavers donated between 1931 and 1965. The historical context, combined with preliminary analysis of the clinical records on these individuals indicates a stress intensive lifestyle that imposed CVD risk factors. A strong link between CVD and rib notching is portrayed from the results of this study. This study also provides a significant advantage in improving the inventory of literature on AA and on the subject of rib notching in addition to informing clinicians and advancing personalized medical treatments geared towards treating CVD in AA.

The Impact of Obesity on Injury Severity and Outcomes in Penetrating Abdominal Trauma

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BACKGROUND: Multiple studies have investigated the association between body mass index (BMI) and the severity of injuries following blunt trauma. However, the studies on the association of BMI on abdominal penetrating trauma patients are limited by modest sample sizes and single-institution experiences. The aim of our study is to evaluate this relationship using a nationwide sample. METHODS: Retrospective data was retrieved from the National Trauma Data Bank (2013-2015). Patients included were those with penetrating abdominal trauma, stratified by BMI status (<18.5, 18.5-24.9, 25-29.9, 30-39.9, >40). We defined injury severity using the abdomen abbreviated injury scale (AIS). Complications and mortality were the outcomes measured. To adjust for patient characteristics, multivariable regressions models were completed. RESULTS: We included 22,110 patients with BMI information who had abdominal penetrating trauma. With increasing BMI, there was a decrease in injury severity (AIS ≥ 3) in both, gunshot wound (GSW) (60.38, 51.70, 52.70, 50.44, 48.13) (p 0.001) and stab wound (SW) (26.36, 27.23, 26.9, 23.06, 20.87) (p < 0.001). Nonetheless, it also showed increased complications and mortality with increasing BMI. CONCLUSIONS: Increased BMI appears to be associated with lower injury severity in SW victims; nonetheless, there is an increase morbidity and mortality in morbidly obese patients across all penetrating abdominal injuries. Understanding the anatomical differences and altered physiologic response to injury in morbidly obese individuals is key for their optimal management.

The characterization of Browshid, a lytic phage which infects Mycobacterium smegmatis mc2155

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Bacteriophages, also known as phages, are viruses that infect bacteria. In this study, the Mycobacterium smegmatis mc2155 was identified as a host for phage Browshid, a phage isolated from soil. The soil sample was collected (6 inches) under a small tree in front of the Social Work Building on Howard University's campus (38°55'22"N, 77°1'17"W). The sample was diluted, filtered and enriched at 30°C, 120 rpm for 2 h. A supernatant was then collected, serially diluted, and plated using the double agar plate method. The phage was purified to show consistent morphology of the plaques. These plaques were lytic, round with diameter of 90 mm. Empirical testing was used to prepare a medium and high titer lysate. The titer of the HTL was 1.0 × 109 pfu/mL and it was used for DNA extraction and quantification, restriction enzyme digest and gel electrophoresis. Browshid was archived and added to phagesdb. Browshid is currently being utilized for immunity testing. Browshid has the potential of being used to fight antibiotic resistant bacteria.

In Silico Analysis of SIRT1 Genetic Polymorphisms And Its Potential Role in Inflammatory Response

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Introduction: Inflammation is crucial in the body's immune response, and has been shown to increase susceptibility to disease. SIRT1, located on chromosome 10 of human sirtuins, modulates proteins that function as inflammation regulators such as NF kB transcription factor. In-Silico analysis helps to identify SNPs in candidate genes implicated in health and disease. The goal of this research is to implement bioinformatics tools to identify SNPs in the SIRT1 gene and determine the largest differences in allele distribution between African-American (AA) and European American (EA) populations which can be an ideal target for further studies. Methods: In Silico analyses were used to identify differences between allele frequencies in both populations. 1000 Genome Browser, was used to identify all SNPs in the SIRT1 gene, while NCBI Gene Viewer and the University of California Santa Cruz Genome Browser, both identified the functionality and location of the SNPs. Genes that were missense, synonymous, or exonic, with allele frequencies between 0.30-0.50, were considered when identifying region chr10:67874669..67928390 in the UCSC Genome Browser. Results/Conclusion: In Silico analysis within UCSC Genome Browser database, yielded no significant allele frequency differences found within the exonic region of the chromosome. However, a significant allele frequency difference of 0.7 was found within the coding-synonymous SNP rs2273773. In using the 1000 Genome Browser, two intronic SNPs, rs35620729 and rs1467568, held differences in allele frequencies of 0.62 when compared in AA and EA. These SNPs should be considered candidates in causing disease related to inflammation and association in health disparities.

Isolation, Purification, and Characterization of Phage Madea, a Mycobacteriophage Discovered at Howard University

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Over time, diseases have become immune to antibiotics. Scientists have tried to figure out new pathways to controlling and ultimately terminating antibiotic resistant bacteria. At Howard University, undergraduates are conducting research on phages as a way to tackle this problem. The bacteria being studied is Mycobacterium smegmatis Mc^2 155 because it is closely related to tuberculosis. Phages were collected from soil samples under a tree East of College Hall North, a dormitory on the campus of Howard University. The phage was first isolated, purified multiple times, then characterized in order to create a genetic fingerprint that could be used to compare to other genomes in the database. The last step was DNA extraction in which sequencing and gel electrophoresis was used. As of now, we have only characterized the phage numerically and as temperate. For further experimentation, tests must be conducted to create lysogens to continue its characterization. Results of this experiment will benefit scientists in understanding antibiotic resistant bacteria.

Investigation of bacterial DNA from New York African Burial Ground Soil Samples to explore evidence of cardiovascular disease

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Advancements in genomics research, along with the understanding of the genetic history of African Americans have been hindered due to 400 years of slavery in America. Significant representation of genomic data of African descended peoples has yet to be acquired and deciphered as a result of the Transatlantic slave trade, yet we are working to combat this issue at Howard University. In 1991, the W. Montague Cobb Research Laboratory analyzed skeletal remains of The New York African Burial Ground (NYABG), over 400 samples of 17th century enslaved and rebel African Americans that were discovered in an unmarked cemetery present day Manhattan. Research is currently conducted on 74-cadaver associated soil samples in an effort to extract, analyze, and sequence via next generation sequencing bacterial DNA exploring bacterial diversity of 16S rRNA gene in the samples. Currently, bacterial DNA found in these samples has been successfully extracted, isolated, and analyzed through the use of the Qiagen DNeasy Powersoil Kit and the Mothur software. The aim of this study is to investigate sequenced bacterial DNA showing evidence of cardiovascular disease in 17th century African Americans. The identification of bacteria, Facklamia hominis, Enterobacteriaceae, and Bacteroidetes related to cardiovascular disease research will further help us gain knowledge of the genetic variation of these individuals and will ultimately increase the number of African American microbiome profiles for inclusion into reference databases. The data obtained from this study could potentially provide valuable insight into the evolution of heart health disparities among African Americans throughout time.

Correcting measures of heart rate variability for the confounding effects of heart rate

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Heart period variability, commonly known called heart rate variability (HRV), refers to fluctuations in the length of this time between heart beats. A host of indices of HRV are used as indices of changes in cardiac parasympathetic nervous system activity. They have been linked to health outcomes and psychological processes. However, de Geus et al,(2018; http://doi.org/10.111psyp.13287) concluded that traditional indices of HRV should be "corrected" for their relationship with heart rate levels. Our study examined the relationship between corrected and uncorrected indices of HRV and resting heart rate. In addition, we studied the relationship between the corrected and uncorrected metrics and reports of perceived psychological stress. These relationships were tested in a sample of 88 clinic outpatients at Howard University Hospital. The indices of HRV were log respiratory sinus arrhythmia (logRSA) and the standard deviation of the heart period intervals (SDNN). As anticipated, the traditional measures of HRV were significantly correlated with resting heart rate levels. When each measure of HRV was corrected using the formulas provided by de Geus et al (2018) the correlations with heart rate were no longer significant. The relationships between HRV measures and measures of stress were not altered by correcting the HRV metrics. Multiple regression analyses revealed that both the traditional and corrected HRV metrics predicted perceived stress after controlling for the predictive effects of resting heart rate. Thus, the corrected values for HRV measures reduced the relationship between resting heart

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Cannabinoid Receptor-Mediated Modulation of Interneurons in the Main Olfactory Bulb

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In the main olfactory bulb, two populations of granule cells (GCs), GABAergic interneurons, can be distinguished based on their location in either the granule cell layer (GCL) or the mitral cell layer (MCL) where they are interspersed with mitral/tufted cells. Little is known about the properties of these two interneuron populations. Using anatomical and functional approaches we have explored this question with respect to endocannabinoid signaling. Our understanding of the role of cannabinoid receptor type 1 (CB1R) in olfactory processing remains limited.

Antibody staining for diacylglycerol lipase DAGL® which is responsible for the synthesis of 2® arachidonoylglycerol (2® AG), shows prominent expression in the MCL and GCL suggesting DAGL® dependent endocannabinoid signaling in these layers. Differences in the physiology of the two GC populations were evident when we compared the responses from two metabotropic glutamate receptor (mGluR) k.o. mouse strains. MCL-GCs in slices from mGluR5 k.o. mice but not from mGluR1 k.o. mice responded to mGluR agonists, whereas GCL-GCs in slices from mGluR1 but not from mGluR5 k.o. mice were responsive to mGluR agonists suggesting different mGluR expression patterns. A CB1R agonist hyperpolarized GCs and made them less responsive to synaptic input, while a CB1R antagonist strongly excited GCs of both populations. These data indicate that the mGluR and endocannabinoid system can have different cellular and network effects and that endogenous release of endocannabinoids and glutamate prominently modulates the excitability and synaptic responsiveness of interneurons in the main olfactory bulb.

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Surgical Complications in Obese Patients Undergoing Hip Arthroscopy: A Propensity-Score Matched Study

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With broadening indications for hip arthroscopy and a growing rate of obesity in the United States, the incidence of the procedure has grown with a 365% increase between 2004-2009. Obesity increases the risk for an individual to develop hip disorders, and understanding how the procedure affects this population of patients is this study's prime objective. Utilizing the American College of Surgeons National Surgical Quality Improvement Program database to access data on patients undergoing hip arthroscopy at over 600 hospitals across the nation, a retrospective review was conducted from January 1, 2008 to December 31, 2016. Inclusion criteria included all patients who underwent hip arthroscopy for femoroplasty, acetabuloplasty, arthroscopy with labral repair, and arthroscopy with debridement/shaving of articular cartilage. Patients were placed in obese and non-obese groups based on having a BMI greater or lower than 30 kg/m2. Operative time and 30-day surgical complications were compared between the two groups. The patients were found to have a significant difference in operative times with obese patients having a mean time of 94.9 minutes while non-obese patients had a mean time of 103.4 minutes ($p<0.001$). However, there were no significant differences in complications in the obese versus non-obese patient groups, highlighting the safety of hip arthroscopy in obese patients. With this information, surgeons reluctant to operate on obese patients for fear of worse outcomes will have the data to negate this misconception giving this population greater benefit from appropriate therapeutic measures.

Dallas: From Trials to Triumph

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In the PHAGES study, the goal has been to obtain and isolate phages for the bacterial host Mycobacterium smegmatis mc2155. A soil sample was collected from the front lawn of the Health Sciences building on Howard University's campus (88.5522 N, -77.115 W). Enrichment isolation and spot testing were used to isolate the phages in the sample. The size of plaques from the spot testing were .725mm3 on average. Post empirical testing, the phage was amplified to produce an HTL. This HTL was titered (5.0 x1011 pfu), archived, TEM samples were prepared. The DNA was extracted, quantitated and used for restriction enzymes, electrophoresis and sequenced using NGS. The genome of the phage, Dallas, will be annotated using software such as DNA master and PECAAN. The gel electrophoresis determined that the genome of Dallas is 111,843 bps long. Dallas was then evaluated to elucidate whether it is a temperate or lytic phage using the test for lysogeny. The lysogeny testing determined that Dallas is a temperate phage. This information has the potential to help scientists further understand and characterize phages. Phages have the potential to help fight bacterial diseases in a world where bacteria are becoming resistant to antibiotics.

The Role of RPN-12, a Subunit of the Proteasome's 19S Regulatory Particle, in C. elegans Male Fertility

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The proteasome is a complex consisting of nearly 30 different subunits of interacting proteins that degrades proteins and maintains protein homeostasis in cells. The proteasome consists of a 19S regulatory particle (RP) lid and base component capping a cylindrical 20S core particle (CP). Our research investigates roles for individual 19S RP proteasomal subunits in fertility. The proteasome is conserved in all eukaryotes and we study 19S RP function using Caenorhabditis elegans, a nematode whose structure and well-annotated genome helps facilitate the investigation of biological processes. My project focuses on characterizing the role of the 19S RP subunit RPN-12 in C. elegans' male fertility. It has been published that RPN-12 is necessary for the incorporation of another 19S RP subunit, RPN-10, into the yeast proteasome. Our lab has shown that in C. elegans, the endogenous rpn-12 deletion mutant (rpn-12(av93)) causes feminization of the hermaphrodite germ line, hermaphrodite fertility issues and a subtle decrease in proteolytic function. A similar phenotype has been reported by others for an rpn-10 deletion mutant. Surprisingly, the male rpn-12(av93) animals show no apparent defects in growth, survival, or fertility. To investigate the role of RPN-12 in C. elegans males, I perform fertility assays to assess the ability of the males to copulate and successfully fertilize oocytes. Also, quantification and characterization of the rpn-12(av93) male spermatids allow us to determine subtle sperm phenotypes of males lacking RPN-12. Collectively our data provides further support that specific proteasome subunits perform different, non-proteolytic, functions in specific tissues.

Characterization of Medume, a bacteriophage which infects Mycobacterium Smegmatis mc^2 155

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Bacteriophages are some of the oldest and most abundant organisms on Earth. The goal of this project was to isolate a phage that specifically infects Mycobacterium smegmatis mc2155. This collection of this data is significant since it will contribute to our understanding of the interactions between Actinobacteria phages. The isolation of the phage Medume was achieved by collection of environmental soil samples, followed by direct and enrichment culturing, spot and plaque assays, multiple rounds of purification, collection of a medium titer lysate, empirical testing, creating max web plates, flooding and collection of high titer lysate. DNA was also extracted and quantitated. The titer was found to be 39.9 × 10^11. Further testing using the patch assay will add more data to the characterization of Medume.

Plasma Soluble Urokinase-type Plasminogen Activator Receptor (suPAR): An Early Indicator of Chronic Kidney Disease in Sickle Cell Disease.

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Chronic kidney disease (CKD) is a major complication of sickle cell anemia (SCA). Proteinuria, the universally used CKD clinical biomarker is not detected at the early stages of CKD. Thus, more sensitive and specific markers are needed for early CKD detection. Elevated soluble urokinase-type plasminogen activator receptor (suPAR) was recently identified as a marker of focal segmental glomerulosclerosis and was also associated with a faster progression of CKD. However, suPAR levels have not been measured in SCA patients in relation to their CKD progression. Our goal was to measure plasma and urine levels of suPAR and correlate them with CKD progression in SCA patients. Levels of creatinine and cystatin C in plasma and, albumin and creatinine in urine were measured by ELISA in 96 SCA patients enrolled in a sickle cell disease registry study at the Center for Sickle Cell Disease, Howard University. CKD stages were assigned to patients according to the National Kidney Foundation guidelines (K/DOQI). We selected a group of 30 patients with CKD stages 1-4 and age-matched 14 control patients with CKD stage 0. Plasma suPAR concentrations were measured by ELISA. In our cohort, CKD prevalence increased with age but was independent of gender. There was a positive correlation between plasma suPAR levels and progression of CKD and, a negative correlation between plasma suPAR concentrations and progression of CKD. As expected, plasma suPAR levels negatively correlated with eGFR. Our findings suggest that elevated plasma suPAR levels in SCA patients can serve as a biomarker of SCA-associated CKD.

The Role of BMI in Perioperative Complications in Patients Undergoing Total Knee Arthroplasty

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Introduction: Osteoarthritis is a degenerative condition which affects weight-bearing joints such as the knee, hip, ankle and spine. Obesity is a modifiable risk factor which causes mechanical forces to be exerted on the joints, further contributing to the debilitating effects of osteoarthritis. This study sought to evaluate if there is an association between BMI and perioperative complications. We hypothesize that increased BMI is associated with increased perioperative complications. Methods: Patients that underwent TKA were identified in the 2011-2014 American College of Surgeons- National Surgical Quality Improvement Program (ACS-NSQIP) dataset. Differences in peri-operative complications were analyzed by BMI categories (underweight, normal weight, overweight, obese, morbidly obese). Results: Of the 106,088 patients included, 62.7% were female, 89.88% were overweight or obese and the mean age was 66.6 y. On multivariate analysis of perioperative complications, increasing BMI was associated with increase in Surgical Site Infections (p= 0.0142), respiratory (p=0.0105), systemic sepsis (p= 0.0361), renal (p= 0.0270) and postoperative DVT (p= 0.0027). Conclusions: This study demonstrates increases in perioperative complication rates in patients undergoing TKA across the BMI categories. Continued efforts are necessary to reduce unhealthy weight gain among adults in the United States. Relevance: This project correlates directly with some of the overall themes of this year's Caucus as it touches on obesity and joint pain. Previous studies have examined obesity in relation to TKA, but a study that encompassed both obesity and race has never been performed. Studies like this are essential for physicians who perform the majority of their work with minority populations. With this awareness, physicians and researchers may adjust existing TKA protocols in obese patient groups as a means of prophylaxis against complications.

High Incidence of Antibiotic-Resistant Bacteria in Kitfo, an Ethiopian Beef Tartar

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Kitfo is beef tartar widely consumed among the Ethiopian community. It is composed of minced beef blended with powdered spices and clarified butter. Previous studies show that kitfo contains several bacteria of public health concern, the status of antibiotic resistance in these bacteria is not well known. In the present study, twenty-six kitfo samples obtained from retail outlets in the Washington DC area were subjected to microbiological analysis. From the mean APC of 6.0 log CFU/g, 104 representative isolates were selected for microbiological analysis. The clonality of the isolates was determined by pulsed-field gel electrophoresis Thirty-four most predominant isolates of public health significance were tested for their sensitivity to 17 clinically relevant antibiotics by the VITEK 2 system. All isolates were resistant to one or more antibiotics while 59% of the isolates were resistant to two or more antibiotics. Higher resistance to cefazolin (59%), cefoxitin (50%), ampicillin (32%) and nitrofuran (18%) was observed, while lower resistance (3-6%) was observed for ampicillin-sulbactam, ceftazidime, ceftriaxone, cefepime, and trimethoprim-sulfamethoxazole. Acinetobacter calcoaceticus and Pseudomonas luteola were multidrug resistants. Seventy-five percent of the isolates were Enterobacteriaceae with Enterobacter cloacae complex, Escherichia coli, and Klebsiella spp being the most predominant. The Enterobacter cloacae complex grouped into a single cluster with less than 55% similarity coefficient, while the E.coli grouped into two clusters with 65% and 80% similarity respectively. The Klebsiella isolates grouped into two clusters, with 55% and 100% similarity respectively. This study suggests that kitfo serves as a reservoir of antibiotic-resistant bacteria.

Life of a Phage

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A bacteriophage (virus which infects bacteria) was isolated and characterized from a soil sample taken from the School of Social Work at Howard University (38.2916 N, 77.0195 W). Since bacterial hosts are specific, the host Mycobacterium Smegmatis mc2155, was used to isolate phages. Phages were amplified by direct and enrichment culturing and supernatant diluted (10 fold) to purify phages. Subsequently, a medium titer lysate was produced and utilized in the empirical testing and high titer lysate production. DNA was then isolated from HTL and quantitated using Nanodrop 2000 and electrophoresis. A restriction digest was performed before it was finally archived and sent to the University of Pittsburg. The plaque produced had a diameter of 3 mm. The titer for the HTL was 5.0 × 108 pfu/mL. Somadina is a lytic phage and therefore may, in future, be used to understand phage interactions with bacterial hosts.

What's There To A Phage: The Isolation and Research of Jonghyun from a Soil Sample

Presenter's Name: Folasade Fashina
Classification: Undergraduate Student
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Bacteriophages (phages) is a virus that specifically attacks bacteria cells, and due to them being viruses they either undergo the Lytic or Lysogenic cycle. Lytic phages lyse their host to reproduce which results in clear "plaques", whereas lysogenic phages inject their genetic material into their host. During this study, lytic phages were isolated from a soil sample collected from the "yard" at Howard University using Mycobacterium smegmatis mc2 155. The data collected during this process was uploaded to the Phages Database which helped to identify the phylogeny of the phage. Following several rounds of purification and enrichment, a High Titer Lysate (HTL) with a titer of 3.3 x 10^11 pfu/mL was formed and used for DNA extraction and restriction digests; both of which returned results that showed a high concentration of DNA. Afterwards, the phage (Jonghyun) was sent off for sequencing, during which it was discovered that Jonghyun is a temperate phage, with a genome length of 41904 bp, belonging to the G1 subcluster. Upon return, the HTL previously collected was titered once again to test for fluctuations resulting in a titer of 3.6 x 10^11 pfu/mL, and then purified in 3 rounds of quadrant streaking. A patch assay was then performed to determine if Jonghyun could influence the formation of Mycobacterium smegmatis lysogens. The discoveries from this process have shown that Jonghyun has a relatively high concentration of DNA and potential to produce lysogens.

Elucidating novel roles of the 19S regulatory particle subunits of the 26S proteasome in C. elegans gametogenesis and fertilization

Presenter's Name: Lourds Fernando
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Presentation Type: Poster Presentation
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Coauthors: Anna Allen

The 26S proteasome is one of the major proteolytic machineries in the cell. Recent studies demonstrate proteasome subunits can perform non-proteolytic functions. In 2014, our lab showed that RNAi depletion of specific subunits of the Caenorhabditis elegans proteasome 19S regulatory particle (RP) rescued the infertility associated with depletion of the Myt1 ortholog WEE-1.3. Since only a subset of the 19S RP subunits suppress the wee-1.3(RNAi) infertility we hypothesize that those specific subunits may play a non-canonical role in C. elegans reproduction, potentially through regulation of the cell cycle inhibitory kinase WEE-1.3. My data show that down-regulation of certain 19S RP subunits results in aberrant WEE-1.3 nuclear oocyte localization, compared to normal perinuclear localization. We generated GFP tagged 19S RP subunits using CRISPR/Cas9 genome editing technology which show ubiquitous expression of RPN-7, RPN-8, RPN-9 and RPN-12 in the germ line and soma, but somatic restricted expression of RPN-6.1. Interestingly, depletion of certain 19S subunits via RNAi, such as rpn-6.1 and rpn-7, results in an alteration of the normal nuclear localization within oocytes of other 19 RP subunits, such as RPN-8::GFP and RPN-9::GFP, but not all subunits (RPN-12::GFP). Finally, downregulation of WEE-1.3 results in an increase in cytoplasmic RPN-9::GFP expression in oocytes. Collectively these data lead us to investigate the roles of RPN-6.1 and RPN-7 in the nuclear localization of RPN-8 and RPN-9, and the role of WEE-1.3 in the subcellular distribution of RPN-9. We are elucidating previously unknown subunit specific roles of the 26S proteasome during gametogenesis and fertilization.

The Characterization of Danielle15

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A bacteriophage (phage) is a virus that infects a bacterial host. In this study, a bacteriophage was isolated from soil (6 inches deep) on the main Yard of Howard University (38.919664 N, 77.018667 W). Phages were then isolated from the soil through enrichment culturing. The filtrate was diluted through a ten-fold serial dilution and both a spot and plaque assay were performed with the bacterial host, Mycobacterium Smegmatis mc2155. The morphology of Danielle15 consisted of teardrop shaped plaques with an average diameter of 7.5 mm. The phages were then purified, and empirical testing was used to generate a medium and high titer lysate. The bacteriophage was determined to be lytic with a high titer lysate of 4.133 × 1010. The high titer lysate was then used for DNA isolation, restriction digestion, agarose gel electrophoresis and lysogeny testing. The concentration of the phage was low, as the results of the nanodrop showed the nucleic acid concentration to be 14.3 ng/µl and the DNA purity to be 2.01. Currently, further testing is ongoing to determine whether the bacteriophage is temperate. Based on the future results, the information collected on Danielle15 can be further used in other scientific research, as well as in the field of healthcare, such as in phage therapy.

Evaluating the dose-dependent antibacterial effects of Nigella sativa extract against intraoral Streptococcus mutans

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Introduction: Nigella sativa extract has antibacterial activity against Streptococcus mutans. Nigella Sativa plant, commonly known as Black Seed Oil, has been marketed to have widespread health benefits. It has been referred to as one of the greatest forms of healing medicine. Many active compounds have been isolated from the seeds of the plant. The most important active compounds include thymoquinone, thymohydroquinone which aid in the oils antibacterial, antifungal, anti-schistosomiasis, antioxidant, antidiabetic, anticancer and anti-inflammatory activity. Ultimately, Black seed oil improves the body's defense system when ingested. The antibacterial effects of Black seed oil have been investigated in recent years. In this study, we have evaluated the half maximal inhibitory concentration, (IC50), of Black seed oil inhibiting intraoral Streptococcus mutans. This study could provide valuable information for future applications. Methods: Streptococcus mutans were grown in a 96-well plate with tryptic soy broth (TSB). Different concentrations of Black seed oil were administered from 0.175% to 11% overnight. The density of Streptococcus mutans was measured by FilterMax F5 Multi-mode microplate reader.Results:The results indicated that Black seed oil inhibits Streptococcus mutans in a dose dependent manner and approximately 1.67% concentration of Black seed oil is able to inhibit 50% of Streptococcus mutans.Conclusion: The significant results support recommendations of a previous study that stated "Black seed oil would serve as an important addition to oral health care products." Further research can be utilized to determine which mechanism of action that specifically provides the antibacterial effects of Black seed oil.

Isolation and Characterization of Mycobacteriophage Xana from a Soil Mixture

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A bacteriophage is a virus that infects bacteria. Since viruses are not alive, these bacteriophages, also known as "phages," infect the host cell, reproduce within the cell, then either destroy the cell or integrate their DNA into the host bacteria and stay dormant. Bacteria have been increasing in resistance to antibiotics, leaving medical professionals in a frenzy for a solution. Mycobacteriophages could be used for a range of biomedical applications including phage therapy antibiotic production, and other molecular biology applications. By continuing to test new phage, new antibodies can be developed and target specific bacteria that have become resistant to current antibiotics. Phage Xana was extracted from an enriched soil mixture filtrate spot assay against *M. smugmatis* then purified through a serial dilution. Medium and high titer lysates (7.4x10 -6 pfu/ml) were collected for further experiments. DNA of Mycobacteriophage Xana was isolated, then the concentration and purity were determined using Nanodrop and gel electrophoresis. The phage DNA was sent to Pittsburgh to be sequenced through Illumina sequencing. To make sure that phage Xana is whether lytic or temperate, patch test was conducted to see if there is a lysogen, The patch assay result indicated that xana is truly lytic not temperate phage.

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Objective:Obesity-associated lipotoxicity induces multiple metabolic dysfunctions, associated with excess lipid deposition in non-adipose tissues, and is characterized by increased oxidative stress, inflammation, and insulin resistance which can lead to type 2 diabetes and cardiovascular disease. Very low-density lipoprotein receptor(VLDLR), is highly expressed in the heart, binds and increases the catabolism of apolipoprotein E triglyceride-rich lipoproteins. The objective of this study is to determine the role of VLDLR in obesity associated lipotoxicity. Methods: Lean WT, VLDLR-deficient(VLDLR-/-), genetically obese leptin-deficient (Lepob/ob), and leptin–VLDLR double-null(Lepob/ob/VLDLR-/-) mice raised to 5-6-month-old on normal chow diet (Purina, St. Louis, MO), were used to determine the role of VLDLR deficiency on obesity-induced cardiac lipotoxicity. Triglyceride-rich lipoprotein, glucose uptake and oxidation were measured in cardiomyocytes and skeletal muscles cells. Results:Insulin sensitivity and glucose uptake were reduced in the hearts of Lepob/ob mice, and VLDLR expression was upregulated and associated with increased VLDL uptake resulting in excess lipid deposition. These changes were accompanied by upregulation of cardiac NADPH oxidase (Nox) expression and increased production of Nox-dependent superoxides. Silencing the VLDLR in Lepob/ob mice reduced VLDL uptake and prevented excess lipid deposition. VLDLR deficiency reduced superoxide overproduction and normalized glucose uptake. Lepob/ob/VLDLR-/- mice compared to Lepob/ob, had significantly improved heart performance and energetic reserves. Conclusion: Upregulation of VLDLR expression, increases lipid deposition, insulin resistance and oxidative stress in cardiac and skeletal muscles in obese

mice. Silencing of VLDLR expression markedly reduces steatosis and prevented obesity-associated lipotoxicity features, including improvement of insulin sensitivity and reduction of superoxide production.

Reduced AMPK Signaling Impairs Placental Mitophagy In Women with Gestational Diabetes Mellitus

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Introduction: Gestational diabetes mellitus (GDM) is a major pregnancy-related complication in the US and worldwide, with long term impact on maternal and offspring health. destruction of mitochondria, reduced ATP production and increased oxidative stress were reported in GDM placentas. Mitophagy, a mitochondria-specific autophagy to degrade damaged mitochondria, is stimulated by AMPK signaling. Here we hypothesized that reduced AMPK signaling impairs placental mitophagy in GDM women. Methodology: Two studis were conducted in this research. In Study 1, we used placental tissues from GDM and BMI. and gestational age matched normal pregnant patients, and investigated the phosphorylation of AMPK (Thr172), expression of autophagic marker genes (BECN1 & SQSTM1) and mitophagy specific gene, PINK1. In Study Two, trophoblast cells were isolated from normal pregnant women and treated with AMPK antagonist, Dorsomorphin (DSM), and its agonist, AICAR for 4 or 24 hours. The ratio of mRNA levels of BECN1 to SQSTM1 and the abundance of LC3II and SQSTM1 proteins were analyzed. Protein and mRNA levels were measured by Western blotting and q-PCR, respectively, and compared between GDM and NGT groups, or between treatments in cell culture by one-way ANOVA. Results: GDM placenta demonstrated reduced phosphorylated AMPK protein, low ratio of mRNA levels of BECN1 to SQSTM1, and low levels of PINK1 transcripts. In cultured trophoblast cells, mRNA levels of BECN1 to SQSTM1 and the abundance of LC3II proteins were reduced by DSM and increased by AICAR, opposite to the change of SQSTM1 proteins. Conclusion: Results indicate that reduced AMPK signaling may impair mitophagy in GDM placentas, thus causing placental structural defects and dysfunctions.

Efficacy of Different Pirenzepine Formulations Against Diabetic Neuropathy

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Peripheral neuropathy is damage to the peripheral nerves, and is common to an estimated 20 million people in the USA. Diabetes is the most common cause of neuropathy and diabetic neuropathy can be studied in mice treated with streptozotocin (STZ), a naturally occurring agent that induces insulin deficient hyperglycemia. STZ-induced diabetic mice develop nerve conduction velocity (NCV) slowing, hypersensitivity to light touch (allodynia), loss of heat sensation (hypoalgesia) and depletion of sensory nerve endings in the skin and cornea. We have recently shown that these disorders can be treated by the anti-muscarinic agent pirenzepine. In order to prepare for a clinical trial of this drug, we determined whether pirenzepine can be effectively administered to diabetic mice via the daily topical application. Nerve function and structure were measured before the onset of STZ-induced diabetes in control mice, STZ-diabetic mice and STZ-diabetic mice treated daily with pirenzepine applied to one hind paw for 30min/day. The 3 different formulations were the 4% pirenzepine in hydrogel, WinSanTor (WST) 34 that contained 16% dimethyl sulfoxide and WinSanTor 100 that contained 15% sesame oil. We assessed the efficacy of the 3 different formulations of pirenzepine in preventing the onset of NCV slowing, touch allodynia, heat hypoalgesia, and loss of corneal nerves at monthly intervals after onset of diabetes and pirenzepine treatment. The most effective formulation, the WST34, was selected for use in the upcoming clinical trial of pirenzepine in a group of diabetic patients.

Isolation and characterization of phage Jarvis from a soil sample

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Coauthors: Bacteriophages are viruses that infect and parasitize bacterium which can multiply only in bacterial cells, and they are detectable almost everywhere where live bacteria exist. Mycobacteriophages are has been studied for its importance in offering the possibility of therapeutic purposes. The current serious medical problem in the increasing antibiotic-resistant bacterial strains phages will be used as antibiotic development. Bacteriophages are also important in epidemiology and as a tool in molecular biology. The soil sample was collected from phage *Jarvis* and enriched using to get a putative phage which can infect M.smugmatis which confirmed using the spot test. Phage *Jarvis* was further purified using subsequent titration, and HTL/MTL (pfu/ml) were harvested. DNA was isolated, the purity and concentration were determined using gel electrophoresis, and nanodrop (ng/ul). The phage *Jarvis* sample was mounted on a copper grid and negatively stained for transmission electron microscope to determine size and morphology. Further studies will be done on sequenc-

ing for annotation of the genome, and other molecular works like PCR.

Generating endogenously GFP-tagged WEE-1.3 and transmembrane domain mutant strains in C. elegans using CRISPR-Cas9 gene editing

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Meiosis is controlled via regulatory phosphorylation events on the cyclin-dependent kinase (Cdk1) component of maturation promoting factor (MPF). The Wee1/Myt1 family of kinases provides inhibitory phosphorylations that keep MPF inactive, halting the meiotic cell cycle until it is stimulated to resume, thus, coordinating oocyte maturation with fertilization. We previously showed that RNAi depletion of inhibitory kinase WEE-1.3in Caenorhabditis elegans resulted in precocious oocyte maturation and infertility. Utilizing a WEE-1.3 antibody and transgenic WEE-1.3::GFP animals we determined that WEE-1.3 expression is ubiquitous and perinuclear throughout the germline and developing embryos. The WEE-1.3 antibody exhibited a unique coating of the diakinetic chromosomes in maturing oocytes not present in the transgenic WEE-1.3::GFP animals, leading us to wonder whether this localization was real or a non-specific artifact of the antibody. The goal of our research is twofold, to generate endogenously fluorescently tagged WEE-1.3 strains through CRISPR-Cas9 genome editing and then to test the importance of the WEE-1.3 transmembrane domain for germline protein functionality. We have generated gfp::wee-1.3 and wee-1.3::gfp strains where GFP is inserted at the 5' or 3' end of the wee-1.3 genomic locus, respectively. These strains exhibit a perinuclear localization expression pattern identical to that observed in the transgenic WEE-1.3::GFP animals and WEE-1.3 antibody stained germlines. We are investigating whether the gfp::wee-1.3 strain exhibits the antibody coating phenotype previously observed only via the WEE-1.3 antibody. This study will provide us with a deeper characterization of WEE-1.3 and enable us to elucidate whether WEE-1.3 transmembrane localization is essential for WEE-1.3 function.

Isolation of Bacteriophage BGJunior Using Bacterial Host Mycobacterium Smegmatis Mc2155

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Antibiotic resistance has become an increasing problem, and this threat continues to grow as more bacteria become resistant to antibiotics. Current bacteria have evolved to resist means in which scientists traditionally treat them, continuing to grow and replicate, they spread their drug-resistant genes exponentially, creating a population that can no longer be killed by conventional methods. In fact, annually more than 2 million people globally become infected with antibiotic-resistant bacteria, resulting in ~23,000 deaths (CDC). This presents a global health-crisis, as medications lose their effectiveness, officials lose the ability to control public health threats. This growing problem is why the SEA-PHAGES program is crucial in the advancement of antibiotics. Therefore, the purpose of the experiments is to achieve a fully annotated bacteriophage genome. Bacteriophage BGJunior was collected from a soil sample near College Hall North (38°55'15.8"N 77°01'04.0"W). The phage's titer was calculated by performing a series of spot tests, plaque purification assays, and other empirical tests to isolate phage BGJunior using Mycobacterium Smegmatis (Mc2155), our host bacteria. The DNA was isolated, yielding a high titer lysate (HTL). The titer of the lysate is 6.4 x 109. The lysate can be further processed to assess whether the phage is a lysogen by performing a spot test, followed by multiple rounds of patch assay and streak test protocol. These procedures are conducted to isolate the lysogen, and then annotate BGJunior, thus characterizing its functions and comparing it to other already annotated phage genomes. So far, we have just obtained a lysogen.

Post Market Surveillance of Malaria Rapid Diagnosis Tests

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Malaria is a serious and detrimental parasite-induced disease that is most harmful to children between the ages 0 and 5 years. If left untreated, victims may face fatality. Accessibility to malaria rapid diagnosis tests (RDTs) is just as important as the quality of the tests so that they may accurately detect the parasite. Test quality is impacted by the quality of the location that they are kept. Post market surveillance is important because it assesses the accuracy and reliability of locally accessible malaria RDTs. The quality of RDTs in the the private sector space are hardly monitored. Researchers visited Lagos Island and Mushin Market in Lagos, Nigeria to collect malaria RDTs of various brands. Pictures were taken to access quality of facility and location of RDT storage. 12 different

RTD brands were accumulated and tested for accuracy using 4 known malaria negative controls and 4 known malaria positive blood sample. Each positive blood sample was tested 4 times with each RDT. Results were cross examined with SD Bioline RDT acquired from the Nigerian government. Results showed that 11 of the RDTs diagnosed malaria accurately showing strong test bands. One brand, OnSite Malaria Pf/Pv Ab Combo Rapid Test, initially showed positive results for all negative controls because it diagnosed malaria through the detection of malaria antibodies, revealing that the patient had malaria at some point during their life but could not identify current parasite presence. Another test, CareStart Malaria Pf (HRP2) Ag RDT, showed 7 invalid results, and 6 faint bands.

EGFR/EGFRvIII enhance the capability of tumor cells to escape immunosurveillance by upregulating PD-1/PD-L1 inhibitory checkpoint

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EGFR is known to lead to cell proliferation and migration when it is activated and it is overexpressed in various types of cancer. The purpose of this experiment is to study whether or not EGFRvIII enhances tumor cells ability to evade immunosurveillance and if this ability is occurring due to the PD-1/PD-L1 inhibitory checkpoint. The EGFRvIII effect on Jurkat T-Cells was observed by co-culturing the Jurkat T-cells in a human breast cancer parental cell line and the EGFRvIII-transfected daughter line. Jurkat cell viability was measured and there was no statistically significant difference observed between the parental and EGFRvIII-transfected cells when comparing their effects on Jurkat T cell growth/proliferation. There was a significant difference between the growth of the T cells when they were co-cultured with and without breast cancer cells ($P < 0.05$). Future experiments aim to; measure the interleukin 2 production of Jurkat T cells after the cells have been co-cultured with human cancer cells, and measure Jurkat T-cell viability after PD-1 or PD-L1 blocking with antibodies.

Extraction of bacteriophage "Blackbrain" from the soil sample in the environment using *Mycobacterium smegmatis*

Presenter's Name: Sanaa Haamen
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School/College: Arts & Sciences
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Abacteriophage also known informally as a phage is a virus that infects and replicates within bacteria. Bacteriophages are composed of proteins that encapsulate their nucleic acid. Phages replicate within the bacterium following the injection of their genome into its host bacteria. Bacteriophages are among the most common and diverse entities in the environment. Bacteriophages are ubiquitous viruses, found wherever bacteria exist. The phage Delirium was isolated from an enriched soil sample collected from the yard (38.5523 N, -77.111 W). The putative plaques from the spot assay were purified using serial titration, medium and high titer lysates (MTL/HTL) $3.1x10^9$ pfu/ml harvested for further experimentation. of phage Delirium DNA was extracted using Promega kit then the concentration and purity was determined using a nanodrop and gel electrophoresis. Phage Delirium sample from the titer was mounted on a copper grid and negatively stained using uranyl acetate for transmission electron microscopy to observe size and morphology of the phage. Further studies such as observing phage Delirium under transmission electron microscopy (TEM), sequencing, annotation and few more molecular biology applications such as PCR using specif primers will be undertaken to complete the characterization of phage Delirium.

A Systematic Review of the Histological and Molecular changes in the Subacromial Bursa in Rotator Cuff Disease

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To evaluate the involvement of the subacromial bursa in the pathologic development of rotator cuff disease (RCD), a systematic review of the literature was undertaken to assess the cellular, biochemical and metabolic changes in the bursa. A systematic review was performed to identify all studies that reported histological and molecular changes in the subacromial bursa pertaining to rotator cuff disease (RCD). The molecular biomarkers found to be altered in RCD included extracellular matrix enzymes, cytokines, growth factors and neuronal signals. Previous reports show an increase in IL-1, IL-6, TNFα, bone morphogenic proteins (BMPs), Substance P and vascular endothelial growth factor (VEGF). All of these factors may contribute to the etiology and pathological changes in rotator cuff disease, but Further study is needed to determine the specific role of the subacromial bursa in the pathophysiology of RCD.

The bacterium Mycobacterium smegmatis mc2155
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The current research was designed to isolate and characterized bacteriophages (phages) which infect the bacterium Mycobacterium smegmatis mc2155. The research goals for this series of experiments were to isolate a bacteriophage from an organic based soil sample, collect supernatant from soil and grow phages through enrichment or direct plating methods. Furthermore, phages were titered and empirical testing used to generate a high titer lysate (HTL). This HTL was used for DNA isolation so that our phages dna could be sequences and used for electron microscopy which helps us get a visual representation of our phages DNA. In addition, smooth54 was purified multiple times to prove rather or not it is a true lysogen. Smooth54 is a temperate phage with a high titer of 6.33 x 10^9 pfu. It is not big considering it is about 1 mm in diameter. The results from the electrophoresis on smooth54 was not recorded due to lack of time. Smooth54 could be used to study similar phages that might be more interesting to the field of medicine. They could even be used in phage therapy in place of antibiotic treatments.

Reactivity of 1,3 Dipolar Cycloaddition with Azide and Strained Allene Rings
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The 1,3-dipolar cycloaddition is a common, versatile reaction in organic synthesis to form heterocyclic rings and stereocenters in one step. Cycloadditions with strained allenes have been much less studied, mainly by the Garg group at UCLA. We were interested to learn if azide cycloadditions to allenes might be fast enough for uses in bioorthogonal chemistry. Density Functional Theory (M06-2X/6-311+G(d,p) // M06-2X/6-31G(d)), a popular quantum mechanical method to predict reaction rates, was used to study reactions between methyl azide and a series of strained, highly reactive cyclic allenes. Our calculations provide quantitative predictions of the activation and reaction energies for formation of possible products. We have found that the most reactive allenes contain the highest levels of strain. Distortion/interaction analysis revealed that regioselectivity is determined by orbital interactions while reactivity is dictated by substrate distortion.

Cannabinoid Receptor-Mediated Changes of Mitral Cell Activity through Modification of Synaptic Input in the Main Olfactory Bulb
Presenter's Name: Thomas Heinbockel
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Coauthors: Ze-Jun Wang, Sherry Shu-Jung Hu, Heather Bradshaw, Liqin Sun, Alex Straiker

The endocannabinoid (eCB) signaling system has been functionally implicated in many brain regions but our understanding of the role of cannabinoid receptor type 1 (CB1) in olfactory processing remains limited. Using a combination of anatomical and functional approaches we have explored this question. CB1 was present in periglomerular processes of a GAD65-positive population of interneurons but not in mitral cells. We detected eCBs in the mouse MOB as well as the expression of CB1 and other genes associated with the cannabinoid signaling system in the MOB. Patch-clamp electrophysiology in mouse brain slices demonstrated that CB1 agonists evoked membrane depolarization, increased action potential firing, and an inward current in mitral cells, while CB1 antagonists reduced firing and evoked an outward current. CB1 effects on mitral cells were absent in subglomerular slices in which the olfactory nerve layer and glomerular layer were removed, suggesting the glomerular layer as the site of CB1 action. We previously observed that GABAergic periglomerular cells show the inverse response pattern to CB1 activation compared to mitral cells, suggesting that CB1 indirectly regulates mitral cell activity as a result of cellular activation of periglomerular cells. This hypothesis was supported by the finding that cannabinoids modulated synaptic transmission to mitral cells. We conclude that CB1 directly regulates periglomerular cell activity to control GABA release and, in turn, regulates mitral cell activity with potential effects on olfactory threshold and behavior.

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Isolation and characterization of phage Delirium from a soil sample collected from Howard University.
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A bacteriophage also is known informally as a phage is a virus that infects and replicates within bacteria. Bacteriophages are composed of proteins that encapsulate their nucleic acid. Phages replicate within the bacterium following

the injection of their genome into its host bacteria. Bacteriophages are among the most common and diverse entities in the environment. Bacteriophages are ubiquitous viruses, found wherever bacteria exist. The phage Delirium was isolated from an enriched soil sample collected from the yard (38.5523 N, -77.111 W). The putative plaques from the spot assay were purified using serial titration, medium and high titer lysates (MTL/HTL) $3.1x10^9$ pfu/ml harvested for further experimentation. of phage Delirium DNA was extracted using Promega kit then the concentration and purity was determined using a nanodrop and gel electrophoresis. Phage Delirium sample from the titer was mounted on a copper grid and negatively stained using uranyl acetate for transmission electron microscopy to observe size and morphology of the phage. Further studies such as observing phage Delirium under transmission electron microscopy (TEM), sequencing, annotation and few more molecular biology applications such as PCR using specif primers will be undertaken to complete the characterization of phage Delirium.

Isolating, Pruifying and Characterizing CharSmith9

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Numerous diseases are caused as a result of bacteria that are becoming harder to treat due to antibiotic resistance within these bacteria. Thus, it is necessary to explore other methods to treat these illnesses due to antibiotic resistance by these pathogens. Bacteriophages are viruses that infect bacteria and are good models to help us better understand and assist in the relationship between bacteria and antibiotic resistance In this study, we isolated phages from soil native to Howard University's campus., outside of College Hall North. The phages were then isolated and purified, using nine rounds of serial dilutions, to determine its' characteristics. Phage DNA was extracted to further characterize using spectrophotometer to determine its DNA concentration and gel electrophoresis were used to determine the purity of the phage. Nemed CharSmith9, the phage had a DNA concentration of 69 ng/µ and a high titer of 2.3 x 1011 pfu/ml. Through this characterization, and continued patch assays, we were able to determine the phage as temperate. Future steps will include a sensitivity assay and DNA annotation. This study will help inform scientist how to treat resistant bacteria.

Inhibition of Spore-Forming and Closely Related Bacteria By Bacteriocins Produced by Lactic Acid Bacteria In "Laban" Milk

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Laban is a buttermilk/yogurt drink consumed in many areas of the Middle East where Lactic Acid Bacteria (LAB) are abundant. LAB are Gram-positive bacteria used mainly in the food industry, due to their tart taste and fermentation capabilities. LAB, also, possess the ability to synthesize bacteriocins; a small, antimicrobial peptide (between >5 - 30 kDa) secreted against closely-related, competing species. These peptides exhibit inhibitory activity through specific mechanisms, such as cell wall disruption, leading to leakage and death. The objective of this experiment was to further characterize and identify bacteriocins. Twenty-seven different strains of LAB were isolated from Laban drinks vendored by different stores in the Washington, D.C. area, and identified based upon 16S ribosomal sequence, and construction of a phylogenetic tree. Each isolate was tested against two indicator strains, *Bacillus subtillis* and *Lactobacillus parafarraginis* using well-disk diffusion assay. Bacteriocin activity was determined using the zone of inhibition (ZoI) size. 89% (24) of the isolates inhibited the growth of *Bacillus subtillis*. While 15% (4) exhibited the ability to inhibit the growth of both *Bacillus subtillis* and Lactobacillus parafarraginis. Within these four, the ZoI of Bacillus subtillis was greater than that of Lactobacillus parafarraginis (a difference of 4 - 10 mm). Overall, these findings support the idea that LAB, in Laban, possess antimicrobial activity in competing bacterial environments. Isolates will undergo further testing to extract their bacteriocins, characterize the genes related to their bacteriocin production, and antimicrobial activity against additional indicators.

Healthcare Needs of the Northern Haitian Population: A Service-Learning Project

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Coauthors: Tomilowo Abijo, Shelly McDonald-Pinkett, Henry Paul, Leslie Jones, Roxanne Smith-White, Marjorie Gondre-Lewis

Background: In June of 2016, 2017, and 2018 The Howard University International-Medicine Service-Learning-Program (IMSLP) traveled to and set up mobile clinics in the Haitian Northern towns/villages of Fort Liberté, Derak, Ouanaminthe, and Acul Samedi, Caracol, Derac, Dondon, and Fort Liberte. The clinics treated pediatric and adult patients. Only adult evaluations are presented. Methods: Demographic information, vital signs, patient complaints, diagnosis, and prescriptions were manually transferred to a database from paper records. In 2018, a digital record was collected onsite. Data were recorded, anonymized and interpreted by the HU Health Sciences team for prevalence, trends, and statistical significance. General, gynecological, dental, and ophthalmological consultations were recorded. Results: Over 3 years, 1648 adults were examined. Of those who provided demographic data, 1101 (73%) were women and 413 (27%) men; 327 (21%) were 17-24yo, 604 (38%) 25-44, 416 (27%) 45-64, and 225 (14%) 65 and older. The most common diagnoses were headache (n=264, 16%), hypertension (n=249, 15%), GERD (n=241, 15%), neck/back pain (n=143, 9%), vaginitis (n=138, 8%), UTI (n=138, 8%), and joint pain (n=102, 6%). Diseases were classified by type including neurological (n=489, 30%), gastrointestinal (n=388, 24%), genitourinary (n=338, 21%), cardiovascular (n= 249, 15%), respiratory (n=86, 5%), dermatology (n=83, 5%). Conclusion: Our study is the first in-depth evaluation of the health presentations in remote towns and villages in NorthEastern Haiti. Our results indicate that diseases associated with exposure to microbes such as genitourinary and gastrointestinal symptoms were most prevalent year-over-year among Haitians. Statistical correlations are in progress.

Dreams with Trauma-Related Insomnia over the course of treatment with Suvorexant/placebo

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Distressing dreams are a common sequela of trauma exposure. Current treatments targeting nightmares in this population have had mixed results. Both dreams and nightmares are associated with rapid eye movement sleep (REMS). There has been controversy about whether treatment of nightmares experienced with post-traumatic stress disorder (PTSD) should involve suppressing or maintaining REMS. In our double blinded, placebo-controlled Suvorexant and Trauma-related Insomnia Study, suvorexant/placebo is given to participants with insomnia related to a traumatic event, with the hypothesis that medication will improve sleep disturbances while enhancing REMS. Alternatively, suvorexant's enhancement of REMS could increase the number of distressing dreams. The objective of this preliminary un-blinded analysis is to investigate the overall trend of dreams in participants throughout their treatment course. Each participant filled out a dream diary over 6-weeks, including prior to, during and after treatment, and recorded dreams and nightmares including description of content and ratings of distress and trauma similarity. At baseline, there were 0.042 nightmares experienced per diary per person, and 0.03 dreams experiences per diary per person. During treatment, there were 0.2 nightmares and 0.057 dreams per diary per person respectively. This modest increase in nightmares was attributable to the only subject where the frequency increased, as opposed to in 28 participants where the frequency decreased. In conclusion, suvorexant doesn't appear to be exacerbating nightmares in most individuals.

GlucoCEST MRI detects metabolic degradation in the mouse brain after rapid microwave fixation

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The study of neurometabolites and the detection of glucose in the brain has relied on anesthetized animals. Prolonged periods of anesthesia required for these studies may affect these metabolites and the ability to interpret glucose detection in the brain. However, performing post-mortem studies of neurometabolites and glucose detection in the brain is difficult to interpret because of rapid degradation. In this study, we utilized focal beam microwave irradiation (FBMI) without anesthesia to collect brain tissue and determine whether there is postmortem degradation of neurometabolites and glucose using 1H-NMR and glucoCEST. Five C57/BL6 mice were administered 0.55 mg/g of D-glucose through intraperitoneal injection in the awake state 15 minutes prior to sacrifice using FBMI. The head was quickly decapitated and the brain was kept in the skull. The tissues were immediately transferred for 1H-NMR and glucoCEST scans using a Bruker 9.4T spectrometer. 1H-NMR detected a steep decreasing trend of NAA level in brain within 24 h after fixation. while Tau, Cho, and Lac consistently increased over time. Glx showed a decreased trend within 48 h of time and Ins was not different after microwave fixation. The glucoCEST detected a decreasing trend of glucose levels in hippocampus within 24 h and a slightly increasing trend from 24 h to 48 h. This study shows the feasibility of applying glucoCEST following microwave fixation to detect the glucose level in the brain, which is usually unobservable by 1H-NMR.

Isolating Iodine Transforming Bacteria from the Hanford Site

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The Hanford site is a decommissioned nuclear site that supported plutonium enrichment and is located on the Columbia River in the state of Washington. Activities related to plutonium enrichment continued until the late 1980s. These weapon production processes left solid and liquid wastes that pose a risk to the local environment. Iodine is an important trace element for humans because of its essential role in thyroid glands. However, iodine-129 is one of the most persistent radionuclides from nuclear facilities, with a half-life of 16 million years, and it is harmful because it could damage to the thyroid and cause other long term health problems. One way of reducing the threat of radioiodine in the environment at Hanford and other contaminated sites is by biologically transforming the iodine to less mobile forms. Iodine-oxidizing bacteria have been isolated from iodine-rich natural gas brines and seawaters. The colonies of these iodine-oxidizing bacteria formed a purple complex when plated on agar media that contains iodine and starch. Unfortunately, these media have not been successful for the screening of known iodine transformers from our research site. Our goal is to develop a medium that will allow rapid culture-based screening of Hanford site isolates for the ability to oxidize iodide and otherwise transform iodine species. Bacteria isolated by collaborators at the Pacific Northwestern National Laboratory, which conducts experiments as Hanford, were streaked onto agar plates containing tryptic soy broth and starch and incubated aerobically or anaerobically in order to determine the optimal conditions for rapid screening.

Identifying Potential Roles of Sin3a as a Metastasis Suppressor in E1B55K-deleted Cells

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Worldwide, there were 14.1 million new cases of cancer and 8.2 million deaths due to cancer reported in 2012. By the year 2030, approximately 13 million people will die from cancer. Metastasis is a complex process that occurs when cancer cells travel to and grow in distant parts of the body, away from the original site of cancerous growth. One main contributor to the survival of cancer cells are genes that are associated with metastasis. These genes are able to be regulated due to chromatin-modification complexes. The study of metastasis is critical because it is the cause of most cancer deaths and there is a lack of treatment options available for patients with metastatic disease. Adenoviruses show promising capabilities for oncolytic viral gene therapy for cancer and specifically as a vector for vaccine delivery. One of the chromatin-modification complexes that have been shown to be involved in metastasis is the Switch-Independent 3 (SIN3) chromatin modification complex. Based on previous published data that demonstrates that the Adenovirus early region 1B55K (E1B55K) protein interacts with SIN3A, we hypothesize that SIN3A will be reduced in wild type infected cells and stabilized in E1B55K-deleted virus infected cells. Since SIN3A is reduced in metastatic cancer, a reduction in the levels of this product by Adenovirus might point to viral factors that are capable of enhancing metastasis. Here we infect human cancer cell lines, including Hela and A549 cell lines and use western Blot and immunoprecipitation assays to detect the presence of SIN3A.

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miRNA 144 and miRNA 451 Regulate the Life Span of Human Erythrocytes

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Aging is the process that affects cells, tissues, organelles, and organisms. There are several mechanisms that drive aging process in human body. Cellular senescence which leads to permanent cell growth arrest and oxidative stress (OS) caused by free radicals are examples of aging promoting mechanisms. Moreover, genetics and epigenetics have been shown to play an important roles in accelerating and/or delaying the onset of aging process. MiRNAs (miR) found to be an important players in controlling OS, aging, and cellular senescence. The purpose of this study was to evaluate circulating erythrocytes (E) miR-144/451 expressions as potential biomarker of cell aging. Blood samples were collected from the consented volunteers and miRNAs were isolated from control group (18-80 year old) (n=9) after a period of 8-12 hours fasting (IRB13-MED-73). Taqman primers were used for detection and quantification of miR-144/451. E were further sub-fractionated into young (y) (1.07-1.09 g/ml), mid (m) (1.09- 1.11 g/ml), and old (o) (1.11-1.12 g/ml) age by using discontinuous Percoll gradient; 35%,40%,45%,50%,55%,65%,80%, and 100%. Total RNA, including miRNA, were isolated from E using miRNA Isolation kit. The miRNA 144 and 451 were expressed as 1:1.74:3.1 and 1:1.6:1.82 in y, m, and o respectively. These results showed that the o cells significantly expressed

more miRNA than y and m. This novel study suggests that miR-144/451 can have a role in aging process.

Isolation of Phage Niaya

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SEAPHAGES, Science Education Alliance Phage Hunters Advancing Genomics and Evolutionary Science, is a program that allows Howard University students to study, discover, and analyze wild bacteriophages -- viruses that infect specific bacteria in order to reproduce themselves. There are temperate phages which are phages that decided allow their DNA to integrate into the host's genome, and lytic phages that immediately begin particle generation. When phages are done reproducing, the cell lyses or bursts releasing the new phages. You can view them on a "lawn" of bacteria grown in a Petri dish of solid L- agar. Soil sample containing Bacteriophage collected from College Hall North dormitory. After obtaining plaques from enrichment plating, a high titer lysate of a purified phage population was generated through three rounds of serial dilution and DNA was extracted and analyzed. The phage Niaya did not produce mesas and yields a titer of 1.33x⟦10⟧^10. For about a week, an infected agar plate was incubated and mesas were not formed on Phage Niaya. Niaya seemed to have been a potential temperate phage, but it did not produce lysogens. In the future Sentitivity asssay would show that if Niaya can superinfect other phages.

Differential Gene Expression in Type 2 Diabetes and Alzheimer 's Disease Patients from Pakistan by Taqman Low Density Array (TLDA): A Snapshot

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Background: Diabetes and obesity are modifiable risk factors for Alzheimer's disease (AD). Several overlapping neurodegenerative mechanisms, including oxidative stress and inflammation, are observed in these disorders. The epidemic of Type 2 Diabetes Mellitus (T2DM) and its role in promoting Alzheimer's disease (AD) has become important health concerns. This pilot study aimed to produce a snapshot of gene expression differences between these two diseases. Materials and Methods: Male and females (one from each disease group) were randomly selected from a larger study that included medical interviews and neurological assessments. High-throughput qPCR Taqman Low Density Arrays (TLDA) were performed on a predesigned array (96 assay formats, Applied Biosystem) and results were analyzed towards the relative quantification of these genes in these two disease groups compared to healthy subjects (male and female controls).Results & Discussion: Differential gene expression analysis revealed distinct differences in T2DM patients compared to controls: it also showed that these genes were up-regulated (100%) in males compared to females (25% up-regulated & 75% down-regulated). CSNK1A1, CSNK1D, CYP45A1, GAP43, APOE, GJB1, GSK3B, GRIN2A, and 2B were the important down-regulated genes; NAE1, SLC30A3, SLC18A3, CDC2, APLP1, APBB2, and IL1A were up-regulated. Most of these genes were linked to the Amlyloid ß protein precursor and cholesterol (Lipid) Biosynthesis Pathways. Many of these pathway genes were also differentially expressed in the Alzheimer's disease patients. Ingenuity Pathway Analysis (IPA) is underway to more fully connect the affected genes to their mechanistic pathways that may be common or different under these two disease conditions.

Isolation and Characterization of Phage Carton

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Background: A bacteriophage is a virus that infects a bacteria host (such as Mycobacterium smegmatis mc2155) in order to survive and carry out its functions. The study of bacteriophages is significant because it will aid in combating the rise of viral pathogenic bacterial infections due to the increasing amounts of antibiotic resistant bacteria. Furthermore, phages are an alternate method for lowering the population of these resistant bacteria. The target of this particular research is to identify, isolate, and then categorize phage Carton. Methods & Materials: The phage Carton was collected from soil found in front of Ernest Just Hall, 38º55'18"N and 77º1'9"W. The bacterium Mycobacterium smegmatis mc2155 was used as a host for bacteriophages. Particular experiments conduct-

ed in order to isolate Carton were serial dilutions and spot tests, plaque purification assays, and empirical tests. This allowed the phage to become isolated enough for a trustworthy calculation of the titer. Currently, experiments such as spot testing, streaking, and patch assays are being conducted in order to see if phage Carton is lysogenic. Results & Discussion: Through the experiments conducted, Phage Carton's titer was able to be identified at 2.7 x 10-9. This phage has small plaques and does not have very strong lysing power. Carton is currently going through an annotation process to not only identify its function and characteristics, but to compare it to other phage characteristics as well.

Recurrent Pain in a Patient with Bilateral Scaphotrapezial Coalition and Radiocarpal Arthritis

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Carpal coalition is an uncommon and rarely reported congenital anomaly that is often found incidentally due to evaluations for trauma or unassociated radiographic studies. It is caused by the failed separation of cartilaginous precursors during fetal development. The overall prevalence of carpal coalition is approximately 0.1% with lunotriquetral coalition being the most common form. Scaphotrapezial coalition is one of the rarest forms, of which there are very few reports described in the literature. This is a novel case report, in which we present a case of bilateral scaphotrapezial coalition in a patient with radiocarpal arthritis and persistent wrist pain. A 26-year-old right handed female presented to the clinic with a chief complaint of right wrist pain. Examination revealed swelling and tenderness to palpation across the dorsum of the right radiocarpal joint. X-ray revealed widening of the scapholunate spaces with possible fusion of the scaphoid and trapezium bones. The patient was assessed with scapholunate advanced collapse stage I (SLAC I) of the right wrist, with an incidental finding of coalition of the scaphoid and trapezium. This patient presented with an unusual case of scaphotrapezial coalition which may have caused radiocarpal arthritis and persistent wrist pain. In this case, the patient's pain resolved and arthrodesis was not performed. This case report is relevant because biomechanical alterations are implicated in recurrent sprains and pain. Most cases of carpal coalition present asymptomatically, thus no intervention is required. However, in cases where there is continuous pain, surgical management is considered.

Isolation, Amplification, Extraction, and Characterization of a Bacteriophage from a Soil Sample: Serekunda

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Coauthors: Madison Moore, Camille King, Ayele Gugssa, Mary Ayuk, Adrian Allen, Somiranjan Gosh, Courtney Robinson

Background: A bacteriophage is a virus that injects its genomic materials into the host cell (bacteria), where they will undergo replication through the utilization of the machinery of the host cell. Each bacteriophage has a specific bacterium that it would be able to infect based on the receptor of that host. The work presented here is focused on the isolation, purification, amplification and characterization of a bacteriophage from a soil sample that will be able to infect bacteria that may be antibiotic resistant. Materials and Methods: For this particular project, we specifically use a non- pathogenic Mycobacterium smegmatis (MC2155) as the host to be infected with the targeted phage named Serekunda. Through the utilization of serial dilution (up to 10-9), patch assay and empirical testing, to ultimately extract, characterize, and identify a completely isolated pure phage, the objective will be reached. Results and Discussion: Thus far, the work has resulted into successfully isolated Serekunda genetic material or genome. The plaques were .1 cm with clear morphology, with a high titer lysate of 1.82x10-8. The average DNA concentration was 38.53 ng/µl. Further work includes the characterization of the phage by testing the sensitivity, efficiency and furthermore characterization of Serekunda by DNA annotation, thus characterizing its functions and comparing it to other already annotated phage genomes to be a unique phage that may be used in future to eradicate antibiotic resistant bacteria.

Molecular Genomic Diversity of mid-19th Century Liberated Enslaved Africans from St. Helena Island, South Atlantic

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St. Helena Island, most remote island in the South Atlantic Ocean has tremendous cultural and genomic diversities now being unearthed–collections of skeletal remains of enslaved Africans from the 1840s. The Africans captured, were enroute for enslavement in the Americas when British Royal Navy intercepted slave ships during the sea voyage; 5,000 to 8,000 died. Over 26,000 enslaved Africans arrived on St. Helena; about 18,000 survived and were liberated by St. Helena's

court. Later, others died in refugee camps and buried in Rupert's Valley, St. Helena. Their remains were discovered during construction of St. Helena's first airport. Approximately 325 Liberated Africans' remains were exhumed and are now being studied. Little is known about the identities of the slaves and where in Africa they originated. Recently, over 5,000 samples of human skeletal and dental materials consisting of petrous bones, metatarsals, and molars from the 325 Africans were collected; and over 130 Living DNA samples from the modern-day population on St. Helena Island. This historic collection now represents the largest assemblage in the world. Forensic and ancient DNA analyses are being conducted on samples collected in order to determine genomic origins of the Liberated Africans. DNA, genomic data collected from the petrous bones, teeth cementum, metacarpals and Living DNA of this historic population is generating unique first-ever data. Investigation of specific genes in the Liberated African population and Bioinformatic analyses will allow comparisons with contemporary populations. Ancient DNA of these individuals has not been successfully studied before, hence this research is groundbreaking.

The Isolation of FlexSeal, a Bacteriophage Discovered on Howard University's Campus Kayla Johnson, Shalom Entner, Glory Bassey, Roy Swagota, Adrian Allen, Ayele Gugssa, Courtney Robinson,Winston Anderson and Mary Ayuk

Presenter's Name: Kayla Johnson
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Background: The Science- Education Alliance: Phage Hunters Advancing Genomic and Evolutionary Sciences, or SEA-PHAGES program is focused on the discovery and characterization of new bacteriophages. A bacteriophage is a virus that infects a bacterial host. Bacteriophages can be temperate or lytic depending on the phage. Methods: A soil sample was collected outside of the Louis Stokes Health Sciences Library. The Enriched Soil Method yielded no plaques. Plaques from another groups findings, after they had used the Direct Plating Method were used. Multiple rounds of serial dilutions followed, to isolate a single phage population. A plaque from this isolated population was selected to generate a lysate, from which the phage DNA would be extracted. The DNA was extracted isolated and analyzed using various tools and techniques such as the Nanodrop Spectrophotometer, Restriction Enzyme Digests and Gel Electrophoresis. Results: A spot titer determined that Bacteriophage FlexSeal had a titer of 1.06 x 10^{1}®pfu/ml and the Nanodrop Spectrophotometer determined the DNA concentration of one sample to be 77.32 ng/µl and a 260/280 ratio of 1.89. Meanwhile another sample had a concentration of 75.13 ng/µl and a 260/280 ratio of 1.883. Conclusion:FlexSeal appeared to be lytic due to its ability to form transparent plaques. This bacteriophage appeared to be Lytic because of its inability to generate lysogens. Further study is needed to confirm if it is Lytic, as well as to further characterize this phage.

Synthesis and Characterization of Some Long Chain Fatty Acid Derivatives for Studies in FXTAS Model.

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Fragile X associated tremor/ataxia syndrome (FXTAS) is a neurological disorder that results in progressive memory deficit, axonal degeneration and Parkinsonian-like motor symptoms during adulthood. FXTAS is reportedly caused by a CGG triplet repeat expansion within the 5'UTR of fragile X mental retardation 1 (FMR1). A number of mechanisms have been proposed in FXTAS pathophysiology including CGG repeat-mediated RNA toxicity, RNA protein toxicity, R-loop-induced DNA damage response, antisense FMR1 RNA, mitochondrial dysfunctions and epigenetic modulation. While recent studies have investigated some targeted therapeutic approaches there is currently no cure for this condition. Some small organic molecules have been studied for the purpose of developing treatment for FXTAS, including studies of some NMDA antagonists, and phospholipase A2 (PLA2) inhibitors. In our effort to identify potential lead compounds that could be subsequently developed for the treatment of this condition, we have designed the synthesis and biological evaluation of a number of long chain fatty acid derivatives for studies in FXTAS. We here present the synthesis and physical properties of some of these long chain fatty acid derivatives.

Purification, Isolation, and Classification of the *Paris* phage from a Soil Sample

Presenter's Name: Syntyche Kane
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Bacteriophages are specific yet greatly abundant viruses that infect bacteria. Bacteriophages have two life cycles: lytic (virulent) and lysogenic (temperate). In the lytic cycle, after the phage DNA is injected into the host cell, viral DNA reproduces and lyses the host cell. In the lysogenic cycle, after the

phage DNA is injected into the host cell, the phage DNA is integrated into the host's genome and represses lytic genes. The host for our bacteriophages is *Mycobacterium smegmatis* (MC^2155). We study this bacteria because it is easy to grow in the lab and nonpathogenic for humans. Phage *Paris,* which is lytic, was isolated from filtrate of enriched soil collected from Howard University's campus (38.920906 N, 77.017968 W) with a spot test against *Mycobacterium smegmatis.* The putative phage was purified using serial dilution which has a medium and high titer lysate (MTL and HTL). The titer lysate was 6.5 X 10^10 pfu/ml. From the high titer lysate, DNA was isolated, the purity and the concentration (13 ng/ ml) of the DNA was obtained using Nanodrop and gel electrophoresis before proceeding with restriction enzyme digest. Phage *Paris* filtrate was mounted on a copper grid and negatively stained using uranyl acetate for transmission electron microscopy to determine the size and morphology. To confirm that the phage Paris is lytic or temperate, a patch assay experiment was conducted to see if a lysogen was present. No lysogen was observed, so this confirmed the phage was lytic. To complete characterization of the phage Paris, future experiments such as sequencing, annotation, and other molecular biological research will be conducted. Learning more about *Paris* will lead to advancements in epidemiology, phage therapy, and phage biodiversity.

Alteration of Blood-Brain permeability during Neuroinflammation using multi-ligands with PET: [68Ga] EDTA, [11C](R)PK11195, and [11C]DPA713

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Objective: Radiotracers with positron emission tomography (PET) imaging frequently used as a measure of neuroinflammation and accurate quantification is an important consideration. However, alteration of Blood-Brain Barrier (BBB) induced by neuroinflammation may mislead the uptake rate. In this study, we tested the changes of influx rate (K1) according to changes in the levels of neuroinflammation. Methods: Six male SD rats were fed with curpizone. Dynamic 60-min PET scans with [68Ga]EDTA (EDTA), [11C] PK11195 (PK) and [11C]DPA713 (DPA) were performed at baseline and then again at 4 to 6 weeks after initiation of curprizone chow. Results: Good correlation of the values of VT between PK and DPA was found at both time points tested: 0.82 (p=0.05) at baseline, and 0.91 (p=0.01) at week 4-6. In addition, a ~30% increase in uptake was evident for both tracers as a result of cuprizone treatment. The mean of PK-VT was 0.93±0.27 at baseline and 1.27±0.47 at 4-6 weeks with p=0.1. The mean of DPA-VT was 0.65±0.29 at baseline and 0.91±0.21 at 4-6 weeks with p=0.05. EDTA PET imaging showed a significant increase in K1 at week 6, however no significant difference in VT (p=0.1). Conclusions: Our data show that neuroinflammation resulted in a significant increase in the uptake of both tracers. The EDTA demonstrated a significant change in influx rate during cuprizon-induced neuroinflammation which may be attributed to changes in the BBB permeability, but may also be a result of changes in blood flow.

Isolation of phage Blkswn from a soil sample at Howard University

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The study of bacteriophages is crucial because of the important roles that they have been played throughout the world's history. Bacteriophages (phages) are viruses that can not function without a host, meaning that reproduction is impossible without the necessary cellular machinery. However, the bacteriophage cannot just enter any cell; each has a specific host range. The general structure of a phage is relatively simple; the protein capsid head contains the viral genome in the form of DNA/RNA, this is attached to the tail that helps with the injection of the nucleic acids into the host cell, on end are the tail fibers that extend to attach the phage to its host. The bacteriophage can go through two cycles after infection of the host for reproduction. Lytic cycle destroys the hosts but produces more than 100 phage particles. Lysogenic cycle results in the integration of the viral genetic material with the host's genetic material that integrates and suppress lytic genes and dormant for extended periods before deciding to lyse the host cell. The host cell we are using is *Mycobacterium smegmatis* MC^2 155. Through the collection of soil samples, direct and enrichment isolation, spot testing, plaque assay, repetition of purification using serial dilution, a collection of a medium and high titer lysate. DNA extraction and quantification, and finally characterization allowed the isolation of Blkswn. A true lysogen and remove any exogenous phages had been derived by using streaking and a patch assay. Blkswn had only produced a lytic phage rather than a lysogen which is needed to continue.

