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ABSTRACT BOOK

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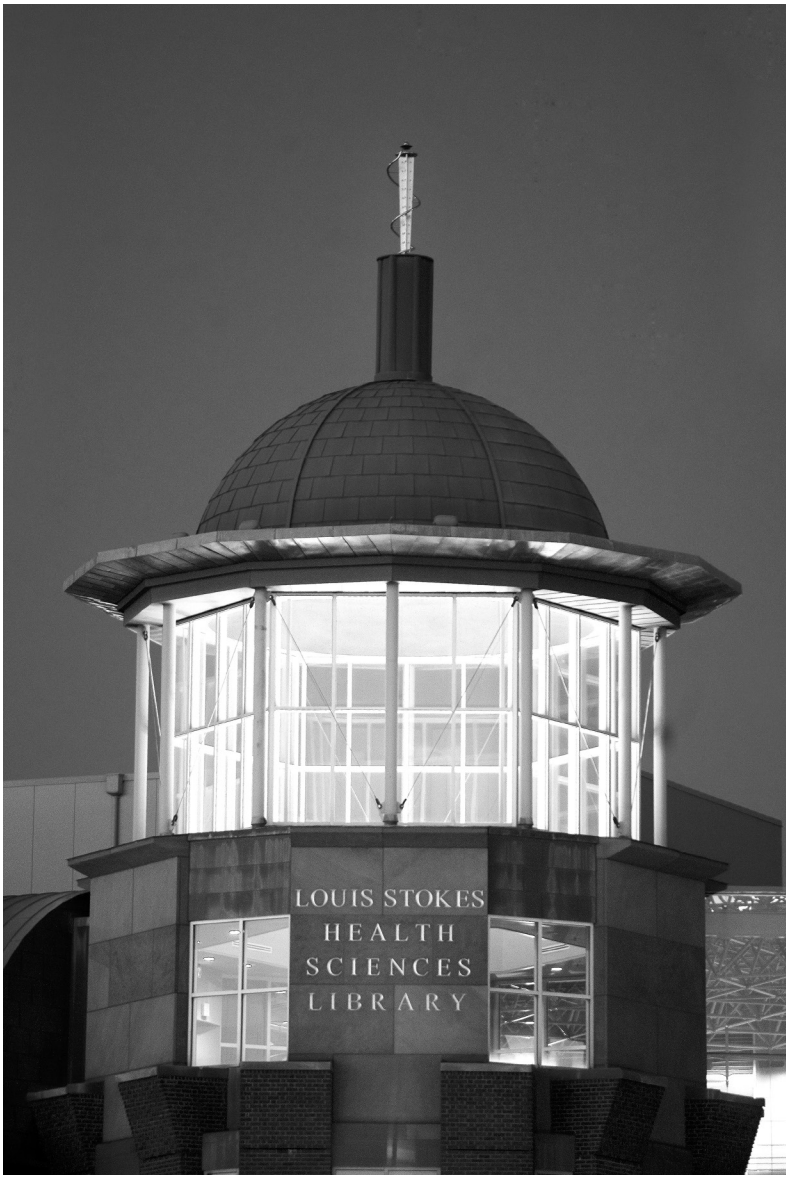


Abstract Book

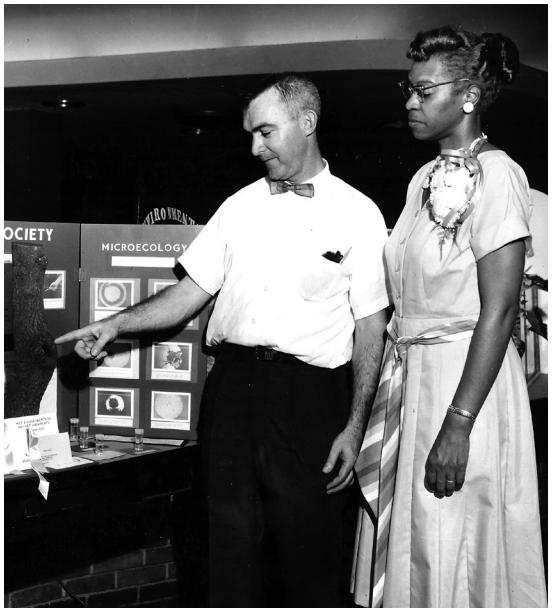
APRIL 13, 2017

HOWARD UNIVERSITY HISTORIC RESEARCH INFRASTRUCTURE

Photos provided by the Moorland-Spingarn Library

College of Medicine- Chemical Cases for Juniors & Seniors, n.d.

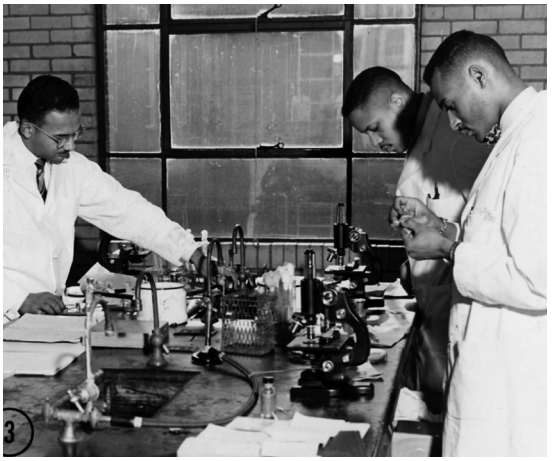
Founders Library, students studying, n.d.



Botany - Spunk Hole Society, n.d.

Chemistry Bldg. Dedication, 1937

Medical School Faculty, 1952



Medical students in lab, n.d.

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HOWARD UNIVERSITY HISTORIC RESEARCH INFRASTRUCTURE

Photos provided by the Moorland-Spingarn Library

Biology Lab Students, 1920s

Association of Medical Women, 1953

Founders Library, students studying, n.d.

Zoology Graduate Students, n.d.

Cancer Research Institute Groundbreaking, 1977

Botany students in the greenhouse, n.d.

Biological & Biomedical Sciences

Downregulation of spargel/dPGC-1 in the wings protects epithelial cell death like a proapoptotic gene

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Coauthors: Atanu Duttaroy

Drosophila spargel, a homologue of mammalian Peroxisome Proliferator-Activated Receptor Gamma Coactivator 1 (PGC-1), is the terminal effector of the insulin signaling pathway. Spargel overexpression in the midgut has been shown to increase life span while its ablation causes reduced body size and sterility. From an unrelated genetic screen, we first noticed that spargel depletion in the wings resulted in the appearance of large brown blemishes on the wings. In addition to the appearance of these blemishes, which increase progressively in size as the flies age, the wings were also held out. Because similar blemishes appear in the mitotic clones of proapoptotic genes like dronc, dark, grim, hid and reaper, we hypothesize that the loss of spargel function is possibly inhibiting wing epithelial cells deaths, a biological process required for the stabilization of adult wing during the final process of wing maturation. Further investigations using TUNEL assay and through live-cell imaging supports this hypothesis as fewer cell deaths occur in the wings following the ablation of spargel. Ultrastructural analysis of spargel-depleted wings confirmed spargel may be an inhibitor of programmed cell death (PCD). Finally, an epistatis analysis showed that spargel actually acts upstream of the canonical PCD pathway of Drosophila.

Lower Extremity Arterial Reconstruction is Associated with Worse Outcomes when Performed on Weekends

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Recent reports in the literature suggest that there may be an increased risk of postoperative complications for certain surgical procedures when performed during weekends. This "weekend effect, however, has not been extensively studied for vascular surgical procedures such as lower extremity arterial reconstruction (LEAR). We undertook this study in order to determine whether LEAR performed on weekends may be associated with worse outcomes as compared to operations performed on weekdays. The Nationwide Inpatient Sample database was queried to identify all patients who underwent LEAR from 2007 to 2012. Patient demographics and presenting comorbidities were recorded. Multivariate analysis was utilized to compare postoperative outcomes between patients undergoing LEAR during weekdays (Monday to Friday) and patients undergoing LEAR during weekends (Saturday and Sunday). There were 74,236 patients who underwent open infrainguinal LEAR during this time period. Of these LEAR procedures, 85% (62,946) were performed on a weekday while 15% (11,290) were performed on a weekend. There was a crude postoperative mortality of 5.2% for LEAR done on a weekday vs. 7.8% done on a weekend. Following multivariate analysis, LEAR performed on weekends was associated with an increased risk of mortality (OR 1.5, 95% CI 1.3 – 1.7) as well as an increased risk of morbidity (OR 1.2, 95% CI 1.1 – 1.3). LEAR performed on a weekend is associated with an increased risk of postoperative morbidity and mortality as compared with LEAR operations performed on a weekday, and further research is warranted.

Open & Endovascular Ruptured AAA Repair Have Equivalent Outcome When Performed Weekdays vs Weekends

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Introduction: Studies have demonstrated that there may be an increased risk of postoperative complications for certain surgical procedures when performed during weekends. We undertook this study to determine if repair of ruptured AAA (rAAA) performed on weekends differed in outcomes as compared to rAAA operations performed on weekdays.

Methods: We conducted a retrospective review of the Nationwide Inpatient Sample (NIS) database to identify all patients who underwent an open or endovascular rAAA repair from 2007 to 2012. Operations were dichotomized into Weekday (Mon-Fri) and Weekend (Sat and Sun); and open versus endovascular. Multivariate analysis was performed adjusting for patient characteristics and comorbidities. **Results:** A total of 15,418 patients had a rAAA repair. In those undergoing open repair, (n=6,623), the mean age was 73 (SD±9) years with an overall mortality of 39.5% and overall complication rate of 43.1%. Comparing weekday versus weekend, open rAAA repair, there were similar rates of mortality (40.6% weekday vs. 39.1% weekend; p=0.264) and morbidity (43.5% weekday vs. 42.9% weekend; P=0.693). In those undergoing endovascular repair, (n=2,170), comparing weekday versus weekend endovascular rAAA repair, there were similar rates of mortality (24.5% weekday vs. 32.7% weekend; OR [95%CI]: 1.30 [0.87-1.96]) and morbidity (31.9% weekday vs. 31.5% weekend; p=0.843). **Conclusion:** rAAA repair is associated with equivalent outcomes when performed on the weekend vs weekday.

Site-specific brusatol delivery to facilitate clinical translation for cancer chemotherapy

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Chemotherapeutic agents that are active against rapidly dividing cells may be relatively ineffective against metastatic prostate cancer because these cancers have a low proliferative rate. Brusatol has been reported to possess a unique potential to target two distinct pathways that are important in the progression of cancers as a result of its action on nuclear factor erythroid 2-related factor 2 (Nrf2) and as a global protein synthesis inhibitor. Due to its non-selective mechanisms of action, it is unlikely that brusatol can be administered as a therapeutic agent without substantial host toxicity. Preparation of brusatol-loaded PEG-PLGA nanoparticles was carried out using the oil-in-water emulsification method. Nanoparticle fabrication was confirmed by electron microscopy with average hydrodynamic particle size of 309.23 ± 2.3 nm. The drug content of the nanoparticle formulation was determined by HPLC. The in vitro release isotherm showed sustained release of the encapsulated drug over 866 hours. 5-day cytotoxicity data revealed that the nanoparticle formulation showed more toxicity to PC-3 and LNCaP prostate cancer cell lines compared to brusatol solution used as control. Cellular uptake of nanoparticles was evaluated using confocal microscopy in PC-3 cells. Data showed internalization of the nanoparticles. In addition, z-stacks images revealed the presence of nanoparticles at various depths within the cells which confirm that the nanoparticles were internalized by the cells and not adhering to the cells. This study shows that the nanoparticle formulation of brusatol can overcome delivery challenges and facilitate the clinical translation of the drug for the treatment of cancers.

Upregulation of Renal Iron Metabolism in Sickle Cell Disease Mice

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Sickle cell disease (SCD), unlike β-thalassemia, is characterized by abnormalities of renal iron metabolism. Renal iron deposition does not correlate with iron overload and blood transfusion. Transgenic SCD mice accumulate iron in the epithelial cells of proximal tubules and represent a suitable model to study iron metabolism in SCD patients. To characterize proteins of the renal iron metabolism in SCD mouse model, RNA and proteins were isolated from the kidney of 5 months old transgenic SCD (Townes) and control mice. Western blot, ELISA, and quantitative RT-PCR were used to measure levels of renal hepcidin, ferroportin, transferrin receptor (TFR1), divalent cation receptor (DMT1), ferritin, and hephaestin in the renal cortex. Immunostaining was used for detection of renal iron accumulation on paraffin-embedded sections. Significant accumulation of iron was found in the epithelial cells of proximal tubules in SCD mice. Also, we found an increased expression of renal hepcidin in SCD mice compared to controls and, surprisingly, decreased mRNA levels of all other proteins involved in renal iron metabolism (ferroportin, TFR1, DMT1, ferritin, and hephaestin). In contrast, increased levels of transferrin receptor, ferritin, and ferroportin were observed alongside with a significant renal macrophages infiltration in SCD mice. These findings

suggest that increased levels of renal hepcidin expression in SCD mice may be associated with renal inflammation. Also, high levels of locally expressed hepcidin may lead to the partial degradation of ferroportin and significantly impair iron export from renal epithelial cells thus leading to the intracellular iron accumulation.

Role of NHERF1 in aging animal models of salt sensitive hypertension (SSH) and chronic kidney disease (CKD)

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Coauthors: Dexter Lee, Syed Khundmirir

Aging is an independent risk factor for SSH and CKD. SSH is caused due to an imbalance in the actions of D1R and AT1R. We showed loss of NHERF1 expression in 22-mo old F344 rats and SSH in 24-mo old FBN rats. We hypothesized that loss of NHERF1 contribute to salt reabsorption in aging. To address this hypothesis, FBN rats (1-24-mo old) were fed 1% and 8% NaCl diet for 1 week and measured urinary volume, sodium, potassium; chloride. We also measured expression of NKAα1, NHERF1, D1R and TNFα. Urine volume (24-hr) increased by 2 fold in 1- and 4-mo rats but not in 24-mo rats on 8% NaCl diet. Urinary sodium (24-hr) increased by 7 fold in 4-mo rats on 8% NaCl diet and 3 fold in 24-mo rats. To our surprise, NHERF1 expression increased with age in FBN rats. Increased NHERF1 expression in FBN rats was associated with decreased D1R expression while in F344 rats D1R expression increased with age. To determine if lack of NHERF1 is responsible for salt wasting, we measured urine volume and Na in 18-mo old WT and NHERF1-/- mice. The urine volume in WT mice were significantly lower than KO mice. TNF-alpha increased in 22-mo old F344 rats and KO mice but not in 24-old FBN and WT mice. We conclude that increased NHERF1 expression as seen in 24-mo old FBN rats result in salt retention while lack of NHERF1 as seen 22-mo old F344 rats and NHERF1 KO mice increase renal inflammation.

A Species Distribution Model of Ethiopian Phlebotomine Sandflies

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Coauthors: Janelle Burke, Winston Anderson, Janet Mansaray

Cutaneous Leishmania (CL) is a zoonotic disease endemic to East Africa, Latin America, and the Middle East. In Ethiopia it is caused by the trypanosome Leishmania aethiopica; this protozoan is typically transmitted to humans by phlebotomine sandflies. Two species of sandfly (Phlebotomus longipes and Ph. pedifer) are known vectors of CL in Ethiopia. To better inform our understanding of human populations vulnerable to CL, we are constructing a species distribution model specific to the niche for these sand flies. Using the program MaxEnt, we reconstructed a niche model for Ph. longipes and Ph. pedifer, using species presence data and bioclimatic layers. Based on preliminary findings, Ph. longipes has a broader ecological niche than Ph. pedifier. Phlebotomus pedifer has a more southern distribution in Ethiopia and into Kenya. This research has applications in epidemiology of CL, and outreach and public health services in the future.

Isolation of Bacteriophage Infected with Mycobacterium smegmatis

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Coauthors: Daphney Bonner, Gretchen Johnson, Adrain Allen, Mary Ayuk, Leon Dickson, Broderick Eribo, Ayele Gugssa,Winston Anderson, Courtney Robinson

Background: Phage research has benefits on the local scale among students and professors, and a global scale among researchers everywhere. Bacteriophages are viruses that attack specific bacteria and exist in any environment where bacteria are present. Bacteriophages are crucial to medical research; they can target specific bacteria that may have become resistant to antibiotics. The phage that was studied in this project was isolated from a soil sample near the Howard University sign at 4th street and Bryant Street. **Methods:**

After the soil sample was collected, then combined with phage buffer. After the supernatant settled it was mixed with 0.5 mL Mycobacterium smegmatis. After Incubation, the phage containing solution was repeatedly serially diluted. The DNA of the pure phage was collected and tested in a Nanodrop spectrophotometer to determine the concentration of Phage DNA. The DNA was processed with restriction enzymes. **Results:** The serial dilutions resulted in multiple morphologies of plaques. To confirm one phage type was producing the multiple plaque morphologies, multiple purification assays were conducted. The plaques differed in diameter size from 1.0mm to 2.0mm. The extracted DNA was subjected to gel electrophoresis, there was not a large amount of DNA, it could not be visually detected. The concentration of DNA according to the Nanodrop was 186.13ng/ml. **Conclusion:** A phage named Jeffrey was isolated and its DNA was extracted. This research will add to the growing database of phage information at phagesdb.org and will help researchers learn more about phages that specifically infect Mycobacterium smegmatis.

Analysis of flavonoid prenyltransferase genes by the Induction of Isoflavonoid by methyl jasmonate (MJ) in Pueraria Cell suspension

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The Pueraria Mirifica plant has great value for is its high estrogenic content. The cultivation of estrogen can be useful in estrogen replacement therapy. The goal of this study is to understand Pueraria Mirifica's production of estrogen through its transcriptome and the induction of methyl jasmonate. In this study methyl jasmonate will be used on the Pueraria Mirifica cell to see if the isoflavoniod in production is increased. Isoflavoniod is a major phytoestrogen, which is the source of the plant's high estrogen content. The procedure was done through callus induction, elicitation of the pueraria cell suspension culture and high-performance liquid chromatography (HPLC) analysis. The HPLC analysis provided chromatograms that graphed methyl jasmonate's effect on pueraria. Results revealed that methyl jasmonate was not proven as an inducer but created interesting peaks of induction at 1.25 µm and 2.50 µm. Further research will be done using Methyl Jasmonate in concentrations between 1.25 µm-2.50 µm on Pueraria, confirming the peaks of the HPLC by adding each isoflavoniod and using Nuclear magnetic resonance spectroscopy (NMR).

Multibacteriocinogenic Lactobacillus parafarraginis KU495926 Inhibits Multi-Drug Resistant Gram-negative Bacterial Pathogens

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Several studies have shown that Lactobacillus species produce bacteriocins with antimicrobial activity against Gram-positive bacteria; however, only few studies have reported activity against Gram-negative bacteria, especially the multi-drug resistant strains. In the current study, sixty-eight lactic acid bacteria (LAB) were initially screened for antimicrobial activities against three standard indicator organisms: Staphylococcus aureus, Listeria monocytogenes and Escherichia coli (O157:H7). Most of the LAB isolates (93%) exhibited antimicrobial activity against the indicator organisms, however, one representative isolate was selected for further characterization. This isolate was identified to be Lactobacillus parafarraginis by 16Sr RNA, accession number KU495926. It was of interest to note that the isolate inhibited fourteen multi-drug resistant (MDR) and extended spectrum beta-lactamase (ESBL) bacteria from clinical sources by spot and well diffusion assays. The minimum inhibitory concentration (MIC) of the lyophilized crude extract was ~20 mg/mL. The 14 isolates were E. coli (5), Pseudomonas aeruginosa (2), Acinetobacter baumannii/haemolyticus (3), Enterobacter aerogenes (1), Proteus mirabilis (2) and Klebsiella pneumoniae (1). Polymerase chain reaction (PCR) detected four bacteriocin structural genes in the L. parafarraginis (KU495926) chromosome, namely, (sakT-β) for sakacinT-β chain (sakT- α) for sakacinT-α chain, (acd T) for acidocin and (plnc8A) for plantaricin-α chain. The results of this study suggest that Lactobacillus parafarraginis KU495926 maybe a novel strain worth exploiting for potential therapeutic application.

The effect of Peroxisome Proliferator-Activated Receptor-α on NOX-4 expression in the heart during a slow-pressor dose of Angiotensin-II induced hypertension

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Coauthors: Dexter Lee

Aging decreases myocardial peroxisome proliferator activated receptor–alpha (PPAR-α) expression and activation of PPAR-α reduces hypertension and cellular oxidative damage. Our goal is to determine if PPAR-α reduces hypertension through a NOX-4 dependent mechanism. We hypothesize that PPAR-α helps attenuate the pressor response to Angiotensin II (Ang II) by negatively regulating NOX-4 expression in the heart. Male (48 weeks old) PPAR-α knockout (KO) mice and wild type (WT) mice were implanted with biotelemetry devices and infused with a slow pressor dose of Ang II (400 ng/kg/min) for 12 days. On day 12 of Ang II, MAP was increased in KO when compared to WT, 167 ± 6 and 145 ± 3 mmHg, respectively. Hearts were homogenized and 25 µg of supernatant proteins were separated by 10% SDS-PAGE, transferred to nitrocellulose paper, and blotted against antibodies to NOX-4. The expression of NOX-4 in the heart was not significantly different between KO and WT controls. NOX-4 expression was also not different between Ang II-treated KO (10 ± 10 ODU) and Ang II-treated WT (12 ± 8 ODU) mice. Previous results from our laboratory suggest that increased NOX-2 expression in the heart and plasma levels of Interleukin-17 are probable mechanisms of significant increase in the Ang II-induced slow-pressor response in PPAR-α KO mice when compared to WT + Ang II. Future studies would determine the role of NOX-2 expression and increased plasma levels of interleukin-17 in increase in blood pressure and oxidative stress in PPAR-α KO + Ang II mice.

Exploring the Life Cycle of Phage AxelR8 through Host Mycobacterium smegmatis

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Coauthors: Joseph Chasse, Gretchen Johnson, Adrian Allen, Mary Ayuk, Leon Dickson, Broderick Eribo, Ayele Gugssa,Winston Anderson, Courtney Robinson

Background: Bacteriophages are viruses that reproduce through the infection of and replication within a bacterial host. The host bacterium used in this research was Mycobacterium smegmatis. This host is particularly interesting because it shares 2000 homologous genes with M. tuberculosis, the same cell wall structure, and is capable of oxidizing carbon monoxide aerobically, as is M. tuberculosis. Microbiologists have looked towards bacteriophages as a possible solution to the problem of antibacterial resistant bacteria. **Method:** The phage AxelR8 was obtained from a soil sample collected from a tree in the main yard of Howard University's campus. Phages were extracted from the soil sample through the process of enrichment isolation. A series of plaque assays followed in effort to isolate and purify the phage population. Plate lysates were collected from webbed plates using phage buffer and a spot titer was conducted with the resulting lysate. **Results:**The phage AxelR8 has plaques with a turbid morphology indicating that it undergoes the lysogenic life cycle, this means that instead of outright lysing the host bacterium that phage integrates its DNA into the host's genome. The size of this phage ranges from 1-1.5 mm in diameter. **Conclusions:** Since AxelR8 is a lysogenic phage, meaning that it integrates its phage DNA into the genome of the host bacterium, it can be used to create lysogens which are bacteria containing phage DNA. Future experiments will test other phages' abilities to infect AxelR8's lysogens.

The Role of Mucin-type O-Glycosylation in Packaging and Secretion of O-Glycosylated Proteins

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Regulated secretion is essential to cell adhesion, migration and communication. Secreted proteins are synthesized in the ER and then move to the golgi apparatus, where conserved post-translational modifications such as O-glycosylation can occur. Proteins are then sorted and packaged into secretory vesicles before being secreted outside of the cell. Our lab is interested in studying the role of mucin-type O-glycosylation in different biological processes using Drosophila melanogaster

as the model organism. Alterations to this type of conserved modification have been shown to cause various developmental defects in Drosophila and furthermore, have been implicated in many human diseases. This experimental work has focused on the importance of mucin-type O- glycosylation on the development of salivary glands in the Drosophila third instar larvae. The method employed to track the role of mucin-type O-glycosylation in the development of Drosophila salivary glands was RNA interference (RNAi) to genes encoding the essential Polypeptide GalNAc Transferases (PGANTs), that initiate mucin-type-O-glycosylation, via the use of GAL4/UAS system. The morphology and secretory behavior of the granules within the salivary glands were analyzed using confocal microscopy. Our work attempts to quantify the differences between control and different pgant knockdowns (pgant3, pgant4, pgant5, and pgant7) by analyzing granule circularity. The results indicate that the absence of specific pgants has consequential effects on the shape of the salivary gland glue granules. This suggests that mucin-type O-glycosylation

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Salvianolic Acid B Inhibits Head and Neck Squamous Cell Carcinoma Cell Growth by Regulation of miRNA Profile

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Head and neck squamous cell carcinoma (HNSCC) is currently the seventh most prominent cancer in the world with over 600,000 new cases are diagnosed each year, with approximately 50,000 coming from the United States. It urgently needs to develop effective anticancer agents for HNSCC disease. Our previous studies have shown that salvianolic acid B (Sal-B) is a promising anticancer agent. Sal-B has been isolated from salvia miltiorrhiza BGE, which has been used for thousands of years in China to treat cardiovascular and cancer diseases. We found that Sal-B inhibits HNSCC growth ether in cultured HNSCC cell lines or HNSCC animal models. In this study, we focused on the mechanism of Sal-B anticancer function that how Sal-B affects the miRNA profiles in Sal-B treated HNSCC cells. MicroRNAs serve as a regulator in gene expression. A penal of miRNAs, including 80 most cancer related miRNAs, was analyzed by nanoString technology in two human HNSCC cell lines (JHU-22 and JHU-29). We found that over 30 miRNAs were significantly upregulated and 20 miRNAs were downregulated after the cells treated with Sal-B. Overall miRNA profiles were similar between these two cell lines. For example, the miR-1246 levels were 40 times decreased in both cell lines compared untreated cell lines. A current report indicated that high miR-1246 expression is associated with poor prognosis in HNSCC. The miRNA expression profiles will greatly help us to better understand the Sal-B anticancer function.

The missing landscape of human genomic diversity in the Arabian Peninsula

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The Arabian Peninsula (AP) is the first site of human migration and habitation outside of Africa. As a major crossroad for human populations, it provides an opportunity to better understand early to modern human demographic patterns through selections, admixture, gene flow, and migration. Dramatic climatic fluctuations have been recorded in the AP that contributed to water availability contractions and expansions. These climatological perturbations are thought to have shaped genomic variations in the human populations that previously and currently inhabit the peninsula. Numerous Arab nation-states have indicated that they are typing national population with a comprehensive goal of identifying the amount of genomic diversity in the AP. We sought to characterize currently typed genomic variation in Arabian populations as a way to contextualize our proposed analyses of Saudi Arabian genomic diversity. Interestingly we find that a comprehensive search of the four national genomic projects (Qatar, Saudi Arabia, Kuwait, and The United Arab Emirates) as well as peer reviewed genomic analyses (N=20 papers) reveals that none of their data is publicly available in contradiction to the literature on their own materials. This analysis demonstrates that while much fanfare and presumably resources have been devoted to the genomics of the Arabian peoples, little actual data is available to support this investment.

Effects of Thymus vulgaris and Varroa destructor on survival and health of European honey bees, Apis mellifera

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European honey bees, Apis mellifera are important pollinators of crops and producers of honey. Honey bees populations have been declining due to the roles the ectoparasitic mite, Varroa destructor and pesticides play on the health of the bees. One of the alternative methods for the control of Varroa mite is the use of plant essences. The aim of the study was to investigate the activity of Thymus vulgaris (thyme) and Varroa destructor on the mortality, growth, virus dynamics and immunity of worker honeybees. The bees were exposed to varroa mites and different concentrations of thyme essence and bees were collected on day 4, 8 and 12 post treatment. The study provides evidences that the exposure of worker honey bees to varroa mites in the absence of the thyme essence showed negative effect on health and survival while exposure of worker honey bees to both the mite and thyme essence showed greater longevity and better health of the bees. These results indicate that thyme essence could be used to improve the overall health of honey bees.

Phenotypic and Molecular Characterization of Nosocomial Multi-Drug Resistant Acinetobacter baumannii Isolates from Four Washington DC Area Hospitals

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Coauthors: Dr. Broderick Eribo

Previous studies have reported the prevalence of multidrug resistant Acinetobacter baumannii in several municipal hospitals. In Washington DC for example, a study limited to Walter Reed Army Medical Center provided the first look at the complexity of antibiotic resistance in Acinetobacter sp. The present study aims to determine the antibiotic resistance, plasmid profiling, and presence of oxacillinases and metallo β-lactamases (MBLs) gene in twenty-eight isolates belonging to Acinetobacter calcoaceticus-Acinetobacter baumannii (ACB) complex from four hospitals in Washington DC. Eighty four percent of the isolates were observed to be multidrug resistant with resistance rates as follows: Cefepime (56%), Ceftazidime (68%), Meropenem (52%), Imipenem (40%), Levofloxacin (68%), Amikacin (60%) and Gentamicin (56%), while only 16% were susceptible to all antibiotics tested. Of the twenty-eight isolates, eleven were Extensively Drug Resistant (XDR) and five were Multi Drug Resistant (MDR) phenotypes. Plasmid profile analysis showed that the isolates had at least one plasmid ranging in size from 100 to >1200kb. PCR analysis confirmed the presence of blaOXA-51 in 86% while blaOXA-23 was present in only 24% of the isolates. Seven imipenem resistant A. baumannii isolates confirmed to be positive for the presence of MBL gene as screened by phenotypic tests. ISAba1 insertion sequence was found to be present in 68% of the isolates. PCR analysis confirmed the presence of ompA genes in 90% of the isolates. The results of this study show that antibiotic resistant A. baumannii may be common in Washington DC area, suggesting the need for continued surveillance.

Effect on Oligosaccharide Grafing on the Polyelectrolyte and Protonation Dynamics of Polyethylenimine

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Polyethylenimine (PEI) is one of the most popular polymers used for condensing DNA in cell-transfection and gene-therapy applications. The PEI polymer backbone is intrinsically hydrophobic, semiflexible, and contains closely-spaced amine groups which are charged when protonated. As a result, the polymer exhibits unusual polymer dynamics. Mannobiose-grafted PEI (PEI-m) is used as carriers for DNA vaccines that provide long-term immunity against chronic pathologies like AIDs and cancer, and has lower carrier-induced toxicity. Our studies indicate that the backbone protonation of PEI-m occurs intermittently with pH in a salt-independent manner. Clustered phases which exist in PEI solutions are attenuated when mannobiose is grafted to the backbone. Mannobiose-grafting also appears to increase the hydrodynamic diameter of the PEI polymer,

and the mechanism is still under investigation. Our findings delineate that the grafting of a hydrophilic moiety modifies the semiflexibility, protonation, and clustering dynamics of the PEI backbone; and these alterations significantly affect the packing of DNA into delivery nanoparticles.

Novel functions for the RNA-binding protein ETR-1 in Caenorhabditis elegans reproduction and physiological germline apoptosis

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Background: ETR-1, ELAV-Type RNA-binding protein, is canonically known for its involvement in C. elegans muscle development as animals depleted of ETR-1 arrest at the two-fold stage of embryogenesis. A 2014 RNAi-based suppressor screen identified ETR-1 as a suppressor of a major cell cycle kinase, implicating ETR-1 in reproduction. In this study, we investigated ETR-1's role in reproduction through fertility assays conducted in wild-type, a somatic defective RNAi mutant and a germline defective RNAi mutants. **Methods:** RNAi, Acridine orange assay, TEM, confocal microscopy. **Results:**These assays showed that ETR-1 depletion alone via RNAi leads to reduced brood size when compared with the control and in addition ETR-1 plays roles in both the germ line and the soma. This reduced brood size was investigated to be as a result of the presence of high number germ cells undergoing apoptosis as evident by increased CED-1::GFP positive early apoptotic cells and apoptotic acridine orange dyed germ cells. Transmission Electron Microscopy (TEM) reveals significant defects in the structure of the somatic gonadal sheath cells and a failure to properly engulf dying germ cells in etr-1(RNAi) animals. Investigating the three established engulfment pathways in C. elegans, we will demonstrate that co-depletion of CED-1 and ETR-1 suppresses the increase in the number of apoptotic bodies observed in etr-1(RNAi) animals, while initial experiments co-depleting CED-2 and ETR-1 appear to enhance the apoptotic phenotype. **Conclusion:** Combined this data identifies a novel role for ETR-1 in both hermaphrodite reproduction and in the process of engulfment of apoptotic germ cells.

Collection, Isolation, Purification, and Extraction of Phage DaMari

Presenter's Name: Daphney Bonner
Classification: Undergraduate Student
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Background: Bacteriophages are viruses that infect bacteria and are diverse because of their specificity to bacteria strains. This study is being conducted to increase the amount of knowledge about Mycobacterium phages and to lead the way in advancing the applications of phages in modern medicine. New phage discovery can lead to advances in bacteriophage therapy, allowing the genetic information of bacteriophages to be used in understanding antibiotic resistant strains of bacteria. **Methods:** Phage DaMari was isolated in front of the Howard University sign at the intersection of Fourth Street and Bryant Street (38.920488 N, -77.017607 W). An enrichment protocol was used to increase the overall phage population and DaMari was isolated through a series of dilutions. Additionally, empirical testing was used to acquire the concentration needed to obtain a webbed plate from a HTL (High titer lysate) while DNA extraction was used to purify DaMari's DNA. **Results:** DaMari was successfully isolated and an HTL of 1.67 x 10^11 pfu/ml was obtained. Additionally, the DNA isolated from DaMari had an extremely high concentration of 395.8 ng/µL. Finally, DaMari produced plaque diameters ranging from 0.5 mm to 1.5 mm. **Conclusions:** A single phage, DaMari, was successfully isolated and purified. The next steps are to discover if a lysogen can be formed from DaMari and to see if DaMari can then super infect another lysogen. Additionally, there are hopes in the future that DaMari will undergo transmission electron microscopy.

Gut microbiome analysis reveals major dysbiosis in Sickle Cell Diseases patients with a prevalence of Veillonella strains

Presenter's Name: Hassan Brim
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Coauthors: Kimberly Vilmenay, Nazli Atefi, Mohammad Daremipouran, Edward Lee, Patrick Gillevet, Patricia Oneal, Hassan Ashktorab

Background: Sickle cell disease (SCD) is an inherited blood disorder that occurs primarily in patients of African descent and generally associates with frequent pain crises. It has been suggested that the gut microbiome structure and function may have a major impact on host health. Aim: To characterize the gut microbiome in patients with SCD. **Materials & Methods:** DNA extracts from 14 controls and 14 cases (7 mild and 7 seevere pain crises) stools were used. 16S rRNA gene V4 region was PCR amplified and sequenced in a MiSeq sequencer. Operational taxonomic units (OTUs) were defined by clustering at 3% divergence (97% similarity). The final OTUs were taxonomically classified using BLASTn and LeFSe analysis was used to determine differential bacteria. **Results:** A major dysbiosis was noticed in the SCD gut microbiome. Several bacterial groups have been depleted from the SCD patients. SCD patients were defined by the prevalence of Bifidobacteria, Campylobacter, Veillonella, Actinomyces, Scardovia and Atopobium. A major shift towards anaerobic bacteria was noted. The analysis among the two SCD groups revealed a higher prevalence of Veillonella and Oxalobacter species among SCD patients with severe pain crises. **Conclusion:** We report a major dysbiosis in SCD patients' microbiota likely driven by local acidosis and hypercapnia in these patients. Veillonella, a normal oral and colon inhabitant, is known for its ability to form biofilms and as a facilitator of Streptococcus strains pathogenesis. Its high prevalence in SCD patients might exacerbate pain crises through biofilms' formation

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Hypoxia facilitates NEPC transdifferentiation

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Coauthors: David Goodrich, Sheng-Yu Ku, Spencer Rosario

Prostate cancer is the most common non-skin cancer in American men as well as the second leading cause of cancer mortality in developed nations. Prostate cancer is an androgen-dependent disease that initially responds to androgen deprivation therapy (ADT) but later becomes resistant. One mechanism of ADT resistance involves transdifferentiation to neuroendocrine prostate cancer variants (NEPC). We suggest that hypoxia (low oxygen levels) facilitates NEPC transdifferentiation and prostate cancer aggressiveness. To test this, tumor cell lines generated from genetically engineered mouse models of prostate cancer were placed in a 1% hypoxia chamber for 3 days, then RNA and protein samples were extracted and analyzed using Western blot and real-time PCR methods. We find NEPC transdifferentiation, demonstrated by increased expression of neuroendocrine markers such as NSE, increases under hypoxic conditions.

Muscadine Grape Skin Extract Inhibits Androgne-Independent Prostate Cancer Cell Growth, Inducing Cell-Cycle Arrest, and Decreasing Migration by Targeting Heat Shock Protein 40 U

Presenter's Name: Collis Brown
Classification: Staff
Presentation Type: Poster Presentation
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Previously we demonstrated that muscadine grape skin extract (MSKE), a natural product, significantly inhibited prostate cancer cell growth by inducing apoptosis through the targeting of phosphatidylinositol 3-kinase-Akt and mitogen-activated protein kinase survival pathways in androgen-responsive transformed human prostate cancer epithelial cell lines. However, the preventive effect of MSKE on more aggressive androgen-independent prostate cancer remains unknown. This study examined the effects of MSKE treatment using complementary PC-3 prostate cancer cell culture and xenograft models. MSKE significantly inhibited PC-3 human prostate cancer cell tumor growth in vitro and in vivo. The growth-inhibitory effect of MSKE appeared to be through the induction of cell-cycle arrest. This induction was accompanied by a reduction in the protein expression of Hsp40 protein and cell-cycle regulation proteins, cyclin D1 and NF-kBp65. In addition, MSKE induced p21 expression independent of wild-type p53 induced protein expression. Moreover, we demonstrated that MSKE significantly inhibited cell migration in PC-3 prostate cancer cells which was complimented by siRNA-HSP40 knock-down that also inhibited cell migration and growth. Overall, these results demonstrate that MSKE inhibits prostate tumor growth and migration, and induces cell-cycle arrest by targeting Hsp40 and proteins involved in cell-cycle regulation and proliferation. This suggests that MSKE may also be explored as a novel therapeutic in castration resistant prostate cancer.

The Road to Finding Chloe2x

Presenter's Name: Maia Brown
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Coauthors: Taylor Burroughs, Gretchen Johnson, Adrian Allen, Mary Ayuk, Leon Dickson, Broderick Eribo, Ayele Gugssa, Winston Anderson, Courtney J Robinson

Background: Bacteriophages are viruses that infect bacterial hosts in order to replicate themselves. They are the most abundant organisms in the biosphere. When phages infect a bacterial host on a Petri dish, it causes a clearing called a plaque. A clear plaque indicates a lytic phage, while a turbid plaque indicates a temperate phage. We studied phages that infect the bacterium Mycobacterium smegmatis mc2-155, with the goal of understanding the phage diversity. **Methods:** Our phage was obtained from a soil sample from The Greene Stadium (38.9249171N and -77.0205566W) at Howard University. M.smegmatis was added to the soil sample to increase the number of phage through enrichment and direct plating experiments. The phage was then isolated and plated through serial dilutions in order to obtain a single population phage. A lysate was then collected and used to extract the DNA from our phages. Recently, streaking petri dishes and creating patch assays have been conducted to test if the phage population is actually temperate. **Results/Conclusion:** A phage that creates clear plagues that are about 1.5mm was isolated and named Chloe2x. The titer of the lysate was 1.08x10-4. Bacterial growth was detected in a previously clear plaque after 7 days of incubation. Chloe2x was thought to be a lytic phage, but the results of recent experiments indicate that it might be temperate.

Consensus Comparative Modeling to Construct Structural Models of Human C-C Chemokine receptor 4 (CCR4) to Discover Small-Molecule Therapeutics to Treat Cancer Metastasis

Presenter's Name: Jeffery Bullock
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Background: Cancer can spread rapidly throughout the human body, either locally to nearby normal tissues or regionally to lymph nodes and distant organs. . Human CC chemokine receptor 4 (CCR4) plays fundamental roles in the development, homeostasis, and function of the immune system, and has profound effects on endothelial cells involved in angiogenesis or angiostasis. A defucosylated, humanized monoclonal antibody targeting CCR4, Mogamulizumab, has been approved in Japan for the treatment of adult T-cell leukemia-lymphoma (ATL). Considering the high cost of antibody treatment, there is an urgent need to develop small-molecule based, anti-CCR4 therapeutics. **Method:** Comparative Modeling has become a powerful tool to address the issue of lack of crystal structures for important drug targets such as human CCR4. Through a new algorithm in Maestro 11, we constructed consensus homology models of CCR4 using multiple templates with success. Initially, the FASTA amino acid sequence for human CCR4 was loaded and pair-wise alignment was conducted. A BLAST query was submitted to NCBI PDB to find homologs, and returned 4MBSas a potential template. The query based on multiple sequence alignment resulted in our second template of 5T1A. **Results:** Our consensus comparative models obtained from different templates meet above stereo-chemical criteria specified, while a premium binding pocket was identified consisting of Lys191, Glu283, Thr259, 195, 284, 247, 257 and Phe182. **Conclusion:** The new consensus comparative modeling algorithm provides an option toward more accurate determination of both the global structure and binding sites for human CCR4.

Lyme: An Insidious Disease

Presenter's Name: Dymond Burnette
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Lyme Disease, designated the "most common reported vector-borne disease" by the Centers for Disease Control, or CDC, has steadily shown an upward trend in the amount of cases diagnosed in the United States over the past few decades. Lyme disease, caused by the microbial spirochete, Borrelia bugdoferi, is transmitted to humans via the saliva from the bite of a Ixodes scapularis tick. In Europe and Asia, it is caused by two other Borrelia genospecies, Borrelia afzelii and Borrelia garinii, which result in regional variations in disease manifestations. Data from the CDC revealed confirmed cases of Lyme disease has more than "doubled nationwide in the past two decades from 1995 to 2016. This research addresses the efforts and challenges to develop a vaccine to combat Lyme disease infection. Given this up-front risk, vaccines

generally must present exceptionally high safety profiles. The onset of prolonged bouts of arthritis in HLA-DR4-positive individuals coincided with development of strong IgG response to a C-terminal OspA antibody response reflected the duration of arthritis.17 Nearly 1000 reports of adverse effects following OspA vaccination were documented by the US FDA less than 2 years after the vaccine was placed on the market. There were serious concerns that a OspA-based vaccine for Lyme disease might induce chronic inflammatory arthritis in genetically susceptible individuals through a molecular mimicry mechanism. In conclusion despite increased incidence of Lyme disease in the United States and expanding geographical range, no vaccine currently exists for human use.

Discovering Bacteriophage PLMatters

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Backgound: Bacteriophages are viruses that infect bacteria. Phages insert their genetic information, typically DNA, into bacterial cells, replicate and kill the host. Studying phages can provide information for the treatment of diseases caused by bacteria, like Mycobacterium tuberculosis, that can be infected by bacteriophages. By isolating a single population of bacteriophage and analyzing the sequence of its genes, functions of the phage can be revealed, which could be key in discovering treatments for bacterial infections. Finding new bacteriophages such as PLMatters, that can infect relatives of pathogens, in this case Mycobacterium smegmatis, is the start of this process. **Methods:** PLMatters was discovered and collected from a soil sample inside Howard University's Greene Stadium. The soil sample was mixed with M. smegmatis, in order to enrich the phage population. The sample was then plated and a plaque, or clearing where a bacteriophage had infected and lysed bacteria, was picked. The phages in the plaque were serial diluted in order to establish a population of one single phage population. A high titer lysate was prepared and used for DNA extraction. **Results and Conclusion:** The titer of lysate was 1.4 x 1011 pfu/mL. Genomic DNA at a concentration of 73.1 ng/µl was then submitted to the Pittsburgh Bacteriophage Institute for sequencing using Illumina technology. The resulting genome sequence is in the process of being annotated and will allow us to learn more about mycobacteriophages and potentially how to treat diseases caused by Mycobacterium species.

"Unearthing Bacteriophage and Obtaining its Characteristics"

Presenter's Name: Desiree Butler
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In the Science Education Alliance – Phage Hunters Advancing Genomics and Evolutionary Science (SEA-PHAGES) lab, students at Howard University have a goal of isolating and purifying bacteriophages that specifically infect the bacterium, Mycobacterium smegmatis mc^2155. Bacteriophages, or phages, are non-living organisms that infect and replicate within bacterium. The three main steps to obtain a pure sample of phage are isolation, purification, and amplification. An environmental soil sample was acquired separation techniques were used such as shaking, centrifuging, and filtering to isolate a phage population. Once a filtered sample was obtained, it was serially diluted with phage buffer and allowed to infect Mycobacterium smegmatis mc^2155. The dilutions were then plated and left in an incubator to infect the bacterium and grow. Over the course of a semester, a pure sample of a phage was obtained through various techniques such as plaque assays, picking plaques, and spot titers. After growing plates where 90% of them were covered in plaques—or areas of clearing from the phage lysing bacterium—and flooded with 8ml of phage buffer. The liquid was collected and filtered so there were no bacteria or other contaminants but only suspended phage. This isolated phage was then named Atlantean. Atlantean was submitted to the Actinobacteriophage Database and later sequenced at the Pittsburgh Bacteriophage Institute. Atlantean is now having its DNA sequence annotated by students and the information discovered through sequencing this viral DNA will contribute to the advancement of genomics and evolutionary sciences.

Differential Patterns of Genetic Diversity at the Interluekin-6 Proinflammatory Gene in Geographically Distinct Human Populations

Presenter's Name: Nia Butler
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Interleukin-6 (IL-6) is an inflammatory cytokine that induces the production of neutralizing antibodies by B cells, and is a key factor in immune response. Studies have also demonstrated that IL-6 plays critical roles in several major physiological systems, including the nervous system. However, despite its biological importance, little is known about the full range of nucleotide variation across the IL-6 gene, which may affect its function. To address this gap in knowledge, we completed a sequence analysis of IL-6 in 1461 individuals from 15 geographically diverse human populations. Our analyses revealed an excess of high-frequency derived mutations, consistent with a scenario of positive selection or adaptive evolution, in East Asian populations, which has never been reported before. Furthermore, we identified novel polymorphisms in the non-coding regions of this gene that are likely the targets of positive selection. Although the precise function of these variants is currently unknown, we suggest these polymorphisms are or have been selectively advantageous during human evolutionary history, representing interesting new candidate loci for additional study. Because IL-6 is a key player in chronic inflammation, the expression levels of this gene have been under intense investigation by a number of research groups. Our study, the largest of its kind to date, will be highly informative for identifying polymorphisms that play a role in human adaptation and gene function, as well as provide further information regarding the evolution of genetic variation underlying immune response in humans.

Antibiotic Resistance Profiles of Bacteria Associated with Two Phlebotomine Sand Fly Species

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Coauthors: Tiffany Clinton, Ingrid Harris, Winston Anderson, Mesheshaw Balkew, Courtney Robinson

Background: Infectious diseases are becoming harder to treat due to the evolving ability of bacteria to circumvent antibiotics' modes of action. The increase and spread of antibiotic resistance is linked to improper use of antibiotics, release of antibiotics from households and hospitals into sewage, and the transfer of resistance genes from environmental bacteria to pathogens. In this study, we determined the antibiotic resistance profiles of the microbiota associated with two Phlebotomus species collected in Ethiopia during the summer of 2015: Phlebotmus longipes, a known vector of leishmaniasis; and Phlebotomus ashfordii, a suspected vector of the disease. **Methods:** Female phlebotomine sand flies were collected from caves and crevasses in and near Debre Libanos, Ethiopia. The insects were surface sterilized and homogenized for total DNA extraction. The total DNA was subjected to PCR screening using eight primer pairs to identify genes [tetA(39), tet(M), imp-2, ampC, mecA, aacA1, aadA4, and mexY] that code for antibiotic resistance. **Results:** During preliminary experiments, the genes tet(M) and mecA were detected in sand fly samples. However, the genes were not present in all sand fly samples. **Conclusions:** Although further experiments are necessary, it appears that PCR screening has uncovered the presence of antibiotic resistance genes associated with these two insect vectors of disease. Further research, such as cloning and sequencing of PCR products, will confirm this finding. The results of this study will contribute to our understanding of whether phlebotomine sand flies are potential reservoirs of antibiotic resistance genes in addition to being vectors for human disease.

Evaluating the antibacterial effects of blackseed oil from Nigella sativa against intraoral bacteria Step mutans.