Trees of the New World Tropics: A New Phylogeny for the Plant Genus Coccoloba

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Two events have been used to explain the diversity of plants in the New World tropics: the uplift of the Andes mountains and the formation of the islands of the West Indies. Yet, plants are also diverse in continental Neotropical lowlands, the flora of which is only now becoming systematically known. The plant genus Coccoloba (sea grapes) consists of trees and woody vines, common in low elevation Neotropical forests. Estimates for the number of species in Coccoloba have ranged widely, being as high as 400 species and as low as 120 species. This is, in part, because Coccoloba species are difficult to differentiate using morphological characters. In order to better understand species diversity in Coccoloba, our objective was to constructed a molecular phylogeny of as many species of Coccoloba as possible. We aggregated plant material from living and herbarium collections at the Fairchild and New York Botanic Gardens, as well as from collaborators. We extracted DNA from leaf material of 51 Coccoloba species and generated DNA sequences for three chloroplast gene regions: rbcL, trnL-F, and psbA-trnH. We reconstructed the phylogeny using a maximum likelihood criterion. Brazil has the largest concentration of Coccoloba species. Therefore, we hypothesized that Brazil would be the geographical origin of the genus, and that the Brazilian species would be the most basal in the phylogeny. Preliminary results indicate that, contrary to our hypothesis, the Brazilian species are not basal but form the crown group of the phylogeny, being derived from species in Mesoamerica and the Caribbean.

A Machine Learning Approach to Classify Sickled and Healthy Red Blood Cells

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Sickle cell disease (SCD) is an inherited hemoglobinopathy that affects tens of millions of people worldwide. Under low oxygen conditions, mutant HbS forms polymers that lead to the hemolysis of red blood cells (RBCs), vaso-occlusion and organ damage. In SCD, patient evaluation requires the determination of red blood cell morphology and counts which can be used to measure the efficacy of drug developed to prevent RBCs sickling. However, existing cell morphology detection tools do not yield accurate counts to be used in the evaluation. Typical microscopy images are noisy and common methods such as thresholding, watershed, and region growing are not suitable for automated analysis. We collected blood from SCD patients using approved HU IRB protocol, then isolated and cultured RBCs in complete RPMI media for 18 hrs at 1% O2. We also cultured control RBCs at 21% O2 in a regular tissue culture incubator. RBCs were photographed at 400x magnification using Olympus IX73 microscope. The images were used for machine learning to segment and classify RBC based on their morphology. Deep neural networks (DNNs), a recently developed image recognition approach was utilized to segment and to classify red blood cells in the microscopy images of blood samples. Initially, we created a small training set by labeling individual RBC in images as healthy, sickled and others. Our preliminary results using the small training set are encouraging and, currently, we are increasing the size of training data set to obtain high accuracy to build a valuable tool in patient evaluation.

NLRP3 inflammasome inhibition via second generation small molecules

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Inflammation resulting from uncontrolled innate immune activation leads to a wide array of disorders, including Alzheimer's disease (AD), type 2 diabetes, multiple sclerosis (MS), atherosclerosis, etc. Nucleotide-binding domain leucine rich repeat protein 3 (NLRP3) has emerged as a druggable molecular target against the innate immune activation. Inhibitors of the NLRP3 inflammasome have shown promising activity in the clinical management of inflammation-associated disorders, such as, MS and AD. There has been a considerable interest in the development of small molecule NLRP3 inhibitors. Our initial research resulted in the identification of tertiary sulfonylurea molecules with good NLRP3 inhibitory activity. The current research involves the development of second generation compounds via refinement of the initial pharmacophore. These compounds were designed using a combination of computational and classical medicinal chemistry principles, synthesized, purified using flash column chromatography, and characterized using spectroscopic and chromatographic techniques. We will discuss the biological screening of our compounds against the NLRP3 inflammasome in sickle cell disease model.

Comorbidity and Health Disparities: The Relationship between childhood asthma and low intake of antioxidants in low-income communities

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Asthma prevalence rates are steadily increasing amongst black and Hispanic children in the United States, which is affecting 6.2 million children under the age of 18 years of age. Studies reported that trends in prevalence of obesity and severe asthma is disproportionate with mortality in African Americans when compared with non-Hispanic whites. In addition, it was further reported that inadequate of fresh fruits and vegetables might be correlated with an increased risk for the development of obesity and respiratory distress including asthma. Studies reported that inadequate intake of healthy fruits and vegetables might result in low intake antioxidants rich foods such as vitamin C, E, Carotenoids, and the mineral selenium. Antioxidants are substances that prevent the cells in the body from oxidative stress and free radicals due to unpaired electrons circulating the body. These substances can either be man-made, synthesized in the body or found in dietary sources such as fruits and vegetables. The most significant antioxidants are Vitamin C, E, and carotenoids found in fruits and vegetables. Hence, the purpose of the study is to examine the relationship between the intake of antioxidants to the development of asthma complications in children in low-income communities. Furthermore, the study will investigate the role of poor intake of these antioxidants in exacerbating the inflammation of asthma and asthma-related obesity.

Evolutionary Morphological and Behavioral Specializations for Jet propulsion in Frogfishes

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Background: Frogfishes are a type of anglerfish (Lophiiformes) that use their gill ventilation (respiratory) system to jet propel. Jet propulsion is a type of locomotion during which frogfishes shoot a jet of water to propel forward instead of swimming. The branchiostegal bones in fishes are responsible for expansion and compression of the gill chamber during ventilation . This study investigates whether the branchiostegals of frogfishes are evolutionarily specialized for jet propulsion, compared to those of other anglerfishes that do not jet propel. Methods:Micro-CT scans and dissections were used to collect measurements of branchiostegals in frogfishes and other anglerfish outgroup species. The CT analysis software Horos was used to take both straight and curved measurements of all six branchiostegals across eight Lophiiformes species. Measurements were size corrected based on head length, and phylogenetic ANOVA was used to compute differences branchiostegals. We also used 3D geometric morphometrics to compare branchiostegals within one representative frogfish species. Additionally, we analyzed movements of the branchiostegals in videos of jet propulsion using ImageJ.Results: We grouped branchiostegals into three groups (Group 1: 1-2, Group 2: 3-4, and Group 3: 5-6) according to their function. We found significant differences among each group of branchiostegals. Conclusion: Combining our morphometric and video analyses, we concluded that branchiostegals in Group 1 are used for inhalation, Group 2 are used for jet propulsion, and Group 3 are used for ventilatory exhalation.

Novel Inhibitor of Tat-dependent HIV-1 Transcription that Targets RACK1 Protein

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Combination antiretroviral therapy efficiently suppresses HIV-1 replication but does not target HIV-1 transcription that is reactivated if the treatment is discontinued. Therefore, targeting HIV-1 transcription with a new class of anti-HIV drug may permanently silence HIV-1 leading to a functional cure. We recently performed a shape-based screening in ChemDiv chemical database (1.6´106 compounds) using protein phosphatase-1 (PP1)-targeting transcription inhibitor 1E7-03 as a template, which inhibited HIV-1 in cell culture (IC50 = 5 uM) and reduced HIV-1 production by 40-fold in HIV-1 infected humanized mice. Top scoring 105 hits were further validated for HIV-1 inhibition using VSV-G pseudotyped HIV-1 virus. A novel compound CD52 demonstrated significantly stronger HIV-1 inhibition (IC50=1.5 uM and CC50 >200 uM) comparing to 1E7-03 (IC50=5.1 uM and CC50>200 uM). CD52 preferentially inhibited Tat-induced transcription with IC50=0.3 uM for Tat-dependent HIV-1 LTR transcription and IC50>30 uM for basal HIV-1 LTR transcription. Stable isotope labeling by amino acids in cell culture (SILAC)-based proteomics analysis showed that expression of 197 proteins was significantly reduced in CD52-treated CEM T cells (>1.5 fold). Pathway analysis showed that CD52 primarily targeted ribosomal proteins including receptor of activated C-kinase 1 (RACK1) that mediates ribosome binding to the internal ribosome entry site (IRES) and controls translation of several viruses in-

cluding HIV-1. Moreover, RACK1 was shown to bind to HIV-1 Nef. RACK1 downregulation was further confirmed by Western blot analysis (Ratio CD52/Control=0.53, p<0.01). Taken together, our study identified a novel small molecule that inhibits HIV-1 by targeting Tat-dependent transcription and downregulating expression of host RACK1 protein.ôø

Isolation of a soil sample from outside Howard Hospital for Isolation and characterization of Mycobacteriophages.

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The viruses that infect and use bacteria resources are known as bacteriophages which are more commonly known as "phages." The research conducted on bacteriophages was done to further our knowledge on them because phages have and continue to play important roles in the field of epidemiology, vaccine development, and as a tool in molecular biology. The applications of this can be helpful in research concerning phage therapy and possibly changing Western medicine in the future. An environmental sample of soil was isolated from a sample found at Howard University Hospital, and the phages were isolated using an enrichment technique and tested against *Mycobacterium smegmatis* using a spot assay test. A lytic life cycle was observed in mycobacteriophage Brasilianraine from the spot assay due to the clear plaque being present. The putative phage was purified through serial dilution, and medium and high titer lysates were collected for further experimentation. Brasilianraine with the titer of 150 x 10^5 pfu/ml infected our host *M.smeg.* DNA isolation from Brasilianraine would be the next step using a Nanodrop Spectrophotometer and gel electrophoresis for further characterization. Sequencing the DNA would allow us to see the size of the base pair and cluster of our phage. Further studies like transmission electron microscopy (TEM)and PCR will then be done on our phage.

Analysis of kinesin mutations implicated in neurological disorders

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The Kinesin family proteins (KIFs) are microtubule-dependent molecular motors that participate in the transport of membrane vesicles/organelles, protein complexes and mRNAs along neurites, thus playing important roles in neuronal function. Many mutations in kinesins are associated with neurological disorders including intellectual disability and hereditary spastic paraplegia. For example, the missense mutations in KIF1A and KIF5A have been found to be implicated in these diseases. In this study, we used structure-based bioinformatics approaches to investigate the damaging mutations in KIFs. The homology modeling was used to construct the structures of Kinesin microtubule binding domain and Kinesin-tubulin complex. The energy calculation methods were applied to determine the effects of missense mutations on protein stability and protein-protein interaction. The results revealed that the mutations associated with intellectual disability and hereditary spastic paraplegia could reduce folding energy and affect binding energy. Many of these mutations are involved in post-translational modifications such as Phosphorylation, Sumoylation, Acetylation and O-Glycosylation. The bioinformatics analyzes provide useful information for understanding the roles of kinesin mutations in the development of neurological disorders.

Effects of pathogenic mutations in kinesins

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The Kinesin family proteins (KIFs) are microtubule-dependent molecular motors that participate in the transport of membrane vesicles/organelles, protein complexes and mRNAs along neurites, thus playing important roles in neuronal function. Hereditary spastic paraplegias (HSPs) are a genetically heterogeneous group of neurodegenerative disorders characterized by progressive lower-limb spasticity and weakness. In past papers, confirmed by our experimental methods, KIF1A and KIF5A have been found to heavily implicated by these mutations in various forms of the disease.

Post-translational modification (PTM) regulates biological processes in eukaryotes through the interaction of small molecules or peptides with specific residues on target proteins. Any aberration in the PTM of any protein would lead to the progression of complex traits and diseases. This study assessed the PTMs sites with SNP sites to predict causality. The SNP data were downloaded from the DbnSFP v4.0b1a, and the PTM data were obtained from dbPTM.

Based on the results from the data set on the effects of mutations on protein-protein interaction (ΔΔG), a p-value of 0.0104 showed the pathogenic mutations displayed an increase in overall protein stability.

Isolation of Bacteriophage Interstellar From an Environmental Soil Sample.

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Bacteriophages are wide-ranging viruses that can infect a host bacterium, which in this course *Mycobacterium smegmatis* mc²155 was used for infection. When a phage infects a host, it can undergo the lytic or lysogenic cycle. Mycobacterium phage *Interstellar* is in the lytic life cycle, meaning after infecting the host cell it replicates and lyses the host cell. In the lysogenic life cycle, the phage genome integrated into the host cell genome by repressing lytic genes and replicate in the host without lysing the host. The phage *Interstellar* was isolated from an enriched soil sample collected from Howard University (38.923333 N, 77.018611 W). The putative plaques from the spot assay were purified using serial titration, medium and high titer lysates (MTL/HTL) 5.7*10^8 pfu/ml harvested for further experimentation of phage *Interstellar* DNA was extracted using Promega kit then the concentration and purity was determined using a nanodrop and gel electrophoresis. Phage Delirium sample from the titer was mounted on a copper grid and negatively stained using uranyl acetate for transmission electron microscopy to observe size and morphology of the phage. Once *Interstellar* is tested for the presence of a lysogen, to make sure *Interstellar* was lytic, not temperate phage and since there was no lysogen, experimental data proved that the phage genome it is lytic. A deeper understanding of the phage genome of *Interstellar* is concluded through bioinformatic technology. By annotating and characterizing a genome on PECAAN, and DNA master the functions of each *Interstellar* genes can be predicted. This characterization and Identifying gene functions have a big role in current science.

Lactic Acid Bacteria in Fermented Milk 'Laban' Show High Activity Against Foodborne Pathogens

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Laban is fermented milk widely consumed in many parts of the world, especially the Middle East. The nutritional and probiotic benefits of laban including the protective role of lactic acid bacteria (LAB) are well documented. Besides these benefits, limited studies have also shown that LAB isolates from laban produce antimicrobial peptides such as bacteriocins. In this study, we isolate and characterize several LAB strains from 29 retail samples of laban exhibiting high antimicrobial activity against foodborne pathogens. From 29 retails samples of laban obtained from metropolitan Washing DC are, a total of 238 LAB isolates were obtained. These were initially screened for antimicrobial activity by spot test and followed by phenotypic and molecular characterization. Of the 238 LAB isolates only 28 exhibited inhibitory activity against all test organisms, E. coli O157:H7, Staphylococcus aureus, Listeria monocytogenes, Pseudomonas aeruginosa, and Bacillus subtilis. The LAB isolates were identified by 16s rRNA sequencing as Lactobacillus helveticus, Lactobacillus acidophilus, Lactobacillus delbrueckii, Streptococcus thermophilus, Lactobacillus casei, Pediococcus acidilactici, Staphylococcus epidermidis, Lactobacillus paracasei, and Lactobacillus plantarum. It was of interest to note that the LAB isolates from laban exhibited broad spectrum activity against both Gram-positive and negative bacteria. Keywords: Lactic acid bacteria (LAB), Laban, antimicrobial activity of LAB, bacteriocins, food borne bacteria.

Are We Doing Too Many Exploratory Laparotomies in Trauma? An Analysis of National Trauma Data Bank.

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Exploratory laparotomy (EL) is widely regarded as the definitive diagnostic and therapeutic modality for abdominal trauma in the US. However, many centers use Diagnostic Laparoscopy (DL) in stable trauma patients in an effort to reduce the incidence of Non-therapeutic Laparotomy (NL). We aim to assess the incidence of NL in the trauma population in the US and compare outcomes between DL and NL using a national database. Using ICD-9 codes, the National Trauma Data Bank (2010-2015) was queried for all patients undergoing any abdominal surgical intervention. Patients were divided into two groups: laparoscopic intervention (DL) and open intervention (EL). Multivariate regression models were used to analyze its outcomes vs the NL group with respect to mortality, hospital length of stay, and complications (VTE, pneumonia, ARDS, cardiac arrest, SSI, sepsis). A total of 5,561 patients underwent NL vs 1,843 who underwent DL. Compared to DL group, the NL group were older (mean age: 35 vs. 31, P<0.01), more likely to be hypotensive on admission (11.3% vs 4.5%, P<0.01), and had higher injury severities (mean Injury Severity Score 10.8 vs. 7.3, P<0.01). On multivariate analysis, NL was associated with increased mortality (OR 2.4, 95% CI 1.1-5.4), higher rate of complications (OR 1.9, 95% CI 1.4-2.6) and longer hospital stay (Coeff. 2.3, 95% CI 1.7-2.9). The high incidence of NL described in this analysis, as well as the favorable outcome profile of DL, highlights the importance of utilizing DL in the armamentarium of trauma surgeons in appropriate patients. These findings warrant further investigation.

Dog Ear Prevention: Middle or End

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Introduction: Dog ears is a ubiquitous term used to describe uneven closure or overlap of skin when closing a surgical incision. According to the definition by Borges, dog ears "denote bunching up of skin when closing a wound." This tends to be an unsightly appearance for patients, especially when such markings are present on the face of a patient. In orthopaedic practice, because most of the wounds tend to be covered with clothing (ie hip replacements, knee replacements), the cosmetic appeal is not necessarily unchanged. However, for visible extremities, such as on the forearms and hands, this tends to cause more patient distress. The goal of this paper is to see if suturing a wound closure, from starting in the center of a cut and expanding outwards (closing one half and then starting from the center again and closing the second half) would result in fewer dog ears than starting at the corner of a surgical laceration and suturing the wound all the way to the end. Methods: Sixty porcine, fowl, and orange peel samples, were used for this study. Thirty were allotted to end-to-end repair, and the other thirty were allotted to midline-to-end laceration repair. A medical student and a resident each sutured fifteen of each allotment, with the attending physician being the final determinant in dog ear determination. Results: 25% of end-to-end closures resulted in dog-earring. 45% of end-to-end closures resulted in dog-earring. Discussion: End-to-end closure provides a more consistent method of avoiding dog ear formation.

Risk Factors for the Rare Presentation of Septic Arthritis, Gout, and Pseudogout

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Discussed is a series of case reports on different presentations of septic arthritis, gout, and calcium pyrophosphate deposition disease (also known as pseudogout) occurring concurrently. Any of these ailments may lead to disability of the joint, requiring use of a cane or walker, and may, at its worse, lead to a complete replacement of the joint altogether or sepsis and death from septic arthritis. From an extensive literature search, there are only a handful of case reports discussing presentations of these patients. Presently, the literature discusses different management strategies, ranging from medical treatment to surgery. One article makes a suggestion on septic arthritis leading to gout and pseudogout, but does not quantify it. We aim to calculate risk factors and quantify it with odds ratios and relative risk ratios to determine what causes the simultaneous presentation of all three disorders. Our hypothesis is that certain factors put people at increased risk for all three diseases simultaneously. Possibly, increasing age, male gender, intravenous drug abuse, alcohol, smoking, and obesity, may play a significant factor for an increased risk of presenting with septic arthritis, gout, and pseudogout simultaneously. Identifying the risk factors will allow us to address them before patients suffer the consequences. We undergo a literature search in relevant medical databases, and studies are chosen which deal with patients with all three diseases. They are then assessed for the risk factors and commonalities between the patients studied.

Association between Social Capital and Chlamydia, Gonorrhea, and Syphilis: County-Level Simple Regression Analyses

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Social capital is a community level attribute and therefore a local phenomenon, examining these associations at lower geographic levels can provide more location-specific results that can be useful in advancing our understanding of the social attributes/characteristics that are associated with the burden of STIs. In this study, we examined the association between SC and STIs at the county-level using a qualitative (visual) and a quantitative approach. The visual analyses were done by visually inspecting and comparing choropleth maps of SCI and the STIs. The quantitative analyses were done to obtain crude estimates of the association using simple regression analyses––one model for each STI which were the dependent variables. Our visual analyses indicated that counties with high SCI had lower rates of chlamydia, gonorrhea, and P&S syphilis. The estimated crude coefficient from the models indicated that a one unit increase in the SCI was associated with a 22% ($p<0.01$) decrease in chlamydia rate, a 49% ($p<0.01$) decreased in the gonorrhea rate, and a 16% ($P<0.01$) decreased the P&S syphilis rate. We found negative associations between county-level SCI and the burden of the most commonly reported bacterial STIs (chlamydia, gonorrhea, and P&S syphilis) in the United States. Future studies can improve on this study by accounting for spatial depen-

dence as well as exploring (and assessing) the inclusion of control variables such as poverty and income inequality.

Correlation of Head and Heart Muscle Malformations in p63 Mutant Mice

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P63 is a transcription factor involved in development and differentiation and is expressed in the epithelium of numerous body parts. Mutations of p63 leads to various malformations during mouse embryonic development, e.g., poorly developed limbs, abnormal craniofacial structures, and cardiac ventricular swelling. It was shown that the head and heart development are closely connected. For example, the cardiopharyngeal field is a mesodermal cell population that will give rise to specific parts of the head and heart musculature in all vertebrates. Therefore, the study of p63 mutant mice and their malformations, such as cleft palate, micrognathia, heart defects, etc., can contribute to our understanding of human embryonic developmental defects. Specifically, we aim to study the musculature in these mice to identify if there are abnormalities of certain head muscles and certain parts of the myocardium as predicted by cardiopharyngeal field studies. We dissected normal adult mice to study the normal head musculature and compared that with normal adult humans. We performed muscle antibody staining followed by dissection of the muscles on wildtype and p63 mutant embryonic mice at different developmental stages (E12-E18) to determine the normal and abnormal muscle development from their anlage to their differentiation, which is currently not well described. The developmental patterns of the mice will be compared with each other and with what is known from human development. This will reveal if specific muscles and/or muscle groups are affected by the mutation. Here, we will present the first data of this study.

Applications of Machine Learning: Driving a New Medical Frontier for Future Physicians

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BACKGROUND: Usage of artificial intelligence (AI) in medicine has the potential to aid in the detection of pathologies and will have a great impact on the field of radiology. In conjunction with public access databases of radiographs, the development of AI use cases, and the relatively inexpensive neural networks, medical professionals can become familiar with how AI will impact their future medical careers. This project aims to create a neural network that can identify medical devices and hardware. METHODS: We utilized the open source image classification neural network, Inception v3, from TensorFlow (Google Brain Team, Mountain View, CA) and trained it with 10,797 images sorted from Chest X-Ray 14 (a NIH Clinical Center public access data set). Inception v3 was trained to sort chest X rays with different medical hardware and devices. Untrained chest X rays from the database that showed medical hardware and devices were presented to the Inception v3 to evaluate the machine learning algorithm for accuracy; results were recorded. RESULTS: After training on over 10,000 sorted Chest X ray images, Inception v3 accuracy rates for new images included, 10% for central venous lines, 30% for mediports and 80% for PICC. CONCLUSION: Results show a preference for accurate identification of PICC that is likely due to the higher number of chest X rays in the training sets of radiographs. Increasing the number of other hardware and devices may improve the accuracy. This exercise affords medical professionals exposure to AI use cases including medical hardware and devices.

Anti-microbial effects of BSA capped Silver (Ag/BSA) Nanoparticles and Poly(3- hydroxyburyrate-co-3-hydroxyvalerate) (PHBV) Encapsulated Ag/BSA Nanoparticles

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Noble metal nanoparticles have been used in place of antibiotics for fighting bacterial infection. Particularly, silver nanoparticles have gained significant importance because they have demonstrated broad antimicrobial activity towards gram positive, gram negative bacteria, and drug-resistant bacterial strains. The purpose of the study is to evaluate the antimicrobial effects of bovine serum albumin capped silver (Ag/BSA) nanoparticles and poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV) encapsulated Ag/BSA

nanoparticles. We have successfully synthesized Ag/BSA nanoparticles by chemical reduction method and characterized the nanoparticles size (80 nm), morphology (spherical) and composition (BSA as the outer layer and silver, the core). The nanoparticles were then encapsulated in the PHBV matrix using the water-in-oil emulsion method. PHBV encapsulated Ag/BSA nanoparticles were found to range from 700 nm to 850 nm via DLS and 200 nm to 400 nm via SEM. TEM showed that the Ag/BSA nanoparticles served as the core of the encapsulated particle while PHBV surrounded it. TEM-EDX and XPS confirmed the chemical makeup of encapsulated Ag/BSA.The Ag/BSA nanoparticles were evaluated for antimicrobial properties by exposing the nanoparticles to Staphylococcus aureus and Escherichia coli and measuring the optical density of the mixture at 630 nm. The minimum lethal concentration of Ag/BSA nanoparticles was 7 ppm for S. aureus and 2 ppm for E. coli; while the minimum inhibitory concentration was 6 ppm and 1.75 ppm for S. aureus and E. coli, respectively. Currently, antimicrobial studies are underway for PHBV encapsulated Ag/BSA nanoparticles with the intent to use PHBV as a drug delivery system for the nanoparticles.

The Influence of Palatable Food Intake on the Expression of Liver MicroRNAs in a Rodent Model of Binge Eating

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Binge eating disorder (BED) is characterized by the recurring consumption of large amounts of high sugar, high fat foods in a short period of time. BED has been associated with an increased risk of metabolic disorders in the liver and changes in liver microRNA expression that may be a contributing factor to the development of these disorders. The purpose of this study is to determine whether exposure to a high fat/sugar diet affects the expression of liver specific microRNAs in a binge eating model. Female Sprague Dawley rats (n=6/group) underwent nine feeding tests to determine binge preference for high fat/sugar pellets (45% fat/35%carbohydrate/ 20% protein). The rats were characterized as binge eating prone (BEP) or binge eating resistant (BER). MicroRNA expression was assessed in each of the liver homogenates from each group, along with a regular chow only group (control). Liver biopsies were homogenized and quantified using Nanostring Technology to determine the expression of the liver microRNAs in each group. Preliminary analysis indicates that the expression of liver microRNAs is influenced by the consumption of a high fat/sugar diet. BEP rats display higher fold changes in microRNA expression in the liver versus BER and control groups. The data is still being quantified in order to determine any statistically significant differences. An increase in particular groups of liver microRNAs may be one of the factors that leads to an increase in metabolic disorders or liver tumors in those who chronically consume high fat, high sugar diets.

Isolation, Purification, and Characterization of Phage Beto

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Bacteriophages naturally infect specific antibiotic resistant bacteria to combat the growth and evolution of contemporary bacteria. The overall purpose of this research is to harvest, isolate, purify, and sequence bacteriophages that could be used to infect and kill harmful bacteria. Bacteriophages were harvested from a soil sample collected from outside the Biology Building, under a large oak trees. A bacteriophage of single morphology was obtained through a series of serial dilutions and spot tests. A high titer lysate (HTL) was obtained by flooding multiple webbed plates of the bacteriophage of single morphology with phage buffer and filtering the collected lysate through a 0.22 micron filter to isolate only the bacteriophage particles. The phage DNA was sequenced using the Illumina method. The prophage was then later streaked on plates to test if the phage was a lysogen. Plaques of uniform morphology were obtained that were then used to form webbed plates. The high titer lysate (HTL) was 5.0x10^9 PFU/mL. DNA isolation showed a concentration of 187.8 ng/microliter and purity of 1.76 260/280. In order to determine if the phage is a lysogen and to characterize the sensitivity of the phage, a series of patch assay, streak assays liquid phage release, and sensitivity assays were performed. The DNA of the phage is then annotated to compare the DNA of the phage to the DNA of other known structures for its uniqueness.

The Role Of Adenovirus E4orf1 In Cellular DNA Content Greater Than G2/M

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Along the path to cancer cells increase their DNA content beyond the G2/M content (DNA> G2/M). The signal responsible for this increase in DNA content are poorly understood. Cells

transfected with Adenovirus (Ad) early region 1A (E1A) show a similar induction of DNA> G2/M. This is also observed in Ad-infected cells. Cells infected with Ad that have a deletion in the early region 1B55K (E1B55K) exhibit higher DNA> G2/M. This suggest that viral factors besides E1A may mediate the induction of DNA>G2/M. Ad early region 4 (E4) open reading frame 1 (E4orf1) promotes signals through the Pi3-Kinase and Rac1 pathways. In other cell systems constitutive activation of Pi3-Kinase and Rac1 results in DNA>G2/M. Because of this, we hypothesize that E4orf1 induces DNA>G2/M in a manner dependent on the Pi3-Kinase and Rac1 pathways. Cells infected with an E1B55K/E4orf1-deleted Ad exhibited reduced levels of DNA> G2/M when compared to the E1B55K-deleted parental Ad. Pharmacological inhibitors of Tiam1/Rac1 (NSC23766), and PI3-Kinase (LY294002) reduce the levels of DNA> G2/M in Ad-infected cells. Both Pi3-Kinase and Rac1 are reported to mediate the activity of nuclear factor kB (NF-kB). Accordingly, inhibition of NF-kB with SC75741 significantly reduced the levels of DNA> G2/M in Ad-infected cells. Thus here we show that Rac1, PI3-Kinase, and NF-kB mediate cellular DNA content in Ad infected cells.

Isolation and Characterization of Mycobacteriophage Kenn

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Background: Mycobacterium smegmatis is one of the species that makes up the genus Mycobacterium. Species that commonly affect humans that belong to the genus Mycobacterium are M. tuberculosis and M. leprae. Although M. smegmatis belongs in the same genus as tuberculosis and leprosy, it is not harmful and is very abundant throughout the environment. This is important because environmental samples collected can be helpful to the study of bacteriophages and antibiotic resistant bacteria. Methodology: Kenn was collected at The Academic Support Building at Howard University (38.9235 N, 77.018 W). Kenn was processed through enrichment and a series of direct plating and spot tests. The bacteriophage was then isolated through numerous rounds of plaque purification assays. Empirical testing was used to calculate the titer of the lysate. After DNA isolation, the DNA was run through gel electrophoresis and restriction enzyme digest for characterization of Kenn. Kenn did not produce a mesa, so it is not being used for any lysogenic work such as streaking or patch assays. Results/Conclusions: After producing no plaques in direct plating from the first soil sample, the second soil sample in which Kenn was found produced average sized and fast-growing plaques. Kenn produced a titer of 4.7x1010 pf u/ml and a DNA concentration of 241 ng/ml. It had a purity of 1.5. Eventually, Kenn will be annotated to further characterize its genes and how they work.

Battle of the Brains

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This project is to determine if gender affects short-term memory. To perform this experiment, I will determine which gender is able to remember the images shown to them. If images are shown multiple times, which gender will be able to recall the images. The results concluded males recalled the images better than females.

Apolipoprotein E Genotype Modulation of the Impact of Exercise Training on Bio-markers of Immune Function and Brain Health in Female Transgenic Mice

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The apolipoprotein genotype considerably increases the risk for the development of cognitive impairment, increase lipid and cholesterol metabolism, as well as down-regulation of brain-derived neurotrophic factor. Exercise has been proven to preserve many biological functions, along with delaying the onset of age-related diseases. In this study, we strive to assess the impact of APOE genotype variance on the beneficial effects of exercise training on biomarkers of brain health and function, as well as the impact on biochemical and inflammatory markers. Apoe ⑧. Apoe ④ and C57Bl6 mice were placed in 4 groups; exercise resveratrol, exercise sedentary, sedentary control or sedentary resveratrol. Baseline locomotor function was measured using rotarod training and in-cage running-wheel activity. Mice in exercise groups were subjected to 30 minutes of treadmill running, 5 days a week for 8 weeks. Voluntary activity in C57Bl6 mice were significantly greater than ⑧ and ④ mice. Despite activity level differences, levels of mature BDNF in hippocampal tissue were similar in all groups. There was a significant difference between rotarod time between Apoe ⑧(a) and Blk6 ($p=<0.05$). Apoe ⑧(b) mice also significantly outperformed Apoe ④ mice ($p =< 0.01$). There were no differences in serum cytokines levels (IL-10, IL-5, IL-6, TNF-® and IL-1⑨. There

was a significant difference in biochemical markers; dHDL, NEFA, and lactase levels between Apoe ⑧ and Apoe ④ genotype. In conclusion; genotype variance had an impact on the beneficial effect of exercise and on voluntary activity, balance, and coordination but had no impact on biochemical and inflammatory markers.

Diabetic Mastopathy: An Imaging Challenge and Malignancy Mimicker

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Introduction: Diabetic mastopathy is a rare but benign inflammatory disease of the breast, usually affecting women with diabetes mellitus. The breast mass may present with other complications of diabetes and may correlate with an elevated HbA1c level. Patients present clinically with multiple palpable, painless masses that mimic malignant lesions on both physical examination and imaging. The purpose of this project is to educate and bring awareness to this rare disease and improve clinical management of diabetes in turn preventing unnecessary biopsies and procedures. Methods: We reviewed the world literature for diabetic mastopathy and specifically focused on the characteristic imaging findings on mammography, MRI, and ultrasound. We also reviewed pathology indicative of fibrous mastopathy and its correlation with clinical and imaging presentation. We illustrated findings of the literature with cases from our institution. Results: The following typical imaging findings of diabetic mastopathy were observed: masses with increased echogenicity with irregular borders on ultrasound and increased fibrofatty density with poorly heterogeneous enhancement on MRI. The spectrum of findings on ultrasound and mammography ranged from regional areas of increased density to architectural distortion. The most common histological findings were: lymphocytic infiltration amongst dense collagen fibers and densely aggregated epithelioid fibroblastic cells. Several cases from our institution mirrored the observations in the world literature. Conclusion: For patients with poorly controlled diabetes mellitus, the ability to distinguish diabetic mastopathy from breast cancer is important. Knowledge of the clinical presentation of diabetic mastopathy within various medical specialties may prevent unnecessary biopsies when breast cancer is absent.

Trends in Firearm Injuries among Children and Teenagers in the United States

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Background: Gunshot violence among children and teenagers in the United States occurs at a magnitude that has drawn increasing national attention. The trends of injury in this age-group relative to the adult population are not well studied. This study seeks to measure trends in firearm injuries evaluated in US hospitals comparing children and teenagers to adult victims. Methods: Data from the National Trauma Data Bank (2010-2015) was used in selecting patients evaluated for firearm injury. Patients were classified as children and teenagers (<20 yo) or adults (≥20 yo). Changes in the proportion of firearm injuries among children and adolescents relative to the overall population was determined using trend analyses. Results: There were 38,151 children and teenagers (19.0%) and 162,282 adults (81.0%) in the study cohort. Compared to adults who had firearm injuries, children and teenagers were more likely to be Black (61.0% vs 52.8%) and injuries were more likely unintentional (14.2% vs 11.5%) (both P<0.001). The proportion of children and teenagers who had firearm injuries relative to adults decreased significantly from 21.9% in 2010 to 17.5% in 2015 (P for trend <0.001). Sub-stratification by race/ethnicity showed a similar trend across all groups (all P for trend <0.001). There was no change in significant decline in self-inflicted injuries. Conclusions: Despite reductions in proportions of firearm injuries among children and teenagers, there remains a significant burden of injury among this age group, particularly among Blacks. Continued efforts are necessary to ensure safety and reduce firearm injuries among children and teenagers in the United States.

The Isolation and Characterization of the phage Onyinye at Howard University

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In the SEA-PHAGES program, there is research done on bacteriophages at Howard University. Bacteriophages are viruses that infect bacterial hosts in order to replicate themselves. Bacteriophages can infect the host cell through the lytic or lysogenic cycle. When phages infect bacterial hosts on a Petri dish, it causes a clearing called a plaque. We studied phages that infect the bacterium Mycobacteriumsmegmatismc2155. Phage Onyinye was obtained from a soil sample from Howard University School of Social Work. The phage was isolated using the direct plating method. Several rounds of serial dilutions were performed to isolate a single phage population. M. smegmatis was added to the soil sample to increase the number of phages. The phage was then isolated to obtain a single, isolated plaque morphology. A lysate was then collected and used to extract the DNA from our phages. The DNA was isolated, and gel electrophoresis and restriction enzyme digest were done to see the length and cut it up into multiple fragments. Recently, streaking petri dishes and creating patch assays have been conducted to test if the phage population is actually temperate. Characterization has been done through annotation and bioinformatics. When sequenced, it was found to be a singleton phage. The titer of the lysate was 7.5x108pfu/ml and DNA concentration was 88.6 ng/microliter. The cluster life cycle is unknown. Through high-titer spot and patch assay, it would be favorable if true lysogens would appear and be identified by patching lysogens onto a layer of host cells.

Isolation and Characterization of Apin77

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As an alternative to antibiotics, if phages were manipulated to target specific bacteria, pathogens could be easily and more efficiently eradicated, hence their importance in microbiology. In this laboratory, Mycobacterium smegmatis mc2 155, a non-pathogenic, fast replicating bacterium was used. A sample containing phages was collected at Howard University Quadrangle (38°55'19"N 77°01'05"W). An agar plate plated with IxTA and 250 µl of M. smegmatis containing plaques, clearings in the bacterial lawn, is indicative of the presence of phages. Following a series of serial dilutions, a single phage, now named Apin77, was obtained in the fourth round of purification. To amplify the concentration of the isolated phage, duplicates of the isolated phage were made, flooded with Phage Buffer, and filtered. The collected filtrate was used to perform a spot test to calculate the concentration of phage in the lysate and how much lysate was required to make a webbed plate. This amount was 18.53 µl of lysate from the 10-4 dilution plate. The webbed plate was duplicated and flooded with Phage Buffer to amplify the amount of phage DNA in the lysate. The high titer lysate now had a concentration of 1.03 pfu/ml. Following DNA extraction, the phage concentration determined by Nanodrop was 8.86 ng/µl. The A260/A280 value was 1.67, indicative of a low phage concentration. Due to human error, the Nanodrop may have given inaccurate results but once obtained, a restriction enzyme digest and gel electrophoresis will be conducted to further characterize the phage isolated.

Identification of potential bacterial pathogens linked to pandemic outbreaks from the New York African Burial Ground

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This investigation explores the 17th and 18th century New York African Burial Ground (NYABG) population. The NYABG is the oldest and largest burial ground in North America where an estimated 10-15,000 free and enslaved Africans are buried. Historical literature has described the treatment of African Americans in the past but the actual lives of African Americans during this time period has yet to be properly investigated. Human-associated bacterial species found in soil samples collected from the NYABG have been analyzed in order to properly contextualize the lives of 17th-18th century African-Americans. Bacterial DNA from the NYABG will inform researchers about the cause of death and the standard of living of this population. Bacterial DNA has been extracted from three different cadaver-associated soil samples from the NYABG. PCR and Gel electrophoresis protocols were utilized to amplify and confirm the presence of selected 16S rRNA genes. DNA sequences will be identified using the Mothur pipeline. Detection and distribution observations of disease pathogen associated bacteria such as Treponema pertenue will be used to infer the impact of historical disease outbreaks like yaws on the African American community in New York during the 17th-18th century. Historical records and the initial archaeological report will be referenced to confirm previous assumptions about the influences of pandemic outbreaks on the African American population during this time. Overall, this research will help create a keyhole view of the lives of African Americans in the NYABG and analyze the impact of disease outbreak in post-colonial New York City.

Isolation and Purification of Phage Xola

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Background: Phages are viruses that infect bacteria by infecting and reproducing in it. The main goal of the current work in the Phages lab is to isolate a bacteriophage from a soil sample, purify, and characterize the same, and its capability to combat the antibiotic resistant bacteria or not. Several spot tests and plaque assays have been carried out to determine if it's a lytic or lysogenic phage. Methods: The soil sample was collected soil sample was collected near a flower bush on the Yard right across from the chapel (38.9225 N, 77.020556 W). Mycobacterium Smegmatis mc2155 was used as a host bacterium to grow the desired phages. In this experiment, a bacteriophage with a single morphology was isolated using serial dilutions and a High Titer Lysate (HTL) was created through the flooding of webbed plates with enrichment broth. The Phages DNA was isolated and undergoes electron microscopy, and further sequenced by Illumina next generation sequencing. Results and Discussion: Plaques were 0.5mm in diameter with a clear morphology. A HTL of 4x10^10 PFU/ml was obtained. Now, by performing streak assays, a patch assay, liquid phage release, and sensitivity assay, the phage can be classified as lysogenic or lytic and then the DNA will be sequenced and annotated to compare known structures of DNA. The HTL was generated and is revealed to contain a lysogenic phage and this is determined through the lysis seen on the plates.

Spatial Learning and Memory in Murine models: Examination of Gender and their Interaction in 5xFAD and APOE Transgenic Mice

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Alzheimer's disease (AD) is the most common cause of elderly dementia with women having a higher incidence than men do. Genome-wide association studies have shown that the apolipoprotein ε4 (APOE ε4) allele is the strongest genetic risk factor for developing late-onset AD along with age and sex. Using APOE knock-in mice (APOE ε3 and APOE ε4) and 5xFAD transgenic mice that overexpress five mutant human familial mutations, we investigated the impact of human APOE alleles and human Alzheimer's mutations (5xFAD) on cognitive performance. Mice aged (6-9 months) were trained on the Barnes maze apparatus for 4 days followed by a 72-hour probe to assess long–term spatial memory. In this preliminary study, we determined whether significant differences due to gender, genotype, and their interactions effected spatial cognition and long-term memory. During training day 1 there was no significant difference in latency times, however, from training day 2- 3 both wild type and APOE ε3 found the target hole at a faster and more significant rate than 5xFAD and APOE ε4 mice. On training day 4, APOE ε4 mice found the target hole at a similar rate as APOE ε3 and WT. In contrast, 5xFAD did not show any learning and was significantly different from all three groups. On the 72-hr probe assessing long-term spatial memory these differences persisted. All behavior data will be further correlated with pathology studies. Understanding the cognitive performance in this model will be important in developing treatment strategies for AD in the near future.

Barriers to Participation in Genomic Health Research by African Americans and Other Minority Populations : A Systematic Review"

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Objectives: Paucity of African-Americans (AAs) participating in health-related research is often attributed to recruitment and retention challenges. Studies demonstrate that AAs may be more difficult to recruit and retain due to psychosocial impacts, cultural beliefs and other issues. Historically, these factors have shown to affect participation and influence health disparities leading to premature death, reduced quality of life, missed economic opportunities, and inequalities. This systematic review seeks barriers to acceptance of health-related research among AAs and other minority populations. Methods: Acceptance to participate in health-related research involving DNA were examined from 37 articles published in PubMed and Scopus between 2008-2018. Results were based on feedback from trained research assistants and phlebotomists during group, face-to-face, telephonic interviews and survey questionnaires. Results: AA participation in health-related research is influenced by perceived and/or actual experiences of mistrust/deceptiveness with investigators and healthcare systems, misuse of health data, unethical research practices, privacy concerns, socioeconomic influences, cultural beliefs and other psychosocial factors. Conclusions: Results of this review are consistent with literature showing diminishing participation of AAs in health-related research is attributable to a range of factors leading to health disparities. It is important to address these factors among minority groups who have not largely been represented in health-related

research to promote better health outcomes and understand how to prevent and treat diseases.

Detection and analysis of bacterial DNA from New York African Burial Ground soil samples to confirm causes of premature death

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The New York African Burial Ground (NYABG) collection located within the W. Montague Cobb Research Laboratory contains numerous soil samples containing the remains of African Americans that lived in post-colonial New York City. Studying and researching this extensive collection may be able to provide insight into the conditions that these individuals lived under and how their genomes were affected. Due to the limitation of resources, human DNA proves difficult to detect in these remains., thus we have set out to detect human associated bacteria. Species found in the samples will tell us more about the lifestyle of the individual associated with each of the human remains. Researchers aim to extract and analyze bacterial DNA from these historic soil samples. Genomic DNA was successfully extracted from soil samples 45, a child's remains where meningitis was evident in the bones, 47, the remains of a middle-aged male where periostitis was observable in the limbs and cranium, 203, identified to an adolescent of unknown sex, and 302, a woman of unknown age. After extraction, and screening for 16s rRNA genes the samples were sent for next generation sequencing and bioinformatic analysis was conducted using Mothur. We identified bacterial species reflecting disease pathogens and that have helped to confirm that many of these individuals did in fact die from the bacterial epidemics indicated in the historical literature. This research has allowed us to gain a better understanding of infectious diseases faced by slaves from the mid-1600s throughout the Revolutionary War in colonial New York.

Popliteal Venous Aneurysm: A Clinical and Imaging Challenge

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BACKGROUND: Venous aneurysm is a relatively new entity in vascular medicine, and can be defined as the continual dilatation of an isolated vein to twice its normal diameter. They can be classified into superficial and deep aneurysms. Popliteal venous aneurysms (PVAs) are the most prevalent deep venous aneurysm of the lower extremity. Possible etiologies include surgery, inflammation, trauma, degenerative changes, or congenital weakness. PVAs are traditionally identified with venous duplex ultrasonography. However, PVAs remain difficult to diagnose via imaging as they can mimic Baker's cyst, popliteal artery aneurysm, and arteriovenous malformations (AVM). METHODS: A review of the world literature was conducted to identify reports consisting of popliteal vein aneurysms, pseudoaneurysms, doppler imaging, surgical procedures, and outcomes. We also looked at the relationship between AVM and popliteal venous aneurysm formation. RESULTS: As of 2015, a total of 212 cases of popliteal venous aneurysm had been reported in the literature. The first case was reported in an autopsy in 1915. Many patients with lower extremity venous aneurysm presented with pulmonary embolism. Recommendations for the management of asymptomatic venous aneurysms are not well-defined. Additionally, the role of prophylactic anti-coagulation has not been well-established. We illustrate these findings with a case from our institution, where a distal tiny AVM caused the popliteal venous aneurysm. CONCLUSION: Popliteal venous aneurysms are a rare condition that can often present with the lethal condition of pulmonary embolism. Further studies are needed to establish clear, evidence-based guidelines in the management of this condition to decrease morbidity and mortality.

Structure of human ferroportin (SLC40A1) inferred from mass spectrometry restraints

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There is a keen struggle for iron at the interface of host organisms and pathogens. However, free iron is toxic from the production of reactive oxygen species and it is essential that iron is tightly regulated. Ferroportin is the only known exporter of cellular iron in mammals and is crucial for maintaining iron balance. Ferroportin function and expression are controlled by hepcidin. Carriers of ferroportin mutation Q248H

associated with elevated iron stores and reduced sensitivity to hepcidin have elevated HIV-1 viral load. Thus modulation of iron levels presents a strategy to control AIDS pathogenesis. In HIV-1 infection, there is marked alteration in markers of iron balance indicated by high ferritin levels and elevated levels of iron-regulating peptide hormone hepcidin. High iron stores correlate with high morbidity, increased opportunistic infections and faster progression to AIDS: high iron content in bone marrow macrophage parallels greater infection, immune dysfunction and poor prognosis. By contrast, patients who were being treated for iron overload had delayed AIDS progression and longer survival. Little structural information is exists on human ferroportin, and how iron is transported through ferroportin is not understood. We have built the structure of ferroportin using hybrid methods with restraints from mass spectrometry. Our model comprises 12 transmembrane helices. The iron binding site matches with that seen in crystal structures of distant orthologs. We are using this structure to answer outstanding questions about the mechanism of ferroportin, iron transport and the importance of the Q248H mutation found in African and black American populations.

Micro-CT Imaging and Molecular Spectroscopy of Dental Remains from 1607 Jamestown, Virginia

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Background: The first English settlement in North America was established in 1607, at Jamestown, VA. The first casualty in Jamestown was a 15yo boy (specimen 1225B), the apparent victim of an Indian attack. His excavated remains show: arrow head at the thigh; broken left collarbone; anterior mandible with Ellis Type III fracture of left central incisor (#24); significant periapical pathological bone resorption. Objectives: Elucidate nature and chronology of odontogenic cause(s) of mandibular pathology evident in skeletal remains, and analyze contents of root canals of fractured teeth to assist assembling a corporeal and physiological history of boy 1225B. Materials & Methods: Cone-beam CT (CBCT) for morphological and chronological assessment of 1225B skull; 3D intraoral visual imager to non-invasively examine and manipulate occlusion; 2D intraoral x-rays to document individual teeth; micro-CT (MCT) to image intact and fractured teeth and root canals; scanning electron microscopy (SEM), energy dispersive x-ray spectroscopy (EDX), and confocal Raman spectroscopy (RS) for nanoscale imaging and elemental analysis of root canal particulate and soil surrounding skeletal remains; optical Z-stack scanning microscopy for spatial assessment of carious lesions. Preliminary Results: MCT of fractured tooth #24 showed arrested root canal maturation, and established boy's age as 8 years at time of trauma to anterior dentition; CBCT supported presence of mandibular, intra-alveolar pathosis for 7 years. SEM-EDX and RS established organic nature of #24 canal particulate, of possible fungal origin. RS also established carbonate content of dental enamel studied. Intraoral imager established feasibility of reconstructing fragmented cranial base to facilitate orthodontic analyses.

Isolation and Purification of Morganite

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Background: Bacteriophages are viruses that are unable to replicate without a host in which case is a bacteria cell. Specific phages are being researched in order to attack harmful bacteria directly instead of using antibiotics. Our project uses the bacterial host Mycobacterium Smegmatis because it is easy to work with. Methods: Soil was collected on Howard University's campus and filtered. The supernatant was used for direct plating and a spot test. Plaques were picked using pipettes and serially diluted three times, in order to isolate a morphologically identical phage by plaque assay. The most webbed plate was flooded with phage buffer to obtain a medium titer lysate. This lysate was used in another spot test and a series of dilutions to know what dilutions would likely yield more webbed plates. The webbed plates were generated and flooded to obtain a high titer lysate and titer was calculated (1.3 x 10^10 pfu/mL). After a long incubation period, the lysate was used in a spot test in order to obtain a mesa, which was streaked and an isolated colony was used in a patch assay. From the patch assay, more of the resulting mesa was picked and streaked to isolate the lysogen. Results & Discussion: A high titer lysate was successfully generated but was revealed to contain a lytic phage as evident from the lack of lyse on the experimental plate on the patch assay. Instead, the experiment continued with a patch assay. Isolation of the stage is underway with Streak 3 finished.

Differences in neuronal activation within different regions of the paraventricular nucleus of the thalamus in binge eating prone and binge eating resistant rats

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Background: Binge eating affects millions of people in the United States, and it is described as the excessive consumption of palatable food at least once a week for a period of at least three months. The paraventricular nucleus of the thalamus (PVT) functions as a communication center between the ventral and dorsal striatum and the lateral hypothalamus, and it has been linked to modulating motivated behaviors, arousal, and reward processing. It is possible that the PVT modulates binge eating behavior; however, no studies to date have definitively identified how the PVT influences this behavior. The purpose of this study is to determine whether there are topographical and activational differences in different regions of the PVT (posterior PVT and anterior PVT) of binge eating prone (BEP) and binge eating resistant (BER) rats. It was hypothesized that BEP rats have significantly more c-Fos-activated neurons versus BER rats. Methods: We used a rodent, binge eating protocol to identify female Sprague Dawley rats (250-300g, n=7/group) that display the BEP or BER phenotype. After completing nine feeding tests, the animals were processed for c-Fos immunoreactivity. Results: Rats classified as BEP consumed significantly more palatable food (high fat, sugar) than BER rats ($p<0.05$). Preliminary analysis of the quantification of c-Fos positive neurons indicates a trend in increased c-Fos in the PVT of BEP versus BER rats. Conclusions: The activation of PVT neurons after palatable food consumption may indicate an involvement of these neurons in mediating binge eating behavior.

Relationship between Hypertension and Inflammatory Process in African Americans with Diabetes and Cardiovascular Disease: Role of Gut Microbiota

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Background: Studies have showed that metabolic syndrome diseases such as hypertension and diabetes are more prevalent in African Americans and other minorities. Some of the patients reported being aware of the disease processes, but stated they are noncompliant with their medication regimen, diet and constant exercise routine. While others are not aware, until it is life threatening. This study investigated other possible alternative treatment that are more organic and cost effective. Trillions of gut microbiota is said to reside in the gastrointestinal tract and can sustain good health when tested on human and rat test subjects. The microbes are said to control hormones, blood glucose and participate in sustaining life. Methods: The study conducted its research from 2015-to the present and thirty experiments, reviews and articles, were analyzed. They consisted of qualitative and qualitative design models. The participants studied were multi-racial humans and lab rats. Chemical components were metabolic chemistry, human urine, and fecal matter from both human and rats were analyzed to study the various gut microbiota. Results: This review has summarized the role of gut microbiota and its metabolites in the pathogenesis of inflammatory diseases and has the possible mechanisms to improve these diseases. Discussions: This paper reviews the current data relating gut microbiota to metabolic syndrome diseases and advocates for dietary recommendations for African Americans and other minorities.

Effects of Sex and the Estrous Cycle on the Associations between Sleep and Fear Memory Consolidation: A Mouse Model of Post-Trauma Sleep

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Women are at greater risk than men for developing posttraumatic stress disorder (PTSD) after trauma exposure. Sleep, especially rapid-eye-movement sleep (REMS), has been considered a contributing factor to the development of PTSD symptoms through its effects on the processing of emotional memories. However, it remains unknown if sex and sex hormones play a role in the hypothesized impact of sleep on the development of PTSD. Animal models have methodological advantages over human studies in investigating this research question; however, animal models of sleep in PTSD have been tested only with males. C57BL/6 mice (7 males and 15 females) were exposed to 15 footshocks in a footshock chamber, and 5 minutes after the last footshock, were returned to their home cages for electroencephalographic sleep recording. Nine to thirteen days later, mice were returned to the footshock chamber for 10 minutes without footshocks. Fear recall rates were computed by comparing freezing behaviors in the footshock chamber immediately after the footshocks to those during fear context re-exposure. Males had significantly lower recall rates compared to metestrous females (which received footshocks on metestrus) ($p=.04$). Overall,

males slept more than metestrous and proestrous females (which received footshocks on proestrus) during the dark period (F=4.7, p=.02). Regression analyses revealed that the average REMS episode duration after footshocks was positively associated with recall rates in males, but negatively associated with recall rates in proestrous females ($p < .05$). Results suggest that both sex and the estrous cycle modulate the associations between REMS continuity and fear memory consolidation.

Motor-Driven (passive) Cycling on Arterial Function

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A plethora of research links prolonged periods of sitting/physical inactivity with increases risk of chronic diseases. Prolonged periods of sitting are associated with impaired glucose tolerance, obesity, and cancer. However, there are circumstances when extended sitting cannot be practically avoided. This study sought to explore if the beneficial physiological effects, which occur as a result of active exercise will occur similarly as a result of passive exercise. Paired t-tests revealed that there was not a statistically significant difference in aortic augmentation (mmHg) between pre-passive and post-passive data collection (P= 0.7433), nor between pre-active and post-active data collection (P= 0.6184). Paired t-tests of PWA studies post both passive and active trials also revealed that passive exercise does not affect augmentation index differently to active exercise (P= 0.8562). Changes in PWV as a result of passive exercise (P=0.1847) were not observed, nor were changes in PWV as a result of active exercise (P=0.5258). Similarly, PWV readings taken following the passive trial were not statistically different to those taken following the active trial (P=0.2005). Endothelial function was not affected by passive (P=0.3414) nor active exercise (P=0.3397). However, similar effects on endothelial function were observed in both post-passive and post-active trials, as neither changed significantly (P=0.2418). Neither one thirty-minute trial of passive exercise nor active exercise has a significant effect on aortic augmentation, PWV, nor endothelial function. In all three measures, however, data collected from post-exercise trials were similar, indicating that neither passive nor active exercise caused significantly different changes within these variables.

Isolating Bacteriophages

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Mycobacterium smegmatis is the bacterial host used in experiments to allow bacteriophages to grow. Bacteriophages are being studied throughout the world because of the effects they are having on medicine and the health of humans. They are located anywhere in the world just like bacteria making it easy to discover. Scientist are currently studying bacteriophages to figure out a way to use it for anti-resistant bacteria that are developing in humans due to the amount of medicine being intaken. To better understand phages, a soil sample was collected from Bethune Annex (38°55'15.8"N, 77°01'04.0"W) and used in multiple experiments to identify a single morphology. By conducting experiments such as purification, plaque assays, spot test, empirical test, DNA extraction, full plate titer, HTL, and streaking a single morphology is isolated and identified. Using the HTL collected from last semester, a titer of 6.5*1010pfu/µl, streak test and patch assay are used to determine if lysogeny is present. The streak test help isolates single morphologies, after isolation the genes are annotated to discover the function and compare it to other discovered genes. The isolated DNA was sequenced through Illumina NGS. It is then processed in programs, DNA Master, phagesDB, PECAAN, and NCBI blast to compare its DNA sequences with different phages that have been discovered all over the world.

Characterization of Artis Phage

Presenter's Name: Patrick Prosper Jr
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Discovering and studying phages' viral diversity and the evolutionary mechanisms that give rise to their genetic variations helps address the scientific issues pointed out by the Science Education Alliance-Phage Hunters Advancing Genomics and Evolutionary Sciences (SEA-PHAGES) program. Mycobacterium smegmatis is one of the many species that make up the genus Mycobacterium and the phylum Actinobacteria. The Mycobacterium genus contains many species that affect human health, including Mycobacterium tuberculosis and Mycobacterium leprae. Methods: Phage Artis was collected in a soil sample between Howard University's two Academic Support Buildings (ASB) on 2435 6th Street

Northwest, Washington, D.C. (38.9232973 N, 77.0188361 W). The phage was isolated and purified through processes of spot test and plaque purification assays. An empirical test was performed to calculate the titer of the phage's lysate. DNA extraction experiment was performed to obtain of the phage's DNA. Gel electrophoresis and restriction-enzyme digest were performed in order to get a deep understanding of phage Artis. Currently, Artis is undergoing lysogenic work to determine whether or not the phage Artis is a lysogenic or lytic phage through streaking procedures and patch assays. Artis produced 3mm plaques with a titer of 1.05x107 (pfu/ml). Results and conclusion: Sequencing results identified Artis as a lytic phage. Various procedural steps are being taken to verify that the phage Artis, is a lytic phage, as it shows the presence of lysogens with conduction of streaking protocols and patch assays.

Rice Receptor for Activated C Kinase1B (OsRACK1B) negatively regulates chlorophyll degradation and salinity induced senescence through interaction with Stay- green (SGR) in rice

Presenter's Name: Md Rahman
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RACK1 is a WD-40 type scaffold protein that regulates diverse signal transduction pathways. Arabidopsis RACK1 has shown to interact with several proteins in salt stress and photosynthesis pathways. However, the mechanism of how RACK1 contributes to the photosystem complex remains elusive. Using T-DNA mediated activation tagging transgenic rice (Oryza sativa) lines, we found that rice leaves from OsRACK1B gain-of-function (RACK1B-OX) plants exhibit stay-green phenotype by retaining more chlorophyll than wild-type (WT) under salinity stress. In contrast, leaves from loss-of-function of OsRACK1B (RACK1B-UX) plants display yellowing phenotype accompanied by chlorophyll degradation. qRT-PCR analysis revealed that several genes encoding chlorophyll catabolic enzymes (CCEs) are differentially expressed in both RACK1B-OX and RACK1B-UX rice plants. In addition to CCEs, transcript and protein profiling revealed a significant upregulation of a key regulator of chlorophyll catabolism- STAY-GREEN (OsSGR) in RACK1B-UX than RACK1B-OX plants during salt treatment. BiFC assay demonstrated that OsRACK1B interacts with OsSGR in planta. Our results imply that major senescence-associated transcription factors (TFs) were altered in accordance with altered OsRACK1B expression, suggesting a transcriptional reprogramming by OsRACK1B. We propose a novel regulatory mechanism involving OsRACK1B-OsSGR-TFs. Taken together, our findings suggest that ectopic expression of OsRACK1B negatively regulates chlorophyll degradation and delays salinity induced senescence. OsRACK1B functions in this process, at least in part, by antagonizing the function of OsSGR through direct physical interaction. Overall, our study provides important insights into the molecular mechanisms of salt-tolerance that can possibly be useful to develop a salt-tolerant rice variety under the current global climate change scenario.

Isolation and analysis of bacteriophage Bandicoot

Presenter's Name: Thomas Randle
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Presentation Type: Poster Presentation
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Bacteriophages (phages) are viruses that attack bacteria. The current research was designed to isolate and characterize bacteriophages (phages) from soil samples collected on Howard University's campus (38.55.22N, 77.1.17W) in Fall 2018. The data derived will further contribute to our understanding of phage interactions with Actinobacteria. Phage Bandicoot was isolated using enrichment or direct culturing, and characterized using empirical testing, HTL preparation, DNA extraction and quantification, restriction digest, electrophoresis, and spot assays. Bandicoot's initial titer was 2.2 × 1010 , but decreased to 7.3 ×108 over the course of a 6 week period. Bandicoot's plaques were turbid, which suggested that Bandicoot was a temperate phage; however, this was not supported by the test for lysogeny. Additional experiments are required to confirm these observations.

The Isolation and Purification of Phage Albuquerque from Howard's Campus

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Background: Bacteriophages are viruses that infect bacteria and are used as alternative treatments for bacterial infections. The present work details the process of collecting, isolating, and characterizing the DNA of the phage Albuquerque with an objective to find a phage that could infect the bacteria Mycobacterium smegmatis mc2155. Methods: A soil sample was collected from the outside of the Academic Success Building of Howard University's campus, which was then isolated by incubating and centrifuging with phage buffer. It was then diluted by plating multiple serial dilutions.

Empirical testing was used to calculate the right dilutions to create a flooded plate, where 95% of the bacteria present has been lysed. A high titer lysate was then formed by flooding the webbed plates with phage buffer. This HTL was then used to characterize the phage with DNA isolation, restriction enzyme digest, and gel electrophoresis. The lysate was also further streaked to test if it was lytic or lysogenic. Results and Conclusions: The experiment resulted in the creation of the isolated phage Albuquerque. It is a lytic phage with a high titer lysate of 7.1 x 109 pfu/µl, and a DNA concentration of 108 ng/µL with a purity of 1.7, which shows some impurities. It forms small clear plaques with diameters of .5mm. Further work involves isolating the DNA from Phage followed by the gene annotation that would identify its uniqueness, resembling its each gene function.

Marshe Abstract

Presenter's Name: Kasyah Richardson
Classification: Undergraduate Student
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The SEA-PHAGES program enables us to study bacteriophage diversity and evolution, as well as discover information about specific bacterial DNA functions, sensitivity, characteristics, and their life cycles. A bacteriophage is a virus that infects a specific type of bacterial host for survival and replication. The structure of a bacteriophage is made up of tail fibers that are used to attach to their bacterial host, a tail that is needed to inject the DNA, and a protein shell that houses the phage's genomic material. We focused on the mycobacteriophage Mycobacterium Smegmatis mc^2 155 as our host, which derives from the Mycobacterium genus. This bacterium is unique for having saprophyte qualities while being apart of a genus that contains other bacteria that are harmful to humans, like M. Tuberculosis and M. Leprae. We studied phages that infect Mycobacterium Smegmatis mc^2 155 with the goal of understanding the phage diversity further. The phage Marshe was derived from a soil sample that was collected at the side entrance of Bethune Annex on Howard University's campus (38.918889 N, 77.018333 W). The phage then went through isolation, a series of, plaque assays for purification, spot testing, serial dilutions, titer calculating, and generation of a webbed plate, aiming to characterize the phage. This phage didn't reach the DNA extraction and gel electrophoresis stage. Although the phage's DNA has not been characterized, Marshe's lysate is currently being used for streaking and lysogeny testing to determine its life cycle and possible lysogeny.

Evaluation of Sensitivity of Breast Cancer Cell Lines to 2, 3- dichloro-5, 8-dimethoxy-1, 4-naphthoquinone and 4 Hydroxy-Tamoxifen

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In the United States, there is a disparity in survival of breast cancer (BC) between African American (AA) and Caucasian women with AA women having a higher rate of mortality. Immunohistochemical classification of BC is based on the expression of the following receptors: ER® PR and HER2. Triple negative breast cancer (TNBC) is a form of BC which lacks expression of ER® PR and HER2 and affects minority population disproportionately. One mechanism for the loss of ER® expression is hyperactivation of MAPK pathway. Due to lack of targetted treatment for TNBC, alternative treatment options are essential to increase patient survivability. 2,3-dichloro-5,8-dimethoxy-1,4-naphthoquinone(Z285) has demonstrated cytotoxic effects in ER+ and ER- cell lines. Cell viability studies were carried out on cells (MCF7, MDA-MB-231 and HCC1806) treated with Z285 alone (0.5-10µM), 4 hydroxy-Tamoxifen (4OH-Tam) alone (3-30µM) for 24,72 and 120hr. In combination studies, the cells were pretreated with Z285 (2 or 5µM) for 6 hrs followed by 4OH-Tam (1-15µM) for 24, 72 and 120hr. These results showed a dose and time-dependent response with individual treatment. Combinatory studies showed significant decreases in cell viability when compared to individual studies. Cells were treated with 5 µM Z285 and RNA microarray analysis was used to determine changes in mRNA expression profile and revealed modulation of several genes involved in the MAPK pathway. Therefore, this novel compound may offer a model for treating TNBC breast cancers by increasing sensitivity of the TNBC cells to anti-estrogen therapy by reactivating ER® expression.

The Isolation and Characterization of Phage Delton

Presenter's Name: Delandra Robinson
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Coauthors: Delandra Robinson, Benedict Quagraine, Adrian Allen, Ayele Gugssa, Courtney Robinson, Winston Anderson, Mary Ayuk

A bacteriophage is a virus that infects a bacterial host cell and uses it to reproduce. The purpose of the SEA-PHAGES program is to isolate a bacteriophage that will infect the bac-

terium Mycobacterium smegmatis, in an overall quest to find bacteriophages that can be used as alternatives to antibiotics, which bacteria are increasingly becoming resistant to. This host is used because it is similar to Mycobacterium tuberculosis and Mycobacterium leprae and will allow us to find phages that may infect these bacteria. Delton was collected and isolated from a soil sample on Howard University's campus, near Bethune Annex (38.918889 N, 77.018333 W). Mycobacterium smegmatis mc2155 is the specific strain that is used for phage isolation. The phage then underwent three rounds of plaque purification assays and a spot titer to the purify the phage and generate a high titer lysate, with a titer of 4.5 x 109 pfu/ml. DNA isolation was performed to isolate the phage DNA and purify it from the rest of the lysate. The concentration of the phage DNA was 126 ng/µl and the purity was 1.73. Restriction enzyme digest and Gel electrophoresis was then performed to further characterize the phage by generating a genetic fingerprint. The high titer lysate was stored in preparation for future archiving and the DNA of phage Delton was sent for sequencing. Currently, lysogenic testing is being performed to determine if phage Delton is lytic or lysogenic. The DNA of phage Delton is also in the process of being annotated.

Identifying the Biological, Social and Structural Factors that Contribute to Viral Suppression in Women living with HIV in Washington D.C.

Presenter's Name: Camille Robinson
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Effective HIV treatment and management has decreased morbidity and mortality driven by the likelihood of achieving viral suppression in individuals with HIV for over two decades. The DC Women's Interagency HIV Study (WIHS) has determined three longitudinal HIV trajectory groups: sustained viremia (high), intermittent viremia (moderate), and non-viremia (low) based on the probability of detectable HIV RNA over time. It has been identified that 36% of women display intermittent viremia (periods of non-suppression and viral suppression), which negatively impacts the health of the individual, but also allows for increased population level transmission of drug resistant HIV. The primary focus of this sub-study was to identify biological, social and structural elements such as HIV stigma, distrust, health care insurance status, and access to care that can contribute to viral suppression for participants in the intermittent viremia trajectory group. In 2006, the proportion of individuals in the intermittent viremia group declined, with many of the women subsequently achieving and maintaining viral suppression. More women reported having health insurance starting in 2006, with a corresponding increase in the number of health care visits after that time point. These findings identify an important structural element that contributes significantly to long-term viral suppression. Access to affordable health care is critical to achieve viral suppression, and may increase self-efficacy among individuals with HIV. Ultimately, they may be more likely to manage their HIV disease through adherence to treatment regimens when given the access to health care insurance.

The Identification of the Antibiotic Resistant gene mecA in Mosquito collected from Ethiopia

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Background: Antibiotic resistance has been a growing epidemic in many countries. The acquired resistance within bacteria makes it difficult to treat infections with antibiotics. One such infection is Methicillin Resistant Staphylococcus Aureus (MRSA). MRSA owes its antibiotic resistance to the mecA gene which codes for an alternative penicillin binding protein, penicillin binding protein 2, which prevents cross-linking of beta-lactamase to the cell wall. The mecA gene has been proven to be found in mobile cassettes called Staphylococcus Chromosome Cassettes (SCC), which have a mec variant and nonmec variant. The purpose of this study is to identify the presence of mecA in the gut DNA samples of mosquitos collected from Ethiopia. Methods: Through Polymerase Chain Reactions (PCRs) and Gel Electrophoresis, the mosquito samples are amplified then identified on a gel. A multiplex PCR was also performed for the identification of the SCC mec variant. This variant is known to carry the mecA gene and has four different types that is notable by the separation of their bands. The multiplex PCR serves as a facile mechanic to allow researchers to use multiple primers in one reaction to highlight the potential variants that are associated with SCC mec. Results and conclusion: The results would then aid in conclusion of the antibiotic resistant presence of mosquito gut samples collected from Ethiopia.

Characterization of phage SharnadoD

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A bacteriophage is a virus which infects bacteria and reproduces. In this lab research, the host bacterium used

was Mycobacterium smegmatis mc^2 155, of the phylum Actinobacteria. The genus Mycobacterium contains many species of bacteria that affect human health due to growing resistance to antibiotics. Thus, isolating bacteriophages that infect M. smegmatis is significant in improving human immune resistance to this particular genus, which also contains M. tuberculosis and M. leprae, infectious agents of tuberculosis and leprosy, respectively. M. smegmatis is usually found in environmental samples such as soil or compost thus we examine how bacteriophages can enhance the understanding of the evolution of phages. From there, we study the benefits of phages, and particularly their use against antibiotic-resistant bacteria to combat its effect on human health. Sharknado D was collected in an environmental sample, with the coordinates 38.5512 N, 77.110 W. Direct plating techniques were used to provide a snapshot of all of the phages and enrichment plating was used to amplify the number of phages in the environment as the soil sample was mixed with the bacterial growth media. Plaque purification was performed on the sample to ensure that only one phage sample was retained, enabling us to characterize the phage and discover its biological properties. A high titer lysate was obtained by 0.22-micron filter, and flooding webbed plates. SharknadoD's DNA was used in restriction enzyme digest techniques and gel electrophoresis which increased the mass of the phage DNA by mixing with the loading buffers.

Adenovirus early genes modulate HIV-1-specific vaccine-induced immune responses

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The development of a safe and effective preventative HIV-1 vaccine is an urgent global health priority. Among various vaccine delivery methods, the Adenovirus (Ad) vector is recognized for its priming ability believed to be linked to the viral surface proteins. However, several reports suggest that the viral early region (E) genes modulate the immune responses induced against the Ad vector and the transgene it carries. To test this hypothesis, we created Ad vectors in which we deleted viral early region genes to include E3 (ΔE3), E1B55K and E3 (ΔE1B55K/ΔE3) and E1B55K, E3 and E4orf1-4 (DE1B55K/DE3/DE4orf1-4). Each of the vaccine candidates was constructed to express full-length single-chain HIVBALgp120 linked to rhesus macaque CD4 (rhFLSC). In both mice and nonhuman primates the DE1B55K/DE3/DE4orf1-4 virus induced higher levels of HIV-specific binding antibodies compared to the DE3, and DE1B55K/DE3 viruses. We assessed the ability of cells infected by the individual viruses to mount an intrinsic immune response by measuring gene expression using commercially available TaqmanÓ Arrays. Nineteen of the 28 human cytokine network genes were expressed at higher levels in cells infected by the DE1B55K/DE3/DE4orf1-4 virus when compared to the wild type. These results represent the first demonstration showing that Ad early genes significantly contribute to the nature of the immune responses induced following vaccination against an HIV immunogen.ôø

Dihydrotestosterone Lowers Cytosolic Sterol Regulatory Element-Binding Protein-1 in Adipose Tissue from Female Mice

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Hyperandrogenemia (HA) and insulin resistance (IR) are hallmarks of polycystic ovary syndrome (PCOS), a common endocrine disorder that affects up to 1 in 5 women. These hallmarks are also integral elements of non-alcoholic fatty liver disease (NALFD), a disorder that is common in women with PCOS. In lean female mouse models of dihydrotestosterone (DHT)- induced PCOS, low-dose DHT promotes IR and hepatic lipogenesis via the androgen receptor (AR), thus resulting in NAFLD. However, the molecular mechanism of HA-induced NAFLD has not been determined. We hypothesized that low-dose DHT would interrupt hepatic lipid metabolism leading to NAFLD. To investigate the role of androgen and AR on a lipogenic master regulator, sterol regulatory element-binding protein-1 (SREBP-1), we extracted white adipose tissue (WAT) from lean, female wild-type mice and lean PCOS female mice, aka "DHT mice." Then we analyzed the effect of low-dose DHT on lipogenic protein and gene expression as a control to low-dose DHT's impact on the liver. We accomplished this by performing Western blots and qRT-PCR analysis of the cytosolic lipogenic proteins and gene expression of WAT. Low-dose DHT lowered the active form of SREBP-1 in DHT mice in comparison to the control mice, but there was no significant change in fatty acid synthase (FAS), acetyl-CoA carboxylase (ACC), phosphorylated ACC (p-ACC), and the active and inactive forms of SREBP-2. We speculate that the low-dose DHT promotes the translocation of SREBP-1 from the cytosol to the nucleus to influence lipogenic gene expression leading to increased lipogenesis contributing to NAFLD.