Presenter's Name: Darryl Caesar
Classification: Professional Student
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Faculty Advisor: Indra Mustapha
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Blackseed oil aka black cumin has been around for centuries for its healing properties in traditional medicine. Scientific studies have documented black seed's ability to help stop infections, regulate allergic reactions and improve the body's defense system. Black seed oil contains a unique combination of oils, phytochemicals and other nutrients that have antioxidant, anti-inflammatory, anti-bacterial and anti-fungal properties. Blackseed oil is now being used as a component in a new toothpaste to the oral care market, known

as SprinJene. This will be the first implementation of black seed oil in a toothpaste vehicle. The effects of blackseed oil on intraoral bacteria have not been extensively researched and the aim of this study is to evaluate the antibacterial effects of blackseed oil against intraoral bacteria Step mutans. For this study, a petri dish will be inoculated with Strep mutans bacteria and then a paper disk (filter paper) treated with different concentrations of blackseed oil will be introduced. After several days, the zone of no growth will be evaluated and the results will be used to quantitatively assess the antibacterial effects of blackseed oil against Strep mutans. As a series of controls, several other components with already investigated antibacterial effects against S. mutans will be tested including amoxicillin, erythromycin, chlorohexidine, eucalyptol oil, thyme oil, and cinnamon oil. With increasing consumer awareness and preference for all-natural health products, the results of this research can be quite promising for a more widespread use of blackseed oil in toothpaste

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The Anti-Inflammatory and Anti-Hypertensive Mechanisms of Peroxisome Proliferator Activated Receptor-alpha in the Brain during Angiotensin II Hypertension

Presenter's Name: Laura Campbell
Classification: Undergraduate Student
Presentation Type: Poster Presentation
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Angiotensin II (Ang II) promotes hypertension by enhancing sympathetic neural outflow, altering the release of hormones involved in volume, salt, vascular, renal, and cardiac regulation, and modulating inflammatory processes. NAD(P)H (nicotinamide adenine dinucleotide phosphate) oxidase is currently viewed as the predominant source of Ang-II–derived reactive oxygen species (ROS) production in the brain. Our previous results suggest that the presence of Peroxisome Proliferator Activated Receptor - alpha decreases renal inflammatory markers and activates anti-hypertensive mechanisms. The goal of this project was to determine the anti-inflammatory and anti-hypertensive mechanisms in the brain during Angiotensin II (400 ng/kg/min) hypertension. We hypothesize that the presence of PPAR-alpha will reduce the expression of gp91phox and inducible NO synthase (iNOS) in the brain during Ang II hypertension. Male (10 - 12 weeks old) PPAR-alpha KO mice and their wild-type (WT) controls will be implanted with biotelemetry devices and infused with Ang II for 12 days. Mean arterial pressure (MAP) was significantly higher in Ang II treated PPAR-alpha knockout mice (163 +/-12 mmHg) when compared to Ang II treated wild-type mice (140 +/- 14 mmHg). The brain expression of gp91phox and iNOS was significantly increased in Ang II treated PPAR-alpha knockout mice (20 +/- 3 % and 16 +/- 5 %, respectively). The anti-inflammatory cytokine Interleukin-10 (IL-10) was significantly higher in Ang II-treated wild-type mice (60 +/- 1 pg/mL) when compared to Ang II-treated PPAR-alpha knockout mice. Our results suggest that the presence of PPAR-alpha activates anti-inflammatory and anti-hypertensive mechanisms in the brain during hypertension.

Life Cycle Characterization of OGAsiah

Presenter's Name: Asiah Cauley
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Background: With an infection rate of 1023 infections per second, bacteriophages, are viruses that infect bacteria. There has been an emergence of antibiotic-resistant bacteria leading to a renewed interest in utilizing phages for a safe and effective alternative method to combat common infections in humans. Through novel phage discovery and testing, more phages can be isolated and characterized. **Methods:** Phage OGAsiah was collected from soil samples at the Louis Stokes Health Science Library garden, isolated and purified via filtration and plaque purification assays and used to develop and calculate a High Titer Lysate (HTL). The HTL was used in lysogenic assays to determine if OGAsiah is a temperate phage. The mesa was streaked and isolated colonies were assayed for potential lysogen using patch assay. **Results:** Plaque morphology was circular, clear with a diameter of 3mm. The HTL concentration was 8.3x109pfu/ml. Isolated DNA had a concentration of 95.2ng/µl with a purity of 1.87(λ260/280). After 48 hours of incubation, no turbid, or cloudy, appearing plaques were seen on the lysogen experimental plate while bacterial growth was seen in the lysogen spot plates. **Conclusion:** From the results, OGAsiah is most likely not a temperate phage. For the next phase of the experiment, OGAsiah could be sent for DNA sequencing and then annotated for better understanding of its unique features and functions.

GO Modified MgO Nanopartcles (MgO@GO) Reinforced PLA Nanocomposites

Presenter's Name: Jianfei Che
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Background: Polylactide (PLA) is a typical biocompatible polymer, which has been approved by FDA for biomedical application. However, lack of sufficient mechanical strength and relatively long degradation time are two obstacles for their wide applications. Graphene Oxide (GO) is a new materials showing unique properties such as mechanical strength. Incorporation of MgO into PLA is basic materials, which might tune the degradation of PLA. This work intends to incorporate MgO/GO into PLA, so that the mechanicals strength and degradation rate may be tuned. **Methods:** The GO nanosheet was poured into the MgO/IPA solution (10 mg/ml) to form the GO covered MgO nanoparticles with graphene oxide sheets (MgO@GO). NH3H2O was used to reduce GO. Then the mixture was separated by lyophilization to obtain GO modified Mg nanoparticles (MgO@GO), which were added into PLA solution in DCM to form the polymer nanocomposite. **Results:** MgO@GO nanoparticles have better dispersion in PLA nanocomposites than GO only. Modification MgO with GO improve their dispersion in organic solvent. Addition of MgO@GO into PLA can improve the tensile strength of PLA. In addition, addition of more MgO@GO led to decreased mechanical strength and more weight loss, indicating greater degradation rate. **Conclusions:** MgO@GO nanocrystals and PLA/MgO@GO nanocomposites were successfully prepared. Incorporation of MgO@GO into PLA has significant effect to their mechanical strength and degradation rate. This work will bring a new method to improve the mechanical strength and tune the degradation rate of PLA, thus may provide promising opportunity to meet the specific needs in biomedical applications.

Osteological Expression of Tuberculosis within The Cobb Collection

Presenter's Name: Zhenhong Chen
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Despite the multitudes of technological advancements and breakthroughs in recent decades, tuberculosis (TB) remains a global pandemic. There is currently a resurgence in active TB cases in the United States (US). TB affects members of every ethnic groups, but disparities in TB cases persist among members of racial and ethnic minority communities in the US, with the majority of the reported cases being African Americans (AA). Despite its pervasiveness, there is an under representation of AA cadaver based TB research. This study will involve the osteological examination of the cadaver remains of the AA individual in Cobb collection whose deaths have been notably caused by TB. We have reconstructed the profiles of 61 individuals using their clinical record and skeletal remains from the Cobb Collection. The demographics of these individuals are the following:

1. Age range from 20 to 86;
2. Sex - 14% females and 86% males;
3. Majority of the individuals were from Washington DC and within these individuals, 51% lived in what is now known as Ward 1 and Ward 5 in DC.

Our preliminary macroscopic/osteological detection of TB shows defects in joint areas which may indicate more severe forms of TB in our population. We believe these individuals serve as relevant examples of untreated TB. With the discovery of such anomalies, it will be possible to examine the linked TB genes in future research to identify factors contributing to the high disproportion of susceptibility to TB within AA community and whether these factors are acquired or inherited.

Effect of Single-Dose and Fractionated Radiation on Fatty Acid Synthesis

Presenter's Name: Cameron Clarke
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Radiation therapy is a primary method of cancer treatment - can be differentiated into single-dose (SD) and multi-fraction, or fractionated (MF) treatment. SD radiation is a large dose of radiation in a single session, while MF therapy is smaller fractions of an equivalent exposure, delivered

multiple times over a period of days. MF radiation is used clinically because of its tendency to preserve normal tissue, while SD therapy is generally used in the treatment of aggressive and nonresponsive cancers. Studies have shown that cells irradiated with MF radiation have different gene expression tendencies and proteomes than cells treated with SD. Fatty acid synthase (FASN) is an enzyme involved in the biosynthesis of fatty acids and cellular division in human cells. FASN expression is correlated with increased malignancy and recurrence in breast and other cancers. C75 is a fatty acid synthase inhibitor that has been demonstrated to block FAS activity and induce apoptosis in cancer cells, and may be effective as a targeted anti-cancer drug. The purpose of this study is to determine whether a prostate cancer cell line (PC3) exhibits different genomic or proteomic profiles when exposed to SD or MF radiation, determine whether those cells differentially express FAS as a result of the different radiation treatments, determine whether the cells have differential survival as a result of FAS expression, and examine whether the cellular response to C75 is affected by the radiation treatments.

Creation of a Genomic Database from New York African Burial Ground Soil Samples

Presenter's Name: Carter Clinton
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The New York African Burial Ground in lower Manhattan is the largest burial site of free and enslaved Africans in the United States and was used throughout the 17th and 18th centuries. This investigation involves 60 cadaver-associated grave soil samples, from which DNA extraction was performed to quantify human, microbial, and viral DNA. Genomic evidence has been detected in four burials reflecting the ability to retrieve DNA from the remaining burial samples. DNA data are entered into an easily retrievable electronic database, which will serve as a reference database for this early African American population. The database will allow us to: 1) reveal the genetic make-up (composition) of individuals, 2) infer the genetic diseases that may have affected this population 3) provide insight into the environmental conditions (as determined by soil chemistry) faced by this population and 4) infer the genetic relationships between modern day African Americans and their "not so distant" ancestors by DNA comparison. The database uses the Structured Query Language (SQL) to facilitate data transfer, and genetic data will have a uniform format across samples, so that results can be easily compared. Genomic sequences in our database will be available in a common format (such as, a fasta format), allowing for comparison with existing databases containing sequence data, such as NCBI. Overall, our database is a unique resource in that it holds sequence data originating from a population of African descent which is highly underrepresented in human genomic research.

Collection, Isolation, and Purification of Bacteriophage

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Many diseases arise from bacterial infections of the body. The primary methods used to fight bacterial infections employ the use of antibiotics. A recurring issue is the resistance that rapidly-reproducing bacterial colonies acquire against these antibiotics. Consequently, in order to combat bacterial-induced diseases, there is a demand to develop new antibiotics to fight newly evolved bacteria. As antibiotic resistance increases, new techniques are being developed using bacteriophages. Bacteriophages are viruses that infect a limited range of bacteria (1). In the PHAGES lab, bacteriophage cultures are isolated to identify specific phage infections and sequence the DNA. The process included soil sample collection and retrieving liquid culture. The culture was then purified through dilution. Next, it was enriched and isolated to achieve ample phage presence. A plaque and spot assay was then done to get high titer lysate. A second spot test was done to test for phage presence. Next, the plaques from the spot test were used to streak plates and get pure lysogen. Patching was then completed in order to ensure the presence of lysogen. Lysogen is the host bacterial cell that holds the lysogeny. Lysogeny is a bacteriophage with an integrated bacterial and phage genome. The most current step was the transfer of bacteriophage to liquid medium in order to grow a colony. The host bacterium is Mycobacterium smegmatis.

The above procedures were done in order to retrieve, isolate, and purify phage. The next phase of the experiment includes analyzing the phage's genetic material and identifying it in the phage database.

Isolation and Characterization of bacteriophage diversity from a soil sample collected from Harriett Tubman Quadrangle using Mycobacterium smegmatis

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A bacteriophage is a virus that infects and replicates within a bacterium. Phages are different because they only infect specific bacterial cells; they are harmless to humans, animals, and plants. Bacteriophages (phages) are viruses of bacteria that can kill and lyse the bacteria they infect. Phages were widely used in vaccine development, bacterial typing and viral typing. Antibiotics have been used to treat patients with different infections, and that has resulted in an increased incidence of resistance. There is an urgent need to identify bacteriophages as competitive alternatives to alleviate the current dependence on antibiotics. Samples of soil were collected from one location (39.115N and -77.55E) on Howard's campus at Harriett Tubman Quadrangle. The possible phages from the soil filtrate were isolated by enrichment technique using Mycobacterium smegmatis as a host at 37oC for 24 hours. Following this, enriched soil samples assayed using spot assay and the putative plaques were purified further using quadrant streaking and medium/high titer lysates (MTL/HTL) harvested with a titer of 3.1 x 106 pfu/mL (plaque forming units (pfu)/mL) for further study. Isolated phages were lytic and have an average plaque diameter of 1.3mm. The phage DNA was isolated and used for DNA sequencing, restriction digest, protein isolation and transmission electron microscopy.

An Epigenetic analysis of the Effects of WIN 55, 212

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Traumatic brain injury (TBI) has been shown to be one of the leading causes of death and disability worldwide. Almost 138 people die per day due to TBI and complications. The main cause of post-TBI complications is neuroinflammation, the brain's immune response to pathological insults that occur within it. This response is facilitated by cytokines, chemokines, prostaglandins, and other byproducts that participate in the inflammatory cascade. The early effects of inflammation have been shown to be beneficial, but prolonged inflammation leads to detrimental effects including neuronal cell death. Repeated TBI's throughout life can lead to the development of chronic traumatic encephalopathy (CTE), caused by long-term, constant neuroinflammation. A solution is needed to combat the short and long- term effects of TBIs and neuroinflammation. Cannabinoids are a chemical family that have been shown to be effective at lowering inflammation. Therefore, in this experiment we tested the chemical WIN 55, 212, a synthetic cannabinoid, on HeLa cells in order to observe its anti-inflammatory effects. We performed an epigenetic analysis, MeDIP Chip (Methylated DNA Immunoprecipation), in order to better understand the anti-inflammatory effects of WIN 55 212-2, mesylate at the gene expression level. Several hundred genes were altered as a result of the treatment, and major gene groups affected are involved in inflammatory responses, and, surprisingly, epigenetic control. This latter result was unexpected and we are further analyzing this. Overall, the hypothesis was validated, but raises new questions about the mechanism of action of WIN 55, 212-2 mesylate, and possibly other cannabinoids.

Small compounds regulating Arabidopsis RACK1A protein modulates growth hormone Gibberellin signaling pathways

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Background: Receptor for activated C kinase 1A (RACK1A) is a WD repeated scaffolding protein that is highly conserved in eukaryotes. In plants, it has been shown to regulate environmental stress and growth hormonal responses. Genetic knockout of Arabidopsis RACK1A resulted in drought resistance in the model plant. The crystal structure of the RACK1A protein revealed the Y248 tyrosine phosphorylation site. In silico studies elucidated two small compounds, SD29 and SD29-12, that may bind to the Y248 site and prevent phosphorylation. RACK1A plays a crucial role in numerous signal transduction pathways in Arabidopsis, including that of gibberellin (Ullah et. al, 2008). Gibberellin, or gibberellic acid, is a plant hormone that induces seed germination and stalk and stem lengthening. The purpose of this investigation is to elucidate the mechanism of RACK1A in gibberellin signaling in Arabidopsis thaliana using these small compounds. **Methods:** After sterilization, seeds were treated with the endogenous gibberellin synthesis inhibitor paclobutrazole. Seeds were then planted in either liquid MS media or solid MS media plates, containing various combinations of SD29, SD29-12, and gibberellin. Seedlings were monitored for onset of germination, as well as stalk lengths, cotyledon coloring, and root lengths. **Results:**Preliminary studies suggest that SD29-12 upregulates gibberellin signaling through RACK1A, while SD29 appears to downregulate GA signaling. **Conclusions:** We hypothesize that SD29-12 stabilizes RACK1A, allowing it to achieve a lower energy conformation that is advantageous for interactions with other signaling proteins; similarly, we believe that SD29 destabilizes the RACK1A protein, and thus, hampers GA signaling through this protein.

Investigating the association of rs6276 Single Nucleotide Polymorphism in Dopamine receptor DRD2 gene With C-reactive protein in African American Young Adults.

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Introduction: New information are emerging on the role of dopamine D2 receptor (DRD2) in controlling innate immunity and inflammatory response and is being identified as a neuro-immune modulatory receptor. Single nucleotide polymorphisms (SNP) in DRD2 gene were reported to increase inflammatory and injury markers. The goal of this Research is to investigate the association of rs6276 SNP in DRD2 and C-reactive protein(CRP) as a marker of inflammation. Our hypothesis is that rs6276 is associated with increased levels of CRP in African American Young Adults. **Methods:** The study population included 600 African American subjects between 18-26 years of age, living in Washington, D.C. SNP rs6276 in DRD2 was genotyped by polymerase chain reaction and restriction fragment length polymorphism using 5'-TCGGCTCCTGGCTTAGAACC-3' and 5'-GCACCTTCCTGAGTGTCAAC-3' forward and reverse primers respectively. A portion of the PCR product (7 uL) was digested with 3.0 units of Taq 1 restriction enzyme at 65 oC for seven hours. 10 uL of the PCR digestion product was resolved on a 4% agarose gel containing ethidium bromide. Three genotypes where determined as follows: a homozygote CC; indicated by two fragments, 180 and 130 bp, a heterozygote TC revealed by three fragments 310, 180, and 130 bp, and a homozygote TT showed by undigested 310 bp. **Results:** We are in the process of performing the statistical analysis using the program SNPstat. This software will allow us to determine the rs6276 genotypic and allelic associations with CRP measured in the study population.

The Digitization of Mid-Atlantic Specimens in the Howard University Herbarium

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As the world continues to rapidly develop into increasingly urbanized systems, it is crucial that we assess the effects on the future of civilization and the biological processes of life. Howard University is one institution in the Mid-Atlantic Megalopolis project. This project investigates vascular plants throughout the largest, oldest, and most populated urban corridor in the US, from Washington, D.C. to New York City. To better understand the vascular plant distribution in this area, researchers are undertaking the digitization of approximately 700,000 herbarium specimens from eleven institutions, including Howard University. The Howard Herbarium, located in Just Hall, has a collection of over 15,000 specimens.

The majority of these specimens are collected from the Mid-Atlantic region. Specimen digitization includes imaging, labeling, data entry, and georeferencing of each specimen. As part of this collaborative project, digitizing herbarium specimens will provide access to previously unattainable data that will be made publicly available for practitioners, such as urban planners and ecologists, who are working towards the bettering of our urban districts.

A Systematic Review of Ethnic Disparities in Herpes Zoster Immunization for Elderly Adult Populations

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Objective: Previous research has documented that vaccination rates in elderly minority populations lag behind those of majority populations for recommended vaccines. The primary objective of this research was to compare herpes zoster vaccination rates in elderly minority and majority adults since the vaccine was released in 2008 and identify documented factors contributing to disparities in receipt of the vaccine. **Methods:** A systematic review was conducted using PRSIMA guidelines. Predefined search terms were used to search peer reviewed articles in the PubMed database. Inclusion criteria for articles used in this study include publication dates within the last 10 years dating up until November 2016, and information on Herpes Zoster vaccination rates in minority populations at least 60 years old. **Results:** A total of 12 studies met inclusion criteria. Persistent and statistically significant disparities were noted in receipt of the vaccine between minority and majority populations. While vaccination rates in Majority Populations currently exceed Healthy People 2020 target goals of 30%, vaccination rates in African Americans are reported at less than 12%. Frequently cited reasons for low Herpes Zoster immunization rates include lack of knowledge regarding the need for immunization and lack of provider recommendation for immunizations during routine wellness health visits. **Conclusions:** Additional longitudinal and interventional studies are warranted to find ways to increase the rates of receipt of herpes zoster vaccine in minorities. More frequent provider recommendation of vaccination during health visits may lead to an increase in vaccination rates for this population.

The Adventures of Phage Discovery, Isolation, and Purification

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The SEA-PHAGES program was introduced to discover phage. The experiments range from practicing aseptic technique, collecting environmental samples, and extends to the current task; liquid medium. These experiments link together because in order to receive successful results, it is a must that aseptic technique is practiced and the environmental sample will start off as the basis for discovering a phage. The experiments began with the lab basics, which consisted of writing in our lab notebooks. Over the course of my studies, a series of steps and protocols have been performed to receive a phage. The first line of protocol was learning aseptic technique that made it possible for all experiments to receive non-contaminated results. After, the experiments were able to be performed, the first experiment was collecting environmental samples. Through a series of direct Serial Dilutions. The next stage of the experiment, is flooding. Flooding makes it possible to create high titer lysate. Using high titer lysate, a new series of experiments have been performed to purify lysogen. A spot test was performed and a dilution. The next stage was streaking. Streaking was performed three times to isolate and purify lysogen. After streaking, patching and liquid medium was done to make sure the lysogen was present. Thus, many phages were produced. In conclusion, these experiment are all vital to discovering phage.

Keywords: lysogen, phage, lysate, isolation, dilution

Isolation and Characterization of Ryvitor04, a lytic bacteriophage isolated from soil

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Bacteriophages are viruses that infect bacteria by inserting their genetic material into host bacteria. Bacteriophage research is important since they can be utilized to elucidate our understanding of bacterial evolution and diversity. In the current study, soil was collected outside of Howard University's Thirkield Hall (38.921906 N, -77.020760 W). Lytic bacteriophages against host Mycobacterium smegmatis mc2155 were isolated and characterized using standard protocols which include enrichment cultures, spot assays, empirical testing, DNA isolation, restriction digests, gel electrophoresis and transmission electron microscopy (TEM). Furthermore, the ability of Ryvitor04 to influence lysogen formation of host post infection was assessed. Data analysis shows that plaques of this bacteriophage are lytic, with a diameter of 0.2 mm and high titer lysate (HTL) of 3.4 ×10^8 pfu/mL. Although preliminary, Ryvitor04 may influence the generation M. smegmatis mc2155 lysogens. The characterization of one phage can be useful in the characterization of many. Information about Ryvitor04 is not only important when considering the phage itself, but also its similarity to other members of its cluster.

Bactericidal Activity of Hagenia abyssinica Extracts on Vancomycin-resistant Clinical Isolates

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Medicinal plants have their essential ability to resist pathogenic microorganisms especially on antibiotic resistant bacteria. Exploitation of medicinal plants for medicinal purposes draws interest to the antimicrobial properties and their metabolites due to the growing incidences of drug resistant pathogens. Scientists are now focusing on the mechanism of action of different plant extracts. Extracts prepared from eight medicinal plants were tested to assess their antibacterial activity against vancomycin-resistant strains of enterococcus. The in vitro antibacterial activity was performed by agar disc diffusion, extracts were serially diluted and impregnated into filter paper discs and placed on the surface of agar plates which has the appropriate strain of enterococcus and incubated for 24hrs at 37°C before zone of inhibition measured. The antimicrobial activities of the extracts were also evaluated using resazurin assay on 96-well plates. Three samples were re-streaked to confirm bactericidal or inhibitory effect of the extract. Samples were also assayed for living and dead cells using fluorescent and electron microscopy to observe structural change. Out of the thirty two extracts studied, two were found to have strong activity with IC50 values below 1 µg/ml and ten showed activities with IC50 values between 1-6 µg/ml.

Potential non-canonical roles of the 26S proteasome system in C. elegans reproduction

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Background: Cellular proteostasis is regulated by the ubiquitin proteasome system (UPS). There is evidence that the 26S proteasome of the UPS, in particular the 19S regulatory particle (RP), engages in non-proteolytic functions. We found a total of 8 RP subunits that when co-depleted with WEE-1.3 suppresses the wee-1.3(RNAi) infertility. Not all proteasome components that affect the proteolytic function of the proteasome suppressed the wee-1.3(RNAi) infertility. Therefore, we hypothesize that specific 26S proteasome components may act in a non-canonical manner during C. elegans reproduction to influence fertility, potentially via direct or indirect interactions with WEE-1.3. **Methods:** RNAi interference, standard brood size analysis, spinning disk confocal microscopy, immunofluorescence and qRT-PCR. **Results:** We show that knockdown of certain proteasome components alter WEE-1.3 subcellular localization suggesting proteasome involvement in proper localization of WEE-1.3. Co-depletion of proteasome component RPN-6.1, RPN-7, RPN-8 or RPN-9 with WEE-1.3 rescues the precocious oocyte maturation observed in wee-1.3(RNAi) animals. Surprisingly however, qRT-PCR

shows an increase, rather than decrease, in the mRNA levels of specific proteasome components targeted for down-regulation in gonads isolated from RNAi treated animals. **Conclusion:** If general inhibition of proteolytic function of the proteasome in wee-1.3(RNAi) animals does not suppress wee-1.3(RNAi) infertility and is not responsible for proper WEE-1.3 subcellular localization, we will have identified a non-canonical, non-proteolytic role for the proteasome during C. elegans reproduction. Future plans include endogenously tagging specific proteasome components with GFP utilizing CRISPR/Cas9 genome editing technology.

Partially divided gastric remnant distention causing chronic nausea and vomiting

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Over the last three decades obesity has become an epidemic in the United States, with more than one third of adults (36.5%) considered to be obese. Vertical banded gastroplasty was among the early surgical solutions to address this rising epidemic. Some of the complications seen postoperatively from a vertical banded gastroplasty include persistent nausea and vomiting and food intolerance leading to malnutrition. We report a case of an 80 y.o. female who suffered from chronic vomiting for the past 29 years secondary to complications of her vertical banded gastroplasty, and developed subsequent vomiting again despite surgical reversal of the procedure in 2012. It was determined that her persistent vomiting was secondary to the chronic distention of the partially divided gastric remnant which included the fundus of the stomach.

Cardiac Computed Tomography (CT) and Cardiac Risk Classification

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Background: Cardiovascular disease continues to be the number one cause of deaths in many ethnic groups around the world. Mortality is still high as 47% of sudden cardiac deaths occur outside of a hospital setting. The advent of new cardiac screening tools can help classify cardiac risk and possibly decrease overall mortality. Cardiac CTA through visualization of coronary artery stenosis and plaque morphology is often superior and/or complimentary to other traditional imaging evaluations like nuclear medicine stress testing or even cardiac angiography.

Methods: We performed a comprehensive review of the existing worldwide medical literature and clinical cases at Howard University Hospital to evaluate:

- Effectiveness of first-line screening methods in classifying patients risk for cardiovascular disease such as the Framingham Risk score and the Multi Ethnic Study of Atherosclerosis (MESA) score.
- Role and efficacy of using CT to classify risk of cardiovascular disease
- Compare effectiveness of Cardiac CT to cardiac nuclear medicine stress testing.

Results:

- Cardiac CT is as effective (or sometimes more effective) in classifying cardiovascular disease in patients than nuclear medicine stress testing.
- Drawbacks of cardiac CT include radiation exposure.
- Limitations of Cardiac CT relate to patient characteristics (irregular heartbeat, or inability to sustain a breath hold for 10-20 seconds).

Conclusion: Despite the risk of radiation exposure, screening patients who have abnormal ECG's and multiple comorbidities with cardiac CT can better classify patient's risk of cardiovascular disease as opposed to other more traditional cardiac imaging screening methods.

The Role of Prostate Cancer Derived Exosomes in Metabolism

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Prostate cancer (PCa) is among the most commonly diagnosed cancer in men worldwide. Increased screening has allowed treatment of earlier stages of the disease. Standard therapies such as androgen deprivation therapy and chemotherapy are initially effective. However for many, PCa recurs and eventually develops into a therapy-resistant disease. As such, there continues to be a search for other aspects crucial to PCa which can be impaired by therapy. Exosomes have recently become a highly studied topic in cancer research. Exosomes are vesicles that form when mutli-vesicular bodies fuse with the plasma membrane and are released into extracellular space. Exosomes participate in vesicular transport of a range of molecules including proteins, lipids, and mRNA. Due to this, studies have recently delved into the biological functions of exosomes in cancer. However, many of the roles of these exosomes remain relatively unknown. We propose that tumor-derived exosomes also contain substances which support the glycolytic and mitochondrial pathways of surrounding tumor cells to amplify proliferation as well as reduce cell death activity. Exosomes were isolated from PCa cells using the exosome isolation protocol. Isolated material was verified to be exosomes by performing nanoparticle-tracking analysis and western blot analysis to confirm the presence of exosome markers. LNCaP and PC3 cells were treated with PCa-derived exosomes. We then analyzed metabolic activity and the expression of metabolic proteins. Depending on the source of exosomes, they can either heighten or suppress metabolic activity. But they do not affect the expression of glycolytic proteins.

Open and Endovascular Ruptured Abdominal Aortic Aneurysm Repair have Equivalent Outcomes when Performed on Weekday vs Weekend

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Introduction: Studies have demonstrated that there may be an increased risk of postoperative complications for certain surgical procedures when performed during weekends. We undertook this study to determine if repair of ruptured AAA (rAAA) performed on weekends differed in outcomes as compared to rAAA operations performed on weekdays. **Methods:** We conducted a retrospective review of the Nationwide Inpatient Sample (NIS) database to identify all patients who underwent an open or endovascular rAAA repair from 2007 to 2012. Operations were dichotomized into Weekday (Mon-Fri) and Weekend (Sat and Sun); and open versus endovascular. Multivariate analysis was performed adjusting for patient characteristics and comorbidities. **Results:** A total of 15,418 patients had a rAAA repair. In those undergoing open repair, (n=6,623), the mean age was 73 (SD±9) years with an overall mortality of 39.5% and overall complication rate of 43.1%. Comparing weekday versus weekend, open rAAA repair, there were similar rates of mortality (40.6% weekday vs. 39.1% weekend; p=0.264) and morbidity (43.5% weekday vs. 42.9% weekend; P=0.693). In those undergoing endovascular repair, (n=2,170), the mean age was 74 (SD±10) years with an overall mortality of 26.5% and morbidity of 31.6%. The mortality rate was 26.5%. Comparing weekday versus weekend endovascular rAAA repair, there were similar rates of mortality (24.5% weekday vs. 32.7% weekend; OR [95%CI]: 1.30 [0.87-1.96]) and morbidity (31.9% weekday vs. 31.5% weekend; p=0.843). **Conclusion:** rAAA repair is associated with equivalent outcomes when performed on the weekend vs weekday.

Microbial Kinetics of Bacterial Isolates Capable of Iodate Reduction in the Presence of Nitrate and Varying Concentrations of Oxygen

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The Hanford Site in Richland, Washington produced weapons grade plutonium during World War II. The plutonium production resulted in radionuclide byproducts that have leaked into the subsurface from various cribs and trenches. Radioiodine (129I) is one of the primary byproducts produced, which has created iodine plumes that cover 1,500 acres in the 200 area on the Hanford Site. This radioactive isotope is of concern because of its toxicity to humans (bioaccumulation in the thyroid), long half-life (16 million years) and its mobility through the vadose zone. Iodine is naturally cycled in the environment and can appear as different species, including: iodate (IO3-) iodine (I2-) and iodide (I-). Research objectives were to influence the reduction of iodate and, to provide understanding of the management of environmental fate and transport of radioiodine in the vadose zone. This project focuses on iodate transformation kinetics for community 31,

a group of bacteria that have been isolated from the Hanford Site, in the presence of nitrate and varying concentrations of oxygen. The experiments were performed in the presence and absence of ringold sediments in M9 minimal medium with glucose as the carbon source. Fed batch reactors were used as the experimental tool to understand the different reactions that took place in the enriched cultures under the varying conditions. Data generated from this project will provide enhanced understanding of how bacteria metabolize iodate in the presence of competing electron acceptors such as nitrate and ferric iron in soil, and how oxygen affects iodate reduction.

Early Menarche Onset in Female Minorities as an Important Precursor for the Initiation of Orthodontic Treatment

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INTRODUCTION: Menarche is an important diagnostic data point to determine growth and development in female orthodontic patients. In this new era, however, girls raised in the United States are developing much faster, exclusively those of African-American and Hispanic origins, and have been characterized by earlier maturation (precocious puberty) in comparison with girls of the same age and race from three to five decades ago. HYPOTHESIS: The age of menarche onset has lowered during the last two decades in the United States and African American and Hispanic girls are the most affected. **MATERIALS AND METHODS:** Orthodontic clinical records of pre-adolescent and adolescent African-American and Hispanic female patients (ranging from 8 to 15 years of age) who received orthodontic treatment within the Howard University Post-graduate Orthodontic Clinic from the time-points: 1/1/1986 to 12/31/2000 and 1/1/2001 to 12/31/2015. **EXCLUSION CRITERIA:** Pre-adolescent and adolescent females that are non-Hispanics and/or African Americans. Pre-adolescent and adolescent females with diagnosed syndromes, physical/developmental disabilities and under hormonal treatment. **RELEVANCE OF THIS STUDY:** Minority females, especially African American and to some extent Hispanics, are in general more likely to show signs of pubertal development at an early age. Earlier studies suggested this may be due to an increase in BMI or a lower socioeconomic status. In the field of orthodontics, these findings should be taken into account when deciding on the starting point of orthodontic treatment.

Role of PI3K/AKT Signaling Pathway in Regulation of Expression of Androgen Receptor in ABCG2+ CWR-R1 Prostate Cancer Cells

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Androgen deprivation therapy (ADT) is the most commonly used treatment for advanced prostate cancer, but, almost inevitably results in castration-recurrent prostate cancer (CRPC). Previous studies have shown enhanced ABCG2 expression and deregulated PI3K/AKT pathway activity in recurrent prostate cancer tissue samples, suggesting roles in resistance. The aim of this study is to examine the regulation of androgen receptor (AR) expression, stabilization, and differentiation in ABCG2+ cells using AKT signaling as a potential link between ABCG2 expression and AR stabilization. We hypothesize that AKT regulation of AR inhibits AR signaling in ABCG2+ cells and when AKT is inhibited, nuclear AR translocation and AR transactivation is enhanced. The role of AKT in regulation of AR expression is assessed by inhibiting AKT-mediated AR regulation using LY294002 in ABCG2+ cells separated from CWR-R1 prostate cancer cells. AR stabilization in the cytoplasm and nuclear AR translocation in the presence/absence of Ko143 and DHT or LY294002 will be assessed using immunofluorescence. Immunofluorescence revealed increased nuclear AR expression when ABCG2+ CWR-R1 prostate cancer cells were treated with DHT + Ko143 and when treated with LY294002 alone compared to cells treated with DHT alone. Additionally, cell proliferation was inhibited in CWR-R1 prostate cancer cells upon treatment with LY294002. Inhibition of PI3K/AKT pathway induced AR expression in ABCG2+ cells separated from CWR-R1 prostate cancer cells, suggesting a role for the pathway in regulation of AR expression in ABCG2+ stem cells. By targeting the PI3K/AKT pathway, ABCG2+ stem cells may become more susceptible to ADT, prolonging the development of CRPC.

Investigation of sexual systems associated with species of the genus Rumex using compared reconstructed molecular phylogenies

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The genus Rumex is a unique member of the Polygonaceae (Buckwheat) family of plants. A source of intrigue for Rumex lies in the diversity of the sexual systems associated with the subgenera, species, and subspecies within this genus. Four currently recognized subgenera, some 200 species, and a number of subspecies comprise the collective Rumex genus. These exhibit monoecious, dioecious, hermaphroditic, gynodioecious and polygamous sexual systems. Moreover, some of the dioecious species contain sex chromosomes, a phenomenon that occurs in roughly 1% of angiosperms. Apart from the confirmed morphological and phytogeographical distinctions, two of the four subgenera, Acetosa and Acetosella, are distinctive in their mode of sex-determining mechanisms, sex- chromosome systems, and resulting sexual systems. This project focuses on the species of Rumex currently classified within subgenera Acetosa and Acetosella. We are working to reconstruct a phylogeny to test the evolution of different sexual systems and sex chromosomes within Rumex. To date, we have observed two molecular markers, rbcL and psbA-trnH, and increased taxon sampling compared to previous work. Preliminary results suggest that the species with divergent sexual systems are more closely related to each other, than other species comprising the rest of the genus. Our phylogeny will be used to test previous researchers' assumptions regarding the taxonomic and phylogenetic classification of Rumex based on cytological inference.

The Phage, The Myth, The Legend: MiloGrossi

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Background: The purpose of the PHAGES lab is to collect, isolate, purify, and characterize a bacteriophage, which is a virus that infects and lyses bacteria cells. As bacteria increasingly become resistant to antibiotics, bacteriophage research is becoming more vital as phages can potentially lyse the antibiotic resistant bacteria and in turn treat diseases. The primary goals after isolation and DNA sequencing is to analyze the genomic data of the phage DNA and characterize the phage. **Methods:** The phage, MiloGrossi, was collected from soil outside of E.E Just Hall at Howard University. The sample went through a series of purification plaque assays to ensure a single morphology. A high titer lysate (HTL) was collected, used for DNA extraction, and was further characterized through restriction digest and gel electrophoresis. DNA sequencing was completed at the Pittsburgh Bacteriophage Institute. **Results and Conclusions:** MiloGrossi yielded plaques of a single morphology with a diameter of 0.5 mm. The phage's titer was 1x109pfu/ml. The concentration of MiloGrossi's DNA was 411.3 ng/µl. Currently lysogenic analysis are continuing to determine if MiloGrossi is a temperate phage. The sequence is being analyzed for further characterization of the phage.

A web based tool for for Next-Generation Sequencing data

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Currently, lots of next-generation sequencing (NGS) data have been generated. Thus, developing software tools that can quickly and accurately analyze NGS data becomes an urgent task in the bioinformatics field. Most of current analytic software for NGS work on only one kind of analyses such as sequence alignments or functional annotations by using command lines. Therefore, an analytic tool with a friendly interface and a combination of logic conditions for NGS data is necessary. We propose a web based automatic pipeline tool that runs in high performance computing environment. The tool takes raw data from Illumina instrument as input. fastQ files are uploaded by the tool from its graphical interface. Then the data will be analyzed automatically. During the process, a GATK based parallel computing scheme is used to control and generate the result.

Antimicrobial Activity of Extracts of Chamaemelum nobile and Amphipterygium adstringens Against Pathogenic Bacteria

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Antimicrobial resistance of bacteria is the etiological agent of many respiratory, stomach, and nosocomial infections. These drug-resistant bacteria are a serious concern today. These infections cause the death of thousands of men, women and children every year. This has led to the search for new alternatives to combat them. There is evidence, from several reported studies, regarding the ability of different compounds or extracts obtained from medicinal plants to inhibit microbial growth of bacteria. This ability is attributed to the plant's chemical substances, which protect it from parasites and pathogens. The purpose of this work is to assess the antimicrobial action of the ethanolic and aqueous extracts of 2 medicinal plants native to central Mexico: Chamaemelum nobile (manzanilla) and Amphipterygium adstringens (cuachalalate). Through cold maceration, vacuum filtration and the use of a rotary evaporator; the antimicrobial activity will be evaluated against 3 bacterial strains. The bacterial strains are as follows: Escherichia coli, Klebsiella pneumoniae, and Pseudomonas aeruginosa. Kirby Bauer's method will be used on plates of Mueller-Hinton agar. The diameters of inhibition will be observed after 24 hours of incubation at 37 °C. I expect to observe antimicrobial inhibition of strains of Escherichia coli and Pseudomonas aeruginosa from both plant extracts. Antimicrobial activity was apparent in strains of Pseudomonas aeruginosa with aqueous extracts of manzanilla and cuachalalate. Further study of each plant is needed to determine optimum antimicrobial ability.

Dopaminergic Synaptic Transmission Regulates Mitral Cell Activity in the Olfactory Bulb

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The glomerular layer of the olfactory bulb receives synaptic input from olfactory receptor neurons that send their axon from the nasal epithelium to the ipsilateral olfactory bulb. Neurons in the glomerular layer fall into three subpopulations: periglomerular (PG), external tufted and short-axon cells. PG cells receive input from the olfactory receptor neurons or dendrodendritic glutamatergic input from external tufted or mitral cells, the olfactory bulb output neurons. A large subset of PG cells contains dopamine and/or gamma-Aminobutyric acid (GABA) and presynaptically inhibits olfactory receptor neurons through GABAergic and dopaminergic transmission. Even though dopaminergic PG neurons are critically placed at the entry to the olfactory bulb neural circuitry, their role in dopaminergic regulation of mitral cells and, therefore, output from the main olfactory bulb remains elusive. We tested the hypothesis that dopamine D2 receptors regulate mitral cell activity and, thereby, have a critical role in sensory processing of olfactory information. We used an electrophysiological experimental approach with whole-cell patch-clamp recordings from mitral cells in mouse brain slices. We recorded from mitral cells that exhibit burst-firing of action potentials. Our results showed that in voltage-clamp recordings, the dopamine antagonist sulpiride enhanced the amplitude and duration of long-lasting current in mitral cells. Similar results were obtained when GABA-A receptors were blocked with gabazine. The results indicate that blockade of dopaminergic or GABAergic synaptic transmission relieves mitral cells from inhibition and results in a significant increase of mitral cell activity which will greatly enhance olfactory bulb output to higher order olfactory centers in the brain.

Sex differences in fear conditioning following footshock stress in mice

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Background: Posttraumatic stress disorder (PTSD) is a psychiatric condition that some individuals develop after a stressful experience. Women are at increased risk for PTSD following trauma exposure compared with men. Animal models are useful in examining immediate effects of stress, but the vast majority of studies were performed with males. Therefore, this study examined sex differences in the development of PTSD-like behaviors after footshock stress using a mouse model of PTSD. **Methods:** Adult C57BI/6 mice (4 males and 8 females) underwent a contextual fear

conditioning session in a standard footshock chamber where they received 15 shocks (0.5mA, 0.5-sec duration) once a minute after 10-minutes of acclimatization to the chamber. After two estrous cycles for females and 9 – 11 days for males, animals were returned to the chamber for a ten-minute period without footshocks. Two blinded researchers reviewed the videotaped acclimatization period of the first session and the 10-min of context re-exposure session and scored freezing behaviors (i.e., the lack of movement except for respiration and heartbeat) exhibited in mice. **Results:** There was no significant sex difference in baseline corrected percentage of freezing during the second session (2nd session – 1st session freezing) (p=.570). Within females, a freezing percentage significantly increased from the first session (12.4%) to the second session (75.1%) (z=-2.52, p=.012). Within males, freezing percentage did not significantly change between the first (0.21%) and the second (42.3%) sessions (z=-1.60, p=.109). **Conclusion:** Females showed greater retention of fear memory than did males. This difference may contribute to women's greater susceptibility to PTSD.

Reversible Firing Pattern Transformation in Central Olfactory Neurons

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Mitral cells (MCs) in the main olfactory bulb (MOB) encode odor information in the form of action potentials. The firing patterns of MCs are related to both intrinsic properties and their synaptic connectivity (dendrodendritic connections). MCs exhibit two types of firing patterns: (1) regular/rhythmic firing and (2) burst firing of action potentials. Using an electrophysiological experimental approach with whole-cell patch-clamp recordings in mouse brain slices, we hypothesized that the two firing patterns could be transformed into each other either spontaneously or pharmacologically. Our results showed that MCs with regular firing preserved their firing pattern in the presence of blockers of fast synaptic transmission suggestive of the firing pattern as an intrinsic property. However, regular firing was transformed into bursting by applying gamma-Aminobutyric acid-A (GABA-A) receptor antagonists to block inhibitory synaptic transmission. In contrast, burst firing of MCs was transformed into regular firing by blocking ionotropic glutamate receptors, rather than blocking GABA-A receptors, indicating that ionotropic glutamatergic transmission mediated the transformation. Long-lasting inward currents (LLCs) measured in voltage-clamp recording conditions corresponded to burst firing in current-clamp recordings. Metabotropic glutamate receptors were also involved in the generation of LLCs in over-excited MCs. Initially, the intrinsic membrane properties of MCs were tested by using fast synaptic blockers. This concealed the fact that membrane properties of MCs were transformable at dendrodendritic synaptic connections. The involvement of both intrinsic and dendrodendritic mechanisms in firing pattern transformation suggests that odor information may be encoded by dendrodendritic mechanisms that work in addition to intrinsic properties of MCs.

Isolation and Assesment of Bacteriophages Diversity from a Soil Sample at 39.115 N and -77.5 E Howard University, Washington DC

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Bacteriophages (phages) are viruses which infect bacteria. These viruses infect a different range of hosts based on the specific receptors found on the bacteria. Although phages are classified as viruses, they are very different from pathogenic viruses because they can only infect bacteria; they are harmless to humans, animals, and plants. Phages were wildly used to treat various bacterial infections in people and animals. Bacteriophages could still provide a solution to the aforementioned problem in antibiotic development. The current study was undertaken to increase the spectra of phages for Mycobacterium smegmatis and to evaluate the diversity of phages in different geographical areas. A soil sample was collected from Howard University's campus in Washington, DC (39.115 N and -77.5 E) to begin the isolation of phages by enrichment and direct plating methods. The filtrates from both techniques were assayed using spot assay with Mycobacterium smegmatis for possible phages and further purified using quadrant streaking.method. Medium titer lysates(MTL) and high titer lysates(HTL) were collected for further research with titer ranging from 2.4 x 104 to 2.7 x 105 pfu/mL (plaque forming units per milliliter). The

bacteriophages were lytic with a plaque diameter of 0.3 mm. Future plans include analyzing bacteriophages using transmission electron microscopy and gel electrophoresis. DNA isolated from the virus will be subjected to sequence analysis using annotation, restriction enzymes, and PCR.

Isolation and Analyzation of Bacteriophage PaigePhage's DNA

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Bacteriophages are viruses that infect bacteria and use their hosts to in order to replicate their genomes and make more of themselves. The objective of this research in the SEA-PHAGES research program was to isolate and identify a bacteriophage's phenotypic and genotypic characteristics. Soil was collected and phages were identified using Mycobacterium Smegmatis (M. smeg) as the viral host. In order to obtain and isolate the phage, purification and titration were performed. After there was a consistent production of plaque of uniform morphology, experiments such as flooding, the spot titer, the medium titer lysate, and the empirical test were performed so that the phage's DNA could ultimately be isolated. After the phage's DNA was isolated, photospectrometry was used to determine the DNA sample's concentration and purity. While the titer of the isolated phage's DNA sample was relatively low when indicated by the photospectrometer, it was larger than the minimum titer (5 x 109) needed for a DNA sample to be used in research and analyzation. Gel electrophoresis showed that the isolated phage's DNA was intact, indicating that the phage's DNA was able to be analyzed. After performing restriction enzyme digest, streaking was conducted in order to purify the lysogen. Only one type of lytic phage was isolated. As streaking is continued, the objective is to purify a lysogen and ultimately search for the presence of a lysogenic phage.

Anatomical and Genetic Characterization of Pila scutata (Mousson,1848)

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Background: Invertebrates are integral to healthy ecosystems, and comprise 97% of all animal species. Yet, less than 1% have been assessed for their conservation status, and we lack the taxonomic workforce needed to identify and evaluate recognized species. Ampullariidae are a diverse family of freshwater snails with confusing taxonomy, and most species descriptions based on shell morphology alone. Since 1848 Pila scutata (Mousson,1848) has been confused with nine other taxa. Recently, populations of P. scutata have declined, and taxonomic confusion hinders accurate assessment of abundances and distributions. A full re-description of this species is needed. **Methods:** Reproductive, digestive, nervous and alimentary systems of eight P. scutata were examined. Shells were digitized and electron microscopy used to image radulae. Phylogenetic relationships were estimated using mitochondrial DNA sequences. **Results:** Shell globose-elongate, thick, chestnut-brown to lighter brown toward margin, variable number of dark brown bands; shell height 34.4 - 43.7 mm, ~2-4 whorls. Operculum calcified, uniformly concave. Radulae taenioglossate with ~30-35 rows of teeth ($\bar{x}$=32.5; n=4). Internal anatomy similar to Pomacea maculata with minor differences in lung, kidney, and reproductive system. Mean genetic distance among Pila spp. was 0.292. **Conclusions:** Preliminary results have revealed distinctive anatomical and shell features that are useful for delineating P. scutata from congenerics, and that will contribute to a full redescription of the species. Future work will include additional genetic analysis and Micro-CT examination of female reproductive anatomy. These data will provide a solid foundation for accurately assessing the conservation status of P. scutata.

Opdivo® (Nivolumab): A Cost Effectiveness Analysis in Melanoma

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Background: The cost effectiveness of Nivolumab relative to Ipilimumab has not been determined with respect to the health care system of the United States. It is important that these

costs be explored with regard to the American healthcare system in order to determine the drug's place in therapy. The objective of this study is to determine the cost effectiveness of nivolumab relative to ipilimumab in the treatment of unresectable or metastatic melanoma. **Methods:** The costs of nivolumab and ipilimumab were calculated based on the wholesale acquisition cost. These calculations were then applied, along with survival rates associated with each drug, to yield the incremental cost effectiveness ratios (ICER). A number needed to treat was calculated (NNT) based on the survival rate. To calculate the ICER, the cost of the difference in the costs of the two drugs were divided by the difference of the survival rates. **Results:** Nivolumab has an incremental cost of $21,337 when compared to ipilimumab. In addition 72.9% of people survived within the first year on nivolumab compared to 45.6% of people on ipilubimab. The resulting ICER was $78,159 for each additional life saved when using nivolumab in place of ipilimumab. The NNT to save one additional life in the first year by using nivolumab was 3.66. **Conclusion:** Nivolumab was the most effective of the two monoclonal antibodies in terms of increasing survival during unresectable melanomas at a modest cost.

Expression Profiles of miRNAs as Potential Biomarkers in HPV-infected Anal Carcinomas

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Background: Over the past decade, compelling evidence has shown that miRNAs which are small non-coding RNAs are dysregulated in human cancers through various mechanisms. Because of their role in tumorigenesis, microRNAs (miRNAs) are emerging as a promising diagnostic tool. Our aim is to identify aberrant expression of miRNAs in anal lesions as they progress to carcinomas. **Methods:** 800 host miRNAs were profiled in 6 normal anal FFPE tissues, three pre-malignant and three malignant anal FFPE tissues, using the novel nanostring microarray technology. Normalization was performed using the average of expression for the top 20 most expressed miRNAs in all samples. **Results:** Analysis demonstrated that expression of miR-15, miR-29, miR-150, miR-203, miR-205, miR-374 and miR-451 was higher in pre-malignant and malignant anal lesions when compared to normal, while the expression of miR-146, miR-520, miR-624, miR-630, miR-1285 and mi-R3605 was lower in both malignant and pre-malignant tissues. **Conclusion:** Emerging evidence has suggested that miRNAs can act as either oncogenes or tumor suppressor genes in tumorigenesis. For instance, the 18-fold increase in expression of miR-29b-3p may enhance tumorigenicity through the down-regulation of anti-angiogenesis target protein COL4A2. On the other hand, the 11-fold decrease in expression of miR-630 in pre-malignant and malignant lesions may result in up-regulation of anti-apoptotic target protein BCL-2. The altered expression of miRNAs in anal cancer types can, therefore, be further explored as markers for possible diagnosis and therapy.