Using Reverse Genetics to Analyze Human Monoclonal Antibody Interactions with Enterovirus-D68

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Enterovirus-D68 (EV-D68) is a positive-sense, single-stranded RNA virus that has caused international outbreaks of respiratory illness and small clusters of acute flaccid myelitis, a poliomyelitis-like illness. Studies of sera acquired prior to these outbreaks show that almost all humans above the age of two were already seropositive for EV-D68 with neutralizing antibodies. However, understanding why outbreaks persist despite nearly universal presence of neutralizing antibodies is clouded by a lack of detailed knowledge about the human antibody response to EV-D68. Using a reverse genetics system, we aim to generate recombinant versions of EV-D68 to further understand the humoral immune response to EV-D68. First, DNA plasmids that encode the entire 7.3 kb genome of the virus are used to generate viral RNA through in vitro transcription. Next, the viral RNA is transfected into mammalian cells, leading to the production of infectious virus. The virus is passaged multiple times under selection of lab-produced anti-EV-D68 human monoclonal antibodies (mAbs). We then sequence the viruses that escaped neutralization to identify mutations coding for amino acids that are critical for mAb binding. By modifying the original plasmid DNA sequence to introduce these mutations individually, we can create mutant viruses that should no longer be neutralized by mAbs and confirm the locations of the mAb epitopes. With this knowledge, we can better understand the interactions between EV-D68 and the antibodies humans make in response to infection, which could contribute to the creation of effective vaccines or drugs to control the viral infection.

Epigenetic Regulation of TP73 Expression in Hepatocellular Carcinoma of Racially Diverse Patients

Presenter's Name: Zaki Sherif
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Coauthors: Zhixing Yao, Grace Mavodza, Cristina Di Poto, Habtom Ressom

Hepatocellular carcinoma (HCC), a primary liver malignancy that occurs predominantly in patients with underlying chronic liver disease and cirrhosis, is now the third leading cause of cancer mortality worldwide. Our team has previously identified differentially regulated metabolites between African-American and European-American cirrhotic and HCC cases by gas chromatography coupled with mass spectrometry. Currently, our focus is to determine if epigenetic modification plays a role in the expression of TP73, HCC development and progression. We first showed distinct TP73 expression patterns between normal and cancer liver cell lines. The TP73 gene, a homologue of the master tumor suppressor TP53, maps to a region of chromosome frequently deleted in tumors, but its role in tumorigenesis is enigmatic. First, TP73 expression was analyzed in various cell types including stem cell lines from isolated normal young and old European-American liver tissues; dysregulated racially diverse hepatic cancer cell lines; gastrointestinal cancer (GI) cell lines and a normal skin fibroblast cell line. The results show that TP73 only expresses in cancer cell lines tested. Similarly, immunohistochemistry studies on normal liver and adjacent cancerous liver tissues from HCC patients of three racial groups confirmed the exclusive expression of TP73 in the cancerous tissues. Methylation-specific PCR and bisulfite sequencing revealed that TP73 promoter is activated only in cancer cell lines by DNA methylation. Furthermore, ChIP assay demonstrated that CTCF (a chromosomal networking protein CCCTC binding factor) binds to TP73 promoter and regulates TP73 expression. Our observation may prove significant for the development of future therapeutic and diagnostic applications.

The Characterization of Phage Trinitium

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Bacteriophages (phages) are viruses that infect that bacterial host cells, and make up a vast majority of the bacteria population. The goal of the study was to isolate bacteriophages from the soil sample were a match for the specific bacterial host used, Mycobacterium smegmatis mc2155. The phage then either goes through lytic or lysogenic cycle. Phage Trinitium was isolated from 38.55186 N,77.01096 W, amplified using enrichment culturing, then purified using the double agar plate method. Emprical testing was used to generate a medium and high titer lysate. DNA was then extracted from the high titer lysate measured to be 1.48 x 1010 pfu/ml, quantitated and purity and stability evaluated using NanoDrop and gel electrophoresis. Restriction enzyme digest and gel electrophoresis were both used to characterize the phage. Furthermore, the ability of Phage Trinitium to generate lysogens was evaluated using the patch assay. Because the phage did not produce plaques, the phage is assumed to be a lytic phage.

Identifying Schistosome ESPs effect on BGE cells using luciferase to measure Hsp70 Levels and BDM treatment on susceptible snails lowers stess

Presenter's Name: Michael Smith
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Schistosomiasis is a snail-borne parasitic disease endemic in several tropical and subtropical countries. The helminth parasite Schistosoma mansoni uses the freshwater snail Biomphalaria glabrata as an intermediate host to reproduce asexually generating cercariae for infection of the human definitive host. Following invasion of the snail, the parasite develops from a miracidium to a mother sporocyst and releases excretory-secretory products (ESPs) that likely influence the outcome of host infection. It has never been shown whether the ESPs are the cause of increased levels of Hsp 70 activity and stress within the snail host. BGE cells were transfected in a 6 well plate using the polymer polyethyleneimine (PEI) mediated delivery of plasmid DNA that contained luciferase gene and Hs70 promoter region into the cells along with several controls; PEI and plasmid independently. The cells were incubated for 48 hours at 37 degrees Celcius. Transfer membranes were placed in wells and 10-12 miracidia were added to each membrane for 2 hour infection. Cells were collected and processed for RNA isolation followed by DNA clean up and finally qPCR analysis. It has been noted that stress induced by heat shock at 32 degrees in susceptible snails' causes' upregulation of hsp70 within 30 minutes. The use of the drug When snails are treated with the drug 2,3-butanedione monoxime (BDM) has yet to be seen as an effective way of treating stress in the susceptible snail. BB02 snail line was treated with 15um of BDM for 20 minutes then HS for 2 hours.

The Isolation and Characterization of Bacteriophage Mussae

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A bacteriophage (phage) is a virus that infects a bacterial host. It can infect the host cell through the lytic or lysogenic cycle. In the current study, soil samples were collected at (38.9235218 N, 77.018873 W), Howard University. The bacterial host Mycobacterium smegmatis mc2 155 was utilized to isolate and purify phages using direct and enrichment culturing. Phages were then purified and the empirical testing, spot testing, were used to generate medium and high titer lysates. DNA was then isolated, quantitated and purity and stability evaluated using gel electrophoresis. Further characterization of DNA was done using restriction enzyme digest. The results of both are currently undetermined. General characteristics for phage Mussae was added to the Actinobacteriophage Database. Mussae has not yet been sequenced and is currently not yet archived. Phage Mussae is a lytic phage with diameter of 1 mm. The titer for HTL was 8.8 × 107. Mussae is currently being evaluated, using the patch assay, to determine if it produces lysogens.

Craniofacial Influences on Third Molar Impaction

Presenter's Name: Laura St. Bernard
Classification: Post Doc/Resident/Fellow/Research Associate
School/College: Dentistry
Presentation Type: Poster Presentation
Faculty Advisor: Kathy Marshall
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Third molar impaction is a frequent phenomenon, most commonly seen in the mandible. Therefore the aim of this investigation is to explore the relationship between craniofacial shape and third molar impaction. Previous work has failed to address if there is a true correlation between impacted thirds and craniofacial skeletal patterns due to lack of sample size. I hypothesize that there is a correlation between dolichocephalic facial shapes and incidence of third molar impaction: that dolichocephalic heads experience greater rates of third molar impaction. Patient mandibular plane angle will be measured using cephalometric analysis for each of the qualifying patient records. Knowing whether people with certain facial shapes are more likely to have impacted third molars can help clinicians and patients decide whether to engage in procedures like prophylactic extraction, thereby removing third molars which are likely to become impacted, and avoiding clinically significant sequelae (or issues) that arise from impacted third molars.

Screening Bacterial Isolates for Iodine Transformation Abilities

Presenter's Name: Tamara Sullivan
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Presentation Type: Poster Presentation
Faculty Advisor: Courtney Robinson
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Background: The Hanford Site in Washington was the location of weapons grade plutonium enrichment. Due to its proximity to the Columbia River, contamination of the groundwater by the resulting pollutants is a major concern. Specifically, our focus is on immobilizing radionuclide iodine-129, a carcinogen affecting the human thyroid gland. It is known that some microorganisms are capable of catalyzing iodine transformation reactions. The purpose of this research was to screen bacteria isolated from Hanford for these abilities in the hopes that they may be used to immobilize iodine-129. Methodology: Characterization of these

isolates has consisted of iodide oxidation assays and nitrate reduction assays, since nitrate reduction has been coupled to iodate reduction. Additionally, q-PCR screening for genes that encode for nitrate reductases and a dissimilatory sulfur reductase was conducted. Results and Conclusions: Iodide oxidation assay of 28 isolates from a 2016 enrichment collection revealed that approximately one third were positive for the ability to oxidize iodide to iodine. Similarly, this assay completed for 20 isolates from the 2017 collection also revealed that the vast majority (16) were positive for iodide oxidation. Using q-PCR, it was determined that four isolates contained genes encoding for nitrate reductases. However, there was no correlation between positive iodine transformation and the presence of either gene. Furthermore, q-PCR for the gene dsr showed no correlation between positive iodine transformation and presence of the gene. Currently, bacterial samples obtained from soil during 2018 are being screened for the presence of these genes.

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30 Day Outcomes of Operative versus Non-operative management for Humeral Diaphyseal Fractures in Patients with Concomitant Hip fractures

Presenter's Name: Daniel Sutton
Classification: Post Doc/Resident/Fellow/Research Associate
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Objective: To evaluate differences in perioperative outcomes between nonoperative and opera-tive management of humeral diaphyseal fractures and concomitant hip fractures. Design: Retrospective study. Setting: Patient data from national trauma database. Participants: Patients with hip fractures and concomitant humeral diaphysis fracture based on ICD-9 codes. Intervention: Operative versus Nonoperative treatment of humeral diaphysis fractures. Main outcome measurements: Perioperative outcomes and mortality of operative versus nonop-erative management. Results: Of the 494 patients identified, mean age was 78.6 years, 74% were female. 81.2% of patients were managed non-operatively. Females were more likely to undergo operative man-agement (OR 1.99, Cl 1.03-3.82, p 0.04). Patients older than 85 years were less likely to under-go surgical fixation of the humerus (OR 0.45, Cl 0.21-0.96, p 0.04). Patients treated operatively had a longer hospital length of stay (LOS) (OR 4.25, Cl 1.34-13.45, p 0.01). No difference was observed in 30-day mortality between the two groups (OR 0.97, Cl 0.87-2.05, p 0.31). Patients treated operatively were more likely to be discharged to skilled nursing facility (OR 4.43, Cl 1.19-16.56, p 0.03). Conclusions: Patients who underwent operative management were more likely to have a longer LOS and to be discharged to a nursing facility. There was no significant difference in periopera-tive outcomes in patients receiving operative versus non-operative management.

The effect of Neuronal Microtubule disruption by MiniSOG on lifespan of C. elegans

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Microtubules are tubular structures found in the cytoplasm, known for their role in skeletal support, organelle movement, and cell locomotion. Microtubule associated proteins allow for the proper function of the microtubules. Scientist have discovered that as aging progresses microtubules degenerate, but there is still limited information on their effect on longevity. The importance of microtubule regulation is emphasized by the role Tau protein plays in microtubule stabilization; its dysfunction often leads to neurodegenerative diseases. Recent studies have demonstrated that loss of ptl-1, the C. elegans homolog of Tau, shortens lifespan. My hypothesis was that manipulating neuronal microtubule stability would modulate lifespan. I found that destabilizing neuronal microtubules with MT-miniSOG, at early adulthood, but not post-reproduction, is sufficient to shorten lifespan, supporting my hypothesis.

Four different strains of C. elegans, containing the miniSOG protein, were used. The strains were transferred onto new petri dishes with a lawn of E. coli, serving as the food source for the C. elegans. The life stages of the worms were then synchronized at L4 and A6. Destabilization was then induced by a blue light treatment for 30 minutes, under a fluorescent microscope. After treatment, the worms were transferred onto FUDR+ plates to stop embryo development. The lifespan of the organisms was then tracked daily. The preliminary data of the blue light treatments showed to be more impactful when C. elegans were treated at L4 stage rather than at A6 stage; suggesting that microtubule integrity is more important during the earlier life stages rather than

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Topographical Differences in Orexin Activation after Pain Assessments in HbAA and HbSS Mice

Presenter's Name: Nia Sweatt
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Title: Topographical Differences in Orexin Activation after Pain Assessments in HbAA and HbSS Mice
Co-Authors: Kimberlei Richardson, Xi Ping, Robert Taylor, Kalpna Gupta

Background: The orexins are neuropeptides that are synthesized in the perifornical area (PFA), lateral hypothalamus (LH) and dorsomedial hypothalamus (DMH) and mediate arousal, sleep, and reward. Orexin–A has an analgesic effect on inflammatory pain and may affect mechanisms underlying neuropathic pain. There have been no published studies to investigate this system as a target to treat neuropathic pain in sickle cell disease (SCD). We seek to determine topographical differences in neuronal activation of the orexin system in a mouse model of SCD. Methods: Female transgenic HbSS-BERK sickle mice that express human sickle hemoglobin and age-/gender-matched controls (HbAA-BERK mice; n = 5/group, 20-30g) expressing normal human hemoglobin A are used in the study. Thermal/heat hyperalgesia, cold hyperalgesia, and mechanical hyperalgesia are used to assess pain-related behaviors. Ninety minutes after testing, hypothalamic brain sections from HbAA and HbSS mice are processed to visualize orexin and c-Fos double label immunohistochemistry. Results: Preliminary analysis shows that topographical differences are observed in LH vs. PFA for HbAA and HbSS mice (p<0.05). The number of double labeled neurons in the LH is significantly lower than those in the PFA and DMH in HbSS and HbAA mice. Additionally, significant topographical differences are observed in LH vs. DMH only for HbSS mice (p<0.05). Conclusion: This data demonstrates that the number of activated orexin neurons is greater after pain testing in the DMH (region associated with stress/arousal) versus LH (region associated with reward) of HbSS mice. This finding suggests that DMH orexin neurons are preferentially recruited during neuropathic pain in SCD.

Topographical Differences in Orexin Activation after Pain Assessments in HbAA-BERK and HbSS-BERK Mice

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The orexins are neuropeptides that are synthesized in the perifornical area (PFA), lateral hypothalamus (LH) and dorsomedial hypothalamus (DMH) and mediate arousal, sleep, and reward. Orexin–A has an analgesic effect on inflammatory pain and may affect mechanisms underlying neuropathic pain. There have been no published studies to investigate this system as a target to treat neuropathic pain in sickle cell disease (SCD). We seek to determine topographical differences in neuronal activation of the orexin system in a mouse model of SCD. Female transgenic HbSS-BERK sickle mice that express human sickle hemoglobin and age-/gender-matched controls (HbAA-BERK mice; n = 5/group, 20-30g) expressing normal human hemoglobin A are used in the study. Thermal/heat hyperalgesia, cold hyperalgesia, and mechanical hyperalgesia are used to assess pain-related behaviors. Ninety minutes after testing, hypothalamic brain sections from HbAA and HbSS mice are processed to visualize orexin and c-Fos double label immunohistochemistry. Preliminary analysis shows that topographical differences are observed in LH vs. PFA for HbAA and HbSS mice ($p<0.05$). The number of double labeled neurons in the LH is significantly lower than those in the PFA and DMH in HbSS and HbAA mice. Additionally, significant topographical differences are observed in LH vs DMH only for HbSS mice ($p<0.05$). This data demonstrates that the number of activated orexin neurons is greater after pain testing in the DMH (region associated with stress/arousal) versus LH (region associated with reward) of HbSS mice. This finding suggests that DMH orexin neurons are preferentially recruited during neuropathic pain in SCD.

Big Data Analytics of Sequence Variations Associated with Mental Disorders

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Mental disorders, including schizophrenia, bipolar disorder and major depression, are global health issue. The genetics factors of these diseases are largely unknown and treatments for the diseases are not satisfactory. Understanding the role of sequence variations in candidate genes is important in elucidating the genetics mechanism of the diseases. Disrupted in schizophrenia 1 (DISC1) gene is a convincing candidate gene for developing mental diseases. The molecular studies have shown that DISC1 functions as scaffold protein in neuronal development through a large set of pathway genes. We analyzed sequence variations in 213 DISC1 pathway genes from 1543 psychiatric patients and healthy individuals. We identified a novel protective association between a common intronic variant in Neurexin 1 in a combined cohort of cases compared to controls. We observed an enrichment of rare disruptive variants in schizophrenia patients, and the increased burden of damaging mutations could reduce cognitive measures. Burden analysis of rare variants in regulatory regions were found to be correlated with psychiatric disorders and cognitive measures. The sequence-based machine learning predictions showed that rare coding mutations can impact protein stability and be involved in post-translational modifications. The structure-based methods revealed that

the missense mutations could reduce folding energy and affect binding energy. The findings improve our understanding of the roles of sequence variations implicated in mental illnesses and provide the targets for the diagnoses of mental disorders.

Isolation and Characterization of Phage SynergyX

Presenter's Name: D'nai Thomas
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Background: Bacteriophages, also known as phages, are defined as viruses that invade and infect, even reproduce, within the walls of a bacterial host. Discoveries of bacteriophages have contributed to fields such as phage genetics that can address questions about gene structure, function, organization, and regulation/ therapeutic usage of phages, etc. This research's purpose and aim are to isolate a bacteriophage that infects Mycobacterium smegmatis mc2155. Methods: The researcher was able to isolate and purify the mycobacteriophage SynergyX, from soil collected on the campus of Howard University. After collection, the phage particles were then amplified through enrichment techniques in order to isolate a single phage colony and purify the phage through plaque purification assays. A lysate, at a titer of 2.08*10-8, was harvested and used for DNA extraction experiment. The concentration of 213.6 ng/µl was obtained, the DNA was used to perform gel electrophoresis and restriction enzyme digestion. DNA sequencing for characterization was conducted. Results and conclusion: Sequencing results identified SynergyX as a lytic phage. Various procedural steps were taken to verify that the phage SynergyX, was a lytic phage, as it showed a presence of lysogens with conduction of streaking protocols and patch assays. Currently, Synergy X, is being studied and further being analyzed, using various bioinformatic software and tools to help solidify and validate the genes of SynergyX and their functions.

Uterine Artery Pseudoaneurysm: An Iatrogenic Cause of Postpartum Hemorrhage

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BACKGROUND: Uterine artery pseudoaneurysm is a rare cause of potentially life-threatening secondary postpartum hemorrhage following cesarean section, and can also occur after dilation & curettage or hysterectomy. A pseudoaneurysm is a blood-filled cavity that communicates with the lumen of the original artery due to one or more defective layers of the arterial wall. Arteriovenous malformation may show a similar presentation on ultrasound, so differentiating between the two is important. The purpose of this project is to raise clinical awareness of this complication. METHOD: A review of the world literature was performed, with special focus on etiology, imaging findings, and treatment of uterine artery pseudoaneurysms. We also provide a case from our institution. RESULTS: This is a rare entity, and most publications were case reports. Eleven case reports (from 1999 to 2017) discussed how patients with uterine artery pseudoaneurysms were treated successfully with embolization, and one patient was treated with hysterectomy due to pseudoaneurysm rupture. The imaging finding typically was a color signal on Doppler ultrasound with a yin-yang pattern of blood flow in the pseudoaneurysm. We illustrate these findings with one case at our institution of a 41 year old G1P1 female who presented with vaginal bleeding after D&C six days prior. The patient was treated with embolization of the spiral branch of the uterine artery. CONCLUSION: Awareness of the risk of iatrogenic uterine artery damage causing severe secondary bleeding is crucial. Early embolization of arterial pseudoaneurysms via interventional radiology techniques is a successful and minimally invasive treatment option.

GlucoCEST MRI reveals decreases of glucose uptake and metabolism in perinatal brain injury

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Perinatal brain injury, such as perinatal hypoxia from chronic lung disease, results in devastating, neurologic impairment. The immediate and longterm effects on brain energy metabolism of glucose – a major source of energy for the brain - are not known. Previous studies have shown that perinatal brain injury from perinatal hypoxia results in long-term decreases in neuronal oxidative metabolism of glucose and decreased synthesis of N-acetylaspartate. In this study, we utilized dynamic glucoCEST enhancement MRI to investigate the pattern of glucose uptake and metabolism between the mice of

normoxic and hypoxic treatment. Prior to the injection of glucose, the glucoCEST showed significant higher contrast in the hypoxic brains than that in the normoxic brains (Hx: 8.9±1.5 a.u.; Nx: 6.2±1.5 a.u., $p<0.01$). After giving 0.55 mg/g D-glucose, the normoxic brain showed clear contrast enhancement starting from 0.5 hr after glucose injection, and reached the highest contrast in 2.0 hr. The glucoCEST contrast disappeared after 3.5 hr post injection. The hypoxic brain, however, endured fewer contrast enhancements after the glucose injection. The group averaged data indicated a ~30% reduction of the glucoCEST contrast in the hypoxic brain. This study demonstrated that hyperglycemia was seen in the hypoxic brain in mice, while the glucoCEST imaging is capable of detecting the high cerebral glucose in their baseline condition. The results showed that the glucoCEST imaging is able to detect the glucose uptake deficit and abnormal metabolism in the hypoxic brain non-invasively.

Isolation and Characterization of Mycobateriophage *Cherise* from an environmental soil sample from Howard University

Presenter's Name: Lauren Williams
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Faculty Advisor: Ayele Gugssaa
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Mycobacteriophages are ubiquitous and the most prominent organisms in the biosphere. A bacteriophage also is known informally as a *phage,* is a virus that infects and replicates within bacteria. Mycobacteriophages are being studied due to their ability to cause the lysis of bacteria, which can help treat bacterial infections instead of using antibiotics. An environmental sample was obtained from a soil sample collected on Howard University's campus near the School of Social Work. The soil sample was then made into a liquid sample and a spot test was performed. A plaque was chosen from the spot test and it was purified through plaque purification assay three times. After purification, a high titer lysate (1.29 x 10^9pfu/mL) was collected from webbed plates to archive the phage and perform further purifications. The DNA was then used to perform gel electrophoresis in order to further characterize and sequence the phage's genome. The phage was also characterized using restriction enzyme digest. The spectrophotometer measured the concentration of the phage DNA sample to be 112.4 ng/µl and the purity of the phage DNA sample was measured as 1.78ng/ul. Plaques produced by this phage were used to streak an agar plate to determine the presence of a lysogen. After streaking, it was determined that a lysogen was present and individual colonies of that lysogen were observed. Due to the presence of a lysogen, it was determined that phage *Cherise* is a viable temperate phage. With further characterization, it is possible that phage *Cherise* may be able to advance the use of bacteriophages to treat antibiotic-resistant bacteria.

Isolating, Characterizing, and Identifying Skywalker

Presenter's Name: Brooke Turner
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A bacteriophage, or phage, is a virus that infects and replicates itself using a bacterial host using one of two life cycles: lysogenic cycle or temperate cycle. It is believed that there are novel phages present in the soil around Howard University. Soil was collected at a diameter of 1 mm, outside Ernest Just Hall (38 55'18"N, 77 01'06"W). Phages were isolated from soil using either enrichment or direct isolation, and the plaque or spot assays. Subsequently, phages were purified, spot titered, and a medium titer lysate generated. Empirical testing using the MTL was used to generate a high titer lysate which was used for archiving and DNA isolation. The DNA was quantitated and the purity and stability checked using NanoDrop and electrophoresis. DNA was also characterized using restriction digest. Phage"Skywalker" produced temperate plaques with diameter of 1 mm, and extracted DNA had concentration of 152.9 ng/µL, and titer for HTL of 1.03 × 1011. Further experiments are underway to confirm whether Skywalker's is temperate or lytic.

Characterization of an E1B55K and E4orf1 Deleted Adenovirus

Presenter's Name: Jasmine Tutson
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Human immunodeficiency virus (HIV) destroys the body's immune system specifically CD4 cells. Due to the compromised immune system the body is vulnerable, increasingly making it harder to fight off infections and other diseases. African American make up among the larger faction of HIV infected even in this age of PREP. Thus, we desperately need an HIV vaccine. Toward this end the lab created an Adenovirus vaccine vector encoding full-length single chain HIVBaL gp120 linked to D1 and D2 domains of rhesus macaque CD4 (rhFLSC). From this virus the genes that encoded early region 4 open reading frame 1 (E4orf1) through E4orf4 was deleted. This virus induce high levels of anti-gp120 antibodies however it remains unclear which of the four deleted E4 genes (E4orf1, 2, 3, or 4) restricts immune responses. To illuminate the role of E4orf1 in the induced antibody responses a virus deleted in E1B55K and E4orf1 was created. My role is to characterized this virus in terms of replication potential by plaque assay, levels of DNA made over time by PCR, as well as the levels of viral proteins and rhFLSC made in infected cells by western blot. Here we will present our current findings.

Methodology of DNA Extraction and Sequencing of New York African Burial Ground Soil Samples

Presenter's Name: Nancy Varice
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Coauthors: Carter Clinton, Fatimah Jackson

The New York African Burial Ground (NYABG) was discovered in 1991, is estimated to contain the remains of at least 15,000 persons of African-descent, both freed and enslaved. Here at Howard University, cadaver-associated soil samples collected from these individuals are being analyzed for bacterial DNA to help us learn more about those buried there. Researchers used the Qiagen DNeasy PowerSoil Kit which was optimized with an additional lysis step and longer centrifugation cycles since our DNA was highly degraded. After extraction, we quantified the DNA using NanoDrop technology and each sample was amplified with 16S rRNA gene primers to confirm the presence of bacterial DNA using gel electrophoresis. The 16S rRNA gene is highly conserved and allows us to analyze the phylogenetic diversity of the detected bacteria. Lastly, samples were sent for Next Generation Sequencing. Researchers looking at disease pathogen, decomposition species, and the microbiome will use bioinformatic analyses to learn more about the individuals associated with each burial. For example, the microbial signature of burial 49, a middle-aged woman, can potentially elucidate Staphylococcus aureus as the cause of periostitis contributing to her death. Furthermore, historical literature will also serve to supplement any knowledge we acquire from our bacterial analyses. Gaining insight into the lives of those buried will impact their narrative and how we understand the history of early African Americans in New York.

Predictors of In-Hospital Ambulatory Status Following Low Energy Hip Fracture Surgery

Presenter's Name: Jordan Villa
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Coauthors: Joseph Koressel, BS, Matthew Cohn, MD, David Wellman, MD, Dean Lorich, MD, Joseph Lane, MD, Jelle van der List, MD

Background: 25-75% of independent patients do not walk independently after hip fracture (HF), and many patients experience functional loss. Early rehabilitation of functional status is associated with better long-term outcomes, however predictors of early ambulation after HF have not been well described. Purposes: to assess the impact of perioperative and patient-specific variables on in-hospital ambulatory status following low energy HF surgery. Patients and Methods: This is a retrospective analysis of 463 geriatric patients that required HF surgery at a metropolitan Level 1 Trauma Center. The outcomes were time to transfer (out of bed to chair) and time to walk. Results: 392 (84.7 %) patients transferred after surgery with median time of 43.8 hours (quartile range 24.7- 53.69 hours) while 244 (52.7%) patients walked with median time of 50.86 hours (quartile range 40.72-74.56 hours). Pre-injury ambulators with aids (HR, 0.70, CI, 0.50-0.99), age >80 years (HR, 0.66, CI, 0.52-0.84), peptic ulcer disease (HR=0.57,CI, 0.57-0.82), depression (HR, 0.66, CI, 0.49-0.89), time to surgery >24 hours (HR= 0.77, CI, 0.61-0.98) and surgery on Friday (HR= 0.73, CI, 0.56-0.95) were associated with delayed time to transfer. Conclusions: Operative predictors of delayed time to transfer were surgery on Friday, and time to surgery >24 hours after admission. Depression is associated with delayed time to transfer and time to walk. This data suggests that is important to perform surgeries within 24 hours of admission, identify deficiencies in care during the weekends, and create rehabilitation programs specific for patient with

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Bacteriophage Cassius

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Background: The purpose of the research is to identify isolate colonies, extract and purify the samples to discover a bacteriophage. Bacteriophages are composed of a genetically diverse population of viruses that specifically infect a bacterial host cell. These viruses may provide alternative medicine, resisting the rates of antimicrobial resistance in bacteria. Method: A sample of bacteriophages was collected from a soil sample of the Academic Support Building of Howard University Campus. The bacteriophages were enriched, identified, then isolated through a series of serial dilutions. A high titer lysate (HTL) was collected from plates of lysed bacteria then flooded with phage buffer, known as webbed plates. The HTL was used again to identify and create putative lysogens and isolated colonies. A patch assay was performed to determine a lysogen, which allows further streaking, establishing isolated colonies. Results: Plaques had an area of 1.5mm, and the calculated HTL was 4.22x10^-8. After performing the DNA extraction, the HTL provided a concentration of DNA 578.8 ng/ul. Using the HTL, a lysogen was identified, and isolated colonies were created. Conclusion: With further streaking and purification of the colonies, the sample may be used to

determine and verify if the phage may or may not be a lysogen. Once the phage is registered on PhagesDB, annotation and natural alignment of the DNA will be performed further to compare and analyze the locations of genes and the phage uniqueness.

Role of Distal Enhancer Regulatory Elements in Altered NIPBL Gene Expression Levels

Presenter's Name: Nina Wallace
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Cornelia de Lange Syndrome (CdLS) is a rare genetic developmental disorder associated with the disruption of cohesin's role in cell proliferation and gene expression. Of the cohesin-related genes, NIPBL accounts for 60% of CdLS cases. This project investigated whether mutations in a potential NIPBL enhancer element result in the reduced expression of the NIPBL protein, despite the absence of mutations in NIPBL itself. A cohort of typical NIPBL CdLS phenotypes without any known mutations was identified. Digital Droplet PCR was utilized to measure NIPBL protein expression and the copy number of both enhancers. Samples were screened for mutations via Sanger Sequencing. Approximately half of the samples had higher NIPBL expression levels than the control while the other half had lower normal expression levels. All the samples had normal copies of both enhancers and no significant polymorphisms. These unexpected findings present new questions into the role of upregulation of NIPBL on cohesin levels and organism development. Future studies investigate for mutations deeper within the intron, other regulatory elements, and other genes that may mimic, control, or overcompensate for NIPBL expression via whole exome sequencing. Until now functional elements in the intron, previously thought to be "junk DNA", were not examined for their role in CdLS. Given that even a small alteration of NIPBL expression severely impacts cohesin function and development, this non-coding genomic element should be included in the future molecular diagnosis of CdLS and other genetic diseases.

Do "tongue-eating" isopods actually eat tongues of fishes?

Presenter's Name: Briana Washington
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Title: Do "tongue-eating" isopods actually eat tongues of fishes?

Author: Briana Washington, Dr. Stacy Farina

Background: Isopods in the genus Cymothoa are known to parasitize fishes, with some species living in the mouth cavity of fishes as adults. These are known as "tongue-eating lice," due to the common understanding that they consume and replace the tongue of their fish hosts. However, most fishes have bony tongues (unlike the muscular tongue of mammals), and it is unknown whether isopods eat or damage the bony tongue during parasitization. In this study, we used micro-CT scanning to compare the bony tongue of a parasitized and non-parasitized individual of the species *Caranx lates,* a subtropical predatory marine fish in the jack family (Carangidae). Methods: To obtain the 3D images of the skeleton of the parasitized and non-parasitized C. lates, we used Horos software to reconstruct and isolate the hyoid bone. We examined the basihyal and hypohyal bones, which are the bones of the hyoid on which the isopod sits. Results: There were no discernable differences in the skeleton of the bony tongue between the parasitized and unparasitized individual. Specifically, the basihyal and hypohyal were not degraded in the parasitized fish. Conclusion: We found no evidence supporting the hypothesis that the isopod eats and replaces the skeletal components of the tongue of *C. lates.* While the isopod may have consumed or degraded some of the soft tissues covering the tongue, the skeleton of the tongue remained fully intact.

Screening for Adverse Childhood Experiences (ACEs): A discussion on the importance of Trauma-Informed Practices

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Background: Adverse childhood experiences (ACEs) are being widely discussed in the medical field. The pediatric community has recognized the importance of ACEs and how such traumatic events–including abuse and neglect–affect the lives of children leading to the development of a wide range of health problems throughout their lifespan. However, the awareness of this phenomenon has not shown a tremendous change in pediatric practices. A 2016 American Academy of Pediatrics (AAP) study with 305 pediatricians found only 4% asked 7 out the of 10 components of ACEs, 32 % did not ask about any ACEs. The main barriers that pediatricians cited were the lack of training and comfort in discussing ACEs with parents. Methods: In our recent study of 638 African American young adults ages 18-25 in Washington DC, we analyzed nine types of exposure to childhood violence (ECV). Results indicate that a high percentage of participants experienced

ECV, such as physical abuse by a grown-up (30%); childhood neglect (19.9%); emotional abuse by a grown-up (28.7%); witnessed a parent to be physically abused by an intimate partner (28.6%); and witnessed a sibling being physically hurt by a parent (20.6%). Conclusion: Since many communities are plagued by violence; developing ways to utilize the knowledge gained from ACEs is imperative. Trauma-informed care provides an approach and ways to discuss ACEs with families. This presentation will discuss the importance of screening for ACEs, barriers to screening and implementing modalities that keep ACEs from having a lifelong effect on children.

Screening for the Presence of blaOXA-58 in Mosquitoes Collected from Ethiopia

Presenter's Name: Precious Wells
Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Poster Presentation
Faculty Advisor: Courtney Robinson
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Coauthors: Courtney Robinson

Background: Antibiotic resistance is a prominent issue in treating bacterial infections. With the overuse of antibiotics and bacteria's high frequency of mutations bacteria rapidly evolve various mechanisms to evade antibiotics. Research has shown that insects are important vectors of pathogens, many of which contain antibiotic-resistant microbiota. The ®lactamase enzyme blaOXA-58 belongs to a group of carbapenem-hydrolyzing enzymes that have been identified as contributors to antibiotic resistance in Acinetobacter baumannii. As a Class D ®lactamase, bla-OXA58 has the ability to hydrolyze oxacillin, a penicillin ®lactam. In its catalysis, bla-OXA58 carbamylates lysine to activate the nucleophilic serine used for hydrolysis. Methods: The purpose of this study is to screen for the presence of blaOXA-58 in mosquito samples collected from Ethiopia. DNA collected from these mosquito samples are amplified through Polymerase Chain Reactions (PCR) using blaOXA-58 primers and then identified through gel electrophoresis analysis. Results/conclusion: The goal is to not only determine the presence of blaOXA-58 gene within the mosquito population in Ethiopia but to use this information to further our understanding of microbial and genetic interactions between bacterial pathogen, insect host, and antibiotic resistance. Through the gel analyses, we have identified a potential positive for bla-OXA58 gene in our mosquito samples. This will be further investigated through methods including DNA sequencing.

The Role of Albumin Levels and BMI on Postoperative Outcomes in Patients Undergoing Total Knee Arthroplasty

Presenter's Name: Rolanda Willacy
Classification: Graduate Student
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Presentation Type: Oral Presentation
Faculty Advisor: Robert Wilson
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Introduction: Osteoarthritis is a degenerative condition which affects weight-bearing joints such as the knee, hip, ankle and spine. Obesity and low albumin levels are modifiable risk factors associated with increased perioperative complications following total knee arthroplasty. Albumin values of <3.0 are clinically significant in perioperative complications. Therefore, our study seeks to establish if increased BMI and decreased albumin levels are associated with increased perioperative complications. Methods:A retrospective analysis was conducted using the 2011-2014 American College of Surgeons-National Surgical Quality Improvement Program (ACS-NSQIP) dataset. Patients between 18 and 90y of age who underwent Total Knee Arthroplasty met the inclusion criteria for the study. All study subjects were stratified into five categories based on their BMI. Results:A total of 51,415 patients met the inclusion criteria. Of the patients who underwent TKA, 90.31% were overweight or obese. When postoperative complications were compared by BMI categories, higher BMI was associated with higher Surgical Site Infections (P<0.001) and respiratory complications (P<0.001). After adjusting for patient characteristics in the multivariate analyses, patients with Class III obesity, modified by low albumin, had significantly higher respiratory complications (Odds Ratio: OR 1.58, 95% Confidence Interval: 95%CI 0.92-2.70), systemic septic complications (OR 2.21, 95%CI 0.89-5.49), and renal complications (OR 1.51, 95%CI 1.05-2.17). Conclusion:This study demonstrates that increased BMI and low albumin levels are associated with increased postoperative complications following TKA. Efforts should be made to decrease these risk factors to minimize complications among patients that will undergo this procedure.

Discovering the Real Jayswill

Presenter's Name: Jalen Williams
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As diseases and illnesses evolve and form immunity to various antibiotics, scientists need to formulate new medicines to replace the now ineffective medicines from years ago. In

order to develop those antibiotics, it is necessary to discuss how important it is to study bacterial cells similar to the diseases and illnesses that are now resistant to antibiotic. In this study, we dive into phages that can be found at Howard University. Phages are good biological models to develop an understanding of antibiotic resistance and the bacterial processes associated with the interaction between antibiotics and harmful bacteria. The phages was collected from a soil sample box in the Howard University greenhouse on the roof of the Biology building. The phage, Jayswill, was isolated, purified, and characterized to determine various characteristics it has when interacting with bacteria, which in this is Mycobacterium Smegmatis. The DNA extracted from the phage was used to determine unique characteristics of the Jayswill by both gel electrophoresis and DNA sequencing. Jayswill was different from other phages by having a fairly high titer of 3.4*1010. So far, Jayswill has only been numerically characterized and determined it to be a temperate phage. In order to further confirm this finding, another variety of experiments must be conducted in order to create lysogens from the phage. Then, using the lysogens to further characterize the sensitivity of the phage. The results of the study will give a better understanding of the relationship between antibiotic resistance and bacterial cells.

Characterization of Vaginal Secretions following Mucocept administration in Rhesus Macaques

Presenter's Name: Erin Winrow
Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Poster Presentation
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MucoCept is an HIV-1 infection-preventative tool that contains a recombinant human vaginal Lactobacillus jensenii (1153-1666). The bacteria was enhanced to express modified cyanovirin (mCV-N, a potent viral entry inhibitor) and it is able to colonize the vaginal mucosa as a part of the vaginal microbiome. The objective of this study is to characterize and compare vaginal secretions isolated from three cohorts of rhesus macaques. Group 1 was immunized with a DNA-SIV/ALVAC-SIV/gp120 vaccine strategy. Group 2 consisted of animals treated with the MucoCept previously described and vaccinated with an identical vaccine of group 1. The third group consisted of unvaccinated, untreated controls. The three-group rhesus study covered an 18-week period – at the end of which, Rhesus Macaques were vaginally exposed to repeated low doses of SIVmac251. In order to characterize these secretion, vaginal secretions were isolated and the same was done for bacterial pellets (isolated from the vaginal secretions) and a Luminex analysis was then performed on the supernatant collected from such material. The data suggest that this approach might contribute to a strategy that might successfully lead to the prevention of HIV-1 mucosal transmission.

Incidence of Antibiotic Resistance in Bacteria Isolates From Ready to Eat Vegetables in Washington, D.C.

Presenter's Name: Simone Yhap
Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Poster Presentation
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The prevalence of antibiotic resistant bacteria in ready to eat vegetables in the Washington, D.C. area were determined from sixteen samples purchased from retail stores and restaurants. The ready to eat vegetables in this project consisted of: spinach, lettuce, and pre-packaged salad mix. The vegetables were processed for standard plate count and bacterial isolation within twenty four to forty eight hours after purchase. The plate count of all samples ranged from 1.17 x 107 cfu/g to 3 x 108 cfu/g. An average of 50% of gram negative and gram positive bacteria respectively were reflected within the samples chosen. Representative colonies were selected from the plate count, and further purified in preparation for antibiotic susceptibility testing though disk diffusion tests.

Streptomycin Complexed Exosomes for the Treatment of Leishmaniasis

Presenter's Name: Todd Young
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School/College: Arts & Sciences
Presentation Type: Poster Presentation
Faculty Advisor: Clarence Lee
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Coauthors: Zoe Parker, Oluwapelumi Kolawole, Jalynn Borders, Charnae Henry-Smith, Zahra Small, Jaslin Pride

Background: Leishmaniasis is a parasitic disease that affects 12 million worldwide and 2 million new individuals each year (Chappius et al., 2007). Currently, there are no vaccines or drugs for prevention (CDC, 2013; Shaw and Carter, 2014). Treatment of the disease is complicated by variation in drug sensitivity, drug resistance, and immune status (Croft and Coombs, 2003). Exosomes and extracellular vesicles are particles secreted from cells ranging in size from 50 to 1000 nanometers. Recently, exosomes have been used as a novel way to transport molecules such as DNA, RNA, and treatment drugs, and have been largely successful because they are able to reach targets more effectively. Methods: The research will use exosomes or extracellular vesicles to deliver the aminoglycoside streptomycin to infected macrophages in vitro. Efficacy will be assessed by comparing the IC50 (Inhibitory Concentration by 50%) of streptomycin complexed with exosomes to the IC50 of streptomycin alone. Preliminary Results: Increasing concentrations of streptomycin inhibits the growth of the promastigote form of the parasite in vitro. Conclusion: The use of exosomes to help transport streptomycin

will increase its concentration at the target site (ribosomes of the parasite), and therefore increase antileishmanial activity in vitro. This method, with the use of streptomycin, will offer a potential new form of treatment.

Extraction, Isolation, and Characterization of Phage Cactojaque from Environmental Sample

Presenter's Name: Amber Johnson
Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Poster Presentation
Faculty Advisor: Ayele Gugssaa
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Bacteriophages also knew as "phages" are the most abundant organisms in the biosphere and very host-specific viruses that infect and replicate within bacteria. Discovery of these phages has been of interest for the advancement of medicine as tools to understand fundamental molecular biology, as sources of diagnostic, and as novel therapeutic agents. Unraveling the biology of phages and their relationship with their hosts is key to understanding microbial systems, and their exploitation. The goal of this research is to discover, purify, isolate, and characterize a bacteriophage that infects *Mycobacterium smegmatis* mc2 155. The purified and isolated phage, Cactojaque, was discovered from an enriched soil culture extracted from Howard University's campus near the Health Science Library. Cactojaque was determined to be lytic phage using the spot assay. The lytic Mycobacteriophage Cactojaque was purified through a series of serial dilution and medium/high titer lysates (MTL/ HTL) harvested with titer 2.3 × 108 pfu/ml for further study. Total genomic DNA was isolated with a concentration of 227 ng/µL followed by restriction enzyme digest and gel electrophoresis before sequencing for annotation. It was determined that Cactojaque was 154,918 nucleotides long was a part of the C1 cluster. Cactojaque has been annotated at Howard University using PECAAN and DNA Master.

Business

The Effect of Technological Knowledge on Productivity Growth Under Financial Development: Evidence from Panel Data at Saudi's Economic Activities Level

Presenter's Name: Hind Alnafisah
Classification: Graduate Student
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Presentation Type: Oral Presentation
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This paper theoretically and empirically investigates the impact of technological knowledge on productivity growth in Saudi Arabia. The study presents findings on the possible factors that may affect productivity growth, and our theoretical prediction is that the acquisition of new knowledge would help to spur economic growth in productivity. This paper develops a growth model and utilizes panel data for 10 industries for the period 1991-2016. Using Arellano-Bond (GMM estimation) regression approach, fixed effect, and random effect, our empirical results indicate that inward FDI is an important vehicle for achieving economic growth in productivity. Although employment growth and oil prices index have a stronger impact on economic growth. While many investigators have studied empirically the impacts of FDI, government expenditure, and human capital on economic growth, our study comes to use a direct existed indicators of the impact of government expenditure on development and FDI inflow as sources of technological knowledge on the output-physical capital ratio. The output-physical capital ratio is one of the productivity measurement. This study takes the largest country that producing oil as a case of study. Thus, suggesting the government of Saudi Arabia to increase investment in the endowment resources and post more financial incentives to encourage foreign capitals to invest in the country. Saudi Arabia government is advised to advertise its roles to improve foreign investment by including more economic activities, which help to spur economic growth. Other policies implications are discussed.

Would Energy Tax Policy Significantly Influence the Diffusion Rate of The Renewable Energy Portfolio in The United States?

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ffect four main renewable energy consumer groups which are residential, commercial, transportation and industrial consumption. Using a linear model and time series data for the period 1985- 2015. Our empirical results indicate that inward tax credit is an important vehicle for achieving renewable energy development. It clearly is seen that commercial, industrial, and transportation consumption of renewable energy significantly increase. Imposing more import barriers that discourage energy import can greatly help the domestic renewable energy consumption. However, industrial consumption of renewable energy is affected positively by the increase in the prices of industrial gas and negatively by increasing in the prices of industrial electricity. While many renewable energy studies have relied on less precise measurement factors (e.g. international oil prices the only and main energy prices that determine renewable energy consumption), our study uses direct indicators as a measurement of renewable energy consumption. We find tax credit has a significant positive impact. Other key factors that spur renewable energy consumption are co2 emission, electricity prices, and gas prices. Thus, suggesting the federal government of United States to continue subsidizing renewable energy development which helps to decrease the prices of renewable energy(electricity for the four types of renewable energy consumers), and spur renewable energy consumption and development. Another key factor that spurs renewable energy consumption is GDP.
Hind Alnafisah: Department of Economics, Howard University, Washington DC, United States; Hind Alnafisah: Economics Department, School of Business, Princess Nora bint Abdul Rahman University, Riyadh, Saudi Arabia.

Cyber Crime: Devastating Impact on Small Businesses Relative to Large Enterprises

Presenter's Name: Rajni Goel
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It is well known that cybersecurity issues are becoming a day-to-day struggle for businesses where sector by sector, businesses, small to big, are faced with a unique prioritized set of cyber threats. Cyber-attacks of various flavors, inflicted on large enterprises as well as small and medium sized businesses, cost U.S. large enterprises $1.3 million and small and medium-sized businesses $117,000. Yet, often it is only the large enterprises that appear in headlines when a when cybercrime occurs. Despite common misconception, small businesses are prime targets for hackers. Small businesses are a necessary component to the economy our country and utilize networks and systems for their success similar to large enterprises. Survey, by Ponemon, results indicate that over 55% of small & medium-sized enterprises (SMEs) have

experienced some level of a cyberattack (50% experienced a data breach within the same time period). The impact of the breaches on the operations and vitality of the organization is the focus of this study. Using external research and document/ dataset analysis, our research validates that the impact of the attacks or ransomware on large enterprises is much less than the detrimental effects to small businesses. We first provide a review of recent data breach trends, including rising data breach costs on both a global and domestic level, as well as arise in over all data breaches for the last 17 years. Finally we provided recommendations for how SMEs can better position themselves to be less impacted and better recover.

Consumer Response to Brand Appropriation

Presenter's Name: Johnny Graham
Classification: Junior Faculty/ Lecturer/ Instructor
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Title: Consumer Response to Brand Appropriation

Background: Through marketing communications, firms dictate specific imagery about their ideal brand user and brand usage. But sometimes, consumer behavior may divulge from this firm-created identity, such as with the wearing of Timberland boots or Carhartt jackets as a fashion statement in hip-hop subculture. Brand appropriation specifically refers to such circumstances in which brand meaning is altered by consumers from a specific subculture. While conventional wisdom may suggest that brand appropriation is a positive phenomenon which increases sales, it is possible that new customers may discourage others from buying. This research examines the potential negative effects of brand appropriation and its underlying mechanisms.Method: Through three experimental studies, this research tests the effect of brand appropriation on consumer brand attachment, specifically through the lens of Wrangler jeans adoption by urban youth (new user), and worn sagging and below the waist (new usage). Results: The findings suggest a significant negative effect of brand appropriation on brand attachment, specifically showing that the wearing of Wrangler jeans, sagging and below the waist, has a negative effect when done by urban youth, but not by rugged, rural consumers. This negative effect is shown to be caused by an underlying emotion of disgust and attenuated for consumers with a high need for uniqueness. Conclusion: These findings can help inform firm strategy when confronting brand appropriation. This research also advances the marketing literature on subcultural consumption and co-creation of brand meaning.

The Moderating Effect of Channel Switching on How the Retailing Experience Relates to Satisfaction, Loyalty, and Positive Word of Mouth Intentions

Presenter's Name: Angela Jones
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Retailers are increasingly offering more ways for customers to shop and interact through different channels. Consumer expectations are changing in response to this. Consumers expect retailer options to include bricks and mortar stores, online, and mobile. Providing alternative modes for consumer interaction requires significant logistics investment by the retailer. This is especially true in the area of returns management. Previous research has focused on channel choice for consumer purchases. However, attention has not been given to channel choice for returns and the related drivers and consumer outcomes. Some consumers may choose to switch channels when returning product, i.e. the product is returned through a different channel than used for original purchase. The concept of staying or switching channels for returns has not been covered in the academic literature and the potential cost, service, and performance implications of stayers and switchers make it an area worthy of investigation. This research includes an examination of the motivations of stayers and switchers, and how satisfaction and behavioral intentions differ between the two types. Service dominant logic, the theoretical basis for this research, supports the examination of motivations and outcomes of consumers decisions to stay or switch between channels for returns. A consumer survey was developed with measures adapted from existing scales. The survey was administered using Amazon's Mechanical Turk. A CFA of the measurement model was performed, and logistic regression and MANCOVA were used to estimate parameters for the model.

The relationship between Agents, Principles, and Corporate Bond Holders

Presenter's Name: Jordan Lewis
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One of the most interesting relationships within the finance industry is the relationship between the managers of a company and the stockholders for that particular company. But something that everyone seems to forget about is the power of bond holders and their place within the company control. Even though bond holders do not have say in how the company is run or who runs the company, they play a huge role in the company's ability to finance itself and if the company

goes under, they are the first to get paid. This paper will discuss the power of corporate bond holders and way so many hedge funds and private equity firms have invested in high yield corporate bonds. It will also discuss how much power corporate bond holders have on the U.S economy and what the average person can do to take the power back from these elite financial corporations.

Determinants of Challenging Assignments
Presenter's Name: Lucy Lim
Classification: Senior Faculty
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Presentation Type: Poster Presentation
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Coauthors: Frank Ross,Caroll Little

Challenging assignments have been shown to benefit job performance and career development (Carette et al., 2013) and to reduce turnover intentions and job search behaviors (Preenen et al, 2011). In this paper, we examine the determinants of challenging assignments. Specifically, we investigate how the following factors affect the chance of getting challenging assignments: (1) having access to social network most important for career advancement, (2) ability to successfully establish social network in the work place, (3) educational degree, (4) having a Certified Public Accountant certification, and (5) having a sponsor who put forward one's name and open door to challenging assignments.
We surveyed African American accountants and use 401 observations in our analysis. We find that having access to social network most important for career advancement, ability to successfully establish social network in the work place and having a sponsor who put forward one's name are positively associated with getting challenging assignments.
Usoff and Feldmann (2010) finds that accounting students' have low awareness of the importance of non-technical skills. Thus this paper is an important reminder especially to newly minted employees and also current students who would like to have career advancements to brush up their communication and networking skills, and to find a sponsor who genuinely wants to help them move up the ladder.

President Trump Tariffs on Steel? Are the tariffs doing more harm than good?
Presenter's Name: Zoe Paige
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Presentation Type: Poster Presentation
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Coauthors: Kayode Salandy

In March of 2018, President Trump imposed a tariff on steel imports. His goal was to bolster the declining American Steel Industry. In September of 2018, he tweeted that "our steel is the talk of the world. It has been given a new life and is thriving.' However, all available evidence suggests that the Tariffs have caused harm to the Steel Industry and are not having the intended effect. We discuss some of the evidence, analyze policies surrounding new tariffs and we use standard trade theory to explain the facts.

Pluralism, Entrepreneurship and Growth
Presenter's Name: Narendra Rustagi
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Presentation Type: Oral Presentation
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Individual make decisions to be happy and successful. Of course, being happy and being successful may mean different things to different individuals. Similarly, nations make decisions that make the citizens happy and successful. Of course, just like individuals, societies may also have different definitions of happy and successful, e.g., capitalistic societies may leave a lot more to market forces and inequality may be acceptable while socialist societies may lay more emphasis on equality in various aspects. Economic growth as an objective invariably is common for both individuals and societies, and both use short-term strategies that may not be in alignment with long term strategies. Depending upon the philosophy of societies at the time, economic growth in a society can occur through expansionist policies of colonizing and/ or entrepreneurial activities. Growth in Europe until the 17th occurred through acquisition, followed by both acquisition and entrepreneurship strategies. During this period, theory of reason evolved and society evolved as a pluralistic economy with both religious tolerance and tolerance of ideas and development on fundamental research evolved. Policies, of course, were influenced by the situation at the time. United States, for example, was using expansionist strategies, e.g., annexation from Mexico, annexation of Hawaii, Philippines, etc. in the nineteenth century. Same country in 1950 came up with the Eisenhower doctrine that if a country used force on another, then, US would come to their help. Evolution of various policies and the evolution and role of entrepreneurship in growth is discussed in this paper.

Creative Arts & Design

Welcome Home: Revitalizing the community, one black-owned business at a time
Presenter's Name: Kaylon Beck
Classification: Graduate Student
School/College: Business
Presentation Type: Poster Presentation
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Are African American businesses struggling in historically black neighborhoods that have been targeted through gentrification & if not, how can new businesses remain both sustainable & profitable in these communities? I have identified and interviewed existing businesses in the Third Ward area of Houston, Texas. This neighborhood is currently undergoing gentrification however has an abundance of minority owned businesses that have continued to remain successful yet have caused challenges for new businesses. In midst of gentrification, my plans of a bed & breakfast are to remain sustainable within the community economically, socially and culturally. I have created a vision board of my boutique bed and breakfast designed with the rich history and culture in which the community entails. It is with hope that both the design and concept will be a positive impact for the community by serving as a constant reminder of history and through providing quality hospitality and programming to guests and local patrons.

Community Revitalization – Public Housing: Designing Social Equity to Build Community."
Presenter's Name: Jacqueline Carmichael asid
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School/College: Arts & Sciences
Presentation Type: Poster Presentation
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The concern for affordable housing for low-income and middle-class families are the basis of this research. Our efforts will concentrate on a current "New Communities" initiative - NCI, (DCHA 2012) to redevelop the historic Washington, DC Barry Farm Public Housing Dwellings. Both the federal and local government are seeking to privatize dilapidated public housing by tearing down and replacing units subsidized with mixed-income, multi-level retail space, and inclusionary zoning initiatives at market rates. While eliminating family size units, which provides for three to six bedrooms, opting for a studio to two bedrooms units. This proposal posits: how interior design proposes housing alternatives utilizing sustainable practices while maintaining cultural and historical vibrancy, as well as, the creation of design schematics, spatial and social needs focused on these most vulnerable groups. We will seek to define and redefine the African American aesthetics of these spaces for end-users of public housing. The instruments for this study include client surveys, group discussions, and interviews with current residents. Also, the study utilizes both place attachment (Altman, 1992) and community-led design theory (Sanders, 2008). This project endeavors to investigate the future of African American housing in urban areas that have experienced historic and constant racial turmoil amid rapid gentrification. Next, engage in community forums seeking best practices from each stakeholder to note concerns and find solutions to issues within these neighborhoods. Also, create a checklist to address both new and native resident members undergoing housing-choice to build social capital, equity, and community. (NCRC 2014)

How interior design and art can impact the well being of people lives.
Presenter's Name: April Covington
Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Poster Presentation
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Interior design is an underrated career path. Most people think all interior designers do is make houses look pretty. It's a bit more complicated than that. The way the interior of a space is designed can impact the health and wellbeing of the people occupying the space. Many people take this for granted. Actually, many artistic professions are taken for granted. The purpose of this research is to see what would happen if secondary schools were to implicate more education on art. I believe that it would positively impact them by giving them a broader aspect of what career path they may follow when they transition into the real world. In order to determine this, I will research past case studies of performing and fine art schools across the country. We will see how the arts affected the students. Also, I will be designing my own performing and fine art school with a biophilic design. Hopefully, through my research, I can create a space that will allow the students that attend the school the ample amount of education so they can choose the career path that is right for them.

Trump vs. Twitter: The Interconnection Between Politics & Social Media Focusing on Donald Trumps twitter
Presenter's Name: Ashli Ferguson
Classification: Undergraduate Student
School/College: Communications
Presentation Type: Oral Presentation
Faculty Advisor: Roger Caruth
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The purpose of this study is to bring millennials awareness on their participation in elections and their role as social media users in the approaching years. Aside from Millennials, I also want to uncover how politics has affected media and news. My hope is to bring awareness to the importance of multimedia politics and how to weed out the real news from the fake in order to have accurate opinions. I also hope that with this information, Howard students will recognize their power to influence people all over the world through their own social media campaigns. We have the education, the influence, and the political power to put the next president into office. As this study is ongoing, it would be unrealistic to propose that, in reading these initial trends, causes and organizations would be able to truly apply these trends to the ways they engage this generation during the 2016 election cycle. However, understanding the evolving millennial mindset in the current political landscape is critical to informing leaders and organizations that want to unleash this generation's ability to create change for many years to come.

The Impact of Islamic Religion on Residential Interior Design
Presenter's Name: Ashjan Halawani
Classification: Graduate Student
School/College: Graduate School
Presentation Type: Poster Presentation
Faculty Advisor: Jacqueline Carmichael
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This research project explores ways the Islamic religion can affect the interior design in Saudi Arabian houses. It illustrates the critical rules in buildings, which aid designers to develop their design according to Islamic states. This study explores the dynamic ways of how designers can design interiors of houses in Saudi Arabia on religious principles. The reason of this research is that many designers do not make a connection between religion and interior design, and this may cause a negative impact on people who live in particular spaces or locales and losing identity. Designer's knowledge of Islamic construction rules helps them to consider Islamic regulations while building in Saudi Arabia. My proposal which called (Muslim Model House Into Western Eyes) is a duplex villa. I incorporate all aspect that affects the houses and explain how and why we build it in that way. However, the building's direction, the room's location, and the interior design limitations are some of the aspects that are determined according to religion.

The Effect of Biophilic Design on the Stress and Performance of College Students
Presenter's Name: Christian Hudson
Classification: Undergraduate Student
School/College: Engineering, Architecture & Computer Sciences
Presentation Type: Poster Presentation
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Coauthors: Anisa Robertson

Humans have an innate tendency to be closely connected to nature and other forms of life, this hypothesis is called biophilia. Biophilia as it relates to architecture it means incorporating environmental features such as water, plant life, natural patterns, scents, etc into the fabric of the building. USA Today explains how focusing on an image of natural scenery for 40 seconds can induce the brain into a relaxed state and have a positive effect on stress levels, heart rate and blood pressure. This is especially important because Americans spend about ninety percent of their time indoors and are expected to produce and perform constantly. College students specifically face many of these same challenges in addition to the pressure of becoming independent, trying to thrive socially and adapting to a new environment. This can be extremely overwhelming and lead to increased stress levels, which can negatively affect one's health and academic performance. Strategically implementing Biophilic Design into the the fabric of colleges and universities will have an instrumental role in improving the the wellness and performance of college students.

The Oprah Winfrey Network's Queen Sugar Television Series: A Case Study on African-American Women Exemplary Representations On-Screen and Behind-the-Scenes
Presenter's Name: Ollie l. Jefferson
Classification: Graduate Student
School/College: Communications
Presentation Type: Oral Presentation
Faculty Advisor: Dr. Tia Tyree
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Oprah Winfrey, the first African-American woman multimedia mogul, initiated a noteworthy change in the media industry when she launched the Oprah Winfrey Network (OWN). This number one major cable network among African Americans produced one of the top-rated drama series, Queen Sugar. This original program series features African-American women in leading roles on-screen and behind-the-scenes, such as the program creator and executive producer, Ava DuVernay. This is a significant difference in an industry where racial and gender inclusion is uncommon. Furthermore, the persistent or pervasive misrepresentations of African-American women on-camera have been attributed to the underrepresentation of African-American women as media owners, creators, writers, executives, producers, and directors. This investigation analyzes textual analysis from three data sources: OWN's Queen Sugar series, OWN's website, and mainstream magazines. Additionally, semiotics on-screen is analyzed with all of the data sources to build the case for an exemplary television show. This case study shows there is a difference on-camera when African-American women are employed behind-the-scenes. The investigation specifically interrogates how the inclusion of African-American women produces counter-narratives and counterstereotypes, alter-

natives to negatives stereotypes. The analysis shows how these women above-the-line disconfirm stereotypes through exemplification representations, which are fully-developed multidimensional characters that bring a sense of dignity and sensitivity to the storyline derived from realistic solutions. The multilayered characters are informative, instructional, and entertaining in the way they defied stereotypes through counter-narratives. The results reported how the female main characters as an activist, seasoned, reformed, and businesswoman are counterstereotypes in their depictions.

Does the Creative Process Lead Artists to Be More Anxious?

Presenter's Name: Camryn Moore
Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Poster Presentation
Faculty Advisor: Monique Major
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Every individual uses creativity. The type of creative strategy employed can improve the ease and quality of decision making (Summers & White, 1976). Conceptualizing or planning the steps to accomplish a creative goal prevents some people from the anxiety of not knowing what to do next. On the other hand, the freedom of creating more associatively relieves others of their anxiety (Bar-on, 2007). According to Fayena Tawil (2017), compared to non-artists, artists plan less in their creative process. The current study investigates whether artists use more associative processes than their non-artist counterparts. Additionally, it will explore whether artists experience more anxiety due to the strategy they employ during their creative process. Ninety-six women college age students (average age = 19.53, s= 2.12) were given colored pencils and told they had 15 minutes to draw anything they wanted. Fifty-six were self-reported non-artists while 40 were artists. The majority were African-American and Black. Participants completed the Experiences of Creativity Questionnaire (ECQ; Nelson & Rawlings, 2009) to measure their anxiety levels during the creative process. Afterwards, the participants also completed the Art Experience Questionnaire (Chatterjee, Widick, Sternschein, Smith, & Bromberger, 2010). The first hypothesis is that artists will use the associative process more than non-artists. Artists will also have higher levels of anxiety during the creative process. The results and implications of this study will be reported in the presentation.

The Effect of Biophillic Design on the Stress and Performance of College Students

Presenter's Name: Anisa Robertson
Classification: Undergraduate Student
School/College: Engineering, Architecture & Computer Sciences
Presentation Type: Poster Presentation
Faculty Advisor: Nea Maloo
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Humans have an innate tendency to be closely connected to nature and other forms of life, this hypothesis is called biophilia. Biophilia as it relates to architecture it means incorporating environmental features such as water, plant life, natural patterns, scents, etc into the fabric of the building. USA Today explains how focusing on an image of natural scenery for 40 seconds can induce the brain into a relaxed state and have a positive effect on stress levels, heart rate and blood pressure. This is especially important because Americans spend about ninety percent of their time indoors and are expected to produce and perform constantly. College students specifically face many of these same challenges in addition to the pressure of becoming independent, trying to thrive socially and adapting to a new environment. This can be extremely overwhelming and lead to increased stress levels, which can negatively affect one's health and academic performance. Strategically implementing Biophilic Design into the the fabric of colleges and universities will have an instrumental role in improving the the wellness and performance of college students.

Mitigating the Affordable Housing Crisis through Shipping Containers

Presenter's Name: Justina Starrad
Classification: Undergraduate Student
School/College: Engineering, Architecture & Computer Sciences
Presentation Type: Poster Presentation
Faculty Advisor: Nea Maloo
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Jamaica is a popular tourist attraction known for its white sand beaches, rich cultural heritage and soothing reggae music. However, the country is also plagued by several issues including a lack of affordable housing. Presently, only 25% of 400000 persons demanding housing can afford the lowest option of US$7589. With an unemployment rate of 12.2% and 60% of the workforce earning less than US$4695 per capita a year, it is easy to understand why most cannot afford the average unit cost of USD$34152. Several have turned to squatting and as a result over 600,000 Jamaicans (approximately 20% of the population) reside in 750 squatter settlements. While the NHT intends to build 20,880 homes over the next 4 years with 50% to target low-income families, this provision is only 25% of the annual demand. This research seeks to examine how shipping containers can alleviate this deficit. Shipping containers are already being upcycled as sustainable low-cost solutions in developing countries and with the island importing over USD$1000000 in goods yearly, there is no shortage of the raw material. In Jamaica, the containers are used as offices, businesses, and even classrooms but limited application occurs in the housing market. The research seeks to analyze case studies of successful implementations of shipping container homes in countries with a similar climate and socioeconomic concerns as Jamaica. The information gathered will be used to design

and predict the implications of a similar model on the housing shortage in Kingston, Jamaica.

Theatre is a Weapon: The Efficacy of Theatrical Presentation as a Device for Combating Systemic Racism

Presenter's Name: Jaylen Wilson
Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Oral Presentation
Faculty Advisor: Ofosuwa Abiola
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The history of theatre and racism in America is inevitably connected. For the purposes of this study, theatre is defined as plays, dramatizations, or any piece of art that is creatively expressed through dance, movement, or text without restraints. In contrast, racism in this study, includes anything that stems from the creation of laws, segregated areas, and unequal opportunities influenced by prejudiced ideologies to manipulate or oppress another race. Theatrical forms of art are devices that break the confines of racism in a non-threatening way. Various forms of theatrical art continue the conversation about negative social and racial constructs within America. Theatre not only highlights these constructs, but it exposes the complexities perpetuating the recurring cycle of social and political deterioration effecting African-American communities. Theatre becomes a "weapon for liberation" through the transformation of text. During this transformation, members of the audience begin to question concepts, challenge injustices, and portray activism through their responses to the text personified on stage. The methodology for this study included primary sources – photographs, video footage, interviews, live plays, newspapers – and secondary sources. The results of this research revealed that theatre successfully and consistently breaks the confines of racism by providing solutions. These solutions are innumerable. However, the primary solution is that theatre exposes everyone that experiences it to the understanding that all people are equal, deserves human rights, and should be treated with dignity.

Education & Outreach

Contrast induced Encephalopathy: a case report

Presenter's Name: Wefag Ahmed
Classification: Post Doc/Resident/Fellow/Research Associate
School/College: Medicine
Presentation Type: Poster Presentation
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Coauthors: Seyed Alavi, Ahmed Maraey

Introduction: Contrast-induced encephalopathy (CIE) is a rare complication of endovascular interventions associated with the use of intravascular radiocontrast agents. Here we report a case of CIE resulted from an iso-osmolar contrast used during coronary angiography. Case report: A 69-year-old man with medical history of coronary artery disease, diabetes mellitus, hypertension, and stroke, presented with typical cardiac chest pain. He was diagnosed with non-ST elevation myocardial infarction. Coronary angiography was performed using 105 ml of an iso-osmolar contrast. Angiography showed diffuse small vessel disease with patent graft. Hours after the procedure, patient was noted to be severely agitated. Brain CT scan showed no signs of acute pathology. His condition progressed with visual hallucination, dysphasia and left eye visual loss. Brain MRI showed no signs of acute CVA. EEG was negative for seizure activity. Vitamin B12, TSH, T4 levels were normal. RPR was negative. On day 5 after the procedure, his condition improved gradually to reach baseline before discharge. Discussion: Contrast-induced encephalopathy is a transient phenomenon with neurological signs usually develop within hours of exposure, and the prognosis is generally good even in severe cases including coma, with spontaneous resolution in neurological status usually occurring over a period of days. Only few cases following the administration of iso-osmolar contrast are available in the literature. Our case is interesting since Contrast-induced encephalopathy occurred following administration of an iso-osmolar media with doses lower than previously reported in the literature.

Does Increased Policing Improve Safety Outcomes in the Middle Grades?

Presenter's Name: Kenneth Anderson
Classification: Senior Faculty
School/College: Education
Presentation Type: Oral Presentation
Faculty Advisor: n/a n/a
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Background: School resource officers (SROs) are often viewed as key contributors to school safety. Despite widespread use, school safety outcomes in relation to SRO use are largely understudied. Purpose: The purpose of this study is to assess the effects of increased SRO use within middle schools on reductions (or increases) in violent acts in the middle grades. Specifically, this study examines outcomes associated with Senate Bill 402, Section 8.36 (402.8.36), a Bill passed by the General Assembly of North Carolina in 2013 to provide matching grant funds for employing and training SROs. Population: Administrative data of 460 schools in North Carolina over a seven-year period, between the academic years 2010-2011 to 2016-2017, were examined. Research Design: Since the outcome variable of interest, violent acts in a given school year, was a count variable, poisson, quasi-poisson, zero-inflated negative binomial, and hurdle models were used to compare difference-in-difference (DID) estimates of the impact of Senate Bill 402.8.36. Results: DID estimates in all models indicate that receiving matched SRO funds was not related to reductions in violent acts in any of the years in which the grant was awarded. Conclusions: Given the fractured relationships between sworn officers and Black or underrepresented groups, SRO policies and practices must be carefully crafted and assessed to protect vulnerable students from over-policing and unintended outcomes. If SROs are used as a component of school safety strategy, clear goals and desired outcomes must be established, regularly reported, and evaluated.

Exploring a Teachers Believed Success of a Classroom

Presenter's Name: Mikaela Armstead
Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Oral Presentation
Faculty Advisor: Brielle Brookins
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There is a significant amount of research that supports the idea that a teacher's belief of a classrooms success is directly correlated to that classrooms statistical success. Doctoral candidate, Brielle Brookins, has collected data on near 100 teachers in America through an electronic survey. This thesis will explore how the teacher's believed success effects success and also, whether the teacher agrees with the education institution as we know it today. This thesis will also compare and contrast teacher demographics, such as, sex, grade level taught, experience and region. This is necessary due to the increase in programs such as Teach for America and Knowledge is Power Program that send young college graduates to school districts that are performing significantly below average. I hope to ultimately explore and hypothesize on ways to further empower black and brown students.

Knowledge and Attitude of Gastroenterologist and Fellows in training in accredited programs towards Nutritional training.

Presenter's Name: Hamed Azimi
Classification: Junior Faculty/ Lecturer/ Instructor
School/College: Medicine
Presentation Type: Poster Presentation
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BACKGROUND AND AIMS: Gastrointestinal diseases greatly affect a person's wellbeing. Nutrition training in gastrointestinal (GI) and Digestive Diseases (DD) fellowship programs has not been thoroughly reported, but it is thought to be inadequate. The aim of this study was to determine GI fellows' exposure to nutrition and to assess nutritional knowledge and practice behaviors for paramount patient care. METHODS: 100 GI specialist and fellows were asked if they would like to participate in the survey at the last ACG meeting. 23 faculty members and 67 GI fellows from the United States and Canada consented to participate. Electronic surveys were sent to each person via survey monkey. Knowledge of Nutrition was assessed by a 30-question survey. RESULTS: 67 fellows participated and 85% (57/67) reported no inpatient nutrition rotations. 88% (59/67) had never written total parenteral nutrition or total enteral nutrition orders, and 12% had treated a home enteral or parenteral patient. 97% (65/67) had no outpatient nutrition or obesity rotation experience, and 55% (37/67) had no core nutrition lecture series at their program. 97% (65/67) had never been assessed for competency in nutrition, and 3% (2/67) had completed a nutrition research project. Too few mentors, poor exposure, and a predominant focus on endoscopy were reasons cited for not pursuing nutrition training. 23 faculty members participated and 78% (18/23) reported a lack of guidance and protocols regarding nutritional training modules for both inpatient and outpatient are the main factors fellows do not get adequate training.

The Assessment of Conduct Disorder for Culturally and Linguistically Diverse Children: A Preliminary Review

Presenter's Name: Eunice Blemahdoo
Classification: Graduate Student
School/College: Education
Presentation Type: Poster Presentation
Faculty Advisor: Jacqueline Caemmerer
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The assessment of conduct disorder (CD) for culturally and linguistically diverse (CLD) populations is an important area of analysis as socially defined age appropriate norms can vary from one context to another, be it geographically, racially, ethnically, or otherwise. Moreover, Polanczyk et al. (2015) found the worldwide prevalence of CD in children and adolescents ranged from 1.6% to 2.9%. While this percentage may appear low, conduct disorder is characterized by externalizing behaviors that are disruptive to group instruction and are associated with low academic achievement (Bradshaw, Buckley, & Ialongo, 2008). In addition, the developmental trajectory for children with CD includes compromised personal relationships, substance misuse, poor employment prospects, comorbid mental health disorders, criminal activity, and other negative outcomes in adulthood (Blair, Leibenluft, & Pine 2014; Erskine et al. 2016). Therefore, it is paramount that the validity of assessments used in diagnosing CD and monitoring treatment and/or interventions extends to a diverse array of children. Through examining how validity is established for a variety of scales, what are the contributions of neuropsychology, and the use of multi-rater designs in assessment and ongoing monitoring, school psychologists will be better equipped to develop, select, and facilitate assessments for diagnosing and monitoring children and adolescents. This literature review will discuss the content validity, construct validity, and measurement equivalence for a variety of methods and instruments designed to assess CD in children and adolescents. Particular attention is paid to the application of various methods and instruments for CLD children and adolescents.

Ingenuity Out of Necessity: Short Term Research Abroad in Developing Countries

Presenter's Name: Barbara Boakye
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Presentation Type: Oral Presentation
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Coauthors: Kendra DeLaine,Stacey LeSure

This study examines the effects of conducting research abroad in nontraditional countries (non-European) on students studying science, technology, engineering and math (STEM) at a historically black college or university (HBCU). Although study abroad research is extensive, showing the importance of student exposure to educational opportunities outside of their home university, this study focuses on the impact nontraditional research abroad has on students express growth through the transformative learning theory- "Mezirow (1991) asserts that only through reflection, active learning, and placing ourselves in an uncomfortable situation are we fully able to develop our understanding of the world and ourselves" (Gibson and Strange p. 87, 2017).
Using preliminary data collected during post-interviews, focus groups, personal journals and blog posts, and pre-post survey data, preliminary findings indicate that experiences gained during research abroad opportunities in nontraditional countries resulted in a change to the student's frame of reference. According to Mezirow (1991), these preliminary findings suggest that the common change in frame of reference indicates that students participating in research abroad, specifically in non-traditional countries, experience trans-

formative learning. Further research comparing student research abroad experiences in traditional and nontraditional countries are needed.

Who measures up? An Examination of Teachers' Perceptions and Beliefs of Student Success in Diverse and Minority-Majority Schools

Presenter's Name: Brielle Brookins
Classification: Graduate Student
School/College: Arts & Sciences
Presentation Type: Poster Presentation
Faculty Advisor: A. Wade Boykin
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This qualitative research investigation seeks to understand if teachers in ethnically diverse and minority-majority schools hold attitudes, beliefs, and perceptions of academic success that are based in the Anglo-American cultural beliefs. Qualifying teachers completed an online research questionnaire focused on their beliefs about student success, teaching experiences and instructional practices. Preliminary results reveal that there are distinct types of categorizations that teachers have to define and measure student success in the classroom. While some endorse the prevailing, mainstream Anglo-American ideals including: competitiveness, individualism, radical empiricism, and objectivity others' attitudes and beliefs stand in contrast to these ideals. Defining ethnically diverse students' success through an Anglo-American cultural lens may leave some potentially successful students behind. Suggestions are made for a redefining of student success in a way that is inclusive and multicultural in nature.

Age, Ethnicity and serum PSA Results for Men Participating in Prostate Cancer Screening

Presenter's Name: Clinton Burnside
Classification: Staff
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Presentation Type: Poster Presentation
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Background: Age1, ethnicity1-3 and prostate specific antigen (PSA) are risk factors for prostate cancer (PCa). Generally, 4.0 ng/ml is the PSA threshold used to recommend additional testing for PCa. Minority men are at greater risk for PCa. Current screening guidelines fail to adequately address ethnic differences. Objective: We review the PSA levels, by age and ethnicity, using the standard (4.0 ng/ml) and a modified (2.0 ng/ml) PSA threshold, in a cohort of men participating in PCa screening in the Washington DC area. Methods: We included prospectively maintained institutional screening data. Descriptive analyses were completed using IBM SPSS Statistics, version 25. Participants' demographics and PSA results by age group and ethnicity are described. Results: 2,442 participants in the "Men Take Ten" PCa screening program from 2009-2016 are included. 78.6% self-identified as Black, 8.2%-White, 6.2%-Hispanic & 7.1%-other. The median age was 56.0 yrs. Preliminary analysis demonstrates, when using the standard PSA threshold, overall, 144 (5.9%) men had an elevated PSA. Only 3 (2.1%) Black men (0-White, 0-Hispanic & 0-Other), 40-49 yrs. of age, had an elevated PSA. However, using the modified PSA threshold3, overall, 414 (17.0%) men had an elevated PSA. Most notable are 23 (5.6%) men, 40-49 yrs. old which presented with a PSA between 2.0-3.99 ng/ml (19 (4.6%)-Black; 3 (0.7%)-White; 1 (0.2%)-Hispanic). Conclusion: As disparities in PCa continues for minority men, there needs to be a shift in how we look for solutions to address this dilemma. Separate screening guidelines for minority men should receive further considerations.

Bison Hack the Yard

Presenter's Name: Lauren Clayton
Classification: Undergraduate Student
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Imposter syndrome is a feeling that one does not belong or deserve to be in a space, based off of the internal fear they will be exposed as being unqualified. People of color often face this problem in technical interviews as well. The purpose of our application is to create an interactive game for undergraduate Computer Science(CS) students at Howard University to learn data structures and other topics commonly asked in technical interviews. Imposter syndrome during interviews is caused by students feeling uncomfortable or unwelcome in the tech community as a whole. After interviewing 30 CS students we found 99% of the students did not feel apart of the CS community. Many female students were too intimidated to participate in mock interviews hosted a the Googler in Residence. A majority of students mentioned they did not bring their whole and complete selves to work with the fear of being ostracized. In conclusion imposter syndrome is a plight many minorities have to overcome in order to be successful in the tech industry. We believe affective computing and AR technologies in an educational application will help to combat the feelings that lead to imposter syndrome. Students will be able to learn and interact with tech influencers through the exploration of their own college campus. This will increase their confidence by giving them the opportunity to practice analytical thinking and coding concepts outside of the classroom. Seeing influencers CS students can identify with will foster a sense of belonging in the CS community.

A content analysis to examine the Mindful Eating to address obesity in College students

Presenter's Name: Mira Coleman
Classification: Graduate Student
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Presentation Type: Poster Presentation
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For over past twenty years obesity and co-morbidities that occurring in youths increases. Results from National surveys show that 3 out of 10 students are either overweight or obese, with a prevalence of obesity in 35.7% of young adults (18-25 years). Excessive weight, poor nutrition, inadequate physical activity, and academic stress often experienced by college students may put them at risk of developing chronic diseases. It is important for them to understand the possible outcomes, take responsibilities of their health and be mindful of what they eat. Mindful eating (ME) is defined as a self-calming method of changing eating behaviors, being aware of what and how we eat, by using our senses. ME is used for dietary behavior change, weight loss programs, and obesity prevention. The purpose of this study is to examine messages students receive when ME is used as a tool for nutritional intervention to address obesity in college students. The study uses a systematic review to conduct a content analysis to answer the research questions 1) Are college students willing, and able to engage in mindful eating habits to address obesity/overweight. 2) How can we reduce the prevalence of obesity through ME and prevent excess weight gain in non-overweight individuals. The study results will provide information for the development of health Nutrition education campaigns to raise awareness of healthy eating patterns, address overweight/obesity and chronic disease prevention. Eating healthy and mindfully can be beneficial for weight gain prevention, and other weight-gain related health complications in college students.

"The Relationship Between Foreign Trained Dentist and International Dental Students and the Acceptance to Treat Underserved Populations Post Residency"

Presenter's Name: Jennifer Collins
Classification: Post Doc/Resident/Fellow/Research Associate
School/College: Dentistry
Presentation Type: Poster Presentation
Faculty Advisor: Kathy Marshall
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Introductions: There are many healthcare disparities and inequalities that plague America. One being the access to dental care. There was a concern that many of the dental schools do not educate their students or residents on increasing assess to care. The aim of this research project was to investigate how public health educational experience has influenced foreign train dentist and international dental students on their decision to treat underserved populations and to determine what variables are most critical to practitioners when deciding whether or not to treat Medicaid patients. It was hypothesis underserved areas continue to exhibit a low proportional amount of returning students/residents based on economic constraints and negative perceptions towards Medicaid reimbursements. Methods: A Survey was developed and distributed to foreign trained dentist and international. The survey was grouped into several categories, including region of the country where education was attained, and other demographic data. The survey consisted mainly of forced-choice questions with yes/no, and multiple-choice questions. Results: A total of 30 (N=30) residents completed the survey. Thirty-three (33%) percent were male and 66.7 % were female. Fifty-three percent (53%) of respondents were 21-29yrs of age, 36.7% of respondents were 30-39yr

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"If My Teacher Believes it, I Can Achieve it!": The Power of Teacher Expectations in African American Middle School Students' Academic Efficacy in Mathematics

Presenter's Name: Kendra Delaine
Classification: Graduate Student
School/College: Education
Presentation Type: Oral Presentation
Faculty Advisor: Kimberley Freeman
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Competence is a central construct in most theories of achievement motivation, and students' perception of their competence is a driving force in academic achievement. Students' beliefs are more effective in determining their motivation and success than what is objectively true. Therefore, behavior is often better predicted by ability perceptions than by actual capabilities. For this reason, it is vital that we understand how to foster positive competence perceptions or academic efficacy among students, particularly in the K-12 mathematics setting. This study utilized a quantitative cross-sectional survey design and a sample of 400 African American middle school students from public charter schools to examine if students' perceptions of their teachers' expectations for their success and academic support in mathematics influenced their academic efficacy. Based on a multiple regression analysis, mathematics teacher expectations uniquely predicted students' mathematics academic efficacy (® = .66, p<.001), but teacher academic support in mathematics did not (® = -.06, p = .313). A mediation effect was present as there was no evidence that academic support influenced academic efficacy independent of its effect on students' perceptions of their teachers' expectations (c' = -.06, p = .313). In conclusion, students' perceptions of their teachers' expectations positively influenced their academic efficacy as well as mediated the influence of academic support within a mathematics classroom. These findings shed light on how communicating high expectations for student success can enhance academic beliefs. With a greater belief system, students are more academically motivated and more likely to persist when faced with academic challenges.

Segregation of Education

Presenter's Name: Ashlynn Donelson
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Presentation Type: Poster Presentation
Faculty Advisor: Amy Yeboah
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Apartheid took place in South Africa from 1948-1994. The results of this post-apartheid world led me to question how the education system was affected based on the effects of apartheid. I was able to see how test scores changed after apartheid. While studying abroad in South Africa, I was able to further my research on the education system. The purpose of conducting this research is to bring light to the education system. While researching, South Africa was named multiple times as the worst education system in the world. It is important to bring light to issues such as the deprivation of a good education because children are the future and should have a chance to share their knowledge in a place that will help them grow. My research was composed of online background and interviews. I was able to research various sites that gave me a foundation going into the country for research. Once I arrived in South Africa, I was able to ask 6 people ranging from high school, college, and adult on their experience with the education system. An interesting discovery is how much the schools varied based on the race of most of the school. Of course, this is common in America, but I did not think it would be so prominent in Africa. My findings found that there is a connection between apartheid and the education system which led to lower test scores in South Africa for the black population of the country.

Private or Public School Education: Which School System Teaches The Most Science Content Knowledge?

Presenter's Name: Arielle Drye
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Presentation Type: Poster Presentation
Faculty Advisor: Helen Bond
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The goal of this research is to compare and contrast two different school systems that involves the amount of science lessons being taught on a weekly academic school year. The study group consist of two diverse school systems, Public and Private, at the elementary level and educators who been in their profession for over a year. The data collected were interviews with educators from the public and public schools who had to answer a short questionnaire. The goal of this project is to focus on the aspect of the inclusion of science and emphasize the importance of integrating these lessons in the educational curriculum. In addition, comparing and contrasting the two school systems, Private and Public. Practicing science strategies at the elementary level can improve student's overall performances, and prepare them for secondary and high school. The results show the private schools have more science lessons than public schools. Private schools have a consistent schedule where they teach science, however with public schools it mainly depends on the teacher's perspective on science.

An Ethnographic Investigation of Telepractice: How Culture is Built Between Speech-Language Pathologists and eHelpers in the Online Environment

Presenter's Name: Lesley Edwards-gaither
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Presentation Type: Oral Presentation
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Telepractice is the online delivery of speech-language pathology services by a remote Speech-Language Pathologist (SLP) using telecommunication technology (ASHA, 2018). For more than 30 years, telepractice has been a recognized modality of service when an SLP is not available in the student's school or district (ASHA, 2018; Gabel et al. 2013; Grogan-Johnson et al., 2013) due to a national shortage of SLPs (National Center for Education Employment, 2017). When services are provided via telepractice, the SLP must rely on an additional on-the-ground, in-person facilitator or eHelper who is present with the student. The process of developing an online relationship and culture between the remote SLP and onsite eHelper is largely unknown when compared to the in-person model of speech-language pathology services. There is a paucity of research exploring the collaboration that occurs between SLPs and eHelpers in the online therapeutic environment. This study will utilize an ethnographic approach including field notes, participant observation, and interviews to describe how culture is built during telepractice sessions between the SLP and eHelper and contribute to best practices for telepractice services.

Unhidden Figures: Increasing Visibility of Howard University's Botanists

Presenter's Name: Osagie Ekue
Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Poster Presentation
Faculty Advisor: Janelle Burke
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The objective of this research project was to create Wikipedia pages for three notable botanists who were at Howard University. The goal of this activity is to bring awareness and to educate the public on prominent African American botanists. More specifically, the botanists that will be discussed in this research project are Drs. Charles S. Parker, Marie Clarke Taylor, and Lafayette Frederick, whose research has significantly impacted Howard University Botany Department. Currently, there are no online informative pages or accounts on these

three individuals. Therefore, the Wikipedia pages will discuss the background, careers, and impacts of each botanist. As a result, populating these Wikipedia pages can significantly increase the exposure of very successful Howard University botanists.Wikipedia is the best source to spread awareness of these important figures within botany and Howard University because often this is the first source individuals gather on the internet.

The Benefits of Culturally Relevant Practices in English Language Learner Classrooms: An Action Research and Analysis

Presenter's Name: Shamaia Ferguson
Classification: Undergraduate Student
School/College: Education
Presentation Type: Poster Presentation
Faculty Advisor: Marilyn Irving
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Studies have suggested misinterpretations of the term culturally relevant teaching, thus creating a discontinuity between in-class learning experiences and student culture. Therefore, the proposed research sought to to determine if culturally relevant practices benefit students in areas of academic proficiency and self efficacy. The research processes included a survey to gather student perception of self as a result of of his or her classroom education. In defining culturally relevant teaching, several other key terms such as academic proficiency, self efficacy, and multicultural education helped create an understanding of the importance of outlining the benefits of culturally relevant practices as it relates assisting and responding to different learners . The results of the research called for action to rethink the curriculum and provide teachers with the support needed to ensure students succeed and defy the stigma associated with english language learning.

Does playing background music in an elementary school classroom, during instructional time, improve student's academic achievement?

Presenter's Name: Epiphany Fields
Classification: Undergraduate Student
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Presentation Type: Poster Presentation
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Being an educator comes with many challenges and task. To be the best educator you must learn what is best for your students. You must know what helps them become focused and willing to learn from a day to day basis. This can be very challenging. Each student has their own strengths and weaknesses. They all learn differently, yet society thinks that adapting and adjusting to all your students is easy. The truth is a teacher can never predict how students are going to respond on an everyday basis. From the research, there are things that prove music can, in fact, be an enhancer for learning. The research presented that there are pros to having music played in the classroom in general.

Black Male Teachers' Practices and Experiences in K-12 Education

Presenter's Name: Oral Grant
Classification: Graduate Student
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Presentation Type: Poster Presentation
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This study seeks to understand how personal and environmental factors shape the career experiences and instructional practices of Black male teachers. Using responses from two open-ended survey questions, a qualitative analysis was conducted on data from 180 Black male public school teachers at the K-12 level teaching more than two years. Coding was done in order to uncover themes. Thematic analysis was performed in order to draw interpretation on how Black male teachers' gender identity, racial identity, teacher efficacy, and role strain was related to their use of culturally relevant pedagogy. While most research on Black male educators focuses on recruitment and underrepresentation, this study examined the school context characteristics, identity, efficacy, and instructional practices of Black male educators who have persisted. Findings from this study reveals Black male teachers are motivated by their personal and environmental experiences which impacts their instructional practices for students of all races.

Knowledge, Access, & Utilization of Low Vision Assistive Technology

Presenter's Name: Kristen Greene
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Presentation Type: Poster Presentation
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Coauthors: Kristen Greene,Quiana Borden,Jordalis Marte

This research project consists of a pilot study to determine if an occupational therapy directed education module on low vision adaptive devices will increase access and utilization of these devices by community dwelling older adults. An initial survey will be completed to determine the participants' baseline knowledge of low vision adaptive devices. An education module consisting of information about programs and devices that aid individuals with low-vision will be provided. Participants of this study will also receive demonstrations of low-vision adaptive devices. At the conclusion of this program, the survey will be re-administered to assess changes

in knowledge about low-vision adaptive devices. Data will be analyzed to determine the effectiveness of educational modules on knowledge and utilization of low vision adaptive devices

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Teachers Perceptions of Multicultural Education in Classroom Settings

Presenter's Name: Malik Holley-Ames
Classification: Undergraduate Student
School/College: Education
Presentation Type: Oral Presentation
Faculty Advisor: Marilyn Irving
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The main question behind the purpose of this research paper is, is multicultural education beneficial to students? The researcher had to interview teachers and get an understanding of how they perceive multiculturalism and whether or not they believe it is beneficial in the classroom. All of the teachers that were interviewed agreed that multiculturalism is beneficial and important to students, however they didn't have the same experience with it in their own classrooms when they were students.

Technology Integration in the Classrooms

Presenter's Name: Oriana Hondras
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Presentation Type: Oral Presentation
Faculty Advisor: Kellee Jenkins
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Teachers are expected to integrate technology without being knowledgeable on how or when to use technology in the classroom. In order to determine if educators are integrating technology in their classrooms; a survey was sent to several educators via email. Some of which are in the DC Public School systems while others are in the Chicago Public School systems. Not all of the people emailed the survey to responded, so the data is slightly limited. A total of 6 responses were recorded; three from DCPS teachers and three from CPS teachers. The survey showed that 100% of the teachers who took the survey are expected to integrate technology in the classroom. About 33% of survey takers feel that they can effectively integrate technology in the classroom. There were no participants who were required to attend any sort of technology training prior to the start of the school year. However, 33% were offered an optional training for technology training. Lastly, about 33% of participants were prepared by their school for technology integration in the classroom. In conclusion, the survey found that teachers are not being explicitly trained on how to integrate technology in the classroom. Until technology is fully utilized and implemented in creative and effective ways, it is impossible to say if the students will be negatively or positively impacted. If future educators can be provided with either in college training, or training post college, they can effectively use technology in their curriculum.

Education Injustice in Contemporary South Africa

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Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Oral Presentation
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The Bantu Education Act was passed in South Africa in 1953. Under this doctrine the schools attended by black people purposely only taught skills that would be helpful in jobs such as factory workers, mine workers, and jobs of service. Even as adults a vast majority of the students taught under of the students taught under the Bantu Education Act struggle to perform what many would consider elementary tasks such as add and subtract as well as read and write.This essay will discuss the continuous and lasting effects of education injustice and Apartheid in South Africa. In present day the harsh effects of apartheid and the residue of the Bantu Education Act still negatively impacts a large amount of the black South African community. Access to education in South Africa still remains extremely elitist, with only those who can for quality educations in grade school being the ones afforded the opportunity to attend University. The goal of this research is to access the current state of education for black people in South Africa as well as attempt to introduce fresh ideas that will improve the quality of education for blacks in South Africa.

Examining the Effectiveness of an Evidence-Based Intervention with a Focus on Executive Functioning Deficits for Children with ADHD

Presenter's Name: Kareem Ishmail
Classification: Graduate Student
School/College: Education
Presentation Type: Poster Presentation
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Attention Deficit/Hyperactivity Disorder (ADHD) is one of the most common neurobehavioral disorders in children. According to the Center for Disease Control in 2016, 9.4% of children, 2 – 17 years old (6.1 million) are diagnosed with ADHD. This research will therefore examine the effectiveness of an evidence-based intervention program: Brain Smart. Brain Smart is an 8-week intervention program that meets twice a week to teach executive functioning skills and improve a child's behavior. Utilizing an evidence-based intervention, Brain Smart is designed for school-age children (ages 6 to 11 years old) with executive functioning deficits and/or ADHD. The Test of Everyday Attention for Children (TEA-Ch), the

Nonverbal Stroop Card Sorting test, and NEPSY-II will be administered to participants, pre- and post-intervention. Parents and teachers will be asked to complete the Behavior Rating Inventory of Executive Function (BRIEF) and the Connors Comprehensive Behavior Rating Scales (Conners CBRS) pre- and post- intervention. Parents will also be asked to complete the Parenting Stress Index (PSI-4) pre-and post-intervention. Findings from this study will hopefully suggest the importance of combining both collateral support (parents and teachers) and child-focused interventions to develop a more comprehensive, non-pharmacological intervention aimed at treating children with a diagnosis of ADHD and/or executive functioning deficits.

Evaluation of Medical Curriculum Integration of Human Patient Simulation as Pedagogical Tool for Cardiorespiratory Physiology Education in MDY1

Presenter's Name: Sheree Johnson
Classification: Junior Faculty/ Lecturer/ Instructor
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Presentation Type: Poster Presentation
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Coauthors: Tamara Owens,Jahn Oneil

The use of human patient simulation and computer assisted clinical skills instruction has become widely accepted as a teaching approach to provide patient-oriented training for medical students and healthcare professionals. In an effort to address curricular modification mandates, medical educators including basic scientists, clinicians, and simulationists recently implemented advanced simulations to teach clinical skills associated with cardiorespiratory physiology for freshmen medical students (MDY1). We hypothesized that cardiorespiratory simulation would be viewed as an effective teaching tool for correlating didactic lecture objectives with clinical skills, and an acceptable pedagogical approach for MDY1 learners. Participants attended two mandatory simulations and completed a voluntary 21-question Likert's Score survey to provide feedback regarding five components: didactic session/instruction, session experience, post-session, faculty instructors and simulation center. Data suggest that the early exposure to clinical skills, in settings reminiscent of "real-life" scenarios, has the ability to fortify student confidence and enhance clinical competencies in addition to reinforcing lecture objectives. The student feedback provided invaluable information for educators that will serve as a dynamic framework for the expansion of similar, more advanced cardiorespiratory exercises tailored for the purposes of teaching basic fundamentals of physiology. We conclude that medical curricular modifications that employ innovative use of simulation to teach basic science physiology will serve as an effectual alternative for correlating didactic lecture objectives and clinical skills for MDY1 students.

From Pushout To All In: An Excellence Framework For Supporting Young Black Girls In School

Presenter's Name: Aja Johnson
Classification: Graduate Student
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Coauthors: Candice Cardwell

Facing racism and sexism, Black female students require more tailored support academically and socially (Kunjufu, 2014). Black female students are six times more likely to be suspended for exhibiting the same behaviors as their white peers (Department of Education, 2011). However due to "criminalization," (labeling an activity as a criminal offense and making it illegal), adultification, and culturally-insensitive disciplinary systems, Black female students get pushed out of school. The Achievement Gap, the systematic disparity in educational access, continuously widens throughout the process. Despite this, Black girls excel in the current system when given supports that prioritize their successes and inherent abilities. The intention of this work is to inform school, district, and state education leaders of feasible solution-based practices that highlight the excellence of Black girls and ameliorate "adultification," (dismissing a youths' innocence by considering their behaviors more adult-like than their peers) (Goff, 2014). Rooted in social justice, we call into question the distribution of opportunity and privilege for Black girls in K12 education. However, although common knowledge of disproportionality in this demographic continues to widen, the education and practices regarding this topic has much greater potential for capacity building. Through an evaluation of the effectiveness of current practices and policies, our study will help educators at the school, local, and state levels build capacity. Through the lens of transformational leadership and an excellence framework for K12 Black females, this study identifies solutions to combat the adultification of Black girls by establishing structures that successfully support and educate them.

The Effect of Undiagnosed Attention-deficit/hyperactivity disorder in Undergraduate Students at Howard University

Presenter's Name: Kevin Johnson
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Mental health is a serious factor when it comes to the everyday life of a college student. Attention-deficit/hyperactivity disorder (ADHD) in adults can cause the following: impulsiveness, restlessness, lack of organization, and poor time management skills. The purpose of this study is to describe the correlation between undiagnosed ADHD and student achievement. This study was conducted on Black and African American colleges attending Howard University. A total of 85 students participated completed the survey. In this study, the researchers administrated an ADHD self-reported screening questionnaire and calculated students grade point averages (GPAs) during the spring semester. The results indicated that students 65% of the students reported having difficulty concentrating on what people say to you, even when they speak to you. Fifty percent of the student report having difficulty getting things order when they have to do a task that requires organization. Students who responded to often or very often on 8-10 of the ADHA scale question were more than likely to have lower GPA. Overall, attending college can build up enough stress on a regular person to where one can produce harm on himself/herself. The factor of ADHD with this amount of chaotic lifestyle may push a student over the edge.

Through Literacy Can We Increase The Number of Black Women Who Get Tested for Breast Cancer?

Presenter's Name: Sydney Lane
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Black women have been affected by metastatic breast cancer for generations, and to this day the reasoning behind this phenomenon has not been solved. Out of any other demographic, no other group of people are diagnosed or killed from metastatic breast cancer as much as Black females. Despite all these claims, there has been not a one solidified answer as to why Black Women are most affected by metastatic breast cancer. To combat this, this research aim was assess the knowledge about the facts, signs, symptoms, risk factors, and treatment for metastatic breast cancer. An online questionnaire was administrated using a stratified random sample of Black women attending Howard University between the ages of 18-30. Out of the population that we researched there was a tremendous 25% increase in African American women who got tested for breast cancer. By communicating with the local mammography center, we were able receive comparable statistics of Black women getting tested before and after the conclusion of the questionnaire.

Sustainability form University to students

Presenter's Name: Nea Maloo
Classification: Junior Faculty/ Lecturer/ Instructor
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Coauthors: Alfonzye Chisholm

Howard University has been always embraced measures of sustainability. This is presentation is the efforts of the Office of Sustainability and the faculty of Department of Architecture to make sustainability design more available to students. The presentation offers the breadth of university lead measures of sustainability, the student led measures and the faculty integration of education and practice . To protect the world for the next generation, the training is from students to the university and the awareness of these successful projects to inspire many more to come.

Traditional Rhythms of the African Diasporan Culture in the Spanish Language Classroom

Presenter's Name: Wendy Mcburney
Classification: Junior Faculty/ Lecturer/ Instructor
School/College: Arts & Sciences
Presentation Type: Oral Presentation
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The Afro-Mexican and Afro-Peruvian musical rhythms are important art forms in the Latin American society because of the role they play in the society. The basic elements of the Son Jarocho and the Lando, namely the musical composition, the instrumentation, as well as the lyrical patterns and themes all reflect cultural influences contributed by the African, the European and the indigenous peoples. The musical forms therefore provide a medium through which all the groups in the society, those of the center and the margin achieve representation and visibility. By its very nature the music can be considered as functioning as a unifying force in the society as it promotes interactions among everyone, demonstrating this firstly in the musical arena between musicians, singers, dancers, as well as, extending to the members of the audience. It can be said that it is an art form which has emerged from the simple people of the community, and which strengthens the bonds existing between all the classes of the community. Additionally, these musical art forms reflect the cultural diversity present in the Mexican and Peruvian communities. The Afro-Mexican and Afro-Peruvian rhythms therefore project an authentic image and identity of these societies since they capture the formative experience of these groups. For this reason, they have the potential for becoming a valuable resource through which language and authentic cultural forms can be integrated in the Spanish Language classroom.

Integration of Interdisciplinary Subjects into Mathematics

Presenter's Name: Sydney Mcfadden
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Presentation Type: Poster Presentation
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Abstract: Many students in elementary school sometimes show an outward dislike for mathematics. This resentment towards mathematics stems from years of traditional approaches of teaching mathematics. Educators struggle with new strategies to implement into mathematics lessons to help increase students' understanding and successful achievement in the subject. One of the strategies used is the integration of other subjects. Based on the literature review, music in particular is a rather common and popular subject that is integrated into mathematics. The integration of subjects in general allow students to gain different perspectives which ultimately lead to a greater chance of success (Gamwell, 2005).

This study explored integrating music into the mathematics curriculum at the elementary level and revealed that this integration can increase can help to improve mathematics skills acquisition, retention, increase student engagement, and reduce mathematics anxiety. Data was collected through a survey completed by certified teachers from the District of Columbia to respond to the following questions: 1) How much preparation and training in subject integration was provided to preservice teachers who are now DC Certified Teachers prior to entering the classroom?, 2) How do you integrate music into your mathematic lesson?, and 3) How did music integration in the mathematics classroom affect students' performance? The results from the observations and survey revealed that music integration into mathematics is not only fun and enjoyable for students, it also helps to improve math skills acquisition, retention, increase engagement and reduce math anxiety.

Skiing the Skies: The Power of Twitter, Instagram and Facebook to Eradicate the African-American Financial Literacy Crisis

Presenter's Name: Anna Mitchell
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In the United States, one might argue that money controls everything. It is a standard measure and common denomination of trade. America is also a country that places an extreme emphasis on wealth. It is also a country where millions of its citizens struggle every day, battling poverty with little to no hope of overcoming it. But while there is a great obsession with having money and possessing material goods to signify status, there is also a great deal of Americans who do not have the means to achieve them. Minorities are the main group living under the poverty line across America, struggling to keep up with the rest of average Americans. This study seeks to further analyze the problem of financial illiteracy that exists among Black people in the United States. It will view financial literacy as a necessary component for Americans in society today. In a country where money represents power, without understanding of how to be fiscally responsible, citizens may struggle to survive or obtain the resources that they need. This study additionally aims to evaluate the disparity of financial literacy education in the Black community and establish the importance of social media platforms Twitter, Instagram, and Facebook to assist the young African American community in adapting and learning how to navigate their finances without receiving fundamental instruction growing up.

A "Food as Medicine" Program and It's Effects on Healthy Eating and Cooking Confidence

Presenter's Name: Deanna Nara
Classification: Graduate Student
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Presentation Type: Poster Presentation
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Coauthors: Allen Johnson, Chimene Castor, Oyonumo Ntekim, Julius Ngwa

African Americans experience poorer chronic disease outcomes and are more likely to die at early ages from all causes. African Americans living east of the river in the District of Columbia have a higher proportion of chronic diseases, such as hypertension and diabetes. The Food as Medicine (FAM) study is a community-based pilot study that measured the effectiveness of a nutrition intervention to improve chronic disease risk factors and outcomes among African Americans with either pre-diabetes, type 2 diabetes mellitus, hypertension, elevated total blood cholesterol levels, obesity or a combination of these disorders. The study enrolled patients who were attending both Howard University Family Medicine and Internal Medicine Practices, and were residents of wards seven or eight in the District of Columbia. Fifty-four participants were enrolled and assigned to five cohorts, which consisted of five group sessions over three months, and focused on improving diet and health literacy through nutritionist-led, culturally-tailored, nutrition education classes that included health literacy, mindfulness exercises, and cooking demonstrations. After program completion, FAM participants demonstrated significant improvements in all outcome measures of interest: healthy dietary patterns ($p < .001$), healthful eating ($p = .002$), positive changes in dietary choices ($p < .001$), cooking confidence ($p < .001$), reduction of cooking barriers ($p < .001$), and healthy food preparation ($p < .001$). Participants

also increased the number of times in one week that they cooked dinner at home (p< .001).

This study demonstrated the positive impacts of including health literacy, mindfulness exercises, and cooking demonstrations in a nutrition education program.

Ethnic Minority Baccalaureate Nursing Students' Identification of Social Networks and Perceived Levels of Social Support, which Facilitates Retention in the Nursing Programs at Historically Black Colleges and Universities, (HBCU's).

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Presenter's Name: Symone Odoms
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For decades there has been an ongoing argument of the relationship between math and reading. The question this article seeks to answer is whether or not reading skills, or the lack thereof (measured by two third grade classes' results on a computerized assessment know as Reading Inventory) has an impact, or is correlated to students' ability to perform highly in math. The rationale behind this argument is that if students are required to not only answer simple computational problems, but to be able to use those skills in real world scenarios to demonstrate higher order thinking, then there must be some a relatively high level of literacy skills required to perform well. If that is the case, is it then only the responsibility of the reading teacher to prepare students for the inevitable circumstances of interacting with literacy outside of a ELA context? Or is it the responsibility of all teachers to aid students in the literacy skills required to succeed in that specific content area? This trial however, did not support the anticipated hypothesis. But while the research says that reading proficiency is not required for math proficiency, that is not to say that literacy skills do not matter at all when it comes to math. In order for students to work completely independently, to completely read and understand math problems, reading and comprehension skills must be honed.

Incorporating Virtual Reality Technology to Chemistry Laboratory Safety Training

Presenter's Name: Simon Wang
Classification: Senior Faculty
School/College: Pharmacy
Presentation Type: Poster Presentation
Faculty Advisor: Simon Wang
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Coauthors: Sasha Pierre-Paul Samson Teka, Jean Tchoumeni, Olyad Begna, Alponcine Fosso, Tamirat Jules, Samichhya Paudel, Liyuwork Adane, Basil Mohamed, Gealle Njoumagem, Peguy Touani, Prine Ene, Archibald Enongene, Yolanda McKoy, Simon Wang

Virtual reality (VR) is an interactive computer technology taking place within a simulated environment. This immersive environment can be similar to the real world but with add-on digital features, or it can be totally fantastical. In recent years, VR is emerging to be the next step for the evolution of 21st century education, showing great potential of changing the traditional way how education materials are delivered in the settings of classroom or laboratory. Particularly, VR can enhance student's participation by creating scenarios that immerse the learners in such an interact manner that be able to motivate them to understand the subject better. Herein, we report our initial efforts of applying powerful VR technology to chemistry laboratory safety training. It includes two topics so far: 1) Instruction on fume hood basics: air flow and operation; 2) How to protect yourself in chemical fume hood. The videos were then incorporated with audio clips for additional instructions and explanation. The original videos were recorded in MP4 format by our 2nd-year Pharmacy students, and then converted to the VR formats to be fully compatible with regular apps for playback at VR-enable devices. The effects of current VR contents on laboratory safety learning are assessed using various criteria and appear to be much favorable. This innovative technology will transform the learning experience of new generation of college students. On the other hand, it informs the way students can approach and contribute to those emerging IT technologies, thus prepare them well for future development.

Improving patient referral linkages for HIV care and treatment through the implementation of a National Sample Transportation Program in 7 districts in Malawi

Presenter's Name: Carol Porter
Classification: Senior Faculty
School/College: Nursing & Allied Health Sciences
Presentation Type: Oral Presentation
Faculty Advisor: Carol Porter
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Coauthors: Kundai Moyo, Mphatso Kachele, Abdoulaye Sarr, James Kandulu

Background: In 2012 the Malawi Ministry of Health in collaboration with Riders for Health and the Howard University Technical Assistance Project implemented a national sample transportation (ST) program in 7 districts in Malawi. Samples and tests results for Early Infant Diagnosis (EID), Tuberculosis (TB) diagnostics and CD4 were transported by motorcycles from 181 health facilities to referral laboratories from the 7 districts and back on a routine scheduled basis. The aim of the analysis was to assess the impact of sample transportation on access to laboratory services to improve patient referral linkages to care and treatment. Methods: Data was collected from specimen and patient tracker logbooks during the first where the number of specimens and results transported were recorded. The number of specimens tested and turnaround times for test results were collected and the number of specimens tested before and during the sample transportation program was also compared. Results: During the first 8 months of implementation, 14,316 specimens were transported. Analysis of laboratory testing data prior to and during the ST program showed an increase in the number of tests performed and a decrease in turn around time. These findings suggest that a coordinated and efficient sample transportation mechanism can increase the number of samples tested and reduce the turnaround times for patients receiving their test results thereby improving referral linkages to care and treatment. Limitations: No data on the time for results to reach patients from the provider and initiation on ART.

Predictors of Mathematics and Science Self-Efficacy in African American Girls

Presenter's Name: Elizabeth Ricks
Classification: Junior Faculty/ Lecturer/ Instructor
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Presentation Type: Poster Presentation
Faculty Advisor: Elizabeth Ricks
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Bandura (1977), suggests that the four sources of self-efficacy are prior experience, mastery experiences, vicarious experiences, and physiological affect. Bronfenbrenner (1979) discusses the role of the social environment in promoting positive development in children. Within the social environment, peers and teachers play a critical role in child development. In addition to the importance of the social environment, third grade is a critical juncture in development as children are at the end of the early childhood period. The goal of the study is to examine predictors of self-efficacy in mathematics and science for African American girls. The study is designed to compare science and mathematics self-efficacy for African American girls and to examine within group differences. The main research question investigated predictors of mathematics and science self-efficacy in young girls. It is important to understand factors that contribute to positive development and achievement in African American children. The study used data from the Early Childhood Longitudinal Kindergarten class 2010-2011 (NCES, 2001) to investigate predictors of mathematics and science self-efficacy among African American girls. A multiple linear regression was conducted to predict mathematics and science self-efficacy based on student perceptions of peer relationships, teacher support and conflict, and prior mathematics and science achievement. Preliminary results revealed that student perceptions of their peer relationship was a significant predictor of mathematics self-efficacy (.13, p=.005) and science self-efficacy (.17, p=.000). Implications for policy and practice and additional findings will be presented.

Self-Efficacy Beliefs and Interest predict Engineering Identity in African American College Women

Presenter's Name: Faun Rockcliffe
Classification: Graduate Student
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Given a decline in bachelor degree attainment for African American women within the past two decades, investigation into factors that support the recruitment and retention of this group in undergraduate engineering education is imperative. The current study explored factors that inform a sense of engineering identity in African American undergraduate women. Specifically, the study explored whether engineering self-efficacy beliefs and engineering interest predict engineering identity. Utilizing a cross-sectional survey design, the study consisted of 611 self-identified African American women enrolled in U.S. colleges and universities, 138 of whom were 2-nd semester first year students, 228 sophomores, and 245 juniors. Utilizing multiple regression analysis, results supported the hypothesis that when controlling for GPA, self-efficacy beliefs and engineering interests positively predict engineering identity. Implications for the results are discussed.

Screening for Sickle Cell and other hemoglobin variants in the Washington metropolitan area

Presenter's Name: Tatiana Tammosova
Classification: Staff
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Presentation Type: Poster Presentation
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Coauthors: Xiaomei Niu,Tatiana Ammosova, Angela Mason, Barbara Harrison, Seyed Mehdi Nouraie, Juan Salomon-Andonie, Sergei Nekhai, James Taylor

Sickle Cell Disease (SCD) is an inherited recessive disorder characterized by severe anemia, acute chest syndrome, stroke and many other life-threatening complications. Sickle

Cell Trait (SCT) is a condition where an individual inherits one mutated beta-globin gene and one normal gene. About 1 in 13 African-American babies is born in the US with SCT. In situations where both parents have SCT, the child has a 25% chance of receiving both mutated genes and inheriting SCD. While newborns in the US are required to be screened, often people do not retain their results over time. The immigrants from high-risk areas, such as sub-Saharan Africa and Caribbean countries, are mostly unaware of their status as carriers. The free screening program at the Howard University Center for Sickle Cell Disease is an important resource for patients without current symptoms and for individuals who carry the sickle cell gene. The retrospective study data were acquired in 2008-2018 years from free walk-in screenings at HU Hospital and health fairs in the greater metropolitan area. Testing was completed in the CLIA-certified laboratory at the Center. The hemoglobin variant levels were determined by high performance liquid chromatography.
In total, we analyzed 3,483 blood samples. The median age was 47 years old. 33.2% of the participants were male, 88.7% were African-Americans, 5.1% were Latino Americans. 329 cases of HbAS (9.71%) and HbAC (2.81%) were identified by the screening. 40 cases of different forms of hemoglobin mutations (1.1%), such as SS, CC and others, were also identified.

Incorporating Virtual Reality Technology to Chemistry Laboratory Safety Training

Presenter's Name: Samson Teka
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Coauthors: Sasha Pierre-Paul,Jean Tchoumeni, Olyad Begna, Alphoncine Fosso, Tamat Jules, Samichhya Paudel, Liyuwork Adane, Basil Mohamed, Gealle Njoumagem, Peguy Touani, Prince Ene, Archibald Enongene, Yolanda McKoy, Simon Wang

Virtual reality (VR) is an interactive computer technology taking place within a simulated environment. This immersive environment can be similar to the real world but with add-on digital features, or it can be totally fantastical. In recent years, VR is emerging to be the next step for the evolution of 21st century education, showing great potential of changing the traditional way how education materials are delivered in the settings of classroom or laboratory. Particularly, VR can enhance student's participation by creating scenarios that immerse the learners in such an interact manner that be able to motivate them to understand the subject better. Herein, we report our initial efforts of applying powerful VR technology to chemistry laboratory safety training. It includes two topics so far: 1) Instruction on fume hood basics: air flow and operation; 2) How to protect yourself in chemical fume hood. The videos were then incorporated with audio clips for additional instructions and explanation. The original videos were recorded in MP4 format by our 2nd-year Pharmacy students, and then converted to the VR formats to be fully compatible with regular apps for playback at VR-enable devices. The effects of current VR contents on laboratory safety learning are assessed using various criteria and appear to be much favorable. This innovative technology will transform the learning experience of new generation of college students. On the other hand, it informs the way students can approach and contribute to those emerging IT technologies, thus prepare them well for future development.

Electronic Toothbrush Use and Its Influence on Brushing Frequency in Children

Presenter's Name: Ashlee Thomas
Classification: Post Doc/Resident/Fellow/Research Associate
School/College: Dentistry
Presentation Type: Poster Presentation
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For years there has been a debate about the efficacy of manual toothbrushes and electronic toothbrushes and undoubtedly patients have their preference. This engagement in turn may be motivational to children during brushing and in turn make the habit more enjoyable for some children leading to more compliance. The aim of this study is to determine if there is an increased motivation to brush in children using electronic toothbrushes compared to those using manual brushes based on parental reports of oral hygiene habits. 15 children (ages 6-10 years) who usually use manual brushes were provided an electronic toothbrush and parents were asked to observe differences in brushing habits, as far as frequency and duration over a 2 week period. Each child's brushing habits were assessed via survey by the parent prior to receiving the electronic brush (how often are they brushing now, for how long, and what time is preferred, night or morning?). Based on tentative results from post-surveys, there has been a positive response to the electronic brushes as it pertains to motivation in children, indicating that the electric brushes have been engaging; more interpretation of results will be provided upon conclusion of study.

An African Model for Solving Global Existential Poverty Through Ethical Education

Presenter's Name: Charles Verharen
Classification: Senior Faculty
School/College: Arts & Sciences
Presentation Type: Oral Presentation
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An African educator has proposed a radical solution to the problem of global existential poverty through a model of ethical education. Grounded in W.E.B. Du Bois's vision of

universal university education, the model establishes rural eco-villages that offer the equivalent of a university education. The model's developer is Professor Godfrey Nzamujo, a Dominican priest from Nigeria. His model, called the Songhai Center in honor of a West African empire, develops rural eco-villages based on three principles. First, the villages must be autochthonous in the sense of being rooted in the physical and cultural soil of the people. Second, the villages must be autonomous in the sense of relying on their own renewable energy and water sources and production of food and other necessities for life. Nzamujo's third principle is that the village must be authentic in the sense of being committed to the flourishing of its residents and their neighbors. The key to his sense of authenticity is ethical education. Employing state of the art information communication technology, the villages offer education from the primary level all the way through to the university. Nzamujo started the Songhai Center in Porto Novo, Benin, but it has spread to other countries in Africa, including Burkina Faso, Chad, Democratic Republic of the Congo, Equatorial Guinea, the Gambia, Ghana, Guinea, Liberia, Malawi, Nigeria, Republic of the Congo, Togo and Uganda.

Incorporating Interventional Radiology into Medical School Curriculum: Report on Year 2 of Establishing a Longitudinal Study

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Background: Interventional Radiology (IR) combines diagnostic imaging with minimally invasive techniques. IR procedures have been shown to increase patient comfort, shorten recovery time and reduce healthcare costs. In 2017, a pilot program was developed at our institution to introduce IR into the medical school curriculum. In 2018, a Radiology Interest Group (RIG) was created. This ongoing project aims to identify and implement methods of increasing medical student interest and exposure in IR. Method: Systemic review of literature on IR in medical school education was performed. After a simulation exercise was conducted and the RIG was established, partnerships with medical schools in the same city were fostered and an IR symposium was held in October 2018. Additionally, a questionnaire is being developed to assess medical student interest in IR and the impact on educational goals over time. Results: Out of about 400 medical students at our institution, over 10% joined the RIG and are working on radiology research projects. The simulation exercise carried out in 2018 was met with positive feedback. RIG has also established national representation with the Medical Student Council of the Society of Interventional Radiology (SIR), SIR Interventional Radiology Outreach Program and Diversity Task Force. Conclusions: For future IR trainees, educational activities are critical and align with SIR's continuing efforts to increase exposure in IR. The Liaison Committee on Medical Education recommends that medical schools prepare students for all specialties. Our initial efforts have encouraged us to continue finding new ways to integrate IR into the medical curriculum.

Influence of the Traditional Read-Aloud on Student Perception of Literacy

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Presentation Type: Oral Presentation
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In K-12 education, many scholars and educators fall short of mandated expectations and struggle to obtain desired outcomes from learning exchanges. Researchers strive to investigate ways in which the likelihood of favorable outcomes can be increased, however no single model has been agreed upon to foster consistent success for various student groups. Within the educational community, professionals agree that all outcomes are in some manner, related to student motivation. Motivation, in turn, stems from students' attitudes towards different skills, processes, and subject matter connected to learning goals. Aligned with this logic, in order to optimize educational outcomes related to goals, one must begin with optimizing student motivation which often begins with their attitudes.

As attitudes and motivation vary for students between subjects, those seeking to investigate these constructs must find a point of commonality to begin their work. Considering the structure of American education, logic dictates that reading and literary processes are integral to performance and outcomes in all content areas, thus, should be the point of inception. A pre-service instructor designed a research study seeking to investigate whether a literary intervention could improve students' attitudes around reading, somehow leading to overall enhanced academic outcomes later. The investigator deployed two surveys on either side of a two-week intervention (read-alouds) in an Urban 3rd grade classroom. Following the intervention, both surveys were averaged using the same Likert measures and conclusions drawn revealing motivation was increased over the allotted time, however the intervention could not be isolated as the cause of improvement.

Control and Education in Black and Latinx Communities

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Students from Howard University School of Law, in collaboration with the law school's Education Rights Center, are responding to the call made by Harvard's Predatory Lending Clinic to consider the problem of for-profit colleges. During the Fall 2018 semester, the "school discipline" seminar researched issues concerning "Control and Education" in the Black and Latinx communities. Inspired by Harvard Fellow Emmanuelle Verdieu's framing of the issue during her presentation at Howard, the seminar contextualized predatory lending as one of many different types of controls on historically oppressed people. While the reverse redlining that Verdieu described may be motivated by greed, rather than intentional animus, administrative policy changes appear to deliberately favor predatory actions that have the effect of putting a chokehold on the finances of many, including people of color.

The "Control and Education" colloquium will survey other instrumentalities of control, beginning with another administration policy change concerning the cross-examination of sexual assault victims in Title IX proceedings and spanning felon disenfranchisement, criminalization of school discipline, systemic failures that affect college readiness and the education of children in juvenile detention, cultural incompetency affecting Teach for America instruction, mislabeling and tracking of children and special needs assessment, and the achievement gap as an historically intentional form of control.

Through Literacy Can We Increase The Number of Black Women Who Get Tested for Breast Cancer?

Presenter's Name: Sydney Lane
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Black women have been affected by metastatic breast cancer for generations, and to this day the reasoning behind this phenomenon has not been solved. Out of any other demographic, no other group of people are diagnosed or killed from metastatic breast cancer as much as Black females. Despite all these claims, there has been not a one solidified answer as to why Black Women are most affected by metastatic breast cancer. To combat this, this research aim was assess the knowledge about the facts, signs, symptoms, risk factors, and treatment for metastatic breast cancer. An online questionnaire was administrated using a stratified random sample of Black women attending Howard University between the ages of 18-30. Out of the population that we researched there was a tremendous 25% increase in African American women who got tested for breast cancer. By communicating with the local mammography center, we were able receive comparable statistics of Black women getting tested before and after the conclusion of the questionnaire.

Investigating the Outcomes of Inclusive Classrooms with Students with Disabilities

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Presentation Type: Oral Presentation
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Students with intellectual, physical, emotional and behavioral disabilities are rapidly emerging in general classrooms throughout the American education system. The purpose of this study was to investigate the outcomes of students with disabilities emerging in inclusive classrooms. A sample of 5 elementary teachers from Elsie Whitlow Stokes Public Charter School located in Washington, DC were chosen for this study. The hypothesis, if students with disabilities are emerged in inclusive classrooms then they will have greater educational outcomes, was examined.

Restoravtive Justice: Online Education for Returnees

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Education is essential avenue to successful reentry for people leaving incarceration. Numerous researchers have detailed the significant barriers faced by incarcerated students educators, and correctional administrators in order to bring online teaching and learning inside a correctional facility. Less apparent, however, are the barriers that face those who leave incarceration and are left with little to no institutional support to regain entry to a productive life. As a result, those under community supervision, parole, or probation often do not participate in education and training programs (Visher, Debus, and Yahner, 2008) either because they are unaware of the resources that might exist or they are more concerned with becoming employed or helping family. The purpose of this article to examine how educators can connect those who have returned from incarceration to online educational resources that can help them regain a foothold in society and prevent recidivism.

Environmental Sciences

Returning Home: A Cross-Cultural Analysis of the Experiences of Displaced Victims of Hurricane Katrina

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The Hurricane Katrina disaster was one of the worst natural disasters to impact the nation in modern times. The disaster led to the displacement of well over 400,000 residents in New Orleans, uprooting their family life, community ties, social networks, and work life. While some sources report residents returning within less than a month after Katrina's landfall, thousands of others lived outside of the city limits for months and some for years after the disaster. This project explores the lived experiences of the returnees of various racial and cultural backgrounds, examining the challenges faced while they were displaced, their reasons for returning, and their homecoming experiences.

Thermal Decomposition of Ozone on Regional Samples of African Mineral Dust

Presenter's Name: Mariam Almedwah
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Presentation Type: Poster Presentation
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Background: North Africa is one of the largest dust source regions in the world, emitting tons of dust particles that are annually transported to the atmosphere by strong winds. These dust particles may be strongly influencing the balance and the chemistry of the atmosphere and thereby has the potential to alter the regional climate system. The primary objective of this study was to determine the thermal decomposition of ozone on certain types of North African mineral dust. Method: Attenuated Total Reflectance (ATR) Fourier transform infrared (FTIR) spectroscopy, was used to investigate the differences between the dust samples as a function of temperature and size. Dust samples were collected from different locations in North Africa: Sudan, Morocco, and Mali. Dust samples were exposed to different concentrations of ozone and then were examined for changes in the surface. Results: The ATR spectra changed significantly for Morocco and Sudan but not for Mali. The preliminary results were very important in understanding the thermal behavior of ozone decomposition on the North African mineral dust and the changes that occurred to the surface composition of the dust while exposed to various temperatures. KEYWORDS: Ozone, decomposition of ozone, Dust, Saharan mineral dust, FTIR, Infrared, Chemistry of the dust

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The decline and extinction of the Steller's sea cow (Hydrodamalis gigas)

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BackgroundThe extinction of the megafauna during the Holocene era has been almost universally attributed to the destructive activities of humans. Identifying human intervention as the driver of extinction events is problematic when other agencies, such as climate change, might also be held culpable. Non-human induced extinction can be studied in remote regions where humans were historically absent. Bering Island lying off the east coast of Siberia was uninhabited until Bering and the St Peter were shipwrecked there in 1741. Once the island was discovered the local fauna were ruthlessly hunted food and pelts and the sea cow was soon extirpated. However, there are several strands of evidence to suggest that this population was in decline prior to its discovery and extinction. Methods: The Smithsonian Institution contains an extensive collection of sea cow bones which were examined for evidence of human activity, such as butchery marks and their depositional history. Results: The surfaces and cavities of sea cow bones showed contact with peat found in the raised beaches formed during postglacial isostatic uplift of the island and predate human occupation. Some bones bear chop marks and derive from the last living sea cows slaughtered sometime between 1741 and 1768. Conclusions: Radiocarbon dates suggest that the sea cow began to diminish in numbers after 1000 years BP, shortly before the Little Ice Age. Thus, whilst the proximate cause of the sea cow's extinction was humanly induced it was likely a population already in decline and therefore extinction prone.

The Isolation and Characterization of Alcazar Phage

Presenter's Name: Kaleb Barnes
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Background: The experiments performed throughout this research is intended to classify the characteristics of a bacteriophage, a virus that infects bacteria. The host bacteria is Mycobacterium smegmatis mc^2 155. This host is in the same family as pathogens Mycobacterium leprae and Mycobacterium tuberculosis. Bacterial phages perform either a lytic or a lysogenic life cycle. The research is heavily focused on the analysis of plaque formation due to phage replication and death of bacteria cell colonies from the viral invasion. Methods: The soil sample containing phage Alcazar was found beside Oliver Otis Howard Hall (38.3052 N, 15.42 W). The phage particles found in the soil sample were enriched to create more viable phage particles for testing. The procedures for patch assays and streaking were performed. The phage particles were then isolated and purified to obtain phages of homogeneous structures with a single plaque morphology. DNA from the phage was isolated and gel electrophoresis was performed. Results: The population of phage Alcazar generated a titer of 2.2x10^10 pfu/mL. The population was unclustered and the sub cluster requires further analysis. Conclusion: The titer generated from the population of phage Alcazar indicated that there were 2.2x10^10 infectious particles per mL of preparation. Alcazar showed clear plaque clearings which proved that phage Alcazar was in its lytic life cycle. Lysogeny procedures are still being conducted on Alcazar to test the resistivity of phage Alcazar to other phages.

Evaluation and Investigation of Air Pollution via Bacteria Appearance and Frequency in the Washington DC Region

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The increasing impurity of the breathing air and some of its public health consequences have received increasing attention over the past decades. In 2013, MIT's news reports that air pollution is responsible for 200,000 early deaths each year in United States alone, and in 2014, WHO reports that it is a cause of seven million premature deaths worldwide. Due to air pollution concern, this study focuses on evaluating and investigating the Washington DC region air in comparing seasonal temperature, appearance, frequency and survivability of airborne bacteria of two data sets collected from February to August 2007 in the region. The appearances of both gram-positive and negative are visible in both June and July above five CFUs. This study shows a high appearance of gram-negative bacteria in June 2007 and a low appearance in April 2007. While for the gram-positive, June shows a low appearance, and February a high appearance. The second data set finds more presence of gram-negative bacteria from February to July. For both data sets, the bacteria (19 identify by name) with the greatest number of frequency of appearance are gram-negative Proteus mirabilis, Enterobacter cloacae, and Pseudomonas luteola respectively. The gram-negative has a protective and impenetrable cell walls, which may have helped them multiply, survive, and endure the seasonal temperature and heat change. This research shows that air pollution, of mostly human sources, represents atmospheric and health threats of significance to the public and thus needs more attention.

The implementation of drainage design methods can help resolve the flooding issues in Trinidad and Tobago

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According to the Resilient Design Institute, resilient design is the intentional design of buildings, landscapes, communities and regions in response to vulnerabilities to disaster and disruption of normal life. Last October, the island of Trinidad and Tobago faced several problems with flooding after heavy rainfall occurred. One of the major rivers on the island, the Caroni river overflowed and as such resulted in the displacement of numerous residents and left many stranded on main roads because of the high waters. According to the director of PURE (Program for Upgrading Roads Efficiency Unit) Mr. Hayden Phillip, most of the flood plains have been filled by developers and hence flooding occurs within a short amount of time. The unit intends to create a plan of action to alleviate the issues. I believe that certain drainage design methods can not only help improve the infrastructure but also help improve the livelihoods of the citizens of the country.

Biological Transformation of Hexavalent Chromium using ES6 and MR1 in a Sustainable System

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Over the years the Hanford Site, which was a nuclear production complex operated between 1943 and 1998 by the United States federal government, has attracted the attention of The U.S. Department of Energy. The Hanford Site poses an environmental risk because of the chromium present as a result of the use of chromate (a corrosion inhibitor) in the reactor cooling water. Chromium migration to the water table can result in a rapid migration to the Columbia River which is a main source of drinking water. The Federal standards of drinking water for Chromium (VI) is 100 micro g/L therefore the migration of Cr (VI) could cause severe health risks in both humans and aquatic lives. In this study Shewanella oneidensis strain MR1 and Cellulomonas strain ES6 were used to biologically reduce hexavalent chromium. The experiments were conducted in a batch reactor system under anaerobic conditions in the presence of hexavalent chromium and carbon tetrachloride. In the system an optical density of 0.01 was achieved for both MR1 and ES6. This showed that the bacteria were neither growing nor dying. It also showed that chromium (VI) and carbon tetrachloride had no effect on the growth of the bacteria. After 7 days MR1 was able to achieve 84% reduction of chromium (VI) without any competing electron acceptors and 70% reduction in the presence of carbon tetrachloride.

A Digital Flora Checklist of Wheaton Regional Park in Wheaton, MD

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Wheaton Regional Park was founded in 1961, and is composed of over 500 acres. Dr. H. David Hammond, a former botany professor at Howard University, undertook a series of floristic surveys of the vascular plants. The final checklist of plants included 459 taxa of ferns, gymnosperms, and angiosperms from more than 80 families. Hammond's survey produced a large amount of specimen material and information, which is preserved in the Howard University Herbarium.
Beginning in 2014, the Burke lab commenced a second set of surveys of the plants occurring in the park, in order to conduct a comparative study 50 years later. The information collected in these surveys will be compared to Hammond's checklist from the 1960s to study the effects of suburbanization and exurbanization on vascular plant distribution.This project uses the data from the Hammond and Burke surveys to build a single digital flora checklist, which will be free and publicly available. Utilizing the Symbiota Web tool and resources from the Mid-Atlantic Megalopolis Collections Portal, the 1960s and 2010s surveys will be combined to form an updated Digital Flora Checklist of all the plant species inhabiting the Park. As a tangible product of the Mid Atlantic Megalopolis Project at Howard University, this checklist serves as an important, dynamic-resource for ecologists and environmental scientists, as well as an outreach platform for the surrounding community to better understand their natural environment.

The Characteristics of Radiosonde Data Under the Influence of the Saharan Air Layer during 2009 AEROSE Campaign

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Previous research has shown that the Saharan Air Layer(SAL) cools the atmosphere, reduces the radiation reaching the ocean, and suppresses the development of hurricanes. In order to better understand the evolution of the SAL during transport and its influence on the regional atmosphere, this research analyzed sounding data obtained during the 2009 Saharan Dust AERosols and Ocean Science Expeditions(AEROSE) trans-Atlantic field campaign to examine signatures of its influence on the SAL. The data were divided in two groups: SAL and non-SAL based on the Aerosol Optical Depth(AOD) observed on site over the tropical Atlantic. The results exhibit significantly different features for temperature, relative humidity, and wind profiles for the two scenarios. It is found that the temperature of the SAL is warmer than the non-SAL below 5 km and has a warmest point than the non-SAL near the top of the inversion(1.8km). Furthermore, the depth of inversion is much thicker on SAL days(400m versus 100m). The "dry tongue" feature presents in the relative humidity sounding profile on SAL days. The stronger easterly wind dominates the SAL days and has less vertical wind shear on zonal wind. The results suggest that the mean sounding without separating the SAL effects can miss several important features. These results indicate that the sounding data should be separated into two types; SAL and non-SAL in the tropical Atlantic. This will lead to more robust representations of the thermodynamics and kinematics when the data is assimilated.

Using symbolic cultural language to promote sustainable design in Saudi Arabia

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Over the course of the last forty years, coinciding with the industrialization of Saudi Arabia, the country has seen a boom in construction projects and expansion. Throughout this process of rapid growth, the people of Saudi Arabia have designed their homes, neighborhoods and entire cities in the Western Modernist tradition. What has resulted in the process is a homogenized aesthetic approach to both architectures, and as a subset, sustainable design. The influence and appropriation of globalized methods has eroded the identity of Saudi Arabia as viewed through the lens of the built environment, which is problematic. The purpose of this thesis therefore, is to show how sustainable design can be approached by referencing distinctive cultural symbols that evoke Saudi identity in the architecture.
Methodology: Use sustainable concepts and tie them in to culture elements
- environmental study for sustainable practice
- Environmental preference theory
- Observation

Case study:
- Explain the relationship between Hijazi cultural elements and sustainable design.
- Repackage the elements in a modern way by providing three designed houses for three different income.

Functional root traits differ in congeneric serpentine-specialist and generalist plants

Presenter's Name: Kristian Harris
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Plants in heterogeneous soil environments face challenges to find essential nutrients and avoid toxins. Serpentine soils are highly stressful because of low nutrients, low water and high toxic metals (Ni, Mg). This study compares functional root traits in two congeneric species adapted to serpentine soils. Alyssum corsicum is an endemic serpentine-specialist. Roots of A. corsicum absorb extraordinary quantities of Ni and transport this toxic metal into shoots where it deters herbivores. Alyssum montanum is an edaphic-generalist that grows on serpentine and non-serpentine soil and does not accumulate Ni. We wished to determine whether roots of these species show preference or avoidance for soil patches containing variable Ni and Ca/Mg ratios. Seedlings were transplanted into arenas with four soil treatment "patches": (1) low Ni, high Ca/Mg, (2) high Ni, high Ca/Mg, (3) low Ni, low Ca/Mg, (4) high Ni, low Ca/Mg. After 3 months, roots were harvested, washed, dried and weighed. Root preference for each plant was scored by determining which soil treatment yielded the highest proportion of total root biomass. A. corsicum had significant root preference for soils with high Ni (Pearson Chi Square = 14.48; p = 0.002), while A. montanum shows no root preference (Pearson Chi Square = 0.224; p = 0.974). Neither species showed root preference for a high Ca/Mg ratio. This study suggests that root foraging for Ni in the endemic serpentine-specialist species (A. corsicum) contributes to the Ni-hyperaccumulation phenotype, while the edaphic-generalist species (A. montanum) exhibits a more flexible phenotype.

Bringing Clarity to Artemisia L. by Categorizing Moroccan Species

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Artemisia L. are angiosperms belonging to the Asteraceae family. This genus of plants is native to Central Asia, but it can also be found in cold and temperate climates in North America, Europe, and Africa. While Artemisia L. has economic and medicinal importance around the world, as it is used in medicine, consumption, and soil stabilizers, there is still a large amount of ambiguity in this genus since there is no global system for species' classification and phylogeny. Despite the uncertainty, there are five recognized subgenera within the genus: Absinthium, Artemisia, Dracunculus, Seriphidium, and Tridantatae. Nine different species of Artemisia L. currently grow in Morocco; however, not all nine of these species have been classified into subgenera. The objective of this research project was to classify each of the nine Moroccan species of Artemisia L. into subgenera. We obtained samples of all nine species, as well as several varieties, of Artemisia L. growing in Morocco, and we performed DNA extractions on 26 collected samples. We then amplified the nuclear ETS and ITS regions, as well as the chloroplast rbcL region, using polymerase chain reactions. Our sequences were then compared to sequences, which were gathered from GenBank, of over five hundred species of Artemisia L. around the world in all five recognized subgenera. We were then able to determine to which subgenus each of the Moroccan species belong. We will continue our investigation into Moroccan Artemisia L. speciation.

Impact of environment on the evolution of acellular bone in ray-finned fishes (Actinopterygii)

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Background: Environmental factors can drive the evolution of physiological traits, but determining which factors influence specific traits across large evolutionary time scales can be difficult. Ray-finned fishes (Actinopterygii) compromise over half of vertebrate diversity and occur in marine, freshwater, and brackish aquatic habitats at latitudes ranging from the tropics to the poles. Many actinopterygians have evolutionarily lost a key cell type of vertebrate bone: osteocytes. While properties of this "acellular" bone are not well known, loss of osteocytes has been previously associated with evolutionary transitions to freshwater. In our study, we tested for evolutionary associations between environment and loss of osteocytes. Methods: Using the largest and most recently published phylogeny of actinopterygians, we computed phylogenetic logistic regression models to test the relationship between acellular bone and environmental factors such as salinity (marine, freshwater, and brackish) and latitude (tropical, subtropical, temperate, boreal, and polar) across 396 actinopterygian species. Results: After testing more than 20 models, we found no statistical relationship between environment and lack of osteocytes. Conclusion: Previous studies of the role of the freshwater environment in driving the evolution of acellular bone have relied on indirect evidence. This study uses the most rigorous and modern statistical tools and data available to demonstrate that this association is not well supported. We conclude that loss of osteocytes was driven by environmental factors other than salinity and latitude, and we continue to explore other possible factors in this major physiological innovation within the actinopterygians.

Architetural Solutions to Impure Water in Slums

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Access to clean drinking water should be a universal phenomenon, yet a large portion of the world is still deprived of this basic need. A reported 1 in 8 people in the world live in slums meaning slums have grown to house nearly 1.2 billion people. It is estimated that by 2020, this number will have increased to 1.5 billion. A major issue in these neighborhoods is sanitation, which is closely linked to the accessibility (or lack of accessibility) to clean water. In addition to sanitary requirements, water is essential to life for drinking and cooking. A lack of access to potable water only increases the probability of diseases, dehydration, and a number of other health issues. It is estimated that more than 5 million people a year die due to inadequate sanitation or illnesses related to unsafe drinking water; 1.6 million of these deaths are children. The following research will examine the effects of contaminated water and attempt to find architectural solutions to water access and water potability. Architectural solutions can help to provide large scale water purification, alleviating many health issues related to unclean water. The location of focus is in Kibera, a neighborhood in Nairobi, Kenya, home of the largest urban slum on the continent. Like many slums, water scarcity plagues the neighborhood.

West African Biophilic Architecture

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The research constituted by this abstract seeks to examine the biophilic design of West African nations and their resiliency. Biophilic design is an approach to architecture that seeks to connect building occupants more closely to nature. Biophilic designed buildings incorporate things like natural lighting and ventilation, natural landscape features and other elements for creating a more productive and healthy built environment for people. The implementations of biophilic architecture constitute advantages in cost efficiency and easy allocation of resources. According to the Resilient Design Institute, resilient design is defined as "the intentional design of buildings, landscapes, communities, and regions in response to vulnerabilities to disaster and disruption of normal life". The main questions however this research seeks to answer is what are the economic advantages of biophilic architecture and design in West Africa and using principles under biophilic design, how it could also provide solutions toward natural disasters in the region.

Root Exploration and Exploitation in Serpentine Soil Environments

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Serpentine soil is challenging for plant growth due to low nutrient concentrations and high concentrations of toxic metals (Ni, Mg). Alyssum montanum (Brassicaceae) is abundant on serpentine soil and grows naturally on non-serpentine soils as well. This study examines patterns of root foraging in Alyssum montanum using a "root foraging arena" design that reveals patterns of colonization of soil patches (exploration) and relative root biomass developed in each soil patch (exploitation). We are particularly interested in the exploration intensity of roots (do roots explore all available patches?) and the exploitation evenness (do roots exploit all patches evenly?). Alyssum montanum seedlings were transplanted into arenas with "patches" that contained one of four soil

treatments: (1) low Ni, high Ca/Mg, (2) high Ni, high Ca/Mg, (3) low Ni, low Ca/Mg, (4) high Ni, low Ca/Mg. We hypothesized that Alyssum montanum would show high exploration intensity because it grows naturally on a wide variety of soils. We also hypothesized that it would show high exploitation evenness because our experimental design only permitted plants to "choose" between identical (homogeneous) soil patches. As expected, our analysis showed high exploration intensity (Chi Square Statistic = 38.02; = 0.000) and evenness of exploitation. Biomass of roots in all four soil types was not significantly different (KW = 2.80; p = 0.424). This study supports other research findings from our lab indicating that Alyssum montanum has a flexible "opportunist" root foraging strategy consonant with its ecological role as an edaphic-generalist species.

Influence of Ni and Ca/Mg Ratios on Root Foraging in Serpentine Plants

Presenter's Name: Arquel Miller
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Coauthors: Mary McKenna

Ecologists have a wealth of information about adaptive traits in aboveground plant structures, but there is still much to be learned about the ecology and function of underground structures. This study explores below-ground ecology of plants that are adapted to grow on serpentine soils that naturally contain elevated levels of toxic elements such as Ni and Mg, and low levels of nutrient elements such as P and Ca. Recent studies indicate that plant roots can seek out nutrients in soil through chemotropisms and adaptive growth strategies. Some serpentine species (known as Ni-hyperaccumulators) absorb Ni from soil and store it in shoots where it provides defense against herbivores. This experiment continues previous research in the McKenna lab to explore whether roots of serpentine plants show a preference for soils containing elevated Ni or a favorable Ca/Mg ratio. Root foraging responses of a Ni-hyperaccumulator (Alyssum corsicum) and a non-accumulator were quantified by measuring the proportion of root biomass in four soil treatments: (1) low Ni & high Ca/Mg, (2) high Ni & high Ca/Mg (3) low Ni & low Ca/Mg, and (4) high Ni & low Ca/Mg. We found that A. corsicum seedlings preferred soil treatments with high Ni concentrations. A. montanum seedlings did not show a preference for any soil treatment. Root lengths of these plants were affected by root preference and showed greater length in the soil treatment most similar to serpentine soil. In addition, leaf chlorophyll content was impacted by root preference in A. corsicum but not A. montanum.

Relative analysis of the effects of different amounts of airspace in bioreactors

Presenter's Name: Ayomikun Olarinoye
Classification: Undergraduate Student
School/College: Engineering, Architecture & Computer Sciences
Presentation Type: Poster Presentation
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Coauthors: Tafadzwa Chigumira,Patrick Ymele-Leki

The big picture of this research is to develop methods for in-situ microbial reduction of radioactive iodate (I129) from radioactive waste contaminated groundwater at the Hanford Nuclear Site in Washington State. Microbial reduction is the use of microorganisms to decrease the oxidation number of a chemical species. The microbial community used is "Community 31". This community was isolated from the Hanford site and although it is yet to be characterized, it is suspected to have iodate-reducing potential. The specific goal of this project is to reduce Iodate (oxidation state of +5) to Iodide (oxidation state of -1). Community 31 was initially cultivated in TSB media before being transferred to a specially designed minimum media (Glover's M9) that allowed for analysis of iodate concentration with UV spectrophotometry. Batch cultures of the microbial community were exposed to an initial concentration of 100 micromole/Liter of iodate with constant shaking under anaerobic conditions. Experiments were carried out in the dark to reproduce groundwater conditions and were monitored over 24 hours for growth and iodate reduction. For reproducibility, robustness of iodate measurements and elimination of unknown variables, the effects of different amounts of airspace in bioreactors were tested and compared. Samples were taken every 4 hours and measured by spectrophotometry. Approximately 40% reduction in iodate was recorded after 24 hours. The data suggests that Community 31 can reduce iodate under the conditions tested. This could have significant environmental implications as it suggests an alternative approach for remediation of contaminated groundwater at the Hanford-site.