Assessment on the Resurgence of Rickets and Scoliosis on African Americans

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The purpose of this study is to identify and comprehensively assess the effects of scoliosis and rickets on the African American community. Prior studies have shown that African Americans are at greater risk of being diagnosed with scoliosis and are more susceptible to rickets as well. This increased risk factor for African Americans stems from the decreased levels of vitamin D from the sun taken in by people of darker complexions. By using the laboratory materials in the Cobb Research Lab, I will examine and analyze subjects reported to have passed away from rickets and scoliosis. I will also use a multitude of various resources such as scientific evidence, medical journals and the reports made by the Cobb research lab to reform the biological history of specific groups of affected people. By analyzing these diseases in detail, I will in turn develop a better overall level of understanding of the historical causes and treatments of scoliosis and rickets and how they matriculated over time.

Estimation of Body Status of 19th and 20th Century African Americans Using Skeletal Remains of the Cobb Collection

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Human skeletal remains are vital tools in the estimation of some biological characteristics such as height, sex, age and ancestry. Body status has been found to have a biological proportional correlation with femoral bone length and has been used in the reconstruction of identity in forensic and medico-legal studies. The Cobb Collection houses skeletal remains of African Americans of the 19th and 20th centuries. The quality of life, social and economic status including traumatic experiences of these African Americans during these eras have been poorly documented. This research aimed at determining body status using femur height from Cobb Collection individuals and evaluates it use as a tool in accessing the quality of life of these African Americans. Two hundred (200) ossified adults from the Cobb Collection were studied systematically. Femur measurements were taken using the osteometric board and digital vernier calipers. Inter-trochanteric crest at the upper level of the femur was measured by using sliding digital calipers. The data were analyzed using SPSS Statistical software for Windows version 22 and descriptive and inferential statistics determined for the sample. The regression equation was established and used for estimation body status. The result of this study enables us to identify a correlation between the clinically documented data of these individuals and the anatomical findings which permits authentication of the records and as a reference tool for medico-legal studies.

The Role of Spargel/dPGC-1 in the Growth of the Drosophila Ovaries

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Background: Peroxisome proliferator-activated receptors (PPARs) are nuclear receptors that function as transcription co-activators regulating the expression of genes. spargel/dPGC-1 is the Drosophila homolog of PPAR gamma co-activator 1 (PGC-1). Reduced spargel expression is investigated in Drosophila and it shows reduced growth, reduced female fertility and shorter life span. When a complete knockout mutant of spargel was isolated by a deletion of the spargel gene, it is homozygous lethal. This reveals that spargel is biologically essential. The overall objective of this research is to determine the effect of spargel/dPGC-1 on the growth of Drosophila ovaries. It is now known that spargel knockdown can influence Notch signaling. Notch aggregates at the edges of the follicle cells when Spargel is overexpressed in the ovaries, and it coagulates in the germ cells in spargel knockdown egg chambers. If Spargel is regulating Notch in the ovaries of Drosophila, how is it achieving this? Ras-associated binding (Rab) proteins are endosome mutants that are involved in trafficking. This led to the hypothesis that Notch is coagulated in the germ cells because Rab proteins are not functional in Spargel knockdown. **Methods:** Rab4, Rab5, Rab7, Rab9, Rab11 and wild-type female flies will be collected and their ovaries dissected. The dissected ovaries were then stained with Rhodamine, Phalloidin to detect actin, and C458 antibody to detect Notch. The ovarioles will be visualized and analyzed using a confocal microscope. **Conclusion:** The results obtained should contribute to the understanding of the biological function of PGC-1.

Exploring the Effects of Ancestral Genetic Composition on African American Identity

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Genetic analyses have been invaluable in elaborating and often clarifying population history. Studies of the genetics of African diasporic populations are in their infancy, largely because of the lack of interest by majority population researchers, limited historical knowledge of the origins and dispersions of New World Africans, and a paucity of meaningfully collaborative teams of researchers exploring population substructuring in the African Diasporas. In our study, self-identified African Americans Biology majors (N=40 individuals, Range= 18-23 years) at Howard University were provided with a pre-survey questionnaire that asked about who they thought they were descended from. Saliva samples were then submitted

to 23andMe for ancestral genomic evaluations. Participants then completed a post-survey questionnaire after receiving their results. Pooled results of the genomic evaluations were discussed and the historical context for findings presented. Participants fell into three main categories of response: those whose ancestral genetic identity matched with expectations from their family stories and their phenotype; those whose ancestral genetic results did not confirm family oral histories but were reconciled through reinterpretation of the results; and those participants whose ancestral genetic results provided an unexpected/unwelcome insight into their past. In this latter case, genetic information was rejected. Overall the results of the ancestral genetic tests increased participant interest in the "why and where" of particular genetic variants and information on coalescence times for particular haplotypes was internalized by many of the participants. Counterintuitively, participants were more receptive to the genetic ancestry results when they knew less information about their immediate biological lineage.

Expression of Claudin-5 Tight Junction Protein in SIV-Infected Primate Brain

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The endothelium consists of a continuous monolayer of endothelial cells, bound together by various tight junction and regulatory proteins. By maintaining and ensuring tight cell to cell contact, these tight junction protein complexes contribute directly to the formation of a electively resistant and semipermeable blood vessel, complete with the ability to regulate the transport of various biomolecules into and out of the bloodstream. Among these proteins, the claudins (claudin-5) provide the structural basis for the formation of these protein complexes, establishing high-resistance junctions and anchoring the various transmembrane proteins into the endothelial cell's actin cytoskeleton. In HIV-infected patients, endothelial adhesion and vasoregulation are altered significantly, causing abnormal erythrocyte adherence to the endothelium and diminishing the overall integrity of the blood vessel barrier. In this study, we hypothesized that the presence of HIV can lead to reduced levels of this claudin-5 tight junction protein in the rains of SIV-infected primate models, compromising endothelial barrier integrity and ultimately permitting the passage of inflammatory mediators and other harmful molecular toxins into the surrounding tissue and extracellular fluid. Using brain tissue sections, immunohistochemistry was used to stain the tissue and assess the overall integrity of the blood brain barrier endothelium.

Necrosis, Alcohol, and the Heart

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Merriam-Webster defines necrosis as the death of a portion of tissue differentially affected by local injury (as loss of blood supply, corrosion, burning, or the local lesion of a disease). Necrosis within the body of an animal implies the death of a significant amount of tissue, often localized to an organ, and the heart is no exception. Necrosis within the heart, specifically when involving cardiomyocytes has even been linked to heart failure. We hypothesize that through immunohistochemistry and imaging analysis of heart tissue collected from fetal alcoholic syndrome (FAS) primates with associated alcohol level diets for low and high alcohol consumption we will be able to reveal whether alcohol will induce necrosis in the cardiac tissues. We anticipate that evidence will show that with high alcohol assumption that it would encourage necrosis in the heart, and with low consumption that it would not increase or decrease necrosis, or that it would promote factors that would discourage or eliminate necrosis in the heart. By making these correlations between necrosis within the heart and the associated pathologies that are caused by binge drinking and alcoholism, we hope to aid in the effort to prevent, aid, and end diseases related to the heart.

Defining Webster2: The Isolation, Purification, and Analysis of a Bacteriophage

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A bacteriophage is a virus that infects bacteria. Bacteriophages are obligate parasites, so, to study them, a specific bacterial host must be used. Mycobacterium smegmatis (M. smeg) was the specific host in this experiment. A bacteriophage compatible with M. smeg was found on Howard University's campus in Washington, D.C. After an enriched sample was filtered and centrifuged, the supernatant was plated. It produced clear plaques indicative of a phage that, after infection and replication, lysed its bacterial host. Spot tests and plaque purifications, where different concentrations of the filtered phage sample were plated with M. smeg, confirmed the presence of a lytic phage and helped characterize its morphology. Once uniform plaques were observed (indicating an isolated phage strain), the 10-3 dilution plates were flooded to form a medium titer lysate (a solution with considerable phage particle concentration) and, through empirical testing, additional plates were flooded to form a high titer lysate. From the latter solution, bacteriophage DNA was extracted and sequenced. Its concentration (0 .252 μg/μl) and purity (1.85) were determined using a spectrophotometer. Gel electrophoresis, restriction enzyme digests, and DNA sequencing were performed to characterize and determine the phage now named Webster2. Annotation of the Webster2 DNA sequence will be performed to further analyze the phage.

Keywords: bacteriophage, DNA sequencing, lytic, M. smeg, PHAGES, Webster2

Alzheimer's Disease and Other Dementias in Sub-Saharan African and the Caribbean

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Background: Alzheimer's disease and other dementia (AD) are an important cause of death and disability in high-income countries. Few published data are available on AD in sub-Saharan Africa (SSA) and the Caribbean. **Methods:** We examined estimates from the Global Burden of Disease Study 2015 for sub-Saharan Africa and the Caribbean. To avoid confounding by age among persons age 70 and over, age-specific rates were examined. **Results:** Globally, rates of death per 100,000 for AD were lowest in SSA. In 2015 age-specific death rates per 100,000 for AD in the Caribbean were lower than those in high-income North America but higher than rates in SSA. Regions within SSA varied from Western SSA, which displayed the lowest rates of any region worldwide, to Central SSA. Also, Central SSA had the highest AD death rates for ages 70-74, and 75-79 relative to the other SSA regions. Central SSA had AD death rates over two times higher than those in Western SSA for ages 70-74 and 75-79. **Conclusions:** Rates of death from AD varied in SSA, being lowest in Western SSA. The Caribbean showed mid-range death rates. Rates increased between the years 1990 and 2015 in both.

Should Active Surveillance Be Offered to African American Men with Low Risk Prostate Cancer?

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Active surveillance has long been the preferred management for men with low risk prostate cancer. With periodic physical exams, prostate specific antigen testing, and repeat prostatic biopsies, active surveillance provides a cost effective method for patients who are unlikely to advance and need radiotherapy or surgical intervention in the immediate interval. However, active surveillance may not be the panacea for all men with low risk prostate cancer. In the United States, African American men are twice as likely to be diagnosed with prostate cancer in their lifetime as compared to Caucasian American men. Despite similar clinical presentations at the time of diagnosis, African American men with low risk prostate cancer may have a more aggressive form, leading to an increase in morbidity and mortality. This systematic review demonstrates the need for a closer look at the criteria necessary to offer and elect active surveillance when treating African American men with low risk disease. We argue for a more thorough approach when discussing treatment options with these men, including providing comprehensive patient education regarding treatment options and long term outcomes.

Trichomoniasis (STI) in African-Americans

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Trichomoniasis is caused by the flagellated protozoan Trichomonas vaginalis. Prevalence is worldwide and has been estimated by the World health Organization to be approximately 174 million. Trichomoniasis is the most commonly occurring sexually transmitted infection (STI). Pathogenesis of the disease is caused by a number of factors including a cysteine proteinase that compromises the integrity of the epithelium in infected individuals. Symptoms commonly include vaginitis and urethritis in males although infection can be asymptomatic. Though clinical symptoms are not as severe as some of the other common STI's, presence of T. vaginalis may be indicative of infection with other more dangerous parasites, viruses or high-risk sexual activity. Easily accessible screening and education could provide a method of primary and secondary prevention against HIV and other common co-infections such as gonorrhea and chlamydia. The prevalence of T. vaginalis infection in the United States is estimated to be 3.7 millions among women aged 14 to 49, based on a nationally representative sample of women. African American women had a prevalence of 13.3%, white women prevalence of 1.3%, and Mexican Americans women prevalence of 1.8%. The high rate of incidence and prevalence in women and the associated risk factors of T. vaginalis require close global monitoring of its incidence as it may be indicative of high risk sexual behaviors and predictive of the spread of other more intractable diseases.

Reconstruction of the early population history of Africans in the Americas through St. Helena Island (South Atlantic) and New York City

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Improved sequencing technologies allow for ancient DNA research of historic remains of underrepresented groups, which can provide riveting insights into their biological history. The combination of molecular genomic analyses and morphometric anthropometric assessments, within bioarchaeological and historical contexts, give a more accurate perspective on the significant events that occurred in the past. The investigation focuses on the status of early to mid-19th century Africans on their way to enslavement in the Americas and the status of late to 18th through mid-19th century enslaved Africans and African Americans in New Amsterdam/New York City. This investigation reconstructs the early population history of Africans in the Americas using these two important source populations. There is an examination of the range of demographic and morphometric diversity discovered among the liberated Africans buried at St. Helena. A goal is to determine if there is any similarity with that observed among individuals found in the New York African Burial Ground. It is hypothesized that skeletal remains on St. Helena show evidence of disease and trauma similar to the skeletal remains found on the New York African Burial Ground. Furthermore, the suggestion is that the range of ancestral genomic variability found in the South Atlantic African remains is similar to the range of genomic diversity observed in the New York African Burial Ground. Together, these sites provide a continuum of insights into the early population history of these African peoples.

Analyzing The Antimicrobial Effects of Chemical Compounds on Biofilm Development

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Phosphoenolpyruvate-carbohydrate phosphotransferase system (PTS) is a chemical cascade that regulates the intake of sugars by microorganisms and controls biofilm formation. A biofilm is a multi-layer of bacterial cells that are connected. Notwithstanding the control of sugar utilization and biofilm formation, the PTS manages a few other cell abilities, including chemotaxis, glycogen digestion system, and catabolite repression. Using a V. cholerae O139 strain, MO10, as the model organism, a chemical screen revealed compounds that have the ability to stall or prevent Vibrio cholerae growth and biofilm formation. In these experimental assays, bacterial growth in LB was assessed in microtiter plates while static biofilm development was evaluated in culture tubes. MO10 was grown in the absence of chemical compounds for use as a negative control. Meanwhile, a

genetically altered strain, which lacked natural PTS activity, was used as the positive control. Biofilm reduction and bacterial inhibition were confirmed by monitoring the growth of V. cholerae in the presence of chemical compounds with spectrophotometry and weighing results against those of the controls. Further assays aim to characterize the mode of action and potency of candidate compounds. Successful completion of this project will allow us to identify and characterize new chemical agents that are capable of preventing or reducing biofilm formation. This could lead to the development of new bacterial resistance strategies, which are applicable in the realms of medicine, pharmacy, engineering, and biology.

Isolation and characterization of bacteriophage Maven86

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Currently, only a fraction of the many bacteriophages in the environment have been sequenced and studied. Bacteriophages have been shown to influence all ecosystems and have potential to help in therapeutics and other areas of research. In this study bacteriophage Maven86 was shown to infect host Mycobacterium smegmatis mc^2 155. Isolation of M. smegmatis mc2155 phages was done with direct, enrichment and spot assays. Subsequently, a lytic bacteriophage was selected for further study. On average Maven86 had a diameter of 2mm with medium titer lysate (MTL) and high titer lysate (HTL) of 10^-4 plate and 8 x 10^-9 respectively. DNA, isolated from the HTL, was quantified and used for restriction digests. Subsequently, Maven86 was shown to produce lysogens post infection of the aforementioned host. Further studies are underway to characterize Maven86.

Harmaline Induces Tremor and Suppresses Auditory Startle Reflex in Mice

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Essential tremor is one of the most common neurological disorders characterized by uncontrollable shaking and tremors throughout the body. Well known to affect adults, it can also affect children as young as five. Harmaline induced tremor is an established animal model for human essential tremor, but it's affects on mood behavior are under review. This current study aims to use pharmacological and behavioral methods in the mouse model to record the auditory startle reflex, prepulse inhibition, gap detection, and tremor. Mice tremors were recorded by the Kinder Startle Monitor System. The mice were initially screened to test their startle reflex, prepulse inhibition, and gap detection before injection of harmaline. Once that has been recorded, they are then injected with Harmaline (12.5 mg/kg). We then recorded their startle reflex, prepulse inhibition, and gap detection. After a 24-hour period the mice were then screened for a follow-up. Harmaline caused the startle response to significantly decrease. Prepulse inhibition and gap responses also decreased upon Harmaline injection and increased the following day, but not significantly from the controls. The frequency of the tremor was from 10-20 Hz. For the first time, we used Kinder Startle Monitor system to reliably record that Harmaline caused a pathological tremor in mice. We also found that Harmaline attenuates the auditory startle reflex in mice by causing the reflex to be suppressed during injection, but did not affect prepulse inhibition and gap detection. These findings suggest Harmaline specifically modulates startle behavior.

The Isolation and Characterization of JaedahBea, a Lytic Bacteriophage

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Bacteriophages (phages), viruses that specifically target bacterial cells as hosts, exhibit two different life cycles: lytic and lysogenic. Lysogenic phages inject their DNA into their host cell, while lytic phages completely lyse their host, creating clear plaques. In this study, lytic phages were isolated from soil using the bacterial host Mycobacterium smegmatis mc2155. Subsequently, data will be used to update the Phages Database and identify phylogenies of different phages. Both direct and enriched isolation were

used to propagate M. smegmatis phages. Following several rounds of purification and empirical testing, high titer lysates (HTL) were generated and utilized for transmission electron microscopy preps, DNA extraction and restriction digests. Similarly, the patch assay was used to determine whether JaedahBea could influence the formation of M. smegmatis lysogens. The phage isolated in this project, JaedahBea, was found at coordinates 38.9218579 N, 77.0204718 W. JaedahBea produced lytic plaques with an average diameter of 0.8 mm. Restriction digests of phage DNA is inconclusive; however, it is hoped that the presence of a lysogen will soon be confirmed. The bacteriophage, JaedahBea, will eventually be sequenced and might be added to a common database, PhagesDB. This will allow researchers to utilize the information to compare phages.

Key Words: Bacteriophage, Mycobacterium smegmatis mc2155, Lysogen, soil

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Generation of Induced pluripotent stem cells (iPSCs) from Hutchinson-Gilford Progeria Syndrome (HGPS) patient fibroblasts using lentiviral, episomal and mRNA based reprogramming methods

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With the discovery of human embryonic stem cells (hESCs) in 1998 and the revolutionary invention of cellular reprogramming technology in 2006, there flourished an era of regenerative medicine that aims to repair, replace or regenerate damaged tissues to treat degenerative diseases and injuries. The use of transcription-factor-based reprogramming of somatic cells to generate induced pluripotent stem cells (iPSCs) for cell-based therapies has gained worldwide recognition and has been implemented in numerous clinical trials with substantial success stories. While there are numerous theoretical benefits of iPSCs in cell and gene therapy, disease modeling and drug discovery, the challenge of optimizing suitable methods for induction of iPSCs from different cell types, maintenance of reprogrammed cell lines and maximizing their pluripotential ability from disease-specific patient fibroblasts remains. Another obstacle involves generation of iPSCs from patient fibroblasts with genetic diseases like Hutchinson-Gilford Progeria Syndrome (HGPS), an accelerated aging syndrome in children characterized by cellular senescence and loss of proliferation. Non-dividing, senescent or high passage cell cultures present a major roadblock to reprogramming by non-integrating methods due to their low reprogramming efficiencies. This research describes the generation of iPSCs from HGPS patient fibroblasts using different methods like lentiviral, episomal and mRNA based reprogramming factors along with different delivery methods including lipid-based transfection and nucleofection. We have also analyzed the efficacy of each method including vector type, delivery methods, and culture conditions as well generated xeno-free and footprint-free HGPS-iPSC cell lines characterized by specific pluripotency assays.

Photoacoustic Monitoring of Radiation-Induced Salivary Gland Damage

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Functioning salivary glands (SG) are essential for speech, eating, and swallowing but commonly experience collateral damage following radiation therapy (RT) in head and neck cancer patients. The development of tools that monitor salivary gland function will facilitate advancements in treatments against radiation-induced damage. Photoacoustic Imaging (PAI) is a relatively inexpensive imaging method, which assesses tissue oxygenation using solely endogenous materials. Recent work in our lab demonstrated the ability of PAI to detect changes in SG oxygenation following gustatory stimulation, and loss of this response following RT. In this project, male severe combined immunodeficient (SCID) mice were split up into three groups: control, fractionated RT, and single dose RT. PAI co-registered with Ultrasound was performed throughout treatment to evaluate changes in SG morphology and oxygenation. Pilocarpine was injected intraperitoneal (20 mg/kg) to induce changes in SG hemodynamics, and saliva was collected to measure alterations in saliva production following irradiation. Salivary gland tissue was removed one week following treatment to co-register with imaging data. One week post treatment, both treated groups showed a significant decrease in both SG volume and weight. Prior to RT, Pilocarpine-induced stimulation resulted in an increase in both salivary secretion and PAI-based oxygen saturation levels in SG. However,

following both RT regimens, salivary secretion in response to stimulation decreased, with the greatest decrease observed 1 week post. Interestingly, this reduction was associated with an increased hemodynamic response as measured by PAI. These findings show the potential of PAI to non-invasively monitor radiation-induced damage to SG.

Accuracy and Role of CT Angiography of Pulmonary Arteries in Detecting Pulmonary Embolisms and Cardiac Malformations

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Background: Pulmonary emboli (PE) are the third leading cause of cardiovascular-related death in the world. Computed tomography pulmonary angiography (CTPA) currently serves as the gold standard for PE diagnosis due to its quick and non-invasive approach.
However, the technical quality of CTPA studies is often variable. CTPA's image quality and resultant diagnoses may be compromised due to a variety of reasons and technical issues.

Methods: We performed a comprehensive review of the existing medical literature and clinical cases at Howard University Hospital concerning:

- The quantification of poor quality image studies and their respective causes;
- The impact of BMI on image quality;
- Medical conditions known to imitate presentation of PE.

Results:

- There are multiple causes for image artifacts: breathing and cardiac motion, poor contrast mixing, incorrect timing of contrast injection, errors by technologists, and interpretation errors;
- BMI did not appear to have a significant impact on the ability to diagnose PE;
- Multiple clinical conditions can mimic the clinical presentation of PE.

Conclusion: CTPA technology in detecting PE has advanced in the past few decades. It is uniquely positioned to evaluate normal and abnormal findings in patients presenting with symptoms of PE or symptoms mimicking PE. Familiarity with the limitations of this imaging technique can significantly impact our ability to provide meaningful and timely medical care.

Cardiac autonomic changes as rhythms are processed

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Investigators are beginning to map the array of brain and peripheral nervous system concomitants associated with listening to music. Subtle changes in the relative contribution of cardiac parasympathetic (PNS) and sympathetic (SNS) occur as psychological tasks are performed. Relatively small, but reliable cardiac adjustments occur as environmental input is processed. This study used an extension of hierarchical regression analysis called shared over simple analysis to calculate the shared and simple contributions of cardiac PNS and SNS to heart rate changes as participants listened to rhythmic passages. Sixty college-aged adults rested comfortably for five minutes and then listened to three pairs of drumming passages. The complexity of the rhythm varied within each pair, while the tempo of each pair was held constant. Indices of cardiac PNS and SNS activity served as predictors of cardiac inter-beat intervals. Presently, shared and simple contributions of each predictor are being computed. We will discuss patterns of relationship between SNS and PNS activation during periods of rest and during the rhythmic passages.

The Effects of A Slow Pressor Dose of Angiotensin II on Sodium Transporters Expression in the Kidney Cortex are Independent of PPAR-alpha

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A slow pressor dose of Angiotensin II (Ang II) has been shown to increase the expression of sodium transporters in the proximal tubules (NHE3), TALH (NKCC2) and distal

nephrons (NCC) before an increase in blood pressure. Peroxisome Proliferator Activated Receptor - alpha (PPAR-alpha) is involved in pressure natriuresis through changes in sodium transport via ameloride and thiazide-dependent mechanisms. We hypothesized that the expression of the sodium transporters during Ang II hypertension were dependent upon PPAR-alpha expression. We treated wild-type (WT) and PPAR-alpha knockout (KO) mice with Ang II (400 ng/kg/min) for 12 days. On day 12 of Ang II, MAP for PPAR-alpha KO (156 ± 16) mice was significantly higher than WT (138 ± 11 mmHg) mice. NHE3, NHERF1, NKA-α1subunit, NKCC2, and NCC expression was detected in kidney cortical homogenates. Ang II decreased the expression of NHE3 in WT + Ang II (0.14 ± 0.02 ODU) and PPAR-alpha KO + Ang II (0.10 ± 0.02 ODU), when compared to WT (2.61 ± 0.93 ODU) and PPAR-alpha KO (2.20 ± 0.58 ODU) controls. Ang II-treatment also decreased NKCC2 in both WT (0.31 ± 0.10 ODU) and PPAR-alpha KO (0.22 ± 0.03 ODU). Ang II decreased NCC and NHERF1 expression in WT and PPAR-α KO mice. NKA alpha1 subunit expression was increased during Ang II hypertension in both WT (1.06 ± 0.26 ODU) and PPAR-α KO (1.64 ± 0.26 ODU) mice. The effects of a slow pressor dose of Ang II on expression of sodium transporters are independent of PPAR-alpha expression.

Determining Activational and Topographical Differences in the Paraventricular Nucleus of the Thalamus of Binge Eating Prone and Resistant Rats

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The paraventricular nucleus of the thalamus (PVT) functions as a communication center between the ventral and dorsal striatum and the lateral hypothalamus. It is involved in mediating motivated behaviors, such as cocaine-seeking and receives innervation from neuropeptides that affect feeding. However, it is not clear what influence the PVT has on binge eating behavior. The purpose of this study is to determine whether there are activational differences in the PVT of binge eating prone (BEP) and binge eating resistant (BER) rats. We will also determine whether there are topographical differences in the activation of cells in the anterior PVT (aPVT) and posterior PVT (pPVT). It is hypothesized that there are activational differences in the aPVT versus pPVT in both BEP and BER rats and that BEP rats have significantly more c-Fos-activated neurons versus BER rats. Therefore, we implemented a rodent, binge eating protocol to identify female Sprague Dawley rats (250-300g, n=7/group) that display BEP or BER phenotype. After the completion of nine feeding tests, the animals are euthanized and processed for c-Fos immunoreactivity. Rats classified as BEP consume significantly more palatable food (high fat, sugar) than BER rats ($p<0.05$). Quantification of c-Fos cells is underway to determine if there is a significant topographical difference in c-Fos immunoreactive cells in BEP and BER rats. The activation of PVT neurons after palatable food consumption may indicate an involvement of these neurons in mediating binge eating behavior.

The Discovery of Bacteriophage

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Bacteriophages are the most abundant biological life forms on Earth. They are viruses that infect bacterial host, using the cellular machinery of their host to replicate. Some phages repress the lytic cycle, stably maintaining its genome within the bacterial cell and lysogens are bacterial cells that carry the phage genome. Phages that are specific to Mycobacterium smegmatis were isolated, purified and characterized. A soil sample was acquired, the phages and bacteria were amplified through enrichment, and plaque assay was performed. The presence of phages specific to the host was verified, and phages purified until a pure culture was obtained. Medium titer lysate was obtained from phage solution. An empirical test to obtain a High Titer Lysate (HTL)was performed and from the HTL, phage DNA was isolated which was characterized using spectrophotometry and restriction enzyme digests. The DNA was sequenced for the purified phage. Further experiments including the testing, and verification of potential lysogens in the phage and Electron Microscopy will be carried out, and annotation will be performed on DNA sequence.

Keywords: Bacteriophages, lytic, lysate, Mycobacterium Smegmatis, plaque assay

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Complications in Primary Cleft Palate Repair: A Review of the ACS NSQIP Pediatric Database

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Background: The aim of our project is to evaluate outcomes of children undergoing surgery for cleft palate/lip deformities in a national surgical database. **Results:** A total of 3775 patients met our inclusion criteria, of which a majority were male (54.7%, n=2064), White (68.4%, n=2583), and between 6-24 months (62.07%, n=2343). Of those who had cleft palate only surgery a majority were female (51.8%, n=975), White (72.49%, n=1365), and between 6-24 months (74.9%, n=1412) (p=0.00). Of those who had cleft palate and lip surgery, a majority were male (61.1%, n=1156), White (64.37%, n=1218), and between 6-24 months (49.73%, n=931). The overall mortality rate was 0%. The overall the reoperation rate was 0.8% (n=33). There was no difference in reoperation rates between those cleft palate only surgery (1.1%) and those with cleft palate and lip surgery (0.7%) (p=0.095). Overall the readmission rate was 1%. There were no differences in the rates of readmissions by the procedure type. Concerning readmission and age categories, the 0-6 months age group had the highest rate followed by 6-24 months age group and >24 months age group. (2.4% vs 1.2% vs 0.5%) (p=0.027). **Conclusion:** Our data demonstrates that cleft palate/lip procedures is relatively low risk and older the patients are the less likely to have a readmission. Further research is warranted to elucidate factors that contribute readmissions in the younger age groups undergoing cleft palate/lip surgery.

Origin and Dispersal of True Seals Based on Recent Fossil Evidence

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Introduction: Although classification of the Family Phocidae (true seals) remains contentious, fossil evidence supports the presence of three extant subfamilies (Phocinae, Monachinae and Cystophorinae) and one extinct subfamily (Devinophocinae). The discovery of Afrophoca libyca (Monachinae, ~ 21 Ma) further demonstrates that the origin of true seals was in the Paratethyan/Mediterranean basins, occurring no later than the Late Oligocene. Seals widely dispersed during the Middle and Late Miocene, crossed the Atlantic Ocean and practically ceased to exist in Europe by the Early Pliocene. **Evidence:** Fossils of the subfamily Devinophocinae (Central Paratethys, 13.8-16.5 Ma) present unique, primitive characters and mixed characters with the other subfamilies. Representatives of the subfamily Cystophorinae (two species of Pachyphoca) also suggests origin in the Paratethys, followed by westward migration (~ 11.2 Ma) before dividing into two modern genera (Cystophora and Mirounga). Leptophoca amphiatlantica (Phocinae) originated on the coast of Western Europe (16.4-15.8 Ma), dispersed across the Atlantic westward to the eastern shore of the North Atlantic in Calvert time (~ 15 Ma) and spread southward in St. Mary's time (~10.5 Ma). Several Early-Middle Miocene phocines were found on the eastern shore of the United States, such as Leptophoca lenis. **Conclusion:** The fossil record from Miocene deposits of Europe and North America supports a North Atlantic - Paratethyan origin of true seals, contradicting the widely accepted hypothesis of a North Pacific origin. The North Pacific record of fossil Phocidae is relatively late, represents only a few genera and provides no evidence about the earlier evolution of the Family.

The Isolation and Purification of Phage Tichi

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Background: Bacteriophages (phages) are viruses that infect and replicate within bacteria. Phages can exist as either a lytic phage, which lyses the cell immediately, or a temperate phage, which integrates itself into the cell's genome. The aim of this study was to explore the diversity of mycobacteriophages, which infect the host bacterium Mycobacterium smegmatis. **Methods:** Phage Tichi was obtained from a soil sample at the Howard University sign at Bryant Street and 4th Street

in northwest Washington, DC. After the collection of the sample, an enrichment technique was used to increase the phage population. Once plaques were obtained a spot test was used to prove the presence of a phage and serial dilutions were carried out to purify a single phage population. The population was then characterized by its plaque morphology and consistency. **Results:** These experiments in combination assisted in the isolation of phage Tichi. This phage ended up being virulent producing clear plaques with a diameter of 1 millimeter. The concentration of plaques calculated from the titer assay was 2.6 x 109 pfu/ml. **Conclusion:** Based off the morphology of Phage Tichi, it is believed to be lytic. Further experiments will be carried out to find further information about the phage and to confirm if it is indeed lytic or may contain a lysogen.

Altered Iron Metabolism in Sickle Cell Disease Modulate Viral Restriction Factors

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INTRODUCTION: Human immunodeficiency virus type 1 (HIV-1) and Ebola like all viruses, require cellular factors and pathways replication but are challenged by antiviral restriction proteins expressed in response to viral infection. We recently showed that decrease in phosphorylation of viral restriction factor SAMHD1 leads to the inhibition of HIV-1 infection in Sickle cell Disease (SCD). We linked this to a decreased CDK2 activity which was affected by low intracellular iron due to ferroportin expression in SCD Peripheral Blood Mononuclear Cells (PBMCs). In this study we identified additional restriction factors induced in SCD PBMC. **METHODS:** A customized array that including known antiviral restriction factors was utilized to determine their expression in SCD PBMCs followed by validation with Real-time q-PCR. The shRNA-mediated knockdowns of the identified genes validated the role of the identified factors in HIV-1 and Ebola replication in cultured and primary cells. **RESULTS:**Customized array showed upregulation of 19 genes in SCD PBMC. The highest upregulated genes, APOBEC3A, APOBEC3C, TRIM5α, TRIM22, MX2 and RSAD2, were further validated using real-time q-PCR in PBMCs treated with heme or iron cheltors. ShRNA-mediated knockdown of APOBEC3A, APOBEC3C, TRIM5α and TRIM22 induced viral replication. **CONCLUSIONS:** In addition to SAMHD1, APOBEC3A, APOBEC3C, TRIM5α, TRIM22, MX2 and RSAD2 were upregulated in SCD PBMCs. This upregulation is likely to be mediated by SCD-related hemolysis. The identified factors might play a role in HIV-1 restriction in SCD. ACKNOWLEDGMENTS: This work was supported by Research grants from the NIH National Heart, Lung, and Blood Institute (1P50HL118006 and 1R01HL125005).

Understanding Evolutionary Patterns in the Sjogren Syndrome-Antigen B Gene in Worldwide Populations

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Sjogren's syndrome (SS) is a systemic autoimmune disease that affects the exocrine glands and is characterized by persistent dryness of the mouth and eyes due to the functional impairment of the salivary and lacrimal glands. Despite the severity of these symptoms, little is still known about patterns of variation at the SSB gene, which has been strongly associated with SS. To address this current gap in knowledge, we examined sequence variation in the SSB gene, totaling 13, 253 bases in length, in >1400 individuals from 14 global populations in the 1000 Genomes Project. Our analyses revealed striking patterns of variation, including an excess of low-frequency mutations and a paucity of replacement (protein-altering) mutations, consistent with a model of purifying selection, suggesting that substitutions in this gene are not tolerated. Furthermore, this finding was consistently observed across geographically diverse populations, implying that purifying selection in SSB is a common evolutionary process in humans. Additionally, we observed similar levels of nucleotide variation and linkage disequilibrium (LD) between nucleotide sites in African and non-African populations, which is not consistent with prior analyses of genomic studies. This observation further indicates that patterns of diversity at SSB are usual. Overall, this study of this gene, the largest of its kind to date, provides further information regarding the evolution of genetic variation underlying a medically-relevant trait in humans.

A Cost-Effectiveness Analysis of Epclusa Compared to Viekira Pak for Treatment of Hepatitis C

Presenter's Name: Lauren Latten
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Background: According to the World Health Organization, 130 to 150 million people globally have chronic hepatitis C infection. Hepatitis C disproportionately affects the black and Asian population. Recently, the rapid development of novel hepatitis C agents have led to the identification of a new hepatitis C drug class known as direct-acting agents (DAA). Both Epclusa (sofosbuvir/velpatasvir) and Viekira Pak (ombitasvir, paritaprevir, ritonavir, and dasabuvir) treatments have cure rates upward of 90% in patients without cirrhosis. The objective of this study was to determine the cost effectiveness of Epclusa in comparison to Viekira Pak in non-cirrhotic hepatitis C treatment. **Methods:** A cost effectiveness analysis was conducted to determine the cost effectiveness of Epclusa in comparison to Viekira Pak using a Markov analysis. The primary outcome measure was an incremental cost effectiveness ratio (ICER) that was derived to determine the cost per quality adjusted life year (QALY) gained. **Results:** Epclusa had superior efficacy than Viekira Pak with 1,000 fewer deaths in a population of 1,000 patients. Epclusa also had an incremental gain of 0.46 QALYs for each person on average using the therapy. The costs for Epclusa were also $14,176 lower than Viekira Pak. Because Epclusa Pak was both more effective than Viekira Pak and less expensive, Epclusa was a dominant therapy. **Conclusions:** When given the choice of Viekira Pak or Eplcusa for treatment of hepatitis Cinfection, Epclusa should be the recommended therapy.

Targeting STAT3 to Inhibit Cancer Cell Growth by Genetic and Pharmacologic Methods

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Since dysregulated STAT3 contributes to cancer initiation and progression, its inhibition is a promising therapeutic approach. OPB-51602, a small molecule direct inhibitor of STAT3, blocks multiple STAT3 functions. Previous experiments showed that OPB-51602 inhibits growth and survival of tumor cells in a STAT3 dependent manner by targeting mitochondrial STAT3 functions. In this study, we confirm and extend these findings by testing the role of STAT3 in five different human cancer cell lines: Lung Carcinoma (A549), Osteosarcoma (143B), and three types of Melanoma (Mel147, A375 and 451LU). Comparing the same cell line with (WT) and without (KD) STAT3, we assessed its role in 2-dimensional culture and in modulating the toxicity of OPB-51602. Our studies show that In four cell lines out of five, STAT3 had no effect on cell growth but in 451LU, higher levels of STAT3 positively affected cell growth (WT grows faster). OPB-51602 affected 3/5 cell lines in a STAT3-dependent manner (in A549, A375, 451LU WT is more sensitive) and affected both WT & KD equally in 143B and Mel147.

Characterization of Unique Bacteriophage Coffee

Presenter's Name: Giordanne Logan
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Background: Bacteriophages are highly-specific, dynamic viruses which infect bacteria. Exploring their diversity could be helpful in diagnosing diseases and understanding viruses which affect humans. **Methods:** Coffee was collected in an environmental soil sample September 12, 2016 at the Harriet Tubman Quadrangle, 38.922 °N, 77.018 °W, at 28°C and a depth of 6.4 cm. Coffee was isolated from an enriched filtrate and purified through purification assays. Through empirical testing, Coffee's high titer lysate (HTL) was collected for future experiments. DNA was extracted, a restriction digest and gel electrophoresis were conducted. DNA was sent to Pittsburgh Bacteriophage Institute for Illumina sequencing. **Results:** The morphology of plaques was 1mm in diameter and clear.5.4 x 10-5 µl of Coffee's lysate resulted in max web plates (80% lysed.) The titer was 3.3 x 109 pfu/ml and the high titer was 1.325 x 1011 pfu/ml. The concentration and purity of phage Coffee's DNA were 1265.4 ng/µl and 1.76 (260/280.) When recalculated for lysogenic assays, Coffee's high titer was 5.6 x 1010 pfu/ml. The spot titer produced no mesas indicating that Coffee may be lytic. Coffee's DNA was sequenced and bioinformatics software will be used to better understand its uniqueness. **Conclusion:** Phage Coffee's uniqueness is being studied using different bioinformatic tools to predict its genes and their functions, and for comparison to other bacteriophage genomes.

Isolation and Purification of Monster Phage Using Mycobacterium smegmatis

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Coauthors: Gabby Boykins, Gretchen Johnson, Adrian Allen, Winston Anderson, Mary Ayuk, Leon Dickson, Broderick Eribo, Ayele Gugssa, Courtney Robinson

Background: PHAGES research focuses on the infection of bacteria with bacteriophages which is a type of virus. Since some diseases are caused by bacteria, and bacteriophages kill bacteria, research with bacteriophages can help solve many unanswered questions regarding treatments for bacterial infections. **Methods:** Initially, this project started off by taking a soil sample from the Caribbean tree on the yard at Howard University. From there the phages in the soil were enriched by adding a bacterial host, Mycobacterium smegmatis mc2155. Then a single phage population was isolated by diluting a sample from the enriched soil. Once the isolated phage was achieved, a lysate was created to create full plate titers to eventually extract the DNA of the phage. Results/ Findings: After conducting these experiments, a phage was successfully isolated. This phage is named Monster Phage due to the large diameter of 2cm of its plaques, which are likely lytic because the plaques are clear. The titer of the lysate was 20x (10) ^(-6)pfu/mL. **Conclusion/ Future Directions:** Monster phage is unusually large, so by extracting its DNA and studying its genome, this can help explain as to why the phage generates plaque with a diameter that is much larger than other mycobacteriophages.

Title: Scaffold Protein RACK1 Potentially Regulates IRES-mediated Virus Translation: A Target for HIV-1 Proliferation Inhibition

Presenter's Name: Israa Malli
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It is documented that an Internal Ribosome Entry Site (IRES) is utilized by some RNA viruses to enhance IRES-mediated viral genomic translation while host's cap-dependent translation is reduced. Therefore, viruses utilize a host's protein, Receptor for Activated C Kinase 1 (RACK1), which was found play a role in IRES-mediated translation. It was reported that RACK1 is an essential for hepatitis C virus (HCV) translation in a human while its absence prevents HCV translation. Moreover, analyzing HIV-1 genome from clinical isolates reveals that HIV-1 IRES is present in all the samples; two were identified among HIV-1 transcripts. This availability reinforces the important role of IRES in HIV-1 pathogenesis, replication and spread of the infection in the host. Since RACK1 is crucial for the translation process of viral genes, the missing function of RACK1 is suggested to inhibit the viral translation and stall the replication cycle. Here we are aiming to unravel a specific role for RACK1 in IRES-mediated translation; thus, we are hypothesizing that HIV-1 is using RACK1 for IRES-mediated translation, cap-independent translation. Therefore, depletion of host's RACK1 will inhibit HIV-1 replication in different cell cultures. Our objectives are: to determine whether or not RACK1 inhibitors target IRES-mediated translation and to analyze the correlation between the depletion of host RACK1 and HIV-1 viral load and proliferation in cell cultures. The significance of our investigation may lead to the possible development of novel antiretroviral therapeutics such RACK1 inhibitors or activators.

Molecular phylogeny of Rumex based on psbA-trnH intergenic spacer

Presenter's Name: Janet Mansaray
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Coauthors: Kirstie Grant, Janelle Burke

With about 200 species, Austrian botanist, Karl Rechinger, created a classification system dividing Rumex into four subgenera based on morphological similarities. Within each subgenus, species vary in sexual systems. Diocey involving sex chromosomes is rare in a genus of plants because plant species are usually synoecious (hermaphroditic flowers). Therefore, by studying Rumex we can learn more about the evolution of different sexual systems. One of the main objectives of this project is to test if Rechinger's taxonomic

classification system still stands with the incorporation of molecular data in a phylogenetic context. . To reconstruct a phylogenetic tree, I will focus my study on the chloroplast psbA-trnH intergenic spacer. PsbH-trnH intergenic spacer is a DNA maker that is relatively short at 500 bp. With samples from field-collected and historic specimens, I performed DNA extraction, PCR amplification and molecular analysis of Rumex species from across its range, with increased sampling from North America, South America, and Africa. Due to its short length, it is my hypothesis that the psbA-trnH intergenic spacer region will align well, yet still show ample variation across species within the genus. This will allow me to see the diversity among Rumex species. It is this diversity that will allow me to build a more clear and concise phylogenetic tree.

Influence of Saturation and Meibum Structure

Presenter's Name: Kayla Massey
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BACKGROUND: Dry eye affects roughly 5% of the populations and in populations 60 and over it occurs at higher rates. Evaporative dry eye is a dysfunction of the lipids on the tear film layer of the eye, in which the lipid layer breaks down leading to the evaporation of the aqueo- serous layer. The tear film layer is the main source of protection and lubrication for the eye. Meibum, produced in the Meibomian gland, is the main lipid that makes up the tear film layer. Our project sets out to correlate the meibum lipid phase transition with the level of meibum saturation parameters to investigate the effects of saturation of hydrocarbon chains alone on the lipids physical properties. **METHODS:** Samples collected from patients were treated platinum hydrogenation to induce the desired amount of saturation. Spectra of the samples are then taken using the Fourier Transform Infrared Spectrometer and analyzed using various computer programs. **RESULTS:** In our results saturation affects phase transition temperature in meibum increased as saturation increased. Hydrocarbon chain order was also affected as was Enthalpy, Cooperativity between lipid molecules, and Entropy. They all increased as saturation of the hydrocarbon chains on meibum increased. **CONCLUSIONS:** Lipid saturation could account for changes in lipid structure that contribute to dry eye as humans age. In addition, small changes in phase transition temperature can cause dramatic changes at physiological temperature.

Characterization of Mycrobacteriophage CousinLit

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Background: Bacteriophages are viruses that infect bacteria to reproduce and who are not susceptible to antibiotics. The purpose of this program was to isolate, purify and characterize a single phage from Howard University's campus to aid in the understanding of global mycrobacteriophage diversity. This is important because we learn about undiscovered phages in nature that could be beneficial in other mycrobiology studies. The soil sample used was found in front of Howard University's Carnegie Hall under a tree (38.923059 N, 77.020447 W). Mycobacterium Smegmatsis MC^155 was the medium bacteria used in trials. **Methods:** Enrichment plating that involved M. smegmatsis was used to increase the amount the phage particles in the sample. The plaques were picked and spotted for purification. Medium titer lysates were collected by flooding webbed plaques from plaque assays. An empirical test was conducted and analyzed to produce plates that could produce more phage particles in a high titer lysate. This lysate was then used for DNA extraction, restriction digest and gel electrophorese. **Results/ Conclusion:** CousinLit is a lytic phage. The HTL produced plaque even when diluted up to the ten to the negative eight. The DNA that was extracted was too diluted and could not be found after the gel was ran. The DNA samples were different concentrations. If available, this phage could be analyzed in the future to better understand CousinLit's genome and the DNA extraction can be redone to gain an understanding of CousinLit.

Development of small molecule Anti-Ebola compounds

Presenter's Name: Sajith Meleveetil
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Ebola virus (EBOV) causes severe, often lethal hemorrhagic fever in humans and non-human primates. Currently there is no approved treatment of EBOV. Our collaborative research has resulted in the identification of protein phosphatase 1 (PP1) as a viable target for the development of non-peptidic small molecules with anti-EBOV activity. We reported the

development of 1E7-03, a urea-containing small molecule with potent anti-EBOV activity via inhibiting a critical step in EBOV replication, namely, PP1-mediated dephosphorylation of viral protein 30 in EBOV. During our stability studies, we observed that 1E7-03 underwent a facile hydrolysis of its urea amide and ester bonds resulting into inactive metabolites. In order to improve the stability of 1E7-03, we performed systematic, iterative alterations to its side chain, by replacing the labile ester linkage with amide functionalities. Accordingly, a series of linear chain and cyclic amide analogs containing carbocyclic/heterocyclic fragments were synthesized and studied for their anti-Ebola activity. Herein, we report our efforts on structural modifications based on 1E7-03 which led to the development of SAM-11, featuring naphthalene carboxamide side chain. We predict that the enhanced lipophilicity of SAM-11 could be attributed to its high lipophiliity. Our efforts of ligand refinement and biological activity analysis will be discussed.

Comparative anatomy of extraocular muscles and orbital neurovascular structures in cetaceans and other marine mammals

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This study examines extraocular (EOM) and orbital muscles as well as orbital neurovascular structures of marine mammals to distinguish oculomotor characters shared with phylogenetic outgroups from ones that are uniquely adapted to life in aquatic environments. Orbits of nine cetacean species and one sirenian are being dissected macro- and microscopically. Three have been scanned by MRI in the Radiology Department at Howard University Hospital. Muscle samples were sectioned and stained by H&E and Trichrome for histological analysis. Each rectus EOM consists of 2 bellies: palpebral and scleral. The scleral insertions, typical for all vertebrates, are very small while the unique palpebral insertions are extremely well developed. Three circular muscle layers have been identified. The first encircles the external surface of the EOMs and is found in all the cetacean species. In the fin whale Balaenoptera physalus a second layer adheres to the scleral surface of the EOMs and a third layer is found crossing the ventral side of the inferior rectus. The circular muscle histology looks typical for smooth muscle. In baleen whales, numerous arteries penetrate the muscles and reach the ophthalmic rete mirabile which surrounds the optic nerve. Additional vascular retia are located between the retractor bulbi and the EOMs. The conical shape of the circular muscles suggest that they squeeze the EOMs and globe, thus protruding the eyeball in antagonism to the retractor bulbi. The well-developed palpebral insertions of the EOMs appear to be synergists to the retractor bulbi.

Sloths in the city: unexpectedly high density of pale-throated three-toed sloths (Bradypus tridactylus) found in an urban forest patch in Paramaribo, Suriname

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In October 2012 individuals associated with the Green Heritage Fund Suriname organized a rescue of arboreal mammals displaced during deforestation of a 6.8 ha plot in northwest Paramaribo. Rescued or observed animals included 137 pale-throated three-toed sloths (Bradypus tridactylus), eight two-toed sloths (Choloepus didactylus), three Brazilian porcupines (Coendou prehensilis), and three silky anteaters (Cyclopes didactylus). In addition, two lesser anteaters (Tamandua tetradactyla) – a mother and baby – were seen but not rescued. Due to their lack of speed and inability to escape, it is likely that almost all of the pale-throated sloths in the forested plot were captured during the thirty-day period of clear-cutting. Comprising 91% of the total rescued animals, the 137 B. tridactylus included 61 males, 56 females, 15 juveniles, and five adults that could not be sexed. Data on body mass, length, and other features reveal a population of reasonably healthy but smaller animals at a population density of 20.1 animals/ha far exceeding any previous reports for this species. While a number of urbanization processes may have the potential to explain this high density, this density, orders of magnitude higher than previously reported, suggests that sloths may be an interesting and important component of tropical urban landscapes. Indeed, reports of high densities of other species of sloths in other urban areas suggests that, this

group should be considered urbanophilic, affirming the need to recognize that the establishment of green spaces in tropical cities is likely to encourage their conservation.

A Rare Case of Segmental Testicular Infarction in a Patient with Polycythemia Vera

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A 56-year-old male smoker with polycythemia vera presented with a two-day history of constant, throbbing right scrotal pain. Ultrasound was non-diagnostic, revealing an ill-defined hypoechoic focus. When he re-presented on illness day 9 with persistent scrotal pain, his right testicle was firm and tender with in horizontal lie, with a tender, firm superior pole and positive Prehn's sign. Ultrasound remained non-diagnostic for testicular infarction vs neoplasm vs other inflammatory causes, and so the patient was taken for scrotal exploration and subsequent right orchiectomy. Pathology results revealed a diagnosis of acute segmental hemorrhagic testicular infarction. At times segmental testicular infarction cannot be definitively diagnosed by ultrasound due to an absence of classic findings. In such cases a contrast-enhanced MRI may allow for a definitive diagnosis of testicular infarction and a conservative approach to management may be taken. However, complex cases remain requiring surgical intervention and 'tissue biopsy for definitive diagnosis.

Obtaining, Isolating and Analyzing Phage BreezyB

Presenter's Name: Bria Moore
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Background: Bacteriophages are viruses that infect and replicate within bacteria through either the lytic or lysogenic cycles. Each virus infects a specific type of bacteria, contributing to the specificity and diversity of bacteriophages. Once injected into the bacteria, the phage takes control of the machinery of the bacteria and begins replication. Mycobacterium smegmatis was the host bacterium used for the infection of Phage BreezyB. **Method:** A soil sample was collected on the campus of Howard University and enriched for the presence of bacteriophages. Serial dilutions were carried out in phage buffer and plated with M. smegmatis with the goal of purifying a single phage population. Once a pure population was obtained, a plate was flooded with phage buffer and a high titer lysate (HTL), a solution containing plaque forming units, was gathered. **Results:** The plaques initially created from infection were turbid, indicating that Phage BreezyB could be lysogenic. The titer of the HTL was calculated to be 1.44 l x 10-9 pfu/ml. **Conclusion:** Phage BreezyB, a mycobacteriophage isolated from Howard University's campus, may be a temperate phage. Future experiments will determine whether this is the case. This research will add to our understanding of the overall diversity of bacteriophages.

The Isolation and Discovery of Actinobacteria Phage Chinwe

Presenter's Name: Nwerebuaku Mpi
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Coauthors: Aliza Ibad, Adrian Allen, Leon Dickson, Broderick Eribo, Ayele Gugssa, Courtney Robinson, Winston Anderson and Mary Ayuk

Background: Bacteriophage is a virus that cannot reproduce without a living cell. They are the most numerous entities in the biosphere, with a great estimate of 1031 particles. Bacteriophages come in various shapes and sizes but most of them come in the common structure: a head or capsid and a tail. Studying bacteriophage is very important to the field of medicine and it aids the understanding of basic molecular biology. Methodology: Phage Chinwe was collected in a soil sample outside of the E.E. Just Hall Biology building. The enrichment technique was used to increase the phage population where Chinwe was then isolated and purified. Phage Chinwe's High Titer Lysate (HTL) was collected and titer calculated. DNA was isolated, quantified and was utilized for restriction digest experiment. HTL was used for lysogenic assays. A potential lysogen is been purified for lysogen sensitivity assay analysis. **Results:** HTL of Phage Chinwe. is 1.35x108 pfu/ml. DNA was extracted with a concentration of 113.2 ng/µl and a purity of 1.8(λ 260/280). A mesa was seen when HTL of Phage Chinwe was plated

on regular LB plates. Patch assay indicated the presence of a potential lysogen. **Conclusions:** Novel phage Chinwe was successfully purified, isolated, and extracted. In the future phage Chinwe's DNA could be sequenced and annotated to better understand the different genes present and their functions.

Dietary Fat Stimulates Growth of Pancreatic Cancer Growth Through The Cholecystokinin Receptor

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BACKGROUND & AIMS: Epidemiologic studies have found that the incidence of pancreatic cancer is greatest in countries that consume diets high in fat. The gastrointestinal peptide cholecystokinin (CCK) is released from the duodenum in response to dietary fat. CCK has also been shown to stimulate growth of pancreatic cancer through the CCK receptor that is over- expressed on pancreatic cancer cells. The aim of this investigation was to determine if dietary fat promotes growth of pancreatic cancer through the actions of CCK at its receptor. **METHODS:** The effects of dietary fat on growth of murine Panc02 pancreatic cancer xenografts were studied in three different systems with immune competent mice: 1) pharmacologic blockade with a CCK receptor antagonist, 2) genetic knockout of the CCK receptor by CRISPR, and 3) in genetically engineered mice lacking the CCK peptide (CCK-KO). After injection of 2x10 6 Panc02 cells subcutaneously, mice were fed either a high fat diet or a control diet for 37-42 days. Tumor volumes and weights were measured and histology performed. **RESULTS:** Dietary fat significantly increased the size of pancreatic cancer xenografts and this effect was reversed by CCK receptor blockade. Receptor antagonist therapy also significantly reduced tumor associated fibrosis and increased the influx of CD8+ lymphocytes in the microenvironment. Panc02 cancer cells lacking CCK receptors failed to respond exogenous administration of CCK in vitro and to dietary fat in vivo.Dietary fat did not stimulate Panc02 tumor growth in CCK-KO mice. **CONCLUSIONS:** The mechanism by which dietary fat stimulates growth of pancreatic cancer is by CCK and this effect is independent of obesity.

Use of CDNB Assay to Determine Calreticulin Domain Responsible for Autoacetylation

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Calreticulin is a biological molecule that participates in multiple physiological processes such as gene expression, immune response, and cancer regulation. It is found in the endoplasmic reticulum where it functions as a resident chaperone protein and a calcium ion regulator, but it can be found outside of the endoplasmic reticulum as well. Calreticulin has been shown to transfer acetyl groups to certain proteins within the cell, and the purpose of this project is to identify which part of the calreticulin protein is responsible for the transfer of acetyl groups to other molecules. Calreticulin is made up of three protein domains: the N-domain, which is a globular, highly conserved sequence in chaperone proteins of the endoplasmic reticulum, the P-domain, which contains many proline residues and a high affinity for calcium ions, and the C-domain, which is rich in acidic amino acid residues, thus giving calreticulin an even higher capacity for binding to calcium. Based on previously reported research, and prior computational modeling done in the lab, we hypothesize the P-domain of calreticulin as the active domain responsible for the auto-acetylation of other molecules. We tested this hypothesis using CDNB assays and analyzing the rate at which the conjugated glutathione-CDNB product was produced over time using full-length calreticulin and its domains.

The Isolation and Characterization of P.Crandall

Presenter's Name: Isabella Ntigbu
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Bacteriophages (phages) are viruses that infect bacteria and form clearings called plaques. Phages are specific to its particular bacterial host, which can range from one bacterial strain to several bacterial strains (2). They are currently classified on the basis of their genome and their morphology into ten phage families (3). Bacteriophages can infect its host in one of two ways: through the lytic cycle or the lysogenic cycle. In the lytic cycle, the phage will lyse the bacterial host

and release phage virions. The objective of this research was to obtain a pure, isolated phage from the environment. DNA was extracted and characterized for isolated phage. A soil sample was obtained, a filtrate from that sample was procured and purified until the phages contained only one morphology. The DNA was then chemically extracted using a Wizard Kit and a Nanodrop spectrophotometer was used to obtain the concentration of the phage DNA. Gel electrophoresis was then preformed to separate the DNA molecules by charge and size, and the gels were visualized using a camera. Gel electrophoresis has become the major analytical procedure for characterizing charged macromolecules both because of the high resolution it provides and the relative simplicity of the technology it requires (5). The phage was submitted into the SEA-Phages database in December 2016 under the name of "P.Crandall." The next step in this research will be annotating the phage's DNA sequence for easier analyzation.

Osmotic properties of Aggrecan interaction in Cartilage

Presenter's Name: Eric Ogharandukun
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Articular cartilage is a specialized connective tissue, whose major function is to provide a seamless, lubricated surface for joints and makes it easier for the bones to glide over each other with very little frictional effect. Articular cartilage has limited ability for healing and repair itself due to lack of blood vessels and nerves ending. This cartilage is composed of dense extracellular matrix (ECM) of highly specialized cell called "chondrocytes". The principal constituent of ECM is collagen; proteoglycans, with other less noncollagenous protein and glycoprotein that help maintain the bio-mechanical properties of articular cartilage. Proteoglycan is composed mainly of a bottlebrush-shaped aggrecan, which forms complexes with linear hyaluronic acid(HA) chains. The aggrecan on the other hand is composed of negatively charged-oligosaccharide species called Chondroitin Sulfate (CS) which generate osmotic swelling pressure and load-bearing capacity for cartilage. To better understand the functions of cartilage and its osmotic properties, we studied the interactions between the major cartilage ECM macromolecular components using different arrays of techniques: osmotic pressure measurements to know its physical properties, Dynamic light scattering (DLS), probing the structure (size) of the aggrecan species in solution, and the aggrecan interaction forces were measured using Atomic Force Spectroscopy (AFS)

The Isolation and Characterization of Phage Wilhelm

Presenter's Name: Lauren Okafor
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Background: The focus of the phages project is to obtain isolated and purified bacteriophages. A bacteriophage is a virus that infects bacteria and is commonly found around other bacteria. The bacteria utilized in this experiment is Mycobacterium smegmatis. The goal of this experiment is to learn about the unique qualities of phages, while analyzing the role that bacteriophages play in the development of alternative treatments for bacterial infections. **Methods:** Phage Wilhelm was collected in a soil sample on the Howard University campus near Douglass Hall. A series of isolation, purification, and empirical testing allowed for the identification of Wilhelm. Restriction digest used to prepare the DNA for analysis and processing. The DNA was isolated from a purified high titer lysate(HTL) and quantified using spectrophotometry and gel analysis. **Results:** The purified plaques, 1mm in diameter, were circular with clear morphology. Through serial dilutions, spot tests, empirical testing the titer 2.5x1010 pfu/mL was calculated. The HTL was collected, the extracted DNA had a concentration of 142.3ng and a purity of 1.86 (λ 260/280). **Conclusion:** This study is not complete as there is still so much to learn about Wilhelm. Using the HTL, additional dilutions have been conducted along with streaking to obtain a putative lysogen. In the future, the phage DNA can be sequenced and annotated to provide a deeper understanding of its properties.

Cancer in an Historic Washington DC African American population

Presenter's Name: Rita Okolo
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Cancer continues to be a major cause of morbidity and mortality in the African American community. The cancer rates among African Americans are on the rise but what was the situation 85 years ago? The purpose of this investigation was to characterize the various cancers within the Cobb Collection as well as to analyze any trends found to occur between 1930 and 1960. Within the collection, multiple types of cancers were reported in patient records and these instances were examined in terms of five factors: epidemiology, etiology, symptomatology, diagnosis, and treatment. The aims of this study were to: 1) assess the frequencies of the cancer types present in the collection; 2) compare this data with current research; and 3) evaluate the environmental and social changes that occurred between 1930-1960 and their contributions to changes in the frequencies of various cancers present in the collection. 14 different cancer types were found within the collection between 1930 and 1960. The cancer types with the highest frequencies were carcinoma of stomach, lung, esophagus, larynx and bronchiogenic carcinoma. 84% of all cancer incidents occurred in males and 76% were among individuals classified as negro/ colored. 71% of the highest incidence cancers were among African American males. This study broadens our historical knowledge on the common cancer disparities in the African American community as well as identifies possible factors that may have influenced the differences in distributions of various cancers over time.

Prevalence of Alzheimer Disease in Hospitalized Patients with Congestive Heart Failure: Patient Characteristics

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Background/Objectives: Alzheimer's disease (AD) may be the most critical medical conditions of the 21st century in part because it affects more than 5 million Americans, including one out of eight Americans aged 65 or older, and nearly half of those over the age of 85. It is also recognized that cardiovascular disease (CVD) risks can catalyze the development of AD. AD and heart failure (CHF) often occur together and thus increase the cost of care and health resources. The purpose of this study is to determine the prevalence of CHF and AD in a national Inpatient sample. **Method:** International Classification of Diseases (ICD) 9 codes (CHF-331, PD 332) were used for the extraction of the main diagnosis. **Results:** Overall gender-prevalence of inpatient CHF with AD was significant ($p < .0001$) with females 62.86% ($n = 12,546$) and males, 37.14% ($n = 7,413$), with an average age of 84 (SD=6.29). White patients with CHF and AD were predominant with 76.20% (14,600) and without AD, 74.59% (481,248), $p = .0001$ when compared with other races. Renal insufficiency (3.61%) and stroke (2.12%) were prevalent among the CHF and AD patients. Patients with low income ($1 - $38,999) were admitted more with 6,580 (33.55%) than those with higher income ($39,000 - > $63,000) while patients with both disorders stayed longer with higher mortality rates than those with only CHF, $p = .0001$. **Conclusion:** Patient age, gender, comorbidities, economic status, LOS and mortality rates play a significant role in the prevalence of CHF and AD.

Characterizing Models of Indolent and Aggressive Prostate Cancer

Presenter's Name: Morenike Olu
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Prostate cancer is the most common type of cancer in men and is the second leading cause of cancer-related death in U.S. men. Metastasis is considered the "lethal phenotype" of CaP. Some of the genetic factors contributing to disease progression involve frequent alteration of genes. PTEN and RB1 are tumor suppressor genes that are frequently altered in CaP, while AKAP12 is a scaffolding protein that suppresses metastasis. The genetic knockdown of AKAP12 and RB1 in a mouse model leads to an indolent, high grade prostatic intraepithelial neoplasia plus early dissemination to the lymph nodes that are non-malignant. However, the knockdown of PTEN and RB1 in another mouse model leads to an aggressive, malignant adenocarcinoma and systemic metastases. Interestingly, both of these genetic models have activated AKT, which is responsible for numerous pathways controlling metabolism, cell survival, progression, and cell migration. AKT has three isoforms and there is evidence that they function differently during metastatic progression. Phosphoinositide 3-kinase activates AKT and plays a role in CaP. PTEN is a PI3K inhibitor and functions by inhibiting AKT activation. Akap12 scaffolds Src, PKA, and PKC to control numerous downstream pathways

related to metastatic progression, likely interacting with PI3K family members. Although both these transgenic combinations activate AKT, they result in two dramatically different phenotypes. Our hypothesis is that the differential regulation of specific isoforms of AKT results in the different cancer progression phenotypes. To understand these differences, cell lines were isolated from both models and characterized using a panel of markers.

A Century-Long Study of The Phenology of Poison Ivy (Toxicodendron radicans (L.) Kuntze)

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Poison Ivy is an angiosperm that is commonly known for causing contact dermatitis resulting in itching and skin irritation. The poisonous and highly allergic oil that is secreted by the plant is caused by Urushiol, a clear oil found on the leaves and the stem of a plant. The Poison Ivy being studied was localized to the District of Colombia, Maryland, and Virginia. The purpose of the study was to view how the flowering pattern of poison ivy has evolved over the last century. Herbarium specimens of Toxicodendron radicans, also known as Poison Ivy, were investigated from records spanning from 1876 to 2016. All of the samples were viewed at the National Herbarium in the National Museum of Natural History Museum. The herbarium sheets were viewed and compared and contrasted based on reproductive stage (vegetative, bud, fruit, or flower). It was expected that over the years, flowers and fruits would bloom earlier in the year due to global warming, which is caused by the rising CO2 levels in the atmosphere. It was found that over that last 140 years, there has been evidence that there is a trend of flowers, as well as fruits blooming earlier in the year; however, the trend is not statistically significant. A further study can be conducted to test the average growth rate as well as the toxicity of the poison that is secreted from the plant.

Isolation and Characterization of Bacteriophage Victoria

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BACKGROUND: Bacteriophages are viruses that infect bacteria. As bacteria increasingly become resistant to antibiotics, bacteriophage research is becoming more vital as phages can potentially lyse the antibiotic resistant bacteria and in turn treat diseases. The objective of this research is to isolate and characterize a novel bacteriophage from a soil sample. **METHOD:** To isolate a bacteriophage, a sample of the cool loamy soil around the E. E. Just Hall at Howard University was collected. Using enrichment plating, serial dilutions, plaque assay purification and amplification, a single phage was isolated and purified. The DNA was extracted, and used for restriction enzymes digest experiments including gel electrophoresis. Currently, lysogeny experiments are been carried out to better characterize the phage. **RESULTS:**The phage was named Victoria. It produced turbid round plaques of 1mm diameter. The high titer lysate (HTL) was 2.65×108 pfu/ml. The phage DNA extracted was quantified using spectrometry and a concentration 128ng/µl was recorded with its purity determined by gel electrophoresis. **CONCLUSION:** Phage Victoria was sent to the University of Pittsburgh for sequencing. When sequence is obtained, further analysis using bioinformatic software will be carried out. Presently, lysogeny experiments are ongoing, with the bacteriophage Victoria seemingly not a lysogenic phage. Information obtained will hopefully increase our understanding of phages and may probably lead to some great findings.

Edaphic factors influence stomatal development and physical defense in a Ni-hyperaccumulator

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Serpentine soils contain concentrations of Ni and Mg that are toxic to most plants, and they have low levels of essential nutrients. Poor water retention on serpentine soils frequently puts plants in drought conditions. Yet serpentine soils host a diversity of plant species specially adapted to these harsh conditions. The focus of this study is Alyssum murale, a Ni-hyperaccumulator that grows naturally in serpentine and non-serpentine environments. Ni- hyperaccumulators extract soil Ni, move it through the transpiration stream, and sequester

Ni at high levels in shoots where it provides an "elemental defense" against herbivore damage. This study explores the effect of Ni & Mg on production of stomata (essential for transpiration) and production of trichomes (stiff hairs that provide a physical defense against herbivory) in mature A. murale plants. A novel finding is that mature A. murale produce greater numbers of stomata under serpentine soil conditions, which may contribute to efficient uptake of Ni, if access to water is not limited. Mature A. murale also produce greater numbers of trichomes under serpentine edaphic conditions (Ni & Mg present) compared to non-serpentine conditions, unlike the defense pattern seen in seedlings. These results suggest that plant age and edaphic conditions are important factors in determining plant defense strategies.

Metabotropic glutamate receptors and GABA receptors regulate firing properties in mitral cells of the mouse main olfactory bulb

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Output neurons such as mitral cells in the main olfactory bulb are computational elements in brain circuits that integrate incoming signals with membrane properties to generate behaviorally relevant synaptic output. Our studies aim to understand the integrative and computational mechanisms that allow main olfactory bulb neurons to respond to afferent input, synaptic or feedback signals. Here, we study the role of metabotropic glutamate receptors and GABA-A receptors in shaping firing patterns in mitral cells. We ask how glutamatergic and GABAergic synaptic transmission regulates neuronal activity of mitral cells. In the main olfactory bulb, mitral cells express metabotropic glutamate receptor type 1, mGluR1 which is activated by glutamate. In addition, mitral cells receive inhibitory input from GABAergic local interneurons. In mouse brain slices, we use whole cell patch clamp recording to study how individual mitral cells respond to an mGluR1 agonist, DHPG, and how mitral cells are affected by decreased inhibition from interneurons resulting from bath application of the GABA-A receptor antagonist, Gabazine. Mitral cells respond with an increased action potential firing frequency when mGluR1 is activated by DHPG. Mitral cells do not show a change in action potential firing frequency in response to GABA-A receptor antagonist Gabazine but produce a higher frequency of excitatory postsynaptic potentials (EPSPs) compared to control. The results demonstrate that in mitral cells direct activation of excitatory receptors compared to relieve of inhibition can result in distinct neural activity patterns which in turn regulate mitral cell output to higher order olfactory centers.

Immunohistochemical localization of parvalbumin calcium-binding protein in the pediatric hippocampus

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Children infected with HIV are more susceptible to neurological impairments compared to adults with the virus. The neuropathology and mechanisms involved in the rapid onset of neurological impairment in pediatric HIV remains elusive. Our lab has previously shown extensive neuronal loss in the hippocampus along with decreased immature neuronal populations. However, the neuronal subtypes targeted in pediatric HIV infection are currently unknown. Interneuron expression of parvalbumin calcium-binding protein (PV) is a critical component of the inhibitory system of the mammalian brain and has been shown to be susceptible in adult HIV-associated dementia. Due to the limited access of human brain tissue, our proposed study uses pediatric simian immunodeficiency virus (SIV) pathogenesis to test the hypothesis that the pediatric SIV infection alters the PV+ neuronal population in the hippocampus. Newborn rhesus macaque brains were prepared for quantitative histopathological analysis. Sequential brain slices were immunostained for PV+ protein. Using design-based stereology, we suggest a reduction in the neuron expression of PV in the CA1, CA2, and CA3 fields of the hippocampus in the SIV-infected infants. The loss of PV-expressing neurons may contribute to the rapid neurocognitive decline associated with pediatric SIV infection.

Global Phosphoproteomic and Structural Analyses of Ebola Virions

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Ebola virus causes severe hemorrhagic fevers with high mortality characterized by unchecked viral growth and inflammation with marked suppression of host innate and adaptive immune responses. Ebola virus infects macrophages and dendritic cells preferentially, repressing the development of MHC and antigen presentation. Patients who succumb to Ebola virus disease show little evidence of a humoral immune response. VP35 inhibits critical immune signaling early in infection. We have carried out global phosphoproteomic analysis of Ebola virions produced in monkey and bat cells using high resolution MS/MS. We detected all viral proteins with high coverage and identified novel phosphorylation sites on all seven proteins in each virion type. We compared phosphorylation patterns and validated the results by testing the role of the phosphorylation sites of interferon-modulatory VP35 protein using mutagenesis, in vivo phosphorylation and minigenome assay. We also did biophysical analyses, structural modeling and simulations of wildtype versus phosphorylated proteins. The phosphorylation pattern differs between virions grown in monkey cells and those grown in bat cells. Nearly all phosphorylation sites were found to be solvent accessible with the majority in flexible regions. VP30, VP35 and NP were characterized by inherent disorder. Mutagenesis, phosphorylation analysis and minigenome experiments showed that VP35 Ser-210 undergoes phosphorylation and is important for transcription. Ser-210 lies in a linker region connecting the coiled coil oligomerization domain and the interferon inhibitory domain. Our findings point to an important role of VP35 phosphorylation and a means of developing inhibitors against EBOV.

Molecular regulation of chemotherapeutic response in cancer

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Standard chemotherapy for cancer aims to produce replication stress induced DNA damage and the ability of cancer cells to recognize this damage and initiate DNA repair is an important mechanism for drug resistance and poor therapeutic efficacy. Genetic variations in DNA repair genes affect DNA repair function and, therefore, influence individual's risk of cancer development and response to chemotherapy. RECQ1 helicase functions are important to restart productive DNA replication after replication stress. Individuals with germline mutations in RECQ1 (also known as RECQL or RECQL1) are at significantly higher risk of developing breast cancer, and RECQ1 expression correlates with patient survival and therapeutic response in cancers. Here, we investigated the role of RECQ1 in cellular response to gemcitabine, a chemotherapeutic drug that disrupts DNA replication. We have employed CRISPR-Cas9 technique to establish a genetic knockout of RECQ1 in human breast cancer MDA-MB-231 cell line and compared the DNA damage response of RECQ1-wild-type and RECQ1-knockout cells to gemcitabine treatment. We established MDA-MB-231 cell lines that are either wild-type or knockout for RECQ1. Consistent with previous findings RECQ1-knockout clones displayed reduced cell growth and proliferation, and increased DNA damage as compared to the wild-type RECQ1 clones. RECQ1-knockout cells failed to activate cell cycle checkpoint response when treated with gemcitabine. Our initial experiments suggests that RECQ1 is involved in cellular response to DNA damage caused by gemcitabine. Our ongoing experiments are investigating the detailed mechanism of RECQ1's response to gemcitabine and a putative role in chemo-resistance.

Effects of Lower Body Resistance Exercise Training on Glucose Tolerance, Systemic Endothelial Function and Brain Electrical Activity in Young Obese Africa-American Women

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Obesity in the United Sates is a major public health concern. It impacts a large proportion of the black population, especially women. Women are at a greater risk for metabolic disorders and cardiovascular disease due to differences in abdominal fat distribution and sex hormones. The purpose of this study was to compare different types of resistance exercise training regimes with partially restricted blood flow on blood glucose, blood vessel function and cerebral electrical activity in 18 to 25-year old obese African-American women. The experiments were designed to determine the effects of occlusion and non-occlusion exercise regimes on glucose clearance and neurological activity employing quantitative electro-encephalogram (qEEG. The study consisted of pre-/post-conditioning laboratory visits, and an exercise protocol in-between. Training protocols prescribed exercising three days per week for six weeks. Both legs were exercise-trained individually. Partially restricted blood flow participants were positioned on the leg extension exercise machine with a cuff wrapped around the upper leg, which when inflated would partially restrict the blood flow to the leg non-invasively. The exercise protocol with partial blood flow restriction and non-restriction consisted of three sets of 12 leg extensions at a resistance to 30% of a previously determined one-repetition maximal value. The study yielded a data set on pre/post-exercise glucose levels, body-mass index (BMI), endothelial function, cranial blood-flow and cerebral electrical activity. The collective data set is hypothesized to show that intensity training with partially restrictive blood flow should decrease BMI, decrease resting blood glucose levels and enhance cerebral electrical activity.

Mannosylated Surfaces exhibit self-adhesive interactions

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Carbohydrate-Carbohydrate interactions (CCIs) are self-adhesive interactions, generally observed cell surface proteoglycans and glycolipids. Many biological processes such as embryogenesis, fertilization and metastasis are driven by CCIs. Mannoses are biologically-significant carbohydrate moieties, that are extensively present on the surfaces of fungi and viruses, and known to mediate host-pathogen interactions. We studied the adhesive interactions between mannobiose (disaccharides of mannose sugars)-mannobiose molecules using atomic force spectroscopy (AFS). Mannobiose-mannobiose molecules exhibited strong adhesive forces when probed with AFS in an aqueous medium. The force-distance curves exhibited peak adhesive forces that subsequently ruptured in 'step' like patterns, indicating that the adhesive forces were due to well-defined molecular interactions. The peak adhesive forces between mannobiose-mannobiose molecules ranged from 0.3 to 5.7 nN. The final 'step' or rupture forces ranged from 0.1 to 1nN, with forces clustering at regular intervals which were multiples of 25 +/- 3pN. The latter suggests the likely magnitude of the single mannose-mannose unbinding force to be 25 +/- 3pN. Also, the mannobiosylated surface displayed 'water structuring' effects that extended tens of nanometers beyond the surface, and which were disrupted by increasing the salt concentration. The majority of fungi and virulent viruses such as HIV, Ebola, and Marburg have mannose patches on their surfaces, and this fundamental study might shed light on the biophysical role of these pathogen surfaces. The water-structuring ability of clustered mannose molecules may manifest as a dense water shell around pathogens, to keep them hydrated.

Max

Presenter's Name: Melisa Philogene
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Ghana is located on the west coast of the continent of Africa. Of a population of over 20 million inhabitants, an estimated 200,000 are blind and over 600,00 more are visually impaired online studies state. During my trip to Ghana I researched why issues of the eye are prevalent in Ghana. What is the central greatest cause of these happenings and what could we potentially do to decrease these numbers in all people? To do this I individually interviewed 30 to 40 random Ghanaian individuals across the cities of Accra, Kumasi, and Cape Coast. All of any gender, or age. I discovered that the research I discovered online was found false in my case of research. I found that 92% of the residents of the country that I interviewed had little to no vision issues. Three percent of people carried glasses. Of the few people who had eye issues, they all abided next to some type of body of water. I also found that many individuals had a yellow tint present in their eyes. The dust and heavy sun in the country contributes to

this. Eye related issues and disease seem to be regional in Ghana, mostly depending on the environment individuals abide in. Heavy water issues within the country may play a contribution in these specific cases of eye issues. A cleaner and more sufficient water system may aid in decreasing these instances of vision problems.

Investigating the Indestructible: A Sampling of Hawaiian Tardigrades

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Background: Healthy ecosystems are associated with higher biodiversity, and knowledge of species diversity and distributions provides the foundation for conservation in the face of environmental threats. The Hawaiian archipelago, a known diversity hotspot and premier natural laboratory for studying biodiversity, makes an ideal location to examine climate change impacts on lesser known animals such as tardigrades. Our research focuses on assessing tardigrade biodiversity and distributions along an elevational gradient. **Methods:** Moss and lichen samples were collected from seven sites ranging from 269 m to 1210 m on Mt. Kaala, Oahu, Hawaii. Two isolation methods were used, traditional "cherry-picking" and differential centrifugation using OptiPrepTM density gradient media. Species were identified using phase contrast microscopy to examine traditional anatomical features (e.g. claws, buccal apparatus). **Results:** The OptiPrep method recovered significantly (t-test; $p<0.05$) more tardigrades (n=213) than cherry-picking (n=61), when excluding three improperly processed samples. Six genera, Macrobiotus, Minibiotus, Milnesium, Echiniscus, Diphascon, and one unidentified genus, were isolated. The highest diversity site, with five genera, was at mid-elevation while the highest abundance sites were found at the lowest and highest elevations. **Conclusion:** The OptiPrep method was more effective and more efficient, reducing processing time by nearly 50%. Differences in abiotic parameters (e.g. temperature, precipitation) along the mountain may, in part, explain the diversity distributions of tardigrades, with highest diversity associated with intermediate temperatures and precipitation, and lower diversity resulting from either extreme. Further analyses of these data will provide insights into how climate change may impact not only tardigrade biodiversity, but other fauna as well.

The Microbial Community Associated with Senegalese Dust

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Background: Massive dust storms move across Africa, the Atlantic Ocean and into the Caribbean and North America during the dry season in Central and Western Africa. Dust clouds can transport microbes including bacteria. This suggests that dust clouds can affect regions near and far from their origin. Senegalese soil and dust represents the last continental contribution to the dust before it leaves Africa. The purpose of this study was to investigate the microbiota associated with Senegalese dust. There is high occurrence of bacterial meningitis during the dry season. Therefore, this work also tested the hypothesis that this dust contains bacteria that cause meningitis, like the β-proteobacterium Neisseria meningitidis. **Methods:** Samples were collected in Dakar, Senegal. DNA was extracted using the MO BIO PowerSoil DNA Isolation Kit. 16S rRNA genes from the total microbiota and the β-Proteobacteria were amplified, cloned and sequenced. Polymerase chain reaction screening was conducted using primers specific to N. meningitidis and other meningitis pathogens such as Haemophilus influenzae and Listeria monocytogenes. **Results:** Initial analyses detected five phyla, and 14 genera of bacteria. Paracoccus (25% of clones), and Kineococcus (26.1%) were dominant. The β-Proteobacteria microbiota included Massilia, Oxalobacter, and Piscinibacter among others. The only meningitis pathogen detected was L. monocytogenes. **Conclusion:** This research has the potential to elucidate the dissemination of meningitis in the Sahel region and to contribute to efforts to decrease infection rates. Additionally, this study will contribute to our understanding of the microbes that can be transported from Africa to the Americas.

Bacteriophage Raju

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Background: The purpose of this experiment is to isolate, purify, and characterize a new bacteriophage, viruses that infect bacteria. Bacteriophage genetic diversity is investigated by comparing genomes of bacteriophages known to infect a common bacterial host. Bacteriophages are important because they can possibly be used as substitutes to antibiotics. This is especially important because there is an increase in frequency of antibiotic-resistant bacteria. **Method:** Bacteriophages were extracted from soil samples from the flower gardens of the Louis Stokes Library. A bacteriophage with a single morphology was isolated using serial dilutions. A high titer lysate (HTL) was made by flooding webbed plates with enrichment broth. DNA was sent to the University of Pittsburgh for sequencing using the Illumina method. The prophage was streaked on a plate creating a putative lysogen. **Results:** Plaques were 1.5 mm in diameter with clear morphology. A high titer lysate (HTL) of 9x10-9 PFU/ml was obtained. DNA isolation showed that there was a 252.6 and 95.3 ng/microliter concentration of DNA. The bacteriophage was registered on phagedb.org. **Conclusion:** Next I can characterize patterns of phage sensitivity by creating and testing a lysogen. Then performing streak assays, a patch assay, liquid phage release, and sensitivity assay I can confirm whether or not my phage is a lysogen. Then annotation of the DNA can be done to compare the phage DNA to DNA of known structures.

The Role of Kainate Receptor Subunit, GLR-6, in C. elegans Reproduction

Presenter's Name: Raina Rhoades
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Background: Sensory perception influences the reproductive activity of C. elegans by driving metabolic resources towards reproduction or survival as needed. Glutamatergic signaling, mediated by the receptor subunit GLR-6 plays an important role in the processing of sensory information within the RIA neurons, second layer interneurons primarily involved in thermotaxis. Previous work has demonstrated that co-depletion of GLR-6 and the meiotic inhibitory kinase, WEE 1.3, suppressed the infertility phenotype generated by RNAi depletion of WEE 1.3. Therefore, we hypothesize that GLR-6 and WEE 1.3 likely interact to influence reproduction in C. elegans in a manner that has yet to be reported. **Methods:** To replicate the results of the previous study we used RNA interference (RNAi) to co-deplete the target genes, glr-6 and wee 1.3. Fertility was assayed via brood count. Confocal fluorescence imaging was used to assess the effects of RNAi on the germ line of depleted animals. **Preliminary Results:** Co-depletion of GLR-6 and WEE 1.3 results in an increased brood size, indicating the suppression of the WEE 1.3 depletion infertility phenotype. **Conclusions:** GLR-6 and WEE 1.3 interact to effect meiotic cell cycle progression. Future work will focus on determining whether this interaction occurs directly via protein-protein interaction or indirectly by other means.

Risk Factors Associated with Chronic Illnesses Among Adolescents in Foster Care

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Multiple barriers to adequate health care exist among children and adolescents who enter the foster care system. The children of foster care are often at a disadvantage before they enter the foster care system. This research will focus on the risk factors associated with chronic illnesses among adolescents in foster care and explain as to why this population's health risks are so much greater than the population. This research will focus on children from the American and South African population. Children who enter foster care often do so with serious mental, physical, developmental, and psycho-social issues rooted in childhood trauma and adversity. Many studies have been conducted on the effects of psychological and behavioral issues in children who have been uprooted from families, abandoned by parents, and placed in several unfamiliar homes. Therefore, this study will focus more so on several of the reasons why chronic illnesses are more prevalent in adolescents in the foster care system than those

from low socio-economic households. The purpose of this study was to identify the risk factors that are affecting the health outcomes of adolescents in foster care. According to Takayama et al. "Reasons for foster placement included abandonment, neglect, no available caretaker, physical abuse, sexual abuse, and failed placement." (1998, p. 11). Adolescents in the system have been proved to be more at risk for chronic illnesses such as asthma, diabetes, hypertension, cerebral palsy, obesity and chronic heart disease.

Reversal of The ERαNegative Receptor in Human Breast Cancer Cells by Dichloro-napthoquinone Analog

Presenter's Name: Anastasia Robinson
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Breast cancer (BC) can present as either estrogen receptor α (ERα) positive or negative. The expression of estrogen (ER), progesterone (PR), and the HER2 receptors subdivides BC into clinically meaningful classes. BC lacking expression of all three of these receptors, triple negative BC (TNBC), are of particular interest, because these tumors currently have no effective targets for therapy. TNBC frequently presents with hyperactivation of MAPK pathway which can repress ERα expression in a reversible manner. The abrogation of the MAPK inhibition may result in re-expression of ERα. Our laboratory has reported the in-house synthesis of a novel dichloro-naphthoquinone analog (DCNQ). Our previous studies have shown that DCNQ possesses pharmacological effects associated with marked anti-tumorigenic activities and inhibitory effects on MAPK signaling. Established ERα+ and TNBC were used in this study. MTX assay and flow cytometry were used to elucidate cell viability and cell cycle respectively. MAPK activity was examined using western blot. The effect of (DCNQ) was evaluated on ERα+ (MCF-7) and TNBC (HCC1806 and MDA-MB 231) dose-dependently following treatment for 1, 3 and 5 days. These studies revealed anti-tumor activities with IC50s for MCF-7, MDA-MB 231and HCC1806 of 1, 4.5 and 10 [Symbol] M respectively. DCNQ induced apoptosis in both ERα+and ERα- cell lines time-dependently with the greatest proportion of cells accumulating in the S- phase by day 5. These cells reevaluated with DCNQ in combination with tamoxifen induces apoptosis. DCNQ may offer a model for treating TNBC by reactivating ERα expression, thus rendering them susceptible to anti-estrogen therapy.

Does FEV1 in addition to Fixed Ratio and/or Lower Limit of Normal of FEV1/FVC improve prediction of Mortality? The NHANES-III-linked-Mortality Cohort

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Rationale: There is presently an ongoing debate on the relative merits of suggested criteria for spirometric airway obstruction. Objective: This study tests the null hypothesis that no superiority exists with the use of fixed ratio (FR) of forced expiratory volume in the first second (FEV1)/ forced vital capacity (FVC) < 0.7 versus less than lower limit predicted (LLN) criteria with or without FEV1 <80% predicted in regards to future mortality. **Methods:** In 1988-1994 the Third National Health and Nutrition Examination Survey (NHANES III), a survey of non-institutionalized residents of the United States, measured FEV1 and FVC with mortality follow-up data through December 31, 2011. For this survival analysis 7,472 persons aged 40 and over with complete data formed the analytic sample. **Results:**There was a total of 3,554 deaths. The weighted percent mortality was 67% in the FR+/LLN- group, 57% in the FR+/LLN+ group and 30% in the group with no airflow imitation ($p<0.001$). **Conclusion:** The addition of FEV1<80% of predicted increased the prognostic power of the fixed ratio< 0.7 and/ or below the lower limit of predicted criteria for airway obstruction in a US national cohort.

The diet and trophic position of apple snails (Pomacea spp.) in native habitats.

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Background: Impacted by invasive species, biodiversity loss is a major hurdle facing humankind. Pomacea canaliculata,

an apple snail, is amongst 100 of the world's worst invasive species, and with a few congeners, adversely impacts non-native habitats. Invasive Pomacea species cause eutrophication and reduce biodiversity, diminishing ecosystem goods and services, while indirectly [negatively] affecting human well-being. To comprehend the functional role of apple snails, we investigated their trophic ecology in lakes within their native range. **Methods:** Tissue samples were collected from all species available in two lakes: Lake Sauce (undisturbed) and Lake Diario (disturbed). Analysis of the stable isotopes 13C and 15N in all samples were used to reconstruct food webs and define the trophic position of 2, or more, Pomacea species. **Results:** Species richness and plant diversity were greater in Lake Sauce (66 taxa, including 13 plants) than Diario (31 taxa, including 9 plants). Most striking was the difference in numbers of insect orders, with seven in Lake Sauce versus only two in Lake Diario. 13Carbon and 15Nitrogen values in Lake Sauce indicate Pomacea species occupy basal trophic positions, consuming nutrients locked in detritus and aquatic plants. **Conclusions:** In Diario, reduced species richness, especially in plants and insects, coupled with ongoing macrophyte removal, may decrease detritus availability in Lake Diario relative to Sauce. The limited availability of detritus and macrophytes, key components of Pomacea species diets, may stimulate widespread and/or intense herbivory in Diario, as Pomacea species shift their diets to acquire resources.

Organochlorine Exposures and Neurobehavioral Disorder in Slovak Children: A Proof of Concept through Molecular Transcriptomics

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Background & Aim: Our group's earlier findings suggest adverse effects of organochlorine chemical exposures (PCBs here) in Slovak children that included poor neurodevelopment, possibly mediated by endocrine disruption, altered neurotransmitter functions, or reduced thyroid hormone concentrations within the brain. The aim of this work is to shed new light on possible mechanisms for the genesis of disorders under such chemical exposures, and to identify potential avenues for prevention. **Methods:** The Bayley Scales of Infant Development-(BSID-II) was performed for Neurologic, Behavioral and Cognitive Development for children. Microarray studies of global gene expression were conducted on the Affymetrix platform along with Ingenuity Pathway Analysis (IPA) to associate the affected genes with their mechanistic pathways. Taqman Low Density Array (TLDA) was done to further validate the selected genes on the peripheral-blood mononuclear blood mononuclear cells of exposed children from the study cohort in Slovakia (n=71), as well as in vitro exposure studies. **Results & Discussion:** The epidemiological and experimental results were weighted towards a strong correlation in PCB exposure with expression of imprinted genes is associated with infant neurobehavioral deficit and/or disorders. The differentially expressed genes (ENTPD3, CYP2D6, CYP1A1, CYP1A2), common in in vitro and population studies, attributed to the important signaling pathways (viz. Oxidative Pathway, Xenobiotic Metabolism, Aryl Hydrocarbon Receptor; etc.), and their respective neurobehavioral functions. This puts the weight of evidence towards the possibility of developing Alzheimer's, Parkinson Disease, and motor neuron disease, the most common of the late-life neurodegenerative disorders.

The incidence of electronic medical record medication errors in a family medicine outpatient clinic at a teaching hospital in Washington, D.C.

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The use of electronic medical records in clinical practice has helped to improve the quality of patient care by reducing the likelihood of medication errors. Medication errors continue to persist in spite of this, and further study of existing electronic medical records needs to be completed to quantify the number and types of medication errors that exist. This retrospective study will identify the types of medication errors in the Howard University Hospital Family Medicine Outpatient Clinic electronic medical record from September 1, 2015 through August 31, 2016. The following data will be collected from the electronic medical record: patient demographics (age, gender, date of birth, race, weight, and

height), allergies, renal function, liver function tests, date of visit, physician name and practice category (attending, resident, or fellow), comorbidities, current medications, medication error types identified, and dates of medication reconciliation. Medication error types include: incorrect dosing, renal adjustment, hepatic adjustment, duplication of therapy, incorrect frequency, drug-drug interaction, contraindication, allergy, errors of omission and commission, or no indication. Information regarding the prescribers will be used to determine patterns of prescribing errors among attendings, residents, and fellows. In identifying the incidence and types of medication errors, the need for a pharmacist on-site to provide medication reconciliation and interventions during clinic visits will be determined.

Emergence of a DNA Repair protein from basic science to translational medical research

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RECQ1 is a member of the RecQ family of DNA helicases genetically linked with cancer predisposition syndromes and well known for their functions in genome stability maintenance through DNA repair. Despite being the first discovered RecQ homolog in humans, its relevance to cellular transformation have remained largely unclear. For the past several years, research in my laboratory has been focused on elucidating RECQ1 functions at the crossroads of DNA replication, repair and transcription. My previous work demonstrated for the first time that loss of RECQ1 is sufficient to cause genomic instability in mouse and human cells. Our subsequent work identified roles of RECQ1 in mechanisms of DNA strand break repair, replication stress response and telomere maintenance. In addition, we demonstrated that RECQ1 is involved in regulation of gene expression. Significance of our basic science discoveries is evident by recent association of RECQ1 germline mutations with increased breast cancer susceptibility. In our efforts to investigate clinicopathological significance of RECQ1, we identified significant correlation of RECQ1 expression with patient survival in sporadic breast cancers. We are currently investigating the molecular mechanisms of RECQ1 functions in repair of DNA damage caused by anti-cancer drugs, and how this impacts cellular response to therapeutics in breast cancer. Our goal is to understand how the loss of RECQ1 functions may promote genomic instability and cancer susceptibility.

Isolation and Characterization of Bacteriophages from Soil

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Bacteriophages (phages), viruses that infect bacteria, are ubiquitous in nature and have been shown to influence bacterial ecology. This study was conducted to isolate a Mycobacterium smegmatis mc2155 phage from soil, and to characterize it using both phenotypic and molecular methods of analyses. Ten grams of soil was collected from Howard University (38°55'19.1"N 77°01'10.0"W), and phages propagated using direct and enrichment culturing. Subsequently, the phage "Ulysses" was spot assayed and streaked to purify phage populations. Ulysses was then characterized using empirical testing, high titer lysate (HTL), restriction digest of DNA, and transmission electron microscopy (TEM). Data analyses indicate that dilutions of 10-2 to 10-7 gave statistical significant range of plaques. Phage titer was calculated as 1.05 × 108. DNA yields were between 129.2 ng/µl--4 ng/µl with purity 0.89. The plaques lytic, 0.5 mm in diameter and circular. The data derived from the current study gives insight into the ubiquity of phages in the environment and increases our knowledge of phages and their possible roles into regulating bacterial diversity and ecology.

Key words: High Titer Lysate, Soil, bacteriophages, Bacteria

TP73's regulation and expression in human cancer cell lines

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TP73, a homologue of the master tumor suppressor TP53, is involved in cellular responses to stress and development. The

TP73 gene encodes two different proteins, TAp73 and ΔNp73 and maps to a region on chromosome 1p36 that is frequently deleted in neuroblastoma and other tumors, and thought to contain multiple tumor suppressor genes. However, the analysis of p73-knockout mice yielded conflicting results with respect to tumor suppression. Global efforts in sequencing the TP73 gene in patient tumor samples have not provided evidence for genetic alterations as a common cause of p73 inactivation in human cancer. The role of TP73 in tumorigenesis has remained elusive to date. In this study, we isolated two stem cell lines from normal young and old human liver tissues and determined TP73 expression in human breast cancer cell lines (MCF7 & MDA321), human hepatocellular carcinoma (HCC) cell lines (HepG2, SNU398, SNU449 & SNU475), neuroblastoma cell lines (IMR32 & SK-N-SH), normal liver stem cell, non-cancerous Li-Fraumeni Syndrome (LFS) skin fibroblasts cells and normal skin fibroblasts. Results show that TAp73 only expresses in cancer cell lines. Moreover, when HepG2 and MDA231 were treated with paclitaxel, a cytoskeletal drug that targets tubulin, TAp73 expression was drastically down-regulated in HepG2 cells and abrogated in MDA231 cells at 1 to 5 μmol/L concentrations. Furthermore, ChIP assay results demonstrated that TP53 and CTCF (a chromosomal networking protein CCCTC binding factor) bind to TP73 promoter and regulate TP73 expression. Our observation may prove significant for the development of future diagnosis and therapy.

RECQ1 Expression Upon DNA Damage

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As a member of the Howard University Advancing Diversity in Aging Research (HUADAR) I conducted research in Dr.Sharma's laboratory. Previously, Dr. Sharma concluded that the cellular phenotype of RECQ1-deficiency is consistent with a role in cancer and aging. Dr. Sharma found it important to characterize RECQ1 because, among the RECQ helicase family, mutations in BLN, RTS, and WRN have been linked to genomic instability in humans. In coordination, I conducted research aimed at clarifying the specific molecular functions of the individual human RECQ1 protein. The specific scientific question posed, was: how does RECQ1 expression change in response to DNA damage? The research included introducing DNA damage across several human cell lines. The study was divided into two aspects of experimentation, which ensued through several smaller experiments involving: immunoblotting, western blotting, and DNA PCR. The research proceeded through several time course experiments observing the response at the the protein and mRNA level to various DNA damaging agents. Preliminary results support that RECQ1 mRNA expression is possibly upregulated upon treatment with DNA damaging agents for the DNA damaging agents used.

Malocclusion and Speech Therapy in Individuals with Speech Abnormalities: Is it Correlated?

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Introduction: The purpose of this study was to identify which malocclusions have the highest positive correlation with abnormal speech and to identify the orthodontists comfort level with identifying abnormal speech. **Methods:** 100 patient charts with noted speech abnormalities were obtained from the Howard University Department of Orthodontics and specific factors, including malocclusion, oral habits and age were noted. Also a survey was sent to 2300 practicing orthodontists and orthodontic residents through the AAO assessing the practitioners comfort level with pathological speech identification. **Expected Results:** There is a relationship between malocclusion and pathological speech, with anterior open bite being one of the main factors correlated to the need for speech therapy. **Conclusions/Future directions:** The next step will be to develop a standardized referral form that can be used by both specialties. Following this, an interdisciplinary training workshop will be developed to better train both orthodontists and speech pathologists on how to recognize and assess speech pathologies and malocclusions, respectively.

Susceptible snails treated with actin-myosin inhibitor before exposure to Schistosoma mansoni lowers stress levels in snails

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Schistosomiasis is a major neglected tropical disease and is considered the most important helminthic disease of humanity in terms of morbidity and mortality. During the past decade, concentrated effort has been made to control the spread of schistomiasis, using drug intervention program aimed at reducing transmission. It has been noted that stress induced by Schistosoma mansoni in susceptible snails' causes' a substantial increase in hsp70 expression. Gene position analysis has shown spatio-epigenetics activation in the snail soon after infection for 2 hours. When snails are treated with the drug 2,3-butanedione monoxime (BDM) and then infected with miracidia for 2 hours gene localization does not occur, instead the gene remains in the periphery. This phenomenon has not been seen at the molecular level and is an ongoing investigation. It is hypothesized that treating susceptible snails with BDM before HS will down-regulate hsp70. BB02 snail line was treated with 15um of BDM for 20 minutes then HS for 2 hours. Snails were homogenized and processed for RNA isolation. After isolation cDNA synthesis was performed using the iScript Advanced cDNA Synthesis. qPCR analysis measured the hsp70 levels in snails that were either treated with BDM and then heat shocked or heat shocked. Results showed down-regulation of hsp70 in snails treated with BDM and then infected as opposed to snails that were infected. BDM has shown to decrease hsp70 levels in the susceptible snails however there is much needed work to determine whether it will stop cercarie shedding.