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12 years analysis of cirrus clouds and its radiative effect over the mid-latitude within the United States.

Presenter's Name: Kafayat Olayinka
Classification: Graduate Student
School/College: Arts & Sciences
Presentation Type: Poster Presentation
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Cirrus clouds play an important role in the atmospheric energy balance and hence in the earth's climate system. The properties of optically thin clouds can be determined using both active and passive instruments. The goal of this research is to understand the optical properties of cirrus clouds and bet-

ter estimate their net radiative effect on our earth surface. A combination of ground based active and passive instruments is used to better estimate the occurrence of the cirrus clouds optical properties. Cirrus cloud properties used in this research are retrieved from measurements of direct solar beam transmittance from the MultiFilter Rotating Shadowband Radiometer (MFRSR) (Min et al., 2004). Cloud mask data from a passive instrument, MultiPulse Lidar (MPL) is used coupled with a radiosonde instrument to derive the cirrus cloud optical depth. In this study, a statistical study was performed on cirrus cloud properties based on 12 years of measurements from both (passive and active) instruments at the Southern Great Plain Atmospheric Radiation Measurment (ARM) sites within the United States. Results from MFRSR analysis show over 30% of cirrus cloud present in the atmosphere is within optical depth between (1-2). Cirrus optical depth slightly increases during spring - summer and decreases in fall - winter. Through the statistical studies, the temporal and spatial variation of cirrus clouds are investigated to determine the occurrence of cirrus within these regions listed above and to also investigate their radiative effects on the atmosphere.

Iodine Transformation Capacity of Soil Microbiota
Presenter's Name: Jerome Oliver
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Presentation Type: Poster Presentation
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Background: Iodine is a biophilic element that is naturally found in the environment. Iodine cycling is the movement of iodine compounds from oceanic, terrestrial, and atmospheric environments. Radioisotopes of iodine (specifically I131 and I129) have contaminated soil and groundwater due to improper disposal of radioactive waste at the Hanford Site in the state of Washington. Due to iodine's ease of motility this creates a major environmental concern. Recently, researchers have discovered bacteria that transform iodine leading to immobilization of these radioisotopes. The growth promotion of these organisms has the potential to be beneficial in bioremediation efforts. The mechanism used to transform iodine in these microorganisms is unknown. Methods: We propose to generate transposon libraries in bacteria known to transform iodine, screen for loss of function, and identify gene responsible for iodine transformation. Results and Conclusion: Here, we present preliminary work that will provide the foundation for the generation two 10,000 member transposon libraries. Briefly, two isolates from the Hanford Site were selected based on their abilities to oxidize and reduce iodine species. These isolates were made competent and transformed with a transposome mix. Gel electrophoresis and growth on selective media was used to verify insertion of transposons. Future studies include iodine redox assays to determine the genes necessary for transformation capabilities of the libraries. This project will increase our understanding of the mechanism(s) used by subsurface bacteria to transform iodine and participate in global iodine cycling.

Understanding bioaerosols and their effect on human health in an open-air hospital in northern Ethiopia
Presenter's Name: Esther Otu
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Presentation Type: Oral Presentation
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Coauthors: Vernon Morris

Particulate matter found in the atmosphere ranges in size from less than a micrometer to more than one hundred micrometers and is known to transport living microorganisms. At the low end of the size spectrum, some of these "hitchhiking" microorganisms are small enough to deposit in the bronchi, bronchioles and the alveoli of the human lungs if they are respired and may cause or exacerbate respiratory diseases. In this study, air filters were used to collect ambient particulate matter in the intensive care unit (ICU) and tuberculosis (TB) wards at the University of Gondar hospital, located in northern Ethiopia,. More than one hundred size-resolved air filter samples were collected during the months of June and July during of 2015 and 2016. This span of two months covers the transition from dry season to wet season in northern Ethiopia. Over this period, a large increase in morbidity is observed each year. This study sought to determine if there were any significant changes in aerobiology that could be related to the health outcomes during this transition period.

The trophic Ecology of Pomacea spp. in Hawaii
Presenter's Name: Kevin Scriber, II
Classification: Graduate Student
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Presentation Type: Oral Presentation
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Background: Invasive Pomacea spp. are amongst 100 of the world's worst invasive species; causing eutrophication and the loss of biodiversity and ecosystem services. To investigate the trophic ecology of invasive Pomacea spp. stable isotope samples were collected from Kawainui Marsh (HI); a novel habitat of cultural and historical importance to the Hawaiian people. Methods: Pomacea spp., and sympatric plant and animal species, were collected from Kawainui Marsh (2019) and analyzed for 13C and 15N isotopes at the Smithsonian Institute's stable isotope laboratory. These two ratios were

statistical analyzed (ANOVA and Tukey Test), and resultant mean and standard error values were utilized in mixing models (SIAR) to define the trophic position and diet of invasive Pomacea spp. therein. Results: Seventeen Pomacea spp. were collected, alongside 10 animal species (e.g.: Astacidae and Hexapoda) and 4 plant species. The average 15N and 13C ratios for Pomacea spp. were determined to be 8.1 ppt ± 1.1 and -21.6 ppt ± 3.1 respectively, and the diet of Pomacea spp., and other constituent species, was defined via SIAR allowing a complete food web to be reconstructed. Conclusions: Stable isotope studies provide insights into the trophic ecology of invasive species, and the mechanisms which facilitate biological invasions. Collecting stable isotope data, before and after invasive species introductions, may allow predictions to be made as to: 1) habitat susceptibility to invasion and 2) resultant changes to community structure. Keywords: Pomacea spp., invasive, 13N, 15N, trophic ecology

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Study of the Kinetics and degradation of Simultaneous transformation of Hexavalent Chromium and Carbon Tetrachloride in aqueous medium using atomized Zerovalent Iron

Presenter's Name: Aadarsh Shah
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This research work focusses on the kinetics and efficiency of transformation of contaminants Hexavalent Chromium, Cr(VI), and Carbon tetrachloride (CCl4) in a mixed aqueous medium by atomized Zerovalent Iron (ZVI) simultaneously, as well as individually, and study any synergistic or antagonistic effects of the contaminants with respect to each other. Hexavalent Chromium and Carbon tetrachloride are two of the most prevalent contaminants in many of the hazardous waste sites, including DOE commissioned superfund sites such as Hanford, Washington and Savanah River site in South Carolina, USA. The chemical and physical properties of these contaminants differ as Cr(VI) is a heavy metal used extensively for it's anti-corrosive properties, whereas CCl4 is a chlorinated organic solvent used extensively as a metal degreasing agent in industries. However, these contaminants have been found to have carcinogenic properties and therefore deemed harmful for humans, mainly through the route of contaminated underground drinking water. ZVI has been shown to transform these contaminants to other benign or less harmful products; Cr(VI) to its less toxic form trivalent chromium, Cr(III) and CCl4 to other products. The literature supports our preliminary studies that show both of these contaminants degrade at a much faster rate in aqueous medium under low pH conditions (pH <2). Our studies have also shown the rate and efficiency of transformation of these contaminants in aqueous medium occur at a much higher rate separately than when transformed simultaneously.

Climate Change Knowledge and Perceptions: Exploring the Influence of Race and Ethnicity on Environmental Prediction Information

Presenter's Name: Carolyn Stroman
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Presentation Type: Oral Presentation
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Coauthors: Carolyn Stroman, Leticia Williams, Shadya Sanders

At present, weather forecasting has been used to warn the public about imminent and long term environmental conditions, and the science has become incredibly sophisticated in measuring and improving forecast capabilities. Despite these improvements, a major gap in the equation remains. While physical measurement systems have been heavily invested in, we must investigate how the public, especially racial and ethnic minorities, interpret, adjust to, and make decisions about climate change and make decisions using this improved technology during natural disasters. Racial and ethnic minority communities are more vulnerable than others across a range of events before and after a disaster (Forthergill, Maestas, & Darlington, 1999; Howard, Agllias, Bevis, & Blakemore, 2017; Lachlan, Burke, & Griffin, 2011; Senkbeil, Scott, Guinazu-Walker, & Rockman, 2014; Taylor-Carter, Koh, & Viswanath, 2007). Though studies have shown that minorities are disproportionately subject to experiencing the effects of climate change including extreme weather events, heat waves, and unemployment (Congressional Black Caucus Foundation, 2004; Leiserowitz & Akerlof, 2010), there is limited research about Blacks, Hispanics, and Native Americans' knowledge and perceptions of climate change. This research attempts to better understand the role and impact of minority status on climate change knowledge, concern for the implications of climate change, and how it relates to trust in environmentally concerned predictions. A web-based questionnaire containing behavioral, attitudinal, and demographic items administered throughout the United States was used. Preliminary results indicate that Blacks are likely to seek information pertaining to climate change and the environment from community organizations, as well as television.

How Urban Density Affects Water Accessibility in Developing Countries

Presenter's Name: Maya Thornton
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Over 50% of the world's population is living in cities, which is growth expected to reach 60% by 2040. Although urbaniza-

tion has its benefits, it's also become a deficit in accessibility to basic human necessities, such as clean water, especially cities in developing countries. With rapid urban growth, there's a need for more holistic means that integrate water and sanitation remedies into the urban planning process. This research will analyze Mexico City, Cairo and Yamoussoukro, three urban cities in developing countries that vary in population, infrastructure, and water access. Although Cairo is located near the Nile river, its residents are suffering from dumping of anthropogenic waste from multiple drains along the Nile River's banks. This has increased water contamination tremendously, leaving Cairo's citizens without clean water supply. Mexico City suffers from poor planning from the Aztecs over 500 years ago. 21 million people do not have access to clean water in Mexico City due to leaky pipes dues to the poor infrastructure put in place. The city's built on top of a valley where the large amount rainwater runs off through the streets and into the city's drainage system; the amount of runoff takes a toll on the poorly constructed pipes. Lastly, Yamoussoukro, the capital of Cote I'voire, lacks investments in their infrastructure and maintenance of their water facilities. Mexico City, Cairo and Yamoussoukro are a few examples of how urbanization is affecting peoples' well-being. Architects have a responsibility to integrate modes of solution to the worldwide epidemic.

Exploring How Coral Reef Structural Complexity Impacts Ecosystem Functions and Reef Recovery

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Coral reefs are diverse and valuable marine ecosystems that are increasingly threatened by a variety of disturbances. Some disturbances, like hurricanes and cyclones, kill coral and reduce reef structure. Other disturbances, like outbreaks of coralivorous sea stars, kill coral while leaving reef structure intact. However, the importance of reef structure in maintaining the ecological function of reef ecosystems, particularly as it relates to the recovery from disturbance, is unknown. This study examines the impact of structural complexity on the ecological function and recovery of disturbed coral reefs in Mo'orea, French Polynesia. Results show that higher structural complexity strongly influenced fish behavior, with herbivores like Acanthurids spending more time foraging and hiding in topographically complex reef landscapes than low complexity reefs ($p<0.001$). Moreover, these fish spent more time grazing in high complexity plots ($p<0.001$). In contrast, bioassays indicated that nutrient concentrations are significantly higher in low complexity reefs ($p<0.001$). Reduced herbivory and higher nutrient concentrations in low complexity reefs indicate that disturbance that reduces reef complexity result in the loss of key ecological functions and are more likely to recover to algal dominant states. In contrast, disturbance that leave reef structure intact have higher herbivory and lower nutrient concentrations, making recovery to a coral dominate state more likely. These different responses provide important information for marine managers, and suggest a more active intervention may be needed to stimulate recovery of reefs that lose complexity due to disturbance.

An Examination of Urban Air Pollution from Traffic and Construction around Howard University Campus

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Harmful particle pollution is one of the most common air pollutants. Particles come from many sources, but primarily industrial processes, vehicle tailpipes, and road dust in urban areas. These particles are detrimental to human health because they enter the human body through respiration and cause asthma attacks and respiratory inflammation. This study used a handheld particle counter, which simultaneously monitors six particle sizes. We sampled at five-minute intervals at four differing locations close to Howard University campus. The locations include Georgia Avenue, 5th St. NW, Elm Avenue, and 3rd St. NW, Data was collected three days per week, twice per day, over a period of six weeks. Data in each location was associated with traffic volume and proximity to construction. We hypothesized that sample locations with the highest traffic volume would show the highest number of particle pollution including fine particles (0.3- 1.0 µm) and large particles (3.0-10.0 µm). Preliminary data analysis showed a trend in data closer to high traffic volume areas had a higher number of fine particles, whereas data closer to construction sites had the highest number of large particles. Specifically 3rd St. NW., the sampling location directly in front of the construction site of Slowe Hall, showed the highest number of 3.0, 5.0, and 10.0µm particles. Also, the Georgia Ave. sampling location, which is directly in front of Howard University Hospital, had the highest car count, and on average had a higher number of 0.5 and 1.0 µm particles.

Shifts in Flowering of Willows (Salix spp.) Over Time and by Plant Sex

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Climate change is affecting the globe in a tangible way. Phenology of plants are shifting in light of temperature fluctuations. For this study, the plant genus investigated is Salix (Willow). These are dioecious plants, meaning the male and female flowers are on separate individual plants. Using physical and digital specimens from the Howard University Herbarium and the National Museum of Natural History Herbarium, changes in first flowering dates in Salix humilis and Salix nigra were investigated over time. First flowering dates were used to quantify the phenological changes over about a 150-year period in the United States Mid-Atlantic region. In Salix humilis, the first flowering dates of the male and female plants both advanced. The average date of first flower is statistically significant between the sexes in Salix humilis. In Salix nigra, first flowering dates advanced in the males while they decreased in the females. Over each 10 year period, the first flowering dates advanced about 1 day. The first flowering dates between the males and females of both Salix nigra and Salix humilis are desynchronizing. Even though in Salix humilis, both sexes first flower dates are advancing, the female plants are advancing faster. In Salix nigra, the desynchronization is even more evident are the males first flower dates are advancing while the females are decreasing. Sample size will be increased in the future to increase the accuracy of the findings in this study.

Can Social Media Enhance Disaster Literacy? #TheMoreYouKnow

Presenter's Name: Mi'chael Wright
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Presentation Type: Oral Presentation
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Research has documented the substantial impact that severe weather events have on individuals across the country, including storm-related traumas, psychological distress, displacement, and community disruption (McGuire et al., 2018). However, technological advances have allowed for better forecasting and improved communication before, during, and after natural disasters, particularly to the general public. Safko (2012) states that people use social networks because they want to share experiences, regardless of the outcome, with people they know and trust. Social networks are becoming an outlet where bonds can be built through experience as well as through education. Anderson and Spitzberg (2010) said "the fact that there are more people in more places from more cultures, often in greater levels of density, means that when a disaster occurs, they have the potential to directly affect more people" (p.222). Nevertheless, being able to identify and enable stronger social networks can play a huge role in how the events transpire. The purpose of this study is to expand our understanding of the impact of social media on the ways the general public communicate risk to others during severe weather events. Additionally, this study aims to document how race and age influence the use of Twitter by Black Millennials during severe weather events. Finally, this study also aims to determine if the use of social media platforms, such as Twitter, during severe weather events can increase disaster literacy throughout the general public. Keywords: Disaster Literacy, Communication, Social Networks, Twitter, Black Twitter

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Radiative Forcing Properties of Aging Saharan Dust Storms Entering the Tropical Atlantic

Presenter's Name: Daniel Yeager
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School/College: Graduate School
Presentation Type: Oral Presentation
Faculty Advisor: Vernon Morris
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The microphysical evolution of the hundreds of millions of tons of Saharan dust aerosols, released per year, has unresolved implications on Earth's atmospheric heat budget. The radiative forcing effect of desert dust aerosols alters the balance between solar energy entering the Earth's atmosphere and terrestrial energy that gets reradiated back into space. The Atlantic Ocean receives the radiative effects of an estimated 60-200 million tons of Saharan dust per year with unclear climate feedback effects. This work addresses uncertainties in longwave infrared (LWIR) emissive properties of Saharan dust aerosols entering the Atlantic Ocean. The 2015 Aerosol Ocean Science Expedition (AEROSE) campaign provided a unique opportunity to examine Atlantic dust aerosol microphysics in conjunction with aerosol optical property measurements. Sun photometer, optical particle counter, surface trace gas measurements, dust particulate chemical analysis, and back-trajectory techniques were leveraged to produce aerosol evolution classifications of each observed dust plume event encountered during the 2015 AEROSE campaign. The Marine Atmospheric Emitted Radiance Interferometer (M-AERI) provided high-resolution, LWIR atmospheric retrievals during dust-laden periods of observation. Based on aerosol optical depth (AOD) and LWIR band ratio techniques, 2015 observations consisted of two heavy dust plumes along with several mixed aerosol events. Within the two heavy dust cases, significant differences were observed in aerosol size, composition, and resulting radiative forcing within the LWIR electromagnetic spectrum. The findings of this investigation benefit climate modeling, and satellite retrieval efforts that seek clarity in the dust aerosol radiative effect and retrieval compromise of key climate parameters, respectively.

Ethics Law & Religion

If the Feds Watching: The FBI's Use of a "Black Identity Extremist" Domestic Terrorism Designation to Target Black Activists

Presenter's Name: Aleena Aspervil
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In August 2017, the Federal Bureau of Investigation under the Trump Administration issued an assessment identifying a new domestic terrorist threat: "Black Identity Extremists" ("BIEs") . However, in truth, the largest emerging domestic terrorist threat is right wing terrorism, perpetrated by white supremacists emboldened by President Trump's refusal to denounce their ideology and violence. The FBI broadly defines BIE's in a manner that essentially encompasses any black person who protests and speaks out against the treatment of black and brown bodies by police officers, reporting that this ideology stems from "alleged police abuse against African Americans" and "perceptions of police brutality." But, describing these abuses as "alleged" and "perceived" ignores the real, historic, and persistent problem of brutality faced by black Americans at the hands of law enforcement. In reality, the use of this domestic terrorism designation targets black activists for no other reason than their blackness. This is not only a violation of the Equal Protection Clause of the U.S. Constitution, but also a dangerously similar reiteration of the FBI's COINTELPRO which was used to target Black leaders during the Civil Rights Era—many of which were murdered or imprisoned as result. Knowing such, I propose a drastic reform of current FBI procedures and guidelines that empower the department to issue biased intelligence assessments that discriminatorily target Black Americans. I argue, that in order to address this abuse, the DOJ must revise the procedures and guidelines of the FBI so that racial bias no longer drives the Bureau's goals.

Muslim-American Mental Health: Islamic Framework, More Than Just Prayer

Presenter's Name: Nur shaina Ayers
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Stigmas about mental health services in Muslim communities, fear of anti-Islam sentiment from non-Muslim psychologists, and lack of Islamic teachings incorporated into therapy sessions has created a deficiency in the mental health care received by the Muslim-American youth. With the rise of Islamophobia coupled with the lack of resources available to the Muslim-American youth in the mental health sector, the mental stability of the Islamic youth has been detrimentally impacted. To address the deficit in the adequate services available, counteract Islamophobia and implicit bias, fundamental knowledge of Islam and Quranic teachings have been incorporated into a mental health guideline for educators, therapists, psychologists, and other professionals who serve the Muslim-American youth. The guideline provides basic understandings of Islam with doctrines and teachings from the Quran to address the common issues Muslim youths are facing today; depression, identity, intoxicants, and gender behaviors.

A Case for Lifting the Cuban Embargo: A Comparative Study

Presenter's Name: Allison Burns
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This research paper reviews the Legislative History of Cuban-American Politics and the specific effects the embargo has on contemporary Cuban society. The research also explores the selective enforcement of sanctions against communist countries through a comparative study of Vietnam, China, and Cuba. Additionally, the paper identifies contradictions in the U.S. emphasis on human rights and its relations with other countries that have committed human rights violations. Finally, after reviewing the damages that the embargo has caused in both the United States and Cuba, the paper evaluates the potential benefits of positive diplomatic relationship with Cuba and encourages with United States to lift the embargo. Both the United States and Cuba can benefit greatly from a positive diplomatic relationship, not only in the economic and agricultural sectors, but also in culture, healthcare, and security.

Land of the Free? An Examination of the Constitutionality of Forced Labor in U.S. Immigrant Detention Centers

Presenter's Name: Jamila Cambridge
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"I don't feel like you should be arrested and put in a place where a murderer would be, for just being in the country too long."
–21 Savage

In 2017, Immigration Customs and Enforcement (ICE) detained over 40,000 migrants—an unprecedented amount of detentions in the United States. In these detention centers, many migrants are subjected to a practice known as the "deprivation scheme," where they must work grueling hours for one dollar a day to afford necessities such as food, toilet paper, toothpaste, and other sanitary products. If they refuse, they are often punished with placement in solitary confinement. As we know, chattel slavery was outlawed by Congress in 1865. This Note argues that, by orchestrating a coercive practice that forces detained migrants to perform labor for little to no pay, U.S. immigrant detention centers' deprivation scheme violates the Thirteenth Amendment's prohibition of slavery. To resolve this, I propose that the courts find that immigrant detention deprivation schemes violate the Thirteenth Amendment and Congress raise migrant pay to the national minimum wage.

"The Lack of Diversity in the Legal Profession: Is Race Above the Law?"
Presenter's Name: Ashley Colvin
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The aim of this study is to investigate why African Americans are the least represented minority in the legal profession today. Findings have shown that African Americans are still below pre-recession numbers within law firms as of 2017. According to the National Association of Law Placement (NALP), individuals within the categories of women and Black/African-Americans have shown declines in representation at major U.S. law firms. I based my research on statistics provided by the American Bar Association national lawyer population survey as well as the NALP. This included an examination of major law firms in the United States who voluntarily submitted statistics of age/gender representation within their firms online. Although minorities continued to make small gains in their representation among law firm partners in 2015, the percentage of African-American associates has declined each year since 2009.The purpose of this project is to investigate if there is a need to increase the number of African Americans pursuing careers in law to offset the racial imbalance as well as determine what factors, if any, contribute to this imbalance. By continuing to research and assess data collected, the researcher will be able to answer the question once presented: Why are African Americans the least represented minority in the legal profession?

The Uncaptured Voice: Examining the role of Religion, and College & University Black Women Chaplaincy Leadership in the 21st Century
Presenter's Name: Cecil Duffie
Classification: Staff
School/College: Other
Presentation Type: Oral Presentation
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There has been extensive research on College & University Chaplaincy. Little though, has been written on how black leaders, especially deans of chapel, college and university chaplains and religious affairs professionals under the banner of supporting pluralistic, inclusive approaches are indeed upholding the role of religion, interfaith literacy, spirituality, and ethical identity in higher education. Even more troubling is the lack of accounts of black women who have held these posts. Karen Longman and Susan R. Madsen note that though "women now comprise the majority of students at all levels – associate degrees through doctorates, and first professional degrees... only 26% of university presidents, 10% of full professors, and less than 30% of the college and university board members are women". Remarkably, women have played a pivotal function in advancing black college and university chaplaincy specifically and college and university chaplaincy in general. Menah Pratt-Clarke Johanna Maes say that women who have similar roles have "varied academic backgrounds, cultural perspectives, and life experiences". The Uncaptured Voice: Examining the role of Religion, and College & University Black Women Chaplaincy Leadership in the 21st Century: where College & University Black Women Chaplaincy Leadership stands, the threats that remain; and its potential especially in the era of millennials. This work takes a qualitative approach and utilizes purposive sampling of: participant and direct observations; interviews; review of records; and collections of writing samples.

"Fed Up!": The Consent Decree as An Unlikley Resolve for Black Men Targeted by Criminal (In)Justice in Baltimore
Presenter's Name: Quiana Harris
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Presentation Type: Oral Presentation
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The HBO series, The Wire, highlights the ever-present evils of Baltimore, from the War on Drugs to the political corruption so deeply enmeshed in the city's criminal activity that law enforcement would often turn the other cheek. One cannot watch an episode, however, without noticing that it's predominately Black male characters who are portrayed as murderers, drug dealers, prisoners, and also the targets of constant police brutality. While The Wire is based on Baltimore, Maryland—where 63% of the population is Black—the

2002 series brings to life the harsh reality of the 2016 Department of Justice investigation into the Baltimore Police Department ("BPD"). Based on the DOJ Report, the Black residents of Baltimore are inarguably in "bad shape" due to their disproportionate exposure to the criminal justice system that historically exacerbates other systemic issues facing poor and minority communities. Being arrested, stopped, and incarcerated more so than any other demographic, Black men are at the "bottom of the totem pole" in the hierarchy of Baltimore. But why? The DOJ Report revealed that the culture of the BPD promulgates intentional racial discrimination, targeting, and systemic oppression of its Black residents. My paper explores these issues plaguing the BPD, and while a recent consent decree was issued in an attempt to address these issues, my paper analyzes the deficiencies of that decree and proposes an alternative plan of action that would empower the Baltimore community and hold law enforcement accountable in an effort to resolve the over-policing of Black bodies.

Income Share Agreements: A Solution to the Student Loan Debt Crisis or a Welcome Mat for Discrimination?
Presenter's Name: Meschelle Noble
Classification: Graduate Student
School/College: Law
Presentation Type: Oral Presentation
Faculty Advisor: Andrew Gavil
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In a growing economy dependent on workers with advanced degrees, obtaining a higher education has become a common, if not essential, part of living a typical "American" lifestyle. However, taking out a traditional student loan, in order to attend college, has become an investment in which the risks may outweigh the benefits. Yet, the use of Income Share Agreements ("ISA[s]") to fund higher education – a resurfacing concept – has the potential to lessen the burden of student loan debt upon graduated borrowers. ISAs allow students to borrow funds for tuition, and other educational related purposes, while enrolled in school. At the outset, the student agrees to pay the lender a certain percentage of their future earnings upon completion of their degree. The problem, however, is that without regulation by the federal government, lenders have the opportunity to discriminate in their distribution of funds based on unconstitutional grounds such as race or socioeconomic status. Additionally, ISAs have the potential to encourage predatory lending practices. To prevent the possibility of discrimination and exploitation by lenders, I propose that legislators create a regulatory scheme that halts the undesirable side-effects of ISAs, before their use becomes widespread in colleges and universities across the country. Specifically, Congress should amend the Equal Credit Opportunity Act, which makes it unlawful for any creditor to discriminate against any applicant, by expanding its scope to include ISAs.

The Future of Legal Work: Autonomous Artificial Intelligence Replacing Lawyers in the Workplace
Presenter's Name: Elijah Porter
Classification: Graduate Student
School/College: Law
Presentation Type: Oral Presentation
Faculty Advisor: Sherman Rogers
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Artificial intelligence can do the things humans can do, and in some instances, better. A recent study predicted that artificial intelligence will outperform humans in all tasks in 45 years and outperform humans in all jobs in 120 years. Assuming the prediction is true, it poses an interesting conundrum for lawyers and the work they do. The possibility of autonomous artificial intelligence practicing law raises serious questions on ethics and compliance. It causes one to reinvent the wheel and determine a feasible legal structure equipped to handle autonomous artificial intelligence. The current legal model does not protect people who may be harmed by machines practicing law. The research in this paper aims to provide a regulatory framework to provide legal remedies in a world where technology can think, do and act like lawyers.

Humanities

The Metempsychosis of Ideas : The Transmigration of Souls in Greek and Indic thought

Presenter's Name: Jyohomson Dawadi
Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Oral Presentation
Faculty Advisor: Charles Verharen
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The Ancient Greeks and the Ancient Indians are two cornerstones of modern thinking in the West and the East respectively, arguably equal in influence but varied in philosophy. However, this paper explores a concept surprisingly present in both schools of thought, namely the Greek idea of metempsychosis, and the Indic idea of the transmigration of souls, i.e. reincarnation. Taking into consideration the Ancient Greek group of Pythagoreans, Plato, and a small sect of Orphic traditions, this paper seeks to compare this Greek development and metaphysics of metempsychosis with the development and metaphysics of reincarnation found in the Vedas and the Upanishadic traditions to find similarities and differences that might be interesting to uncover. The relative uniqueness of metempsychosis and the sudden occurrence of the idea in Greek thought suggests that these two extremes of the Ancient World might have been connected in ways history has yet to uncover.

A Segregated Sisterhood? A Critical Discourse Analysis of 'The Racial Divide: Women of Color and White Women'

Presenter's Name: Jasmin Goodman
Classification: Graduate Student
School/College: Communications
Presentation Type: Oral Presentation
Faculty Advisor: Wei Sun
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African American actress, producer, and musician, Jada Pinkett-Smith, premiered her new digital streaming series Red Table Talk on Facebook Watch mid-2018. Featuring her mother, Adrienne Banfield-Norris, and her daughter, Willow, Smith holds weekly, intergenerational and intimate conversations about love, race, politics, and more with invited guests. On November 12, 2018, the series aired The Racial Divide: Women of Color & White Women with anti-race educator, Jane Elliott. The episode featured three Black women and two White women sharing their perspectives about race amongst women. The purpose of this study is to investigate how Black and White women engage in a discourse about race and gender. The research questions are as follows:

- RQ1: How do Black and White women engage in discourse about race?
- RQ2: What types of stories do Black and White women share when discussing race?

Co-cultural theory, which provides a lens for investigating the communicative practices between dominant and subordinate groups, will serve as the theoretical framework. Bell's (2010) model for analyzing social justice stories about race (i.e. stock stories, concealed stories, resistance stories, or transforming stories), will serve as an additional framework of analysis. Through the critical discourse analysis method, the researcher will examine 200 Facebook comments to identify prominent themes. The significance of this study is to increase the understanding of how Black and White women discuss race in contemporary society. Bell, L. A. (2010). Storytelling for Social Justice. New York, NY: Routledge.

A Literary Analysis of Black Female Controlling Images in African American Churches

Presenter's Name: Kenya Goods
Classification: Graduate Student
School/College: Graduate School
Presentation Type: Oral Presentation
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Coauthors: Cassandra Jean,Anas Askar

Patricia Hill Collins (1990) argues that the church as an institution qualifies as a site where "dominant ideologies are simultaneously resisted and reproduced." Patriarchal and controlling narratives can be found in African American churches, despite these places working diligently to oppose racial oppression and promote equality for all. Collins identifies specific controlling images that Black women are consistently categorized as, contributing significantly to their oppression: the mammy, the matriarch, the welfare mother, the Black lady, and the Jezebel. According to Collins (1990), each of these images contributes to Black women's oppression by dictating what kind of behavior and activity is deemed acceptable or condemnable. This paper aims to highlight literature that focuses on the ways oppressive and controlling images may present themselves within predominantly African American churches. Specifically, the researchers aim to highlight the contradictory spaces of freedom and oppression that Black women have to navigate through and the broader social implications of this navigation.

Flamenco and the Appropriation of Global Black Cultures in the Construction of Spain's National Brand

Presenter's Name: Aidan Keys
Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Oral Presentation
Faculty Advisor: Mercedes Tibbits
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This paper analyzes two crucial moments in the history of Spanish flamenco as they correspond to notable shifts in Spanish culture to trace the influences of global African cultures on the construction of Spain's national brand and image. The first is the release of Paco de Lucía's 1973 rumba flamenca album, Entre Dos Aguas, two years before the death of Spanish dictator Francisco Franco. This album demonstrates the ways notions of Spanish imperialism reflect in its popular culture: just as Spain systematically absorbed the cultures of Latin America and Africa to justify colonialism, Entre Dos Aguas borrows from the rumba of Afro-Cubans and the jazz of African-Americans. Today, rumba flamenca is often the most recognizable palo of flamenco, which, in turn, has become the sound of Spain's national identity. Catalan cantaora Rosalía recognizes this: critics and aficionados alike laud her 2018 album El Mal Querer, released a year after Catalonia's independence referendum, as a redefining moment in Spanish culture. Still, El Mal Querer continues flamenco's legacy of cultural appropriation, drawing heavily from black musics in the Americas, such as reggaetón and trap, to reimagine Spanish identity. The racial issue of appropriation in flamenco complicates further, as Paco de Lucía and Rosalía are both white Spaniards credited with revolutionizing a genre created by gitanos. By tracing the history of one aspect of Spain's national brand, this paper seeks to include the contributions of black and romaní people in the narrative of Spanish identity.

Old News: Analyzing African-American Baby Boomers' Trust in the Media

Presenter's Name: Maya King
Classification: Undergraduate Student
School/College: Communications
Presentation Type: Oral Presentation
Faculty Advisor: Kehbuma Langmia
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Whether it takes the form of television punditry, radio presentations, podcast interviews or the written word, the mass news media has had a profound influence on American culture and thought. In the age of the technological revolution that goes hand-in-hand with social media-driven news, the population of both the United States and the world is more connected now than it has ever been. However, even as people ravenously consume the news on a minute-by-minute basis, their trust in the news media—and subsequent choices to read, watch or totally ignore it—has waxed and waned remarkably over the past ten years. This study examines the way one American demographic—African-American Baby Boomers (aged 54-72)—consume the news as it occurs. Using historical context, qualitative and quantitative survey results, and information from existing media consumption data, it will measure and analyze the levels of trust that members of this population place in the newspapers and magazines they read. The results of this study should reveal more about how the way facets of the American public feel about news coverage, and how those opinions are shaped by the factors we have little control over.

In Flo Jo Fashion: The Cultural Appropriation of Sportswoman Apparel

Presenter's Name: Leelannee Malin
Classification: Junior Faculty/ Lecturer/ Instructor
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Presentation Type: Oral Presentation
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They called her Flo Jo. She was fast, had fortitude and was fashion forward yet with her untimely death, her style, grace and recognition as a trendsetter to the image and sportswear of female athletes was buried with her. In the discussion of appearances and the sportswoman there has been a constant debate about self-objectification, femininity, perception and coverage of women in sport. Parallel discussions are also taking place; that of culture appropriation, the concept of black girl magic and the role of women in sports and entertainment. However, there is limited discourse about the intersection of these discussions. More specifically, the discussion about the role of cultural appropriation of black female athletes in the context of sport and its profound impact on the sport and fashion industries is non-existent. This essay will discuss how the apparel of sport women and its media coverage and consumer interest have spurred the birth of the ever-popular athleisure wear; while inadvertently contributing to the cultural appropriation of one of the greatest Olympic athletes, Florence Griffith Joyner. With much ado about her four-inch colorful nails and handmade track suits, Flo Jo should be credited for the popular culture shift in female athletic wear that has now been coined as athleisure apparel. Fashion trends that included hairstyles, clothing and nail art that were once categorized as 'ghetto' and 'flamboyant' are now coined as high-end fashion and have become a billion-dollar businesses.

The Violences We are Forced to Bear: How Gender Impacts Experiences of Criminalized Im/migration in the films The Pirogue and Borders

Presenter's Name: Jayden Mcclam
Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Oral Presentation
Faculty Advisor: Anita Plummer
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What is legal is not always what is ethical; for centuries, the law has been wielded to maintain oppressive hierarchies. This essay explores the films The Pirogue (2012) by Moussa Touré and Borders (2002) by Mostefa Djadjam and examines the consequences of European nations criminalizing African people im/migrating into the continent. The characters' experiences convey the psychological impacts of transnational migration: the films position the decision to leave one's home as a form of dislocation, display the arduous and gendered journey overseas, and finally show migrants' harrowing encounters with militarized borders upon arrival at their destinations. Notably, gender socialization affects im/migrants' experiences as they travel from their homes to the former colonial metropoles. The films under study portray men competing for power, oftentimes forcing women into roles of subjugation. As a result of patriarchal socialization the men characters navigate their emotions of uncertainty and grief differently than the women do and consequently, women bear the burden of men's emotional repression. Through the travelers' journeys, the wounds of colonialism are shown bleeding bright red.

A Chemogenomics Database of Rare Diseases Prevalent Predominant in People of African Descent: A Case Study of Crohn's Disease

Presenter's Name: Rebecca Mengue Ngoua
Classification: Professional Student
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Coauthors: Chibuzo Obi, Kodilorah Okoye, Anita Richter, Sade Thesier, Adanze Onwuliri, Chanae Brown, Nkemjika Okany

In United States, a rare disease is defined when it affects fewer than 200,000 Americans at any given time. Fewer medical researchers and pharmaceutical companies would dedicate time and resources to discover their causes as well as medications. Recently, we are assembling a chemogenomics database of rare diseases prevalent in people of African descent which was logically built on our prior works. We have identified 103 diseases types so far for this category and collected comprehensive details such as symptoms, inheritance, test and diagnosis, potential treatment options for individual disease type. More importantly, we are transforming our prior database to be of chemogenomics nature by incorporating chemical ligands information to potential targets for rare disease. It will assist 1) determining modes of action of known medication; 2) identifying new drug targets; 3) identifying genes in biological pathway. Herein, we report a most recent case study of Crohn's disease which is a type of ulcerations formed in the small and large intestines. The prevalence of Crohn's Disease in African Americans has been attributed to a variety of reasons but the core being genetic composition. Our ongoing effort was aimed to gather chemogenomics information on the causes of this disease and the potential medications, e.g. thiazolylaminomannosides as potent antiadhesives of type 1 piliated Escherichia coli isolated from Crohn's disease patients. These types of information will be instrumental in providing pharmacy professionals and other stakeholders in the healthcare business with information on how to treat and manage this disease.

How Queer Folks Contributed to the Black Panther Party

Presenter's Name: Carrie Morris
Classification: Graduate Student
School/College: Graduate School
Presentation Type: Poster Presentation
Faculty Advisor: Carolyn Byerly
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The Black Panther party practiced militant self-defense for marginalized communities against the U.S. government. The Black Panther party has a long history of leading and driving liberation movements. The party pushed for socialism through education and mass organizing. Many of the parties ideology and mission centered around the divestment of capitalism. The party is comprised of mostly women, which is opposite of the parities primary known leadership. There is a gap in how LGBTQ members of the party were represented and how their experience in the party differed from heterosexual members. This research will illustrate the lack of visibility around how LGBTQ communities were a part of the Black panther party and also how LGBTQ folks acted as comrades in the fight for liberation with the panthers. It is vital for this research to detail how queer panthers were instrumental in upholding and progressing the party. The results of the content analysis display that there were many members who did identify as Queer whether or not they were publicly out or not. This analysis shows that though the party did have members who were queer, they practiced homophobic discourse that prevented members from embracing their intersections of identity.

Viral Violence: The Effects of Viral Tragedy and Trauma on American Blacks' Mental Health Born Between 1995-1999

Presenter's Name: Jessica O'Donnell
Classification: Undergraduate Student
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Presentation Type: Oral Presentation
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This paper examines the correlation between consuming traumatic media and mental health. The researcher hypothesizes that there will be a strong correlation between people who have greater exposure to traumatic media and self-reported negative effects on their mental health. American Blacks born between 1995 and 1999 are the ideal demographic to study because of a few unique factors: police brutality and natural disasters. Fifty-four percent of Black youth report that they or someone they know was harassed by or experienced

violence from the police, compared to thirty-three percent of white youth and twenty-five percent of Latinx youth. Further, Black Americans exhibited a greater likelihood of meeting criteria for PTSD in the aftermath of a hurricane compared to whites and Latinos. This research provides existing literature concerning the influence of mass media and how tragedy impacts our psyches. Previous studies have found that mass media can greatly influence our lives – from decision making to opinions. Similarly, researchers have analyzed the lasting impact tragedy has on the human psyche. This research asks: how does this translate if the tragedy occurs virtually? The researcher distributed online surveys with questions pertaining to the hypothesis. Preliminary findings show that a correlation exists between viewership and negative mental health effects.

Ballet as a Political Vehicle in Russia
Presenter's Name: India Peterson
Classification: Undergraduate Student
School/College: Business
Presentation Type: Oral Presentation
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The art of ballet was a widespread European phenomenon that first took off during the 17th century. Many German, Italian, and French artists took time to develop its aesthetic and perfect its technique. Ballet was considered a fine art form and famous choreographers from all over the western world spread their art all the way to Russia, where ballet would begin to transform into a cultural phenomenon. Russian composers and choreographers began to take the principles developed by their foreign mentors and develop a type of ballet that was distinctly Russian. Ballet soon became an intricate part of Russian culture and eventually, political propaganda. Major Russian ballet theaters like the Bolshoi began to put on shows and tour around the world performing ballets, like Swan Lake, that incorporated hidden messages about the struggle between the communist and the capitalist agenda. The Soviet Union used ballet as a tool for cultural exchange, spreading their message all across Europe. Tchaikovsky's adaptations were not the only popular ballets of the Cold War Era, however, and choreographers like Leonid Yacobson produced shows that incorporated messages in direct opposition of the Soviet Union. For more than forty years the Cold War raged on and it was a war not fought with military campaigns, but political ones. Ballet, once an art form exclusively accessible to aristocrats, became a medium to communicate to the average Russian citizen through, making it the ideal political vehicle in the Soviet era.

Georgia Douglas Johnson and Eva B. Dykes: An Integrative Archive of the American-African in 20th Century America
Presenter's Name: Catherine Saunders
Classification: Graduate Student
School/College: Arts & Sciences
Presentation Type: Oral Presentation
Faculty Advisor: Dana Williams
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My project examines the scholarly lives and literary ambitions of Georgia Douglas Johnson and Eva B. Dykes as portraits of the early African in America. Though Dykes was a scholar and Johnson a creative, both navigated lives rooted in a humanistic approach to civil rights and racial inclusion. I call this "humanistic approach" an integrative ideology. Dykes and Johnson, both contest and illustrate an integrative ideology. As archived through Dykes's book The Negro In English Romantic Thought: Or A Study Of Sympathy For The Oppressed, and Johnson's poetry, notably her first collection The Heart of A Woman, which, though employing a different genre, also integrates the hegemonic Romantic Period and style with black female influence. I consider how their integrative ideologies delineate how America archives the displaced African's approach to an American identity; specifically, while pioneers of black female possibility, my presentation considers the ways Douglas, as an early black female playwright and Johnson, as a pioneer black female scholar, reveal integration as a restricted resource or a dead-end street, their archives painting an early portrait of a nuanced integrative ideology, author Toni Morrison named the American-African.

Too light or too Black?: A study on colorism in social media through the lens of Black women at Howard University
Presenter's Name: Fatou Sow
Classification: Undergraduate Student
School/College: Communications
Presentation Type: Oral Presentation
Faculty Advisor: Kehbuma Langmia
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Beauty is a combination of qualities, such as shape, color, or form, that pleases the aesthetic senses, especially the sight. Human beings naturally encompass an ideal image of what they want to look like or what they imagine looking like. With various media outlets and access to social media sites, beauty is portrayed in multiple forms. However, for many, beauty is skin deep and being born with a specific skin complexion can determine the effects of self-perception. Colorism is part of the everyday reality of Black women (Saraswati, 2012). This study seeks to determine if colorism within social media effects Black women ages 18-22 on the campus of Howard University. Colorism is directly displayed on social media sites, such as Twitter and Instagram, in online advertisements, in song lyrics, and various literature. There are serious problems amongst Black communities and one of those is self-perception of beauty. The bigger issue at hand

addressed by this paper is the set ideal standard of beauty which stems from racism, white supremacy, and what is of access to media. The present study will investigate colorism in social media through the experiences that young adult, Black women have had and communicative expressions on Black skin complexion.

The Deconstruction of Pygmalion
Presenter's Name: Janelle Williams
Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Oral Presentation
Faculty Advisor: Byron Jackson
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Women in many civilizations have been overpowered by the dominant class: men. This structure has permeated through the ages of civilization and has been but recently under the scrutiny of change. This structure will be analyzed by extracting key elements from "Pygmalion" found within Metamorphoses, an epic poem composed by Ovid. Ovid was a Roman poet during the Augustan Age–whose work was quite influential to classical artists and classicists, historically and within modern times. Ovid is best known for his gently worded retellings of Greco-Roman mythology with the use of sympathetic elements in his writings, consequently, garnering a sympathetic appeal. As sympathetic as Ovid has deemed himself to be for the human condition, he has depicted the human condition quite notably in regard to its nature and the constructs and constraints that it is bound to. In respects to the universality of classical texts and the themes in which they speak to, Ovid's "Pygmalion" is a perspective embedded into a myth that reigns relative to society in regard to women and the idea of the "favored" or "constructed" woman. This essay will dissect or 'deconstruct' Ovid's "Pygmalion" to survey the paradigm of women within a male dominant society, thus examining the social and political expectations of women in the ancient world.

The Conflation of Ethnocentricity and Moral Objectivism
Presenter's Name: Quinn Williamson
Classification: Undergraduate Student
School/College: Arts & Sciences
Presentation Type: Oral Presentation
Faculty Advisor: Assya Pascalev
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In recent years, people have become more conscious of their sociopolitical identities and this, in turn, has increased sensitivity around the projection of one's internal categorization system onto others. The trend of political correctness has (rightfully) caused people to check potentially ethnocentric behavior. Hypersensitivity around such behavior has led to more and people's moral codes falling in line with ethical relativism, as opposed to moral objectivism often due to a belief that moral objectivism tends towards a certain cultural dynamic (Eurocentric). This research argues that it is not only paradoxical to subscribe to the theory of ethical relativism as opposed to moral objectivism, but it is counterintuitive for the purpose of progressivism. This is to say that moral objectivism, which definitely has the potential to be ethnocentric, is not always and, in actuality, is preferable to ethical relativism for the purpose of human progress because it is (1) sensitive to cultural relativism, (2) takes into consideration all social constructs, (3) defends progress through generality, and (4) defends against hierarchies within morality. My goal is not to outline a comprehensive normative ethical theory that confronts all the problems that arise in ethical relativism or fallows all precepts set forth by the moral objectivism I describe, although, based on my discussion, a derivative ethical theory may become clear. I simply mean to explain how moral objectivism defeats claims of ethnocentricity and rather how ethical relativism fails as a framework for progressivism.

Collections & Connections: Reading the Archive of Africana Literature at the MSRC
Presenter's Name: Forrest Yerman
Classification: Graduate Student
School/College: Graduate School
Presentation Type: Oral Presentation
Faculty Advisor: Dana Williams
Faculty Advisor's email: d_williams@howard.edu

Coauthors: Jimisha Relerford, Cecily Duffie

This presentation emerged from a Spring 2019 graduate course taught by Dr. Dana Williams, in which the panelists have researched lesser-known pioneers in black literary studies. The course has prompted us to grapple with questions related to the "ethnic archive," especially as it relates to Africana literature in the United States and across the diaspora. How does the ethnic archive compel us to reconsider archival methodology? What does the ethnic archive teach us about the historical, cultural, collegial, and material contexts out of which black literary studies emerge? Our answers have been informed by close examination of the collections of notable early to mid-twentieth century black literary figures whose records are held in the Moorland-Spingarn Research Center: Charles Eaton Burch, Benjamin Brawley, Eva B. Dykes, Georgia Douglas Johnson, and Arthur P. Davis. This panel presents our insights into what these collections reveal about the ethnic archive and the historical record of black literary studies. Forrest Yerman traces connections to the Appalachian region found in the collections, which inform his theorizing of Washington, DC as an Appalachian/Affrilachian place. Cecily Duffie discusses the role of misogynoir in both the lives and archived collections of Dykes and Johnson, focusing on the gaps that silence their experiences of racialized and gendered discrimination. Jimisha Relerford discusses the ways in which the collections complicate accepted genealogies of African American literary criticism in the early 20th century. This panel aims to present new perspectives on pioneering literary figures and on the archive of Africana literature.

Physical Sciences & Engineering

Theoretical Characterization of Ligated Copper Clusters

Presenter's Name: Adebola Adeagbo
Classification: Undergraduate Student
School/College: Engineering, Architecture & Computer Sciences
Presentation Type: Poster Presentation
Faculty Advisor: Andre Clayborne
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Coauthors: Arianna Boyd

Organic ligand-protected metal nanoparticles have attracted extensively attention owing to their atomically precise composition, determined atom-packing structure and the fascinating properties and promising applications. While most research has been focused on thiol-stabilized gold and silver nanoclusters, copper nanoparticles are gaining interest due to promise as electrocatalysts, electrochemical sensors, and their ability to restrict the growth of bacteria. Here, density functional theory calculations (DFT) at the PBE level are used to elucidate the properties for a series of ligated copper clusters. Investigations on Cu4(PNC13H11)4, Cu6(SC7H4NO)6), and Cu25(SH)18 illustrate the importance of the metal core size and ligand composition on the geometry and optical properties. Results suggest that depending upon the ligand coordination to the copper metal core, the symmetry can become distorted which causes a shift in the electronic energy levels. A detailed structural analysis of the Cu4 cluster revealed that by changing the ligand from -PHNHCH to -SNHCH the Cu-Cu bond lengths decrease. Interestingly, the electronic gap, that is the gap between the highest occupied molecular orbital and lowest unoccupied molecular orbital, increases as the ligand size decreases. Additionally, as cluster core size increases, the electronic gap also decreases ranging from 0.05 eV to 1.75 eV. Investigations on the UV-Vis absorption spectra show similar trends for all ligated copper clusters.

Influence of Functionalized Carbon Nanofibers on the Electrochemical Performance of LiFePO4 Cathode for Li-ion Batteries

Presenter's Name: Adewale Adepoju
Classification: Graduate Student
School/College: Graduate School
Presentation Type: Oral Presentation
Faculty Advisor: Quinton Williams
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LiFePO4 offers exciting possibilities as a cathode material for Li-ion batteries because of its high practical capacity (160mAh/g), excellent structural stability, nontoxicity, and inexpensive resources. However, its poor electronic conductivity is a major challenge for commercialization. Although different techniques have been developed to address this problem, we approach this challenge by incorporating carbon nanofibers (CNFs) as conductive additives in the LiFePO4 cathode material. The CNFs were treated with HNO3 to help activate the oxygen functional groups for better chemical bonding to LiFePO4 particles. A comparative study of the effect of the functionalized CNFs and pristine CNFs was carried out. Electrochemical testing showed the LiFePO4 with functionalized CNFs exhibited excellent rate capability performance up to 20C and enhanced cycling stability over 50 cycles at 1C.

Characterization of Functionalized Graphene Nanoplatelets using Scanning Electron Microscopy and Raman Spectroscopy

Presenter's Name: Iman Ahmed
Classification: Undergraduate Student
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Presentation Type: Oral Presentation
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Coauthors: Prabhakar Misra, Daniel Casimir, Hawazin Alghamdi, Raul Garcia-Sanchez

The properties of graphene, a 2D crystalline hydrocarbon, have been thoroughly studied and discovered to hold a diverse range of applications in electronics, optics, and chemical sensing. Similarly, functionalized graphene nanoplatelets have exhibited enhanced mechanical, thermal and electrical properties, indicating a potential for diverse applications. This study comparatively analyzes characteristics including morphology and topography obtained by Scanning Electron Microscope (SEM) imagery and Raman spectral features of functionalized graphene nanoplatelets doped with the following elements and compounds in order of largest to smallest aggregate size found (in the Z direction): nitrogen, oxygen, ammonia, carboxyl, fluorocarbon, and argon, respectively, with an aim of better understanding the effect of individual additives on graphene's intrinsic properties.

Investigation of Temperature-Sensitive Nanofluid Gels

Presenter's Name: Mousab Ahmed
Classification: Graduate Student
School/College: Engineering, Architecture & Computer Sciences
Presentation Type: Poster Presentation
Faculty Advisor: Mohsen Mosleh
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Nanofluid gels to be used in lubrication applications have been prepared and experimentally investigated including their uses in manufacturing processes such as incremental

sheet forming (ISF) and deep drawing. The temperature-sensitive gels of nanofluids overcome the particle settlement in typical nanofluids. Nanofluid gels were prepared at room temperature by mixing Cytel alcohol (CA) and increase its concentration percentages in the solvent and adding a different concentration of Sodium Oleate (SO) to the mixture. The gel will form in a different physical and chemical properties. The intermolecular bond as well as the solvatophobic interaction of Sodium Oleate are formed by the noncovalent interactions including hydrogen bonds, ϖ – ϖ stacking, coordination bonds and van der Waals forces among the gelator molecules. These forces can induce the formation of supramolecular aggregates. The supramolecular aggregates are entangled with each other through junction zone to form a three-dimensional networks having lamellar structure which are responsible for the gel. The viscoelastic properties of the surfaces of our gels were investigated using Rheometer and AFM and measurements are carried out with increasing Cytel alcohol and sodium oleate concentrations in a wide range of temperature. The gels have been shown to behave as viscoelastic materials. The rheological measurements indicate that our gels are highly viscoelastic and the storage modulus (G9)increases with an increase of the Sodium Oleate concentration in the mixture (Solvent + Cytel Alcohol). In addition, we used Atomic Force Microscopy (AFM) to provide more surface information about our lubricant gel.

Significance of Remote Observations of the Lunar Sodium Corona

Presenter's Name: Irima Ajang
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School/College: Arts & Sciences
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Through the observations of the Lunar Sodium Corona, the quantification of sodium in the exosphere is expected. Once quantified, analyzation of any potential correlations between information received explains why the data observed is what it is. The programs that are involved in this research are primarily Maxim dl and Image J, which help to calculate the amount of sodium in the lunar corona. Earth and Space weather reports are also involved in this research. The goal of this is to see whether a correlation exists between: various points of information that would affect the amount of sodium in the exosphere, such as photon-stimulated desorption, sputtering, etc,., various points of information that would affect observations, such as seeing and visibility, and the amounts of sodium observed. This increases understanding of the lunar corona.

Thermal Effects Associated with the Raman Spectroscopy of Tin Dioxide

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Metal oxides are useful for the detection and sensing of combustible and toxic gases in air. The present spectroscopic investigation focuses on thin film and powder samples of tin dioxide (SnO2), with an aim to study its physical characteristics at the nanoscale using a Scanning Electron Microscope (SEM) and its vibrational modes using Raman spectroscopy with an inVia confocal Raman Microscope using laser excitation at 514 nm. The tin dioxide samples have been studied with the Raman Microscope in the temperature range 30 - 180 0C and the temperature effects on the primary peaks quantified, together with its impact on the wavenumber and line transition intensities in the Raman spectrum. SEM images have been recorded in order to understand the morphology of the nanoscale particles of SnO2. The physical characterization of the tin dioxide samples, together with their detailed temperature-dependent Raman spectra will be presented.

Adsorption and Separation of CO2 and CH4 Gas Mixture in a Graphene Layer and a Graphite Surface

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The goal of this work is to predict the selective adsorption of CO2 from a mixture with CH4 on a graphene/graphite substrate. The substrate consists on a layer of graphene with slits suspended on top of graphite at a distance of 10 Å. Molecular dynamics was used to simulate this adsorption. In this system, methane is modeled as a single, spherical atom with one Lennard-Jones site. Carbon dioxide is modeled as a linear rigid body with three Lennard-Jones sites and three partial charges. The slits in graphene are made by deleting carbon atoms from the lattice within a region of specified width. Graphite is modeled as a 10-4-3 wall. We run the simulations at 300K and compare the selectivity of CO2/CH4 on the substrate to test the capability of the graphene/graphite to separate CO2 from CH4.The result shows that the selectivity is higher for narrow slits.

Rate Performance of Carbon Nanofiber Anode for Lithium Ion Batteries

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Graphite, the most common electrode for commercial anodes has a low theoretical specific capacity (372 mAh/g) which places serious limitations on rate capability. Carbon nanofiber (CNF) is considered an excellent candidate to overcome these obstacles. In this research, CNF is studied as the main conductive material for Lithium Iron Phosphate battery (LFP) anodes. Additionally, electrochemical properties were investigated when using CNF as an anode material. Our comparison studies show that CNF anodes enhance the rate capability and specific discharge capacity in Lithium iron phosphate (LFP) batteries, when compared to graphite anodes.

Characterization of Bovine Serum Albumin capped Silver Chloride and Silver Phosphate Nanoparticles filled Biodegradable Polymer Composites

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Silver phosphate and silver chloride nanoparticles are potent antimicrobial agents. These nanoparticles are known to disrupt bacterial DNA replication by inactivating membrane proteins due to their enhanced activity. The primary objective of this study is to synthesize the nanoparticles, encapsulate them in a polymer matrix, and characterize both the nanoparticles and the polymer encapsulated nanoparticles. The bioconjugated nanoparticles (AgCl/BSA and Ag3PO4/BSA) were prepared by the precipitation method. The synthesized nanoparticles were characterized by Scanning Electron Microscopy (SEM) and Dynamic Light Scattering (DLS). We established that the synthesized nanoparticles are coated with bovine serum albumin (BSA) which should enhance the biocompatibility of the nanoparticles. The size of spherical AgCl/BSA nanoparticles and Ag3PO4/BSA nanoparticle were found to be approximately 140 nm and 40 nm, respectively. The AgCl/BSA nanoparticles were then incorporated, into poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV) matrix using the water-in-oil emulsion method, to produce polymer encapsulated nanoparticles. The size of the encapsulated AgCl/BSA nanoparticles was found to be approximately 800 nm as established by SEM. The elemental composition of the bare nanoparticles and the PHBV encapsulated AgCl/BSA nanoparticles were determined using SEM-EDX and Atomic Absorption Spectroscopy (AAS) techniques. Results strongly suggest that silver and other constituents of the nanoparticles represent the core of encapsulated nanoparticles while polymer represent the shell of the encapsulated nanoparticles. In our ongoing work, we are evaluating the synthesized nanoparticles for antimicrobial activity and comparing the potency of the various encapsulated nanoparticles for potential biomedical applications.

Analysis of aqueous surface tension change with various mixing ratios and fatty acid chain length from 5°C - 30°C

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Cloud droplet formation depends upon the presence of a surface that will allow water vapor to coalesce and develop into a cloud. These surfaces are called Cloud Condensation Nuclei (CCN) and can be either liquid or solid. Frequently the liquid surface is water, but the solid surface may emanate from anthropogenic pollution or forest fires. Since biomass burning can contribute a significant source of microscopic solid particles, this research will investigate biomass combustion exudates. Specifically, varying concentrations of Succinic and Adipic acids, which are emitted into the atmosphere by vegetation fire emission; along with 50µL and 100 µL concentrations of Benzaldehyde where investigated from temperatures of 5°C - 30°C. Adipic acid had a greater effect lowering surface tension of binary and ternary dicarboxylic acid solutions than Succinic acid. Considering quaternary solutions, 50 µL of Benzaldehyde was the dominant factor in surface tension lowering at 6g/L and 16g/L of Succinic acid and 3g/L and 6g/L of Adipic acid. But, it was not the dominant factor at 3g/L Succinic acid or 16g/L Adipic acid solutions. 100 µL of Benzaldehyde proved to be the dominant surface tension lowering factor at 3g/L and 16g/L of Succinic acid and 6g/L of Adipic acid quaternary solutions. Though, it was not the dominant factor at 6g/L Succinic acid or at 3g/L and 16g/L of Adipic acid quaternary solutions.

Dry Separation of Agro-materials for Enrichment of Proteins at their Native States

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Conventional wet fractionation methods are still widely used in food and pharmaceutical industries to separate agro-materials into their major components (protein, starch and fiber), even though they involve harsh processing conditions of isoelectric precipitation and energy-intensive dehydration step. Our "Bioprocessing Engineering Research Laboratory" has focused on the development of dry and chemical-free separation processes to selectively enrich legumes, cereals and oilseeds in protein through dry fractionation processes of sieving and electrostatic separations. The development of these processes has resulted in the production of protein-rich fractions containing at least twice more protein compared to their original fractions. To selectively enrich proteins in agro-materials, they have been initially suspended inside the fluidized bed by the air stream, before being passed through a tribo-charger tube where they can be charged differently according to the amount and charging behavior of their constituent particles. The charged particles are then being separated in the separation chamber under the influence of gravity and electrostatic forces. The resulting protein-rich separated fractions are then begin analyzed for their protein content through the micro-Kjeldahl method consisted of three main steps of acid digestion, Nesslerization and absorbance determination at 420 nm using a microplate reader.

Reconfigurable graphene-based dual-band rectenna for terahertz energy harvesting

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In recent years, there has been an increasing demand for more efficient energy harvesting solutions than the presently available ones. The concept of rectenna (RECTifying antENNA) devices dates back to the early 1960's with the pioneering work of William C. Brown. Initially proposed for wireless power transmission, it has become an alternative and very efficient way of harvesting electromagnetic radiation and converting it into a direct current. A standard rectenna incorporates an antenna connected with a rectifier (formed by one or more diodes) to convert high-frequency electromagnetic fields to direct current power. Fundamentally, the rectenna is similar to a solar cell in that both require the absorption of photons to generate a direct current. The main problem in a rectenna device is the impedance mismatch between antenna and diode, which limits the total amount of power received by the antenna and delivered to the diode for rectification. A computer-aided design and numerical calculations have been performed to simulate the characteristics of the proposed antenna model. The performance of the antenna is evaluated in terms of reflection coefficient from 0.2 to 1 eV, thus exhibiting a quasi-perfect impedance matching. To date, no efficient THz energy harvester is available to overcome the gap between RF harvesting technology and solar panels. We propose a tunable dual-band graphene-based dipole antenna on silicon substrate for potential use as an EM energy harvester in the THz frequency regime.

Simulating Surface Enhanced Raman Spectroscopy Using COMSOL Multiphysics

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The overall research goal of this proposal is to understand the fundamental plasmonic response of gold and silver nanoparticles (NPs) interacting with proteins, which is critical for disease detection. The current objective is to understand how different variables such as particle size effect the electric field created by SERS, and use this to determine the optimal conditions of the nanoparticle needed in order for the electric field around it to reach peak intensity for the detection of proteins. This will be attained by running numerical simulations using COMSOL Multi physics. These simulations will be created using Electromagnetic Waves, Frequency Domain and periodic boundary conditions, where a background E field will be used to mimic a beam wavelength through the nanoparticle. A parametric sweep can then be used to generate graphs that depict the peak intensity based off of predetermined variables.

Modeling Neon Density Fluctuations in the Lunar Exosphere (A comparison to LACE Data)

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Killen et al. (2018) recently reanalyzed the neon data measured in the Taurus Littrow Valley by LACE experiment during the Apollo 17 mission. During the 2nd and 3rd lunations in 1973 the neon densities followed the typical trend of an exosphere produced by the solar wind in thermal equilibrium with the surface temperature increasing from dusk to dawn. However, in the 4th and 5th lunations the neon measurements were found to decrease from dusk to dawn. Therefore, we used a Monte Carlo model to examine how variability in the solar

wind flux and outgassing from a moonquake would have temporally affected the neon densities. The variable solar wind during the 1973 lunations does not reproduce the LACE measurements. Contrary, to previous studies we find that the Moon's exospheric neon may not be explained solely by a steady state solar source balanced by it loss to photoionization. We discuss the model - data discrepancies and compare with previous results.

Broadband Terahertz Polarizer in the Transmission Mode

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Previous studies have shown cross-polarization control in terahertz metasurfaces via modulation in spectral amplitude and bandwidth by controlling the separation distance of two gaps in a split ring resonator (SRR) via translation along one axis and varying distances of twisted SRR pairs respectively. In this work it is shown that translation of two capacitive gaps of a SRR, made of an ultrathin and highly flexible metamaterial, along two axes (x-to-y or y-to-x) leads to a strong cross-polarized transmission spectra. The noted modulation of both the amplitude and bandwidth is coupled with the increasing asymmetry introduced by the translation of the two capacitive gaps. The SRR structure is composed of planar, 100nm thick aluminum with two capacitive gaps rotated by 90 degrees with respect to each other supported on kapton material and are fabricated using standard optical lithography.

Factors influencing the release of BSA conjugated Ag (Ag/BSA) nanoparticles from nanocomposite hydrogel

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Natural and synthetic polymer based hydrogels have been extensively studied for various medical applications. Nanocomposite hydrogel as wound dressing material that release biocidal nanoparticles can preserve the sterile environment while maintaining physiologically moist environment for enhanced healing. In this regard, we chose chitosan as the matrix to formulate hydrogel because chitosan is biocompatible and has the ability to promote wound healing. The nanocomposite hydrogel was synthesized by incorporating preformed Ag/BSA nanoparticles via chemical reduction method using sodium borohydride, into the chitosan /sodium tripolyphosphate mixture and allowing it to gel. Swelling studies of the nanocomposite showed a strong relationship between wet weight and % of crosslink indicating the network structure of synthesized nanocomposite. We evaluated the various factors (crosslinking density, loading concentration, temperature and pH) that influence the release of nanoparticles from nanocomposite by measuring the silver content in the analyte (upon digestion) by Atomic Absorption Spectroscopy (AAS). The release profile was found to follow a pattern of short initial burst with sustained release over extended time. Preliminary results identified an optimal crosslinking density that correlates to maximal nanoparticles release as well as a strong dependence between loading concentration and nanoparticles release from the nanocomposite hydrogel. Studies are currently underway to evaluate pH and temperature dependence on release of nanoparticles from hydrogel. Findings of the study could have significance in designing stimuli triggered release of nanoparticles from nanocomposite in the site of wound for maintaining sterile environment.

Shewanella Oneidensis MR-1 and Community 31 for Microbial Reduction of Iodate at the Hanford Site

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Radioiodine-129 (I129) from leaking nuclear waste storage tanks is one of the major contaminants of groundwater at the Hanford Site in Washington State. Speciation of I129 in the contaminated groundwater is predominantly as iodate, organo-iodide and iodide. A forthcoming bioremediation solution is to use microbial dissimilatory reduction of iodate to iodide. Shewanella oneidensis MR-1 (S.oneidensis), a strain of bacteria known to reduce silver and uranium, was investigated in this study for its potential to serve as a bioremediation agent against iodate. For this purpose, S.oneidensis was grown in minimal media in the presence of iodate under both aerobic and anaerobic conditions for 24 hours. Iodate speciation was monitored by colorimetric assays with UV Spectrophotometry. Data suggest that S.oneidensis could reduce iodate content in the medium by 30.6% in aerobic conditions, whereas no reduction was observed in anaerobic conditions. Additionally, iodate reduction experiments using a community of bacteria collected from groundwater at the Hanford Site, named Community 31, suggest the presence of local iodate reducing bacteria. Results showed that the community may be capable of reducing iodate by 41.5% aerobically. Reduction was not observed in anaerobic conditions. Preliminary experiments

testing S.oneidensis's reduction capabilities in concert with Community 31 produced average percent iodate reduction of 41.3% in aerobic conditions and 15.0% in anaerobically. Findings from these experiments could lead to the development and design of novel facultative anaerobic bioreactors for the bioremediation of groundwater, soils and sediments.

Investigation of Solar Electron Hysteresis Event in June 2011 as Observed by STEREO-B IMPACT

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After the analysis of the June 4, 2011 Solar Electron event, evidence was found of an unusually coherent time delay between low and high energy particles in a so-called "Hysteresis" event. This Solar Electron event was brought about by a Coronal Mass Ejection, in which significant amounts of plasma, charged particles, and magnetic field are released. The flux of high energy particles rose at the end of the event, instead of rising and falling in correlation with the low and mid energy particles. It is believed that this was caused by Diffusive Shock Acceleration (DSA, a subclass of Fermi Acceleration), which led to low energy electrons and protons to be accelerated over the course of the event. In DSA, charged particles are accelerated due to repeated reflected in a "Magnetic Mirror" which consists of the magnetic inhomogeneities that precede and follow solar shock waves.

Preparation of Pyrrolinones via 3-amino-2-butenamide Dimerization

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Title: Preparation of Pyrrolinones via 3-amino-3-butenamide Dimerization
Author: Ayza Croskey and Jason Matthews

Background: Pyrrolinones are versatile building blocks for molecules with applications ranging from HIV-1 protease inhibitors to anti-malarials and antimicrobials. Their methods of preparation include [3+2] cycloadditions and transition metal catalyzed intermolecular cyclizations that suffer from low availability of starting materials and narrow substrate scope coupled with functional group incompatibility. Previous work in our group centered on the synthesis of 3-amino-2-butenamides for use in the preparation of volatile MOCVD precursors. However, it was recently discovered that 3-amino-2-butenamides readily dimerize in air to produce polysubstituted pyrrolinones thus greatly improving their ease of synthesis and structural diversity. Methods: Polysubstituted pyrrolinones were synthesized via the dimerization of a series of 3-amino-2-butenamides utilizing two methods: an uncatalyzed solventless reaction and an acid-promoted reaction in toluene. 1H and 13C-NMR, FTIR spectroscopy and ESI-MS will be used to characterize the synthesized products. Conclusions: The synthesis of pyrrolinones will be greatly simplified thus allowing for the preparation of chemically diverse scaffolds that can be used to prepare HIV-1 protease inhibitors and anti-microbials.

Development of Web-Based Collaborative Platform for Human Terrain Data Analysis

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Previously, a decision-making system has been developed using machine reasoning algorithm for human terrain data analysis which leads to the determination of social unrest threat level. The decision-making system can update its decision with additional data added to the human terrain database. Also, the decision-making system has the ability to tacking and trend-analysis of predictive variables for continuous monitoring of social status. The objective of this project is to develop a collaborative platform which accommodates data upload from multiple parties, data aggregation and update to a common database, algorithm's access to the database for decision rule generation and trend analysis, and display of the result on the user's browser. This project requires to build a web-server and, after understanding the algorithm and implementation, and testing it in a Python environment, porting and converting the algorithm to the web-server environment. The webpage will be created using HTML, the database will be created with the SQL language, and the connection between the webpage and the database will be made through Apache server by the scripts in PHP language.

Blockchain Technology in Pharmacy: Developing a Public Drug Safety Database

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A blockchain, at its fundamental core, is a time-stamped series of data based on three core principles: decentralization, immutability, and transparency. The science behind the technology is that all users have access to information created, edited and stored, thus creating a high degree of control, autonomy and trust of the data. Having already shown immeasurable value across areas of banking and finance, the technology could yield great potential across medicine, healthcare and pharmacy. In recent years, there have been emerging but promising usages of blockchain in biomedical as well as pharmaceutical fields in the combat of fake medicines, increasing data integrity, healthcare research and the pharmaceutical supply chain. Herein, we report our recent effort of applying blockchain technology to building a public drug safety database. It is aimed to trace active pharmaceutical ingredients during actual manufacturing process, along with other sections of supply chain. The number of deaths related to these issues have been increasing in recent years while there were multiple recalls of antihypertensive drugs by US FDA since late 2018. The unique technical features of blockchain are essential to ensure the transparency and security of pharmaceutical drugs and related products. At this point, we are building the local framework using blockchain technology where real-time data can be made available at the push of a button. It will be expanded in the future to a larger scale in order to exert direct impact on the overall population.

A Survey and Methodology for Internet-of-Things Security Testbed

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With the rise of connected devices in the modern world in the form of the Internet of Things (IoT), the need for security testing becomes more and more prevalent. IoT security is as nascent a field now as computer security was in the 1990s. IoT devices may suffer from a lack of security mechanisms due to resource constraints and economic factors. The current method of vulnerability discovery is reactive in the sense that vulnerabilities are found after the damage has been done to a network by an outside threat actor. In this paper, we introduce a deep reinforcement learning-based approach in the context of IoT network virtualization to enable security assessment. The purpose of this testbed is to enable the sandboxing of the network comprising of IoT edge devices, central cloud, and peer-to-peer networks within the ecosystem, in order to discover and mitigate vulnerabilities. The first few steps toward completing this comprehensive security testing framework for the IoT will be implementing an intrusion detection system along with a graph learning algorithm.

Temperature-Dependent Raman Spectroscopy of Graphene and Graphene Nanoplatelets

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Graphitic nanomaterials (e.g., graphene, graphene nanoplatelets and carbon nanotubes) serve as attractive integral ingredients for various applications ranging from energy storage, toxic gas sensing and flexible electronics, because of their lightweight, mechanical rigidity and high electrical and thermal conductivities. The present research focuses on investigating the effects of temperature on the line intensities and positions of the Raman bands of graphene and graphene nanoplatelets (GNPs) utilizing Raman spectroscopy. A Renishaw inVia Raman microscope using the 514 nm laser excitation was used to carry out the spectral measurements over the temperature range 27 – 200 °C. The morphology of the GNPs was also documented using a Scanning Electron Microscope (SEM). We will present our SEM results and the variation in intensities and wavenumber shifts of the prominent Raman bands as a function of temperature, which in turn will shed light on the thermal conductivity and related characteristics of graphene and graphene nanoplatelets and their promise for a wide array of laser spectroscopy applications.

Direct observation of fouling behaviors in cross-flow membrane system and anti- fouling strategy development

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The US Department of Energy is currently engaged in the cleanup of one of the largest plutonium production sites in the US, the Hanford Site, located in Richland, WA. Remediation of wastes stored at the Hanford Site will involve crossflow filtration to separate the tank waste solids from waste liquids. Currently, efficient separation of the wastes is hindered by fouling of the membrane by the waste solids. The current study seeks to improve knowledge of cross-flow filter fouling by coupling permeate production rate measurements with direct imaging of solids accumulation on the filter surface during crossflow filtration of a simple waste simulant. The overall goal of the project is to determine the fouling

mechanisms so that effective fouling reduction and membrane cleaning strategies can be implemented. Specific tasks related to this goal include: a) Evaluate the factors (i.e., solution chemistry, particle properties) governing inorganic fouling. A novel microscopic approach will be employed to monitor the particle –membrane coverage in real time. b) Examine the effects of operating parameters on long –term membrane fouling performance during high-level tank waste filtration. Typical operating parameters on long-term fouling and flux decline (crossflow velocity, operating pressure, filtration time) will be investigated. The obtained results showed that different axial velocity and scoring operation can affect on membrane fouling. Furthermore, scouring operations usually increase the filter flux after each experiment. In the same way, the bead coverage increases with time, and the increase of bead coverage is co-related to the decrease of filter flux.

Validated Numerical Modeling of Wire Rope Isolators under Dynamic Excitations: Nonlinear Finite Element Analysis

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Wire rope isolators (WRIs) are made of stainless steel wires which are twisted to turn into a cable that is mounted between two bars. Varying the global dimensions of the WRIs, the number of rings, and the angle of mounting results in different responses under a given dynamic excitation. However, under dynamic excitations, WRIs experience highly nonlinear geometric behavior because of their global shape and intertwined friction between individual wires and strands. In this study, a numerical model is constructed and developed to capture the effective dynamic properties of WRIs in different working modes under tensile, compressive, and shear/roll excitations employing nonlinear finite element analysis. The objective of this research is divided into three parts: 1) to validate the numerical model using experimental results of dynamic simulations to obtain effective dynamic properties of different types of WRIs. 2) To define modeling parameters for the application of the Bouc-Wen model to capture the force-displacement relationships of WRIs without the need of running expensive laboratory tests. 3) To model a seismic protection platform containing inclined WRIs in order to control the undesirable rocking phenomenon in seismic protection platforms. The preliminary results show that implementing one-dimensional beam element to model WRIs not only reduces the computational costs corresponding to considering friction between individual wires and strands, but also gives results that are in good agreement with available laboratory tests for different amplitudes (3 mm, 6 mm, and 12 mm) and frequencies (1 Hz, 10 Hz, and 100 Hz) in tension, compression, and shear/roll.

Dust Density, Measured by Cassini's Radio Spectrum Analyzer

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Saturn's sixth-discovered ring, the F-Ring, is composed of several narrow rings; its bends and bright clumps creates an illusion of a braided appearance. Enceladus, Saturn's moon, has an ice-covered ocean with an ejection plume at the south region, where internal gas and dust erupt through cracks in the ice. Data from the Cassini mission was used to explore the dust densities and dust impact rates during the F-Ring and Enceladus passes that were measured by the Radio and Plasma Wave Science (RPWS) instrument. When dust struck the Cassini spacecraft during the Saturn ring flybys, the particles experienced impact ionization and created a radially outward expanding plasma cloud due to the high velocity of both the spacecraft and particles. The plasma cloud created a pulse of electric pressure that was measured by the RPWS electric field antennas. The amplitude of voltage is directly related to the mass of the particle. Using the Cassini Spectrogram Plotter, the F-Ring and Enceladus passes are observed, where dust impacts peaked. Using a C++ program that I built, the dust densities and dust impact rates are calculated based on an algorithm in Wang et al (2006). The dust impact rates are derived from the power spectral densities (PSD). Lastly, the work is compared to other published works for calibration of our new algorithm. These efforts will help further investigate the dust density and dust impact rate observations from the Cassini mission, specifically the F-Ring and Enceladus flybys. The Cassini mission is important because it has expanded our understanding of how planetary systems form and what conditions might lead to habitats for life. Specifically, future missions have have been proposed by GSFC and this helps define requirements for plume chemical analysis.

Evidence of transition between Heisenberg and Ising-like phases in mesoscale Ge:Mn spin glass

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The glassy dynamics of vector spin glasses in presence of a weak uniaxial anisotropy has been a subject of longstanding controversy. It has been predicted that in presence of such anisotropy Heisenberg-like spin glass system first undergoes longitudinal moment freezing, followed by a transverse moment freezing at even lower temperature. Evidence of such phase transition is seen in the temperature chaos experiments in thin film Ge:Mn spin glass. In these experiments, the sample temperature is increased from the quench tempera-

ture after the correlation length has reached its thickness. For large enough positive change of temperatures the maximum barrier height increases monotonically, which is consistent with a phase change of lower temperature Heisenberg-like phase to higher temperature Ising-like phase.

A Casual and Long-term Partnership Disease Model for HIV and HSV-2

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Population models for sexually transmitted diseases are typically based on a model that is better suited for measles or the flu by including only a zero-length partnership. We overcome this weakness by developing a population model that can account for the possibilities of an infection from either a casual sexual partner or a longtime partner. The model allows for multiple long-term partnerships, which adds the advantage that network models have, the means to include serially monogamous and concurrent relationships. Unlike pair formation models, this model can capture the effect of concurrency with moment closure methods and can easily be further diversified by including heterogeneous subpopulations, e.g. populations divided by sexual behavior and other characteristics. With this model we can define a measure both medical personnel and scientists need, the reproduction number, that is, the average number of new infections one infected person generates over the course of the infectious period. We develop a model for sexually transmitted diseases with long-term partnerships using a SI (Susceptible-Infected) population model with differential infectivity, i.e. infection stages with different infectiousness levels. Results include systems of equations for a homogeneous group (no sexual behavior differentiation) and a heterogeneous group (includes sexual behavior differentiation into two populations), along with the accompanying reproduction numbers, and numerical simulations using HIV and HSV-2 data.

Anisotropic dependency of tensile properties of hexagonal boron nitride to strain rate and temperature: an atomistic simulations study

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Hexagonal boron nitride (hBN) is the most stable crystalline form of the bulk boron nitride that has recently found increasing applications in diverse fields, particularly the design and fabrication of advanced, multifunctional, high-performance materials. True success in utilizing hBN and its remarkable properties requires a deep understanding of the atomistic mechanisms governing its properties (e.g. mechanical or thermal) and the effect of environmental and operating conditions (e.g. temperature and mechanical loads) on its behavior. This paper reports a study on the influence of temperature and strain rate (loading speed) on the tensile properties (i.e. elastic modulus, failure stress and failure strain) of hBN using a large set of molecular dynamics simulations. Accurate computational models of hBN are created and stretched in the both of its chief directions (i.e. armchair (AC) and zigzag (ZZ)) to consider its anisotropy. Two strain rates of 0.1/ns and 1/ns are applied at different temperatures in the range 100 K to 300 K. Results indicate a direction-dependent influence of temperature on the tensile properties of hBN; while increasing the temperature from 100 K to 300 K results in similar reductions of approximately 7% in its elastic modulus in both AC and ZZ directions, its stresses and strains at failure in the AC and ZZ directions experience 3% and 5% and 31% and 35%, respectively. The results also show that hBN exhibits a strong strain-rate-dependency in its tensile response only in the ZZ direction.

Towards Understanding How Technology Can Affect Mental Health Needs of Natural Haired Black Women

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Historically, the world has told Black women with textured hair that their kinks and curls are not "good enough." Those negative perceptions are starting to change yet Black women can benefit from space that provides esthetic validation and exchange of hair care and health solutions. To address self-care needs, Black women need safe space to give and receive advice. YouTube tutorials on natural hair provide social support for Black women lacking proficiencies in caring for their own hair. Over the last 10 years, the Internet has transformed the way Black women create safe space to interact around affirming Black esthetics and hair care (Byrd & Tharps, 2014). This paper examines the scope and mental health impact of Black hair from an technological perspective. Origins of conflicting rates and prevalences are explained in terms of varying methodology. Risk factors for victimization, including age, race, gender, and disability, are also outlined, and derived from both national and geographically limited U.S.-based studies. Finally, mental health outcomes of self esteem are documented, with conclusions drawing on both national and regionally specific studies. These outcomes focus on posttraumatic stress disorder, but also include depression, abuse, and panic.

Quantitative analysis of ferric ion reduction by Shewanella oneidensis MR-1 bacteria

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The groundwater of industrial sites like Hanford, WA, which has a connection with surface water bodies, are being contaminated with numerous inorganic and organic chemical species. Among those contaminants' hexavalent chromium (Cr (VI)), nitrate (NO3-), carbon tetrachloride (CCl4), and tri-chloroethylene (C2HCl3) have detrimental impacts on the environment, ecology, as well as human health. These contaminants can be reduced to nontoxic or less toxic species by applying zerovalent iron (ZVI) and/or ferrous (Fe2+) ion. Since through this process, ZVI and Fe2+ are also oxidized to ferric (Fe3+) state, and Fe3+ has no ability to reduce the contaminants further, the whole remediation process terminates. But, metal-reducing bacteria, Shewanella oneidensis MR-1, regenerate Fe2+ by reducing Fe3+ with the help of an organic electron donor such as sodium lactate in an appropriate bacterial media. Thus, the remediation process continues in a cyclic order. This poster presents the extent and kinetics of Fe3+ reduction by Shewanella oneidensis MR-1 bacteria. The reduction was initially fast up to 10 hours and approximately 70% conversion happened in this period; no significant reduction took place between 10 hours and seven days. It was also observed the amount of Fe2+ rose with the increase of initial concentration Fe3+ while electron donor and amount of media remained the same. Keywords: Groundwater, remediation, ferrous ion, ferric ion, kinetics

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Extraction, Isolation, and Characterization of Phage Cactojaque from Environmental Sample

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School/College: Arts & Sciences
Presentation Type: Poster Presentation
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Bacteriophages also knew as "phages" are the most abundant organisms in the biosphere and very host-specific viruses that infect and replicate within bacteria. Discovery of these phages has been of interest for the advancement of medicine as tools to understand fundamental molecular biology, as sources of diagnostic, and as novel therapeutic agents. Unraveling the biology of phages and their relationship with their hosts is key to understanding microbial systems, and their exploitation. The goal of this research is to discover, purify, isolate, and characterize a bacteriophage that infects *Mycobacterium smegmatis* mc2 155. The purified and isolated phage, Cactojaque, was discovered from an enriched soil culture extracted from Howard University's campus near the Health Science Library. Cactojaque was determined to be lytic phage using the spot assay. The lytic Mycobacteriophage Cactojaque was purified through a series of serial dilution and medium/high titer lysates (MTL/ HTL) harvested with titer 2.3 × 108 pfu/ml for further study. Total genomic DNA was isolated with a concentration of 227 ng/µL followed by restriction enzyme digest and gel electrophoresis before sequencing for annotation. It was determined that Cactojaque was 154,918 nucleotides long was a part of the C1 cluster. Cactojaque has been annotated at Howard University using PECAAN and DNA Master.

Effects of Dy and Fe ions on Misfit-layered Calcium Cobaltite as a promising thermoelectric material for high temperature application

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A series of Dy and Fe co-doped Calcium cobalt oxide (Ca3-xDyxCo4-yFeyO9) samples was fabricated using the sol-gel reaction. The powder sample was pressed using a pressure of 1Gpa for 10 minutes at room temperature. X-ray diffraction (XRD) and Scanning Electron Microscope (SEM) was used to characterize the samples. The XRD analysis showed a shift towards lower 2®angle, indicating the substitution of Dy3+ and Fe2+/Fe3+ for Ca2+ and Co3+/Co4+ respectively. SEM analysis shows a decrease in carrier concentration due to the substitution of Dy3+ for Ca2+ . This helps improve the thermopower. The substitution of both Dy3+ and Ca2+ contributed in decrease in the phonon scattering, hence a decrease in lattice contribution leading to a decrease in thermal conductivity, which is desired of a thermoelectric (TE) material. For the doped samples, the electrical resistivity (®) decreased over the range of the measured temperature but shows metallic-like behavior above 800oC, while the base sample show a metallic behavior at 400oC and above 700oC. Seebeck coefficient (S) increased over the measured temperature, except for the case where Dy = 0.5, where there is a decrease in S as a function of temperature. For all the investigated samples, those with single phase (x = 0, y = 0; x = 0.05, y = 0.05; x = 0.1, y = 0.05; x = 0.3, y = 0.2) has a low ®as desired for a TE material.

Gas Traps In The Martian Regolith

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Studies on Mars taken by the Curiosity Rover indicate seasonal methane variability in the martian atmosphere. These changes happen rapidly and in order for this phenomena to occur, Mars would have to be abruptly releasing methane into the atmosphere from its subsurface. Under Mars-like conditions, we have simulated the formation of gas impermeable caps in the shallow sub surfaces of Mars-like soil (JSC-1A). Briny water mixed which is mixed into the JSC-1A migrates to the top of the sample as pressures decrease. After evaporation or sublimation occurs, a thin layer of salt is left causing cementation of the first few centimeters of soil, creating a cap. We tested a hypothesis that these soil salt caps can trap gasses such as methane beneath them. We injected Neon underneath our samples and measured the pressure differentials above and beneath the sample to determine the permeability of neon through the salt soil caps. We found that different ratios of MgCl, water, and JSC-1A were capable of creating a gas impermeable salt caps at various temperatures that could withstand an excess of 5 mbars of pressure beneath them. We also found that seals can be created using NaCl, as well as in wet soil with no salt present at all, each showing similar holding strengths. Our results suggest the formation of salt soil caps could be a widespread phenomena on Mars in shallow subsurface areas with an abundance of salt and shallow permafrost.

Selective Enrichment of Oat Protein for Food and Pharmaceutical Applications by an Electrostatic Separation Technology

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Oat proteins are currently being used in production of different food and pharmaceutical products. The conventional plant protein separation processes have many imperfections such as ineffective consumption of water and energy as well as loss of solubility and native functionality of the separated proteins. The combination of sieving and tribo-electrostatic separation techniques was developed by our research team to separate oat protein in a dry and chemical-free environment. First, oat flour was sieved at sieve aperture size of 106μm. Resultantly, the starch-rich fraction with 10.1% protein and the bran-rich fraction with 17.1% protein were obtained. The starch-rich fraction was further used as a starting material for the tribo-electrostatic separation step. The tribo-electrostatic separation system consisted of air cylinder, fluidized bed vessel, tribo-charging tube and separation chamber with one negative and one positive electrode plates. The concept of tribo-electrostatic separation relies on different charging characteristics of constituent compounds. This is achieved by passing cereal flours through the charging tube and subsequently separating the flour constituent particles in the fractionation chamber based on their acquired charges. The influences of important process parameters such as air flow rate and plate voltage were systematically studied. We found relatively high separation performances at turbulent air flow regime and low plate voltage. After successful optimization of the process parameters, the protein content of the starch-rich fraction was increased from 10.1% to 16.2%, equivalent to protein separation efficiency of 54.5%.

Development of Palladium-catalyzed dicobalt octacarbonyl-mediated carbonylation reaction

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Carbonylation of carbon-halogen bonds constitutes a common route for the synthesis of carbonyl derivatives such as carboxylic acids. The advent of transition metal catalysis has improved the substrate scope of this transformation. Generally, the carbonylation protocol requires the use of forcing conditions, such as, high temperature, high pressure of carbon monoxide (CO) and requires specialized instrumentation, such as an autoclave. Such requirements are not conducive for large scale synthesis of carbonyl derivatives. We have developed a synthetic route that utilizes dicobalt octacarbonyl [Co2(CO)8] as a source of CO. These Co2(CO)8-mediated reactions do not require high CO pressure, can be applied to a wide array of carbo- and heterocyclic substrates, and furnish the desired products in good to excellent yields. Our versatile protocol can be applied to the synthesis of a variety of carbonyl derivatives, such as, aldehydes, carboxylic acids, amides, hydrazides, and hydroxamic acids. Interestingly, Pd-catalyzed Co2(CO)8-mediated carbonylation protocol can be extended to heterocyclic substrates such as benzoxazole. This three-component coupling accomplishes C-H activation, carbonylation, and C-C coupling in one pot, leading

to the corresponding biarylketones. Our optimization efforts, substrate scope, and mechanistic rationale will be discussed

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On Geometric Optics Problem involving Refraction

Presenter's Name: Henok Mawi
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In this talk we will discuss a numerical algorithm used to approximate a solution to a problem in geometric optics which involves refraction. The problem deals with determining an interface, between two media of propagation of light, that is capable of refracting a light beam from a source, in medium I, with a given illumination intensity into a prescribed intensity distribution on a target located in medium II. First, we will present a a mathematical model to the problem and then introduce a method of iteratively constructing a free-form interface for the problem by using a set of primitive surface elements. This is joint work with Roberto De Leo (Howard University) and Cristian Gutierrez (Temple University).

Investigation of proton radiation damage effects on the mechanical and chemical properties of 3D printed acrylonitrile butadiene styrene for in-space manufacturing and application purposes

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Protons are the predominant form of ionizing radiation found in space and their energies range from few MeV to 10 GeV. The National Aeronautics and Space Administration (NASA) is developing and researching effective methods for maintaining the logistical needs of space crews during long-term missions and prolonged space flight. NASA recently completed a 4-year study of the effects of 3D printing on acrylonitrile butadiene styrene (ABS) in a low Earth orbit, microgravity space environment. The ability to use 3D printing for in space to manufacture necessary tools and replacement parts is vital in meeting the needs of long-duration spaceflight and extraterrestrial space missions where resupply from Earth is not a viable solution. The purpose of this research is to understand the damage caused by proton radiation on 3D printed ABS and how that radiation damage impacts the ABS mechanical performance. Preliminary data of 3D processed, unirradiated ABS specimens shows that print parameters have a significant impact on the ABS mechanical performance which is consistent with existing literature. Currently, research is being conducted into the ABS filament and 3D processed unirradiated ABS specimens to establish the chemical composition of control specimens so that the results can be compared to the irradiated specimens for evaluating the proton damage effects on 3D printed parts.

Exploiting Real Time Simulation to Study Load Frequency Control in Distribution Generation Based Power System

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This study aims to analyze the application and importance of real time (RT) simulation systems to perform load frequency control studies for a power system consisting Distributed Generations (DG). New emerging power systems are embedded with renewable energy systems distributed across the network near load centers for supplying loads and improved performance. Power system is designed to operate at reduced loss and minimum cost of operation. However, during different contingencies the network suffers from power imbalance between generation and load leading to system frequency problems. Various methods are performed by researchers to solve frequency stability problems. Most studies are based on offline simulation systems which does not allow real time modeling and simulation of power networks and controls. Various Research universities are working on developing control systems using real RT technologies to analyze the impact of DG integration. This paper which is based on ongoing work at Howard University Center for Energy Systems and Control focuses on:

- Studying the capability of RT simulation, Real Time Digital Simulator (RTDS) for modeling of power systems.
- Modeling different components of network using RTDS for fast and accurate computation of system components.
- Modeling of various contingencies on a network to obtain impact analysis and indices to for system response.

The result will be used to develop controls for power system frequency under different contingencies. The study will be performed on RT platform using RTDS. Benefits of RTDS is evaluated in terms of speed and accuracy of control parameters compared to the classical simulation techniques.

Constructing a Clifford Graph Algebra from a Classical Clifford Algebra of Higher Dimension

Presenter's Name: Timothy Myers
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A geometric (Clifford) graph algebra GA(G) is a useful structure for studying a graph G with n vertices. Such an algebra associates each of its n generators with one vertex in a way that depicts the connectivity of G. We will first construct any Clifford graph algebra by specifying a rule for selecting n generators from the monomials that span a larger Classical Clifford Algebra. We will then refine this construction for the path graph and the complete star graph by choosing as many generators as possible from the bivector subset of the parent Clifford algebra of minimal dimension. Defining new generators with bivectors is helpful because the anti-commutative property for distinct generators is fundamental to any Clifford algebra, and thus yields a tractable representation for GA(G) as a sub-algebra of the parent Clifford algebra. This bivector representation for path and star graphs can also be useful for studying trees, one of the most useful graphs in the field of computer science, which are composed of both.

Brain Bender: Empowering Adolescents Suffering from Chronic Headaches through Affective Computing and Gamification

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Background: Although headaches occur in all ages, children are less likely to be educated on their treatment plan and the importance of medical adherence. By age seven, 40% of children have at least one headache. With the rise of adolescents using technology, a sustainable mode of educating adolescents on their treatment is through technologies incorporating human-computing interactions (HCI). The purpose of the study is to design an application using HCI, specifically gamification, by empowering children to understand and maintain their headache treatment under medical and parental guidance. Method: A systematic review of the world literature provided insight on treatment nonadherence, the current health-related applications, and HCI-related factors pertaining to adolescents. The study tracked the interaction of adolescents (aged 11 to 13) and adults via survey with the app in four categories: happiness, engagement, usability, and effectiveness. Howard University's Affective Biometrics Lab, Children's National Medical Center, and Brain Bender developers were consulted to make the necessary adjustments and increase overall user experience of the app. Results: Our results indicate the paucity of HCI-driven applications geared toward encouraging medical treatment management among adolescents. Based on the data collected from the initial showcase, Brain Bender mobile application design was improved to use implicit and explicit methods to encourage treatment adherence and empower adolescents in self-management. Conclusion: Thus, Brain Bender is a step well on its way to improving medical adherence and empower adolescents. In conclusion, understanding HCI is proving to be effective in producing more adolescent-related medical applications.

Quasiperiodic functions on the plane

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The study of the level sets of Quasiperiodic functions on the plane, in its simpler instance, corresponds geometrically to the study of planar sections of triply periodic surfaces, namely surfaces which are periodic in the X, Y and Z directions. This problem originated in the physics discipline where, in the 1950s, several experiments revealed a complicated dependence of magnetoresistance in metals by the direction of the magnetic field. In the semiclassical model of metals conducibility, energy is a triply periodic function of the electron's momenta so that, under a constant magnetic field, the orbits of quasimomenta are exactly planar sections of a triply periodic surface and their geometry dictates the magnetoresistance behavior. The mathematical study of this theory was started by S.P Novikov and his topological school in the 1980s. They found an unexpectedly rich underlying structure: the topology of the plane section of the level sets of a triply periodic function depends in a fractal way from the direction of the planes. In general there is no hope to find an analytical representation of these fractals and we have to rely on numerical analysis in order to visualize and study them. So far only, a handful of such fractals have been published in literature and all of them have very similar shape. The aim of this project, funded by NSF grant DMS-1832126, is exactly to explore and analyze numerically many more cases with several different geometries, creating finally an extensive panorama of examples of geometrical and physical interest.

Role of self-sugar in host virus binding

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The surface of cells and pathogens is coated with a layer of carbohydrates or glycans. These glycans are either rich in the sugar mannose or have a core of three mannose sugars followed by non-mannose sugars (complex type). In other words, the surface of all cells and pathogens has a core tier of mannose residues. The glycan on pathogens have shown to have primary or secondary targets for recognition of host cells, adhesiveness, adsorption and protection. To be better understand the biological advantages why pathogens and cells are covered with glycan, a force spectroscopy was done by bringing two virus molecules into contact at different rates on an AFM. The results reveal two types of interaction taking place. At higher speed we observed a long-range release and at lower speed, short-range sharp release were observed, respectively. The long-range release is consistent with already reported monolayer of sialic-sialic interactions and the short-range sharp release was also consistent with monolayer mannose-mannose interaction. The results show that at lower rate the AFM probe was able to penetrate onto the mannose core of the virus but was not able to penetrate the atop sialic acid at higher rate. Also, as a control measure, the virus molecule was treated with different types of enzymes to expose the different tiers of sugars present on the glycan shield, and a repeat of the virus-virus interaction was done. The results show a similar pattern of self-sealing force when the mannose core was exposed. and no interaction when

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Bitcoin, Blockchain Technology: Why Cryptocurrencies are Still Secure Assets

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In December 2017, Bitcoin reached its highest value at $17, 900 USD. However, since July 2018 Bitcoin has oscillated between $3,400 USD and $4,500 USD. As a result, many question whether Bitcoin and blockchain technologies are stable currencies. Still, not surprisingly, others point to the theft of Bitcoin from Japan's Coincheck which is estimated to be a loss of 860 million yen as an indication that not only are cryptocurrencies insecure financial instruments but their insecurity contradicts blockchain technologies' premise that, "Its stability is based on its secure cryptographic algorithms." This abstract argues otherwise. First, we describe the nature and origins of Bitcoin, blockchain technology, and cryptocurrency. Second, we examine how Bitcoin initially implemented the Secure Hash Algorithm, SHA-1, as its primary hashing function which was later replaced by SHA-256. We further discuss how SHA-1 is used in digital signatures, most notably the RSA algorithm, which is frequently used in online banking. Next, we suggest new techniques for further strengthening the algorithm as well as outline why the National Institute of Standards and Technologies(NIST) guidelines and practices contribute to a robust secure system. Lastly, we point out how human error and weak passwords are the main causes of data breaches and cryptocurrency theft. We conclude by illustrating how Amazon and AWS are currently implementing blockchain in Jakarta, Indonesia. This presentation makes use of both Fermat and Euler's Theorem, the Euler phi-function: ϕ(n)=(p-1)(q-1) where both p and q and 300 digit primes, binary arithmetic and modular arithmetic.

Heat Analysis of a Cylindrical Sample Cell Using COMSOL Multiphysics Simulation Software for Laser Spectroscopy Applications

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The present study focuses on the heat analysis of a cylindrical container to be used as a sample cell for laser spectroscopy applications. Finite element analysis using the COMSOL Multiphysics modeling and simulation software is performed. Following an initial dimensional study of the container, the values obtained are used to model the external geometry of the cell housing. Material property is then defined, and heat conduction equations are chosen for both stationary and time-dependent modeling and analysis. Initial conditions are specified, and the results obtained provide a temperature profile and solution for further time-dependent analysis. The results of the analysis can be used to determine the thermal state of the heated cell that is used for temperature-dependent spectroscopy experiments involving nanomaterial samples (e.g. carbon nanotubes and graphene). The goal is to be able to determine the temperatures of the different components that make up the heated cell and obtain the electric potential that increases as a function of time and subsequently create a basic model of the environment related to electrical potential and temperature mapping to which the sample is subjected in order to carry out the temperature-dependent spectroscopy experiments on nanomaterials with the Ventacon Heated Cell inside the DXR Raman Spectrometer.

Computational Characterization of Three Multi-Shell Gold Nanoparticles

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Coauthors: Andrew Frojd, Andre Clayborne, Andreas Schnepf

Gold nanoparticles have received interest due to their promise in the detection of biological threats, as drug delivery agents, and as materials for catalysis. In order to employ gold nanoparticles in each of these endeavors, it is critical to understand their structural, electronic, optical, and electrochemical properties. We report on the computational studies using density functional theory of three multi-shell gold nanoparticles, Au25(SMe)18- , Au32[(C3H7)3P]12Cl8 and Au70(PPh3)12S20. Initial computational scaling studies show how computational run time using the GPAW DFT code changes with respect to the size and composition of the nanoparticle. In each system, the Au-Au bonds lengths range from 2.80 Å – 3.02 Å. Based on the electronic structure, Au25 is a superatom complex, while Au70 does not exhibit any superatom character. Interestingly, Au32 is stable but has a Jahn-Teller effect that distorts the geometry and is observed in the electronic shell splitting. Finally, UV-Vis spectra obtained using time-dependent DFT (TDDFT) shows good agreement with experimental results.

Investigating Deep Defects in Cubic Boron Nitride for quantum applications

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The term quantum technologies refers to an emergent field in science that uses counter-intuitive principles from quantum mechanics in different applications. There are numerous physical platforms that are being explored by the researchers for implementing these technologies. A class of defects, called the deep defects in wide bandgap semiconductors, is one such platform. We used first principles approach to investigate various defects in cubic boron nitride and determined their suitability for quantum applications.

Cocrystals Formed by Combining Major Therapeutic Drugs with the Bioavailability Enhancer Piperine

Presenter's Name: David Roberts
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Coauthors: Woldegebriel Yeibyo, Damian Njoku, Raymond Butcher, Chris Cahill, August Ridenour, Jennifer Swift

Cocrystals are a common but little-studied phenomenon in chemistry. Often seen as a nuisance, compounds often crystallize with other substances in the crystal lattice, most commonly water or other solvents. However, large molecules can sometimes form co-crystals together, especially if there are attractive interactions such as hydrogen bonding between the components. Working in Dr. Fortunak's lab at Howard, we have produced a large number of candidate co-crystals from a variety of antiviral and analgesic drugs with piperine, a substance that has been found to increase the bioavailability of many drugs. This is important because it can reduce the dose needed to get a desired effect, thereby reducing both toxic effects of the drug and its cost to the patient. A cocrystal from a drug with piperine is especially desirable since, as a new substance of defined proportions, it may have superior physical properties and stability relative to a simple mixture. Experimentally, co-crystals are prepared most commonly by cooling or evaporating a solution of the two components in a solvent or mixture of solvents, although other methods are sometimes used. To characterize the cocrystals, we use a variety of analytical methods, including thin-layer and high-performance liquid chromatography; nuclear magnetic resonance spectroscopy; powder and single-crystal x-ray diffractometry; thermogravimetric analysis and differential thermal analysis. Preliminary results with powder x-ray diffraction indicate the presence of cocrystals in a number of our samples. We report here the results of these studies.

Finding an Unexpected Product While Seeking a Better Pathway to the Anti-Malaria Drug Artemisinin

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Coauthors: Tai-Yuen Yue

Dihydroartemisinic acid (DHAA) is an important precursor to the manufacture of the malaria wonder drug artemisinin. We are investigating cheaper and more efficient ways conduct this conversion as part of Dr. Fortunak's ongoing program to provide essential medicines more cheaply to those in need.

Artemisinin is obtained from DHAA conducted by first treating DHAA with singlet oxygen, a reactive form of oxygen that can be generated from hydrogen peroxide in the presence of a molybdate catalyst, to produce three hydroperoxides. The major product, a tertiary hydroperoxide, is converted to artemisinin by treatment with strong acid. It was previously reported that a major undesired byproduct of this process is the lactone dihydroepideoxyarteannuin B (DDAB) formed by solvolysis of the tertiary hydroperoxide. Previous studies at Howard found that this lactone can be obtained in high yield by heating the hydroperoxide in a nonpolar solvent like hexane. Attempting to reproduce this result, we obtained a mixture of products which were separated by flash column chromatography. One of these was initially identified as DDAB by its NMR spectrum; however, characterization by gas chromatography-mass spectrometry (GC-MS) indicated that it was not DDAB, but rather deoxyartemisinin, which has an almost identical NMR spectrum to DDAB. This was a surprising result, as there is no obvious mechanism that would yield this product. We report here our further studies of these reactions by GC-MS to fully characterize the intermediates and products and confirm our result.

Optical Properties of Rare-Earth Element Doped-Nanocrystals

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Presentation Type: Poster Presentation
Faculty Advisor: Searles Thomas
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Colloidal Nanocrystals (NCs) are nanometer-sized semiconductors that exhibit technologically relevant optical and magnetic properties due to their strong quantum confinement. Critically, NCs have large optical absorption coefficients, diameter-dependent bandgaps, and high quantum efficiencies, which make them an increasingly attractive material for high-color-purity applications, such as next-generation monitors and light emitting devices. Although not as well explored, the magnetic properties of transition-metal-doped NCs are also scientifically rich, especially since spin-exchange effects can be significantly enhanced due to the quantum-confined carrier wavefunctions. In this work, we explore the optical properties of rare-earth element-doped NCs in differing chemical environments with the aim of studying low-temperature magneto-photoluminescence (PL). Before low-temperature measurements can be made, we performed room-temperature PL and optical absorption measurements on undoped CdSe NCs and Tb-, Sm-, and Eu-doped CdSe NCs in organic solvents. In all cases, strong exciton absorption and emission were observed. When the NCs were transferred to polymer matrices (for low-temperature measurements), measurements clearly showed strain-induced spectral shifts and broadening from the polymer. Several NC films exhibited optical properties that are currently being investigated at low temperatures and high magnetic fields. Our room-temperature characterization work on undoped and doped CdSe NCs represents a significant step forward towards measuring their as-yet unexplored magneto-optical effects.

Transpotrt and fate of CeO2 nanoparticles in saturated sand; Effects of sand grain size distribution

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Production of Cerium oxide nanoparticles (NPs) has increased over the past decade due to its unique application in fuel cell, metal polishing, and automobile exhaust catalyst. The effects of sand grain size on the transport and retention of CeO2 NPs still is unclear. In this study, transport and fate of CeO2 NPs in saturated sand with two different grain size distributions (fine and coarse) under different environmental variables such as ionic strength, pH values, and flow rate were studied. For both fine and coarse sand size, the retention of NPs in the column packed was increased by increasing ionic strength from 1 to 100 mM for all pH values due to reduction in diffuse double layers that causing a reduction in repulsive electrostatic double-layer forces and attractive Van der Waals forces, leading to increased deposition and aggregation. The retention of NPs was increased for both fine and coarse sand size by increasing pH from 3.5 to 6.5, while it was decreased from pH 6.5 to 10. At pH 3.5, CeO2NPs were positively charged and electrostatic repulsion was dominant, resulting in a higher mobility of NPs. At pH 10, higher hydroxide concentration appeared in solution which could change the surface charge of CeO2 NPs to negative charge and repulsion between sand and NPs cause higher mobility of NPs. The retention of NPs in fine sand was higher than coarse sand for all conditions due to the small grain size and higher surface area of the sand, which prevented particle breakthrough.

Atomistic insight into temperature- and strain rate-dependent mechanical properties of graphene

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Molecular dynamics (MD) simulations are carried out in order to investigate the influence of strain rate and temperature on the mechanical properties of graphene. In the simulations, a large set of graphene models are subjected to two tensile strain rates of 0.1/ns and 1/ns along the two principal direc-

tions of graphene, i.e. zigzag (ZZ) and armchair (AC), at different temperatures ranging from 0 to 1500 K. The AIREBO potential is used to describe the interactions among carbon atoms in the models, and the atomistic stresses are calculated using the virial stress (also known as local atomic level stress or total stress) theory. Results indicate that increasing the temperature considerably decreases the stress and strain at failure of graphene in both directions. For a given rise in the temperature, however, more reductions are observed in the strength and failure strain in the ZZ direction. In contrast, both the stress and strain at failure increase at higher strain rates, especially at higher temperatures (> ~500 K). In a parallel research study, the data produced in this study are enriched by considering graphene sheets with different types and concentrations of defects and used to develop predictive models for the mechanical properties of graphene and develop integrated computational materials engineering for polymer composites filled with graphene.

Searching for Ion & Neutral Emissions from the Lunar Atmosphere

Presenter's Name: Ajani Smith-Washington
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Coauthors: Menelaos Sarantos

Recent observations indicate that the lunar exosphere is more particle rich than previously believed, with particle densities ~106 per cubic centimeter. The Apollo 17 Lunar Atmospheric Composition Experiment and ground based telescopes have detected small amounts of He, Ar, Ne, NH3, CH4, CO2, Na, and K in the moon's atmosphere. These results encouraged NASA to launch the LADEE satellite in 2013 equipped with the UVS Spectrometer to, "characterize the lunar exospheric dust environment and measure any spatial and temporal variability and their effects on the lunar atmosphere," as well as, "determine the composition of the lunar atmosphere and investigate the processes that control its distribution and variability, including sources, sinks, and surface interactions." We began our search for lunar new exospheric species by examining spectroscopy data from the night side of the moon before, during, and after full moon to take advantage of shielding provided by the Earth's magnetosphere and observe variation in signal levels with lunar phase consistent with theory. We confine our search to data from the night side of the moon in order to avoid major complications from surface reflectance. Our work has identified opportunities for improvement in our current noise reduction strategies and confirmed that night side observations are bright enough to detect our target species.

Developing Functions for Magnetopause Size and Shape

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The solar wind is the supersonic mass of charged particles that the Sun continuously emits. Earth's magnetopause is the boundary between this solar wind and Earth's magnetosphere. The magnetopause changes size and shape to account for changes in the solar wind. Models of the magnetopause have been made to predict and study the size and shape of the magnetopause. Previous models gave insight into the factors of magnetopause size and shape. Important factors including the interplanetary magnetic force and solar wind dynamic pressure are known to affect the magnetopause. Currently, other factors will be explored to model the size and shape of the magnetopause. Modeling involves looking at satellites that move in and out of the magnetopause. One satellite observed is the ARTEMIS P1. The satellites are determined to have crossed the magnetopause based on their position in space as well such as other factors such as proton flow speed, ion thermal velocity, and magnetic field measurements. Once crossings are found, fits can be made based on the solar wind conditions at the crossings. The effect on the magnetopause of each factor of the solar wind will be measured. This research will improve our understanding of the relationship between the solar wind and the magnetopause.

Poroviscoelastic Shell Mechanics of HIV Pseudovirus

Presenter's Name: Wintana Tewolde
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Background: The HIV consists of a soft membrane envelope lined on the inner side with a thin lattice of proteins, enclosing cytosol fluid and protein capsid that houses the virus genome. It is not clear how the multi-layered and multi-shell structure responds to indentation: would the probe compress the structure as a whole, penetrate through individual layers, buckle individual shells or simply squeeze the internal fluid out. Method: We used Atomic Force Microscope to test the hypothesis that indentation rate can be tuned (50 – 521 nm/s) in order to access different material information in the virus structure. Results: At lower indentation rates, the approach curves had multiple sharp rises and falls suggesting break-in resistances to the penetration of virus' individual

layers. They also had plateaus (3-6 nm in size) around 20-40 nm virus thickness indicating buckling of shells or penetration through fluid-like membrane walls. The retraction force curves had sharp jumps that can be mapped to a sequential release of penetrative adhesion. As the indentation speed increased, however, the plateaus became shorter, virus thicknesses appeared smaller, and the number of break-in resistances decreased. Concurrently, the retraction forces exhibited attenuated releases of adhesion. Conclusion: Our results suggest that at higher indentation rates, the force curves reflect the mechanical properties of the virus as a whole; whereas at lower rates, the force curves provide information on the internal organization of the virus and the properties of its structural layers.

Educating Engineers To Meet Grand Challenges (GC's) And Address Sustainable Development Goals (SDG's)

Presenter's Name: John Tharakan
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Presentation Type: Oral Presentation
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In this paper, we posit that there are several critically necessary components that must imperatively be incorporated within any engineering program in order for program graduate's to be prepared to meet and address the Grand Challenges and to contribute to addressing and achieving the United Nation's Sustainable Development Goal's. These include first and foremost, an emphasis and focus on critical and creative thinking skills and their nurturing and development. Second, and equally important, an incorporation of real world project-based learning, preferably project's that are community-based, that is open-ended, team-based, design focused and real-world solution oriented. Third, it is critically essential that ethics in science and engineering is introduced and incorporated as an integral part of the program through integration across courses and throughout the curriculum. Fourth and finally, an ability to bring all these components and thrusts together and be able to clearly and logically communicate through a collaborative team-written final project report as well as an oral group presentation of the research and findings on the open-ended problem/project, is essential. Program chairs and curriculum coordinators should encourage and assist engineering faculty to incorporate into their courses such pedagogical approaches and conduct the necessary faculty development activities to enable this, which will dramatically enhance the preparedness of our engineering graduates to be productive global citizens enabled and empowered with the capacity and capabilities to solve global problems.

EmotiColl: Towards Understanding and Prediction of Harmful Acts by Depressed Students

Presenter's Name: Shondace Thomas
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Many university students experience a series of emotions during their time in college and it increases tremendously around midterms and finals. Some individuals do not know who to turn to for many reasons and are afraid of telling their parents, the school's counselor, etc. A previous study was conducted amongst students from different HBCUs; this was so to see if it was a universal issue amongst different HBCUs. Of the 92 respondents, 64.1% were female, 34.8% male and 1.1% were transgender. As a result of analyzing the survey, it was clear that mental health is an important often overlooked topic at HBCUs. Results also showed bottling up your emotions does more harm than good; both psychologically and emotionally. This research outlines a tool called EmotiColl; a virtual journal application that will allow the user (students) to record videos and write notes about their present emotions. The purpose of this study is to improve the overall mental health of students attending a Historically Black College and University(HBCU) by providing an application that will allow them to release any bottled emotions.

Biomimetic Remineralization of Hydroxyapatite for Enamel Repair

Presenter's Name: Nancy Trang
Classification: Professional Student
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Presentation Type: Poster Presentation
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Enamel is the outermost layer of teeth and serves as an important barrier against bacterial invasion into teeth pulpal tissue. Despite the fact that enamel is the strongest tissue in the human body, it is prone to demineralization which is the first stage in the development of dental caries. Hence, this research aims to investigate ways to remineralize enamel and prevent dental caries. The main structural component of enamel is hydroxyapatite, so this study investigated the effect of different Ca^{2+}, PO_3^-, and F^- concentrations on remineralization of hydroxyapatite crystals. The concentration of these key ions allows for manipulation of hydroxyapatite crystal size, orientation, and configuration. Overall, the size and orientation of the hydroxyapatite crystals grown via a biomimetic solution can be controlled. A decrease in the PO_4^{3-} concentration resulted in smaller and more numerous hydroxyapatite needle structures, where as an increase in Ca^{2+} concentration resulted in smaller hydroxyapatite crystals. The data also suggests that within the F^- concentration range

of enhanced mineralization, lower concentration of F- results in more numerous and smaller needles.

Safe and Sound: Towards Understanding, Evaluating, and Creating LGBTQ Safe Spaces with Technology

Presenter's Name: André Vincent
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Frederick Herzberg once proposed theories about what motivates and invigorates employees to feel fulfilled at the workplace; Abraham Maslow later refined the theory into a pattern of ideas that constitute fulfillment, today known as Maslow's Hierarchy of Needs. Because this ideology is modeled into a pyramid, each preceding level must be satisfied before another. LGBTQ+ people often lack personal satisfaction or feelings of substantial contribution to society because they are not protected in the way that their cis-gender and heterosexual counterparts are. This becomes even more evident when these marginalised people move to a new city or area to follow their career or school paths. With limited resources relevant to their identity, it is common to see that LGBTQ+ people rely on dating applications to calculate the climate and discover safe spaces in their area. These applications are purposed primarily for dating, and so denoting welcoming areas for their users is often not within their purview, leaving LGBTQ+ people at a loss in their quest for safety. If a mobile application that identifies safe spaces specifically for the LGBTQ+ community is distributed to those very same people, then more people of this community will be able to fulfill their needs within Maslow's Hierarchy and therefore become closer to pursuing their full potential.

Investigating the dynamic properties of computer server frames using experimental and numerical analysis.

Presenter's Name: Camille Wallace
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Coauthors: Claudia Marin

Computer server frames are becoming an essential component in most buildings. These frames control hospital functionalities, transportation systems among other essential city functionalities. In earthquake-prone cities such as San Francisco, the need for these frames to remain functional after a major earthquake is highly critical. In this study, experimental and numerical analysis is carried out to investigate and validate the dynamic responses of flexible and rigid server frames subjected to seismic loads. Each frame is subjected to different input earthquake excitations and the corresponding output responses of the structure are collected and analyzed. The fundamental period, effective damping, and the amplification factors of each frame are defined and used to determine the energy dissipation of the frames and their foundation seismic demands. In addition, a numerical model of the rigid frame is created using SAP2000, a finite element program, to simulate the physical properties of each frame that are subjected to base earthquake excitations. Results from this study indicate a variation in each frame's dynamic response, which is related to the frame's ability to dissipate energy and dynamic characteristics. Results of the numerical analysis show dynamic responses similar to the experimental data with minimum differences in peak responses. The seismic demands of the frame obtained from the numerical and experimental responses are compared to that defined by the ASCE 07-16 code. It was observed that the ASCE07-16 code was conservative in its estimation of foundation seismic demands and the necessary recommendations were made. Keywords: Energy dissipation, Fundamental period, dynamic responses.

Noncommutative algebra from a geometric point of view

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Coauthors: Chelsea Walton ,Milen Yakimov

In this poster, I will discuss how to use algebro-geometric and Poisson geometric methods to study the representation theory of 3-dimensional Sklyanin algebras, which are noncommutative analogues of polynomial algebras of three variables. The fundamental tools we are employing in this work include the noncommutative projective algebraic geometry developed by Artin-Schelter-Tate-Van den Bergh in 1990s and the theory of Poisson order axiomatized by Brown and Gordon in 2002, which is based on De Concini-Kac-Priocesi's earlier work on the applications of Poisson geometry in the representation theory of quantum groups at roots of unity. This presentation demonstrates a strong connection between noncommutative algebra and geometry when the underlining algebra satisfies a polynomial identity or roughly speaking is almost commutative.

Tungsten di Telluride and the effect of Metallic Dopants on its Magnetic and Structural Characteristics

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Presentation Type: Oral Presentation
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Tungsten di Telluride WTe2 is a transition metal dichalcogenide which was found to possess very large non saturating magnetoresistance. This work studies how the introduction of metallic dopants into this semimetal Orthorhombic structure affects the magnetoresistance, crystalline structure, magnetic properties and the topological characteristics of WTe2. SQUID, XRD, and transport measurements were done to monitor how these properties changed with the addition of metallic dopants with percentages ranging from 10% to 80%. These percentage dopants were used for the replacement of tungsten(W). The WTe2 crystals used for this experiment were grown by flux growth and the dopant used were Chromium and Manganese.

All-Frequency Stable Finite-Element Formulation and Application in Electromagnetic Multiscale Problems

Presenter's Name: Su Yan
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Presentation Type: Oral Presentation
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Many electromagnetic problems encounter multiscale issues, which are caused by either structural natures of the objects or wide frequency range under consideration. The numerical modeling and simulation of such problems require an accurate and robust formulation that is applicable to tiny mesh elements and/or at very low operating frequencies. While the second-order wave equation is a widely used full-wave formulation, it suffers from the low-frequency catastrophe, which, when applied to problems at very low frequencies or with very fine meshes, generates erroneous solutions. As a common remedy, the tree-cotree splitting technique can be applied to represent the electric field into rotational-like and purely-gradient parts, which correspond to the magnetic vector potential A and the electric scalar potential phi, respectively. Another popular remedy is to reformulate the problems with A and phi directly to separate their contributions explicitly. The resulting A-phi formulation can be solved by the finite-element method without a gauge condition, with the zero-tree gauge, or with an explicit Coulomb or Lorentz gauge, leading to solution schemes with different numerical performances. In this talk, several finite-element formulations applicable at all frequencies are presented, compared, and discussed. The inhomogeneous Coulomb and Lorentz gauge conditions are applied to obtain a unique numerical solution, whose accuracy is demonstrated and compared through several benchmark examples. The connection between different formulations is studied and their numerical performances are compared and discussed. The applicability of these formulations at dc, quasi-static, low-, mid-, and high-frequency regimes are also investigated theoretically and numerically.

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study of the energy capacity of lithium iron phosphate batteries versus the addition of varied weight percentages of reduced graphene oxide

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Research has shown that adding reduced graphene oxide(R-GO) to Lithium Iron Phosphate(LFP) batteries can improve conductivity and performance. This improvement has been demonstrated with LFP/RGO composites delivering an initial discharge capacity of 158mAhg-1 at 0.1C, which is comparable to pristine LFP theoretical capacity of 170 mAhg-1. This research is focused on exploring the addition of low weight percentages (2 - 8wt%) of reduced graphene oxide to LFP cathodes. Initial discharge capacity results of 148 mAh/g at 0.1C show values comparable to the aforementioned discharge capacity in batteries where low weight percentages of reduced graphene oxide is added to LFP cathode material. In contrast, batteries with 2wt% of graphene added to the LFP cathode material had similar specific capacities in comparison with batteries made with pristine cathode material. Initial conductivity values show a substantial increase from 10^(-2) to 10^(5) S/cm.

Green Chemical Synthesis of Amodiaquine: anti malaria drug

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Abstract: Malaria amounts a major global health burden with crude estimated 216 million new cases and 445000 deaths in 2016 alone (WHO, http://www.who.int/malaria/publications/world-malaria-report-2017/report/en/ ISBN 978-92-4-156552-3). Approximately, 91% of all malaria deaths reported in 2016 are in Sub-Saharan Africa. It is estimated that 99% morbidity and mortality associated with malaria in sub-Saharan Africa is caused by plasmodium falciparum. Plasmodium vivax accounts 36 % of malaria infection in the rest of the world. In 2015, 67% of people in sub-Saharan Afri-

ca had access to a Long-Lasting Insecticide Net (LLIN), 52 % of pregnant women at risk of malaria received a single dose of Intermittent Preventive Therapy while 17 % received the recommended of three or more doses and 47% of children with malaria that received treatment were provided with Artemisinin combination Therapies (ACTs). Malaria drugs are unaffordable for low-and middle-income countries. Designing cost effective way for manufacturing these essential medicines in sub-Saharan African is a priority in this work. We have reduced the cost of amodiaquine for malaria treatment (Artesunate: Amodiaquine; ACT combination) by reducing the number of steps in synthesis of the active pharmaceutical ingredients in an environmentally friendly chemical synthesis. We are also working to decrease the dose of it by co-dosing with a pharmacokinetic enhancer (PKE) that would reduce the dose but yield an identical exposure (area-under-the-curve; AUC). The impact will have a tremendous effect in reducing cost of Artemisinin-based combination therapy; hence, saving more lives in low- and middle-income countries.

Numerical Method for Solving the Far Field Refractor Problem

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The far field refractor problem in geometric optics is an inverse problem that deals with recovering an interface (lens) that is capable of redirecting light beam from a point source with specific intensity into a set of target directions and carrying pre-specified intensity. In this work we present implementation of a numerical algorithm that is used to approximate such a surface to a desired level of accuracy. In our work we use MATLAB for the implementation of the numerical algorithm.

Social Sciences

Combating Gender-Based Violence in South Africa Through Addressing State-Directed Violence

Presenter's Name: Yasmine Allen
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Marginalized communities, specifically of the LGBT+ population, face the burden and obstacles of violence committed against them. In the context of South Africa, European colonialism, apartheid, and its current period post-apartheid would remain of historical significance considering systematic educational and health access deprivation of Black people and especially for the Black LGBT+ community. This research explores specifically the multifaceted dimensions of South Africa's legislation against prostitution that further marginalizes the Black LGBT+ community. Furthermore, this research explores the interactions between race, gender/sexual identity and expressions, and class that can reveal the ramifications of the government's neglect for the Black LGBT+ community. The researcher uses a combination of literature and statistical data on violence against sex workers, observations while interviewing local residents of the townships of Capetown and Johannesburg, as well as an interview with a representative of Sonke for Gender Justice, an organization committed to combat gender-based violence in South Africa. There are significant and violent consequences from the criminalizing legislation against prostitution that marginalizes sex workers. The findings suggest greater systemic issues related to policing, incarceration and deprivation of educational and health-care resources foster interpersonal and community-based violence committed against sex workers and the greater LGBT+ community. There is a need for more inclusive legislation that protects and decriminalizes sex workers in order to combat the very violence that marginalizes them.

Film Consumption and HIV Stigma on Historically Black College and University Campuses

Presenter's Name: Noah Allen
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The AIDS epidemic of the 80's and 90's not only ravaged the bodies of some of the most marginalized communities in the United States, it also sowed fear and misunderstanding in the minds of the American public. This led to the marginalization, stigmatization and "othering" of populations thought to be at the highest risk of contracting the virus: gay men, black people from Africa and the Caribbean, and black women. This widespread stigmatization has many roots. Prior research has, however, proved that the media, in shaping our perception of those with HIV, play a significant role in perpetuating the HIV stigma. The proposed research will investigate the link between media consumption and HIV-related stigma on college campuses. Prior research in this area has by and large targeted populations in sub-Saharan and other parts of Africa, leaving a broad knowledge gap about specific American communities. The proposed study, therefore, aims to explore this issue by examining the media consumption behaviors of students attending a university in the Northeastern United States. The qualitative paradigm will be the research method, and focus groups will be deployed as data collection instruments. Data will be analyzed to find out if consumption of film is linked to HIV-related stigma, and if educational environments like universities challenge or contribute to HIV-related stigma.

Facebook as a Safe Sphere: The Influence of Facebook Intergroup Activities on Reducing Islamophobia in the US

Presenter's Name: Miaoun Alsebaei
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Faculty Advisor: Dr. Yong Jin Park
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Islamophobia is increasing in the US, while the Pew Research Center found that only 38% of non-Muslim Americans know a Muslim in person. Thus, Facebook can be employed to reach more non-Muslims and combat Islamophobia. This study survey non-Muslim Facebook users (N=415) about the ways Facebook helped them to overcome stereotypes and lack of information about Muslims in platform with highly visual cues. Intergroup contact theory (Allport, 1954) was used to examine the negative correlations between frequency of likeable Facebook intergroup activities (direct communication, passive communication, and broadcasting) and Islamophobia. Contact theory and hyperpersonal model of CMC were used to examine the influence of interpersonal communication with a Muslim on Facebook (N=250) as a moderator between Facebook intergroup activities and Islamophobia. Results showed that all Facebook intergroup activities have significant negative correlations with Islamophobia, while only passive communication predicts Islamophobia. The study also found that Facebook communication with a Muslim moderates the relation between Facebook intergroup activities–direct and passive communications, but not broadcasting – and

Islamophobia. This dissertation confirms the inference that efficient exposure to visual cues, via mediated content, should be considered when seeking to improve intergroup relations, which seems a significant topic for additional research. Results also offer additional insight by extending the hyperpersonal perspective integrated with contact theory that effective online interpersonal communication not just increases intergroup relations but also the desire of ingroup members to use online visual cues to communicate and read more about a specific group, likely acting as factors to reduce Islamophobia.

The effect of time on the creative process

Presenter's Name: Kaalex Ash-Green
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According to Bar-on (2007), the creative process greatly consists of the aspects of thinking and doing, but how are these factors affected by time? In this qualitative study about the artistic creative process, twenty undergraduate students were asked to create sculptures using clay for 15 minutes. The participants were then interviewed about their creative process while watching a recording of themselves making the sculptures. These interviews were coded and analyzed using a coding scheme with codes about the participant's experience, knowledge, and problems that arose in creating the sculptures. Next, a data display was generated to determine if a participant used a more associative, conceptual or mixed process. An emerging theme from the data were comments about time. The data will be analyzed further to understand the relationship between time and whether an associative, conceptual or mixed strategy was used to create the sculptures. The results and implications of the study will be discussed during the presentation.

Understanding the Public's Response to Uncertainty Through an Interdisciplinary Analysis

Presenter's Name: Anas Askar
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Coauthors: Anas Askar, Dr. Terri Adams, Shannell Thomas, April Greene

Although the weather enterprise has made vast improvements in prediction capabilities, the nation continues to experience high rates of weather-related fatalities and injuries. In an effort to better protect the public, the National Oceanic and Atmospheric Administration (NOAA) is considering increasing the use of uncertainty information in disseminating warnings and other messages. However, it is important to first consider how the public processes and responds to uncertainty. To accomplish this, of the most efficient ways is to highlight theoretical frameworks from the social sciences on how people process and respond to uncertainty. More specifically, drawing theories from sociology, psychology, economics and public administration assists in understanding the responsiveness to uncertainty within the framework of practical communication yielding what we hope is better and more proactive responses from the public. This project examines these issues through an in-depth review and analysis of several theoretical paradigms. Transferring knowledge found in an interdisciplinary review of the literature can lead to the development of impactful communication practices that can lead to the minimization of the impact of threatening weather events.

Preparing Students for Practice and Medically Underserved Areas

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Background: There is a documented need for mental health professionals who practice in medically-underserved communities. In fact, this shortage has been described as the "crisis in the mental health system" and is referred to by Medical News Today (2004) as the "Silent Shortage." Through the Behavioral Health Workforce Education and Training (BHWET) Program, the Howard University School of Social Work (HUSSW) aims to train social workers committed to be active participants in the provision of quality behavioral health services with a specialized capacity for cultural sensitivity and clinical practice competency. Methods: A repeated measures pre-test/post-test design, with an academic intervention of a bus tour, was utilized in an effort to educate students on health disparities and the provision of services in underserved areas. Twenty social work students and a group of interdisciplinary (nursing, pharmacy, and psychology) students participated in a bus tour of the medically-underserved, providing participants with the demographics (location, income, and ethnic background) and behavioral health needs of the area. Results/Conclusions: The results show significant changes in levels of knowledge among participants in the BHWETP (t (df=31) = -6.65; $p < .001$). Participants significantly increased their levels of knowledge from 33.09 (SD = 11.46) at pretest to 46.25 (SD = 4.68) at posttest; an increase of 13.16 points on average. Findings were also supported by the Wilcoxon signed ranks test (z = -4.68; $p < .001$). Results provide statistical evidence that the Interdisciplinary Bus Tour is effective in increasing students' knowledge of the community.

How Did the Innovative Rental Housing Program in Montgomery County, Maryland Affect Access to Affordable Housing?

Presenter's Name: Deniz Baglan
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Presentation Type: Oral Presentation
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Coauthors: Haydar Kurban

Montgomery County has designed and implemented a program, Moderately Priced Dwelling Unit Program (MPDU) for renters, since 1970s. The MPDU program gives developers density bonuses and in return a certain portion of new units are offered to lower income purchasers and renters at discount prices. The program aims to further income integration and reduce housing segregation in the county. In this project we want to provide an extensive evaluation of one of the oldest Inclusive Zoning (IZ) programs in the country. We study the effects of rental MPDU program on income integration and other goals and guidelines of the program. These results will be important and useful for similar IZ policies in other parts of the country. We have access to data from various stages of the program, to explore possible discrepancies between the actual outcomes and the expected outcomes of the program goals and guidelines. Such discrepancies can occur when there is either a loophole in the program design or in various stages of the program implementation. By studying the distribution of program benefits by income, this paper also explores the effects IZ ordinance on mobility and the achievement of other potential benefits including access to good quality schools and urban transportation system. We use mixed-method approach where regression techniques are used to identify and analyze any discrepancies between the successful applicants and the target population. Our preliminary results indicate that all eligible low-income residents do not have equal access to the rental program.

Out of darkness let there be light: The relationship between the Black Church and Black Women Reporting IPV to the Black Church

Presenter's Name: Anjerrika Bean
Classification: Graduate Student
School/College: Graduate School
Presentation Type: Poster Presentation
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Intimate partner violence (IPV) is a pervasive social problem that compromises the personal health and safety of millions of women each year (Bachman & Saltzman, 1995; National Coalition Against Domestic/intimate partner violence, (1996). According to the Center for Disease Control, 1 in 5 women has experienced severe physical violence from an intimate partner at some point in their lifetime. African American women experience IPV at a rate 35% higher than that of white females (Bureau of Justice, 2001). Historically, Black people have turned to the church for social problems because of their mistrust in the judicial system. Although there is no direct relationship between the Black Church and violence, literature reports that Black women associated with religious institutions report IPV to the church. The purpose of this study is to examine the role of faith-based communities in Black women reporting's of IPV to the Black Church. This research was done online through social media outlets, Facebook, Instagram, and Twitter. Data was collected from 343 Black women, 18 years or older. The participants completed an online survey about religious commitment, the severity of abuse, and interpersonal power when reporting IPV to the Black Church. This study gives insight into Black women perceptions of their leadership and access to resources. The findings indicate that the Black Church has the potential to foster a larger platform for women disclosing IPV.

Parent-Adolescent Communication and Risk Behaviors among HBCU Students

Presenter's Name: Chynere Best
Classification: Graduate Student
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The first year of college presents a unique opportunity for new students to experiment with various risk behaviors. Parental messages about these behaviors can have varying impacts on how students choose to partake in risk behaviors, especially when looking at how culture affects how that communication takes place. While findings from previous research has indicated that Black students at historically black colleges and universities (HBCUs) take more preventative measures than those at predominantly white institutions (PWIs), they also engage in riskier behaviors regarding substance use and sexual activities. The present study was conducted to examine the impact of parent-adolescent communication (PAC) about substance use and sexual risk behaviors on student engagement in those risk behaviors among first year college students at HBCUs. A cohort of 102 Black students attending HBCUs was recruited. Gender differences in PAC and student risk behaviors were examined.

Cultural Orientation as a Moderator of the Relationship between Perceived Racism and Self-Rated Physical Health of African Americans

Presenter's Name: Kevin Boyd
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Coauthors: Jules Harrell, Clive Callander, Den'ee Mwendwa, Alphonso Campbell

There is a growing literature that shows a relationship between objective indices of physical health and racial discrimination among African Americans. This has led researchers to speculate that race-based discrimination contributes to racial health disparities. Recently, studies have reported that sociocultural measures such as ethnic identity may serve as a buffer against the effect of racial discrimination on physiological measures (Neblett & Roberts, 2013). Self-rated measures of physical health provide another method by which the impact of perceived racism on physical health can be determined (Lewis, Cogburn & Williams, 2015). The purpose of the present study was to examine the relationship between perceived racism and self-reported health in a community-based sample of adult African Americans (Age=45.6 years; N=161). Additionally, this study looked at cultural orientation as a potential moderator of self-related health. Participants in this study were administered the Perceived Racism Scale, Mainstream Orientation Questionnaire and the SF-36 measure of self-rated health. Correlational and regression analyses revealed a weak relationship between life experiences with racism while on the job and the self-reported general health of African Americans. However, the introduction of cultural orientation as a moderator yields a significant interaction (95% C.I. [-.0126, -.0031]). The tendency to endorse mainstream Euro-American values, was associated with poorer subjective ratings of physical health. The implications of these findings will be examined.

The Moderating and Mediating Effects of Gender and Race-Based Traumatic Stress on the Physiological Outcomes of Viewing Videos of Police Killings of African American Men

Presenter's Name: Brianna Brower
Classification: Graduate Student
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Presentation Type: Poster Presentation
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Over the last twenty years, a growing body of research has established that racism and chronic stress have an enduring impact on adverse health outcomes (Harrell et al., 2011). Among African Americans, racism has been pervasively present during police encounters. A recent analysis of federal data on fatal police shootings found that black males between the ages of 15-19 are twenty-one times more likely to be killed by a police officer than their white counterparts (Gabrielson et al., 2014). The recent accumulation of viral videos showing black males being killed at the hands of police officers has intensified the long and painful history of damaged relations between the police and the African American community (Gilbert and Ray, 2015). Guided by pertinent research and building on foundational stress and coping theories, Carter's (2007) Race-Based Traumatic Stress Injury model conceptualizes racism as a traumatic stressor and examines the pernicious effect of racism through a lifetime and in the course of one's daily life experiences. The current study is designed to extend Carter's theory to community-police relations. At present, no study to date has used the Race-Based Traumatic Stress Injury model to better understand the physical and emotional stress evoked by witnessing videos of police killings of unarmed African American men. Thus, this study will investigate two primary aims: 1) Is there a significant relationship between perceived racism and physiological arousal? If so, to what extent is that relationship mediated by race-based traumatic stress, and 2) Does gender moderate the hypothesized mediated relationship.

Communicating the Health Implications of Climate Change in Communities of Color : What We Know and What We Need to Know

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The public debate swirling around the still-evolving issue of climate change embraced by the environmental science community has become an inflection point for multidisciplinary academic inquiry and public policy. Climate change is not only a threat to our planets' ecological system but can also have negative health effects on human populations. Maibach, et al. (2010) states that significant efforts have been made over the past several years by public health organizations to raise awareness of the public health implications of climate change. Climate change disproportionately affects communities of color due to limited resources, political isolation in climate change policy, and lack of preparedness for natural disasters such as floods and hurricanes (Hesed & Ostergren, 2017). The African American community in the United States may be affected in unique ways. In this study, we aim to understand how communities of color communicate climate change and its health effects. Thus, we are in the process of conducting a systematic review of health and communication research that addresses how climate change affects communities of color. Preliminary findings suggest

that African Americans' reliance on social networks impact how we communicate about climate change. These social networks also impact the messages that African Americans give to each other that influence decisions impacting health outcomes. We found, as did (Paolisso et al., 2012) that community members had robust and varied understandings of climate change, based on both local experiences and information obtained from media sources.

The Nexus between Women's Position in Newsrooms and News about Women

Presenter's Name: Carolyn Byerly
Classification: Senior Faculty
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Presentation Type: Oral Presentation
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This research is concerned with whether having more women in higher ranking positions within news organizations increases the amount and quality of news about women. The study performed secondary analysis on data showing the position of women in the newsrooms of 55 nations in relation and data on news coverage of women in those same nations. Using regression analysis to compare the two data sets, the study found, among other things, that nations with large percentages of women in the journalistic profession (generally), also had the largest percentages of women in higher ranks within newsrooms. Findings then revealed that it appears to be women who hold reporting roles (as opposed to managing editor or higher positions) who have the greatest ability to expand coverage of women in stories, as well as to include a feminist perspective. The study uses critical mass theory and elite theory as the analytical framework examining the relationship between women's position in newsrooms and the content of news produced by those newsrooms. This study is part of a larger collaborative multi-nation study of women in news funded by the Swedish government and set for publication in late 2019.

My Skin As My Logo: The History of Ideas of Identity Construction Among Americans of African Descent in Negro World/Black World Publications

Presenter's Name: Angela Carter
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Presentation Type: Oral Presentation
Faculty Advisor: Jules Harrell Carter
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Language translates culture through time and space. Throughout history, humans have developed complex language structures to express their manifestations of the world and themselves relative to it. Nowhere is language more revealing than in self-designation processes. Language, a product of cultural meaning-making is hostage to the ontology that produced it. Inevitably, linguistic markers of identity emerge and can act as mental cues for social perception. Historical factors impact the ways that people are signified and socialized over time. Notably, the process of self-designation characterizes the narrative of ethnogenesis of Americans of African descent. Since their forced arrival to the Americas, people of African descent have been recognized by many names. However, the historical and social factors driving those name changes are important to acknowledge because of their significance in shaping the perception of Americans of African descent. The succession of identity markers African, Colored, Negro, Black, and African-American and the conscious acceptance of the terms signify many things about the cultural and political conditions of the historical period. How have we been socialized to remember the period when the usage and perception of Negro and Colored people predominated? The present study investigates the psychological impact of the history of ideas on the process of identity construction among Americans of African descent. A bibliometric instrument is used to analyze the changes in the usage of identity labels for Americans of African descent.

The Significance of Concussion Education in Mixed Martial Arts Athletes

Presenter's Name: Jeffrey Chang
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Presentation Type: Poster Presentation
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Background: Mixed martial arts (MMA) is a full-body contact sport with high-risk for repeated concussions. Premature return-to-play before completely healing from an initial concussive event leads to lasting effects including chronic physical symptoms, changes in emotional/psychological well-being, and deficits in cognitive-communicative skills. Consequently, many athletes are not aware of the cognitive-communicative skills necessary for effectively executing functional daily tasks and communicative activities. In addition, many athletes do not know the role of the speech-language pathologist (SLP) in the prevention, assessment, and management of cognitive-communication deficits. This presentation will review existing literature and data to examine concussion knowledge and awareness among adult athletes for concussion experience and knowledge of the associated symptoms, as well the role of the SLP in assessment, management, and return-to-activity. Methods: Literature and data are reviewed on concussion education among amateur-level mixed martial arts (MMA) athletes including results from a concussion education seminar, a pre-education survey utilized to determine baseline knowledge and awareness, as well as a post-education survey administered to identify any increase or changes in knowledge and awareness of concus-

sion information. The data were analyzed qualitatively and with descriptive methods. Results: Preliminary findings indicate low pre-education knowledge and awareness of the cognitive-communicative symptoms associated with concussion as well as decreased knowledge of the role of the SLP in concussion management. Post-education data demonstrated increased knowledge and awareness for MMA athletes. Conclusions: Concussion education with an emphasis on cognitive-communication and speech-language pathology was beneficial in increasing the athletes' knowledge of symptoms and processes of care following concussion.

Land for Food: The Case of Liberia

Presenter's Name: Monyai Chavers
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Presentation Type: Oral Presentation
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Liberia must create a stable and progressive land rights system to encourage economic, political, and social growth. This paper will produce a historical assessment of Liberia's land system to provide context for the new Land Authority Act (LAA). In addition, the provisions of the Land Authority Act will be evaluated to identify measures designed to curb land issues. The Participatory Social Learning Theory (PSLT) will be the method used to evaluate the LAA. Each of the five imperatives united with participatory social learning is crucial for Liberia to improve food security and end discriminatory land practices toward women. The purpose of this evaluation is to show the importance of land rights to sustainable development, food security, and peace building. Ultimately, the research encourages land reform based on a people centered approach.

Layered Stigma and Cognitive Depletion in Third-Gender Community of Delhi, India

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Problem Statement: Persons living with HIV/AIDS (PLWHA) often experience multiple forms of stigma related to their illness and gender identification. Navigating concurrent forms of stigma potentially consumes one's mental resources, leaving less cognitive bandwidth for other tasks of daily living. This can be particularly debilitating for the third-gender community living with HIV and poverty in India. Socio-behavioral consequences of HIV-stigma such as diminished self-concept and declining immunologic function have been well established. To our knowledge, however, there has been no experimental studies that examine how anticipated stigma based on HIV and other socially marginalized categories deplete cognitive resources among PLWHA. Therefore, we examined the relationship between HIV and gender-related stigma (referred to as layered stigma) and cognitive depletion among third-gender [TG] and cisgender [CG] women at an HIV outpatient clinic in Delhi.

Results: The sample consists of 81women (28 TGHIV+; 27 CGHIV+; and 26 CGHIV-). We hypothesize that experimentally induced thoughts of HIV and gender-based stigma will significantly reduce performances on two cognitive tests of problem-solving (Progressive Raven's Matrices) and selective attention (Symbol Search) among TGHIV+ primed with the High layered stigma condition. Thematic analysis of the participant responses to the scenarios reveals cumulative forms of stigma among the three groups, underlining consequences on their cognitive ability to pay attention and make decisions. Qualitative responses introduce a plausible explanation that layered-stigma may not necessarily consume cognitive capacity because resources have already been tapped by competing stressors of being poor – an intriguing direction that warrants further investigation.

Why Do The French Tweet #Blacklivesmatter In English?

Presenter's Name: Tiffany Copeland
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Abstract: The French are Tweeting hashtag #BLMFrance and hashtag #FergusoninParis, to gain the attention of the English speaking world about a young unarmed Black man, named Adama Traore, who was killed by police. A critical analysis was employed on tweets that used the hastag #HisNameWasAdama, from the time the hashtag was launched on November 24 until December 31, 2016. Eighty-one English and 81 French tweets were evaluated. The results show that the French were mainly using Twitter as an information dissemination platform: they were sending tweets in English, they were encouraging one another to continue to send tweets in English, they were posting French videos with English subtitles, they were reaching out to American celebrities, and they were exposing racism in France through Adama's story. It was uncovered that the French were engaged in a new public sphere advocating what the researcher calls a Digital Blackness, in which Black people are connected transnationally, and are working on their total liberation through their strategic use of social media platforms, like Twitter.