Unicystic ameloblastoma in mandible: focus on differential diagnosis, FNAC and radiographic features

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Unicystic ameloblastoma (UA) represents cystic conditions that demonstrate clinical and radiographic attributes of an odontogenic cyst but on a histopathological examination displays a characteristic ameloblastomatous epithelium lining as a component of the cystic cavity. UA is less aggressive, affects younger age-group patients, and typically has a favorable response to therapeutic modalities. We presented a rare case of UA observed in a 35-year-old female patient and emphasize the importance of Fine Needle Aspiration Cytology (FNAC). Long term research is critical to comprehend the possibility of recurrence and prognosis in accordance with radiographic features as ill-defined radiographic boundaries tend to have a more aggressive behavior. A comprehensive clinical and radiographic correlation with histological findings complemented with molecular knowledge is the needed for the best management of ameloblastoma for a favorable prognosis of UA. The focus of UA management should be to reduce surgical trauma and ensure functional & aesthetic characteristics as UA typically affects younger age group patients. The role of FNAC should also be highlighted in the clinical work-up of radiolucency in jaw bones. An update on radiographic features of ameloblastoma should be done to help in determining the prognosis. The purpose of this presentation is to make the clinicians aware of the differential diagnoses of a swelling with a radiographic appearance of an unilocular radiolucency in mandible.

Lulu100 the Inhibitor

Presenter's Name: Jacqueline Spencer
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Bacteriophages may one day be a solution to the suppression of drugs used to combat diseases in the human body. Therefore bacteriophages could be the new source in replacement of, or supplementing antibiotics. In the current study, the host Mycobacterium Smegmatis mc2155 was used to isolate phages from soil collected from a flower box on Georgia AVE and Howard Pl, Washington, DC (-77.0203955N, 38.922515W). The phage was purified through direct and enrichment plating, plaque and spot assays, empirical testing and the generation of high titer lysate. Lulu100, the isolated phage, was shown to be lytic, produces circular plaques with area 2.3 mm2. High titer lysate (HTL) was calculated as 2.88 × 104 M. smegmatis mc2155 did not produce lysogens when infected with Lulu100. Although the current study is

preliminary, it is possible that Lulu100 may ultimately be used to curb infections caused by multiresistant bacteria.

Key Words: Bacteriophage, High Titer Lysate, Morphology, Plaque, Dilution.

The Importance of Host Coevolution in the Development of Viral Innovations in Bacteriophage Lambda

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Previous research on the bacteriophage λ and its host Escherichia coli strain B shows that they readily coevolve in the laboratory. E. coli evolves a regulatory mutation that represses expression of λ's receptor LamB, thereby conferring defense to viral infection. Subsequently, λ develops counter-defense mutations to exploit a novel receptor, OmpF. However, the repeatability of this dynamic with other strains of E. coli was unknown. To directly test this, I performed evolutionary replay experiments with four other strains of E. coli. The strains used in the first three treatments were one laboratory strain related to E. coli B, K12, and K12 without OmpF. The next strains were natural isolates, VS820 and TA149. We observed that in the presence of K12, but not the ompF deleted strain, λ evolved to exploit OmpF. This suggests the unique nature of the OmpF receptor that facilitated the evolution of a key innovation. Furthermore, sequencing the genome of the OmpF+ phage grown with K12 revealed that despite having an identical phenotype to that evolved with B, its genotype was unique. Therefore, different molecular roots can promote parallel phenotypic evolution. λ co-cultured with VS820 rapidly evolved to exploit a new receptor within days, but not when co-cultured with TA149. We hypothesize that rapid evolution with VS820 was facilitated by homologous viral recombination with prophage integrated in VS820 genome. Altogether my work shows that viral evolution is contingent on genetic details of the host. This realization is important to understand what drives the emergence of zoonotic diseases.

Electroretinogram signals of the stink bug compound eye

Presenter's Name: Jaime Strickland
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The brown marmorated stink bug, Halymorpha halys in United States has become an agricultural nuisance. According to the United States Environmental Protection Agency, this polyphagous feeder creates damage and yield loss in a wide range of crops. The damage and yield loss is a result of a suckering mechanism utilized by the stinkbug for the removal of sap from desirable food sources. The crops affected by the stinkbugs are often left unappealing to consumers. The typical methods utilized for prevention of damage and ultimately loss have been non-biological pesticides, which are designed to kill or cause adverse effects to living organisms. However, more recent control measures have included the design olfactory and visual traps. The incorporation of visual traps as an alternative to the common non-biological pesticides would both be beneficial to human health, as well as to other living organisms. To utilize visual traps, it is first necessary to know the visual characteristics of the compound eyes of this insect. Here, we performed electroretinogram (ERG) responses from the corneal surface of the eyes to test visual sensitivity. Our results indicate that the ERG response was a negative initial monophasic waveform followed by a maintained component that lasted for the duration of the flash with no off-response at the end of the light stimulus; the phototopic eye responds to over a six log unit change in illumination as indicated by a V/logI curve, and response latency is long in dim illumination and short in bright illumination.

Collection, Isolation, and Purification of Bacteriophage Shanaynay400

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Background: Bacteriophages are viruses that infect bacteria. Phages are specific to certain bacteria (host) by protein receptors on both the phage and bacteria cell. Research of

phages is critical for medical science as an alternative for antibiotics which bacteria are rapidly becoming immune to. **Methods:** Phage Shanaynay400 was collected as a soil sample under The Caribbean Tree at Howard University in a moist environment. A single morphology phage was purified after several plaque assays. Lysate was collected, empirical testing was carried out to determine the titer of the phage. DNA was isolated with the concentration and purity determined by nanodrop. Gel electrophoresis was performed to separate size and length of the DNA. A spot test of the HTL was preformed along several rounds of streaking were performed to isolate putative lysogen bacterial colonies. Patch Assay displayed clearings which indicates a potential lysogen may be present. **Results:** Shanaynay400 was isolated and purified with a titer of 2 x 1010 and a DNA concentration of 135.6 ng/µl, and a purity of 1.88 (260/280). The phage DNA was cut by ClaI and HindIII. The phage is temperate and a potential lysogen. **Conclusion:** A putative lysogen was obtained. The next steps are to determine if the lysogen is releasing phage into a liquid culture.

Characterization of Scuffle88, a lytic Bacteriophage isolated from soil

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Bacteriophage (phages) are extremely genetically diversified and provide the largest collection of undiscovered genetic information in the biosphere. However, even though the phage population is roughly 1031 particles, only 2 × 103 genomes have been sequenced. In the current study, the lytic bacteriophage Scuflle88 was shown to infect Mycobacterium smegmatis mc2155. Scuffle88 was isolated from soil collected on Howard University's campus and characterized with a series of experiments with the objective of sequencing its genome. Initial isolation was done under enrichment conditions using standard media. Plaques were then purified by serial dilution, plaque assay, spot titer, empirical testing and a high titer lysate (HTL) collected. DNA, isolated from HTL, was 97.8 ng/µl, and was utilized for restriction digests. Data shows that Scuffle88 is a lytic bacteriophage with diameter 73 mm, titer of (12.3 × 107) and contributes to the growth of M. smegmatis lysogens. The analysis of Scuffle88 shows that phages does contribute to the evolution of bacteria, and may solve the world's current antibiotic resistant problem.

KEY WORDS: Bacteriophage, Lysate, Restriction digest, lysogen

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In vitro mRNA and miRNA expression profiles in human macrophages in response to serotonin receptor 7 (HTR7) activation.

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INTRODUCTION: miRNA epigenetic regulation of gene expression has been associated with immune function modification. The neurohormone serotonin (5-HT) acts in an immunomodulatory capacity due to the presence of receptors on immune cells. We aimed to evaluate the HTR7 induced modification of immune-related gene expression and regulation in human macrophages. **METHODS:** Primary human M1 macrophages were cultured in the presence or absence of serotonin receptor antagonists with varying concentrations of 5-HT. Total RNA was isolated using TRIzol Reagent and the nanostring nCounter system was used to quantify the expression of 584 immune related mRNAs and 800 miRNAs. A two-way ANOVA using the PRISM 6 software was used to determine statistical significance. **RESULTS:** The activation of HTR7 alone when compared to the total HTR activation resulted in a statistical increase in the expression of ITGA4 at physiological concentrations of 5-HT and a dose-dependent increase of S100A9. Irrespective of 5-HT concentration, HTR7 activation resulted in a decrease in B2M and HLA-A. The activation of HTR7 was also determined to increase expression of the miRNAs hsa-miR-3065-5p, hsa-miR-3144-3p, and hsa-miR-302d-3p but decrease hsa-miR-548j-3p at elevated 5-HT concentrations. At physiological 5-HT concentrations, HTR7 activation decreased expression of hsa-miR-425-5p, hsa-miR-1908-3p, and hsa-miR-525-3p. Correlations in expression were determined between the gene expression of ITGA4, S100A9,

B2M, and HLA-A and the miRNAs hsa-miR-302d-3p, hsa-miR-525-3p, hsa-miR-122-5p, hsa-miR-92a-1-5p, hsa-miR-627-5p, hsa-miR-1908-3p, hsa-miR-425-5p, and hsa-miR-567. **CONCLUSION:** This data identified HTR7 induced changes to the expression of several immune-related genes and miRNA molecules that possess the capability to regulate their expression.

Isolation and Characterization of Bacteriophage Vivante

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Background: Bacteriophages are viruses that need a bacterial host to reproduce. Phage Vivante's information will be used collectively to determine if it can combat against infections caused by Mycobacterium smegmatis. This is important because the discovery and development of alternative anti-infection modalities has become a major focus in the fields of biology and medicine due to increasing rates of resistance to antibiotics. **Method:** A soil sample was collected on September 12, 2016, into a 15-mL conical tube on Howard Universities yard. The phage Vivante was isolated, purified, and the high titer lysate (HTL) was collected. Vivante's DNA was used for restriction enzyme digest, gel electrophoresis, and DNA sequencing were performed to further characterize Vivante. Phage HTL is currently be utilized for lysogenic assays. **Results:** The morphology of the phage Vivante was clear. HTL had a concentration of 2.45x1010 pfu/ml. using spectrophotometry phage DNA concentration was 138.5 ng/µl and purity was determined by gel electrophoresis. **Conclusion:** Most performed procedures were to isolate, purify, and characterize Vivante. After sequencing, Vivante was is a duplicate phage having a similar sequence to previously isolated phages. It is still unknown whether Vivante can be used to combat against infections cause by Mycobacterium smegmatis.

The Isolation, Purification and Characterization of ZekeeTamba

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Background: Bacteriophages are viruses that attack bacteria. They incorporate their phage DNA into the bacterial DNA by homologues recombination. The rise and popularity of phages and their uses could be very impactful in the field of medicine in many different ways. **Methodology:** Phage ZekeeTamba was collected in a soil sample in front of the Louis Stokes Library at 38.9198° N and 77.0188° W. In order to increase the population of ZekeeTamba, we used the enrichment method and then he underwent many purifications through serial dilutions to finally obtain a phage with one morphology. With his one morphology, we were able to collect a High Titer Lysate, we were able to purify the DNA and run a gel electrophoresis. In order to get him where he is today. **Results:** ZekeeTamba's titer was 1.2 ×10^10 pfu/ml, he had a DNA concentration of 885.5 nanograms/microliter. He was not a pure phage because when the gel electrophoresis was run on him, there were smears. ZekeeTamba was 1mm in diameter and was a clear plaque. **Conclusion:** ZekeeTamba was not sent to be sequenced, however, with the availability of funds, he can be sequenced and with that we can see what his use will be in the field of science and possibly in the world.

Bioinformatics Analysis of Rare Coding Variants in DISC1 Interactome

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Psychiatric disorders, including schizophrenia, bipolar disorder and major depression, are important public health issue in the United States. The pathogenic causes of these diseases are largely unknown and treatments for the diseases are not satisfactory. Thus, understanding the genetic mechanisms of mentor disorders is a research priority. Disrupted in schizophrenia 1 (DISC1) gene is a convincing candidate gene for developing psychiatric disorders. The

molecular studies have shown that DISC1 functions as scaffold protein in neuronal development through the interactions and functions of a large set of proteins (DISC1 Interactome). Recent high throughput sequencing studies showed that rare mutations have large effects on the risk for psychiatric disorders, which indicates that rare variants account for much of the missing heritability in the development of mental illness. We applied bioinformatics approaches to investigate the effects of rare non-synonymous mutations in DISC1 Interactome on protein structures and functions from public databases. We used machine learning methods to predict the effects of the rare disease-causing mutations on protein function, protein stability and post translational modification. In addition, we utilized protein structure modelling methods to analyse the effects of mutations on protein stability and protein-protein interaction. We showed that the rare missense mutations could significantly affect the protein structures and functions. The findings provide useful information for further analyses to estimate the functional effects of rare coding variants. It could help biomedical scientists to develop the better diagnostic and treatment methods for the individuals with psychiatric disorders.

Isolation, Purification, and Characterization of Bacteriophage Doodle1

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Background: Bacteriophages are viruses that infect bacteria. The bacteriophage, Doodle1, was isolated using Mycobacterium smegmatis, purified, and its DNA was then characterized. The study of bacteriophages furthers the understanding of basic microbiology. Results from experimentation with bacteriophages can ultimately lead to advancements in medicine, such as destroying disease spread throughout human population. **Method:** A 15mL soil sample was collected in front of Howard University's Harriet Tubman Quadrangle (2455 4th St NW, Washington, DC 20059 (38.92° N, 77.02° W). The sample was then used to isolate, purify, and characterize a homogenous bacteriophage population. Using webbed plates High titer lysate (HTL) was collected, titer calculated and DNA was isolated. DNA isolated was used for restriction digest, gel electrophoresis and sequencing experiments. DNA was sequenced at the Pittsburgh Bacteriophage Institute. **Results:** The isolation of lytic bacteriophage Doodle1 from the environment yielded plaques, 1mm in diameter with plaques unvarying in morphology. The titer of the collected HTL was 1.1x108pfu/ml. The concentration DNA isolates sample 556.7ng/µl. DNA sample was sent for sequencing and its currently been analyzed. **Conclusion:** DNA sequencing of Doodle1 shows that it is a duplicate of bacteriophage Atlantean. The lysate of Doodle1 is also being used in Lysogenic experiments to better characterize the phage. Phage Doodle1's DNA is currently being annotated to better understand the genes present and their functions.

Investigating the Periodontal Phenotypes associated with Osteogenesis Imperfecta

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Osteogenesis Imperfecta (OI) is a genetic disorder characterized by brittle bones and skeletal deformities. OI may also have a phenotypic effect on the dentoalveolar complex i.e., dentinogenesis imperfecta (DI); however, little attention has been targeted at the periodontium. This research project is designed to determine if there are periodontal phenotypes associated with OI and if yes, to characterize the nature and extent of these phenotypes. The majority of OI cases are caused by mutations in type I collagen, composed of α1 and α2 chains, encoded by COL1A1 and COL1A2, respectively. A gene variant of COL1A2 causing a glycine to cysteine substitution at position 610 (G610C) has been identified in affected OI individuals. In order to characterize a possible periodontal phenotype, murine models featuring a G610C heterozygous mutation were used. Furthermore, recent research has shown that the aberrant collagen is degraded via autophagy in osteoblasts, which may allow these cells to retain some level of functionality. Our collaborators created several variations of the G610C murine model including ones in which autophagy was diminished. These were compared to wild-type mice. Preliminary results obtained from three dimensional reconstructions and histological

staining revealed subtle differences in dentin and cementum morphology between wild-type and OI models. Furthermore, it appeared that autophagy knockout mutations may affect osteocyte density in the alveolar bone in OI models. These results suggest an altered periodontium in G610C mouse models, which may be influenced by autophagy, warranting the need for more research to further characterize the periodontal phenotypes associated with OI.

Analyses of Ventilation perfusion (VQ) scan results as compared with clinical probability of pulmonary embolism in a predominantly Black population

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Background: Current guidelines suggest the use of the more specific Wells score could safely reduce the number of unnecessary scans. Aims: This study aims to evaluate the correlation of clinical pretest probability of PE with VQ scan results in a predominantly Black patient population. **Material and Methods:** A retrospective descriptive study to determine the diagnostic utility of V/Q scan was conducted among patients who were seen during January 2012 to January 2016. The study population included patients who underwent V/Q scan for evaluation of PE. A total of 180 charts were reviewed and 49 were excluded due to poor quality data. Wells probability of PE were compared with the results of the scan. **Result:** The median age of the study population was 63.02 ±16.12 years. Majority of the study population 121 (92.4%) was black. Sixty four (48.9%) VQ scans were done for a low clinical probability for pulmonary embolism as defined by the well's clinical score. The most common clinical presentations were shortness of breath 74 (58%), Leg pain 39 (29.8%), and chest pain 36 (27.4%). Sixty two (96.9 %)patients with low clinical probability had low probability VQ scan(P=0.03). Among patients who did CT angio and VQ scan, low probability scan was noted in patients with no pulmonary embolism in CT in 25(96.2 %)(P=0.006). **Conclusions:** The study showed strong correlation between low clinical probability and low probability VQ scans and its utility to safely rule out PE in a predominantly black population. Studies conducted in other populations have detected similar findings.

Isolation and Characterization of Bacteriophage GT3

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Bacteriophages, viruses which infect bacteria, are diverse, may influence the microbial populations in urban areas and may provide a solution to the problem of multiresistant bacteria. The Howard University (HU) SEA-PHAGES Program encourages students to research and understand the importance of collecting, isolating and characterizing a phage. This kind of research will lead to new medical breakthroughs to fight infectious diseases. In the current study, the diversity of Mycobacterium smegmatis mc2155 bacteriophages was evaluated. Soil samples were collected on Howard University's campus outside Ernest Just Hall (38˚55 18.53˚W, 78.58' 49.43 W), and bacteriophages were isolated using enrichment techniques followed by spot titer, full plate titer, phage extraction, and quadrant streaking. Phage GT3 was shown to produce lytic phages with diameters of 1mm, 3 mm, and 4mm. Eventually both medium (MTL) and high titer lysates (MTL) were determined to be 21.2 X 10-3 pfu/mL and 84 x 10-6 pfu/mL. DNA, isolated from HTL, had a concentration of 49 ng/µl and purity of 1.8 ng/µl. Restriction digest of GT3's DNA was instrumental in its characterization. In addition, M. smegmatis mc2155 did not produce lysogens, post infection with GT3. Although preliminary, the current study provides the framework to further demonstrate the ubiquity of bacteriophages in the environment.

Key Words: Bacteriophages, Mycobacterium smegmatis

Sex Determination in Dioecious Rumex acetosa

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Dioecious plants are plants with male and female reproductive parts on different plants. Sex ratio in dioecious plants is an

issue still being explored amongst botanist. The sex ratios in dioecious plant populations are often close to a 1:1 ratio, or are male biased due to gender-specific differences. Rumex acetosa (Polygonaceae) is a dioecious wind-pollinated plant in which females posses XX, and males XY1Y2 sex chromosome system. To resolve functional sex among R. acetosa plants, leaf material was analyzed, using a PCR-based technique involving RAY, a male-specific DNA marker, to determine the sex of the plants. The observed female bias sex-ratio is consistent with the view that the Rumex population shows female bias which has been shown in other studies. The results of the sex screening will be used to determine a nutrient treatment regimen to further study the sex ratio in Rumex acetosa.

International students and residents' attitudes and behavior regarding the provision of care for underserved patients

Presenter's Name: Kevin Vakani
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Past studies on the amount of orthodontists in the United States indicates a major discrepancy and an imbalanced distribution of private practice orthodontic providers in most regional areas across the United States. According to relevant data and geographic studies, many of these areas are in underserved areas and have been characteristically associated with low income households and median incomes. The purpose of this project is to analyze whether certain demographic factors, such as the student's gender, ethnic/racial background, and age, as well as educational factors affect their desire to return to underserved areas of similar cultural descent. Therefore, the objective of the project is to explore international student's, AEGD/GPR residents' attitudes and behavior regarding the provision of care for underserved patients and to determine how the providers' characteristics affected these attitudes and behaviors in forming a decision on where to return following their dental education and/or specialty. The parameters used in this study were based on socioeconomic status of the area, population and demographics. **Methods:** Develop a questionnaire that is to be distributed to international dental students and final year AEGD/GPR residents to determine future location sites and reasons for pre determined areas. The results will be analyzed and reported using the chi square test. **Hypothesis:** Underserved areas continue to exhibit a low proportional amount of returning students/residents based on economic constraints and negative perceptions towards Medicaid reimbursements. In addition, cultural familiarity is not considered to be a reason for returning to these underserved areas.

Investigation of the role of the C. elegans gene etr-1 by exon-specific genome editing using CRISPR/Cas9 system

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Coauthors: Ruby Boateng

Background: ETR-1 is a muscle-specific ELAV-like regulatory protein sharing 74% homology with human CUGBP1; the misregulation of which is associated with Duchenne myotonic dystrophy. Interestingly, co-depletion of etr-1 with wee-1.3, a gene implicated in oocyte maturation regulation, results in suppression of the WEE-1.3 depletion infertility phenotype. Therefore, etr-1 may also have regulatory roles in reproduction, independent from its canonical function in muscle development. There have only been two ELAV-like proteins identified within the C. elegans genome, ETR-1 and UNC-75. However, etr-1 exhibits extensive alternative splicing, a feature not very common in C. elegans, resulting in 19 known isoforms. We speculate that individual isoforms play distinct functional roles in the organism. **Methods:** Using CRISPR/Cas9 endogenous genome editing technology, we generated exon-specific GFP strains to study the localization and function of different ETR-1 protein isoforms. **Results:** GFP insertion tagging of exon 8 was confirmed through PCR analysis. Exon 8 is found specifically in ETR-1 protein isoforms A and B. However, a homozygous strain has yet to be isolated. Progeny of ETR-1(exon8)::GFP/+ hermaphrodites show GFP expression in the spermatheca and polar bodies of developing embryos. **Conclusions:** Preliminary data suggests ETR-1 isoforms A and/or B are localized to reproductive tissues. Further studies will include isolation of homozygous ETR-1::GFP strains targeting exons 2, 3, 4 and 8, and subsequent analysis of their respective expression patterns.

Isolation, Purification, and Characterization of N(au)la

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Background: Bacteriophages can conduct their destruction through two different phases: the lytic life cycle and the temperate life cycle. A new phage will be identified through a process of isolating, purifying, and eventually characterizing the phage. **Methodology and Results:** The beginning of the isolation of the selected phage was through a soil sample. N(au)la's soil sample was collected at Howard University's Health Sciences Library in 70 degree weather.This filtrate provided a lysate, which would used for the testing of the phage's purity through phases of spot titers, purification assays, gel electrophoresis, and multiple other experiments. After observing the physical components of the phages and using smegmatis mycobacterium to plate N(au)la, a conclusion drawn about the purity of a phage relied in its morphology. If a plate from a phage displayed plaques with morphologies resembling one another, one could assume that the phage is more pure than a phage on a plate with plaques displaying multiple morphologies. The goal of plating a phage is to obtain one morphology, therefore, plating was a process repeated very often in the lab. After purification, the characterization of the phage begins with the DNA sequencing of a phage, where nucleotides would be evaluated for the identification of possible new phage. **Conclusion:** This information can be applied in the medical field, as phages can be relied on to generate themselves in combat against bacteria that multiplies rapidly.. This information is beneficial as it will be added phage databases, where researchers can establish newfound purposes that N(au)la could possibly serve.

Bacteriophage 'DorisAnne', Isolated from Garden soil, Shows Lytic Activity Against Mycobacterium smegmatis mc2155

Presenter's Name: Jaelyn Vigee
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Presentation Type: Poster Presentation
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Bacteriophages (phages), viruses that infect bacteria, are the most abundant organisms in the biosphere. The isolation and characterization of the phages grants scientists the opportunity to manipulate the phages in a way to be utilized in molecular biology. Phages against host Mycobacterium smegmatis mc2155 were isolated from the environment with hopes of further investigating their potential to be used in the medical field for phage therapy, and to combat populations of pathogenic bacteria. Several methods were utilized to fulfill the objective, these include direct/enrichment plating, titering, DNA isolation, restriction enzyme digest (BamHI, ClaI, EcoRI, HaeIII, HindIII), agarose gel electrophoresis, quadrant streaking, and the patch assay. Through multiple rounds of purification, one plaque morphology was achieved on Luria Bertni (LB) plates with a titer of 1.1 × 10^10. This was used to determine the empirical assay and subsequently the generation of an HTL with a titer of 1.1 × 10^10. DNA, isolated from HTL, had concentration in range 55.7 ng/µl-65.0 ng/µl. Restriction digest of DNA further helped in characterizing the phage. Subsequently, a true lysogen was generated using patch assay, that is, M. smegmatis mc²155 produced lysogens post infection by DorisAnne. Although preliminary, the current research will further elucidate our understanding of phages, their host range and our understanding of how they could affect microbial diversity.

Key Words: Mycobacterium smegmatis, Phage, Restriction Digest, Lysogen, Titer, Enrichment

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Construction and characterization of a reverse genetics system of Zika virus

Presenter's Name: Shengfeng Wan
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An arthropod-borne virus, Zika virus (ZIKV), has recently emerged as a major human pathogen. Associated with complications during perinatal development and Guillain-Barré syndrome in adults, ZIKV raises new challenges for understanding the molecular determinants of flavivirus pathogenesis. This underscores the necessity for the development of a reverse genetic system based on an epidemic ZIKV strain. Here, we describe the generation and characterization in cell cultures of an infectious cDNA clone of ZIKV 766 strain. The constructs was assembled into a newly designed yeast-E. coli shuttle vector by homologous recombination technique. The cDNA clone-derived RNA is infectious in vero and C6/36 cells, and the growth of the

cDNA clone-derived virus is same as the parental isolate in vero cells. This ZIKV reverse genetic system, may help identify viral determinants of human virulence and mosquito transmission as well as inform vaccine and therapeutic strategies.

Specific Interaction of Amphiphiles with Sodium Channels

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Amphiphiles are chemical compounds possessing both hydrophilic and lipophilic properties. They are widely used in pharmaceuticals, food, cosmetics and for drug delivery. Their effects include ameliorating symptoms of pathneurological pain, increasing blood brain barrier, enhancing transdermal drug delivery, and prolonging sensory-selective nerve blockade of local anesthetics. Their effects are thought to result from non-specific lipid–protein interactions, namely, a bilayer–protein hydrophobic coupling mechanism. Little is known about the molecular interaction between amphiphiles and target proteins. Here, we hypothesize that some amphiphiles specifically interact with sodium channels to exert their pharmacological action. Two groups of chemical analogues, Polysorbates and Spans, were selected to test the direct action on sodium channels using whole-cell patch-clamp recordings from transfected CHO cells that stably expressed the Nav1.2 sodium channel isoform. Polysorbate 20 and Polysorbate 80 display tonic inhibition of sodium currents, modulation of voltage-dependent availability and larger use-dependent block. However, Spans, which are chemically analogous to Polysorbates but lack the poly(-O-CH2Ch3) group in their hydrophilic head, fail to modulate the function of sodium channels. The results indicate that 1) not all amphiphiles modulate sodium channel function through a bilayer–protein hydrophobic coupling mechanism; 2) Polysorbates specifically interact with sodium channels to inhibit sodium channel function. The specific interaction with sodium channels provides direct evidence that the prolonged sensory-selective nerve blockade of anesthetics by amphiphiles is pharmacodynamic rather than pharmacokinetic, and will lead to the development of novel prolonged-duration local anesthetics and a novel therapeutic strategy for treatment of neuropathic pain.

The Isolation and Purification of JulesWinnfield with the Host Bacteria of Mycobacterium smegmatis

Presenter's Name: Raines Warren
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Background: The Science Education Alliance: Phage Hunters Advancing Genomics and Evolutionary Science (SEA-PHAGES) program at Howard University is funded by the Howard Hughes Medical Institution to conduct research on bacteriophages. A bacteriophage is a virus that parasitizes a bacterium by infecting and reproducing inside it. The phage then practices either a lytic or lysogenic life cycle. When the host bacteria are infected in Petri dishes and die, clearings called plaques form. Bacteriophages can be used for genetic research in the medical health field and food manufacturing. **Methodology:** The phages in this study were collected from the Howard University campus. Specifically, soil was extracted from the south side of the football stadium at 38.924917 N,77.020557 W. The soil sample was subjected to various enrichment techniques to increase the phage amount. Isolation and purifications through plaque assays were used to narrow down plaque morphologies in hopes of achieving a single isolated phage. Once a single phage population was obtained, DNA was extracted. **Results:** The phage was named JulesWinnfield and created plaques about 1.5mm in diameter. A HTL titer of 5.9 x 109 pfu/mL was determined through a plaque assay. Along with that titer, an average DNA concentration of 216.2 ng/L was determined with a Nanodrop spectrophotometer. **Conclusions:** The initial observation of clear plaques suggested that JulesWinnfield was a lytic phage. However, in recent experiments, JulesWinnfield has shown evidence that it may be a temperate phage and capable of creating lysogens. Additional experimentation will provide conclusive evidence.

Analyzing the Activity of Chemical Compounds Against Vibrio Cholerae Biofilms

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Phosphoenolpyruvate-carbohydrate phosphotransferase system (PTS) is a multistep chemical process which regulates the intake and use of carbohydrates by bacteria. Bacteria growing through the use of nutrients, such as sugars, may form biofilms. Biofilms are multi-layered communities of bacterial cells that grow attached to one another. In addition to controlling sugar uptake by bacteria, the PTS regulates several cellular functions such as chemotaxis, glycogen metabolism, catabolite repression and the aforementioned biofilm formation. Using a chemical screen, this study identified small molecule compounds that promote the production of Vibrio cholerae biofilms. V. cholerae MO10 served as model organism. It was grown in the absence of chemical compounds as a negative control, while an altered strain lacking PTS activity served as a positive control. Growth kinetics was evaluated in absorbance-based microplate assays, and quantitative biofilm assays were performed in borosilicate glass tubes. All assays were monitored by spectrophotometry. Biofilm induction was confirmed by monitoring the growth of V. cholerae in the presence or absence of chemical compounds. Further assays are underway to elucidate the mechanism through which candidate compounds affect the formation of biofilms. These assays will determine whether or not biofilm induction occurs through interactions with the bacterial PTS. Success of this project will result in the identification and characterization of chemical agents that regulate biofilm formation by modulating activity of the bacterial PTS. This may lead to the development of novel microbial control strategies with applications in biological, medical, and pharmaceutical sciences.

Superoxide Dismutase Activity in Caenorhabditis elegans

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In aerobic organisms, Reactive Oxygen Species (ROS) are produced as by-products of oxygen metabolism causing oxidative damage to DNA, proteins, and carbohydrates. Superoxide Dismutase (SOD) enzyme detoxifies ROS species. Previous studies have shown that deletion of SOD in aerobic organisms, including Drosophila melanogaster, Escherichia coli, and Mus musculus, resulted in significantly shortened lifespan, reduced growth rate, and/or neonatal lethality. However, knockdown of the five reported SOD genes in Caenorhabditis elegans, a free-living soil nematode, posed no viability problem for the worm. In this study, an in-gel SOD activity assay was performed to compare levels of active SOD proteins in D. melanogaster, E. coli, and C. elegans. As expected, the gel-assay revealed three active SOD bands for E. coli and two active bands for Drosophila. However, the assay yielded only one active SOD band for C. elegans, contradicting previous findings which report 5 active SOD proteins. Previous studies have also reported an increase in SOD expression during the stress-induced dauer larvae stage of the nematode as well as in the long-lived Daf-2 mutant. Thus, additional in-gel assays were performed to compare SOD protein activity in the Adult, Dauer-Larvae, and Daf-2 stages. Results continued to display single active SOD bands for all three stages, confirming that only one of the five SOD genes in C. elegans expressed active SOD protein. Minute amount of SOD protein activity in the nematode suggests that C. elegans may use an alternative free-radical system for its metabolic purposes differing from that of D. melanogaster and E. coli.

Phenotypic and Molecular Characterization of a Lytic Mycobacterium smegmatis mc2155 phage

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There are millions of phages in this world, yet only a small percentage of these have been sequenced. Similarly, iIt is important for us to get a better understanding of phage diversitys since it will elucidate mechanisms of disease control and how they affect bacterial ecology. Bbacteriophages are viruses which infects and replicates within a bacterium to produce lytic or temperate plaques. In the current study, efforts were made to isolate, purify, and sequence a phage which infects the bacterial host Mycobacterium smegmatis mc2155. This phage was isolated from enrichment cultures using soil collected on Howard University's campus (38.921 N, 77.018 W). The phage, LuckyMargie, produced plaques with diameter 2 mm and generated a maxweb plate with titer of about 1.8 ×x 10^-4 pfu/mLl. Subsequently, DNA isolated from LuckyMarjie was sequenced using Illumina

sequencing. LuckyMargie genome is 68075 base pairs long, circularly permuted, with GC content of 66.5%. LuckyMargie belongs to phage cluster B and subcluster B1 with potential morphotype of Siphoviridae. Although these findings are significant, efforts are been made to annotate LuckyMargie's genome using several softwares.

Effect of gender on the association of isokinetic quadriceps strength with hypertension among older Americans.

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Background: In this study we examined the association between isokinetic quadriceps muscle strength (Newton) and hypertension (HTN) in a cross-sectional analysis of data from a US national sample National Health and Nutrition Examination Survey (NHANES) 1999-2002. **Methods:** In 2016, we analyzed the NHANES data from 1999-2002 in adults aged ≥ 50 years with no history of cardiovascular disease (n= 2,335). Hypertension was based on reported diagnosis of blood pressure measurement of ≥140/90 or use of antihypertensive medications. Isokinetic muscle strength was measured by a dynamometer. **Results:** Mean quadriceps strength was significantly higher in normal individuals (n=904, mean 393, 95% CI 379-406) than in individuals with diagnosed HTN (n=1007, mean 357, 95% CI 346-367) and undiagnosed HTN (n=355, mean 355, 95% CI 337-374). Gender specific analysis demonstrated that men aged ≥65 years had significantly lower quadriceps strength (p= 0.00) than men aged 50–64 years. Quadriceps strength was significantly lower in men with diagnosed HTN (p = 0.02) than in those with no HTN. Quadriceps strength was lower in men with undiagnosed HTN than in normal individuals, but this difference was not significant. Women did not show such an association. **Conclusions:** We found that among adults aged ≥50 years without a history of cardiovascular disease, isokinetic quadriceps strength was significantly lower in men with diagnosed and undiagnosed HTN than in men with no HTN. No such association was seen in women. Greater understanding of the role of muscle strength in HTN pathogenesis might clarify the benefit of physical activity.

Rouge22 Isolation, Purification, and Investigation

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Background: Bacteriophages are viruses that infect bacteria and are commonly referred to as phages. The bacterial host used in the experiments reported here was Mycobacterium smegmatis. Bacteriophages produce clearings on bacterial lawns called plaques, where all of the bacterial cells have been lysed. The purpose of this project was to isolate a single phage and test for lysogens - bacteria that contain phage DNA that has integrated into the bacterial chromosome. **Methodology:** Soil samples were collected from Drew Hall at Howard University and directly plated. This was done to test whether there were phages present in the soil sample. After phages were confirmed, a single plaque was chosen and isolated through purification and dilution processes including serial dilutions and plaque assays in order to obtain a pure phage population. **Results:** The phage that was isolated, Rouge22, was initially suspected to be a lytic phage. It generated clear plaques with two diameters of 1 mm and 2 mm. However, bacteria was streaked from a plaque. **Conclusions and Future Directions:** Preliminary results indicate that Rouge22 may be able to create lysogens and therefore, may be a temperate phage. Future experiments wil confirm this. Phage research has great potential in medicine, regarding antibiotic resistant bacteria that are human pathogens, such as MRSA. Phages could be the solution to the increasing problem of antibiotic resistance, and phage research in any type of way contributes to that end goal.

A systematic review of ethnic disparities in receipt of the pneumococcal vaccine amongst elderly adult populations over the last ten years

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Background: Pneumococcal disease exerts a substantial burden on the U.S. health care system. Recent estimates indicate the disease exerts an economic burden of over $1.85 billion annually, and there are over 440,000 cases of the disease annually amongst those over the age of 65. Blacks are disproportionately affected by pneumonia with incidence rates that are more than two times higher than that seen in whites. The objective of this research was to compare the proportion of blacks and whites that had received the pneumococcal vaccine over the past 10 years. **Methods:** A systematic review was conducted using preselected search terms. Data was abstracted from peer reviewed articles retrieved from the PubMed database. Articles were retrieved over a 1o year period ending in November of 2016. Data that was abstracted included the immunization rates among white and African American patients. In addition, information was collected regarding the reasons that minority patients did not receive the vaccine. **Results:** A total of 24 studies met the inclusion criteria. Cross-sectional studies were the most frequently employed study design. The immunization rate in African Americans was noted to consistently be lower than that seen in whites. Blacks reported lower awareness of the vaccine and also chose to decline the vaccine more often than whites. **Conclusions:** More interventional studies are warranted to help alleviate the substantial and significant disparities seen in pneumococcal related disease. Interventions will have to employ multiple

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Sex differences in sleep after footshock stress in mice

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Background: Women are at a greater risk of developing posttraumatic stress disorder (PTSD) than men after experiencing trauma. Studies have shown that sleep contributes to the development of PTSD differently between men and women. Animal models have been used to study sleep immediately after stress exposure; however, those studies used only male animals. The purpose of this study was to examine sex differences in sleep after exposure to stress in mice. **Methods:** Sleep of C57BL/6 mice was continuously monitored using telemetric electroencephalogram (EEG) before and after an early light period footshock session in which 15 footshocks (0.5 mA, 0.5 sec duration) were delivered over 15 minutes. To date, EEG data from 3 males and 9 females have been scored to identify wake, rapid-eye-movement (REM) and non-REM (NREM) sleep during two days before [baseline (BL), averaged] and after the footshocks [post-shock (PS1, PS2)]. **Results:** Female mice compared with males showed higher sleep efficiency (SE, percentage of time spent sleeping within the recording period) in light hours at both baseline and post-shock (Male: MBL=38.92% vs. Female: MBL=54.00%; MPS1=47.20 vs. 54.46; MPS2=39.95 vs.49.31). Within females, SE, percentage of NREM and REM sleep during light periods decreased from the baseline to PS2 (t=4.85, p=0.001,t=4.74, p=0.001, t=2.38, p=0.044). Within males, SE during light periods did not change from baseline to post-shock. **Conclusion:** While female mice sleep more overall, they experience greater deficits in post-shock sleep post-shock than male mice.

Isolation and Characterization of Mycobacteriophage Renaissance

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Background: Bacteriophages, also known as phages, are viruses that parasitize a bacterium by infecting it and reproducing inside it. The host of the bacteriophage isolated in this study was Mycobacterium smegmatis. The goals of this research were to isolate and characterize the genomics of a novel mycobacteriophage. **Methods:** The phage, named Renaissance, was attained from under the Howard University sign on the corner of 4th Street and Bryant Street in Northwest, Washington DC. Multiple experiment, including direct isolation, spot tests, and plaque assays were conducted in order to isolate a pure phage. Renaissance was purified through various rounds of purification, followed by spot tests, allowing for DNA to be isolated and purified as well. The DNA was sent to the Pittsburgh Bacteriophage Institute for sequencing. **Results:**Renaissance, produced clear, medium-sized plaques that were approximately 1.8 mm in diameter. Enzyme digests revealed distinctive banding through gel electrophoresis. The Renaissance genome is 41879 bp in size

and contains 61 open reading frames (ORFs). **Conclusion:** A single phage population was isolated, purified, and named Renaissance. The genome of this seemingly lytic phage is currently in the process of being annotated. This analysis will result in the identification of genes and regulatory elements. Further analysis of this phage will also include electron microscopy and experimentation to determine whether it is actually a lytic phage, or a temperate phage. Ongoing research includes genome annotation for Renaissance.

Biomimetic Formation of Shape-controlled BaTiO3 Nanocrystals

Presenter's Name: Xuetao Yue
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Background: BaTiO3, SrTiO3, and mixed Ba1-xSrxTiO3 are important perovskite materials exhibiting a range of outstanding properties, such as ferroelectricity, piezoelectricity, high dielectric constant, and photorefractivity. Synthesis of BaTiO3 nanostructures has attracted much attention because of its novel shape- and size-dependent properties. **Methods:** Solid-state reaction, hydrothermal and sol-gel methods are common used to synthesis BaTiO3. In this work, a biomimetic method was developed to prepare BaTiO3 nanocrystals, which were controlled by functional polymer. In the presence of polymers, e.g. polyacrylic acid, TiO2 was reacted with NaOH to produce Na2Ti3O7, followed by addition of Ba(OH)2 solution to form BaTiO3. By the change of NaOH concentration, solution temperature, additives and reactive time, the morphology and characteristics of the result materials were controlled. SEM was used to characterize the morphology of the crystals. **Results:** SEM indicates that granulate TiO2 particles were converted into needle-like crystals, which would be Na2Ti3O7, upon addition of NaOH. The shape could be well controlled by temperature and concentration and 70°C with 15M NaOH might be the optimized conditions to obtain needle-like nanocrystals. The needle-like nanocrystals Na2Ti3O7 can react with Ba(OH)2 to form BaTiO3 and the morphology could be controlled by variation of functional polymers. **Conclusions:** A biomimetic polymer controlled method was developed to prepare Na2Ti3O7 and BaTiO3. Their morphologies could be controlled by temperature, concentration, and functional polymers.

Business

Are Economic Development Projects Tipping Points for Their Neighborhoods?

Presenter's Name: Amira Alghumgham
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This paper investigated whether the context and the type of neighborhoods matter to the effectiveness of investment projects to promote neighborhoods to grow faster. This is measured by the economic impacts of these projects on household income and property growth values in three respective Washington, DC, neighborhoods. Using a differences-in-differences approach (DD), property values and individual income growth were examined before and after a government announcement or the start and completion of a development project. We found that government investment has some positive impacts on property values and individual income growth after a project is completed. These positive results are linked to the context of Washington, DC being a gentrifying city, which has experienced a pattern of general economic growth, increased individual income levels, and a growing populationin the past decade. A robustness assessment of the results on properties and individuals income growth was consistent in the first and second control groups. However; in contrast, the Columbia Heights neighborhood generated a contradictory result for the individual income growth due to the nature of census tract difference.

Keywords: development projects, differences-in-differences, gentrification, property values, income growth, stadium, tipping point

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In Pursuit of Greater Social Capital: Customizing Online Relationships for a Return on Investment

Presenter's Name: Rajni Goel
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Social networking has matured into a set of hyper-standards adopted by individuals across the globe. Growth in the social media outlets has stimulated the increase in the amount of daily hours individuals invest in social networking interactions. As a result, social network platforms scurry to create innovative tools and services to maintain user connections and promote additional use. This directly impacts greater social media pipelines to extend and promote digital data volume, which provides users more opportunities to gain value from their online interactions. The increase in data and social content creates a greater awareness for how users are sharing data and the need to understand how social media usage behavior potentially creates a return on investment (ROI). This study will extend past work of online engagement by exploring the direct relationships between social identity attributes (SID) and their impact on social capital. The goal is to develop a framework to calculate a "SID Score" which represents social capital from a business value (bridging capital) and personal value (bonding capital) perspective. As your credit score determines your credit worthiness, the SID score will contribute to defining your online social capital benefit. The outcome will assist users in determining the significance of their online relationships and gives users a tool to manage engagements to achieve stronger social capital (ROI).

"Pour Me Some 'Dirty Sprite': An Exploratory Analysis Of Brand Appropriation"

Presenter's Name: Johnny Graham
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Firms such as Burberry, Timberland, PBR, Doc Martens, and many others have encountered brand appropriation, the altering of brand meaning by non-target consumers who belong to a subculture. Though managerially relevant this construct is theoretically unique to the marketing literature. This research specifically looks at brand appropriation through the lens of Dirty Sprite consumption. While soft drink brand Sprite is traditionally associated with obeying the thirst of teenagers, within the lean consumption subculture, Sprite is used an ingredient to create a drug-like high. A netnography of consumer forums, a content analysis of firm-generated marketing communications, and in-depth interviews with

multiple consumer groups are used to address why a brand (Sprite) is appropriated into the subculture, and the process through which the appropriation is spread. This multi-method investigation reveals that Sprite's role is not that of an accomplice in the subculture's dissent or pervasion to mainstream society, but it is rather used to mask the group's disgusting and damaging elements, thus functioning as a gateway to enhance social approval. The brand also functions as a symbol of authenticity, which legitimizes subcultural capital and membership. The findings also reveal the role of the hip-hop subculture, a common association in Sprite's marketing communications, as a conduit in the spread of appropriation both within and outside of the lean subculture. Overall this research gives theoretical and practical insight into the role of brands within non-brand centric subcultures, while also offering unique context to the process of brand meaning transfer.

Top management team composition and environmental performance

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As the importance of maintaining a proactive environmental agenda gains significance, the composition of the top management team (TMT) becomes salient. Given the impact of environmental initiatives on the supply chain, experience in this area can benefit decision making within TMT for a proactive environmental or green strategy. Drawing on upper echelon theory, we analyze the impact of supply chain management (SCM) experience in TMTs for a proactive environmental strategy. To further contextualize the characteristics of the TMT, we include age and heterogeneity in our analysis as important factors in setting the green agenda of a firm. The theory is tested with an original panel data set of 4,334 firm-year records. Measure of a proactive environmental strategy is drawn from Kinder, Lydenberg, and Domini (KLD) database, while TMT composition is derived from executive profiles recorded in Bloomberg. Our findings support the positive impact of SCM experience in TMTs on a proactive environmental agenda. Furthermore, the results reveal stronger support for a green agenda in an aging and heterogeneous TMT. Our findings also support the importance of having SCM experience in aging TMTs to implement an environmental management agenda. This study extends research in environmental management strategy to include the significance of TMT composition.

Audit Fee Trends from 2000 to 2014

Presenter's Name: Lucy Lim
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Coauthors: Ratna Dey

Since 2000, audit fees are required to be disclosed by publicly traded corporations. Understanding the trends in audit fees is important since the audit is mandated and regulators will need this information for policy decisions. Several events that may impact audit fees, including: the collapse of Arthur Andersen (2002), passage of Sarbanes-Oxley Act of 2002 (SOX), the issuance of Auditing Standard (AS) No. 2 in 2004 and then No. 5 in 2007 by Public Company Accounting Oversight Board, financial recession of 2008, and the passage of Dodd-Frank Act of 2010. The model below is run for the year 2000: $LFEE = \beta0 + \beta1LASSET + \beta2FOREIGN + \beta3INVREC + \beta4MSHARE + \beta5LEVERAGE + \beta6LOSS + \beta7ROA + \beta8TENURE + \beta9BUSY + \beta10GC + \varepsilon$

The unexpected audit fees is the prediction error deflated by the predicted fees. The model is re-run using price adjusted variables to ensure that the results that are not driven by inflation and changes in auditor's salary. We also re-run our analysis on firms that exist in all of the years to ensure that the results are not caused by changes in the composition of our sample across the years. There was a significant audit fees increase after the passage of SOX 2002 and AS 2 in 2004 especially due to the requirement for internal control audit and a decrease (a smaller increase).

How Consumerism Caused (and Can End) the Plastic Plague

Presenter's Name: Jordan Mcrae
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Presentation Type: Poster Presentation
Faculty Advisor: Nea Maloo
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Each day, the consumerist culture of the United States results in tons of trash being left in the ocean. In 2010, eight million

tons of plastic trash were left in the ocean worldwide, and America was one of the top 20 culprits. This study will delve into precisely how the buildup of plastics in the oceans is a direct result of consumerism. Then, we will examine how the 'plastic plague' can be halted. There are currently numerous businesses that profit from recycling ocean plastic into new goods like Pharrell Williams' Bionic Yarn and Adidas' Adidas x Parley. People love to buy 'green' in order to mitigate the guilt of hurting the natural environment. Nielsen studies have found that 72% of those ages 15-20 are willing to pay more for products and services that come from companies who are committed to positive social and environmental impact. Therefore, with the proper investments and advertising, these ventures could become wildly successful. The main goal of this study is to determine which of these plastic recycling businesses have the most potential for success in putting an end to the plastic plague.

The Scramble for Africa: An Investigation of Neocolonialism and the Rise of Chinese Economic Influence within Africa

Presenter's Name: Chinwe Obodo
Classification: Undergraduate Student
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During the nineteenth century, European powers collided to annex the continent of Africa and extract its resources. Presently, China is Africa's top bi-lateral trading partner with trade volume exceeding $166 billion. From the years 2003 to 2011 China has increased its investment thirty-fold from $491 million to $14.7 billion. This research project is centered on understanding the impact of Chinese investment in Africa. It also seeks to investigate concerns over opaque investment deals, corruption, the implications of Chinese labour importation over the development of local skills, and whether China's occupation weakens Africa's ability to build it's own industries.

Measuring the Effectiveness of Product Placement Among Millennial Audiences

Presenter's Name: Amanda Scott
Classification: Undergraduate Student
Presentation Type: Oral Presentation
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Marketers are always looking to find new ways to promote and advertise their product within a dynamic media marketplace. A practice often used to connect with audiences is product placement. Product placement is a practice by which marketers push goods or services to gain exposure by paying for them to be featured on various media platforms. Product placement will be the focus of this study to determine its efficiency and effectiveness as a means of communications for millennials. Using online surveys, this paper will examine millennials' marketplace behavior when it comes to brand awareness. It will also examine the results from product placement and the overall perception of the practice. Participant responses will be analyzed based on the meaning transfer theory. It is likely the study will find that product placement is effective amongst millennials. It can be predicted that a) millennials will be brand driven and focus on brand impact over the features and benefits of the good or service and b) product placement will increase brand awareness but may or may not have a direct effect on brand sales. This study will provide deeper insight into the perception and practice of product placement than have already been researched. Because millennials are the target subjects of this research, insights into the millennial marketplace and the power of the millennial dollar will b great takeaways. This study will have the potential to influence product placements' future application among millennial audiences and within the marketing world.

Citizenship-by-Investment Programs in the Eastern Caribbean: Economic Benefits and Rewards

Presenter's Name: Jean Wells
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Coauthors: Gwendolyn McFadden-Wade

Financially strapped governments in the Eastern Caribbean have creatively generated revenue by adopting nontraditional methods, such as Citizenship-by-Investment Programs (CIP), commonly referred to as "passports for sale." This paper examines the evolution of these programs in the region, reviews the benefits and rewards to individuals and countries, compares the exemplary features of the Grenada CIP to the less successful program in St. Kitts and Nevis and offers the Antigua and Barbuda CIP as a model to other countries anticipating instituting such a program. The typical CIP offers non-citizens at least two investment

paths to citizenship: (1) contribution to a fund which is used to finance various government projects and (2) investment in government approved real estate and/or investment in government approved business projects. The CIP provides benefits for the applicants including visa-free access to at least 90 countries thereby decreasing travel restrictions and no tax on worldwide income.Benefits for the countries include substantial contributions to the government treasuries, real estate development, and increased local employment.

Creative Arts & Design

Alleviating City's Environmental Impacts and Revitalizing Its Urban Fabric Through Green Roofs – A Case Study In Ho Chi Minh, Vietnam

Presenter's Name: Huy Bui
Classification: Undergraduate Student
Presentation Type: Poster Presentation
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Background: Urban heat-island, CO2 emissions, urban flooding, rampant development, and faceless building facades are just among many pressing issues that Ho Chi Minh, the commercial capital city of Vietnam, is facing with urbanization. The objective of this research is to examine a new green-roof policy that would help the city alleviate its adverse impacts on the environment and revitalize its urban fabric. Specifically, the policy will require the installation of green roofs in all new residential and commercial buildings with roof slopes less than 30 degrees. **Methods:** By establishing benchmarks through the analysis of the city's building fabrics and environmental condition, the transforming effects of green roof can be predicted and quantified within three parameters: temperature reduction, rainfall retention, and air quality improvement. Subsequently, 3D computer-programs will be employed to study the influence of green roofs on the image of the city, especially in terms of the city roofscape. Finally, the cost for installation and maintenance of green-roofs will also be validated for better insight into the practicality of such large-scale urban implementation. **Conclusions:** The study has found that the installation of green-roofs city-wide will tremendously improve the city's environment by reducing its overall temperature and flooding, while increasing air quality and biodiversity. Green roofs will also enhance the urban fabric, creating distinct roofscapes that are characterized by native tropical plants and enlivening the previously faceless concrete blocks. Compared to other roofing systems, green roofs are also highly affordable given the small economic scale of Vietnam households.

Social Media and Business Relationships

Presenter's Name: Cassidy Dixon
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Social media is defined as a method of communication via various electronic devices. In the early 2000's 65 percent of college students were on social media. In 2015, over 98 percent of college students were on social media. This research examines 'How social media affects communication and business relationships between millennials?' Surevys and interviews will be used to determine how social media affects communication in the workplace . The focus of this research topic is to determine if social media is causing changes in the current generation of millennials behavior and to see if the workplace is conforming with these changes as well. In order to investigate the topic of 'How social media affects communication and business relationships between millennials?', a comparative study will examine workplace interviews and networking during the past ten years. In additin, I will examine the the career opportunities in today's workforce and the impact of social media on these positions.

"I never looked at it that way!": Employing film semiotics in the video production classroom

Presenter's Name: Olivia Drake
Classification: Junior Faculty/ Lecturer/ Instructor
Presentation Type: Oral Presentation
Faculty Advisor: Self Self
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The video production student is an ardent viewer of cinema, television and various online video content. In addition, the images in motion pictures make a lasting imprint in the mind of the student, compelling her or him to imitate cinematic ideas. Accessing film semiotics in the classroom can deepen the video production student's perspective of seeing by rehearsing signifier and signified codes through writing, filming and digital editing. The researcher proposes that training the video production student to interpret meaning about a single frame, frame set or sequences can inspire him or her to develop original fictional narratives. Moreover, learning the system of film semiotic processes may incite new ideas in the video production student. This study purports to: 1) clarify how film semiotics can authenticate the video production student's fictional narratives, and 2) explain how applying film semiotics to the video production course can ameliorate pedagogical outcomes.

Advertising As Advocacy: How Advertising Can Combat the Real Life Implications of Mute-Group Theory.

Presenter's Name: Nitya Gittens
Classification: Undergraduate Student
Presentation Type: Poster Presentation
Faculty Advisor: Mark Bartley
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Background: Currently, during what some have described as the fourth wave of feminism, the issue of women's rights is no longer being addressed solely by academia, but is at the forefront of public discourse. While discussions around intersectionality, sexual abuse, reproductive rights, unequal pay, female representation in business and politics, sexuality and gender roles and expectations are driving the movement, there seems to be little awareness outside of academic spaces about the adverse day to day implications of mute-group theory in women's lives. **Methods:** In order to increase public awareness of this problem, an advertising campaign was created which targeted a broad audience of males aged 18-35. **Results:**This campaign, which consists of provocative visuals, serves as a public service announcement which aims to increase awareness of the negative effects of mute group theory by 30% among the target audience.

Morg-Folio: An App/Website for the Costume Designer's ResearchProcess

Presenter's Name: Asia Mccallum
Classification: Undergraduate Student
Presentation Type: Poster Presentation
Faculty Advisor: Robin Harris
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Background: During the Fall 2016 semester, the author completed a research paper for her Theater History/ Dramaturgy course on the topic of The Importance of Historic Accuracy in Costume Design. She discovered that there are limited scholarly resources devoted to costuming, due to the stigma that anything related to apparel is a woman's field and therefore not worthy of scholarly analysis. However, Google Images should not be the only source for designer's research, as the costume design process on a professional level includes hands-on studying. **Methods:** The author conducted 3 interviews with costume designers/directors in the Washington, DC area, as well as read and analyze a widely recognized 200-page dissertation written by a student at Iowa State University, on the debatable topic of historic accuracy in costume design. **Results:**The author wrote a 7-page argument paper that defends the importance of precision in costume design, and created an idea that will be presented at theater conferences. Morg-Folio is a mobile application/ website dedicated to the research process for the costume designer. The features include: a) visual search engines for photographs and videos from various themed categories and time periods b) a database of published written references c) how-to guides for construction, rendering, and makeup/ hair techniques, and d) a forum for student and professional designers to share their work. The temporary working link can be found here: https://asiaanansidesign2.wixsite.com/morgfolio. **Conclusions:** The website will launch for testing/ market research purposes in mid-March.

Education & Outreach

An Examination of Attitudes Towards Women in Leadership Positions in Public Universities in Saudi Arabia

Presenter's Name: Norah Alfawzan
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Presentation Type: Oral Presentation
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Despite opportunities for female leadership higher education is offering through its gender-segregation policies, women are underrepresented in leadership positions in Saudi Arabia. There are many obstacles that Saudi women face in regards to holding leadership positions in higher education, including societal attitudes associated with gender. Due to the pervasive and powerful influences of attitudes on behaviors, this study, through a survey, examined attitudes towards women in leadership positions in relation to gender, age, education, religiosity and income, within the Saudi higher educational system. The Study was conducted in two public universities in the central and western regions. Faculty, students and their immediate family and community members participated in the study (N = 440). Women as Managers Scale (WAMS) was the instrument used in this study. The conceptual framework of this study was influenced by Muslim Feminism Theory, which is a theological approach to the reinterpretation of Islamic texts from a woman-friendly perspective. Results indicated that the entire sample scored 4.87 as a mean in the WAMS scale. It appeared that attitudes of groups in the higher educational system were tilting toward a relatively favorable trend than what was traditional. A comparative analysis of WAMS scores based on the study variables was performed. In terms of gender, women had more positive attitudes. Also, there was a significant difference between regions. Participants from western Saudi Arabia had more favorable attitudes. On the other hand, no significant differences among age groups, education levels, employment status, and income levels were found.

Knowledge, attitudes and readiness regarding naloxone for opioid overdose reversal in pharmacy students about to enter practice

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Coauthors: Adetokunbo Adedokun

OBJECTIVE: To conduct a naloxone training for opioid overdose reversal for pharmacy students and assess their readiness on naloxone prior to entering pharmacy practice.
METHOD: We conducted a three-hour training for fourth-year pharmacy students (P4) from Howard University. It consisted of three, one-hour sessions: Pharmacology of naloxone, District of Columbia laws and regulations on naloxone, and Signs and symptoms of opioid overdose. An anonymous, five-item questionnaire that assessed knowledge, attitudes, and readiness in naloxone administration was given to students after the training, data was analyzed using SPSS.
RESULTS: Of the sixty-five students in the P4 class, thirty-two attended the naloxone training (N=32). Twenty-seven students responded that the training increased their knowledge of naloxone administration, twenty-nine responded that it was beneficial and should be included in the pharmacy curriculum. Nineteen students felt comfortable administering naloxone after the training. **DISCUSSION:** The participants reported that the training increased their knowledge of naloxone administration. Twenty-nine stated that naloxone training should be included in the pharmacy school curriculum. Due to time restriction, some of the participants were unable to practice administering naloxone using the Evzio® Trainer-kit. As a result, some reported that it would have further increased their comfort level if they practiced using the trainer-kit. Other limitation includes the small number of participants. Several pharmacy schools are creating naloxone training programs as continuing education for pharmacists. The next step is for pharmacy students to receive training before starting practice to ensure competent pharmacists are at the forefront of this critical public health issue.

Give. Gain. Grow Ghana: Re-framing International Service Learning through the lens of Howard University ASB students.

Presenter's Name: Obinna Asawabelem
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Coauthors: Tyler Ellis, Krystal Jacobs

ASB-Ghana's mantra is: "give, gain, grow" give freely, gain daily, and grow consciously, while serving Ghana and affording students with an opportunity to "expand their global footprint." The program addresses disparities facing black and brown students ability to study abroad by providing opportunities reflecting a Pan-African agenda. Quite often international service learning (ISL) opportunities are cited to have the power to promote leadership skills and levels of civic engagement among students that will attribute to their development as leaders and change agents (Booker Ammah, 2015). While universities advocate for short-term ISL and long-term study abroad experiences, rates of Black students that participate in short and long term study abroad experiences are low, accounting for less than 5% of the total number U.S. College students participating in aforementioned opportunities.Moreover, only 4% of the total percentage of U.S. College Student study abroad experiences happen on the continent of Africa. This presentation focuses on the qualitative reflections of ASB Ghana participants as they engaging in ISL activities from a Pan-African framework. Drawing on the motto of Truth and Service", while simultaneously providing cultural immersion that advances world views, we outline an intentionally engaged program designed to emphasize civic engagement and leadership development. This presentation is crucial in order to highlight the importance of civic engagement and leadership development, if international service-learning, often taking place in the Global West Africa, is to become a robust, critical, and ethical practice.

'Good Slips' Behavior Management Intervention

Presenter's Name: Anisa Bailey
Classification: Undergraduate Student
Presentation Type: Poster Presentation
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Behavior management is one of the key components of effective classroom management. Negative interactions among students can contribute to off task behaviors that interrupt instruction and create a negative classroom space. With little literature on student guided behavior management strategies, this paper aims to explore how the "good slips" intervention helps to increase prosocial behaviors as well as decrease negative and unwanted social behaviors. Prosocial behaviors included staying on-task, assisting classmates, politely monitoring other classmates, etc. "Good slips" allowed students to observe and record only the positive behaviors of their classmates each day over a two-week implementation period. This intervention was facilitated amongst a group of 17 second-grade students at an urban elementary school in Washington DC. A pre-and post-intervention survey was conducted to assess and monitor the effectiveness of the implemented intervention. A paired t-test was used to analyze the changes in students' perceptions of their behaviors in the classroom based on the pre-and post-intervention survey. It was calculated that the t-test probability value was .51, showing that the intervention was statistically ineffective. However, the implications of this intervention show that giving students the responsibility of monitoring each other's behaviors correlates with their perceptions of their own behaviors in the classroom.

How Speech Intelligibility Affects Individuals

Presenter's Name: Dominique Barrett
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Coauthors: Martine Elie

School-age children use language to form meaningful relationships and to express themselves as individuals. Therefore, it is suggested that low speech intelligibility correlates with behavioral and self-esteem issues. The purpose of this research project is to investigate the impact of speech intelligibility on social relationships and self-confidence. Additionally this research will investigate the impact that speech intelligibility may have on behavior. A meta-analysis of research studies focusing on speech intelligibility in school-age populations will be completed. The results of the findings will be utilized to determine impact of speech intelligibility on social relationships and self-confidence, thus investigating the need to nurture self-esteem and confidence.

Evaluating the Impact of the Howard University College of Pharmacy's Pharmacy Biomedical Preview (PBP) Program on Academic Performance

Presenter's Name: Kirsten Bazemore
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Objective: To determine the relationship between participation in the Howard University College of Pharmacy's (HUCOP) Pharmacy Biomedical Preview (PBP) program and students' academic performance during their first year in the Doctor of Pharmacy (PharmD) degree program. **Methods:** A retrospective analysis of preadmissions data during the first year of the PharmD was compiled for students that were admitted to HUCOP in 2013 and 2014. Chi-square tests and independent sample T-tests were used to compare preadmission characteristics based upon PBP participation. Linear regression analyses were conducted to predict the effect of PBP participation and preadmission characteristics on pharmacy student's first year academic success. **Results:** A total of 122 students were evaluated. Overall, PBP students were younger, received more D's and F's prior to admission, and had lower undergraduate science and cumulative GPAs compared to students not participating in the PBP program. Age and pharmacy college admission test (PCAT) quantitative scores had a significant association with students' cumulative 1st year GPA in the unadjusted regression analysis. After adjustments, attendance at a 2-year college, undergraduate GPA, and participation in the PBP program were predictive of the first year cumulative GPA in pharmacy school. Participation in the PBP program was associated with a statistically significant 0.22 unit increase in a student's GPA after accounting for other variables. **Conclusion:** Participation in the PBP program was associated with a stronger academic performance during the first year in the PharmD program.

Exploring the Efficacy of International Service Learning to U.S. College Student Development and Community Needs in Ghana among Students of Color

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International Service Learning pedagogies can serve as viable tools to impact college student development and are recognized across universities to enhance college missions of having students emerge into culturally competent citizens and competitive professionals in an increasingly global workforce (Mitchell, 2007). While ISL programs are cited as effective experiential opportunities for all students, a racial gap exists where students of color represent less than 10% of total U.S. college student participants. ISL in Ghana among American university students of color as a phenomenon was the focus of this qualitative study using Service Learning Theories and Critical Participatory Action Research frameworks. Results of the study suggest expanding research to show the need for sustained ISL programs at the university level, especially among students of color. The presentation will include discussion of importance of ISL programs towards university student leadership development and levels of civic engagement. The presentation will also discuss the Alternative Spring Break Ghana Howard Model set forth in 2017 as means to both address the gap of students of color participating in ISL and study abroad experiences.

The impact of the US Preventive Task Force recommendations against prostate screening on utilization of the Howard University Cancer Center's "Men Take Ten" prostate cancer screening program

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Background: Black men in DC face significant prostate cancer disparities. Incidence for blacks is 230.7 and 99.7

for whites. Mortality is 2.6 times higher for black men. To address this disparity, since 2005, the Men Take Ten (MTT) program has offered outreach, education and screening. In 2012, the US Preventive Task Force (USPTF) recommended against prostate cancer screening, presenting a decisional dilemma for black men. Currently, MTT continues to offer screening, emphasizing informed decision-making. Aim: This study examines the impact of the USPTF recommendation on prostate cancer screening in the MTT program. **Methods:** We analyzed MTT utilization from July 2009 through December 2015. Social and demographic characteristics of 1,045 DC residents are described. **Results:**From 2009 – 2012, on average, 123.3 men participated in MTT screening annually, while utilization increased to an average of 183.7 men per year from 2013-2015. Over half (57.4%) were screened at community-based events. Participants' mean age was 56.6 years and 84.1% were of African descent. Over half (55.9%) reported education beyond high school and 43.3% reported a household income of < $36K. Two-thirds had medical insurance, 41.8% had a primary care physician, and 21.9% had a family history of prostate cancer. Forty-four percent resided in DC wards 5, 7 & 8 which have the greatest prostate cancer incidence rates. **Conclusion:** Despite the controversies surrounding prostate cancer screening, our data does not reflect a decrease in program utilization.

Strengthening the Academy: Scholarly Productivity of Black Ph.D. Students

Presenter's Name: Rhonda Celey
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This study examined whether social support, psychological well-being, and type of institution predict the scholarly productivity of Black Ph.D. students. Scholarly productivity was measured with three variables: number of conference presentations, number of data collection projects, and number of publications in journals. Preliminary results of the study reveal that there is some type of interaction between social support, psychological well-being, institutional type and publication number. This study also examined other factors such as relationship status, funding, etc. of Black Ph.D. students. It is important to note that this study also included a covariate of time in program.

The Feasibility of using an Intern Readiness Course to Provide the Structure for Assessing Entrustable Professional Activities

Presenter's Name: Roderick Davis
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Coauthors: LaDonna Kearse, David Rose, Bonnie Davis, Tamara Owens, Debra Ford

Background: In 2014, the Association of American Medical Colleges (AAMC) published a list of 13 core entrustable professional activities (EPAs) senior medical students should be able to accomplish before their intern year. There existed a discrepancy between competencies residency directors assumed any intern should be able to perform, and what they were able to accomplish. **Purpose:** To determine if an established Intern Readiness Course can assess students' confidence performing EPAs, as outlined by the AAMC. **Methods:** In 2015, senior medical students participated in a four-week intern readiness course (IRC) at Howard University College of Medicine. The course integrated seven of the EPAs (2, 4, 8, 9, 10, 12, and 13) into the curriculum. Pre-and post-course surveys were completed requiring students to report their confidence performing the entrustable professional activities on a Likert scale. **Results:** Surveys were sent to all 110 participants (response rate 99%). Overall, students' confidence performing the EPAs post-course was generally favorable. More students were confident performing EPAs 4, 8 10, 12, and 13. 69.3% were confident evaluating and managing patients in urgent/emergent settings (EPA 10) pre-course compared to 80.7% post-course. Students confidence performing procedures (EPA 12) was 22.8% pre-course versus 89.8% post-course. **Conclusion:** The IRC increased students' confidence in performing five of the seven EPAs that could be formatively assessed in the current incarnation of the course. Utilizing a course such as the IRC to assess students' preparedness for intern year using the EPAs as a guide is feasible.

Cultivating Melanin in STEM fields through the NCAS CAREERS Weather Camp

Presenter's Name: Tierra Ellis
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NOAA Center for Atmospheric Sciences CAREERS (Channeling Atmospheric Research into Educational Experiences Reaching Students) Weather Camp intervention is where NCAS goes beyond exposing minority students to the atmospheric sciences by linking atmospheric sciences to common science and math disciplines that they are most familiar with in their everyday high school courses (i.e., math, biology, physics, and chemistry). The CAREERS Weather Camp intervention served 60 minority participants (65% Hispanic-American, 28% Black-American, 5% White-American, and 2% Other) and was hosted at four minority serving institutions (Howard University, Jackson State University, University of El Paso, and University of Puerto Rico-Mayaguez) in the summer of 2015. This study evaluates the impact of the CAREERS Weather Camp intervention on minority students' attitudes, interest, and perceptions regarding science and math and their likelihood to aspire to math and science-related careers. The quantitative data demonstrates an increase in high school students' positive attitudes, interest, and perceptions of science and math and their likelihood to aspire to employment opportunities after their Weather Camp experience.

A Study on the Small Group Re-Teaching of Phonics to 3rd grade Students

Presenter's Name: Daniellue Finley
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The goal of my study is to increase the comprehension skills and phonological awareness of ELL students and those who are below their grade level in reading. The rational is that small group and one on one re-teaching of phonics methods will increase the student's comprehension and awareness. My participants were 6 third grade students, 3 of which were ELL and below grade level and the other 3 were below grade level. I was guided in my research by asking the general questions of "Will re-teaching tools for phonics success lead to comprehension?" and "Is this teaching more effective in small group or one on one instruction?" The major findings in my research indicate that re-teaching did improve with comprehension, but also fluency in students, but the results on student's increase in phonological awareness was mixed. I more than likely should have focused on primarily comprehension and fluency by way of phonological awareness, but I did not. The results show the importance of small groups and how they work for the benefit of students. The results also show the importance of taking the time to re-teach struggling students, though that may take extra time or effort on a teachers part. Furthermore, it is necessary for teachers to put in that effort for the benefit of the students whom they teach.

The Implementation of Technology and Its Effect on Course Performance

Presenter's Name: Kenisha Ford
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This project investigates if using Tegrity in a course will positively affect students' performance at a research two university. Tegrity is a fully-automated lecture capture software used in courses to record lessons, lectures, and skills. Its website boasts that its personalized learning features make study time incredibly efficient and its simple integration into Blackboard brings this benefit to every student on campus. Physics II lectures were recorded and made available on Blackboard for students to reference while studying. The number of times recordings were accessed by students was available to professors using the software. All exam grades, along with midterm and final grades, of the students were compared to the grades of students in the course previously offered by the same professor were studied. Despite its broad availability, Tegrity is widely underutilized by professors on this university campus, especially in the hard sciences, specifically, in the physics department, where most professors were not even aware of Tegrity.

Breaking the Cycle: How Does Menstruation Impact Girls' Education?

Presenter's Name: Jori Fortson
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This research looks at the impact of menstruation on girls' education in Ghana. This research draws mostly upon primary sources based on interviews and service-learning conducted in Accra, and Kumasi, Ghana. Most prior research focuses on the connection to access to feminine hygiene

products in Ghana and its impact on girls' academic success. Health education and maintaining proper menstrual hygiene management are essential to girls' and women's well-being and development. The objective is to increase young women's knowledge about menstrual hygiene. The first phase of the project is small group discussions with young women about how their menstrual cycle impacts their educational and social experience. The second phase is to provide young women with feminine sanitary products. The final phase is to have a personal hygiene workshop. By identifying the impact of menstruation on girls' education, we will eliminate the assumption that all Ghanaian girls have the same experience. This will allow for more individual consideration of Ghanaian people and may direct future research on women's health.

Elementary Students and their Attitude and Achievement Toward Math

Presenter's Name: Marviana Gills
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Presentation Type: Oral Presentation
Faculty Advisor: Deena Khalil
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An action research experiment using nine-second grade students from a DCPS Elementary School examined their attitude and achievement toward the subject math. It includes information from articles related to the subject of elementary students and their attitudes toward math, the impediments that may affect their attitude and achievements. The goal of this study is to gather information about students, their attitude, and its effects on their achievement toward math. Students struggled with performing well during whole group and grasping the concepts with the subject, which lead me to create an intervention that allowed me to work with them in smaller groups. This intervention lasted for eight school days and on the first day, the students took a survey in regards of their attitude and feelings about the subject. From the first day, students started the intervention of small group instruction in relation to the topic and strategies instructed during whole group. From this research, I found that students perform better in small groups than they do in whole group instruction because they were less self-conscious about their answers. My hypothesis for this intervention is that their attitude and their achievement will improve. Overall, this intervention worked very well as far as their achievement in math and their attitude toward math did change slightly, resulting in my hypothesis being correct.

Conceptualization of Math Problems

Presenter's Name: Michael Harris
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The purpose of this paper is to focus on the importance of elementary grade students having a systematic approach to conceptualizing word problems through visualization. From my time student teaching inside Mr. Greenaughs classroom I noticed students are consistently incapable of solving word problems. My second grade students struggled to decipher a math problem in order to provide a solution. The Student's struggles ranged from their inability to read the problem, to not understanding the question being posed and hence, a subsequent inability to apply the correct steps to solve the problem. In order to test my hypothesis , a pretest and post-test were administered to 8-second graders. They were instructed to solve the word problem to the best of their ability and to ensure that they included all the steps used to solve the word problem. Students were provided with a four-step intervention which will assist them in selecting the operations or steps required to solve the problem. These four steps of solving the problem are called the "Draw-It Problem Solving Cycle." The data from the pre-test and post-test were compared through a paired T-test. A key component learned from doing the intervention was the benefit of low achieving students working in small groups. Results indicated that my initial hypothesis was validated. Visual strategies are effective for conceptualizing word problems . However, our results also indicate that ELL students require additional assistance in solving word problems, which is consistent with current research on this topic.

Peer tutoring affects on low-achieving elementary school students

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Peer tutoring is a flexible, peer-mediated strategy that involves students serving as academic tutors and tutees. The hypothesis tested if lower level math students, once paired with higher level math students would improve their grades and overall outlook on school, as well as on themselves.

The rationale for the study was to test if lower achieving students would be motivated more by working with a peer. This research study was important to do because finding innovative ways to motivate students and help them learn best is part of a teacher's job. There were two groups, each group had six students, therefore there was total of twelve students participating in the intervention. Prior to grouping the students, I interviewed the lower achieving math students as well as tested them on a reoccurring concept that they would be learning throughout the intervention. The students had improved academically from the intervention but their overall efficacy towards school showed little change due to the short amount of time of the intervention. Prior to my intervention, the types of learning implemented in my class were whole class instruction, small group instruction, and computer-based learning. Implementing a peer tutoring intervention was a new and innovative approach that the students were not accustomed to. Since students are the essential change specialists, peer tutoring is an effective technique for giving individualized direction to numerous students at the same time.

There's more to "cooking" than Ramen Noodles.

Presenter's Name: Keyera Howard
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Presentation Type: Poster Presentation
Faculty Advisor: Nea Maloo
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Background: Being in college can feel like another world. With housing and food provided on the campus, there is not always a reason to leave the campus. Since dining halls try to accommodate for vegetarian, vegan, and other diets, student can avoid cooking for themselves and take this luxury for granted. When students graduate, and enter the real world, some of them do not know how to prepare a meal. Purpose: The aim of this study is to investigate the hindrance that dining halls impose on college students, and how this affects their few years after graduating. **Method:** The sample will include at least 50 college students and graduates from various universities. The students will range from freshman to recent graduate of 5 years, both full and part-time credit load, and both on-and off- campus residents. The data will be collected using two **Methods:** (1) verbal interviews for those within proximity, and (2) online surveys given to the distant, yet willing college students. The interview and the online surveys will ask the same questions. These will include basic information (such as classification and residency), slight background history (previous exposer to cooking like a family restaurant), and basic cooking history (last meal cooked on stovetop, frequency of cooking, meal plan, etc). Anticipated **Results:** More than half of undergraduate college students will not be experienced in cooking for themselves.

The Critical Need for African Centered Educational Leadership

Presenter's Name: Joycelyn Hughes
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Coauthors: Chase Frazer, Kmt Shockley

Education leaders, namely African Americans, are continually exploring the educational, thus societal possibilities for African American students. Doctoral students who have chosen educational leadership as their focus must consider the explicit benefits of African-centered education and its impact on the development of the child. True education consists of students culturally identifying with their education. Instruction, otherwise, compromisingly positions students to mere training which predominantly works to maintain pre-existing occupational thus social orders. Rarely does institutionalized training allow students to think and perform beyond skills and mentalities they have been trained to execute. African American students are the descendants of the most marginalized community in American society and are continually placed in the most compromised positions of social maintenance. African-centered education uses African American students' culture as the foundation for the development of pedagogical practice, methodology, and curriculum for educators. Thus, African-centered education considers the spiritual, social, mental, and physical development of each student; furthermore, African-centered education is aligned to a consistent tradition of core cultural values which promotes collective achievement.

An Undifferentiated Intern Readiness Course for Fourth Year Medical Students Prepares for the Transition to Internship

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Coauthors: Roderick Davis, Bonnie Davis, Pamela Coleman, Vishal Poddar, Bryan Curry, Adedoyin Kalejaiye, David Rose, Pamela Carter-Nolan, Tamara Owens, Debra Ford

The purpose of this study is to establish a non-specialty-based readiness course for senior medical students transitioning into intern year and to provide a detailed description of the course as a model for undergraduate medical education programs. **Method:** We conducted a cross-sectional IRB-approved study, IRB-16-MED-38, of fourth year medical students who participated in a 4-week undifferentiated Intern Readiness Course (IRC) over a two-year interval. An interdisciplinary panel, including medical school faculty and students, Graduate Medical Education (GME) program directors, and hospital staff, designed the IRC to prepare senior medical students for intern year, regardless of specialty. Students completed course evaluations and open-ended course reflections about the structure and efficacy of the IRC. Analyses included t tests which measured satisfaction with course structure, objectives, sessions, and faculty. Grounded theory was used to identify themes in the course reflection responses. **Results:**Course evaluations and self-reflections were completed by 204 students (n=204, 100%). Students reported satisfaction with the course (n=202, 4.79±0.41). Themes identified in response to written feedback about the course indicated appreciation for technical skills (20.6%), interpretation skills (13.0%), and overall structure of the course (15.3%). Responses showed areas for improvement to include didactic components of the course (18.5%) and increased exposure to more specialty-specific skills (17.4%). Discussion: Student participants of the IRC reported satisfaction and desired continuation for future classes. Implementing a course that provides an opportunity to increase knowledge, behaviors, and skills required of interns, regardless of specialty, could serve to lessen the gap between expected and actual intern preparedness.

Why Cancer Prevention and Early Detection Must be Priority

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Cancer, ranks among the top causes of morbidity and mortality globally. In 2016, the National Cancer Institute estimated more than 1.6 million new cancer cases and this was accompanied by more than 595,000 deaths in the USA alone. Current view of cancer is a disease that is associated with several hallmarks including: abnormal cell proliferation, resistance to apoptosis, avoidance of immune destruction, induction of angiogenesis, and the ability to activate invasion and metastasis. These processes are mediated by both genetic and epigenetic mechanisms which activate oncogenes or inactivate of tumor suppressor genes causing genomic instability. Scientific advances and cutting edge technological tools for detecting genetic and epigenetic alterations, screening and therapeutic interventions has significantly impacted the diagnosis and treatment of cancer. Despite the progress made against cancer, there is still no cure for the disease. This is because cancer is not one disease but more than 125 types and one of the biggest challenges is coming up with therapies that continue to work for patients, as some patients do not respond or develop resistance to therapies. Recent decline in new cases and mortality rates of some common cancers parallels reduction in risk factors such as tobacco smoke, improved widespread screening and detection as well as improved cancer therapeutic treatment. On the other hand, adoption of unhealthy behaviors, including excessive alcohol consumption and caloric-dense processed foods as well as adoption of sedentary lifestyle are significantly associated with increased cancer risk. Thus concerted efforts must be focused on preventative measures.

Cultural Responsiveness: The Function of School Psychologists in Response to Intervention Models

Presenter's Name: Jasmyn Ledford
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This research presents a review of the literature around school psychologists' implementation of culturally responsive RTI

systems in diverse settings. Response to intervention benefits all general education students and reduces disproportionality within culturally and linguistically diverse populations. However, school psychologists must ensure that children are receiving culturally responsive, appropriate, and quality instruction that is evidence based, while also deeming it fitting, and validate it with students with whom it was applied (Klingner & Edwards, 2006). A leading factor of influence in the school environment is culture. Culturally responsive educational systems are grounded in the beliefs that all culturally and linguistically diverse students can excel in academic endeavors when their culture, language, heritage, and experiences are valued and used to facilitate their learning and development, and they are provided access to high quality teachers, programs, and resources (Harris-Murri, King & Rostenberg, 2006). A consistent overrepresentation of any specific student group requiring additional supports must be addressed by strengthening the culturally responsive nature of the universal tier's curriculum and instruction. Culturally relevant curriculum utilizes diverse cultural references across content areas, multicultural perspectives, student lived experiences and multiple means of presenting content. Instruction infused with cultural practices should require various ways in which students can express what they know, multiple ways of engaging students and utilize differentiation to obtain prior knowledge and lived experiences. School psychologists are responsible for understanding the cultural nature of learning, considering the socio-cultural context of schools and promoting equity within school based decisions and practices.

Black on Black Learning: Towards a 21st Century HBCU Aesthetic

Presenter's Name: Sadiyah Malcolm
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Abstract: This study explored the question "Do Historically Black College and Universities (HBCUs) provide a distinct benefit to Black students in the 21st century?" Grounded in the Black Aesthetics Theory and the concept of the Black Radical Tradition, the research question was explored through a mixed methods approach; including both questionnaire and in-depth interviews. A total of 309 students, nationwide completed questionnaires concerning the perceived benefits and disadvantages HBCUs afford Black students. In-depth interviews regarding student experiences were conducted with four students who attended a Historically Black College or University for at least one semester. These methods helped to assess students' levels of comfort, sense of connectedness and socialization on HBCU campuses. By using cross-tabulation analyses, and a thematic analysis approach, findings revealed that students who attended HBCUs felt significantly more connected to their campus communities. Amongst the emergent themes were 'social life,' 'classroom experiences,' and 'relationships with faculty and mentors.' This study concludes with a discussion of practical implications and considerations for future research.

The shades of Green - Analysis of the different building certifications/labels for green certifications, cost analysis

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To promote healthy performing building the green codes are now integrated in the District of Columbia building code in both residential and Commercial building type. The building industry has been inundated with different assessment to help create the shades of green. Being green is not a label to put on building after the construction is complete. Green certifications are conscious approach to achieve credibility to building and adds integrity to the building team with third party certifications. The assessment for green and the label is differentiated with many parameters, and must be weighed against the cost of getting such a certification. The shades of green are in concentric circles with the building industry in the center and other disciplines in every outer circle. There are many benefits for being certified such as higher rental or resale value, lower operating costs and local and national recognition. These must be weighed against the economic value from upfront cost and time involved. The research will analyses the major brand labels such as Energy star, LEED (leadership in Energy and Environmental Design), WELL building standard, HERS Resnet, LIVING building challenge etc. The research will highlight the cost value of these systems with real examples to understand which shade of green one must value and adopt for the building to enhance its healthy performance space to achieve guaranteed value. It will help us understand when we work or live in a certified building, what value end user can expect.

Incorporating 3-D Online Anatomical models in Allied Health Anatomy labs

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The current curriculum in allied health programs is intense and fast paced, especially in the Physician Assistant programs. This results in students within Physician Assistant Programs across the country being expected to graduate with roughly the same knowledge as Medical Students, but with far less time spent on courses. Furthermore, the curriculum for most anatomy labs geared toward allied health students is constructed to teach these students without undergoing cadaver dissections. Cadaveric dissection is a well-established form of teaching anatomy, so much so that most gross anatomy labs targeted to the medical career teach the regional approach with cadaveric dissections. While cadaveric dissection is a valuable tool, it is a very time consuming process that results in most students not being able to dissect all structures. Recent advancements in technology have made it possible for detailed renderings of anatomical structures to be viewed as digital 3-D structures. In order to combat these issues that is currently plaguing the allied health field, it is proposed that incorporating 3-Dimensional Online anatomical modeling in the classroom, will aid students in studying for the laboratory portion of anatomy and will result in higher scores on laboratory practical exams and student preparation. The goal of implementing this new technology is that it will be an effective method of teaching anatomy to allied health students versus the traditional method.

Integrating the En-Bloc Model and Self-Directed Learning to Enhance Pediatric Competencies

Presenter's Name: Edwin Powell
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Background: It is essential that all medical schools adopt a model that transfer power from the expert clinical preceptor to the medical student. The En-Bloc model emphasizes on core competencies that must be mastered, while providing broad concepts and visual information as well as integrating clinical and basic science information. A range of challenges have been identified in this integrative approach, however this model provided the conceptual framework for improving clinical instruction. **Methods:** The study model was a repeated measure pre-test/post-test design, with an academic intervention of ten (10) assignments and related quizzes that are aligned with national pediatric competencies. The inclusion criteria for the analysis required the database to be culled to N=127 medical students that took both the pre-test and the post-test. All analyses were performed at the 95% confidence interval, with a P Value < .05 considered to be significant. **Results:** Data shows that students scored an average of 6.181 points better on the post-test than they did on the pre-test. Forty-one students (n=41, 32.3%) did the same or worse on the post-test as on the pre-test, while 86 students (67.7%) showed improvement over the baseline (average, 9.90 points). **Conclusions:** The Blackboard course was a success, in that it produced a >6 point improvement over baseline. At least 66% of students gained statistically significant knowledge from the intervention. This integrative teaching and learning model improved the score and level of competency of medical students in a pediatric clinical rotation.

Small-group instruction, specifically differentiated learning increases students instructional reading levels.

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Instructional learning is used within elementary school settings to help enhance teaching strategies with a focus in student development in areas such as behaviorism and cognitivism. While some students reflect a mastery in their grade level reading fluency, others tend to fall behind due to a lack of differentiated instructional guidance. Achieving the goal of improving and maintaining students' instructional levels begins with small-group instruction on the basis of focusing on including students with implementation and assessment. Instead of focusing on a directive style of teaching, employing a consultive style better helps with student interests towards their improvement. This paper will analyze and assess a 2nd grade class for a 12-week period, focusing on students' instructional reading levels through small-group instruction. Understanding students' difficulty in instructional learning and recognizing the stages of their progress will enrich teachers' integration of strategy

instruction and lesson plans. Differentiated small-group instruction focuses heavily on development models, hands-on work, and high-quality interactions between teachers and students. Modifying teacher instruction is needed to meet students' needs and respond to their reading more effectively.

The Effects of Study Time on Howard University Students' Academic Achievement

Presenter's Name: Jaryn Trent
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This paper explores different articles and the effects of adequate study time, involvement in extracurricular activities, and working while enrolled in school full-time. These articles explain how habits are formed far beyond enrollment into a college institution and how these habits carry on into postsecondary education. The habits described fall anywhere between organizational skills and self-motivation. Even though some of these habits take a while to form and may not benefit the students in anyway, it does not mean that students cannot learn more beneficial habits as they go on to college. Student-athletes and those who work may have a harder time with time management as they balance outside activities, but athletics and employment does not mean that these students are incapable of high academic achievement. However, not all articles come to the conclusion that study time has any impact on academic achievement. Researchers such as Nonis and Hudson (2010) found that students believe that they could perform well if they chose to do so and believe that by exhibiting better organizational skills, they could have higher academic achievement.

Keywords: study time, academic achievement, employment, athletes

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How does the teacher-student relationship quality impact student off-task behaviors?

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The major findings of this research was most students do respond better when they are actively engaging in a positive relationship with their teachers, but not all students. Although, research indicates signs of progression due to multiple factors, the teacher-student relationship quality did help students improve their behaviors slightly. These findings indicate to first year teachers that it's important for teachers to build get to know their students and build positive relationships with them. As a result, students' off-task behaviors decreased. One of my suggestions for further studies is to include students in the process of defining a positive relationship between teachers and students.

Cultural Responsive Pedagogy in the Classroom: The Correlation Between the Cross-Cultural Communicative Processes for Educators, African-American Learners, and Student Outcomes

Presenter's Name: Alexis Tucker
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Classrooms, where power, class, and/or cultural differentiations exist among children and their teachers, offer a rewarding setting for cross-cultural communication research. The purpose of this proposed case-study is to investigate the competencies of the communicative practice known as culturally responsive pedagogy in relation to student achievement amongst African-American learners in urban school districts throughout the country. Evidence-based research was used for this quasi-experimental design via the following research **Methods:** facts sheets, pre-post assessments, classroom observations, and survey data. The study findings prompt us to consider how teachers can facilitate healthy cross-cultural adaptation among African-American high school learners, who are seldom the focus of cross-cultural communication research in an educational context.

Howard University's Next 50 Years: Research and Teaching for the Bicentennial

Presenter's Name: Charles Verharen
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Background: Howard University's historical mission is to provide a first-rate education for those who would not otherwise have the opportunity. This essay reflects on the nature of that philosophy of education. Its grounding hypothesis is that the purpose of education is to solve unsolved problems, whether in the lives of its students or in the larger communities that have justified and shaped Howard's continuing existence. On this principle, Howard's mission is research rather than teaching. Rather than forcing research and teaching into opposition with one another, the essay argues that Howard teaches its undergraduate students how to do research. **Method:** The paper proposes several steps to crystallize Howard's methodologies for solving unsolved problems: introducing matriculating undergraduates to Howard's history as a problem-solving institution; inaugurating a years-long process leading to a universal requirement for completing a senior thesis or capstone project; promoting a service learning component that requires all undergraduates to transfer their problem-solving skills to the communities that support the university's continuing existence; assuming responsibility for the life-long learning of its alumni; encouraging alumni to form communities of learning to transfer their problem-solving skills to their wider communities throughout their lives. **Results:**Making undergraduate student research critical to the University's mission in formal ways will underscore Howard's standing as a research university and advance its research capacity. **Conclusion:** A co-evolutionary model of research and teaching sketches Howard's path to its Bicentennial Celebration.

Ethics, Law & Religion

The Relationship between Mental Illness, Neighborhood Disadvantage and Delinquency among African American Youth Arrested in the District of Columbia

Presenter's Name: Brianna Brower
Classification: Graduate Student
Presentation Type: Poster Presentation
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Historical accounts of racial injustice and disparities in healthcare treatment are well documented, and have influenced many African Americans to view the mental health system as a microcosm of a racist society (Brandon, Isaac, & LaVeist, 2005; Whaley, 2001). Due to this stigmatization, minority adolescents are often under diagnosed for a range of mental health disorders, and are placed in juvenile detention centers for poor behavior related to undiagnosed mental illness (Lawson & Lawson, 2013). Exact estimates vary, but the majority of youth within the juvenile justice system meet criteria for at least one mental health disorder (Fazel, Doll, & Långström, 2008), with findings consistently indicating that girls have a greater incidence of mental health disorders than boys (Andretta, 2014; Steadman et al. 2009). Research indicates that youth who reside in high risk urban communities frequently encounter a variety of community level risks factors, which significantly compromises their psychological functioning and increases their likelihood for involvement in the juvenile justice system (Fitzpatrick et al., 2005). This study will estimate the incidence of mental illness, by gender, among a sample of 2,073 African American youth arrested between January of 2015 and March of 2016 in Washington, D.C., and will examine whether there is an association between community socioeconomic disadvantage and rates of delinquency. The study will use an archival data set that was collected as part of a previously established protocol for screening adolescents at the Superior Court of the District of Columbia, Child Guidance Clinic.

Black women in law

Presenter's Name: Ashley Colvin
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The aim of this study is to investigate why black women are less prominent in the law field today. Findings have shown that African American women are still below pre-recession numbers within law firms as of 2017. I based my research on data collected by the 2016 Report on Diversity in U.S. Law Firms published on January 14, 2017. This included an examination of major law firms in the United States who voluntarily submitted statistics of age/gender representation within their firms online. Among law school graduates taking jobs in private practice, minorities are more likely than their non-minority peers to take that job in one of the 21 largest law firm employment markets for new graduates. Women and Black/African-Americans have shown declines in representation at major U.S. law firms, according to the latest law firm demographic findings from NALP. Although women and minorities continue to make small gains in their representation among law firm partners in 2015, the overall percentage of women associates has decreased over the majority of the last five years, and the percentage of African-American associates has declined each year since 2009. By continuing to research and assess data, I will be able to answer the question once presented: Why are black women less prominent in the law profession today?

The Challenges Facing Our Nation: Providing Possible Solutions to Police Brutality Against Citizens in the United States

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Coauthors: Kennedy Watson

Background: Following the shooting of Michael Brown, Jr. by a police officer, many people began to question and

debate whether police were actually using proper tactics and training against civilians. The purpose of this paper is to provide possible solutions to police brutality against citizens and challenge the ways in which police departments are handling situations. **Methods:** The paper provides four different methods of providing potential solutions to police brutality. They include: de-escalation training and how it is implemented in police departments, preparing questions for psychologists to examine the skills and screening police officers are required to complete, the hiring process of police departments in different cities and states, and the many cases of police brutality that have resulted in individuals bleeding out and dying. **Results:** De-escalation training is not very adequate; police departments are starting to investigate better training tactics to use on individuals to avoid the use of excessive force. Qualifications to become a police officer are very basic and should require extensive review. There are many cases of policemen shooting individuals, in attempt of providing care and preventing individuals from bleeding out, emergency medical kit ideas were proposed as a solution to provide immediate medical attention. **Conclusion:** Police departments should be required to thoroughly evaluate applicants and examine any prior history of violent action. Many of the killings that have occurred without any form of medical attention should be given immediate attention. The solutions provided would be beneficial in creating better outcomes in these critical situations.

The Seduction of Ole Massa's Sons: An Examination of Race, Religion, and Sexual Perversion in the Peculiar Institution.

Presenter's Name: Jay-paul Hinds
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Sigmund Freud's "A Child is being Beaten" is a complex essay that examines the etiology of sexual perversions, as evinced, primarily, in beating fantasies. Upon investigation one learns that the essay, written in 1919, demonstrates Freud's still wrestling with the core tenants of a theory he had abandoned almost twenty-years prior: the seduction theory. In sum the seduction theory posits that adults suffer from neurosis because of an abusive sexual experience with a parent (most often the father) during childhood. After an immense amount of criticism from his peers, Freud abandoned the theory, positing, instead, that these experiences were rooted not in reality but fantasy. This presentation argues that Freud's "A Child is being Beaten" provides a unique perspective for our better understanding the sexual abuse of black men during slavery. For one, in "A Child is being Beaten" Freud mentions Uncle Tom's Cabin as a work of fiction that, through its vivid depiction of slave torture, stimulates what he terms "beating fantasies." One would be hard pressed, though, to find instances of children being beaten in Harriet Beecher Stowe's classic novel. What one does read, however, particularly in the case of the story's protagonist, Uncle Tom, is of a black man being beaten by two other black men all for, as I argue, the perverted pleasure of their master, i.e., the plantation patriarch, the lascivious Simon Legree. What seduced Uncle Tom's torturers to perform such an act? And—alas—is this deleterious form of seduction still prevalent today?

Womanism & Advertising Ethics in a Converged Era (Poster Design or Oral Presentation)

Presenter's Name: Joanna Jenkins
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Advertising ethics in mass communications is a topic of critical importance propelled into mainstream agenda by the prevalence of convergence. Once distinct boundaries between media, technology and culture have blurred resulting in indistinguishable advertising. Governing bodies have insisted that advertisers clearly distinguish communications amid a growing number of indistinguishable practices that incorporate techniques such as lifestyle integration, product placement, branded entertainment, and sponsorship. Professional organizations and regulatory institutions have also urged advertisers to revisit advertising ethics in a converged era. The Institute for Advertising Ethics' (IAE) revised its current model, Principles and Practices for Advertising Ethics, to account for complexities associated with indistinguishable advertising and convergence. Despite successful attempts towards ethics and self-regulation, there is room for improvement. Research suggests that gaps are largely attributed to a lack of theory, framework, and sound measure. As a contribution, I recommend the use of Womanism. Although contemporary ethical frameworks have addressed plaguing issues, including social media and privacy, several controversies remain absent from discussion. Advertising ethics in a converged era requires attentiveness to the diverse needs of contemporary audiences and indistinguishable

advertising. Through a theoretical examination of the IAE's current model, I contend that, Womanism—a profound and diverse body of feminist thought—supplies robust insight, rigorous methodologies, pragmatic solutions and inclusive research design, that will contribute to advertising ethics. Through Womanism it is hoped that what is produced in advertising, taught within its curriculum, experienced in its workplace, and consumed by citizens pushes America towards a more complete democratic reality.

The Key Nodes of Impact of the Transatlantic Slave Trade and its Subsequent White Supremacist Ideologies and Models on the work and structures of the Academy in the New World

Presenter's Name: Rachel Leslie
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The impact of the Transatlantic Slave Trade on Western scholarship has been greatly discussed in the corridors of Howard University and other leading universities, particularly, since the Civil Rights' Movement. The Academy has begun to normalize the social critique and analyses of African American and African intellectuals from W.E.B. Dubois and Prof. Angela Davis to Dr. Cheik Anta Diop and Professor Wole Soyinka. However, we have not yet succeeded in fully systematizing our understanding of slavery and its subsequent White supremacist and Eurocentric models on the theoretical models and schools of thought that continue to dominate the Academy. Nor have we fully analyzed the impact of these ideologies on the structures of the Academy itself. It is important for us to understand how the Trans-Atlantic Slave Trade not only led to the alienation of humanity from Africans, but rather how it also led to the alienation of the human, including civilization and its attributes, from the African and consequently, the African-descended. This dynamic extended to theological scholarship. At one time, the Catholic Church declared that Africans had no souls and other churches in the New World prohibited their baptism. This research project aims to identify key cornerstones of White supremacist ideology in the slavocratic New World and examine their impact on the development of scholarship in the Academy during the first centuries of the Trans-Atlantic Slave Trade. Further, we will examine and systematize how those models continue to persist in the work and structure of the Academy today.

The Churches Role in Education Reforming

Presenter's Name: Andrew Lofton IV
Classification: Graduate Student
Presentation Type: Oral Presentation
Faculty Advisor: Zainab Alwani
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According to the Washington Post's latest rankings of America's Most Challenging High schools, Washington International School here in D.C. is ranked first in the Washington, D.C. area. Although, some charter schools outperform traditional schools, it is also true that many charter schools have failed based on some of the problems that occur among students and teachers within their institution. In this paper, I am going to identify the five problems that I have observed within the Washington DC Public Charter Schools and explain what the churches are doing or can do to help rectify the situation. I went to various churches within the Washington DC area to explore what churches are doing to solve the problem. Through my observation, I discovered that various churches were hosting workshops, preparing team activities within their lessons, creating fellowship activities outside of church. I believe that my project is important because through identifying the five problems that I see within the Washington DC Public Charter Schools that the church has a responsibility to help rectify the situation. In conclusion, it is the responsibility of the church to help build a strong foundation for our children.

Breaking the Academy: Universal Education in the Age of Disintegrated Ethics.