Utilizing Music Lyrics to Assess Abstract Language Skills in African American Young Adults

Presenter's Name: Aija Crawford
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Background: Figurative expressions are often utilized in assessments to examine cognitive-communication skills including comprehension of abstract language. Consequently, many common standardized assessments used by speech-language pathologists include expressions that are not familiar to African American (AA) young adults (Davis, 2016). Familiarity is important when selecting stimuli to obtain the most natural responses from clients and avoid misdiagnosis of cognitive-communication deficits. Metaphorical music lyrics can be utilized as culturally familiar stimuli for AAs since music lyrics have served as methods of conveying messages for many years. The purpose of this study is to analyze the verbal interpretations of figurative expressions from music lyrics as a cognitive-communication assessment with AA young adults. Methods: A secondary analysis of verbal interpretations from 28 AA young adults was analyzed using descriptive methods utilizing a modified rating system developed by Brundage and Brookshire (1995). In addition, a qualitative analysis of the participants' communicative style and overall communicative intent was performed to identify cultural and dialectal aspects of communication and language. Results: Preliminary findings indicate familiarity as a significant factor in providing appropriate verbal interpretations. In addition, trends were identified which allowed the investigators to identify music lyrics that are beneficial to assessing abstract language. Trends were also found in the communicative styles of AA young adults. Conclusions: The results of this analysis provide the foundation for developing culturally appropriate and relevant stimuli for abstract language tasks and lead to the development of a cognitive-communication assessment tool for speech-language pathologists working with AA young adults.

Incarcerated pregnant and parenting women: An analysis of criminal justice and health care

Presenter's Name: Janeen Cross
Classification: Junior Faculty/ Lecturer/ Instructor
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Presentation Type: Oral Presentation
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In the last 30 years, women are the most rapidly growing criminal justice population [National Resource Center on Justice Involved Women (NRCJIW), 2016). The number of pregnant and parenting mothers in jail are also increasing (Minton & Zeng, 2015). Pathways to imprisonment include substance use, serious mental health issues, childhood victimization and trauma. Substance use is the most common disorder for female inmates followed by serious mental illness and trauma. The increase in women offenders is contributed to national drug policies that include mandate prison terms for low-level offenses (NRCJIW. 2016). Criminal justice response for substance-using pregnant woman varies and prosecutors do not use specific statutes designed for pregnant substance-using women. Women are stripped of prenatal health choice related to provider (i.e. physician, nurse, midwife) or birth plan (i.e. delivery room, support person) and women are not provided access to basic prenatal health care or access to abortion services (Roth, 2012). There are compelling concerns that incarcerated pregnant women are medically abandoned in a form of institutional neglect. Objectives:

- This presentation will discuss the pathways for incarceration for women
- Describe the policies that jeopardize the health and well-being of mothers and infants
- Discuss trend to reform health care outcomes for pregnant & parenting women
- Identify practice, research and policy implications for social work
- Identify ways to advocate for the needs of pregnant and parenting women

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The mediating effect of inflammatory markers on the relationship between eating behavior and verbal learning among African Americans

Presenter's Name: Sanaz Dabiri
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Obesity, a chronic disease that afflicts 33% of all Americans poses a threat to the public's health. The obesity rate is even higher (48.1%) among African Americans. Recent studies suggest that obesity is associated with declines in cognitive function (Liang et al., 2014). There is an absence of studies that have looked at the effects of high-fat and high-sugar on cognitive functions among African Americans; particularly, the mediating effects of inflammation on cognitive function as a result of high-fat and high-sugar diet. The aim of this study was to examine whether: 1) eating behavior impacts verbal learning 2) inflammatory markers mediates the relationship between eating behavior and verbal learning. A sample of 182 African Americans was administered the Eating Behavior Pattern Questionnaire (EBPQ) and California Verbal Learning

Test (CVLT-II). We tested the hypothesis that participants who consumed high-fat and high-sugar diets would earn lower scores on the CVLT. We also examined the mediating effect of inflammatory markers on eating behavior and verbal learning by obtaining conditional process analyses. Higher scores in low-fat subscale of EBPQ was associated with higher scores in verbal learning, after controlling for age and education (B= .2454, p=.0040). In addition, haphazard meal planning was associated with reduced verbal learning, after controlling for age and education (B= -.2276, p=.0387). IL-1 and IL-6 were not significant mediators in the association between subscales of EBPQ and verbal learning. These findings can aid future studies in identifying pathophysiological factors that contribute to cognitive decline.

Understanding the Effects of the Twin Sins

Presenter's Name: Richmond Danso
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School/College: Graduate School
Presentation Type: Oral Presentation
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Africa in the 19th century was seen by invaders as a ripe fruit waiting to be plucked. Countries like France and Britain had the juicy parts while latecomers like Italy only had the deserts. In their irate moments of wanting to dominate the continent, these colonists created unplanned states and sent Africans to different parts of the world. The impact of colonization and slavery have continued to shape the destiny of Africans and people of African descent since then. This paper seeks to build on research that has been conducted on the impact of colonialism and slavery on Blacks. I will situate Black liberation within the American and international context in areas relating to racial discriminations and inequalities. Particular, I will examine cross-cutting issues and their effects on the Black community. Among other factors, I believe that these issues have been used not only as divisive tools among Blacks but also as a means to perpetuate white supremacy. In examining them I hope to expose some of the inconsistencies upon which they have been presented and reecho the Pan-Africanist voice—Blacks have more similarities that bind them than they have been made to believe. Data for the research will be collected through documented sources. Secondary and thematic analysis will be the medium through which the data will be examined. Based on these examinations I hope to prescribe policies and practices that can address some of the challenges.

Publish or Perish: Understanding Academic Overproduction

Presenter's Name: Kiara Davis
Classification: Graduate Student
School/College: Graduate School
Presentation Type: Oral Presentation
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This study will investigate the social foundations and ramifications of "publish or perish," a popular academic slogan that represents the pressures of publishing for early scholars. The push to produce scholarship is deeply influenced by its relationship to the job market. Junior scholars and faculty are often judged by the quantity of publications and the quality of the journals in which the work was published, rather than the quality of the work itself. Through the use of empirical observations from 2 HBCUs at the undergraduate and graduate levels, I will investigate the impact publish or perish has on the knowledge production system. Particpatory observations and survey data will produce the empirical data necessary for analysis and further reseearch. Research questions will include, but are not limited to: 1) In what ways does "publish or perish" impact scholarship production? 2) Do scholars feel they are benefiting from the "publish or perish" model? 3) What are viable alternatives to the "publish or perish" model?

"Build a Wall and Crime will Fall": Crimmigration, The Latino Threat Narrative, and Police Shootings of Hispanic People 2015-2018

Presenter's Name: Akiv Dawson
Classification: Graduate Student
School/College: Graduate School
Presentation Type: Poster Presentation
Faculty Advisor: Marie Jipguep-Akhtar
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Research on race and police violence focuses largely on African-Americans' experiences with law enforcement. Several theoretical propositions, have been used to explain the over-representation of people of color with the police. Findings suggest that Blacks are more likely to experience police stops, arrests, and deadly force. Similar research with Latinos as victims of police violence is limited. To address this lacuna, we test a model that integrates individual and structural correlates of police shootings of Latinos in America. The study considers the unique experiences of Latinos who, much like African Americans, battle institutional racism along with today's growing nativism in the political sphere. Accordingly, we assess how Latinos are constructed in the political sphere using C-Span videos. Then, using data from the Washington Post's Fatal Force database, we address three research questions pertaining to Latinos experiences with police use of force. The research questions, data analysis, and findings are discussed.

The Effectiveness of Gun Regulations in Correlation to Death by Firearms

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Gun violence in the United States is a major national concern that results in tens of thousands of deaths and injuries annually. All 50 states were studied. Data was retrieved from the Web-Based Injury Statistics Query and Reporting System ,1 which provides mortality tables with the numbers of injury-related deaths and mortality rates according to cause (mechanism) and by state. These mortality data are compiled by the National Center for Health Statistics, Centers for Disease Control and Prevention (CDC) from multiple cause of death data.This study assesses the correlation between these gun laws and regulations and death by firearms by state to state, it needs to be conducted so that society can gain insight on whether these regulations are helpful.This study has practical significance and will determine whether states with fewer or more gun laws or regulations differ in deaths by firearms. This is important to study because humans should not be killing humans and firearms make it a lot easier to do so. The results showed gun ownership was a significant predictor of firearm homocide rated however there was no direct correlation to gun regulations and laws.

How Does Media Imagery of Black Women Impact Black Men's Decision to Intermarry?
Presenter's Name: Tia Dickerson
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School/College: Arts & Sciences
Presentation Type: Poster Presentation
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The declining rate of black marriage has been widely studied. According to the U.S. Census Bureau black women represent the lowest rate of all races of having ever been married by age 40 (Raley, Sweeney and Wanda, 2015: 90). Compared to white women, black women marry later, have higher instability in their marriages, and have higher divorce rates (Raley, Sweeney and Wanda, 2015: 92). Current research has built its theories on the socioeconomic factors and general availability of black men. Common themes among the literature trace the issue to low employment rates for black men and their high likelihood of incarceration (Raley, Sweeney and Wanda, 2015: 92). Further studies have highlighted the increasing trend of black men marrying outside their race. In the last three decades the rate of black men intermarrying has more than tripled (Pew Research 2017). Considering the already limited pool of available spouses, this is particularly troubling for black women. This paper seeks to understand the social factors that contribute to mate selection in the black community, and in particular, how mass media impacts this process. Studies such as Perry (2005) and Bany, Robnett and Feliciano (2014) have highlighted the modern attitudes of black men towards marriage and men's attitudes towards dating black women. Data from the studies' interviews inadvertently highlighted the mediating effects of media and stereotypes in mate selection. I will explore how these factors have influenced black men's decision to intermarry and how this impacts the declining rate of marriage amongst black women.

Payday Loan Use Among Older Lower Income Population
Presenter's Name: Bahareh Eftekhari
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Coauthors: Bahareh Eftekhari, Nyanya Browne

This paper explores how the use of payday loans among social security income receivers and supplemental security income receivers affect their financial wellbeing. A significant share of low-income and low-wealth population experience financial hardship and pay exorbitant fees and interest when they borrow from alternative financial service providers including pawn shops and payday lenders. Since social security and disability payments are considered as an income source by payday lenders, consumers use their checks from the social security administration as collateral. The use of high-cost payday loans and other alternative financial services has significant long-term ramifications on the financial wellbeing of those rely on social security income as a sole income source. Payday lenders charge exorbitant fees and interest rates and are predatory, rather than mitigating financial hardship, they increase the likelihood of bankruptcies. The literature mostly focuses on whether payday loans are beneficial or harmful and whether more restrictive or more permissive payday lending regulations have positive effects on the wellbeing of the borrowers. This study contributes to the literature by studying (a) the frequency and reasons for payday use among the social security beneficiaries, (b) how using payday loans affect the long-term financial wellbeing of these receivers, (c) whether payday loan use increases demand for other social programs such as Temporary Assistance for Needy Families (TANF). Based on publicly available surveys our results show that payday loan use rate among social security beneficiaries is comparable to the payday loan use rate among the younger lower income population.

The Development and Reliability of the PRESS to Function Approach: A Systematic Method for Upper Extremity Assessment
Presenter's Name: Mona Elsayed
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The aim of this study is to examine the development of a conceptual framework and provide evidence for reliability

and responsiveness of the PRESS to Function Approach as an outcome measure used to assess upper extremity function. The PRESS to Function Approach is designed to be used at the point of care as a valuable approach to evaluate and monitor progress during recovery of upper extremity function. A multi-site study will be conducted using 30 participants with upper extremity musculoskeletal disorders from Howard University Hospital and Pinnacle Hand Therapy Clinic. Participants will be evaluated using the PRESS to Function Approach. Construct Reliability and Test-Retest Reliability will be determined. Using Cronbach's alpha ranges and correlation coefficient with SPSS Version 22.0, findings will be analyzed to determine if the PRESS to Function is an effective approach to be used in clinical practice.

Self-Acceptance Mediating the Impact of Childhood Adversity on Relationship Quality

Presenter's Name: Mayowa Fageyinbo
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Coauthors: Christian Mallett,Jules Harrell, Ph.D.

Background: Research shows that adverse childhood experiences (ACEs) are associated negative future health outcomes. Few studies have evaluated explicitly the role that ACEs have on the quality of interpersonal relationships or self-acceptance as a mediator of these relationships. Purpose: This study seeks to determine if self-acceptance mediates the relationship between adverse childhood experiences and quality of interpersonal relationships. Participants: One hundred eighty Howard University undergraduate students participated in this study. Procedure: Participants signed consent forms, and completed questionnaires on site which included demographic items, the Adverse Childhood Experiences (ACE) questionnaire, and the Ryff Scales of Psychological Well-Being. Results: A preliminary mediation analysis of data from 82 participants tested the indirect impact of adverse experiences on ratings of quality of interpersonal relationships through self-acceptance. Ordinary least squares regression analyses found that the overall model significantly predicted ratings of quality of interpersonal relationships with others, $F(1, 80) = p < 0.01$. Self-acceptance mediated the relationship between ACE prevalence and quality of interpersonal relationships with others (B = -.81, 95% CI [-1.60, -.12]). Discussion: The results suggest that experiencing more childhood adversity predicts lower levels of self-acceptance, and individuals with low levels of self-acceptance are more likely to have less positive relationships with others. The results also suggest that childhood adversity impacts quality of interpersonal relationships through self acceptance.

Adverse Childhood Experiences and Psychological Well-Being: The Moderating Effects of Family and Social Support for Black Young Adult Survivors of Childhood Sexual Abuse

Presenter's Name: Jayda Farmer
Classification: Undergraduate Student
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Presentation Type: Oral Presentation
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Adverse Childhood Experiences (ACE) are traumatic events that occur during one's childhood before the age of 18. Prior research indicates that there is a strong positive correlation between ACEs and chronic diseases and mental illnesses. More specifically, the more adverse childhood experiences, the higher the risk factor for chronic diseases and mental illnesses. Given the history of collective trauma that Black people have experienced due to slavery and racism, intergenerational trauma adds another complexity to the ACEs of people of African descent. This study explores the moderating effects of family and social support on the relationship between ACEs and psychological well-being of a sample of Black young adults. While surveying for all adverse childhood experiences, the study will specifically focus on the role of family support on childhood sexual abuse (CSA) and psychological well-being of CSA survivors. An electronic survey will be administered to Black young adults between the ages of 18 and 35 to assess ACEs, perceived family and social support, and psychological well-being. It is hypothesized that perceived family and social support will moderate the relationships between CSA and psychological well-being. It is predicted that lower levels of family and social support may be a result of intergenerational trauma, thus negatively impacting the mental health of survivors. This research will shed light on the importance of unity and family support within the Black community, and the need for collective healing.

Black Female Resistance Behind Bars: Centering The Voices of Incarcerated Black Women

Presenter's Name: Britany Gatewood
Classification: Graduate Student
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Presentation Type: Oral Presentation
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Coauthors: Dr. Bahiyyah Muhammad

Black women have had a long-standing exclusion from the best jobs, schools, health care, and housing options. This illustrates the broad array of social policies designed to exclude Black women from full citizenship rights. The intersections of their race and gender create disparities of conditions and treatment socially, politically, and economically which are different from Black men and white women. These disparities are also prevalent within the criminal justice system. Black

women are disproportionally represented among women within the carceral institutions and receive more severe charges and longer sentences. Women have been involved in Black liberation movements for centuries in order to resist racial and gender oppression inside and outside of carceral institutions. The tradition of resistance by Black women is influenced by the deeply rooted sense of activism in opposition to discriminatory practices. Methods of resistance from Black women are present in society as a whole and manifests itself within carceral institutions. Carceral resistance scholarship has grouped all women into a homogenous group. There is a lack of research on the subject of methods of resistance of Black women within carceral institutions. This exploratory study examines documented methods of resistance employed by incarcerated Black women. Common, documented methods of resistance across institutions are prison riots, hunger strikes, labor strikes, refusing medical care, legal action, filing grievances, art, absconding, journaling, support groups, forging connections with outside groups, and education. These methods will be explored in relation the tradition of Black woman's resistance and the manifestation within a carceral institution.

How the Value of a Business is Being Driven by the Owner's Demographics

Presenter's Name: Taleya Harris
Classification: Undergraduate Student
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Presentation Type: Poster Presentation
Faculty Advisor: Gerald Daniels
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Determining a business' success is subjective to the owner but situational demographics can limit an owner from reaching their personal standards. Using data from the Survey of Consumer Finance (SCF) we examine the association between the demographics of small business owners and their median business values. We find that there is a negative relationship for the median business value when comparing Black/African-American and Hispanic owners to White Non-Hispanic owners, controlling race and other covariants. We find evidence that owners with a college degree have higher values for their small businesses compares to a business owner that does not have a high school diploma or GED. This research will examine how the value of a family-owned small business is affected by the demographics of the owner. This research will also determine how a business being inherited from the previous owner influences the value of the business.

The Impact on Language Development in African American Children Exposed to Intimate Partner Violence

Presenter's Name: Dorian Harris
Classification: Professional Student
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Presentation Type: Poster Presentation
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In the United States, thirty-five percent of children diagnosed with a speech and language delay have been exposed to intimate partner violence (IPV) (Sullivan & Kuntson, 2005). Exposure to domestic violence occurs when a child directly or indirectly witnesses one parent or caretaker use any tactic to gain power and control over another parent or caretaker (Mclintosh, 2002). Witnessing IPV can affect the entire language, cognition, and social development of a child and can continue to affect children in their future intimate relationships. Although there is a significant number of children diagnosed with speech and language delays in the US, the field of speech-language pathology has limited knowledge and awareness of effective treatment and intervention necessary for working with children exposed to IPV (Westly,2001). If a child's language continues to be underdeveloped, the child is at an increased risk of academic failure, decreased socialization, difficulty establishing and maintaining peer to peer or romantic relationships, and unemployability. Therefore, my proposed presentation for research week includes investigating the negative impacts children exposed to IPV experience in language development.

My Culture, Your Trend: An Analysis of Cultural Appropriation on Social Media and How It Affects the Self-Image of Young Black Adults

Presenter's Name: Ariyiana Haynes
Classification: Undergraduate Student
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Presentation Type: Oral Presentation
Faculty Advisor: Kehbuma Langmia
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Historically, various aspects of Black culture have not been accepted in mainstream society. In American society, many White people over time have adopted the same practices that Black people have be penalized and ridiculed for doing, while still refusing to socially accept Black people, thus the creation of a double standard between the races. With the overwhelming presence of young Black adults on social media, it is not surprising that they make up a large population on social media sites. On social media, many young Black adults have admitted that they have seen cultural appropriation Black culture and have had an opinion on the matter. This is what led the researcher to begin this research. The purpose of the research is to determine the effect that the appropriation of Black culture in social media has on the self-image of young Black adults, and if this effect is harmful to the Black com-

munity. The research model consists of a purposive sample of young Black adults ages 18-22, who identify as Black or of African descent, and have an active account on Facebook, Twitter, and/or Instagram. The researcher has completed two separate focus groups. Each group was asked the same ten open-ended questions and provided food and refreshments in exchange for their participation.

You Are What You Watch: Examining the effects of media consumption during childhood on psychological distress experienced in adulthood in African-Americans

Presenter's Name: Troi Henderson
Classification: Undergraduate Student
School/College: Communications
Presentation Type: Oral Presentation
Faculty Advisor: Kehbuma Langmia
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The rates of young people, specifically college-aged individuals, struggling with cases psychological distress is growing rapidly in America. More relevant to this study, the rates of mental health issues in young Black individuals is rising as well. The purpose of this study is to examine the relationship between media consumed during formative years of childhood and psychological distress experienced in adulthood, and explore a possible causal relationship between the two phenomena. Research questions looking to be answered are 1) How are young minds affected by exposure to depictions of distress? And 2) What is the relationship between the nature of media consumed during childhood and the amount of psychological distress experienced in adulthood? The aim is to emphasize the relevance of media to socialization, and provoke a discussion on development and how the language we are exposed to – as well as the context in which we are exposed to it – has a major influence on our socialization and, in turn, the personalities that develop from it.

Do You Know Who You Are? The Effects of Ethnic/Racial Identity on Exposure to Racism and Stress

Presenter's Name: Alysa Herrera Taylor
Classification: Graduate Student
School/College: Graduate School
Presentation Type: Oral Presentation
Faculty Advisor: Debra Roberts
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Coauthors: Naya Wright, Donovan Taylor, Jules Harrell

Research suggests, that when subjected to chronic or acute forms of racism, African Americans are faced with psychological challenges such as depression, anger, lowered life satisfaction and self-esteem, and feelings of loss, helplessness, and fear (Utsey & Hook, 2007). Physically, following stressful events, individuals can experience issues with their immune, neuroendocrine, and cardiovascular functioning (Clark et. al., 1999), and the stress associated with chronic exposure to racism has been implicated in the onset of cardiovascular disease (Merritt et. al., 2006). However, the acquisition of cultural knowledge and racial coping skills taught via socialization has the potential to shield adults and adolescents, and arm them with the ability to manage the challenges that come along with being Black in America (Harrison et. al., 1990). An individual who has been successfully socialized develops a racial identity which allows them to internalize these teachings and communications and figure out how to live as a person of color (Stevenson & Arrington, 2009). Therefore, the goal of this study is to understand how ethnic/racial identity (ERI) impacts the relationship between exposure to racism and stress. Using self-report questionnaires, data from approximately 70 African American undergraduate students was collected using measures regarding experiences with racism, ethnic identity, and perceived stress. Preliminary findings suggest that ERI is a significant predictor of the outcome variables. Based on proposed analyses, additional results will be discussed within the context of increasing our understanding of the importance of ERI and its ability to combat the negative effects of racism and stress.

The Psychological Effects of Success Guilt in the Black Student

Presenter's Name: Brittany Hinkle
Classification: Graduate Student
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Presentation Type: Oral Presentation
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Coauthors: Brittany Hinkle, Nyla Wofford, Rylan Rosario

Black people are constantly fighting against the negative narratives by placing themselves in situations that are associated with better outcomes such as receiving a college education (Covarrubias, Romero, & Trivelli, 2015). Paradoxically, their succeeding beyond others leads to consequences such as "feeling uncomfortable and guilty about their educational achievements when their family members do not have similar access to higher education" and "feeling as though they had psychologically, and in some cases financially, abandoned their family because they chose to attend college" (Covarrubias, Romero, & Trivelli, 2015). Similarly, this upward mobility in the form of academic success is frequently interpreted by other Black people as a sign of moving up and moving away from the family (Spurlock, 1985). Previous research findings have shown Black college students with success guilt is associated with depression (Covarrubias et. al., 2015; Austin, 2009). This oral presentation aims to examine the psychological manifestations of success guilt and how counselors can work with students to address success guilt while providing social support and resources.

African American Female Crossover Youth: An Exploration of Historical and Current Barriers to Services

Presenter's Name: Latoya Hogg
Classification: Graduate Student
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Presentation Type: Poster Presentation
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Current research identifies that there is a gap in services for crossover youth (youths who have an active child welfare and juvenile justice involvement) across the United States, ranging from access to adequate mental health services to appropriate out of home placements (Crawford, Pharris, & Dorsett-Burrell, 2018; Dierkhising et al., 2018; McGuire et al., 2018). However, due to an increasing number of dually involved females in recent years, there has been focus placed on the disparities of youths who are of African-American descent (Baumle, 2018; Williams-Butler, 2018). African-American female crossover youth of color are likely to experience sexual, emotional, and physical trauma; however, their needs are not addressed because of institutional and systemic biases. Furthermore, youths also encounter various physical health disparities, mental health stigma, and educational barriers during multiple phases of their involvement with the juvenile justice and child welfare systems. This poster presentation will review published literature related to the historical criminalization of African-American youth, and current gaps in research related to African-American crossover youth. Presenters will also examine promising interventions that are aimed at combatting barriers often encountered by African-American female crossover youth.

Gentrification and New Narratives of "South L.A." A critical analysis of Los Angeles tourism campaigns and Issa Rae's "Insecure"

Presenter's Name: Jacqueline Jackson
Classification: Graduate Student
School/College: Communications
Presentation Type: Oral Presentation
Faculty Advisor: Jacqueline Jackson
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This study aims to examine contemporary narrative themes of South Central Los Angeles (now known as South L.A.). In the post-industrial American city, tourism has emerged as a multi-billion dollar industry with a record of 48.3 million visitors to Los Angeles in 2017 (L.A. Department of Convention & Tourism Development, 2017). The city's Black and Latinx residents provide cultural capital on which music, film and television industries capitalize. However, Black and Latinx residents have seen hardly any economic benefit (Soja, 2013). In fact, as Wilson (2005) notes they continue to be criminalized and marginalized while being actively displaced due to historic policies of segregation, urban renewal, and gentrification (Freeman, 2006). This study was conducted through a content analysis of videos from the Discover Los Angeles 2016 "Get Lost in L.A." and 2018 #EveryoneIsWelcome tourism campaigns and a critical discourse analysis of the 8th episode of Season 2 of "Insecure" titled "Hella Perspective." This analysis investigates the ways in which tourism campaigns continue to exclude predominantly Black and Latinx communities in marketing communications, and how a popular television program promotes gentrification. These public narratives have enriched the tourism and entertainment industries, while actively devaluing Black and Latinx communities of Los Angeles that have faced systemic racism and oppression historically.

Silenced Pain: The Unspoken Truth About Intimate Partner Violence Within Same-Sex African American Male Couples

Presenter's Name: Cassandra Jean
Classification: Graduate Student
School/College: Graduate School
Presentation Type: Oral Presentation
Faculty Advisor: Terri Adams
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Studies of same-sex relations receive considerable attention in social sciences in recent years. However, most of these studies focus on white people. Relative few studies consider African American's experience in same-sex relationships. This research examines hidden experiences of physical, mental and domestic abuse within same-sex African American male couples. Specifically, this research applies W.E.B. DuBois's theory of double consciousness to examine the complexity of being a black, gay male in America and the factors they face regarding domestic violence. Drawing data from the National Intimate Partner and Sexual Violence Survey, this study aims to show that the black male experience and the stigma of homosexuality in the black community explain why abuse among same-sex black male couples remain hidden. Negative cultural pressures deter a homosexual male from reporting any violence. The double consciousness in the lived experience of black gay men can further constrain their ability to vocalize their maltreatment comfortably. Some of the stigmas associated with homosexuality include lack of masculinity, the prevalence of or the disproportionate impact of HIV/AIDS, and perceived predatorial behavior. By examining how domestic violence in same-sex African American male couples are shaped by complex social processes (i.e., societal pressures on black males, stigmas against black gay males, and victimization that accompanies domestic abuse), this research makes significant contributions to the studies of same-sex relationships, race and ethnicity, and domestic violence by promoting discourse on a critical issue that has not received adequate attention.

White Writers, White Rooms, and Colorless Women: An Examination of Colorblind Casting's Impact on the Black Female Narrative on 21st Century Television

Presenter's Name: Natasha Jean-Pierre
Classification: Graduate Student
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Presentation Type: Oral Presentation
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Colorblind casting is the process of excluding racial identities from character descriptions. This mechanism is used to increase the number of minority actors in roles by ensuring the roles are accessible to every actor. According to Variety, the number of black women with speaking roles on television has increased to 19%. Many television executives and showrunners attribute colorblind casting for the success of their shows with black actresses. Nevertheless, this faux ideology only placates and appeases white people while denying black women visibility on the small screen. This research study focuses on the manner in which colorblind casting upholds systemic racism and willfully suppresses the experience of black women which maintains white supremacy and white hegemony. Method: This research is based on secondary sources including published data, interviews and articles with writers and showrunners . Result: The lack of black writers on television shows ultimately silences the black female experience and reinforces the idea of white female normativity. Writers tend to write black female characters in a manner which is interchangeable with white womanhood. The failure to create nuanced black female representation on screen undermines the dual experience of black women. Conclusion: A shift from colorblind casting to racial consciousness would be beneficial for exploring black female narrative on television. Hollywood should create opportunities for black writers to develop stories that are nuanced in the black female experience. Additionally, television executives should relinquish their fear of alienating white audiences by addressing race and the power dynamics associated with it.

A Literature Review Regarding Systematic Barriers That Lead to Incarceration

Presenter's Name: Emerald Jones
Classification: Graduate Student
School/College: Arts & Sciences
Presentation Type: Poster Presentation
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Purpose: Mass incarceration has severely increased among minorities. Previous research and literature propose the determining factors to be socioeconomic status, educational attainment, and race. Completing a review of the literature incorporating Michelle Alexander's conceptualization of the penal population while merging Critical Race Theories notion that race plays a major role in minorities being the target for mass incarceration and job inequality/unemployment in societal institutions is the overall objective. Methods: This paper will use Michelle Alexander's "The New Jim Crow" and the concept of Critical Race Theory to apply the historical events of the past and how the laws and policies in place now benefit chiefly one racial group and social class-the upper class. Results: The integration of Michelle Alexanders "The New Jim Crow" and Critical Race Theory provided a beginning framework to the system of mass incarceration. The literature supported the ideology that socioeconomic status, educational attainment, and race increases the likelihood of a person being incarcerated. Conclusions: The results indicated that certain attributes such as ascription and achievement are the known components that lead to an individual being incarcerated. Socioeconomic status, educational attainment, and race are some of the elements mentioned in "The New Jim Crow" and expanded by Critical Race Theory. Analyzing mass incarceration within the contexts of the literature presented from the scheme of those texts; either increases or decreases the chances of joining the world of the prison.

The Influence of Adverse Childhood Experiences on Interpersonal Relationships and Decision-Making: A Sample of Black, College-Aged Women

Presenter's Name: Talasia Jones
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There is a wealth of research that links adverse childhood experiences (ACEs) to long-term psychological outcomes for children and adults. Few studies have explored the influence of ACEs on the developmental period of emerging adulthood. Identity and relationship formation are key areas of exploration during this developmental time. Existing literature describes how interpersonal relationships and decision-making in emerging adulthood is influenced by specific adverse childhood experiences. However, this research often fails to consider the influence of race and gender in these areas of study. This study will utilize a mixed-method design to assess the influence of adverse childhood experiences on interpersonal relationships and decision-making amongst a sample of Black female, emerging adults attending a historically black college/university (HBCU). This study will add to the body of research that examines ACEs and long-term effects by focusing on the experiences of a population that has been traditionally excluded or marginally considered when exploring these areas of study. Findings of this study will broaden our understanding of the influence of ACEs on adult attachments and decision-making. This information can be used to inform clinical interventions.

Additionally, it will provide insight to the experiences of a group that not often considered – Black women, emerging adults.

Predictive factors in achieving high grade point average among Ethiopian diaspora students enrolled in the Nontraditional Doctor of Pharmacy program at Howard University College of Pharmacy

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The future of pharmacists' depends on their ability to manage their patients' drug therapies. Many practicing pharmacists outside of the United States and those who hold a B.S.Pharm, have elected to enroll in a non-traditional doctor of pharmacy(NTDP) program to enhance their skill sets. Identifying factors facilitating successful NTDP allows universities to screen candidates effectively and provides academicians a valuable insight. This project examines several factors that predict the academic performance of Ethiopian diaspora students in the NTDP as measured by their grade point average (GPA). In previous study conducted by our colleagues, being an Ethiopian descent was a significant predictor in students achieving high GPA. This subgroup analysis further identifies factors within this group that predicts in a student achieving high GPA.

When Skin Tone Matters: Colorism Affects Attraction and Perceived Personality Characteristics among African Americans

Presenter's Name: Adea Kelly
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Among African-Americans, colorism has been shown to influence attitudes towards individuals varying in skin tone. Participants completed a questionnaire assessing their feelings and attitudes towards pictures of African American individuals varying in skin tone and estimated the traits those individuals possessed. Light skinned persons were judged more attractive but with less desirable traits findings. This study also demonstrated that skin tone of the participant moderated the effect of target tone and perceived trait characteristics. Results suggest that colorism remains among today's African American students, and there are different stereotypes of light and dark skinned individuals qualified by the skin tone of the participant.

Linguistic Landscape of Addis Ababa and Bishoftu, Ethiopia

Presenter's Name: Beverly Khabo
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Linguistic landscape is the visibility and prevalence of languages on public signage in a given region or territory. Linguistic landscape can signal the relative power and status of linguistic communities in and around a given region or territory. The purpose of the research in Addis Ababa and Bishoftu, Ethiopia was to investigate the linguistic landscape to get a better understanding if the ethnolinguistic vitality in those areas. Ethiopia is a linguistically and culturally diverse nation with more than 102 million people. There are more than 85 languages spoken in Ethiopia, however, there are four major languages: Oromia, Amharic, Somali, and Tigrinya. Photographic material and field notes were used to describe the linguistic landscape of Addis Ababa and Bishoftu, Ethiopia. A coding system was developed to address the variables measured. Codification included languages that appear on signs, the position of the languages, first language displayed, salience of languages displayed, location, and types of signs. Results indicate signs in the area were primarily multilingual with most signs appearing bilingually in Amharic and English or signs appeared in three languages: Oromia, Amharic, and English. There were no signs in Somali or Tigrinya. This research adds to the body of knowledge by making us aware that transnational Ethiopians may speak more than the two most commonly known Ethiopian languages- Amharic and Tigrinya.

Psychosocial Differences in College Experiences: HBCU vs PWI

Presenter's Name: Stacia King
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A recent Gallup poll from Purdue University suggests that Black students who attended Historically Black Colleges or Universities (HBCUs) were more likely to feel supported while in college and reported being more engaged in work after graduation compared to their peers who attended Predominantly White Institutions (PWIs). However, much conversation is had in the academic and non-academic world questioning the necessity, importance, and significance of Historically Black Colleges or Universities. Therefore, this study seeks to identify the potential differences in psychosocial variables among students currently attending PWIs versus those at HBCUs. Differences in cultural, racial, and ethnic identity, as well as self-esteem and self-efficacy between the two groups will be explored. Participants include approximately 75 students who self-identify as Black (of African de-

scent) and currently attend a PWI or HBCU. It is expected that students will differ in scores on measures of cultural, racial and ethnic identity. It is also hypothesized that the relationship between these variables, self-esteem and self-efficacy will differ by type of institution. Results will add to the sparse literature that aims to enhance our understanding of the perceived environmental value of attending an HBCU compared to a PWI, and the impact of that experience on developmental outcomes such as self-esteem and self-efficacy.

Depression in Post-Stroke Patients

Presenter's Name: Shakira Kittrell
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Annually, cardiac-related deaths are among the highest causes of fatalities in America. The occurrence of stroke can lead to physical disabilities, numbness, troubles with speaking and understanding speech, and many other life altering symptoms. However, often times in cases of stroke, the patient's mental health is not given as much emphasis and attention as their physical health. Studies have shown that post-stroke depression is one of the most common symptoms of stroke because people may lose their independence which can decrease life satisfaction. The purpose of this paper is to analyze existing literature on the prevalence of depression in post-ischemic stroke patients and potential cultural differences that may arise in emotional regulation. This is an important topic to study and bring awareness to because the health care field can be improved by incorporating culturally relevant and sensitive treatment for patients. By examining commonly used tools that screen for depression and if their results are effective across cultural differences, the goal of this paper is to reinforce the necessity of a multicultural approach when screening for depression, accessing how to treat someone, and how to broaden one's professional worldview in caring for patients.

Black and White Youths' Pathways from Child Welfare to Juvenile and Criminal Justice System Contact

Presenter's Name: Karen Kolivoski
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Coauthors: Jeffrey Shook, Sara Goodkind

Children and youth with child welfare system contact are more likely to have juvenile and criminal justice systems contact than those in the general population. The pathways from child welfare to juvenile justice and criminal justice systems are unclear. Out-of-home placements in child welfare systems, such as foster care and group homes, are used to provide children and youth with safety and security; however, some research suggests they may contribute to increased juvenile justice system contact. Further, research suggests that Black youth compared to White youth have different pathways on the child welfare-juvenile justice-criminal justice pipeline. The purpose of this study is to examine the mediating role of juvenile justice system involvement between child welfare and criminal justice systems among a sample of Black and White youth with out-of-home placements. The sample was a birth cohort of children and youth with child welfare contact from one county (N = 8,317). Two path models (i.e., Black/White) examined the direct effect of juvenile justice on criminal justice system, as well as direct and indirect effects of demographic, child welfare experiences, and contextual variables. Juvenile justice system contact was associated with criminal justice system contact. For Black youth, out-of-home placement and child welfare system variables demonstrated complex relationships with juvenile justice system contact. Providing drug/alcohol services seemed to act as a protective factor for Black youth prior to juvenile justice contact. Specifying relationships among variables helps identify youth most at-risk for justice system involvement and better targets services, particularly drug and alcohol services.

CSD Students' Clinical and Social Perceptions of Various Speakers

Presenter's Name: Shanna Lee
Classification: Graduate Student
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Coauthors: Jay Lucker

The purpose of the study is to identify if there is a need for increased awareness regarding respect and acceptance of dialectal differences in training programs and gain a better understanding of which universities are experiencing cultural breakdowns. The specific aims of the study are to:

(1) analyze SLP undergraduate and master's students' social perceptions of AAE speakers and identify if there is a need for increased awareness regarding respect and acceptance of dialectal differences in training programs to improve social perceptions of speakers of African American English speakers,
(2) analyze SLP undergraduate and master's students' clinical perceptions of AAE speakers and identify if there is a need for further training regarding distinguishing AAE differences from disordered speech to improve accuracy in clinical diagnoses,

(3) compare and contrast social perceptions and clinical perceptions of AAE speakers among undergraduate and master's students at historically black colleges and universities vs. majority-white institutions to determine if there is a difference between the school types. Data collection will occur online. The participants will receive a link in which they can access the survey. Only undergraduate and master's students attending a particular historically Black university and a particular culturally White university will be allowed to participate. Students will listen to and rate the audio samples in the appropriate sections of the survey. The researchers will analyze the rating forms and document how each participant identified and rated the dialects that he/she heard on the recordings.

Political Implications Behind the Television Coverage of Gov. Northam in Blackface

Presenter's Name: Jordan Lindsey
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Coauthors: Indira Somani

This article investigates the role of agenda-setting (McCombs & Shaw, 1972; McCombs, 2004) in the coverage of Virginia governor Ralph Northam and the exposure of his bearing of blackface during his time in medical school. Using the television coverage of the story by MSNBC's NBC Nightly News and Fox News' Special Report from February 1, 2019 to February 8, 2019, we conduct a qualitative content analysis in order to discern. Considering Virginia's political trends, MSNBC's and Fox News' fairly partisan audiences, as well as the historical significance of blackface, we hope to shed light on the ways racial issues are covered and potentially politicized in contemporary US contexts. Some of the issues to be considered in the paper include: does the politicization of the story diminish its racial features, are partisan biases evident in the coverage, and what (if any) agenda may potentially be transferred as salient to the public.

Examining the Use and Results of Art Therapy Within Prison

Presenter's Name: Lillian Lo
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The use of art therapy in prison rehabilitation projects has been widely used. The use of art therapy with prison inmates can be useful in the rehabilitation, readjustment back into society, and help with preventing returning to prison. In this study, we will report the findings from a systematic review of the existing research about the effectiveness of art therapy with imprisoned populations. An example of a study we will include in the review is one where scales such as the Formal Elements Art Therapy Scales (FEATS) and the Beck-Depression Inventory-Short Form (BDI-II) were used to operationalize the effectiveness of art therapy in managing the presence of depression and trauma commonly found in inmates (Gussak 2005). This study will offer a better understanding of how art therapy can impact their lives. It will also highlight future directions for art therapists who want to work with this population.

A Pedagogy Learned

Presenter's Name: Adanech Makey
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2,635,743 public school students received an out-of-school suspension in the 2013-2014 school year in the United States. Of that total population, 1,042,991 students were Black; making them the highest demographic of students receiving out-of-school suspension within that year alone. This statistic highlights the harsh discipline-oriented nature of the American public school system and portrays the underlying institutional racism that works to keep Black students out of the classroom. Due to the Eurocentric foundation which America's public school system is based on, current solutions to end racial disparities in school discipline generally overlook discipline methodologies utilized in African-centered schools. For this research, an observational analysis in the form of a survey conducted with public school teachers will be implemented to study behavioral maintenance strategies utilized in African-centered schools. The specific methodology for this project will include executing regression analysis to determine how the disciplinary methods of a normative public elementary school and an African-centered elementary school differentially impact student behavior. Due to findings gathered from preliminary observation and literature review, it is hypothesized that fewer behavior problems will be recorded following disciplinary actions in the African centered school as opposed to in the normative public school.

A systematic review of professional engagement among occupational therapy practitioners

Presenter's Name: Cheryl Mathews
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Professional engagement in occupational therapy is essential to promote the field and address key challenges encountered by practitioners, including increased demands for high quality and cost-effective care. Furthermore, professional engagement and advocacy are crucial to develop awareness of the distinct value of occupational therapy. A systematic review is being conducted to determine the factors that potentially impact professional engagement among occupational therapists, as there is not sufficient research regarding the topic. The systematic review will include the use of seven electronic databases and inputting key search terms, such as "professional engagement", "advocacy", and "occupational therapy" to extract relevant articles in accordance to the research question. Data collection will then include two separate screening stages. The first screening stage will entail reviewing ten percent of abstracts among three reviewers based on the inclusion criteria. The second screening stage will be more rigorous as a full-text review will be administered among the selected articles from the first screening stage. The second screening stage is followed by data extraction which will be conducted through descriptive and narrative synthesis. Lastly, a quality review will be administered to further contribute to a summary of understanding common factors that impact professional engagement among occupational therapy practitioners.

The "Turning Point" Generation: An Assessment of Ethnic Identity and Achievement Among Third-Generation West Indians in the United States

Presenter's Name: Dana Mccalla
Classification: Graduate Student
School/College: Graduate School
Presentation Type: Poster Presentation
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Studies on West-Indian immigrants and their children have become a distinct area of focus within the literature on immigrant assimilation (Sowell, 1978; Waters, 1994; Foner, 2001; Rumbaut, 2004; Richards, 2014). This population has piqued the interest of researchers who seek to better understand the diverse lived experiences of Black and Latino populations in key metropolitan cities around the U.S. With scholarship on first- and second-generation groups steadily expanding, studies now point to the need for investigations of social, political, and economic outcomes among the new third generation. Guided by the principles of segmented assimilation theory (Portes and Zhou, 1993) and cultural-ecological theory (Ogbu & Simons, 1998; Warikoo and Carter, 2009), this study seeks to examine the relationship between ethnic identity, educational attainment, and occupational attainment among third-generation West-Indians in the United States. Data from the General Social Survey will be used to conduct a descriptive, exploratory quantitative analysis of these variables.

Reducing Poverty through Density Bonuses: Analysis of MPDU Rental Housing Program in Montgomery County, Maryland

Presenter's Name: Kirsten Mcleod
Classification: Graduate Student
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Presentation Type: Oral Presentation
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Montgomery County, Maryland has one of the oldest affordable housing programs, Moderately Priced Dwelling Units (MPDU), designed to advance affordable housing in the county. This paper studies the impact of the rental MPDU program on poverty reduction. An important goal of the MPDU rental program is to provide affordable housing to the lower-income population in mixed-income neighborhoods with better education and employment opportunities. Since MPDU ordinance covers new developments, the lower-income population can potentially have affordable housing opportunities in high-growth neighborhoods of Montgomery County (MC) including the growing exurban communities of Clarksburg and Germantown (Urban Institute, 2012). Contrary to more exclusive zoning regulations, rental MPDU Inclusive Zoning (IZ) ordinance enables the program beneficiaries to obtain rental housing at below market rates and of comparable quality with market-rate units. This study will make use of a novel data set of property level rental contracts obtained from the MPDU program to examine poverty alleviation impacts of the program via the following research questions:

- Did MPDU rental program increase housing affordability in the county?
- Has MPDU rental program met the program goals in terms of racial integration?

The paper will combine the address level data with the neighborhood level Census Data. The preliminary findings indicate housing affordability, as measured by the ratio of renter's annual rent to annual income, to be in excess of the rule of thumb. This suggests an adverse outcome in the case of lower-income renters in the county, which may have negative implications for poverty alleviation.

Understanding the Underlying Stereotypes and Depictions of Black People and Their Lasting Impressions on Society

Presenter's Name: Savannah Miller
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Presentation Type: Oral Presentation
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More recently, it has appeared that there is more diversity in television and media. The presence of Black actors and Black content has made its way onto major broadcasting networks, during the prime time hours, and have prospered in ratings. During these prime time hours, the viewership on these networks are at its highest. These times typically take place in the evenings on weeknights, and since the competition is so high, networks tend to schedule their best performing shows during this time. As prime time television continues to include more and more Black content, actors, and storylines, these shows continue to reach a broader demographic. In a study conducted by Nielsen, it was discovered that some of these same shows have grown to develop an abnormally large cross-cultural appeal, meaning that a majority of its viewers are of non-Black ethnicities. While American Broadcasting Company (ABC) is featured the most for producing and broadcasting these cross-culturally appealing shows, The National Broadcasting Company (NBC) and The Fox Broadcasting Company (FOX) are also on the list. There was once a time in television where Black actors could only be featured in roles that perpetuated harsh stereotypes like mammies or minstrels or thugs, so to see a "broader" range is refreshing. In fact, it might discourage others from dissecting the roles that exist today, given the strides in which Black actors and Black productions have made. However, this study seeks to explore the underlying stereotypes that exist within these shows, and whether or not they

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United States Immigration Policy and Latinx Migrant Children Trauma

Presenter's Name: Natalie Munoz
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Presentation Type: Oral Presentation
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50 million migrant children around the world have crossed borders or were forcibly displaced (UNICEF, 2016). "Approximately 50% of these children fled violence and insecurity such as bombs, gang violence, persecution, shriveled crops, and low family wages" (UNICEF, 2016, p. 3). Migrant children are at risk for some of the cruelest forms of abuse and exploitation during their journey (Escobar, 2018). This report analyzes the causes of immigration and the size and scope of Latino child migrant trauma to the United States. To illustrate, it provides a historical overview of immigration policies under various presidential eras. It also includes two interviews with Latinas who migrated to the US as children. Lastly, it provides research-based solutions to address policies that contribute to child migrant trauma from a social work perspective.

Graphene-Bi (111) interface: atomic structure and electronic properties

Presenter's Name: Ivan Naumov
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Presentation Type: Oral Presentation
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Interfacial interactions are widely used to engineer desired electronic properties. In this context, the interface between graphene and nanostructured bismuth is especially interesting since both the materials exhibit unique properties associated with the Dirac cones (graphene) and quantum spin-Hall states along the edges and hinges (bismuth ultra-thin films and nanowires). In this work, using first-principles calculations, we study the interfacial interaction between graphene and Bi (111) surfaces. Since the actual structure of graphene on Bi (111) has not been experimentally determined and can be incommensurate, we investigated a large number of crystal approximants to the incommensurate interface and found the most stable moiré structure among the studied composites. Despite hybridization between graphene and substrate orbitals, the graphene-derived Dirac cones are preserved, although shifted with respect to the Fermi level due to the n-doping of graphene. We also find that a small gap opens up at the original Dirac points in these cones due to interface–induced spin–orbit coupling within graphene. At the same time, the bands near the gamma point are mostly Bi-derived and resemble the corresponding surface states in pure Bi. Using the obtained results, we discuss possible applications of graphene/Bi interfaces in future electron and spin transport devices.

Witnessing Videos of Police Killings of African-American Men: An Exploration of the Psychological and Physiological Outcomes on Young African-American College Students

Presenter's Name: Mickaela Nicholson
Classification: Graduate Student
School/College: Graduate School
Presentation Type: Poster Presentation
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Coauthors: Jamar Nash, Sean Northern

The short and long-term effects of African-Americans' exposure to murder and violence at the hands of law enforcement is an under-investigated topic that has public health and epidemiological implications (Alang et al., 2017; Cooper & Fullilove, 2016). The media continues to display images and re-

cordings of excessive force inflicted on adolescent and adult African-American bodies by the hands of law enforcement (Trujillo, 2018). This study seeks to investigate the physiological and psychological impact these images have on young, adult Black viewers. Participants' blood pressure and heart rate will be monitored as they are exposed to a compilation of videos depicting the homicides of unarmed African-American males by police officers. A control video that includes homicides of White victims by law enforcement will be presented in order to address the impact of racial identity has the expected outcomes. Self-report measures will be used to gather important information concerning the participants' background including their prior exposure to violence, trauma history, perceived discrimination experienced, and racial identity. We will also be exploring the extent to which viewing these videos may influence psychological outcomes such as anger/hostility, state anxiety, and future orientation. This study is guided by a race-based-trauma-focused, biopsychosocial model, which examines the participants' socio-emotional history as a predictor of both physiological and psychological health outcomes. The participants will be Howard University undergraduates. We hypothesize that viewing the homicides of the African-American males will elicit a distinct and measurable stress response.

Girl Interrupted: Legal System Involvement through the Gendered Lens

Presenter's Name: Ashley Ortiz
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There are a multitude of ways in which girls, especially ethnic minorities, become entangled in the juvenile legal system. Gendered pathways are structured to push girls into the legal system based off responses from their behavior. Their behavior is viewed through a gendered lens, and is directly related to experiences of sexual abuse and violence. Gender and race intersect which creates a unique context for girls of color to experience their social world, and in turn how others and the system react to them. Ethnic minority girls' traumatic and unhealthy social contexts drive their behavior and subsequent involvement into the juvenile justice system. Feminist researchers propose gendered pathways into the juvenile justice system that reflects the unique pressures and roles of girls in society rendering the juvenile justice system as inherently sexist. The decision to arrest and detain girls in these cases has been shown often to be based in part on the perception of girls' having violated conventional norms and stereotypes of feminine behavior even when that behavior is the result of traumatic experiences. Equally important, the patriarchal structure of the criminal justice system itself, a hierarchical institution characterized by such masculine values as dominance and control, and the tendency to label offenders and offenses differentially by gender and race must be taken into consideration. This "gender-bias" will be examined through the literature to reveal the structural inequities that disproportionately sweep girls of color into the juvenile justice system, and the unique influence of trauma on girls' mental health.

A look at poverty and belief systems in America; the beginnings of developing effective alternatives

Presenter's Name: Angela Pashayan
Classification: Graduate Student
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In 1935, the welfare assistance program begin in America. History demonstrates a shift in attitudes regarding welfare assistance from the presidency of Franklin D. Roosevelt to current times. Some people view welfare assistance negatively, though they view international aid positively. The intent of welfare from the 1930's Great Depression was to help the unemployed. This study takes a look at perceptions of welfare over time in comparison with perceptions of international aid; a comparison of beliefs regarding values, work ethic, race, and class as it pertains to welfare. The purpose is to bridge gaps in our understanding of each and to helps America build alternative ways of reducing poverty.

Wikipedia and the Outsider Within: Teaching the Politics of Knowledge with Black Feminism and Wikipedia

Presenter's Name: Tracy Perkins
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Black feminist thought has long drawn attention to incomplete, biased and discriminatory knowledge claims in academia and the public sphere, as well as black women's role in advancing sociological thought. Biased and inaccurate knowledge claims persist, and spread even more quickly in the digital era. While some black feminist scholarship is examining the politics of knowledge in the digital realm, less work has been done to analyze Wikipedia specifically. Wikipedia is ripe for such analysis: the majority of its contributors are white men, and it is the single most referenced online encyclopedia in the world. This paper presents a class assignment in which predominantly black, female, undergraduate students analyzed and then improved content on Wikipedia. We [the instructor and three students who completed the class project] reflect on our experience with the assignment.

We argue that engaging the tension between positivism and black feminist thought on Wikipedia can help train the next generation of black feminists thinkers. It also provides a much needed framework to improve Wikipedia content, academia, and by extension, the information available to the global public.

Bougie While Black: An Exploratory Study of the Significance of Race Among the Black Middle Class 2009-2016

Presenter's Name: Keadrick Peters
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Presentation Type: Oral Presentation
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After the victories of the Civil Rights Movement, Wilson (1978) posits that social class had transcended race as the salient determinant of life chances for Black Americans. This research project is an empirical test of the "declining significance of race" thesis in relation to life chances of Black Americans. The proposed research will study the significance of race and class among Black Americans subjective attitudes on life chances. Lending support to Lacy and Marsh (2011), "life chances" include not only the economic barometer, but also the possibility of attaining a happy and satisfying life without discrimination. The relationship between race and quality of life has two schools of thought regarding the key determinant of life opportunities. On the one hand, scholars that corroborate Wilson's thesis situate "social class" as the source of problems for Black Americans due to an increase of class phenomenon rather than race. Whereas, the "persistence of race" scholars view race as the increasingly the source of problems Blacks confront. The two aforementioned perspectives are tested using data from PEW Research Center for Racial Attitudes Survey 2009 and Racial Attitudes Survey 2016. The effects of race and class were compared across the years of each survey on selected measures of quality of life that include occupational mobility, racial discrimination, and racial stereotypes. The results revealed a persistent race effect on all the quality of life variables. The results yield a statistical significance of the race perspective that being Black impedes life chances regardless of social class.

The Health Gap: What's the relationship between socioeconomic status and healthcare?

Presenter's Name: Kayla Pindell
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According to "How Socioeconomic Status Affects Patient Perceptions of Health Care: A Qualitative Study" socioeconomic status refers to an individual or families economic and social position in society in relation to others based on income, education, and occupation. In our society, nearly one third of all americans live day to day life without a sense of security or certainty of what they will do if a medical emergency were to come about. Disparities in American society exist in healthcare due to socioeconomic factors.The purpose of this research is to explore how different socioeconomic factors affect healthcare and make the general population aware of the different health disparities that come with being of a lower socioeconomic status. Over the course of a semester, the research group created a survey on the awareness of the healthcare that is provided at a college university. The survey is aimed at discovering the benefits and drawbacks of healthcare and student awareness of coverage in this research setting. The survey data of 150 participants will be analyzed by using the SPSS program. The reason for this exploration is to investigate how extraordinary financial status' influence human services all in all. To analyze the data it will be based off an statistical test on the relationships between those of the upper and lower socioeconomic classes and healthcare. The test will be surveyed based off of questions pertaining to socioeconomic statuses on campus such as awareness, access, benefits, and perception.

Generation Z and HIV: Understanding the Sexual Health Knowledge, Attitudes, and Practices of People born at the Apex of the AIDS Epidemic

Presenter's Name: Marie Plaisime
Classification: Graduate Student
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Coauthors: Marie Jipguep-Akhtar, Akiv Dawson, Cassandra Jean, Anas Askar

HIV rates among African-Americans remains higher than other racial groups. This has led to a surge in initiatives designed to combat the HIV epidemic. Due to advances in medicine and technology, HIV has become a treatable condition. However, finding ways to prevent the transmission of the virus is still an important social issue. Understanding Generation Z's knowledge and attitudes regarding sexual health is one important factor in reducing the spread of HIV. The paper discusses the sexual health knowledge and attitudes of Black youth born in Generation Z. The research primarily focuses on college students at a historically Black university in Washington, D.C. The study is significant as it addresses how sexual health attitudes and knowledge, particularly as it relates to HIV, may be different in generations that are removed from the HIV epidemic of the 1980s and 1990s. Furthermore, these attitudes may contribute to the spread

of HIV or other sexually transmitted diseases. The study involved respondents from various demographic groups. We distributed self-administered questionnaires and instructions to participants. Data was analyzed using SPSS to address the research questions. The emergent themes, sample limitations and recommendations for future research are discussed.

Social Movements & Medical Mistrust: The Influence of Social Media among Black and Hispanic Millennial Women on Healthcare Services

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School/College: Arts & Sciences
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Prevailing literature suggests that racial minorities, aged 65 and older, distrust the healthcare system. The historical trajectory of institutionalized racism suggests that older Black and Hispanic women have less trust in the healthcare system and health providers than their white counterparts. Considering the rise of social media and social justice movements, young adults' perceptions of race and racism require further exploration, especially among Black and Hispanic millennial women. Evidence suggests that Black and Hispanic millennials use social media to engage with one another and identify ways to dismantle institutional racism. Using the Behavioral Risk Factor Surveillance System (BRFSS) national survey, we investigated how internet use influenced perceptions of race, racism, and access to health services among African American, White, and Hispanic women. Participants (n=3929) disclosed their experiences with race and racism. Overall, when seeking healthcare services, 63.8% of non-Hispanic white women felt they were treated better than other races. In comparison, 90.9% of Black women and 71.0% of Hispanic women felt they treated worse than other races. When stratified by age, 51.7% of white women (ages 18-24) reported being treated the same as other races while 75% of Black women (18-24 yrs) reported feeling treated worse than other races. This analysis suggests that additional research should be conducted to explore how social movements and social media platforms contribute to medical mistrust among Black and Hispanic millennial women.

Determining Differences in Neurocognitive Performance Between Student Service Members and Civilian Students

Presenter's Name: Mara Ramirez ruiz
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Background: Previous research suggests exposure to deployment, combat, and military training may lead to poor neurocognitive performance. Although previous research has examined the mental health of service members' in higher education, there is a dearth of literature on student service members/veterans (SSM/V) neurocognitive performance. The purpose of this study was to determine the difference in neurocognitive performance between SSM/V and civilian students. It was hypothesized that there would be a difference in neurocognitive performance between veteran, ROTC, and civilian students due to military experiences. Methods: Data for the current study was extracted from the study entitled, "The Neuropsych Study". The sample consisted of 3 student veterans, 12 Reserve Officers' Training Corps (ROTC) students and, 45 civilian undergraduate students from Virginia State University with a mean age of 22.78 (SD = 8.60) years. Upon study entry, participants were administered a series of neurocognitive assessments that measured memory, attention, and executive functions. Results: Independent sample t test indicated ROTC students (M = 3.25, SD = 1.60) had significantly lower Digit Span Backward scores than Veteran students (M = 6.00, SD = 0.01). Employing multivariate analysis of covariance, Veteran (M = 54.50, SD = 7.77) and ROTC students (M = 55.27, SD = 8.63) Symbol Digits Modalities scores were significantly higher than civilian students (M = 48.29, SD = 8.63). Conclusion: Differences in neurocognitive performance may be due to the potential benefits of physical and military training experienced during service.

The Florida Project

Presenter's Name: Leondre Ramsay
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Ending temporary protected citizenship status (TPS) for Haitians, increased arrests by Immigration and Customs Enforcement (ICE), and the banning of sanctuary cities in Florida are a few examples of recent policies which disproportionately affect racialized/marginalized communities. Florida, having the fourth largest immigrant population (as a percentage of the state population), is particularly affected by these policies and impending demographic changes. I utilize settler colonial theory to analyze the underlying conflicts in demographical changes and contextualize the current moment in relation to state history. I argue that the contemporary treatment of racialized communities in Florida can be understood through the logic of the form of colonialism practiced there, settler colonialism. Settler colonialism is defined as a distinct type of colonialism that functions through the replacement of Indigenous populations with an invasive settler society that, over time, develops a distinctive identity and sovereignty. The time period chosen for this research is 1815-1860 because this period contains the US acquisition of

Florida, and three Florida-Seminole Wars. The regression of Florida from a sort of safe haven for Indigenous peoples and formerly enslaved Africans into a state of slavery and Indigenous displacement following its acquisition by the United States represents the larger objectives of settler colonialism: to eliminate the Indigenous in order to acquire land and exploit others in order to turn a profit. In determining appropriate steps on decolonization, we will repurpose racial categorization based on settler colonial theory.

From the Classroom to the Courts: Examining the Impact of Race and Gender on Zero - Tolerance Policies and Outcomes in Washington D.C. High Schools

Presenter's Name: Joshua noel Rivera
Classification: Undergraduate Student
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Presentation Type: Poster Presentation
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Over the past 30 years, the United States education system has collaborated with the juvenile court system, transforming schools into a prison-like environment. This alliance led to the criminalization of school infractions and the fomenting of a School to Prison Pipeline. The Pipeline tracks students "out of educational institutions, primarily via zero tolerance policies, and directly and/or indirectly, into the juvenile and adult criminal justice systems" (Heitzeg, 2009). Today, zero tolerance, the "policy that mandates the application of predetermined consequences, most often severe and punitive in nature, that are intended to be applied regardless of the apparent severity of behavior, mitigating circumstances, or situational context" (Mallett, 2016) is ubiquitous in US high schools. However, responses to policy violations range from minor disciplinary actions like teacher reprimands to the most severe response, expulsion. This study seeks to determine whether there are any racial or gender differences in violations and outcomes in Washington DC, which as the 49th lowest ranked school system in the nation, is among the systems with the highest percentage of threatened/injured students but maintains the lowest bullying incidence rate (WalletHub, 2018). DC is also the fastest gentrifying city in the US (Folger, 2017). Since 2000, its black population has declined, its white population has increased, and the city has gained 50,000 Hispanic residents (Baca and Finio, 2018). To determine how school demographics inform the outcomes of zero-tolerance policies in DC, we will compute a racial ratio or "index of dissimilarity."

An Analysis of Speech-Language Pathologists' Knowledge of the Sociolects in African American iGeneration Teens'

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This research study will investigate speech-language pathologists' (SLP) knowledge of social dialects (or sociolects) used by African American teens, ages 13-18. This study will further investigate whether an inter-generational gap exists between the sociolects of these iGeneration (or GenZ) teens and that of Millennial speech and language clinicians, ages 24 and above. Data collection sources will include online databases and social media platforms, such as the Urban Dictionary, Instagram, and Twitter. This data will be utilized to develop a data set of defined generational lexicons that can lend to the understanding of generational gaps between clients and clinicians and how this may affect treatment approaches. Results from this study will have implications for school-based speech-language pathologists, as well as general and special educators, who work with teenage speakers of the non-mainstream dialect, African American English. This project addresses multicultural issues that may result in educational disparities for students from culturally and linguistically diverse backgrounds.

An Examination of Educators' Attitudes, Feelings, and Perceptions Toward African American English as a Coming of Age Social Dialect

Presenter's Name: Erica Roberson
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This research study will examine generational language differences between millennial (and older) educators and African American iGeneration adolescents, ages 10-18. The study will further examine educators' reactions to language change and adolescent speech patterns that may differ from their own. Data collection sources will include responses from semi-structured interviews and field notes from an unobtrusive observation of an academic or therapeutic lesson. Results from this study will contribute to a better understanding regarding generational and cultural language differences and possible stereotypes that are associated with African Americans who use nonmainstream dialects. This project addresses multicultural and cross-cultural issues that may ultimately result in educational disparities and/or discriminatory practices against individuals from culturally and linguistically diverse backgrounds.

Association of Multiple Childhood Victimization Risk, Sleep, Depression and Drug Use among African American Young Adults in DC

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Coauthors: Roderick Harrison

Children are exposed to several forms of violence every day and this exposure has a significant long-term impact on physical, emotional and mental health and well-being that can last into adulthood. This research examines the association of multiple childhood victimization, depression, sleep and drug use among African American (AA) young adults. We detail these experiences in 637 self-identified AAs, ages 18 to 25, from socioeconomically disadvantaged wards in Washington, DC. Method: Five categories of exposure to childhood violence were used in this study: conventional crime, child maltreatment, peer and sibling victimization, witnessing and indirect victimization and sexual victimization. The childhood exposure to violence scale contains 34 questions asking participants indicate whether they experienced or witnessed several forms of violence in each category before age 18. As children, 30% of the participants were exposed to physical violence by caregivers, and 27.8% witnessed domestic violence. Witnessing or being an indirect victim of violence such as a burglary of the family household, was significantly correlated with trouble sleeping in adulthood ($r=.221$, $p<.05$). Sexual victimization was significantly correlated with having problems with alcohol, tobacco and other drugs ($r=.257$, $p<.05$). There was a significant correlation between victimization by peer/sibling and depressive symptoms ($r=.156$, $p<.05$). Measuring exposure to childhood violence is crucial for developing services, programs and policies to reduce childhood victimization and problems that can carry over into adulthood. Our findings highlight the importance of examining multiple forms of childhood victimization and point to the need for trauma-informed programs that are

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Police Violence in Salvador, Bahia

Presenter's Name: Leaynet Sahilu
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Presentation Type: Oral Presentation
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My presentation will focus on police violence in Brazil, particularly in the notheastern city of Salvador, which is home to the largest black population outside of the African continent and has a strong African-influenced culture. Although residents in cities such as São Paulo and Rio de Janeiro have suffered at the hands of law enforcement, Soteropolitanos (Brazilians from the city of Salvador) have also been victims of police violence, with the majority of police victims being young black men. In my presentation, I will briefly talk about the history of police brutality against the Afro-Brazilian population, the political, social and economic marginalization they have been suffering since the abolishment of slavery, as well as how factors such as slavery, post-slavery discrimination against the Afro-Brazilians, etc contributed to the situation that they are in today.

Weighing the Costs: Why Orthodontic Treatment Improves Job Prospects

Presenter's Name: Warren Scott
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Separate studies show that aesthetically pleasing teeth increase employment prospects (Pithon et al., 2014), and lead to positive trait judgments of attractiveness, intelligence, and warmth (Kershaw et al., 2008; Newton et al., 2003). However, it is unknown whether these traits explain the effects on job outcomes. This research presented individuals before and after receiving orthodontic treatment and measured traits and job prospects. Participants also paired targets with job titles (e.g. Nurse and Telemarketer), which were translated into salaries using Bureau of Labor Statistics data. Ten photos of Black patients (5 male) were evaluated by 88 Black participants. Photoshop was used to counterbalance old and new faces with pre and post-treatment teeth. A mixed effects model set the primary variable, good versus bad teeth, as a fixed factor, and participant and target individual as random factors. Bad teeth significantly decreased judgments of warmth (Mdiff = .23), competence (Mdiff = .58), and attractiveness (Mdiff = 1.09, all ps < .01). Bad teeth led to lower salary estimates on the measure using job titles (Mdiff = $7,073). A model with attractiveness, competence, and warmth as parallel mediators showed that only competence explained the effect of unaesthetic teeth on salary ($5,190, 95% CI [$3,574, $7,059]). Finally, bad teeth photos were paired with non-client facing jobs more than good teeth ($X2$ (2, 878) = 11.67, $p <$ .01). In sum, withholding orthodontic has a tangible negative impact on job options, and salary, the later due to low competence judgments.

Effect of a Cursive Handwriting Program on Legibility of Written Work for Male Middle School-Aged Students

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Development of handwriting skills is imperative for a child's overall success in school. Unfortunately, an average of 10 to 34% of school-age children fail to master this skill (Smits-Engelsman, et al. 2001). Failure to master the skill of handwriting may consequently be detrimental to the child's self-esteem, personal relationships, and his or her self-perception as well as others' perceptions of the child's abilities (Schwellnus, et al. 2012). This project aims to provide more research in the area of cursive handwriting instruction and occupational therapy interventions for middle school-aged students. A small group of selected middle school-aged boys with handwriting difficulties will be seen weekly for 8 weeks for cursive handwriting interventions. The Evaluation Tool of Children's Handwriting (ETCH) tool will be used as a pretest assessment to evaluate the student's current print handwriting speed and legibility. A survey will be provided to the students to assess current satisfaction in their written work. In the following 6 weeks, the researchers will use the Handwriting Without Tears: Can Do Cursive handwriting tool as a method to instruct the students how to write in cursive. The ETCH will be re-administered the week following to observe improvements. In addition, the students will be re-administered the survey detailing their current satisfaction with their written school work. The teachers will also be administered a survey to note any changes in their students' handwriting following the intervention. The anticipated results should show an increase in writing legibility, speed, and level of self-esteem.

The Mental Health Impact of Microaggressions Imposed on College Black Women and Coping Strategies Employed

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Microaggressions are verbal, nonverbal, and environmental indignities, whether intentional or unintentional that communicate hostile, derogatory, or negative messages toward people of a marginalized group (Sue et al., 2007) Microaggressions have been found to increase the likelihood of depression and negative affect (McCabe, 2009). While students may employ immediate coping strategies when faced with a microaggression, there can be resulting psychological distress experienced after the encounter of a microaggression poses concern of how students cope in the aftermath of a microaggression (Solorzano, Ceja & Yosso. 2000). A specific demographic of students that have a specific intersectional social position are black women. Black women are a demographic of intrigue for their representation of two marginalized groups. There is a dearth in research on the coping strategies and impact of microaggressions that college black women face. Furthermore, perhaps there is an opportunity for clinicians to gage a therapeutic approach in serving female clients of color who have experienced a microaggression on account of both race and gender. Therefore, the following discussion and theoretical research model poses and aims to address the following questions: Why do some black female students experience psychological distress after experiencing a microaggression and others do not? What are some resilience factors that allow some black female students to cope long term with microaggressions? What are some of the strategies and perspectives employed black female college students to cope with microaggressions? How can clinicians serving clients that have experienced a microaggression therapeutically address the psychological distress caused by the encounter?

The Effects of Cognitive-Communicative Disorders on Academic Success and Juvenile Delinquency in Low Socioeconomic Standing-Minority Youth

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There is a long standing gap in the racial differences within education and criminal outcomes for low-SES minorities in the United States. Generally, in low-SES minority communities, health disparities present with racial gaps and limited focus on analyzing and addressing the disparities. This is most prevalent from the viewpoint of the impacts health disparities have on complex social factors and social determinants such as quality of life including mental health and ability, education, and criminal thinking and behavior (CTB). Healthcare has been identified as a weak health determinant for addressing the validity of social, economic, and environmental factors as a means of improving and influencing population health disparities in low-SES minority populations (Heiman & Artiga, 2016). This proposal hypothesizes that health disparities such as limitations and access to speech-language pathology intervention for cognitive and communication disorders (CCD) within the schools and community for low-SES minority populations at-risk for or experiencing undocumented and untreated CCD is directly correlated to their academic success, status offenses, and delinquent behavior (DB). The researcher proposes to examine specific social determinants of health: a) economic stability – specifically poverty and employment; b) social and community context – from the prism of discrimination and incarceration; c)

neighborhood and environmental context – such as, crime and violence; and d) education – language and literacy, and high school graduation (World Health Organization, 2016). This presentation will discuss the findings of a research study aimed to analyze the impact of CCD on academic success and delinquent behavior.

The Application of Mixed Methods to Child and Adolescent Mental Health Studies in an African Context

Presenter's Name: Jasmine Stevens
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Since the mid to late 1980s, mixed methods research that integrates quantitative and qualitative data has been widely used to understand both the decision making process and outcomes of utilizing mental health services in underserved communities. This approach is particularly relevant in the African context when we seek to understand how persons decide to utilize services. This line of inquiry also permits consideration of what services are deemed credible by the local community, and what mental health problems warrant help. This poster presentation will introduce the application of a mixed methods approach in our study, Improving Utilization of Service for Children and Adolescents Mental Health, a 3-year study in partnership with the University of Ibadan to understand how adult guardians decide to use accessible mental health services for their children in Ibadan Nigeria. Specifically, we will describe adapting and integrating the semi-structured McGill Illness Narrative Interview with select quantitative measures to be administered to a subset of 50 guardians who completed the larger quantitative survey (total sample=255). The proposed qualitative questions and the corresponding items from the quantitative battery will be presented with other methodological considerations including interviewer inquiry (and listening) approach, linguistic and cultural adaptation of terms, and the tailoring the qualitative questions to capture 3 types of accounts about child mental health (CMH) - links connecting past experiences to CMH symptoms, analogies drawn between past events and CMH symptoms, and causal explanations of CMH – all of which may not necessarily reflect western models of reasoning about illness.

The impact of pre-sleep behaviors on sleep quality in good and poor sleepers.

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Author: Alicia Stokes, M.S.

Background: Sleep disturbances are likely contributors to the health problems faced by urban residing African Americans. However, little is known about the specific behavioral contributors to these sleep disturbances. Good sleep hygiene and pre-sleep behaviors are known to increase restfulness and act as a buffer against sustained sympathetic nervous system activity during sleep. The objective of this study was to compare rates of endorsement of prominent sleep disruptive behaviors in good and poor sleepers. Methods: This study examined African Americans residing in urban neighborhoods in the Washington D.C metropolitan area. The participants were surveyed on their neighborhood stress and sleep-related behaviors prior to going to sleep using an ecological momentary assessment. Results: Our preliminary findings suggest a trend towards greater endorsement of nocturnal vigilance among poor sleepers. However, endorsement of electronic use before bed seems to be evenly dispersed between both groups. Conclusions: Further investigation of the impact of pre-sleep behaviors on sleep quality in good and poor sleepers would have implications for reducing health disparities in urban residing African Americans.