Presenter's Name: Anupam Roy
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Presentation Type: Oral Presentation
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The central aim of the paper is to argue for widespread research in the society supported by an alternative research institution. This institution would empower the disintegrated ethics of each individual and ground it in philosophical research. A synthesis of the educational philosophies of Friedrich Nietzsche and W. E. B. Du Bois will serve as a guiding principle in formulating the aims of education, the pedagogy model and the institutional framework of an alternative educational institution that would generate a global education web that teaches philosophical research to a universal audience. The institution would also support primary research of interested individuals through a research clinic that would be open to the public.

Humanities

Reframing African Consciousness and Black Activism in the Soviet World

Presenter's Name: Nia Blasingame
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The Soviet Union played a tremendous role in Black activism and reframing African consciousness during the 1930s-1970s. Looking at the writings of Black activists shows the role. The Soviet Union became vital to many Black activists, particularly Paul Robeson, Langston Hughes, and George Murphy. All the activists wrote extensively on their travels throughout the Soviet Union and their writings explore ideas of reframing African consciousness and also reflect the impact the Soviet Union had on their travels. The writings of these activists also reveal the strong ties Black Activism had with the Soviet Union and how African consciousness was sparked back to life during their travels. Robeson's works reflect the early connection between the Soviet Union and Black activism, what it means to be a Black American activists and how African culture could become prominent again in Black Activism. Hughes and his reflections on his journeys through Central Asia create a connection between the struggles of African Americans and ethnic minorities in Central Asia and how the Soviet Union could be an influence for equal rights for Blacks Americans. Finally, George Murphy in his writings explains the damage of capitalism on Blacks and how the Soviet Union is beneficial to the fight of Black Americans and connecting them to the global fight of the African Diaspora. Robeson, Hughes, and Murphy helped to reframe a lost African Consciousness by looking at the Soviet World.

Moving On, Moving Up: Realities, Relations, and Advancement for Black Women in Post-Apartheid South Africa

Presenter's Name: Ange Dye
Classification: Undergraduate Student
Presentation Type: Oral Presentation
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The effects of apartheid are lingering and evident in South Africa, and previously marginalized and minority groups continue to fight the lasting obstacles created by the political, social, racial, and economic practices of apartheid. This research explores the opportunities for social and economic advancement that exist for black women, primarily those aged 18-35, in post-apartheid South Africa. While in Johannesburg and Cape Town in December 2016, I met, interviewed, and developed relationships with some women who shared insight about their individual experiences and the relation of those experiences to South Africa's history. There were clear pros and cons in my three areas of focus: education/career, healthcare, and family. While much progress has been made, much work remains. This research aims to illuminate both the progress and potential.

Lack of Diversity Within the Media

Presenter's Name: Branson Falker
Classification: Undergraduate Student
Presentation Type: Oral Presentation
Faculty Advisor: Martine Elie
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Purpose: The time of this research looks at the lack of diversity within the media workforce from newsrooms to late-night television programming. The purpose of this research is to analyze the history of representation within media and to come up with solutions for areas of improvement. **Findings:** Representation in television is an area that needs improvement because not all races and ethnicities are depicted on our television screens. The importance of diversity is essentially pivotal because it enables viewers to see a different perspective and accurate representation from people of difference races, sexes, ethnicities, sexual orientations, socio-economic classes and overall backgrounds. **Design/method/approach:** The first part of this research examines race relations on camera and gives percentages of diversity in many media outlets through observation and quantitative research will be conducted to get the numbers. Additionally, this research will take a physical look through the years of late-night television programming and examining the lack of diversity and how most late-night television hosts are white men. **Conclusion:** This research concludes with solutions and ways to promote more diversity and overall opportunities for equality for future generations of media professionals.

Keywords: research, diversity, programming, solutions, media, television, ethnicity, sex, newsrooms, representation, late-night television.

New Master, Same House: The Paradox of Black Women's Self Ownership in Beyonce's Lemonade

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In Lemonade, Beyoncé is very much commoditized, but also reimagines Black women's navigation of the market. As a human commodity, Knowles occupies the unique position of determining her exchange value; she possesses an inherent knowledge of her worth in relation to the market. This paradoxical role-play establishes the paradoxes that frame the film. The autonomy that Knowles asserts through self-commodification is realized to an extent, but not without the racist and sexist undertones that mar American society. Beyoncé recalls the ugly history associated with America's formerly slave-based society, attempting to rebalance the power dynamic between Black women and the oppressive society that surrounded and continues to surround them. Knowles intentionally re-engages with the antebellum South in order to re-imagine the roles that Black women were allowed to play during the period. In this presentation, I will analyze the Southern aesthetic in Lemonade and Knowles's reliance on or subversion of these images, forcing a paradox between history and an idealized future for Black women. Using antebellum and modern Southern aesthetics, Knowles presents Lemonade as her journey away from the capitalist structure that oppresses Black women. For all the empowerment she offers, the ties of disadvantage that bind Black women to capitalism are not broken by the film's end. As a result of learned performances for survival and the weight of the heteronormative structure that pressures women to acquiesce, the shadow of patriarchal capitalism looms large over Black women's attempts at self-ownership in the film.

A Crowdsourced, Comprehensive Database of Rare Diseases Prevalent Predominant in People of African Descent: The Case Study of Noma

Presenter's Name: Noble Htar
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A rare disease is defined rare in USA when it affects fewer than 200,000 Americans at any given time. Over 7000 rare diseases are characterized by a broad diversity of disorders and symptoms that vary not only from disease to disease but also from patient to patient suffering from the same disease. Particularly, such diseases are largely neglected in the population of African Descent including African Americans, due to the lack of health care services or lack of education to emphasize on the importance of the disease. Herein we report our ongoing efforts of building database via the crowdsourcing approaches, i.e. to solicit contributions from various types of research on the studies, mainly via the online sources followed by strict data verifications. Specifically we focused on Noma disease. Noma is an opportunistic infection promoted by extreme poverty. It evolves rapidly from a gingival inflammation to grotesque orofacial gangrene. It occurs worldwide, but is most common in sub-Saharan Africa. The main victims of Noma are children aged 1 to 6 years, coinciding with the period of linear growth retardation in deprived children. The main purpose of this research is to collect and analyze biomedical and chemistry data about Noma. All the information gathered has been indexed at https://sites.google.com/a/xswlab.org/diseases-prevalent-in-african-american/ which is easily accessible to the public. This database provides much-needed resources to educate the public about Noma's signs and symptoms, cause and predisposing factors, management and treatment, also to facilitate researchers to develop orphan drugs for rare diseases including Noma.

Looking Inside: Black Women's Literature and Healing from Crimes against the Black Female Body

Presenter's Name: Dominique James
Classification: Undergraduate Student
Presentation Type: Oral Presentation
Faculty Advisor: Rachel Watson
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There exist many examinations of violence against black women. For example, the history of racialized and gendered violence has been discussed as with the actual ways violence manifests and operates today. However, there are very few inquiries on healing methods. Sassafrass, Cypress, and Indigo by Ntozake Shange, The Color Purple by Alice Walker, The Salt Eaters by Toni Cade Bambara, and Good Woman by Lucille Clifton, offer examples of nonclinical healing methods utilized by black women who have faced sexual and physical violence. Because the responses of the characters do not operate within the rigid structure of psychoanalysis and trauma studies, these theories must be augmented if not disregarded altogether. Drawing from these texts, diaspora wide black women's liberation theory, and archival research conducted in South Africa, I highlight systems of healing that come from Black thought/thinkers and address sex crimes in deeper, systematic ways than the current western frameworks do. I demonstrate the inadequacies of current frameworks and, in response, synthesize and present the methods suggested by the texts themselves. The healing in the novels can offer guidance to victims and expand the conversation beyond analysis and towards productive and collective recuperation.

ReDefining Entertainment in the Digital Age: Is digital streaming the new wave of programming for regular entertainment?

Presenter's Name: K.giselle Johnson
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Faculty Advisor: Aitza Haddad
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This research explores how entertainment is indeed being re-defined and argues the idea of network television and the monotonous way of programming are on the road to extinction. Netflix, Amazon Instant Video, Hulu, YouTube, are just a few of the many new ways of watching entertainment that seem to pop up for audiences every day. The purpose of this research is to identify the cause for the trend and why it is growing. Looking at three variables: content, cost and convenience, surveys will help draw conclusions as to why digital streaming is taking over the way we watch television and movies. Focus groups will also be administered through screenings of content broadcasted on cable television and streaming platforms, to understand the audience demographic and whom this entertainment is appealing to the most The screenings will consist of shows of the same genre, which will help the participants compare the content. These results will help to answer the "why" of the trend opposed to the "how". Therefore, the study aims to provide information about why certain demographics are more drawn to digital content opposed to others, based on age, geography and financial income. The study will focus on the cognitive process of the audience in their decision to cancel cable subscriptions and their recognition of how the entertainment world is changing.

Study Abroad: Minorities vs. Non-minorities

Presenter's Name: Monica Johnson
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Studying abroad allows students to improve their interpersonal and intercultural skills, as students are introduced to new ways of life, different views of the world, and new ways of doing things. For college students study abroad is vital, because it helps prepare them for the increasing number of internationally based jobs. Howard University and other HBCUs (Morgan State, Bowie State and Norfolk State, for example) encourage their students to study abroad to get that competitive advantage. However, do African Americans have the positive experiences necessary while abroad to prepare them for the international work force? Are the negative experiences they encounter rare occurrences with no significance or is there an underlying pattern to them? The US has a strong stance on inclusion in terms of diversity and gender equality. The assumption is that other countries feel the same, yet that may not be true. Will an African American have the same experience in Europe as in Africa? Will a woman have the same experience in Asia as in the Middle East? This study sought to answer whether minorities are more likely to have negative experiences while studying abroad than non-minorities, a topic overlooked by study abroad programs. If so, what are they due to-- lack of preparation, discrimination, extreme culture shock or other factors? Research methods included mixed qualitative (blog reviews) and quantitative (survey) approaches. The preliminary results suggest that minorities are more likely to have negative experiences, mostly due to discrimination in specific parts of the world.

Labor of Love: Literary Criticism in the Creative Writing of Fanfiction

Presenter's Name: Khaliah Peterson
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Presentation Type: Oral Presentation
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Fanfiction is amateur writing that takes literary elements from a chosen source text and uses them to create new works. Using the fanfiction produced by Harry Potter fans, I will show that by reading and writing fanfiction, readers are critically consuming the source text and that their response constitutes an informal form of literary criticism, one that critiques racial norms.

In focusing the presentation in treatment of race in Harry Potter by fanfiction writers, I will introduce relevant critical theory to highlight the gaps in the source text to which the fanfiction writers are responding. I will present a subsequent close reading of the fanfiction that demonstrates the ways it challenges pre-existing assumptions about race by commenting on issues such as double consciousness, constructed whiteness, and colorblindness. I will introduce the fan narrative, "Black" by a fanfiction writer who has assumed the pseudonym Potterworm. I will use this story to discuss the way this writer deconstructs the fictional world of Rowling's series and reshapes it by using racebent characters to construct a minority voice and perspective. I will show that by doing so, Potterworm is able challenge the assumption of default white characterization in literature. Fanfiction has struggled against a long-standing assumption that it is an illegitimate form of literary production. By demonstrating that fanfiction writers engage in literary criticism, this presentation will prompt scholars to reconsider the literary merit of fanfiction, a form of critical analysis accessible to readers of all ages and educational backgrounds.

Lack of Diversity in the Film Industry

Presenter's Name: Maya Reese
Classification: Undergraduate Student
Presentation Type: Oral Presentation
Faculty Advisor: Martine Elie
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Major television networks have a tendency to only refer to African-Americans in instances of being ghetto or criminalized. According to Entman and Rojecki (2001), African Americans appear in stories most often about crime, entertainment, and sports. They further stated, "the number of soundbites on foreign affairs uttered by Whites: 99; by Blacks: 1," whereas, "the number of soundbites on economics uttered by Whites: 86; by Blacks: 1." Likewise, a study conducted at the University of Southern California revealed that in 2014, 73.1 percent of the top 100 films produced that year had a white-only cast. Whereas, only 17 included a non-white lead or a non-white co-lead actor. The purpose of the research is to investigate the diversity in the film industry. The Oscar nominated movies of 2015 will be reviewed to determine the level of diversity amongst leading role characters. These research findings will substantiate the question -- does America need to diversify its media portrayals?

The Black Press

Presenter's Name: Bre'onna Richardson
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The black press was officially established back in 1827 when Samuel Cornish and John B. Russwurm founded Freedom's Journal. The black press has given African Americans a voice and an outlet. According to Columbia Journalism Review, mainstream media is the more popular source of current events in comparison to the black press among consumers. This research will explore if African American college students, between ages 18-21, receive their news from the black press. This research will be conducted through a survey of Annenberg Honors students.

Colorism: Am I Too Dark?

Presenter's Name: Fatou Sow
Classification: Undergraduate Student
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Faculty Advisor: Martine Elie
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Coauthors: Martine Elie

Colorism is a global problem among people of color throughout the African diaspora. Colorism is a process that discriminates against individuals with a dark skin tone, typically among people of the same ethnic or racial group. The purpose of this research is to determine if colorism

affects women aged 18-25 in African-American communities in the United States as well as determine how it may affect them physically and psychologically. Colorism is indirectly displayed in the media portrayal and casting of women of different skin hues. The same can be said for women in the community as a whole. The present study will investigate the experiences that college aged women have had relative to colorism.

The Impact of the Obama Family's Use of Social Media to Portray Familial Images on African-American Millennial Views of Marriage

Presenter's Name: Sydney Wilson-roberts
Classification: Undergraduate Student
Presentation Type: Oral Presentation
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This study seeks to address whether the Obama Family's use of social media to display their family images has impacted the millennial African-American views on marriage. There has been an apparent decline in marriages within the black community over the past few decades; but, there has been a resurgence of images that feature positive black families with married parents. President Obama and his wife, Michelle, are avid users of social media to communicate their platforms, community activities as well as give a glimpse into their personal lives and ultimately portray familial images. This study will examine the perceptions of the postings due to the extensive use social media and online usage by millennials. In order to gather the data necessary to address these research questions both quantitative and qualitative methodologies will be used. The methods that will be used are a questionnaire and series of interviews. The questionnaire will show, in numbers, how many people are affected by the Obama's familial images on social media as well as how they are affected. The series of interviews will give deeper insight into why participants feel the way that they do towards the postings by the Obama family.

Physical Sciences & Engineering

Functionalized Silica Magnetite Nanoparticles for Magnetic Removal of Lead from Aqueous Solutions

Presenter's Name: Naomi Adams
Classification: Undergraduate Student
Presentation Type: Poster Presentation
Faculty Advisor: Stacie LeSure
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Although there are numerous types of water remediation methods, most reveal economical and technical disadvantages, sensitive operational conditions, significant energy usage, and inefficient removal when metal concentrations are not that high. However, among these methods, magnetic absorption based methodologies have been of interest to environmental researchers due to it's simplicity, cost effectiveness, and environmental friendliness—In principle, absorption cannot only remove heavy metals but recover and recycle them back into the industrial process. The magnetic removal of Pb2+ from water has been assessed using functionalized silica coated magnetite particles (Fe3O4@SiO2-TEPA). The magnetite particles were first prepared by hydrolysis of FeSO4 and their surfaces were modified with amorphous silica shells that were then functionalized with tetraethylenepentamine. These magnetic nanoparticles were characterized by transmission electron microscopy (TEM), Scanning Electron Microscope (SEM), Energy Dispersive Spectroscopy (EDS), and Fourier Transform Infrared Spectroscopy (FT-IR). The adsorption properties of Fe3O4@SiO2-TEPA nanoparticles for the removal of Pb2+ in wastewater were deeply studied, and tested. In conclusion, these nanomagnetic particles show great potential for the removal of heavy metal ions of polluted water, via magnetic separation.

Non-standard Finite Difference (NSFD) Schemes : Achieving Dynamical Consistency

Presenter's Name: Oluwaseye Adekanye
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Coauthors: Talitha Washington

Many real world phenomena can be modeled by dynamical systems that describe the evolution of phenomena over time. For example, the growth and decay equation models how a quantity changes over time. The transport equation with a flux term models the flow of a particle through a given medium. The Airy equation models the diffraction of light. Using the growth and decay equation, we can develop the foundation for an exact nonstandard ?finite difference scheme (NSFD) which can preserve properties of the dynamical system into its discretization (dynamical consistency). Some equations require the NSFD scheme to adhere to time and space step size constraints. In this talk, we will show how to construct NSFD schemes that outperform the traditional standard finite difference schemes.

Effect of Sorted Single-Walled Carbon Nanotubes on Rate Capability of Lithium-ion Batteries

Presenter's Name: Adewale Adepoju
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Lithium iron phosphate (LFP) is a promising cathode material for Lithium-ion batteries. LFP has many unique properties like great thermal stability, high energy density, and excellent cycle life. However, one disadvantage to LFP is its low rate capability (C-rate). To overcome this disadvantage, we incorporated single-walled carbon nanotubes (SWCNTs) into the electrodes of LFP batteries. SWCNTs have emerged as one of the leading additives for LFP batteries due to their ability to enhance electrode conductivity and charge/discharge rate for high power applications. The incorporation of SWCNTs create a better electrical percolation network thereby enhancing the rate capability. To this end, LFP coin-cell batteries were fabricated with the addition of metallic and semiconducting SWCNTs. Measurements were made on the rate capability and cycle stability. Comparison measurements have shown LFP with SWCNTs incorporated into the cathode material have better C-rate with a modest improvement in cycle stability.

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

Presenter's Name: Iman Ahmed
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Graphene is a 2D crystalline hydrocarbon, with inherent properties that make it a good candidate for a diverse range of applications in electronics, optics, and chemical sensing. Functionalized graphene nanoplatelets have exhibited enhanced mechanical, thermal and electrical properties. This study comparatively analyzes physical 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.

Precision and Accuracy of Fused Deposition Modeling (FDM) 3D printed parts across three grades of printers.

Presenter's Name: Tolulope Akingbade
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The goal of this study was to measure the accuracy and precision of samples printed on 3 grades of 3D printers. These printers, which all utilize Fused Deposition Modeling (FDM) technology, were the Afinia H480, Makerbot Replicator + and uPrint SE. The highest grade of these printers was the uPrint and the lowest grade the Afinia H480. All samples were printed in the thermoplastic Acrylonitrile Butadiene Styrene (ABS) except for with the Makerbot Replicator + which prints in PLA (PolyLactic Acid). The STL file printed was the ASTM D638 standard tensile testing sample scaled down by a factor of .80 with altered thickness of 0.1968in. These samples were printed simultaneously 5 times on each printer. The dimensions of these prints were compared amongst each printer and to the dimensions of the STL file. The Afinia showed the greatest percent accuracy when compared to the theoretical dimensions of the STL file with a value of 5.664211328%. The samples were then tensile testing to obtain their Young's Modulus and Yield Strengths for comparison. The study yielded a maximum standard deviation in dimensions of 0.043054616in. in parts printed on the Afinia, 0.007135592in. in the uPrint and 0.007778175 in the Makerbot Replicator +. The maximum standard deviation in yield strength in parts printed on the Afinia was .034205263 ksi, .042568741 ksi in the uPrint and .056589747ksi in the Makerbot Replicator +. The highest standard deviation in Young's Modulus was .007415828ksi in the Afinia, .008423617ksi in the Makerbot Replicator and .0097412364ksi in the uPrint.

Modeling of Current density in Cathode materials with Nano Particle for Lithium Ion Batteries.

Presenter's Name: Misagh Alaie faradonbeh
Classification: Graduate Student
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Lithium ion battery is the one important research for finding high efficiency in electrical storage. This kind of battery is used for electrical and electronic instruments and stations such as electrical storage in wind and solar power station, electrical car, mobile and etc. One method for making fast charging and discharging process in lithium ion battery is changing electrical conductivity and electron transferring. Electrical conductivity in lithium ion batteries can be changed by using different materials in cathode and anode. In this research cathode material is changed by adding different Nano particles to the model. Comparison of different shape of Nano materials in lithium ion battery's cathode for electron transferring is analyzed by mathematical algorithm and model. In this research mathematical algorithm is programmed for special model and running by software to improve output current density and electron transferring in lithium ion battery's cathode. Then actual curve is showing by output data which are reached by running the program. Also mathematical fitting function is found for the actual curve.

Adsorption and Separation of Water and Nitrogen Mixtures on a Graphene Substrate

Presenter's Name: Hawazin Alghamdi
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In this work we study the adsorption of H2O and N2 mixtures on graphene by using the method of Molecular Dynamics. We run the simulations at constant temperature from 200K to 500k. The H2O molecule is modeled as a 3-point rigid system and N2 is considered a spherical super-atom with Lennard-Jones interactions. The substrate is a rigid graphene layer located at the bottom of the simulation cell. The LJ parameters of interaction between the molecules and the graphene are calculated by fitting the atomistic pair-wise sum of carbon-atom interactions with the 9-3 potential. We calculate the selectivity of H2O/N2 on graphene to test the capability of graphene to separate the water or nitrogen from the air.

Simultaneous Transformation of Co-existing Cr(VI)-TCE Contaminant Media Using Zero Valent Iron, ZVI.

Presenter's Name: Daniel Attoh
Classification: Graduate Student
Presentation Type: Oral Presentation
Faculty Advisor: Ramesh Chawla
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Industrialization has helped advanced science and technology at the cost of contaminating the natural environment. Contaminants from industrial effluents can leach through the earth crust, adsorb onto soil particles and pollute subsurface aquifers, groundwater and portable water sources. Among the numerous co-contaminants in groundwater and subsurface aquifers, Hexavalent Chromium, (Cr(VI), and Trichloroethylene, TCE, have been classified by the USEPA as known carcinogens. Thus, remediation efforts to convert them into non-toxic forms are a priority. Survey of recent research literature, show many successful attempts using ZVI, to individually reduce Cr(VI) and de-halogenate TCE. However, none of these studies have attempted investigating simultaneous transformation of these co-contaminants and the associated synergistic and antagonistic effects. This project aims at using ZVI as a single transforming agent to degrade co-contaminant media of Cr(VI) and TCE, determine kinetic parameters and degradation efficiency. To achieve the above objectives, it was hypothesized that using ZVI to simultaneously degrade Cr(VI) and TCE in aqueous may statistically impact the effectiveness of the ZVI. To test this hypothesis, different concentrations of Cr(VI) and TCE were reacted with ZVI at ambient temperatures(25oC) in acidic medium(pH≤2). Amounts of Cr(VI) and TCE degraded were quantified using Gas Chromatography and UV-VIS Spectroscopy respectively and degradation kinetics determined. The data obtained from the experiments shows that increasing amount of ZVI positively impacts the extent of Cr(VI) and TCE reduction. Also, with both Cr(VI) and TCE competes for available ZVI, the quantities used for degradation must be more than the combined stoichiometric.

The Effects of Household Co-solvents on Trichloroethylene Solubility

Presenter's Name: Timara Benson
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Coauthors: Dhruba Paudel, Apsara Williams, Ramesh Chawla

Physical/chemical or biological remediation of sites contaminated with hazardous wastes with low aqueous solubility, is often limited by mass transfer of contaminants from the soil surface to bulk phase, consisting of reactive aqueous medium. To reduce the surface tension between soil and organic contaminants, alcohols and household detergents were used as co-solvents to increase the aqueous solubility of chlorinated contaminants. Criteria for co-solvent selection were developed, which would lead to an inexpensive and nontoxic addition of the most efficient additive for subsurface remediation. Relative efficiency of various co-solvents were determined under the same conditions for trichloroethylene (TCE) spiked samples. The effects of electrolyte addition was also studied under similar conditions of spiked samples. Potassium permanganate (KMnO4) was reacted with TCE and the selected co-solvent to determine the relative reaction and mass transfer resistances. Results of these studies will be presented and their significance to hazardous waste site remediation will be discussed. Analysis of chemicals will be done with gas chromatography and spectrophotometry.

Transfer and Characterization of 2d Graphene and Hexagonal Boron Nitride on to Silicon Carbide

Presenter's Name: Anthony Brandon
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The growth and development of 2D materials consists of several different techniques. In this experiment we are looking at the techniques of metal etched transfer and electrochemical delamination (bubble) transfer. These two techniques aid in the transfer of thin film materials from one substrate to the next without the use of toxic gasses. To ensure that the transfer is successful, Raman spectroscopy and scanning electron microscope (SEM) images are taken and analyzed. When transfer is complete, the samples will be analyzed further with an atomic force microscope (AFM Cypher). Hall measurements will be conducted of the samples using the Vander Pauw method to determine the mobility, resistivity, and other Hall values. The sample is going to be fabricated on silicon carbide, with CVD grown graphene and transfered hBN.

Identification With Machine Learning Algorithm: K-Nearest Neighbors

Presenter's Name: Alston Clark
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The objective is to identify each of a large number of black-and-white rectangular pixel displays as one of the 26 capital letters in the English alphabet. The character images are based on 20 different fonts and each letter within these 20 fonts will be randomly distorted to produce a file of 20,000 unique stimuli. Each stimulus will be converted into 16 primitive numerical attributes (statistical moments and edge counts) which will then scale to fit into a range of integer values from 0 through 15. We will train on the first 16000 items and then use the resulting model to predict the letter category for the remaining 4000. Conveniently the dataset is public and can be found in the UCI Machine learning repository (Letter recognition dataset). We will be using the K-Nearest Neighbors machine learning algorithm for this task and will compare the accuracy of the results to the work done by P. W. Frey and D. J. Slate done in 1991 on the same dataset. The research for their article investigated the ability of several variations of Holland-style adaptive classifier systems to learn to correctly guess the letter categories associated with same vectors of 16 integer attributes extracted from raster scan images of the letters. The best accuracy obtained was a little over 80%. The end goal is to have an idea of the thought processes that go into the selection of machine learning algorithms for solving various tasks.

Method to Characterizing the Thermal Conductivity of Microchip Packaging Material Using Thermal Cycling and a Modified Cut-Bar Method

Presenter's Name: Zion Clarke
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Presentation Type: Poster Presentation
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Coauthors: Jeantelle Francis

Understanding how a material will behave at various temperatures is an essential design component for the microchip industry. Microchips packaging consist of various materials that often undergo thermal cycling. Thermal cycling occurs when a system is exposed to alternating levels of heating and cooling. When material is packaged together in microchips and one material cools at a faster rate than another it affects the efficiency of the system. Copper (Cu) and Niobium (Nb) are traditional microchip packaging material. While there is vast data available concerning the effects of thermal cycling and heat transfer for Cu, little is known about how Niobium's properties are affected in this type of environment. A materials thermal conductivity measurement and its temperature gradient are used to calculate its heat transfer rate. For this research project the thermal conductivity of Cu and Nb is characterized as they undergo thermal cycling between 298K and 4K. The experimental method used in this research project is a modified set-up of the traditional cut bar method. The cut-bar method sandwiches one unknown and two known materials with a cold mount at the base and a heat source at the top. The proposed modified method eliminates the need for two known materials. Cu is utilized as the known material and Nb the unknown. Preliminary testing verifies that thermal conductivity for the select material decreases as the temperature increases and that this can effectively be measured by the modified.

Theoretical/Virtual Synthesis of Ultra Thin Diamonds: Chemically Induced Phase-Change in Graphene

Presenter's Name: Pratibha Dev
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Calculations show that one can create well known materials, but with quasi-2D thinness, such as ultra-thin diamond at ambient conditions. Earlier works [A. Kvashnin et al., Nano Letters 14, 676 (2014)] and our preliminary calculations show that a few layers of graphene, when appropriately functionalized, will spontaneously form multi-layer diamond. On the other hand, conventional approaches of making diamond in laboratories require exceptionally high temperatures and pressures to convert weakly-interacting sp2-bonded layers in graphite into strongly bonded, three-dimensional sp3-bonded diamond. In particular, these ultra-thin diamonds were investigated for their possible use in quantum computing. This was done by creating a nitrogen-vacancy defect center (NV-center) in the ultra-thin diamond. This work is the first step in eliminating the twin-issues of expense and fabrication difficulties, thus enabling practical application of the system in quantum technologies.

Performance of Lithium Iron Phosphate (LFP) with modified electrode material

Presenter's Name: Mohamed Doumbia
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Presentation Type: Poster Presentation
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Lithium iron phosphate (LFP) is a leading candidate for the cathode material to be used in rechargeable batteries. LFP has many highly desirable characteristics which includes high energy capacity, low toxicity, slow self-discharge, no memory effects, high power-density and great cycle ability. However, one downside is LFPs intrinsically low electronic conductivity. Our goal is to improve electronic conductivity through the bulk material through the introduction of gold nanoparticles (AuNPs). Initial testing reveals that the addition of AuNPs modestly increases the charge/discharge rate of our batteries. Preliminary comparison data is presented for our batteries made with and without the inclusion of AuNPs in the cathode composition. Charge/Discharge cycle testing data will be shown for battery pairs made with and without the addition of AuNPs. Finally, further testing also shows that the LFP cathode material does not lead to energy capacity fading or other observable deleterious effects.

A Novel Synthesis for the Darunavir Core

Presenter's Name: Tiffany Ellison
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Presentation Type: Oral Presentation
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Highly Active Antiretroviral Therapy (HAART) is currently recommended for human immunodeficiency virus (HIV) management. HAART is a combination therapy that consists of three or more antiretroviral drugs that target different stages in the HIV life cycle. Darunavir is a protease inhibitor that is essential to second-line HAART therapy. Due to the heavy financial burden of second-line HAART therapy, millions of people in low- to middle- income countries could lose access to this treatment. The design of a more cost-effective synthetic route for the core of darunavir is essential for continuing access to HAART treatment in low income countries. The key to lowering the cost of darunavir is replacing the expensive chiral epoxide with a less expensive starting material. This work presents a more cost-effective route for synthesizing darunavir using tert-butyl (S)-(4-chloro-3-oxo-1-phenylbutan-2-yl)carbamate instead of the expensive chiral epoxide.

Utilizing Cryogenic Cycling and the Comparative Cut-bar Method to Characterize the Resistivity of Copper and Niobium

Presenter's Name: Jeantelle Francis
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The purpose of this research is to effectively find the electrical resistivity of Copper and Niobium. The ability to identifying the resistivity of these materials gives us the opportunity to use the materials more extensively within mechanical designs. Electrical resistivity is defined as the ratio of the voltage applied to the electric current which flows through it. In this project, we design, fabricate, and test an automated

and/or semi-automated method to test the electrical resistivity of the sample materials. To test the material, the Comparative Cut Bar Method is used. This method, which is widely used, is well suited for this experiment because it is specifically recognizes axial thermal conductivity. The sample will be placed between Copper bar references. One of which will act as a coolant while the other as a heater. The temperature of the test sample will be regulated using a cryostat as a constant electrical current is applied. The software we have generated will collect and process the voltage. After the processing is finished, the software will calculate and output the values of the electrical resistivity.

Development and Optimization of Machine Learning Algorithms & Models of Relevance to Large Databases Using MatLab

Presenter's Name: Jamal Gilmore
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The issue with the threat of terror is that there is usually no way of knowing when and where it will strike. One trending characteristic of attacks are posts on social media outlets, prior to their occurrence. Theoretical programming which has been developed to retrieve data indicating such intentions can in principle provide a barrier to such threats. Through the use of MATLAB (Matrix Laboratory) software, a numerical matrix computer and programming language, text-mining may be used to accomplish the objective of halting extremist violence before it happens. The methodology for using MATLAB is as follows: scan massive amounts of text, categorize the information, read through the information to find key words, store found key words in a database. Key words can be found through the use of machine learning algorithms, which provide continuous relevant word findings. Optimally programmed scripts have been shown to improve the efficiency of locating the key words. Small-scale observations on social media downloaded data subsets have yielded 97.46 % word discovery of known key words. Further research with larger data sets are expected to yield better results with less uncertainty.

Location-based Lightweight Security for Wireless Communications in ROAR Architecture

Presenter's Name: Sean Grant
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Dynamic spectrum access is considered an emerging technology for spectrum efficiency where secondary unlicensed users access primacy licensed bands in an opportunistic manner. Because of the openness in dynamic spectrum access enlivenment, malicious users could mislead the overall communication resulting in no wireless services to legitimate users. For instance, when secondary user queries the RF spectrum database, it sends a query along with its geolocation which could be intercepted and hijacked by the malicious users to attack the systems or block the secondary users from using available RF spectrum. To solve this problem, we develop lightweight encryption technique where location of the secondary user is used as an encryption key to provide security by leveraging the Real-time Opportunistic Spectrum Access in Cloud-assisted Cognitive Radio Networks (ROAR) architecture. The proposed location-based lightweight encryption technique leverages the secondary user's location (latitude, longitude and altitude) information, which is assumed to be unique at a point in time, to encrypt the data being transmitted to protect the system from possible malicious attacks. This approach has two stages: first, share the location information (i.e., longitude, latitude and altitude) secretly using pre-shared string with the geolocation spectrum server. Second, the secondary users use their location information to encrypt the message being transmitted between them and geolocation spectrum server. A key feature of this approach is if a malicious user tries to send data to the geolocation spectrum database, malicious action will be detected and malicious users would not get the service for dynamic spectrum services.

Method for automated measuring of residual resistance ratio and superconducting transition temperature of single substrate materials in superconducting microchips

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Fabrication of superconducting microchips for increased energy efficiency requires accurate characterization of electrical and thermal properties of materials in the assembly. Superconducting materials lose electrical resistance at a specific low temperature known as the transition temperature. At zero kelvin all superconducting material theoretically loses its resistance. However, in reality conductive materials do not lose their electrical resistance entirely, always containing a small electrical resistance called residual resistance. The Residual Resistance Ratio (RRR) is used as quality number for defining the purity/impurity concentration of conductors. The higher the RRR value, the higher the purity of the conducting material. The purity of the material impacts its performance. This research experiment tests copper and niobium in a liquid helium cryostat that cools from room temperature to 4K. A constant electric current is applied to the test samples at ambient temperature and at 4K. A MATLAB script collects and process the data from a Nano-voltmeter and automatically calculates the resistance of the sample. This data provides the information necessary to calculate the RRR and superconducting transition temperature. The transition temperature of Niobium is theoretically between 9.2K and 9.5K. The Niobium test results will be compared to the following theoretical values. However, high purity copper has a theoretical value RRR of 860 with electrical resistivity of 0.002 * 10-8 Ω*m (residual resistance) at 4K and 1.72 * 10-8 Ω*m at room temperature, which is low implying readily allowable flow of electrical current. Once the lab copper samples are test at 4K RRR.

The Establishment of the Cobb Lab's Information System

Presenter's Name: Whitney Griffith
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In this paper, an Information System is defined as a comprehensive collection of digital data that provides an organization internal and external benefits. The Cobb Lab's Information System incorporates all existing data available on each specimen in the lab (Bio-histories, clinical records, 2D and 3D imagery, genomic data, associated microbial and viral data, past research) as well as the lab's operational records (funding sources, lab maintenance, researchers information, administrative information...). The internal benefit for creating such a system is that it helps streamline, focus and coordinate the copious activities of the lab so that a more efficient workforce can be attained. In turn, this enables the lab to focus more time and efforts on external affairs such as branding ourselves in the research world, and increasing our research efforts. This information system will be manifested in the form of an android, iPhone and windows mobile application as well as a cloud based database. However, before the tangible products (mobile application and cloud based database) can be implemented several steps have to be taken. Once the Cobb Lab's Information System is established, the W. Montague Cobb Research Lab will technically become a NextGen Research Lab, that is, a world renowned leader in African Interdisciplinary Research.

The Influence of FDB Build Parameters on the Mechanical Properties of 3D-Printed Acrylonitrile Butadiene Styrene (ABS)

Presenter's Name: Kemar Hibbert
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Background: The goal of this study is to investigate the effects of build parameters such as raster angle, layer thickness, and interior fill style on the mechanical properties of 3D-printed Acrylonitrile Butadiene Styrene (ABS) produced via fused deposition modeling (FDM). **Methods:** The experiment was conducted via the full factorial experimental design incorporating a 2-level, 3-factor design

with raster angle, layer thickness, and interior fill style being the factors under analysis. Tensile tests were carried out, per ASTM D638, at four different strain rates to determine how the build parameters influence the mechanical properties of ABS and to assess its strain rate sensitivity under quasi-static loading. **Results:** Preliminary results showed that the raster angle significantly affected ABS's modulus of toughness. Of paramount interest was the presence of craze yielding- a phenomenon only seen in the specimens built with the [-45°/45°] raster angle. The interior fill style influenced the yield strength and ultimate tensile strength (UTS) of ABS. However, the main effect of the layer thickness was inconclusive. ANOVA confirmed statistical significance of the results, while Digital Image Correlation (DIC) was used to investigate the propagation and breakdown of crazes in ABS. Finally, ABS exhibited modest strain rate sensitivity with all mechanical properties investigated in this study. **Conclusions:** The results indicated that the mechanical properties of the ABS are heavily influenced by the investigated build parameters. This research can be used to advance the principles of FDM to levels in which it can compete with, compliment, and eventually exceed some of the capabilities of traditional manufacturing processes.

The Preparation of Isoflavones and Chromones Used for Hydroxylase and Prenyltransferase Enzyme Assay in Miroestrol Synthesis

Presenter's Name: Kaila Holloway
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Miroestrol is a phytoestrogen compound found in the Thai herb Pueraria mirifica that mimics the biological activity of the hormone estrogen. Because of its advantageous properties, the compound is widely used throughout the Thai community as an herbal hormone supplement that is believed to relieve menopausal symptoms and reduce wrinkles (Patisaul & Jefferson 2010). Although miroestrol is biosynthesized in Pueraria mirifica, it can only be extracted in trace amounts. By chemically synthesizing the compound, larger quantities are able to be obtained and used. This study aimed to chemically synthesize miroestrol through a proposed synthesis pathway, by first synthesizing an intermediate in the reaction. A proposed mechanism for the synthesis of the intermediate, 5-(7-hydroxy-2H-chromen-3-yl)benzene-1,2,4-triol, was tested, and will be used for the synthesis of miroestrol once the expected product is obtained. The first two reactions in the intermediate synthesis were esterification and acylation. After refluxing, washing, separation using column chromatography, and NMR spectrometry, multiple trials showed that the esterification reaction was successful in producing the expected product. The acylation included reacting the chemicals over an ice bath for two hours, then washing and separation by column chromatography. When the product from the acylation was put through the NMR spectrometry, there was a discrepancy in the results. After multiple trials of the esterification and acylation reactions, it was concluded that the procedure for esterification was successful, while the procedure for the acylation must be retested to ensure that the correct product is continuously obtained before moving forward with the intermediate synthesis.

Chemistry within compressed alkali azides (NaN3, KN3)

Presenter's Name: Nicholas Holtgrewe
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The pursuit for greater high energy density materials (HEDM) continues to be an experimental challenge in the field of material science. HEDMs contain large amounts of chemical potential energy stored in the compact form of chemical bonds, and provide a substantial amount of energy release into the surrounding environment when activated. All-nitrogen containing material would be a great candidate for the ultimate HEDM[1], decomposing to harmless N2 in the atmosphere, but its synthesis either remains unreasonable (cg-N[2], NaN3[3]). Here we explore alternative routes to generating HEDMs using a combination of photochemistry/ heating and pressure[4] with alkali azides (MN3, M = Na, K) as precursor molecules. We report on the generation of new Nx ($x \geq 3$) molecules or MxNy phases from application of either laser heating or femtosecond laser light (varying frequencies). The mechanism for photochemically produced species is absorption into the conduction band, supported with evidence from tuning the excitation frequency and detection by Raman and/or IR spectroscopy[5]. X-ray diffraction data shows no apparent changes in the structure unless laser heating is applied. We find the generated products can be decompressed to nearly ambient pressure (~1-2 GPa) at room temperature before the onset of decomposition.

Analysis and Predictive Modeling of Alumni Donations

Presenter's Name: Maalik Hornbuckle
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Universities are increasingly depending on alumni donations more than ever. Statistical models of alumni donor data can help to decrease the cost of soliciting process by predicting the likely donors at various levels. Currently, only 9% of Howard University alumni donate annually. We studied the rich alumni dataset at Howard University to identify the strongest predictors of donor response. We merged the alumni data with the census data for the median income of counties where the alumni lived. In our efforts to predict the "last gift amount" by a single alumnus, we built a random forest regression model using factors such as: lifetime giving, total years of giving, largest gift amount, total consecutive years of giving, year of first degree from Howard, and the median income of the county in which they lived in. In addition, we constructed a second model to predict last gift amount because the first model cannot be applied to graduates who have not previously contributed. Unlike the first, the second model used the variables: first and second degree received from Howard, and the year in which these degrees were obtained, and median income of the county in which they lived. In conclusion, our models allowed us to identify the most important variables in the existing alumni data that influence the annual gift amount from an alumnus. The variables in the decreasing order of importance were: year of first degree, total years of giving, median income, and types of degrees.

Photocurrent in Bismuth Junctions with Graphene at Room Temperature

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Coauthors: Scott Johnson, Sunil Lamichhane, Vignon Antoine

Graphene is an excellent candidate for the next generation of electronic materials. Owning its structural flatness and high mobility, graphene is investigated as a building block for optoelectronic applications. However, graphene's poor light absorption causes low responsivity. We studied a room-temperature photodetector based on bismuth nanowire arrays. Bi is a semimetal that complements graphene's gapless and mobility characteristics and bismuth nanowire arrays have demonstrated strong absorbance. We probed the doping at the interface via Raman spectroscopy, we analyzed the electrical properties of the bismuth graphene junctions in terms of contact resistance and characterized the charge transfer between graphene and bismuth in terms of built-in fields. Because of photo carrier pair generation and transfer at the interface the photocurrent is robust without sacrificing the detector spectral width. The detection wavelength ranges from the visible (350 nm) to the near infrared (980 nm) and telecommunication band (1550 nm). These key properties may enable application of graphene bismuth devices in detector and light harvesting applications. With the participation of Vignon Antoine (PGCC), Kevin Kotomale (PGCC), and Sunil Lamichhame (Chem. Eng., Howard U.)

Using Apollo Data to Characterize the Lunar Environment

Presenter's Name: Keenan Hunt-stone
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The Charged Particle Lunar Environment Experiment (CPLEE) was deployed during the Apollo 14 mission to measure electron and ion fluxes incident at the surface of the Moon. This study focuses on utilizing CPLEE observations to investigate the interaction between the Moon and the surrounding space plasma environment; in particular, determining the electric potential between the lunar surface and ambient plasma under different conditions. Previous analyses of CPLEE data reported a lunar surface potential of >200 V positive on the dayside when the Moon was in the plasma sheet region of the Earth's magnetotail; this is about an order of magnitude greater than expected from surface charging models. During our investigation we re-evaluate the constraints that can be placed on the sign and magnitude of the lunar surface potentials using CPLEE data. By curve-fitting

Maxwellian distribution functions to CPLEE energy spectra we can well-constrain the plasma temperature; however, we have not yet found any truncations in the energy spectra indicative of surface charging effects (likely due to CPLEE's high energy threshold of 40 eV). Therefore, variations in ambient plasma concentration and surface potential cannot be uniquely distinguished, thus we obtain a family of possible solutions for these two parameters.

Intelligent Control for mitigating Voltage-VAr in a Microgrid

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Distributed generators in a microgrid enhances power generation to take care of the ever-increasing demand for power, but it brings its own challenges which one of it is voltage-var problems and this significantly affects the performance of the microgrid. This work aims to find a method for intelligent control for mitigating voltage-var in a microgrid. Many of the current approaches involved in voltage-var control like the classical optimization of on load tap changers, switched capacitors, and step voltage regulators cannot cope with bi-directional power flow, and thus cannot perform their control tasks, and so there is the need for new methods to handle the above problems. The control approach to be used for mitigating voltage-var will be a hybrid of fuzzy logic and artificial neural network. Computational tools and real time simulators will be used. The intelligent hybrid controlled microgrid will be simulated real time using the RTDS test bed with hardware-in-the-loop for real time control. A comparative analysis between the classical optimization controlled grid and the intelligent hybrid control grid will be done in terms of reliability, efficiency, speed of operation and power quality. The implementation of this intelligent hybrid control method will optimally enhance power quality, efficiency, reliability and security of the microgrid.

Analysis of Electric Vehicle Charging Impact on Grid Voltage Regulation

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The global automobile market has recently recorded a significant boom in the sale of electric vehicles (EV). With the introduction of new extended-range vehicles resultant from extensive research efforts and advances in battery technology, the demand for electric vehicles is expected to further increase exponentially. This increased adoption consequently results in larger penetration of electric vehicle charging stations in the grid. This presents the challenge of uncontrolled charging where the vehicle owners plug-in their vehicles at will during peak load times thereby overstretching the grid. The effects of uncontrolled charging of electric vehicles include harmonic distortion, transformer overload and increased deviation of system voltage from the statutory limits of ±5%. Consequently, this presents a need to come up with a suitable infrastructure and charging strategy to ensure the system remains within its statutory limits. This work studies the hour-by-hour impact of the integration of EV charging on the grid at increasing penetrations using a practical time varying load. It analyses using OpenDSS, a distribution simulator, the maximum number of EVs that can be charged in a grid at a given node while maintaining the system's statutory voltage limits, it also studies the impact of different penetrations of EV charging on the grid at different nodes of varying distance from the substation. This results presented in this work is important to utility planners and industry in the future citing of EV charging stations at different locations of varying proximity to the grid and also in the development of incentives by utility.

Electronic Control of the Charge State of Nitrogen Vacancies in Diamond

Presenter's Name: Aaron Jackson
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Background: In diamond, the nitrogen vacancy (NV) center is a naturally occurring point defect that has interesting quantum properties. In particular, the electron spin state

of the NV center can be initialized and read out optically. Since the spin state has a long coherence time at room temperature, NV centers are potentially useful for quantum computing. However, the readout requires the NV center to be in the negative charge state. Unfortunately, NV centers can stochastically change between the neutral and negative charge states. In order for the NV center to be useful, techniques to control the charge state must be developed. **Methods:** Single crystal diamond epitaxial layers were grown by hot filament chemical vapor deposition. Commercially available diamond wafers were used as the substrate. Nitrogen was introduced as a dopant toward the end of the growth. An undoped cap layer was grown over the nitrogen-doped region. The surface of the epilayer was subsequently exposed to a hydrogen plasma to induce conduction. Ohmic, and Schottky contacts were then deposited. The area between the two contacts was masked off and the epilayer was exposed to an oxygen plasma to isolate the region between the contacts. A bias was applied to the contacts while the region was probed using a 532nm laser. A confocal microscope was used to collect the NV photoluminescence. **Conclusions:** A Schottky diode was fabricated in order to electrically control the charge state of nitrogen vacancies.

Feasibility of effective cooling through integrating Microchannel Heat Sinks (MCHSs) and nanofluids in power module design

Presenter's Name: Darryl Jennings Jr.
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This study explores the feasibility of increasing the thermal performance of Microchannel Heat Sinks (MCHSs) that are integrated with nanofluids. Energy dissipation by heat loss is a typical design concern when increasing power output and efficiency of existing power systems. Devices such as MCHSs were developed to mitigate this common occurrence. The introduction of fluids and nanofluids alike into such devices have proven effective in reducing heat loss and serve as an additional thermal barrier. The approach outlined in this research entails defining governing equations, developing an analytical model for MCHSs, identifying unique thermal properties of a fully assembled configuration (Heat Sink integrated with nanofluids) and simulation of the MCHS's thermal performance. Furthermore, a literary review indicates which, if any, additional assumptions are needed for accurate system modeling. Simulation of the thermal performance identifies and quantifies the intrinsic thermal properties of both the MCHSs and nanofluids. PowerSynth software is a unique and novel optimization tool developed by the University of Arkansas. The software's capability to display the tradeoff between electrical and thermal performance of Multi-Chip power modules (MCPMs) provides the optimal framework for advancing power module design. Analysis conducted with ANSYS Fluent and PowerSynth displays the thermal interactions between nanofluids and MCHSs as well as the tradeoff between electrical and thermal performance of a fully configured power module. Overall, experimenters gain a physical understanding of the implementation of a MCHS into a power module by executing this two phase simulation approach.

Ligand-based Pharmacophore Modeling of Human CC-Chemokine Receptor 4 Allosteric Antagonists

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Human CC-Chemokine Receptor 4(CCR4) belongs to the G-protein-coupled receptor family and is expressed in T helper 2 cells. CCR4 inhibitors represent a novel therapeutic intervention in diseases where CCR4 has a central role in pathogenesis, such as asthma and various other allergic diseases, cancer, the mosquito-borne tropical diseases, such as Dengue fever. Allosteric modulation is the regulation of a receptor protein by binding at a site distant from the protein's major active site, thus providing alternative opportunities for modern drug discovery. Procopiou and others have synthesized and examined the structure-activity relationship of indazole-arylsulfonamides as CCR4 allosteric antagonists (J. Med. Chem. 56(5), 1946–60 (2013); Org. Biomol. Chem. 12(11), 1779–92 (2014)). We obtained chemical structures of 35 active indazole-arylsulfonamides to build pharmacophore models and search for new allosteric antagonists of CCR4. Pharmacophore-modeling searches for common chemical features on the 3D conformations of ligands responsible for the activity. In particular, PHASE finds hypothetical pharmacophores of the ligands in the modeling set and represents them as vectors of inter-site distances. It clusters the vectors by partitioning the vector

space into high-dimensional cubes. Each cube populated by hypothetical pharmacophores gives us a hypothesis/model. The hypotheses are scored using the structural alignment and activity values of the contributing ligands. We computed multiple models for 35 actives and validated the best scoring models using an additional set of 15 actives and decoys. Our next step is to search the compound libraries for leads and validate the results experimentally.