Statistical Analysis of Opioid Overdose-Related Mortality among Different Racial Groups from 1999-2017

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The opioid epidemic is becoming a public health emergency in the U.S. and many states have declared opioid crisis since 2017. In 2016, among 42,249 Americans who died of drug overdoses, 4,374 were Blacks and 3,440 were Hispanics. In 2017 the death toll reached 47,600, at the same time the death counted for Black and Hispanics were 5,513 and 3,932 respectively. While government agencies, medical professionals and researchers are looking for a resolution to solve the crisis, it is important to address potential health disparities in affected minority communities. In several states including the District of Columbia and Maryland, the number of African Americans who died of drug overdoses has increased at an alarming rate.

This research aims to investigate the trend of opioid crisis based on national statistics of opioid mortality from 1999 to 2017 (Statistics on Kaiser Family Foundation database, https://www.kff.org/state-category/health-status/opioids/), and to compare and contrast the racial disparities of opioid mortality. By identifying the trend in opioid-related morbidity, the researchers raise awareness of racial disparities in opioid crisis and recommend community leaders and policymakers to take actions and procedures to address the issue.

Criminalization of Black Girls and its Impact on Academic Achievement

Presenter's Name: Chioma Tait
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Black children have chronically been at the bottom of the achievement gap compared to their White peers at the national average for over 50 years, despite an increased emphasis on closing the gap. The hyper-criminalization of students' behavior has become a prevalent issue in school systems. The overuse of suspensions and expulsions in schools lead to more time outside of the classroom, which results in decreased academic achievement. Overwhelmingly, prior studies have focused on the academic progress of Black males while neglecting Black females which is unfortunate, because criminalization is increasing in girls as well. Overall, Black girls are three times as likely to receive a referral to the office compared to White girls. Black girls are disciplined for more ambiguous actions such as disobedience, dress code, and aggressive behavior. Academic achievement is negatively impacted by frequent referrals to the principal's office, suspension and expulsion because students are spending large amounts of time outside of the classroom. If made aware of negative internal biases, teachers, principals, and other staff members have the opportunity to curb their bias and reduce the chances of criminalizing Black girls for subjective behaviors. School psychologists would have a responsibility to mitigate the potential response of negative biases by forming an intervention seminar that exposes the biases and suggests ways to reduce them in classroom settings.

Factors Influencing Facial Profile Preference

Presenter's Name: Angelique Teasley
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Over the years, there has been a varied change in the esthetic standards for the African American soft tissue facial profile. The purpose of the study is to determine the influence of factors such as age, gender, race, and media exposure on the soft tissue facial profile preference of dental students and residents. Two hundred participants completed a 20-item survey evaluating their soft tissue profile preference. Additionally, they were asked to indicate the amount of media exposure that they have on a weekly basis and their desire to resemble the celebrities seen in the media. The results indicate that race and media exposure have a significant impact on facial preference. Results also show a strong correlation between high amounts of media exposure and the desire to alter the face to look more like celebrities. The results of this study will bridge the gap between clinician–patient perceptions and potentially result in improved patient satisfaction, as the treatment plan may be customized with consideration of culture, preference, and perception of facial esthetics.

Arrested Femininity: Print Constructions of the Black Female Victims of Police-Perpetrated Homicides, 2000-2019

Presenter's Name: Shannell Thomas
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School/College: Graduate School
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Coauthors: Akiv Dawson,Marie Jipguep-Akhtar, PhD

In recent years, chronicles of the black male victims of state-sanctioned violence have been duly broadcasted and lamented across various media platforms. Police-involved fatalities of black males – like those of Eric Garner, Michael Brown Jr., Laquan McDonald, Tamir Rice, Walter Scott, Freddie Gray Jr, Alton Sterling, Philando Castile, and Terrence Crutcher – are being extensively documented in the news cycles of many media outlets. Noticeably however, police violence against Black women has not garnered as much attention or outrage. Only Sandra Bland, a black woman whose routine traffic stop ended in her alleged jail-cell suicide, received equivalent attention. The deadly force used against women like Kathryn Johnston (killed by police in 2006 in Atlanta, Georgia during a botched drug raid), and Rekia Boyd, (murdered by an off-duty police officer in Chicago, Illinois during 2012) was generally overlooked by mainstream media. Even the violent death of Korryn Gaines, whose 2016 killing by Randallstown, MD police resulted in injury to her 5-year-old son, failed to receive comparable coverage. These black women are less familiar than Sandra Bland, but their lives (and deaths) are no less meaningful. Using a content analysis of national newspaper coverage over the last nineteen years, this research attempts to identify the conditions under which police-involved deaths of black individuals become noteworthy. It elucidates disparities between the exposure afforded black male and black female victims of police-involved homicide, and calls for

a collective feminist response to the too-often-overlooked state-sanctioned violence against black women.

The Psychological Effects of Viewing Police Brutality Videos Among African American Young Adults

Presenter's Name: Lauren Thompson
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Background: Research with African American adults reveal that exposure to race-based violence through the media, such as footage of police-involved killings of unarmed African American men, can result in psychological trauma with symptoms of anxiety and anticipatory stress (Bor et al., 2018; Bryant-Davis et al., 2017). However, there is a dearth of studies examining the role of specific coping mechanisms such as racial identity on psychological outcomes. Informed by a stress and coping model, this study poses two questions: (1) to what extent do spirituality, religion, active coping strategies, and social support mitigate the negative psychological effects of viewing fatal police violence directed toward African American men, and (2) is racial identity a mediating factor of how young African American adults respond to witnessing police killing. Methods: The study will collect data from both male and female African American undergraduate students during two sessions. During the first session, participants will complete: the demographic information form, and measures assessing state anxiety, depression, perceived racism, and racial identity. During the second session, the participant will complete the STAI, then the participant will view a video of a Caucasian police officer killing an unarmed African American man. Immediately, the participant will complete the STAI, the PARS, and the Brief COPE inventory. Following this procedure, there will be a 5-minute recovery period with relaxing music followed by debriefing. Conclusion: The results of this study will contribute to the literature by exploring possible effective coping mechanisms for dealing with race-based trauma.

No Sabe Television sin Gringos: Identifying the Lack of Afro-Latinos in Telenovelas

Presenter's Name: Alethia Tilford
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During the mid-Atlantic slave trade, thousands of Africans were shipped to North America, however millions were shipped to Latin America and the Caribbean which resulted in those countries having high populations of Black people. In modern society, mass media outlets such as Television, film and radio have become sources of information because of their ability to export content around the world. However, specific groups are underrepresented in the media and if they are the representations are negative or stereotypical. Telenovelas are Latin American based dramatized TV shows that depict Hispanic life. They are recognized globally, especially in Latin American countries, however there are large populations of Black people who receive little to no representation in these telenovelas. As a result, many people do not know that countries such as Brazil and Colombia have populations that are over 70 percent Black. The purpose of this research is to identify the lack of Afro-Latino depictions in telenovelas and determine whether those depictions impact viewer's perception of Black Hispanics. A content analysis and focus group were conducted to determine if there was a relationship. The researcher found that 98.9 percent of the characters show in the chosen telenovelas were Euro-Latino compared to the 1.1 prcent of Afro-Latinos found. The following theories; agenda-setting, cultivation analysis and media dependency theory are used to examine how media corporations use their platforms to frame messages for consumers.

Connected Paths: the Complex and Dynamic Rise of Internet Media in South Africa

Presenter's Name: Deborah Woods
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Guided by a curiosity for African history and heritage, this paper will explore the history of Internet media in South Africa. Understanding that the influence of internet media has risen similarly – and yet differently– this paper included research the causes and effects of Internet media's political, social and economic structure and development within the nation. Lastly, the paper will investigate and analyze how internet media in South Africa functions within and/or affects South Africa as a society today, asking questions such as: How is Internet media reflective of intercultural and intracultural relationships and how we can observe that in how South Africans communicate? Is the press trusted by citizens in South Africa? What is the role of Internet media within South African society? Does the media in South Africa accurately reflect the population? Through presentation and analysis of historical, political, social, verbal research, the paper will explore the many varied, complex answers to these questions

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Translational & Clinical Sciences

Development of Combination Drug Loaded Nanoparticles for Breast Cancer

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Coauthors: Funmilola Fisusi, Semilore Olatunde

One of the major setbacks in chemotherapy is high toxicity. The inability of clinicians to determine the amount of chemotherapeutic agent that reaches the target site (cancer cells), during treatment, results in high and frequent doses of these agents. This is done to ensure that sufficient amount of the bioactive agent is present at the site of action for effective tumor therapy as the combination anticancer drugs exhibit different pharmacokinetics. This method of treatment poses a great risk to the patient's healthy cells, resulting in adverse side effects. Studies have shown that the use of nanotechnology platform, as a drug delivery system, effectively reduces systemic toxicity by enabling synchronized targeted delivery of bioactive agents and overcoming modes of anticancer drug resistance. Cancer cells are known to have multiple pathways of growth and survival. They have a broad-ranging capacity to activate compensatory signaling pathways to overcome barriers presented by a single agent therapy. Awareness of the heterogeneity and complexity of cancer cells has steered interest in combination therapies that simultaneously target multiple key pathways in carcinogenesis. Paclitaxel, an FDA approved chemotherapeutic agent, and 17AAG, an HSP90 inhibitor have different mechanisms of action. Hence administration of these two drugs in combination suggests synergistic or additive outcomes. The objective of the study reported here is to determine the in vitro cytotoxic effects of combination drug-loaded nanoparticles and compare the data with that of each single free drug on breast cancer cell lines.

Design and Fabrication of Polymer-Monoclonal Antibody Conjugates for the Development of Targeted Nanoparticles for HER2-Positive Breast Cancer Treatment

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Monoclonal antibodies (mAbs) remain the targeting agent of choice for diverse biological studies due to their wide availability, specificity, broad range of validated targets, and proven biological activity. The power of mAbs lies in their highly specific binding of only one antigenic determinant. MAbs may be conjugated to bioactive agents or other delivery systems such as nanoparticles to allow specific delivery to target sites. The unique properties of PEG make it suitable for many biomedical applications including PEG-monoclonal antibody conjugates. Conventional methods for covalent protein modification typically involve reacting the appropriate amino acids with reactive agents (activated PEGs). The modification methods are not site-specific and there is no control over which amino acids are modified and the resulting conjugates are often modified in positions that weaken or even abrogate the binding to the antigen, which in turn decreases the efficacy of the targeting system. The core-shell (corona) stealth polymeric nanoparticles developed in our laboratory by dispersion polymerization technique at ambient temperature are suitable for varied and diverse biomedical applications: targeted delivery of bioactive active agents such as drugs, nucleic acids and contrast agents for imaging. Site-specific attachment of a suitably functionalized polymer is one way to produce PEG-mAb conjugates without introducing a steric barrier into an essential binding site on the protein molecule. We report here our efforts for site specific conjugation of PEG-macromonomer to mAbs at the Fc region of trastuzumab and pertuzumab. The conjugation method preserved the binding (using flow-cytometer) and biological activity (cytotoxicity) of the ligands (PEG-mAbs).

Dihydrotestosterone Does Not Modulate Key Lipogenesis Regulator in Skeletal Muscle from Female Mice

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Polycystic ovary syndrome (PCOS) affects 10% of women and is hallmarked by hyperandrogenemia (HA), which is also a component of non-alcoholic fatty liver disease (NAFLD). In this project, we aimed to investigate how androgen and androgen receptor (AR) impact a key player of lipogenesis, sterol regulatory element-binding protein-1 (SREBP-1). To this end, skeletal muscle from lean, female wild type mice and mice administered dihydrotestosterone (DHT) for one month were extracted and analyzed to determine the effect of low dose DHT on lipogenic cytosolic protein and gene expres-

sion. We performed Western blot and real-time quantitative polymerase chain reaction (qRT-PCR) analysis of lipogenic intermediates in homogenates of an energy storage tissue. Skeletal muscle was used as a control. Low-dose DHT lowered the active form of cytosolic SREBP-2 in skeletal muscle. However, FAS and p-ACC protein and mRNA expression levels were unchanged in skeletal muscle. The results indicate that SREBP-2 is the primary SREBP isoform in skeletal muscle but that it is not playing a role in DHT-induced lipogenic gene expression or NAFLD.

A Bivariate Model for Clustered Binary Data: Joint Modelling of Systolic and Diastolic Hypertension in Ghana

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High blood pressure, or hypertension, is one of the major risk factor for cardiovascular diseases. Health facility-based records indicate that hypertension is the leading cause of disability and mortality among adults in Ghana. Regression models for hypertension studies usually focused on classification based on set threshold for systolic and/or diastolic blood pressure. We develop a joint statistical modeling approach for bivariate binary outcomes allowing for (i) characterization of the dependency of each binary response separately on covariates and (ii) the characterization of the degree of association between the pairs of responses and the dependence of this association on covariates. The marginal distribution of each binary outcome is modeled to depend on covariates through logistic function. We applied our approach to model systolic and diastolic hypertension in a cluster of families in the 10 regions in Ghana. The results suggest aggregation of systolic and diastolic hypertension within families within the regions. This implies that the data was sampled from a population where the aggregation of the region is higher than that from the general population. Increase in Age associated with increased risk in both systolic and diastolic hypertension and intake of fruits is associated with the reduced risk of both systolic and diastolic hypertension.

Association of Colon Sessile Serrated Polyps with Endometrial Polyps

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Background: Due to conflicting reports of higher colon polyps in patients with endometrial polyps, we aimed to evaluate if there is such an association in African Americans. Method: We reviewed all patients who had endometrial (EN) presentations (n=3,600) and colonoscopy (n=14,888) (2004-2015). Cases consisted of patients with endometrial polyps and have undergone colonoscopy (n=118). Controls consisted of endometrial-free patients who underwent colonoscopy (the year 2010, n=664). Clinical and pathological features were collected and the association between EN and Colon polyps was analyzed. Results: Mean age was 34 in Cases and 31.7 in Controls. Cases were older and had higher rates of smoking and DM than Controls (p,0.05). Overall, colon polyp prevalence was not statistically different. Sigmoid and rectal locations were more prevalent in Controls than Cases. SSPs were more frequent in Cases (p=0.03). Whether considering the overall study population or just those with colon polyps, SSA/Ps lesions associated with an Odds Ratio of > 4 (p=0.02) for EN polyp occurrence. An age-based sub-analysis within the Cases group revealed no major risk factors in patients <50 vs. >50. Conclusion: Overall colon polyp's prevalence was similar in EP patients and controls. However, SSA/Ps were more associated with EP patients. Smoking and DM were higher in these patients. Females with SSA/Ps might benefit from a screening for endometrial polyp in an age-independent manner.

Molecular Markers, MLH1 and MSI Status Differentiate Hyperplastic Polyps from Sessile Serrated Adenoma/Polyps Among African American Patients

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Background: Up to 30% of CRCs develop through the serrated pathway that consists of hyperplastic polyps (HPs) and Sessile serrated Adenoma/polyps (SSA/Ps) with different malignancy potential.Aim: Determine markers that may distinguish SSA/Ps from HPs in African Americans (AA). Methods: We conducted a retrospective study of colonoscopies (n=12,085) performed at the Howard University Hospital (2010-2015) which confirmed 4,070 AA patients with polyps, including 252 with SSA/Ps. Gene expression and mutation frequency profiles were analyzed in a total of 47 patients (62 specimens: 29 SSA/Ps, 26 HPs, 3 TAs 4 normal tissues). We tested 4 transcripts (MUC6, FSCN1, SEMG1, and TRNP1) us-

ing qRT-PCR. MSI and BRAF mutations were analyzed. CIMP analysis was performed using CACNA1G, IGF2, NEUROG1, RUNX, SOCS and MLH1. Results: MUC6, SEMG1, TRNP1, and FSCN1 were significantly more expressed in SSA/Ps vs. HPs (P<0.05; fold differences of 37.2, 10.7, 5.8 and 2.5, respectively). BRAF mutation was found in 55.6% of SSA/Ps vs. 12.0% in HPs (P = 0.001). The frequency of CIMP was higher in SSA/Ps but not statistically significant, while MSI was more prevalent in HPs (P > 0.05). There was higher loss of MLH1 expression in HPs than SSA/Ps (42.9% showing expression vs 70.3% IHC staining >=2 in HPs and SSA/Ps). The SSA/Ps in our study were primarily distal (67%).Conclusion: Our results show that MUC6-SEMG1-TRNP1 expression and BRAF mutation have the strongest correlation with SSA/Ps. The distal location might help explain why MSI and CIMP may not be optimal molecular biomarkers in AA patients with SSA/Ps.

Induction of specific carcinogenic miRNAs expression as a potential mechanism by which Streptococcus sp. VT_162 infection contributes to colorectal cancer

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Several miRNAs have been linked to Streptococci infections' contribution to colorectal cancer (CRC). The aim of this study is to determine whether Streptococcus sp. VT_162 influences known and/or novel miRNAs in CRC cell lines. Methods: HCT116, SW480 and LoVo were infected with Streptococcus sp. VT_162 (MOI: 10 and 50). RNA extracts were used on an Illumina sequencer and the miRNAs profiles were generated. To estimate differential expression between different samples, the count data were used in DESeq2 R package. miRNAs with statistically significant difference from untreated cell lines and log 2 FC >2 are reported and their relation to cancer investigated. Results: miRNA analysis revealed 69 miRNAs with Log2 fold differences higher than 2 with 9 of them [mir-146a, mir-320d-1, mir-320d-2, mir-320c-1, mir-320e, mir-1246, mir-4791, mir-548v, mir-411] with a significant statistical difference (p<0.05) with the following respective log2 fold differences: 3.69, 3.18, 3.08, 2.41, 3.79, 2.97, 2.27, 2.64 and 2.07. Interestingly, the detected miRNAs have been previously reported as biomarkers of different mechanisms in rectal, colorectal, gastrointestinal, melanoma and lung cancers. Additionally, these miRNAs were reported to play important roles in immune responses within the tumor microenvironment, metastasis and resistance to chemotherapeutic drugs. Conclusion: Streptococcus sp. VT_162 oncogenic effects are predicted to act, in part, through upregulation of specific oncogenic mi-RNAs. Our results constitute a platform on which additional studies need to be conducted to determine the specific targets for the identified miRNAs and ultimately increase our understanding of how Streptococcus sp. VT_162 contributes to CRC in humans.

Potential Novel Serological miRNA Markers of Colon Carcinogenesis in Obese and Diabetic African Americans

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Background: Adiponectin, leptin, TNF-alpha and IGF-1 are prevalent in serum of patients with colon adenomas. In the present study, we aimed to establish specific miRNA signatures in obese and diabetic African American colorectal adenoma patients. Patients & Methods: Sera from 18 normal, 18 adenoma-obese, 18 adenoma-diabetic and 18 adenoma-obese-diabetic patients were collected (age and gender matched). RNA extracts were used for library preparation and sequencing on an Illumina NextSeq500. Annotation data in the form of a GFF file from mirBase was used. miRNAs with statistically significant (p<0.05) expression difference from normal and log 2 FC >2 and/or <-2 were selected for analyzed using Ingenuity Pathway Analysis (IPA). Results: Comparisons revealed that 11 miRNAs [hsa-mir-34a, hsa-mir-133a-1, hsa-mir-127, hsa-mir-99b, hsa-mir-485, hsa-mir-378d-2, hsa-mir-3168, hsa-mir-3679, hsa-mir-378e, hsa-mir-4635, hsa-mir-6509] down-regulated in Adenoma-Obese, 3 miRNAs down-regulated [hsa-mir-1228, hsa-mir-3912, hsa-mir-4665] and 3 up-regulated [hsa-mir-455, hsa-mir-219b, hsa-mir-8072] in Adenoma-Diabetic patients and 2 down-regulated [hsa-mir-487b, hsa-mir-6777] and 1 up-regulated miRNA [hsa-mir-4525] in Adenoma-Obese-Diabetic patients. The IPA analysis revealed that the altered miRNA have known roles in carcinogenic and metabolic syndrome pathways. Conclusion: Diabetes seems to be associated with more miRNA profile alterations in the analyzed samples than in colon adenomas in obese patients. miRNA-4525 can be used as potential serum marker in Obese patients while miRNA-455, miRNA-219b and miRNA-8072 can serve as such in diabetic patients. Except for miRNA-455 that was previously described as promotor of migration and invasion in breast cancer, the other mi-RNAs are novel and their mechanisms of action need further studies.

Relationship between PTSD and Recovery in a Sample of Dually Diagnosed Individuals on Medication-Assisted Treatment for Opioid Use Disorder

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Background: Experimental induction of "opioid-mediated stress-induced analgesia" from trauma stimuli has been shown in individuals with posttraumatic stress disorder (PTSD) (Pitman et al., 1990). Because of the involvement of opioid systems in PTSD stress response, we asked whether PTSD would influence the outcome of clients with opioid use disorder being treated with medication-assisted therapy. Therefore we compared retention rates among patients with opioid use disorder being treated with buprenorphine/naloxone therapy with and without a dual diagnosis of PTSD. Methods: Participants were a group of 50 dually diagnosed individuals receiving buprenorphine/naloxone and group therapy through a university mental health center as part of a study evaluating supported employment. Fifty percent (n = 25) of these participants had a posttraumatic stress disorder (PTSD) diagnosis. Their adherence to BUP/NAL treatment was monitored through weekly drug screen tests and attendance to treatment (group therapy). Results: Of the 25 participants who had a PTSD diagnosis, 17 (68%) stayed in treatment for at least 12 months. Only 12 of 25 participants (48%) without PTSD were adherent to treatment. Four (14%) of the 29 participants adherent to treatment for at least 24 months had PTSD. Conclusions: Preliminary finding of higher retention needs confirmation in a larger sample. PTSD is common among those with opioid use disorders. Whether PTSD influences the outcome of recovery in opioid use disorder has theoretical and clinical implications. Larger studies evaluating outcomes of those with PTSD and opioid use disorder may be helpful in understanding short-term and long-term recovery.

Associations between Cytokine-Induced Inflammation, Loneliness, and Depression in Elderly Populations

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Interleukin-1, interleukin-6, and tumor necrosis factor alpha are all pro-inflammatory cytokines that are released when the body is invaded or threatened. Though evidence that cytokines are released in response to a physical ailment exists, new research seeks to highlight the relationship between cytokine-related inflammation and mental or emotional trauma. Research suggests that high levels of interleukin-1Beta and interleukin-1ra are associated with the onset of late-life depression; geriatric depression is associated with loneliness (Biggelaar et al., 2007; Milaneschi et al., 2009; Aylaz et al., 2012). The present study hypothesized that depression mediates the effects of inflammation (levels of the cytokine Interleukin-1 alpha) on loneliness. One hundred and seventy-eight, Howard University Hospital patients completed the Beck Depression Scale, UCLA Loneliness questionnaire, and had their interleukin-1 alpha level measurements taken as part of a larger study of renal disease. We found that high levels of interleukin-1 alpha predicted depression (p= .0007) and that there was a significant relationship between depression and loneliness (p< .0001).There was not a significant direct relationship between interleukin-1 alpha levels and loneliness, but the indirect relationship between interleukin-1 alpha and loneliness through depression was significant (95% CI [.0059, .0366]). The results of this data suggest that elevated levels of interleukin-1 alpha may not directly cause feelings of loneliness, but when someone with high levels of interleukin-1 alpha suffers from depression, there is a great chance that the person will experience loneliness. Depression may be the affect state that causes someone to more readily label their current status lonely.

Drug-Induced Lingual Ulcer: A Novel Case of A Post-Renal Transplant Patient with An Tacrolimus Induced Lingul Ulceration

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Buccal ulcerations as a side effect of tacrolimus have been well-reported and documented in previous case reports; however, the finding of lingual ulcerations are unreported and were previously an unknown side effect of the drug. We report a novel case of a 51-year-old Hispanic male presenting with end stage renal disease, secondary to biopsy-proven immune complex chronic glomerulonephritis, who underwent a living unrelated (altruistic) donor renal transplant. The patient initially tolerated immunosuppressant drugs with moderate, documented gastrointestinal side effects; however, a few months later he presented to the emergency room with severe mouth pain due to ulcers and was also discovered to have leukopenia. All of his immunosuppressive medications except tacrolimus were discontinued; however, his oral

ulcers persisted, and three months later, a new ulcer on his tongue appeared. The ulcer was biopsied with no findings of malignancy, yet failed to heal or reduce in size. The patient spent a two-month, inpatient course due to inability to feed and subsequent weight loss which required parental feeding and supportive care. Tacrolimus was discontinued and the ulcer on the tongue as well as the mouth resolved. Further investigation of the mechanism and cause of this type of devastating ulcer due to tacrolimus is warranted, as many other transplant patients who may also be similarly afflicted would benefit from early prevention and more efficient treatment course.

ACA's Impact on an Academic Medical Center's Orthopaedic Surgery Department

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Introduction: Urban Academic Medical Centers (AMC's) and their Orthopaedic Surgery departments were particularly impacted by the ACA, and thus can be used as a barometer of the ACA's success. One anticipated result is that Center for Medicare and Medicaid (CMS) patients would become a higher proportion of an Orthopaedic Surgeon's patient population. This study aims to assess the validity of this projection and to analyze additional economic implications of the legislation. Methods: Data was collected from faculty practice plan administrative offices for years 2014-2017. Patient services were categorized into: distal radius fractures, ankle fractures, trigger finger procedures, and carpal tunnel procedures. Entries were then analyzed by procedure fees, procedure reimbursement, and primary insurer type to observe trends over the years in question. These results were compared by year, CPT or ICD9/10 codes, and insurer status. Results:Average Medicaid reimbursement from 2014-2017 was increased for distal radius (+4.36%) and ankle fractures(+4.68%) but decreased for trigger (-15.77%) and carpal procedures (-5.68%). Analysis of the proportion Medicaid patients comprised of the total patient population per year revealed a small decrease from 2014-2015 (-1.7%) but a larger increase from 2015-2016 (+13.1%) and 2016-2017 (+12.8%). Conclusion and Discussion:The percentage of our patient population insured by Medicaid, in addition to our total patient population, increased. These findings suggest the ACA increased access and coverage in our catchment area. The reimbursement rates of the trauma related conditions increased, while the outpatient treated conditions decreased. Further research is needed to explain this finding.

Identifying Social Isolation and Dementia Among Older Adults in Senior Housing in Washington, DC

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This proposal uses convergent parallel mixed methods design with qualitative and quantitative research on an older adult population residing in Senior Housing in Washington, DC. The aging population in senior housing is often susceptible to social isolation. This research examines social isolation and the neuroscience involved in aging brains and the adverse effects of social isolation, which can have as a consequence which can lead to dementia. The effects of social isolation and the neuroscience that seeks evidence to show specifically how the brain is affected by interaction, and social stressors like micro-aggressions can be recognized as mental health problems. Through showing this correlation of social isolation and the neuroscience of the effects within the population, this research can assist in health programming for the aging population that can identify social isolation earlier and thereby reduce long term care institutionalization. Further, this research findings can help to inform policies surrounding the role of social isolation supports. Evaluation of older adults with these identified challenges can help researchers, practitioners and policymakers address the problems associated with neurotransmitter damage as seen through neuroscience of the brain. By addressing these factors, which are especially taking place in African American older adult communities we can build a causal bridge between social isolation and the potential of dementia. Ultimately this could potentially slow the onset of dementia caused by social isolation.

The Barriers in the Effective Management of Alcohol Addiction: Implications on US Economy, Consumers' Health and Healthcare Professionals

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Background: Alcohol addiction remains a prevalent public health concern in the United States. To date, several studies have been focused on the medical treatment of alcohol-related liver diseases ranging from alcohol-related fatty liver to alcoholic cirrhosis. However, the increasing cost related to excessive alcohol use implies that medical treatment alone is ineffective in addressing other underlying barriers that impede chronic alcohol users to achieve long term abstinence. We investigated on the barriers that hinder the ability of chronic alcohol users to overcome alcohol addiction and

the impact to the nation when interventions and strategies fail to maintain sobriety of alcohol users. Method: A systemic review was conducted from various journals using PubMed and Cochrane Library databases. Key terms were used to select 30 articles that meet the criteria of this study from 2015 to 2018. The articles were categorized according to research type. Each article was analyzed following the principles of systematic review. Results: This study reveal that the negative perceptions of healthcare professionals toward alcoholic patients and the lack of access to treatment services are the barriers in the effective management of alcohol addiction. However, combining therapies that are directed toward complete abstinence along with addressing these treatment barriers increase the prospect of chronic alcohol users to achieve absolute abstinence. Conclusion: Significant savings in terms of health and social cost can be attained in patients who reach complete abstinence from alcohol abuse.

Carica papaya Linn: Safety and Efficacy during Pregnancy and Lactation

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Background: In Nigeria decoctions and aqueous extract of the leaves of Carica papaya Linn (CP), are commonly used in the treatment of diabetes and malaria. Ninety percent of the populations of developing countries use traditional medicine for their primary health care needs. In the developed countries dietary supplement is considered to be potentially harmless. Objectives: There is a paucity of data on the effects of consumption of CP during pregnancy and lactation. Methodology: AHMED, CINAHL, Cochrane CENTRAL, Cochrane Library, Medline, Internet journals, Natural Medicines Comprehensive Database, and Natural Standard were reviewed from inception (year) to 2019 for information on Carica papaya Linn, as it relates to use on "pregnancy", "lactation", and "breastfeeding". Data were compiled based on the grade and evidence found. Results: No evidence- based scientific data to support the use of CP during pregnancy in humans was found. Toxicity studies of the leaf extract revealed no signs of toxicity and deaths when Sprague Dawley rats were treated with, a dose of 2000 mg/kg body weight (BW), of CP orally. No mortality or significant changes in the body weight, food and water consumption were reported. Relative weights of the internal organs were normal. Seed extract administered orally could induce reversible male infertility and could be used for pharmaceutical development of a male contraceptive. In postpartum mothers, the administration of papaya leaf extract is effective in increasing prolactin hormone. Conclusions: Rigorous and well controlled- clinical research is needed before this plant can be used during pregnancy and lactation in humans.

Place of birth, educational status and colorectal cancer screening among US adults

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Background: Immigrants have lower colon cancer (CRC) screening rates compared to US-born persons. Formal education is associated with better health care utilization. It is unknown whether education status is associated with improved CRC screening among immigrants. Aim: To determine uptake of CRC screening among US-born and foreign-born adults in the US and evaluate the relationship of the highest formal education attained on this relationship. Methods: We used the 2013 Health Information National Trends Survey (HINTS) 4 cycle 3 and identified 1,569 US-born (weighted population size = 79,676,395) and 250 foreign-born (weighted population size = 10,498,687) respondents. We evaluated whether survey respondents were ever screened for CRC (with fecal occult blood test or endoscopy) and compared CRC screening by educational status among US and foreign born respondents. All percentages were weighted. Results: Foreign-born respondents were less likely to have been screened for CRC when compared to US-born respondents (61.6% versus 75.6%; OR = 0.45; 95% CI: 0.25-0.83; p= 0.011). Higher education status was associated with increased CRC screening uptake among those with some college education (73.2% versus 66.8%: OR = 1.58; 95% CI: 1.05-2.37; p=0.03 and among those who were college graduates (78.6% versus 66.8%: OR = 1.97; 95% CI: 1.17-3.31; p=0.01) when compared to those who had high school education or less. However, this association of education with CRC screening uptake was only found among US-born respondents. Conclusion: There is a need to improve specific cancer prevention education and CRC screening among foreign born adults in the US.

The HEART Score in Blacks with Emergency Presentation of Chest Pain: A Performance Test and Risk Analysis

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Background: The HEART was designed to aid in disposition of patients presenting to the Emergency Department(ED) with Chest Pain(CP). Methods: Using prospectively collected data from the local and regional electronic health record system, CP presentations to the ED of Howard University Hospital were investigated.The primary outcome was major adverse cardiac events(MACE) within 6weeks of presentation. Results: MACE data was available in 817 Blacks. MACE incidence was 8.7% amongst CP presentations.The MACE rate in the low risk, intermediate risk and high risk HEART score categories were 1.07%, 12.58% and 60.87% respectively. Using logistic regression analysis, the HEART score was significantly associated with MACE(OR 2.69[2.21-3.29];p<0.0001). After adjusting for demographics, baseline risk factors and comorbidities, the association remained significant (OR 2.90[2.05-4.09]);p<0.0001). All risk factors except for female gender, obesity and recent cocaine use were significant univariate predicators for MACE. However only dyslipidemia (OR 2.81[1.06-7.43);p=0.037), family history of myocardial infarction (MI) (OR 2.34[1.14-4.77];p=0.020) and past history of MI (OR:3.39[1.25-9.19];p=0.016) remained significant predictors of MACE after adjusting for covariates. Conclusion The HEART score performs reliably in the Black population. We established specific risk factors for MI that may have a stronger association among Blacks and could represent potential targets for preventive intervention.

The Effect of a Social Media Cleanse on Young Adults Experiencing Negative Health Impacts Due to Excess Exposure to Social Media

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Since the early 2000s, social media has been a topic of discussion in the United States, especially its negative impacts. According to several researchers, adolescents and young adults' experiencing an excess exposure of social media has led to issues concerns regarding their mental health. (Fails, 2018). Being that over half of the United States' population are social media users, the U.S. population must learn how to adjust their actions for the sake of obtaining and maintaining all aspects of their health (Demographics, 2018). Through a qualitative, cohort study, a 30-day long social media cleanse was administered to a group of 20 college students at Howard University. A survey was posted on social media for voluntary participants. After reviewing the surveys, 20 participants will be randomly selected. Participants completed a pre and posttest. During the cleanse, participants could not access any social media sites, as outlined in the cleanse guidelines. During this 30-day period, participants completed mandatory weekly journal entries, in which they will described their experience throughout the cleanse, reflecting their positive and negative thoughts. Progress within the journal entries and activity logs of the participants was analyzed using a in text analyses. The overall participants in the study demonstrated a positive correlation between no social media and increase in self efficacy and self confidence.

A Clinical Study to Investigate Genetic Addiction Risk and Trauma in Opioid Use Disorder (OUD)

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Addiction to opioids/heroin involves dysregulation of dopamine homeostasis in the brain. We developed a system to provide precision addiction management for opioid use disorder (OUD) based on individual neurogenetics. Complex experiences interact with genetics to influence addiction pathology and adherence to treatment (MATs). Genetic variations within 10 reward genes (COMT-DRD1-DRD2-DRD3-DRD4-OPRM1-DAT1-5-HTTL-MAOA-GABRB3), and social/behavioral history were analyzed. Participants (n=35) in addiction treatment appeared for an interventional, randomized, placebo-controlled study consisting of 5 visits at 30-day intervals, questionnaire administration, and a 30-day supply of the nutraceutical or placebo per visit. Cheek swabs and blood were analyzed for compliance and to determine genetic addiction risk profiles. Behavioral data are from the Reward Deficiency Syndrome (RDS), Comprehensive Universal Behavioral (CUBS) surveys, and Life Event Checklist (LEC). Sixty nine percent of participants who were receiving MAT for OUD exhibited depression at enrollment with 23% in the severe rangeaccording to the (CUBS). A significant number of participants identified as needing constant activity, overstimulation and having risky behaviors, p<0.05 (RDSQ). Traumatic experiences ranged from physical assault with/without weapons, sudden violent deaths, severe human suffering and life-threatening illnesses.

List of worst events included sexual assault, witnessing a murder, abuse, and being arrested or shot (LEC). Chi square analysis revealed RDS scores had a sognificant association with Trauma (X2(2) = 6.804; p = 0.033). Genetically, 100% of participants exhibited ≥4 and ~74% ≥7, up to 14 risk alleles, indicating risk for drug or alcohol addiction respectively. Genetic predisposition, behavioral history and environmental exposure to violence influence risk of drug and alcohol abuse and addiction.

Fetal Growth Restriction: A Novel Case of A Small for Gestational Age Infant with An Inherited Xp Deletion

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Intrauterine growth restriction (IUGR) refers to a condition in which a fetus fails to grow at a normal rate inside the womb. The baby's estimated weight must be below the 10th percentile for gestational age to be considered small for gestational age (SGA). Growth restriction falls into two categories, symmetric or asymmetric IUGR, depending on a host of maternal and fetal factors. We report a novel case of a full-term baby girl who was born at 38.2 weeks gestation to a 24 year old African-American female with a learning disability and a rare hemoglobinopathy. The patient qualified as symmetric IUGR during the initial prenatal assessment and was subsequently found to have a chromosomal deletion Xp11.4p11.23. Genetic analysis of the patient's mother and sister found the same Xp deletion, the latter of whom also qualified for IUGR/SGA at birth. A review of open source genetic databases found several syndromes linked to Xp deletion within or adjacent to the Xp deletion found in our patient, including OTC deficiency, Kabuki Syndrome, Norrie Syndrome, and Wiskott-Aldrich Syndrome. Further investigation of the genetic and developmental effects of Xp deletion is warranted, as the commonalities of many of the syndromes affiliated with this chromosomal defect could help enhance early detection, protection, and perhaps prevention of these syndromes in the future.

The Impact of Socioeconomic Barriers on Breastfeeding of African-American Infants

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Introduction: Reduced rates of breastfeeding likely contributes to health disparities among African-Americans. Examining potential socioeconomic barriers like age, educational status, or economic status, on breastfeeding is vital in cultivating interventions to increase rates of breastfeeding. Objective: To identify which barriers (education level, marital status, income, age, mental/emotional status, physical health) have the most impact on breastfeeding of African-American infants. Methods: We extracted data from the 2016 National Survey of Children's Health (NSCH) which was a cross-sectional survey of the health and well-being of non-institutionalized children, birth to 17 years (n=50212). We included African-American infants of biological or adoptive parents who answered the relevant questions on breastfeeding, breastfed infants, and formula fed infants. Non-African American infants, and those with missing data on relevant breastfeeding questions were excluded. Logistic regression was used to describe data and explain relationships between variables. We used a confidence interval of 95% and p-value ≤ 0.05 to establish statistical significance. Results: Of the one thousand three hundred and forty six (1346) African American infants, only 435 had answers from parents to the question on breastfeeding. Of these, 317 (73%) infants were breastfed. We found a significant association between marital status, age, income and breastfeeding, with age having the most significant impact. Conclusion: Breastfeeding rates among African American infants is significantly influenced by parental marital status, income and age. Future research may use this information to create and test targeted educational programs and policies aimed at increasing the rate of breastfeeding in the African American population.

Diet and Emotional Well Being Among African American Cancer Patients

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The goal of this study was to investigate how the diet influences the emotional well-being of American Americans.
Data was collected from the third wave (year) of a longitudinal cohort study from a majority Black, Protestant church located in Houston, Texas with over 16,000 members. The cohort study had 1,316 total participants which were used to conduct secondary data analyses. Researchers conducted univariate analyses on participants health behaviors, demographics, and socioeconomic status. The study used the Mindful Attention Awareness Scale (MAAS) and the Freiburg Mindfulness Inventory (FMI) to measure awareness and attitude. The dependent variables used in this study were 5 a day fruit and vegetable consumptions and food frequency scale. An association between fruit/vegetable consumption and emotional well being. Participants that have a higher fruit

and vegetable consumption are more aware of their health status and are emotionally stable.Practitioners and educators can help improve the emotional well being of their patients by prescribing their patients the proper diet. Utilizing culturally appropriate health materials and interventions may positively impact one's awareness, attention, self-report general health, and diet.

Using the PEN-3 Model to Identify Cultural Factors Among Black College Females Regarding Physical Activity

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Objective: This study explored the knowledge, beliefs, and cultural views among Black college females regarding physical activity by using the PEN-3 model. Methods: A qualitative study using interviews was conducted with among 10 Black female college students who attended two Historically Black College and Universities located in the District of Columbia. Interviews were audio-recorded, transcribed verbatim, and coded for common themes. Results: The culturally relevant themes identified that influenced the level of physical activity among Black female college students were: hair maintenance concerns; body image (appearance); neighborhood safety concerns; lack of knowledge; the media; family support, group fitness activity, and community engagement. Conclusion: Health education interventions involving physical activity must be culturally focused and introduced at an earlier age among Black females.

Metastatic Prostate Adenocarcinoma to the Left Subclavian Lymph Node

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Metastatic Prostate Cancer (PCa) to the left supraclavicular lymph node has been previously described in the urology literature with a variation of clinical presentations. Although a rare and unusual site of metastasis, it has been reported in several case series as the first site of metastatic PCa, even in patients without documented Prostate Specific Antigen (PSA) elevation. The patient in this case report presented with metastasis to bone, bulky retroperitoneal lymphadenopathy, obstructive renal failure, mediastinal lymphadenopathy, markedly elevated PSA, and a left neck mass which turned out to be metastatic adenocarcinoma of the prostate. Immuno-stains performed on cell block sections of this neck mass showed that the tumor cells were positive for PSA and prostein and negative for CK7, CK20 & CDX2. He was treated with anti-androgen ablation therapy and percutaneous nephrostomy tubes with resolution of kidney failure.

Examining the role of 2 phyla that dominate the intestinal flora: Firmicutes, and Bacteroidetes as a Nutritional Intervention for obesity treatment.

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Introduction: Obesity is a disease caused by the imbalance of dietary intake and energy expenditure. Studies have shown that the gut microbiome may be mediators for the treatment of obesity. There are 2 phyla that dominate the intestinal flora: Firmicutes, and Bacteroidetes. They are essential in the maintenance of gut homeostasis and are involved in a variety of biological processes, including the regulation of gut immune active processing, absorption, and storage of nutrients we consume. Studies have also shown that these microorganisms work to synthesize vitamins, ketones, and extract energy from compounds that we cannot digest. Dysbiosis occurs when there is an alteration of the intestinal flora. Hence, this study seeks to examine the role of the 2 phyla that dominate the intestinal flora, and the potential role in the mechanism of adipose tissue storage and so, a possible nutritional intervention for obesity treatment. Research Hypothesis: Balancing the intestinal flora ratio of Firmicutes and Bacteroidetes to other bacteria in the microbiome will reduce the risk of developing obesity with BMI >30 kg/m2. The use of probiotics and prebiotics will reduce inflammation in the digestive tract and reduce the risk for obesity. Research Method: The study will involve a systematic review of peer publications using the following search engines: PubMed, NIH, and Google Scholar to elucidate the relationship between gut inflammation, obesity risk, and Firmicutes and Bacteroidetes. Conclusion: Currently, few studies have addressed the role of the gut microbiome in the onset of obesity risk and as a potential treatment for it.

Is there a difference in outcomes in lower extremity vascular trauma (LEVT) on the weekday vs. weekend?

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Several studies suggest patients admitted on weekends have worse outcomes than those admitted during the week. Lower extremity vascular trauma (LEVT) often requires emergent surgical intervention and so might be sensitive to this "weekend effect." The objective of this study was to determine if there's a weekend effect in LEVT. Patients ages 18 and above were extracted from the NIS database (2005-2014), if admitted with an ICD-9 code indicating LEVT. Patient and hospital characteristics obtained included age, sex, race, insurance type, median household income, Injury Severity Score, Charlson Comorbidity Index, Abbreviated Injury Scale for each body region, and hospital location/teaching status. Outcomes measured were in-hospital mortality, amputation, length of stay (LOS), and discharge disposition. Independent predictors of each outcome were identified using multivariable logistic regression models. Patients admitted on the weekend were more likely to be younger than 45 years old (67.6% vs. 55.4%), male (80.5% vs. 74.6%), and uninsured (22.1% vs. 17.2%) [all $p < 0.001$]. There were no significant differences in terms of mortality (3.80% vs. 3.29%, $p = 0.209$), amputation (7.85% vs 7.19%, $p = 0.258$), or discharge home (57.3% vs. 56.1%, $p = 0.271$). LOS was prolonged for patients admitted on weekends (median 15.5 days vs. 13.8 days, $p = 0.009$). After adjusting for relevant factors in multivariable regression analyses, there were no statistically significant differences between the groups for mortality, amputation, discharge home, or LOS. This study did not identify a weekend effect amongst patients admitted with LEVT in the United States.

Drug Efflux Modulation for Prevention of HIV Sexual Transmission

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Background: Sexual transmission is the major mode of HIV infection in healthy humans. None of the vaginal microbicides and/or oral therapies has yet resulted in a complete protection from sexual transmission of HIV. Attachment of HIV to the human CD4+ T-cells, incorporation of viral enzymes and genetic material constitute the first steps of HIV sexual transmission. The purpose of the study is to screen the primary human CD4+ T-cells for the presence of prominent ABCC class of drug efflux transporters and evaluate their role in HIV drug absorption. Methods: Molecular screening was performed by gene expression followed by sequencing analysis. Functional screening was performed by 3H-Tenofovir uptake in the presence of specific ABC efflux inhibitors. Results: Single specific PCR gene products corresponding to GAPDH, MRPs1-7, MRP9, BCRP and P-gp were observed in primary human T cells. Single distinct bands for MRPs 1-9, BCRP and Pgp were observed in VK2 cells. Relative % drug uptake of tenofovir in primary human T cells in the presence of 50 µM MK571 was 173.9±5.8%), 100 µM MK571 (205.7±10.6%), 50µM Pgp4008 (215.4±9.2%) and 50 µM Fumitrimorgin (192.1±18.38%) compared to control (100±6.65%). Conclusions: The results, for the first time demonstrated the molecular and functional expression of multiple ABCC drug efflux transporters in primary human T cells and VK2 cells. Further, functional uptake studies revealed that the prominent drug efflux pumps (MRPs, Pgp and BCRP) are functionally active in unactivated human T-cells leading to decreased intracellular tenofovir concentrations.

A Preliminary Study of The Anticancer Property of Black Seed Oil, Black Seed Honey, and Black Forest Honey in Breast Cancer and Head and Neck Cancer Cells

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The CDC reports Cancer as the second leading cause of death among Americans. As a result, it is important to make greater strides in developing preventative forms of treatment to fight cancer. The goal of this study is to look for affordable, effective, and safe anti-cancer agents. This study investigated the potential use of several natural compounds as alternative interventions in cancer chemoprevention and treatment. After comparing both archaic medical texts with recent publications and studying the nutrition of different countries with low rates of cancer, three compounds were chosen to have their cytotoxic effects tested against head and neck squamous carcinoma cell lines (JHU 22 and JHU 29), and a breast cancer cell line (MB-MDA 321). Three cell lines were used throughout this study. The natural compounds used were black seed oil, black seed honey, and black forest honey. Previous studies have shown black seed oil to be efficacious in fighting cancer. The chemistry of the two honeys also hints that they could be effective forms of treatment. This study involved finding an ideal dosage range of the compounds

showing that treatment concentrations from 1ul to 10ul in a total of 200ul of cell culture medium to be a good test range. After several tests, all compounds proved to be effective, with black forest honey consistently following a dose-dependent trend. These results suggest studying the mechanisms of action of the compounds, as they could be used in correlation with other forms of chemoprevention or treatment in the future.

Locally Advanced Primary Signet Ring Cell Carcinoma of the Bladder

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Bladder Cancer is the 6th leading cause of cancer in the United States, leading to almost 17,000 deaths in the year 2017. The majority of these cases are classified as urothelial carcinoma, followed by squamous cell carcinomas and then adenocarcinomas. Of the 2% of bladder cancer cases that are primary adenocarcinomas, approximately 30% of these tumors are of the signet ring cell subtype. Primary signet ring cell carcinomas were initially described in Urology literature in 1955 and are characterized by their poor differentiation and large mucin globules that displace the nucleus to the periphery of the cell. These tumors peak in the 6th decade of life, occur more frequently in men than women, and are generally found to be resistant to chemotherapy and radiotherapy. Here we present a case of locally advanced signet ring cell carcinoma of the bladder in a 59-year-old male who presented to Howard University Hospital with recurrent hematuria. The patient was successfully treated with radical cystoprostatectomy with ileal conduit urinary diversion and bilateral pelvic lymphadenectomy.

No Ordinary Colonic Polyp

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Schistosomiasis is one of the world's most predominant parasitic diseases caused by blood flukes of the genus Schistosoma. It is prevalent in tropical and subtropical areas, particularly in agricultural fishing communities and places with poor water sanitation. Although schistosomiasis commonly involves intestinal and urogenital systems; rarely however does it present as a large colonic polyp. Below is a case report of this rare presentation. A 31yr old male with no significant past medical or surgical history, presents with diffuse abdominal pain, bloody stool, and diarrhea for the past 5yrs. His last colonoscopy 5yrs ago showed mild colitis. Present colonoscopy exploration revealed normal terminal ileum, cecum, and transverse colon. Mild colitis of the ascending and sigmoid colon and moderately severe colitis of the rectum was found on additional exploration. Furthermore, a single pedunculated sigmoidal polyp was visible. Several mucosal biopsies were taken along the length of the colon and a polypectomy. Pathology report from polypectomy revealed 2.1x1.2x1.1 polyp containing Schistosoma calcified eggs and worms. Examination of both gross and microscopic specimens both confirmed the diagnosis of Schistosomiasis. Schistosomiasis affects 10% of the population worldwide and is mostly endemic in Africa, Asia, parts of the Americas. Clinical presentation Schistosomiasis includes bloody diarrhea, anemia, and weight loss as in this case. While macroscopic findings can include mucosal granularity, friability, and punctate ulcers, in this case it presented as an inflammatory polyp. Microscopically, inflammation, granulomas, and eosinophilia can be seen. Worms are known evade immune response.

Hospital-based visits for dental conditions in Prince George's county, Maryland

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Oral health disparities in the United States can differ according to many variables including but not limited to race, ethnicity, gender, age and socioeconomic status. For many of the underserved, barriers to regular dental care can include the high cost, the lack of available facilities and transportation difficulties. Because of the inability to access regular dental care, patients needing dental care may seek treatment at hospitals and hospital emergency departments (EDs) but these facilities are not equipped for the provision of comprehensive dental services. This study will utilize the MedStar database to identify patterns of hospital use among the EDs and other hospital clinics for dental-related reasons in Prince George's county, Maryland. The study will provide representative estimates of visits for conditions including dental caries, pulpal and periapical lesions, gingival and periodontal lesions and cellulitis for children and adults 18 years and over.

Multiple Fractures In Childhood: Bad Luck or Bad Omen?

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This Preliminary Analysis evaluates the African American patient subjects who were admitted to the Emergency Department at Children's National Medical Center and enrolled in the study. This analysis investigates the subjects based on the following variables: Vitamin D content, DXA scores and concentrations of blood calcium and albumin. The patients were selected via inclusion and exclusion criteria designated by the research protocol. The value for the variables are contained in the patient files and can be accessed via Cerner, as the patients Medical Record Numbers have been provided. The hypothesis is that average Vitamin D levels, DXA scores and albumin levels will be lower than the national average, and the blood calcium levels will be higher. In addition, the analysis will further explore the effect of these variables by comparing case vs. control subjects. Case subjects are adolescents that have had more than one fracture, and control subjects are adolescents that have had only one. The hypothesis is that for case subjects, Vitamin D, albumin and average Z scores for DXA scans will be lower, and blood calcium concentration will be higher. With both approaches to the analysis, a comprehensive preliminary understanding of the trends in the African American youth community can be established.

General Health Perception as a Proxy for Quality of Life Assessment in the Clinical Setting

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Within oncology, quality of life has been studied extensively and it has become commonplace for this assessment to be included in research focused on cancer patients. However, quality of life assessment becomes problematic when used in the clinical setting due to time constraints in nurse-patient interaction. Most of the instruments measuring quality of life are lengthy and require additional time away from patient care for responding to, and scoring the items. There exists a need for a one-question item that can be used to elicit an individual's quality of life in the clinical setting. General perception of health is a one-item global question that measures an individual's reported health status on a scale from 1 to 10, with higher scores representing better perception of health status. Using Pearson product-moment correlation coefficient, data collected from a sample of 56 individuals with cancer between ages of 18 and 41, were analyzed to evaluate the relationship between their health status rating (general health perception) and quality of life. The Quality of Life Index – cancer version instrument was used to measure quality of life. There was a strong, positive correlation between general health perception and quality of life, $r=0.686$, $p<0.001$, with high health status rating associated with higher levels of overall quality of life. Given the low level of health literacy in the adult population a simple one-item question evaluating quality of life may be more appropriate in the time constrained clinical setting.

The mechanism of olfactory dysfunction in APOE-associated dementia: Olfactory study in human APOE4 carriers

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As the number of older Americans grows rapidly, there is a dire need to identify and validate early pre-clinical markers for Alzheimer's disease (AD). Recent studies have shown that abnormalities in olfactory structure and function may precede overt symptomatic development of AD by more than a decade. However, the molecular mechanisms of olfactory neural dysfunctions in AD are poorly understood. Apolipoprotein E (APOE) impacts olfactory neuronal structure and function and AD pathogenesis. However, this finding has not yet been demonstrated in living human subjects. In this preliminary analysis, we examine olfactory pathways in APOE4 human carriers. In our human study, we used our platform of human-derived olfactory tissue to explore differences in molecular signatures comparing olfactory neuronal isoforms derived from APOE4 carriers and non-carriers. Initial findings show APOE4 variant had significant effects on the level of oxidative stress, mitochondrial dysfunction, Tau, and collapsin response mediator protein 2 (CRMP2) phosphorylation in the olfactory tissues of AD subjects. We have optimized the protocol and troubleshooting strategy in the study of protein and molecular signatures in APOE4-carriers human olfactory neurons. We found that both total and phosphorylated CRMP2 levels were increased in olfactory neurons from APOE4 carriers compared to non-carriers of APOE4. Our findings illustrate the utility of olfactory epithelial and neuronal platform as a model to study preclinical development of AD in those at high clinical risk. We anticipate extending this platform for detailed morphologic, molecular and proteomic studies that would define mechanisms of AD development and progression in preclinical populations.

Contemporary trends in the use of Partial Nephrectomy

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Introduction: Partial Nephrectomy (PN) has demonstrated to achieve oncologic outcomes equivalent to those produced by Radical Nephrectomy (RN) in kidney tumors leading to reduced risk of adverse outcomes linked to RN. This study evaluates contemporary trends in the use and outcomes of PN in the US. Methods: A retrospective analysis of 2005 -2014 data from the National Inpatient Sample identified adult patients with malignant neoplasm of the kidney who underwent nephrectomy. Patients were classified according to the type of nephrectomy into RN and PN. Demographic, clinical and hospital factors were extracted for each patient. Patterns of hospital mortality and length of stay (LOS) were determined. Using multivariate logistic regression models, factors associated with the use of PN were identified. Results: A total weighted sample of 352,653 patients were included. PN increased from 19.3% in 2005 to 36.8% in 2014 ($p < 0.001$). LOS for patients undergoing PN was 4.16 days vs 5.38 days in patients undergoing RN (<0.001). Overall mortality rate was 0.73% (0.27% in PN vs. 0.92% in RN, $P < 0.001$). Among patients who underwent PN, the mortality rate went from 0.42% in 2005 to 0.22% in 2014 and LOS from 5.04 days 2005 to 3.5 days in 2014. In the multivariate analysis younger patients, female, private insurance, high household income and urban teaching hospital status were associated with performing PN. Conclusion: Although the use of PN has increased in the United States in the last decade, there remains a significant underutilization of this procedure, particularly among the elderly, male, and socio-economic disadvantaged population.

Key Health Factors Can Predict Clinical Outcomes and Cardiopathologic Progression in Atrial Flutter Patients.

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Background/objectives: Atrial fibrillation (AF) is the most common type of cardiac arrhythmia that frequently leads to cardiac arrest and stroke; its prevalence in the U.S. is projected to double to 12.1 million by 2030[1]. New onset and recurrence of AF are common complications of atrial flutter (flutter) that are associated with grim prognosis, although knowledge about preemptive treatment of the clinical progression from flutter to AF has been poorly developed thus far. The present study seeks to quantify the risk of AF progression and mortality in flutter patients, and to assess the predictive power of key predisposing health factors in flutter-to-AF/mortality progression. Methods/results: A retrospective chart review was used to collect medical history data from a population of 1019 Olmstead County patients (58.1% male) diagnosed with atrial flutter between 1980 and 2010. Clinical correlates of flutter were examined during each patient's follow-up period, which lasted from the date of AF onset to death, if observed, or last follow-up date. Co-variates include baseline characteristics extrapolated from past medical history. Multivariate logistic regression model was used to identify predictors of AFL conversion to AF. Results were reported as odds ratios with a 95% confidence interval. To estimate the likelihood of AFL-to-AF progression, a time distribution was generated using the Kaplan-Meier curve; this method was also used to estimate comparative survivorship in AFL patients. Overall, 757 (78.5%) patients developed AF during the follow-up period (mean=7.00 years). The mortality rate was high in the AF group after 7 years of follow-up.

Comparative Outcome of Inpatients with Different Disease Categories: Electronic Health Records Interrogation

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Background: Although the advancement of electronic health records (EHRs) utilization in clinical research may allow for feasibility studies, and identify patients who are eligible for enrollment in clinical trials, it is a complex process to conduct clinical and translational research studies by merging data from different EMRs. However, it is imperative to note that leveraging EMRs to counterbalance these challenges is an area of intense interest and data sharing from regional hospitals may enable clinical research with large samples for a moderate or large effect size. To inform this issue, the investigators worked across urban hospitals with data extracted from different systems, for patients diagnosed with either diabetes (DM), myocardial infarction (MI), or both disease categories. Methods: Using ICD 9 codes for diabetes (25000) and myocardial infarction (41000), data were extracted from selected Maryland and DC Metropolitan hospitals. The data were then cleaned, merged using common fields, and analyzed. Results: The results showed that patients discharged in 2013 from the selected urban hospitals with MI, were 3.8 times more likely to die while in admission and 4.2 times in MI + DM patients. Race and gender were not significant in the

adjusted model. However, patients' age, low density lipoprotein, systolic blood pressure and body mass index significantly impacted the mortality rate. Conclusion: This project is a proof of concept of how data from different EMR platforms could be used to conduct a comparative pilot study through direct hospitals' EMR interrogation, without additional time needed in capturing data from the bedside.

Characterizing dynamic functional connectivity changes following a physiological stressor in myalgic encephalomyelitis/ chronic fatigue syndrome and gulf war illness

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Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) and Gulf War Illness (GWI) are phemenological diseases with similar symptom profiles characterized by chronic pain, fatigue, and dyscognition. A shared syndromic feature is post-exertional malaise (PEM). PEM is defined as an exacerbation of symptoms following a physically/cognitively demanding activity. We previously reported a novel paradigm that modeled this PEM by utilizing fMRI scans taken before and after sub-maximal exercise. Prior studies analyzing resting state scans have led to inconsistent results in both populations. This may be due to the methodologies used for analysis. Recently, resting-state fMRI experiments have reported meaningful real-time changes in correlational patterns that occur within one session. This dynamic functional connectivity (dFC) behavior has not been explored in ME/CFS or GWI. We recruited 49 GWI, 33 ME/CFS and 23 sedentary controls to complete the fMRI-exercise protocol. DFC was assessed using resting states scans acquired before and after exercise. The data was decomposed into components. Subsequent analysis then computed changes within session using sliding window analysis (40 s in length). Prior to exercise, there was no significant differences in the dFC patterns between the groups. Following exercise, subgroups revealed dFC differences between regions in the anterior insula, fronto-parietal network (FPN), and Default Mode Network (DMN). Exercise-induced alterations of dFC within large scale neural networks provides further evidence of PEM in ME/CFS and GWI. Taken together, our results expand on the limited knowledge regarding PEM in ME/CFS and GWI.

Scrotal pathology: A Window into Larger Systemic Disease Processes

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Background: Scrotal and testicular pathology is generally localized and grouped based on anatomical location in which they develop. Rarely are these pathologies manifestations of a systemic disease. Here, we present three patient who presented initially with testicular infarction or testicular masses where larger disease entities were found. Methods: These were qualitative case reports describing the clinical scenarios, clinical course, radiology and pathology, follow-up medical consultations, and referrals. Discussion: Disease in the testes are most commonly localized to the testes. In the cases presented, testicular infarction was the initial presentation for Polycythemia Vera and testicular masses were the initial presentation for Sarcoidosis, Tuberculosis, and Systemic Lupus Erythematosus. With these three cases we have found that there can be additional diagnoses that should be considered when a patient initially presents with scrotal and testicular pathology. We aim to familiarize our readers with these presentations and associated systemic diseases to improve diagnosis and treatment. We hope to expand the differential diagnoses of scrotal and testicular pathology to include systemic disease processes in patients with initial scrotal presentation.

Preventing Clostridium difficile Transmission in Hospitals: Family Members Adherence to Infection Control

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Background: Clostridium difficile (C. difficile) is an opportunistic, gram-positive, anaerobic, spore-forming bacillus. The clinical effects ranges from self-limiting diarrhea to a life-threatening toxic megacolon and peritonitis. C. difficile is one of the most widespread hospital acquired infection in Canada, United States, and Europe leading to long hospital stays and high mortality. Despite widespread knowledge that consistent adherence to contact isolation precautions is a cornerstone to prevent the spread of this pathogen, recent studies continue to demonstrate poor compliance with these basic, yet crucial infection prevention interventions. We investigated on the most effective methods to combat the spread of this deadly pathogen in acute care

hospitals. Method: A systematic review was conducted using CINAHL, COCHRANE and PubMed datasets to extract articles from 2015 to 2019 and the principles of systematic review were adhered to. Result: Active hospital team on C. Difficile control is needed to adhere to the hospital policy and ensure that all visitors and family members are aware of the rationale for effective washing of hands on entrance and exist. Such policy was the most effective variable in combating the spread of C. Difficile in healthcare institutions, antimicrobial was also universally recognized as essential, with effective environment cleaning, use of personal protective equipment, surveillance, and education. Conclusion: Education and a team that oversees handwashing adherence may be the most effective variables to ensure reduction of the spread of C. difficile, which may finally decrease the prevalence of hospital acquired infection in the health care facilities.

A cross-sectional study analyzing the willingness of patrons to recieve Point of Care Services in Community Pharmacies

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Background: Community pharmacies are increasing theirs role in the provision of point of care services which engage pharmacists in patient care services beyond dispensing of prescriptions and medications. However, there is a scarcity of data indicating which patients would be willing to accept these services from pharmacists. Objective: The purpose of this study is to ascertain sociodemographic characteristics that are predictive of patrons willing to accept point of care services at community pharmacies. Methods: A cross-sectional study was conducted using data from the 2015 National Consumer Survey on the Medication Experience and Pharmacist's Roles, with responses from over 26,000 participants. The independent variables included gender, age, ethnicity, household income, education, and prescription drug status. Multivariate logistic regression was utilized to evaluate which factors helped to predict if patrons would definitely be willing to accept point of care services at community pharmacies. Results: After adjusting for other factors, females had 1.15 to 1.21 times greater odds of definitely being willing to accept point of care services at a community pharmacy. Patrons at least 35 years old also displayed a stronger likelihood of accepting provision of these services at community pharmacies. Individuals with prescription had 1.17 to 1.38 times greater odds of being willing to accept point of care services at a community pharmacy. Conclusion: The types of patients most likely to welcome point of care testing at a community pharmacy include females, patrons at least 35 years and those with prescription drug insurance.

Preliminary Ecological Evaluations of Cannabis Use and Sleep

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Cannabis is a widely used substance that is purported to have therapeutic benefits in areas such as pain management and mental health. Within mental health, cannabis use has been perceived as a sleep aid. Lack of evidence and prominent perception that cannabis use improves sleep highlight the need for further research in this area. The following study aims to understand the relationship between cannabis use and sleep by assessing ecological momentary assessment (EMA) and actigraphy data from the Sleep Health Urban Stress at Howard University (SHUSH) study. Cannabis use 60 minutes prior to sleep, sleep duration, sleep efficiency, and morning restedness were collected as part of the study. Out of 24 participants assessed, 7 participants had nights of both cannabis use and no use. The mean sleep duration was approximately 462.60 minutes for nights of use compared to 380.67 minutes for nights of non-use and showed a marginal trend towards significance. The mean sleep efficiency was approximately 84.90 for nights of use compared to 88.24 for nights of non-use with no significant difference. The mean rating for restedness was 6.26 for nights of use compared to 6.74 for nights of non-use with no significant difference. Although we found a marginally significant difference in sleep duration, there was no evidence for an advantage for sleep efficiency and quality. The limited sample size and self-reporting of cannabis use constrains the utility of these results. Thus, further investigation is required for a thorough understanding of the relationship between cannabis use and sleep.

The Role of Social Media and Mobile App on Weight Management of Overweight/Obese

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Obesity refers to the condition of excessive fat store in the adipose tissue, caused by imbalance between energy intake and expenditure; it has become a national epidemiology with growing prevalence and risks for development of chronic diseases including diabetes, heart disease, hepatobiliary disorders, etc. As technology is growing, the use of social media

(Facebook, Instagram, etc.) and different mobile applications (text messages, step trackers, etc.) has been integrated into dietetics practice as an intervention for weight management program, which involves dietary and behavioral changes; however, evidence for the intervention is limited. The purpose of this study is to examine the role of technology, more precisely, mobile tools, as an educational material for weight management and chronic diseases risks prevention programs. The study will utilize methods for systematic review, using PubMed, JSTOR, Google Scholar, and Medline. Inclusion criteria was randomized control trials from 2010 and 2018, involving adults with age range from 18 to 65 and BMI range from 25 to 50 kg/m2, consisting of weight management programs with social media and other smartphone applications. The primary outcomes were weight, BMI, and waist circumference, and the secondary outcomes were risks factors for development of chronic diseases, including lipid profile, blood glucose, and other biomarkers. The results of the review should be disseminated in peer-reviewed journals and at scientific conferences. Expected outcomes are positive effects of mobile tools-integrated nutrition intervention on weight management, both in primary and secondary outcomes; further research may improve the quality of the evidence provided in this study.

FACE-UP: Educating and Empowering Teens on Prevention
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Problem/Purpose: Teen pregnancy rates continue to be the highest in the United States. An educational intervention, called the Friendly Adolescent Care Environment for Utilization of a Pregnancy Prevention Model (FACE-UP), provided pregnancy prevention strategies to at-risk high school students in Washington, D.C. The goal of the intervention was to decrease risk behavior patterns and increase knowledge to empower student participants. Evidence/Background: One of the aims of the Healthy People 2020 initiative is to decrease the overall rate of adolescent pregnancy. The country's overall pregnancy rate remains the highest of any other industrialized nation at 24.2 per 1,000 women aged 15-19 years. Teen births in Washington, D.C. declined from 1,880 in 2010 to 637 in 2013. Methods: Implementation of the Realityworks' Healthy Choices Curriculum among ninth grade students was over nine weeks. A Parent Seminar was held to improve communication on relationships between parents and their children using the Parent-Child Communication Basics Curriculum. Pre- and post-test assessments, student surveys, and parent surveys were used to evaluate the intervention. Paired Samples t-test with comparisons were used for pre- and post-assessment comparison. Results: 30% of students stated that they were less likely to have sexual intercourse during the next year. 75% of parents stated that the seminar helped them to understand the importance of communication. Conclusions: There was no significant decrease in sexual risk factors based on sexual activity and contraception use and a decrease in sexual risk factors related to sexual abuse and orientation.

"What's in a name? that which we call a [red] rose": Reconsidering erythema, pathognomonic phrases, and hallmark descriptors in skin of color
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The commonly taught and examined pathognomonic phrases and photos for hallmark dermatologic diseases have limited applicability in all skin types outside of Caucasian skin. In a descriptive literature review and visual photo comparison study, we examine the utility of pathognomonic phrases tested in USMLE UWorld (the leading United States Medical licensing exam preparation tool) Step 1 and Step 2 questions in describing identical lesions in skin of color. Examples include "salmon colored plaques" and "silvery scales" to describe psoriasis. The results of this descriptive visual study illustrate that the usage of phrases that describe erythema such as "pink, rose colored, red, and salmon" are not applicable in darker skin types where erythema does not necessarily appear as "redness." Several pathognomonic and hallmark descriptors for dermatological skin disease in children and adults are not applicable in skin of color. These non-inclusive descriptors contribute to provider diagnosis difficulty and disparities in disease diagnosis. Further study and exploration in inclusive language to describe dermatologic disease such as psoriasis in all skin types is necessary, particularly when teaching medical trainees.

Buyer beware or you might get burned: Unregulated photosensitizing agents available without prescription from major online retailers
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According to the WHO, the majority of the world's population relies on plant-derived medicine as their primary form

of healthcare. There are numerous reasons why an individual might eschew Western medicine in favor of a more naturopathic approach, including perceived health benefits, cost, prior failure of physician guided treatment, a lack of awareness about the risks these products carry, cultural norms, and desperation born of the psychosocial burden of one's disease. A 73-year-old Eritrean man presented to our outpatient dermatology clinic with a severe, acute, phototoxic reaction following the ingestion of Athamanta decoction for the self-directed treatment of vitiligo. The dessicated Athamanta leaves, sought in the absence of medical consultation, had been obtained from a mail order vendor in Egypt which had advertised them as a "miracle effect for curing vitiligo." We identified a total of 11 products—6 listed on Amazon, 3 listed on eBay, and 2 listed by Cheap Generic pharmacy—that had either a photosensitizing compound, or a plant known to contain a photosensitizing compound, on its list of ingredients. 27.3% of products were available in formulations intended for ingestion, such as tablets or powders. 90.9% of products listed psoralen, or a plant known to contain psoralen, as a major ingredient. Topically and systemically administered psoralen-containing products for the treatment of vitiligo are widely available without a prescription from several online vendors. These products are affordable, and utilize suggestive packaging to tout the benefits of the products, without mention of their risks.

The Limitations of Fitzpatrick Skin Type: A student perspective on the constraints of the dermatologic tool

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Thomas Fitzpatrick developed a subjective classification system to assess the propensity of the skin to burn during phototherapy, known as Fitzpatrick Skin Type (FST). FST is the most commonly used classification system in dermatologic practice. The original FST classification included only skin types I–IV and was initially based on skin and eye color. Skin types V and VI were later added to the classification to represent individuals from Asian, Indian, and African origin. The use of FST to describe skin color is imperfect, as it groups the widest spectrum of skin colors into only three categories (IV–VI). Additionally, an equal number of categories (I-III) represent much less variation in white skin. Skin of color is no longer the minority. As racial and ethnic distinctions continue to blur, attempts to encompass all non-white skin tones under the umbrella term "skin of color" becomes increasingly problematic. Although physician assigned FST has been demonstrated to correlate with race, race does not consistently correlate with objective measures of pigmentation or self-reported skin phenotype. As two medical students of color, we have observed the seemingly innocuous addition of FST to the charts of patients who were not receiving phototherapy, both within the field of dermatology and outside of it. We acknowledge that the conundrum of how to classify individuals with non-white skin or skin of color is not simply answered, and explore several alternative skin classification models that have been proposed to improve the sensitivity and specificity of identifying patients with skin of color.

Implementation of the Critical view of safety during laparoscopic cholecystectomy complicated by cholelithiasis and empyema of the gallbladder

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Implementation of the critical view of safety during laparoscopic cholecystectomy complicated by cholelithiasis and empyema of the gallbladder

Background: One of the most common causes of iatrogenic biliary tract injury during laparoscopic cholecystectomy is the failure to define the anatomy of the hepatocystic triangle. Confusing local anatomy, adhesions, hemorrhage, and inflammation are the common factors responsible for conversion from laparoscopic to open surgery. Literature reports the national conversion rate to be between 5 and 10 percent. Establishing the Critical View of Safety is a means of preventing biliary injuries. Meticulous and careful dissection to define the hepatocystic triangle ensures identification of relevant anatomy in complicated and technically difficult laparoscopic cholecystectomy surgeries. The primary aim of our study is to emphasize the necessity and safety of defining the critical view of safety during a laparoscopic cholecystectomy; complicated by cholelithiasis and empyema of the gallbladder to achieve a successful surgical outcome. Methods: We present a 51-year-old female with findings of acute calculous cholecystitis on computed tomography complicated by gallbladder empyema. The patient was consented for laparoscopic cholecystectomy and intraoperative cholangiogram. Results: Meticulous dissection to define the critical view of safety. Optimal intraoperative cholangiogram performed with no filling defects. Gallbladder was removed via endocatch bag. No iatrogenic biliary injury. Patient discharged without complication. Conclusion: Mobilization, hemostasis and obtaining the critical view of safety is essential to avoid biliary tree injury during complicated laparoscopic cholecystectomy.

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