ROAR: Real-time Opportunistic Spectrum Access in Cognitive Radio Networks

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As the number of mobile subscriptions and wirelessly connected devices increases, there is a need to improve efficiency in the use of the radio frequency (RF) spectrum. Opportunistic spectrum access has presented itself as a solution to avoiding scarcity in the RF spectrum; allowing Secondary Users (SUs) to sense and connect to channels in idle bands that are licensed to Primary Users (PUs) without interfering with the PU. We present ROAR: an architecture for real-time opportunistic spectrum access in cognitive radio networks. ROAR implementation works in two steps. Firstly spectrum scanning/sensing for idle bands and reporting of the geolocation, frequency and time stamp of the idle band by an RF sensor and storage of this information into a cloud-based database. The second step is cloud assisted dynamic access of the database. For opportunistic spectrum access each SU interacts with the spectrum database to find the set of idle channels. Distributed cloud computing is used to determine the best idle channel to access based on data where certain parameters such as geolocation and data rate are considered. Once the SU complies with this admissibility criteria the spectrum database sends a list of available idle channels to the SU which, in turn decides its optimum channel for communication. We evaluate the ROAR operations using wide-band software defined radio devices.

5α-Reductase Inhibitory Activity (in silico): Synthesis of Avicequinone C and Derivatives

Presenter's Name: Angelica Mack
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Androgenetic alopecia (AGA), a class of scalp hair loss, is caused by the overproduction of androgen 5α-dihydrotestoterone (5α-DHT)- a more potent form of testosterone (T) converted by 5α- reductase enzyme (5α-R). Clinical studies have demonstrated that inhibition of 5α-R results in decreased concentrations of 5α-DHT with a concomitant increase in scalp hair. Thus, identifying enzymatic reaction inhibitors is important because it may be a possible key for AGA treatment. The aim of this research is to synthesize and characterize inhibitors of 5α-R that have a higher efficacy and lower cytotoxicity than pharmaceuticals currently used to treat AGA. Compound Avicequinone C has exhibited 5α-reductase type 1 inhibitory activity, illustrating reduction of DHT production by 52% (1). Proven effective by human hair dermal papilla cell (HHDPC) based assays, its derivatives are expected to show comparable results. In experimentation, Avicequinone C and several derivatives were examined by molecular docking. After analysis and observations, Dutasteride, 4-Hydroxycoumarin and Avicequinone C exemplified the best inhibitory activity when reacted with 5α- reductase enzyme type one, while Avicequinone C, WNK-1 and WNK-4 illustrated good inhibitory activity with 5α-reductase enzyme type two. Three derivatives of Avicequinone C were then synthesized and tested for inhibitory activity. Based on TLC results and NMR verification, synthesis of WNK-1, and WNK-4 were affirmed successful. However, column chromatography should be repeated in order to get complete separation and yield a pure product for WNK-6 in future work. Furthermore, other derivatives of Avicequinone C can be docked and tested for 5-α reductase inhibitory activity.

Adaptive Cybersecurity through Federated Cloud Computing Architecture

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The threat of Cybersecurity and data breaches has become a priority for all organizations and governments around the world. This threat can target an organization's software and hardware platforms, be influenced internally or externally by an individual or a well-funded syndicate, whose presence can be domestic or international, and an attack can be perpetrated intentionally, accidentally or by honest mistake by users. The cost of an attack can be devastating to an organization affecting it financially, in lost productivity and other ways. As cybersecurity risks are growing, organizations are developing strategies on how to minimize and mitigate these risks by employing customized computing frameworks that will help protect her against cyber-attacks. In light of this, cybersecurity and big-data analytics systems that are necessary for emerging services, applications and platforms are now being presented under a federated cloud computing framework. The proposed system is aimed at solving major challenges end users encounters as well as its implementation. This federated model enhances the several benefits of many devices using cloud computing aided by edge, fog and cloud computing as dictated by the restrictions within the operating environment, which includes service quality, level of security, closeness of location among many others limitations. From our paper, we have provided numerical results we observed from the simulation we conducted in order to evaluate our claims. From our research, the comparison of the proposed model against the static model showed that the performance of the proposed framework far exceeds that of a single layer based approach.

Characterization and Properties of Wrinkle-free Cotton Fabrics via 1,2,3,4-Butanetetracarboxylic acid and Polypropylene glycol diethyl ether

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The current chemicals used to treat cotton fabrics to achieve desired wrinkle free properties are not environmentally friendly. The goal of this project was to achieve wrinkle free properties in cotton while maintaining its strength by utilizing chemicals that are not harmful to the environment. First, to achieve wrinkle free properties, a strip of fabric was soaked in 1,2,3,4 - butanetetracarboxylic acid (BTCA) utilizing two different catalysts to see which one would produce better results. Second, to achieve desirable strength properties, the fabrics were soaked in polypropylene glycol 640 diethyl ether (PPG) utilizing different catalysts to see which combination would produce the best results. Fourier transform infrared spectroscopy (FTIR) was used to analyze whether or not the chemicals had successfully crosslinked with the cellulose fibers. The carboxyl peak in the 1735-1750 range would show the strength of the ester bond (C=O) which indicates that BTCA has cross-linked with cellulose. However, FTIR is not conclusive enough to state that BTCA has cross-linked with the fabric, as it may have just deposited on the surface without changing the chemical composition of the fabric. To draw more accurate results, solid-state nuclear magnetic resonance (NMR) was conducted on a variety of samples for comparison. The results did in fact, indicate that the chemical properties of the cotton fabric changed, signifying cross-linking. Solid-state NMR had never been performed on cellulose prior to this project. The desired physical properties were tested with a wrinkle recovery angle test (WRA) and a tensile testing machine.

Purifying Pollutant; Photodegradation and Tobacco Effluent

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This principle of this experiment analyzed the purification effects an energy of light radiation greater than the bandgap of a semiconductor, otherwise known as photodegradation. To conduct this study, Titanium dioxide (TiO2) was used as a semiconductor. The process of photodegradation is a beneficial purifying method due to the reliability and affordability of materials used. Since the primary element of photodegradation is sunlight, photodegradation is utilized in many African and Southeast Asian countries. This allows many isolated areas to have access to clean drinking water in a matter of hours. Though there happens to be three types of Titanium dioxide—anatase, brookit and Tinferous sand (sometimes referred to as rutile)—the purification effects of both anatase and Tinferous sand were measured in this study (anatase and Tinferous sand contain higher amounts of Titanium dioxide).

The sand and anatase were tested against sample of tobacco effluent and set out in direct sunlight for eight hours at a time. Former research has concluded that using photodegradation, also as known as using solar energy as a catalyst for methods of waste water purification, has decontaminated waste water carrying bacterium. It was hypothesized that the Tinferous sand would purify the effluent better than the anatase due its black color, as opposed to the white color of the anatase. The hypothesis was conclusive and the sand treated more effluent than the anatase. Future research in this study would be used to find how often the Tinferous sand can be used before the purification rate decreases.

Thermally Tuned Optical Metamaterials

Presenter's Name: Sirak Mekonen
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Metamaterials acquire exotic electromagnetic properties from their artificially designed structure rather than their chemical composition, and have contributed to the development of various physical phenomena and functional devices. Recently, metamaterials made up of planar array of two coupled resonators with almost identical resonance frequencies and a large contrasting linewidth provides an ideal classic system to mimic electromagnetically induced transparency (EIT) phenomenon. In EIT systems, the destructive interference between different excitation pathways creates narrow spectral regions with high dispersion. In this study, we explore the effects of thermally tuning the frequency of EIT metamaterials with various structures at different temperatures. To realize this device, we plan to perform electron beam lithography via Scanning Electron Microscope (SEM). The proposed metamaterials are comprised of a 25 nm thick metasurface in contact with a thicker (~3 um) film of barium titanate (BaTiO3). After fabrication, we will characterize the devices with a Fourier Transform Infrared Spectroscopy (FTIR) with temperature capabilities of up to 500 K. The dielectric constant of BaTiO3 depends on the temperature, therefore it is possible to dynamically tune the electromagnetic response by increasing the temperature. Current computational simulations show a red-shift in the transmission feature of the metamaterials upon the increase of the dielectric constant of BaTiO3 thin film from 2 to 4, which is caused by increasing the temperature. Here, we present computational simulations, Atomic Force Microscope (AFM) characterization of surface roughness of the titanate films and process development of device fabrication.

Raman Spectroscopy of Compressed Water and NaCl Solutions

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All models of the interior of icy bodies in the universe rely on our knowledge of the behavior of a few simple molecules under high pressure and temperature, with water (H2O) being of major interest due to its abundance and its connection to the existence of life.1 Water, wherever it exists in nature, typically contains unavoidable amounts of dissolved ionic species, including various salt complexes, and in relation to crust interiors of icy bodies, little experimental attention has been paid on the high pressure behavior of salt water concentrations. Various studies support the presence of high pressure ice polymorphs in the interior of Galilean satellites, and there is strong evidence of subsurface salty oceans in some of them .2 If ice forms highly loaded complexes with ionic species, their physical properties would be highly relevant for the understanding of icy bodies in the solar system and beyond. Using the Raman Spectroscopy coupled with diamond anvil cell technique, we present the Raman data of water with different concentrations of salt at different pressures.

A Hybrid Fizzy Logic and Artificial Neural Network Based Load Frequency Control for Micro Grid

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This study aims to develop an algorithm for Load Frequency Control (LFC) for micro grid. A deviation of frequency value from the standard arises when real power generation fails to supply demand along with losses. Various LFC studies have been done exploiting control strategies ranging from classical control schemes to soft analysis techniques.

Integration of renewable energy system and storage in power system has increased its complexity and sensitivity to disturbances. Hence, developing advanced control at equal standard with the system developments has become the focus of many scholars. Current researches utilized advanced analysis tools and optimization techniques to develop LFC for conventional systems. In this study:

- Micro grid architecture with RES and storage will be studied
- New modeling approach to system dynamics will be formulated
- Hybrid of fuzzy logic and Artificial Neural Network techniques and advanced optimization tools will be used to build a robust LFC system.

Real time performance analysis using test bed with hardware in the loop will be done to run different scenarios affecting its performance. Incorporation of advanced tools and optimization techniques improves controls response time allowing fast recovery of the system over disturbances and reducing system down time. The result of this work improves system performance and outage costs. It also gives other researches a chance to exploit different technologies to improve LFC schemes.

Keywords: Load Frequency Control, Micro Grids, Renewable Energy Sources, Load

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Framework Implementation for CPES on Micro-grid Test Bed

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Cyber-Physical System (CPSs) refers to a new generation of systems combining computation, communication, and control techniques to provide reliable and robust integration of computing and physical process. CPSs can tackle different areas such as transportation, defense, agriculture, manufacturing, healthcare and energy system. The energy system, one of the most important components in a smart and connected community, has been under dramatic transformation in recent years because of the advent of smart grid technology and the increasing penetration of Renewable energy resources, smart equipment, energy storage system etc. Cyber-Physical Energy Systems (CPES) are blend of both electrical gird technology, and intelligent communication system. CPES enhancements are constrained by the availability of realistic cyber-physical energy environments. Which will require multidisciplinary research using advanced system theory concept to ensure a reliability, cost effective, efficient and secure infrastructure. Test-beds that integrate both cyber and physical components provide ideal environments to perform and evaluate research efforts. Various design strategies will naturally lend themselves to different research areas; therefore, an understanding of development constraints is important to enhance future efforts. This work allows to design a representative architecture of future grid with all essential discrete/continuous state variables and control model. The proposed scheme to report the micro-grid variability will co-simulated architecture, control and optimization to mitigate various sensitivity, potential attack and counter measures. Test case results will show the impact and complexity on test-bed caused by integrated cyber-physical attack.

Comparison of Artificial Neural Networks and the Human Brain on Computation

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Artificial Neural Networks are approach to computation in the field of computer science that is based on a collection of artificial neurons that solves problems in a similar way to how a biological human brain solves problems. Each individual artificial neuron works together as unit to work on a problem. Modern day artificial neural networks solve problems and projects with a few million artificial neurons and millions of connections which is orders of magnitude smaller than what the Human Brain has. The Human brain is among one of the most complex computational machines in the world. It has billions of nerve cells with over trillions of connections that allows it to do calculations. In fact it took over over 80,000 processors running on one of the world's fastest supercomputer to be able to simulate 1 second of activity in the human brain. In my research I will be comparing and contrasting how artificial neural networks and the human brain solve very complex computation problems. I will measure this by analyzing the performance of the human brain and artificial neural networks on various datasets and problems.

Model of vestibular fluid response to body motion

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The vestibular system is the balance center of the body, responsible for sensing both translational and rotational motions, as well as gravity. This information is transmitted to the brain, where it is used to generate compensatory eye movements that stabilize gaze. Due to its position within the inner ear, in vivo study of the vestibular system is not possible without causing permanent damage to the subject. Previous vestibular studies have focused on animal vestibular systems. Though similar in function to human vestibular systems, animal vestibular systems are physiologically different and are required to respond to different stimuli. Though animal models have provided many insights about the vestibular system, current research is focused on understanding the dynamic response of human vestibular systems. Computational modeling is an effective tool for characterizing this response, information that may otherwise be inaccessible. A computational model of vestibular response has been developed, relating body movement to eye movement and vestibular fluid displacement. This model focuses on human vestibular systems and includes endolymph, a fluid present in the vestibular system and accurately simulates results found during previous studies. A novel relation between eye velocity and endolymph displacement has also been developed, allowing inferences to be made about fluid movement within the vestibular system based on eye velocities that can be non-invasively measured. Understanding this fluid displacement is an important step in modeling mechanotransduction, the process through which the vestibular system communicated with the brain.

Validation and verification of bidirectional seismic analysis of a high damping rubber isolation system

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Background: Analysis of numerical predictions of the behavior of the isolation system of a full-scale five-story building subjected to horizontal bidirectional loading is performed. The isolation system is composed of four high damping rubber (HDR) bearings that were modeled using several methodologies available in OpenSees (a software developed at the Pacific Earthquake Engineering Research Center). Validation and verification of the numerical predictions are accomplished using experimental data sets available of full-scale prototypes. **Methods:** The numerical analysis of the HDR bearings involves models that try to predict the local and global behavior of the isolation system under uniaxial loading. The local behavior is analyzed by comparing the numerical and experimental force-displacement loops for a single HDR bearing. The analysis of the global behavior involves the comparison between the numerical and experimental data in terms of recorded displacements, accelerations and global force-displacement loops of the building and isolation system. **Results and Conclusions:** The validation and verification of the numerical analysis allow the identification of the methodologies that better predict the local and global behavior of the HDR bearings under uniaxial loading. Agreement between the predicted numerical responses and the corresponding experimental responses for a single HDR bearing and the isolation system of the building are reported. Further, limitations of some available modeling methodologies are identified. The previous results serves as basis for further planned research on bidirectional analysis of the HDR isolation system.

Key words: Isolation system, seismic signal, bidirectional analysis.

User Anomalous Activity Detection in Mobile Wireless Network

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Mobile wireless networks can leverage spatio-temporal information about user and network to embed the system with end-to-end visibility and intelligence. Big data analytics has emerged as a promising approach to extract actionable insights and build intelligent models using machine-learning tools. In this research, we utilize mobile network data (big

data) – call detail record (CDR) – to analyze anomalous behavior of mobile wireless network. For anomaly detection purposes, we use unsupervised clustering techniques namely k-means clustering and hierarchical clustering. The detected anomalies are compared with ground truth information to verify their correctness. From the comparative analysis, we observe that when there is high use of network, it experiences abruptly high (unusual) traffic demand at any location and time, which the network identifies as anomaly. With such repeated analysis over a time span, the network usage behavior can be understood/predicted. This information is further helpful for the network operators in identifying regions of interest (RoI) for special actions such as proactive resource allocation, fault avoidance solution etc.

An Investigation of the high-Mg rocks of Northern Virginia for Potential Carbon Dioxide Storage

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Studies have shown a direct correlation between the increased amount of anthropogenic greenhouse-gas emissions and atmospheric temperature diversions. The four major kinds of greenhouse gases found in the atmosphere include Carbon dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2 O), and fluorinated gases. Among these, CO_2 is the most abundant. In order to reduce the effects of man-made climate change, scientists and engineers have developed technologies to store CO2 in subsurface geologic formations. One CO2 storage method is through carbon mineralization, in which CO2 reacts readily with high-Mg rocks, such as serpentinites, to form the stable carbonate mineral magnesite (MgCO_3) or calcite (CaCO_3). The two forms of carbon sequestration that are commonly investigated are ex-situ carbonation, conducted above ground through chemical processing plants or waste mines, and in-situ carbonation, conducted underground in geological formations. The main objective of this investigation is to study the potential of carbon storage by in-situ carbonation in serpentine minerals, using rock samples collected from northern Virginia serpentinites, in order to better understand how CO_2 mineralization technologies will apply the mineral resources in the United States. The study is further broken down into three main questions: how much carbon dioxide can be stored in Northern Virginia Serpentines, will the reactive surface area for new carbon mineralization increase through reaction-driven cracking or decrease through filling of available pore space, and how will carbonation of serpentine minerals have an effect on the mobilization of environmentally harmful heavy metals.

Fabricating Rechargeable Lithium-Ion Coin Cell Batteries

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Lithium-ion batteries are important sources of power that are used in everyday materials. Although they are reliable sources of power, their limited life span can be detrimental. As a means of learning about the functionality of lithium-ion cells, this research focuses on assembling, charging, and discharging cells. This work is an initial step to further optimize the rate capability of lithium-ion batteries by discovering factors that support the mobility of electrons within cathode material. Lithium-ion cells were made using lithium iron phosphate (LFP), N-Methyl-2-pyrrolidone (NMP) (solvent), Polyvinylidene fluoride (PVDF) (binder), and carbon black in a controlled environment. The lithium-ion cells that were made serve as a base line for a comparison between the charging rates of pristine lithium-ion batteries and lithium-ion batteries containing gold nanoparticles in future research. Data analysis has suggested that using modified ratios for cathode and anode slurries may lead to enhanced charging performance, ultimately leading to an optimal, independent variable that will support further improvements in batteries.

COTD: Reference-Free Hardware Trojan Detection and Recovery Based on Controllability and Observability in Gate-Level Netlist

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This paper presents a novel hardware Trojan detection technique in gate-level netlist based on the controllability and observability analyses. Using an unsupervised

clustering analysis, the paper shows that the controllability and observability characteristics of Trojan gates present significant inter-cluster distance from those of genuine gates in a Trojan-inserted circuit, such that Trojan gates are easily distinguishable. The proposed technique does not require any golden model and can be easily integrated into the current integrated circuit design flow. Furthermore, it performs a static analysis and does not require any test pattern application for Trojan activation either partially or fully. In addition, the timing complexity of the proposed technique is an order of the number of signals in a circuit. Moreover, the proposed technique makes it possible to fully restore an inserted Trojan and to isolate its trigger and payload circuits. The technique has been applied on various types of Trojans, and all Trojans are successfully detected with 0 false positive and negative rates in less than 14 s in the worst case.

Bison Bikes

Presenter's Name: Michael Schroeder
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Howard University will benefit with new electric bikes for transportation. It will give users the relief needed over stressed shuttle system linking the Metro system and Howard, and improve the current parking situation. The research data will show that a bike share program increases transportation efficiency and is a viable option of transportation. Data from already existing bike share programs in other cities will prove the feasibility how Howard can benefit from Bike share on campus and the infrastructure needed to succeed. Bike share can alleviate the parking congestion stemming from vehicle commuting by Howard Bison and improve the pedestrians to be safe. The infrastructure already exists in the district to support biking through the city, because the bike being supplied will be electric, they will help our larger colleagues to leisure exercise at a manageable pace.I have contacted and arranged Riide electric bike company who has already agreed to supply the bike and charging stations at no cost to the university. This will be pro-type which will bring Howard University embrace sustainability in mode of transportation and embracing the District of Columbia's bike friendly city. The data will prove that a bike share will positively impact the lives daily of Howard Bison. If given the opportunity I know the selection committee will see the value that a Riide bike share program will provide. Thank your for your time and consideration in reviewing this proposal.

Simultaneous Degradation of Cr(VI) and TCE Using Iron Powder

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The success of iron permeable reactive barriers in treating groundwater plumes containing chlorinated organic solvents has simulated interest in applying this remediation strategy to other compounds present as co-contaminants. Hexavalent Chromium (Cr(VI), and Trichloroethylene, TCE are co-contaminants in groundwater and subsurface aquifers that the USEPA has classified as known carcinogens. Thus, efforts to degrade these contaminants into non-toxic forms are a priority. Many successful attempts to reduce Cr(VI) to Cr(III) and dechlorinate TCE into non-toxic hydrocarbons using elemental iron abounds in literature. However, none of these investigations have attempted to research the simultaneous transformation of Cr(VI) and TCE in a co-contaminant media and the associated impact on each other's transformation. The goal of this research work is to reduce Cr(VI) and TCE using iron powder (elemental iron) as a single transforming agent and determine the kinetic parameters for combined reduction. To achieve the above objectives, different concentrations of Cr(VI) and TCE were reacted individually and combined with iron (Fe0) powder at ambient temperatures(25oC) in aqueous medium(pH≤2). Amounts of Cr(VI) and TCE reduced were monitored as a function of time using Gas Chromatography and UV-VIS Spectroscopy. The individual and combined kinetics of the reduction were determined from determined the data obtained. The experimental data indicates increasing amount of iron powder positively impacts the extent of Cr(VI) and TCE reduced. Also, both Cr(VI) and TCE species competes for available Fe(0) in solution thus the amount of iron used must be more than that required for combined stoichiometric reduction of Cr(VI).

Stochastic Modeling and Optimization in Micro-Grid

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In recent years, micro-grid has received considerable attentions to improve the reliability and economy of the power system. Moreover, the future smart grid is expected to be an interconnected network of small-scale and self-contained micro-grids, in addition to a large-scale power system. Micro-grids increasingly employ a mixture of different Distribution Generators, Energy Storage Devices and Renewable Energy Sources (RES). But the intermittency/unpredictability of RES has set challenging task that lead to insufficient generation and reliability issues, especially during the Islanded operation. Therefore, efficient uncertainty modeling technique is required to handle such problem. Furthermore, micro-grid planning is subject to other external uncertainties, such as fluctuations in load and energy storage devices etc. Therefore, stochastic optimization tools should be used to take into account the statistics of the uncertainties and make optimal decisions for efficient, reliable with economic planning, operation and control of micro-grids. In a micro-grid with RES, unit commitment is a challenging issue. Owing to the stochastic and uncertain behavior of the wind power generation, using just the forecasted wind data, may not completely yield a practical solution to the unit commitment problem. Therefore, uncertainty of wind velocity is carried out considering both the forecasted wind data and the prediction error. A novel approach is developed for creating clusters of unit status, associated with a probability of occurrence from an initial set of large generated wind power scenarios. Also, stochastic security-constrained unit commitment problem is formulated, in which the random outages in both the main grid and micro-grid are considered.

Non-Linear Bending Mechanics of Three-dimensional Slender Structures

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From the nano/microscale biological filaments found in cells, and tissue to macroscale high-tensile ropes and cables, many structural components are designed as slender elements. Solving for the deflections in such complex systems becomes challenging as the system of equations become non-linear due to discontinuities in geometry or failure under high axial loads causing buckling under large deformations. In this work we present a methodology to capture the three-dimensional nonlinear bending dynamics applicable for large deflection systems while considerably reducing the computational cost. The methodology utilizes string of beams as a method of discretization, and higher order beam bending is solved using interpolation functions, which provide a 5th degree of continuity in bending axis. By comparison of deflections with data obtained from other methodologies that exist in the literature we demonstrate the efficiency, and accuracy of the "string-of-beams" method presented here.

Long-Term Timing of Globular Cluster Pulsars

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Pulsar timing is a powerful astrophysical tool that allows us to study both pulsars and their environment. Timing models provide information about the pulsar itself, including mass, position, and orbital parameters for pulsars in binary systems. Timing models also provide information about the pulsar's neighborhood and about the interstellar medium (ISM) between the pulsar and the Earth. We present the results of timing two millisecond globular cluster pulsars over five years, as well as steps involved in preparing the data for use in the timing model. Data was obtained using the Robert C. Byrd Green Bank Telescope (GBT) observing at 1.5 GHz between 2011 and 2015. Here, a description of the data processing procedure is given, and timing results including dispersion measure and higher order rotational period derivatives are discussed.

ThermoHUE: A Smartphone Application for Chemical Kinetics Experiments

Presenter's Name: Simone Stanley
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Chemical engineering kinetics studies the rates of chemical reactions. It governs the production of almost all industrial processes, including manufacturing, pharmaceuticals, healthcare, petrochemicals, and food production. The purpose of this study was to develop an experiment based smartphone

application to introduce this fundamental engineering principle through an interactive learning environment. The kinetics experiment relies on thermochromic dyes and their ability to change color with changes in temperature. Firstly, we developed an app that accurately produces colorimetric measurements of the thermochromic dyes solutions with varied concentrations. Then, we designed hands on kinetics lessons suitable for pre-college students that take advantage of the capabilities of the app. Additionally, we tested the app in a classroom setting. Two cohorts, totaling thirty pre-college students, were engaged in an interactive program which involved the app in a laboratory setting. Surveys were conducted before and after the 4 day program in order to assess effectiveness of the app as a learning tool. Survey results and student suggestions will be analyzed and considered to increase accuracy and efficiency of the app and to develop further experiments that fit the need of the students and teachers alike in pre-college settings. The app could inspire additional Smartphone-based lesson plans and activities for K-12 institutions, especially those with limited resources or those that target under-represented minority populations. Affordable technology solutions such as this learning app will help introduce engineering education to the classroom, increase college readiness in science and math and influence the production of STEM professionals.

Graphene-based Tunable Terahertz Metasurfaces

Presenter's Name: Erin Strickland
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Metamaterials are artificial structures with engineered electromagnetic properties derived from the arrangement of metallic unit cells ("meta-atoms"). The feature size of the unit cell is directly proportional to the wavelength of interest. Therefore, large gains in research and development of metamaterials have been made in longer wavelengths due to well-established microfabrication techniques. Graphene metastructures have several advantages over traditional metallic structures including, but not limited to high carrier mobility, flexibility and tunability through application of a gate voltage or external field. Therefore, the objective of this research is to fabricate the theoretically proposed tunable graphene metamaterial terahertz (THz) devices with high amplitude modulation (up to ~80%) and tunability (up to 400 GHz). Metasurfaces were fabricated on Si substrates using a standard electron beam lithography technique. First, a typical RCA procedure was used to clean the substrates. A monolayer graphene was transferred from CVD grown samples on copper. The patterns were drawn using ultra-high resolution electron beam lithography. Metallization was performed with thermal evaporation to deposit 200 nm of Cu as the metasurface metal. The active surface of the fabricated devices is 2.5 x 2.5 mm2 and measurements to monitor the ability to modulate THz waves were made using a high resolution terahertz time-domain spectrometer. We aim integrate these devices into systems for sensing and quantum electronics applications. This work is supported by the Air Force HBCU/MI Program, NSF Center for Integrated Quantum Materials and the Harvard Center for Nanoscale Systems NNCI Scholars Program.

Electrostatic Separation as a Sustainable Approach for Dry Fractionation of Agricultural Flours

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Oilseeds and grains are considered to be excellent sources of non-animal proteins containing the appropriate essential amino acids required for optimal human health. Conventional wet fractionation techniques for the production of plant protein powders involve the use of solvents, concentrated acids and alkali that result in protein denaturation, thereby reducing the quality and functionality of the protein ingredients. A bench-scale solvent-free tribo-electrostatic separator was developed and successfully applied in the fractionation of navy bean flour as a model system. The process consisted of a fluidized bed flour reservoir, polytetrafluoroethylene (PTFE) tribo-charging tube, and a plate-type separation chamber. This methodology employed a tribo-electrostatic approach to selectively charge proteins, carbohydrates, and fibers in the bean flour and separate them based on the magnitude and type of their charge. The optimization of the tribo-electrostatic separation of navy bean flour was successfully carried out by designing a mixed level full factorial experiment, followed by analyzing the data with a multiple linear regression model. Using the optimum operating conditions, the protein content of the original navy bean flour was increased from 25.4% to ~40% accounting for 60% of the total protein. This novel solvent-free tribo-electrostatic separation approach is of considerable commercial significant as it preserves the

bio-functionality of the protein and averts the likelihood of toxic microbial contamination common in currently used wet processes.

The solution to feeding the world

Presenter's Name: Christopher Taylor
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Background: It is not difficult to say that we are currently living in dystopian times. Even though our technological advances are far beyond our predecessors, people are still starving daily across all continents. Along with this we are currently ruining our atmosphere with our rampant release of air pollution. Thankfully we have the technology to end everyone's hunger, as well as naturally filter our environment through hydro/aquaponics. **Proposed Idea:** I propose a new form of architecture that includes: sustainable energy collection, hydro/aquaponics for food growth and landscaping (topiaries shrubberies, flowers), and water recycling facilities inside of a high-rise structure. **Research:** These buildings will not only be designed to grow millions of fruits and vegetables a year, but it will also be able to house its caretakers in a comfortable and "technologically smart" interior environment. It is recorded that 7.7 million heads of lettuce can be produced per year at SPREAD's Kameoka Plant which is only 2,868 sq.meters (308,700 sqft) and 15.95 meters tall (52 ft). Although it doesn't show the same "green" exterior as Dr. Ken Yeang's designs, and his designs don't grow food, there is no building that has attempted to merge the two ideas. **Anticipated Results:** The manufacturing of my proposed hydro/aquaponic architecture will work as one of the basic and necessary building blocks for future city construction. Using these ideas to create this form of architecture, sustainable energy collection, sustainable food production, technologically advanced housing, and water filtration/recycling, we can build more efficient and sustainable cities right.

Revisiting the Trend of Debris Disks with regards to the Improved Ages of Early-Type Stars

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Coauthors: Lynne Hillenbrand

Finding excess infrared emission around a star can indicate the presence of a debris disk, a collection of dust in orbit around a star as a result of large-body collisions (such as between asteroids). In order to see how these disks evolve, it is crucial to be able to define the ages of a large sample of stars. David and Hillenbrand (2015) were able to derive their own uniform technique for deriving the ages of 3,493 early-type stars using specialized photometry to derive parameters such as surface gravity and effective temperature. Correlating their sample of stars with infrared data from the Wide-field Infrared Survey Explorer (WISE) and 2 Micron All Sky Survey (2MASS) missions, we improved available trends among debris disk presence, stellar age, and spectral type. We did this by plotting different color-color and box-and-whisker diagrams in order to determine excess emission in the WISE and 2MASS bands. Colors ks-W3 and ks-W4 were chosen as our standard colors to detect circumstellar disk candidates after considering the reliability of the data. Stars above 1σ were considered to be stars with candidates. The percent frequency of sources with evidence of excess in ks-W3 is 6.4 ± 2.0% with ages <600 Myr and declines to 2% for older sources. The percent frequency of sources with evidence of excess in ks-W4 is 7.1 ± 2.1% with ages <600 Myr and declines to 4.4% for older sources.

Separation of Music by Genre Using Feature Extraction Tools and Fitness Function

Presenter's Name: Morganne Veal
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In today's world, music is a part of life. All walks of life enjoy a plethora of genres shaped by cultural trends, social happenings and populous opinion. As a result, scientific classification tools in music are becoming more attractive subjects of melodic based research. In order to develop a

robust parameterization tool, specific characteristics must be selected so that the tool is able to extract unique features and identify or analyze its melodic features so that it may divide music samples. The application presented in this paper has two purposes: (1) classify 100 songs by genre and (2) determine which pattern of features will make the classification the most straightforward. The first step is to import and evaluate an audible song file. After the song file has been imported, a feature extraction tool, called jSymbolic, is used to obtain contents that lead to assigning the music to one of the four chosen genres: (i) Classical, (ii) R&B, (iii) Jazz or (iv) Hip-Hop. jSymbolic is able to analyze MIDI music files based on defining features. The resulting information is loaded into a tool that uses C4.5 programming knowledge to separate the data by using a fitness function.

Analysis of Graphene/semiconductor interfaces using Raman spectroscopy

Presenter's Name: Antoine Vignon
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Coauthors: Kevin Kotomale, Bedhatu Wake

Raman spectroscopy is used to identify materials, it provides a unique fingerprint for materials. Raman measures the vibration of the sample due to the excitation that occurs when light (in form of laser) hits the sample and gets reflected. Then, it plots the intensity of the Raman scattered radiation as a function of wavenumber of the scattered radiation. Using a Renishaw inVia Raman Microscope, we analyze several graphene/semiconductor interface and studied their Raman shifts. The quality of graphene sheets are measured by a large 2D to G intensity ratio (I2D/IG) and a low D peak intensity (ID). Single-layer graphene is expected to show I2D/IG > 2, and the amount of disorder in the sheets is often correlated with ID. In our samples, we observe I2D/IG = 2 and a negligible D peak amplitude. For bismuth and silicon, the intensity of the D peak becomes relevant indicating a larger disorder while we still have an I2D/IG = 2. Graphene is a unique material, unlike metals or semiconductors, it is gapless and has no density of states. Bismuth is a semimetal, unlike conventional metals that have subnanometer Thomas-Fermi screening length, bismuth has higher screening length(In order of 30 nm). When graphene is coupled with bismuth, charge transfer occurs between the two interfaces. This causes a change in the Fermi energy of graphene, unlike conventional metal or semiconductor. The change in Fermi level of graphene causes a property change in graphene. The change is confirmed with Raman.

Terahertz Spectroscopy of Dirac Plasmons in New Topological Insulators

Presenter's Name: Pheona Williams
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Plasmons are collective discrete oscillations of the free electron gas density. Applications of plasmons involve manipulation of light beyond the diffraction limit and at high oscillation frequencies. In topological insulators, materials whose bulk interior is insulating but whose surface contains conducting free electrons, it was recently shown that Dirac plasmons exist at terahertz frequencies. The objective of this work is to explore the physics and applications of plasmonic nanostructures in new topological insulators. To realise this goal, we patterned thin films (d ~100 nm) of bismuth selenide on sapphire substrates into nanostructures with width and periodicity of 2, 4, 8 and 20 microns. We then measured with our high-resolution broadband THz spectrometer the resonant excitation for each ribbon width. As a result of this work, we hope to explore new metastructures and exploit the predicted novel physical properties of these materials.

Graphene, a promising addition to Lithiuim Iron Phosphate batteries

Presenter's Name: SharahYasharahla
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Research has shown that adding graphene(G) to Lithium Iron Phosphate(LFP) batteries can improve performance. This improvement has been demonstrated with LFP/G composites delivering an initial discharge capacity of 160mAhg-1 at 0.2C, which is comparable to pristine LFP capacity of 170 mAhg-1. Our research is focused on exploring the addition of low weight percentages (0.25 - 5wt%) of graphene to LFP cathodes. Initial results have shown slightly faster charging

times in batteries where 0.5wt% of graphene was added to LFP cathode material. In contrast, batteries with 1 wt% and 1.5 wt% of graphene added to the LFP cathode material had a similar charging time in comparison with batteries made with pristine cathode material. Currently, our experimental investigations are focusing on battery charging time versus low wt% of graphene centered around ~0.25wt%.

Optimizing structures: nature leads the way - case study: optimization of offshore foundations using ant colony optimization

Presenter's Name: Hessam Yazdani
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Over the course of billions of years of evolutionary history, nature has heuristically developed a diverse and remarkably-ingenious set of dynamic and robust strategies that have endowed creatures and organisms with optimum yet sustainably-resilient adaptability to their in-flux environments. Significant research efforts have been devoted to understanding these strategies and exploring their applicability to solve a variety of complex engineering problems. One class of these strategies is swarm intelligence, which is the collective behavior of a system capable of accomplishing difficult tasks in dynamic and varied environments without any central coordination, external guidance, or control. In this research, the ant colony optimization (ACO) algorithm is used to optimize the foundation of offshore wind farms (OWF). ACO simulates the foraging behavior of ants and makes an analogy between finding the shortest path from nest to food and minimizing an objective function, which is here the weight of an OWF foundation. Results indicate that the ACO algorithm is a suitable technique for the optimal design of offshore foundations and could help significantly reduce the construction costs. Findings of this study also indicate that considering materials nonlinearity in the analysis can lead to a more economical design for these foundation systems.

Social Sciences

Russian Nationalism and its Implications for its Relationship with the West

Presenter's Name: Elizabeth Akinbusuyi
Classification: Undergraduate Student
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Russian nationalism has long been an influential factor in the implementation of Russian foreign policy. Russia's strong nationalist identity is in part supported by its anti-Western sentiments and amongst scholars, long has this has been perceived as a dangerous thing. Drawing on qualitative data, archival and scholarly documents, and with first-person anecdote, my research will delve into the relationship between Russian nationalism and its foreign policy relations –more specifically with that of the United States– and additionally explore the justification of scholars' fear of this country's nationalism. Taking into consideration, propagandist devices, Russian history, economics, and relationship with other nations, this research will explore the extent to which this deep-rooted nationalist ideology has influenced its friction-riddled relationship with America and what this means for the present and future conditions of U.S.-Russian relations.

Gender Moderates the Impact of Induced Mindfulness on Moral Decisions and Decisional Certainty

Presenter's Name: Imer Arnautovic
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Coauthors: Lloyd Sloan

Background: Meta-analytic evidence suggests that females show a greater tendency to ruminate than males (Johnson & Whisman, 2013), and mindfulness interventions may be particularly effective in reducing rumination (e.g., Ramel, Goldin, Carmona, & McQuaid, 2004). The literature in dual process moral judgment has shown that individuals find it less morally acceptable to sacrifice one person for a group in dilemmas requiring direct and thus personal harm, than in dilemmas requiring indirect harm (Greene et al., 2004, 2001). The literature in attitude certainty suggests that certainty may be increased by perceiving greater elaboration (Barden & Petty, 2008) and consideration of the pros and cons of a message (Rucker, Petty, & Briñol, 2008). Would gender moderate the potential impact of a brief mindfulness induction on moral decisions requiring either indirect or direct physical harm and/or on decisional certainty? **Methods:** 154 undergraduates were randomized to a mindfulness induction (versus control) and made either indirect or direct deadly moral dilemma decisions. **Results:**While there were no significant differences in utilitarian decisions in the mindfulness condition, female controls were more likely to make utilitarian decisions than male controls. Relative to participants in the control condition who showed no meaningful gender differences in certainty, mindful males and females were more and less certain in their decisions, respectively. **Conclusion:** The impact of brief mindfulness inductions on cognitive judgments involving moral action and its associated certainty may, in part, depend on whether one identifies as male or female.

Mass Media or a weapon in disguise? A historical case study of the approaches in which news and films have drastically influenced and controlled the narration of African-American lives.

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Over the years scholars argue that different forms of mainstream- American media, such as films, and news outlets have conditioned the masses of American citizens that people of African descent are the most consistent images of "Traditional deviancy".To elaborate, as roles are depicted in society, based upon race, culture, and religion, many ideological and behavioral origins that Black Americans use as to identify themselves are in turn used to functions as societal abominations. Thus, to expose this pattern it is asserted by authors such Robert M. Entman, the writer of "The black image in the white mind", that Media is one of the most powerful instruments in introducing and perpetuating People of African descent as inferior, sources of entertainment. Also,

It is often debated that the repercussions of internalizing such narratives hold an irrefutable negative impact on developing the perceptions of a broad American audience, causing true representations of black people to be diluted and distorted. Therefore, the purpose of this thesis is to intimately discuss parasitic images that are disseminated to the public through the media, the danger of internalizing these narratives, and the overall relationship between the history of black deviancy and the impressions that these narratives have had on the social development of individuals in America. The purpose of this thesis will prove the conclusion that media is a strong contributor to ideals of black inferiority because of the lack of individual development in stories surrounding the lives of African-American people.

Struggle and Resilience: Novel Traits in the Black Self-Stereotype

Presenter's Name: Milan Benn
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Stereotypes are a common topic of discussion within the Black community. However, the largely negative stereotypes held towards Blacks, including laziness and being poor, have primarily been explored from the White perspective. Less is known about the self-stereotype held by Blacks. A pilot study of self-identified Black participants mentioned the traits of struggle and resilience as descriptors of Blacks, but not of Whites or Asians. The current study investigates struggle and resilience using an experimental design. We hypothesized that recalling experiences of struggle or resilience would lead to higher levels of association of the self with the Black group compared to control conditions. Participants recalled times when they experienced either one of four conditions: ease, annoyance, struggle, or overcoming struggle. Next, participants were asked to complete the sentence "I am…" 15 times as a measure of whether their self-concept had changed due to the recalled experience. Overall, race was mentioned 19 times in the memory recall, 15 of which were in the overcoming condition, supporting that these types of experiences are closely linked to Black identity. Surprisingly, mentions of race in "I am…" statements did not differ between conditions, so self-concept did not shift. Ultimately, Blacks view experiences of overcoming, but not experiences of struggle, as related to their race. However, thinking about these experiences does not change how they see themselves overall, even momentarily, suggesting a more stable self-concept. Future research should explore this stability of self-concept and whether this protects against experiences of discrimination.

Changing Perceptions of Environmental Responsibility in Southwest Washington, D.C.

Presenter's Name: Amanda Bonam
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The concept of environmental responsibility supposes that those living or working in a particular area have a duty to protect or preserve the quality of the environment there. While the leadership of the majority of environmental organizations is predominantly White, the fight for environmental justice is intertwined with African Americans' decades-long fight for civil rights. The predominantly African-American Southwest quadrant of Washington, D.C. has undergone rapid development and construction over the past decade, which has introduced new sources of air, soil, and water pollution to an already-contaminated community. This research analyzes the community's response to the cumulative impacts of multiple sources of pollution. The author examines community members' perceptions of their responsibility to preserve the health of their changing environment through a series of interviews and an analysis of community organizing efforts against new development.

The Effects of Parent-Adolescent Communication on Academic Achievement in African American Middle and High School Students

Presenter's Name: Kallie Brown
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Parent-child communication refers to the routine communication that occurs daily between a parent and their child (Fulkerson, 2010). Previous research suggests that this type of communication has a direct effect on child outcomes and aids in the positive development of a child. However, there

lacks research on the specific influence of parent-adolescent communication on African-American adolescents' outcomes, particularly in academics. The current study aims to examine the relationships between parent-adolescent communication and academic achievement in African-American children, and assess the differences among gender and grade level (middle or high school). A pre-existing data set was used from a larger study that evaluated the association between parent-adolescent communication, social skills, and African-American children's academic achievement. Data was taken from this study to assess parent-adolescent communication and academic performance in forty middle school and forty high school students for a total of eighty participants. It was hypothesized that (1) parent-adolescent communication will have a positive impact on the overall academic achievement of the student, (2) there will be a difference between middle and high school students in the effects of parent-adolescent communication on academic performance, and (3) there will be a difference between male and female outcomes. Preliminary findings suggest that parent-adolescent communication does have a positive effect on academic achievement in African-American adolescents and this effect is more evident for students in middle school than high school. However, there were no pronounced differences between male and female students. Implications of the study and directions for future research will be discussed.

Neighborhood Disorganization and Cohesion Predict Adverse Childhood Experience Prevalence

Presenter's Name: Claudia Byer-tyre
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Bronfenbrenner's Ecological theory purports that the various systems which comprise society influence each other. The exosystem, which includes the neighborhood, influences the microsystem, which includes the household. The present study hypothesized that neighborhood disorganization and cohesion predict adverse experiences occurring in the household. Fifty-one Howard University undergraduates, ranging in age from 18 to 24 years old (M = 19.73, SD = 1.58), participated in the study. Seventy-six percent of the sample was female. Participants completed consent forms and the Adverse Childhood Experiences Scale (M = 2.35, SD = 7.08), the Neighborhood Disorganization Scale (= .91, M = 9.20, SD = 5.23), and the Neighborhood Cohesion Scale (= .71, M = 26.06, SD = 3.86). A standard multiple regression analysis was performed between adverse childhood experience prevalence and ratings of neighborhood disorganization and neighborhood cohesion using SPSS REGRESSION. Regression analysis revealed that the model significantly predicted adverse childhood experience prevalence, $F(2,48) = 34.92$, $p < .000$. R2 for the model was .59. Individually, neighborhood disorganization ($t = 3.063$, $p < .004$) and neighborhood cohesion ($t = - 4.070$, and $p < .000$) each significantly predicted adverse childhood experience prevalence. The results of this study suggest that neighborhood contexts can predict the rate of adverse childhood experiences--children in more disorganized environments may be more susceptible adverse experiences while children in more cohesive environments are less likely to experience as many adverse experiences.

Negro In Modernity: Preliminary Study of the Meta-Cognitive Processes of African Racial Esteem.

Presenter's Name: Angela Carter
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Coauthors: Tanisha Burford

An African proverb proclaims, " an ax that cuts down a tree forgets but the tree remembers." In many respects, perception is the curator of memory. Although memory facilitates the gathering and retrieval of information, perception is what enables individuals to generate understandings of their environment. Historically, intellectual genealogies of African cultural memory have been decentered and discredited by European ontology. Consequently, Africans across the diaspora have internalized negative constructs of African identity. The present study is an investigation of African African's view towards racial identity. We determined through a Pearson correlation analysis that an open mindset is related to the development of African identity. In a study of 60 students, 37 women and 23 men completed the Multidimensional Model Inventory of Black Identity and the International Personality Item Pool Measure of Openness. A Pearson's correlation determined a strong positive correlation between Afrocentrism and openness to experience, and a negative correlation between a humanistic approach and openness to experience.

Effects of South African Prenatal Care on Low Infant Birth Weight

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Background: Within the first several hours after an infant is born, the physicians attending to the baby will measure his or her weight. Infants born under 2500 grams (5.5 pounds) are considered to be underweight. Low birth weights are usually attributed to preterm birth or intrauterine growth restriction. Prophylactic prenatal care is a commonality in American culture. In other regions of the world, this luxury is not an inevitable right but is subjective and based on accessibility as well as awareness. Prenatal care helps to reduce the pregnancy related complications and increase the quality of life for the neonate. Objective: The purpose of this study is to identify the relationship between prenatal care and low birth rates in South African infants. The knowledge gained from this research will allow room for patient education emphasizing the importance of prenatal care during the stages of pregnancy. **Methods:** A community based survey was given to participants to answer specific questions of the nature of the prenatal care received and the birth weight of their child. Participants were South African natives between the ages of 15 to 30 and have give birth within the last five years. **Results:**Participants of the research gave detailed accounts of their prenatal care experience or lack thereof which provided valuable insight on the type of prenatal care being delivered to patients in South Africa. **Conclusion:** The results yielded a strong positive correlation between prenatal care and infantile birth weights.

Mental Health of African Americans

Presenter's Name: Byrone Collins
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Social media has developed a new culture of opening one's private life to the public and creating new basis of comparison. As material things like cars, big houses, and money become a standard of achievement, more young people have deemed themselves as unsuccessful because they can not compare to their peers. Not only do the new social norms of the Millennial's society play a factor in their mental health but within the African American community there is a negative perception to those who seek mental counseling of any kind. Historically, African Americans have dealt with adversity resulting in a negative effect on their educational, mental, financial, emotional, physical, social and other resources. Without the help of their community or governing body these socioeconomic barrier are linked to their mental health and coping behavior. Generally speaking, most African Americans are not open about their possible mental health issues and receiving treatment; with men being more concerned about the stigma. Because of this there is a need within this community to create and environment for people to feel comfortable and one about their mental health issues. This study focuses on men because of their natural nature to withhold feelings and emotions that make them feel weak. When adding together the need to be accepted by peers along with the stereotype that that men are emotionless, men are often trap and hold in feelings and emotion unlike women who are more will to be vulnerable.

The Impact of Cultural Socialization and Self-Esteem on Career Aspirations among Low-Income African American Adolescent Girls

Presenter's Name: Leonna Davis-ross
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Despite the progress made regarding race relations, women's rights, and diversification of certain fields in recent decades, many women of color in the United States are still not equally represented or present within various fields, particularly STEM. For African American adolescent girls, this reality is even more daunting. In addition to confronting the many stressors normally associated with the period of adolescence (Thomas et al., 2008) young girls have to negotiate the dual forces of both gender and racial injustices. This combination of factors can take a major toll on their self-esteem, which often have aversive effects on their future aspirations. Research reveals a strong relationship between self-esteem and future aspirations (Shukla & Katepeth, 2016) and the positive

impact of cultural socialization on self-esteem (Strong, 2012). However, little is known about how cultural socialization and self-esteem combine to predict career aspirations among low-income AA girls. The goal of this research was to examine self-esteem as a mediator in the relationship between cultural socialization and career aspirations. The data of 78 low-income AA girls were extracted from a larger study that investigated interrelationships among various factors potentially impacting psychosocial development of students attending a public middle school in a northeastern metropolitan area. Regression analyses revealed a significant positive relationship between cultural socialization and self-esteem, no significant relationships emerged between both predictor variables and career aspirations. Given the low percentage of girls aspiring to professional STEM related fields, the importance of this research is discussed in helping challenge the norm.

Black Lives Matter in the Public Sphere: A Critical Race Analysis of Opinion-editorials about Police Violence

Presenter's Name: Akiv Dawson
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The purpose of this qualitative study is to examine the manner in which, police application of lethal force is accounted for in the public sphere. The study examines opinion editorials from the New York Times, Washington Post, Contra Costa Times, Pittsburgh Post-Gazette, and the Salt Lake Tribune. The study applies Altheide's methodology of ethnographic content analysis to opinion editorials written between July 2014 and September 2015 about three specific cases involving the death of an African American male due to police use of lethal force. Each editorial was loaded into an NVIVO 10 project and coded line by line. This study includes one-hundred and seventy-six (176) opinion editorials. The following eight themes emerged: (1) Black lives aren't valued, (2) racial roots prevent post-racialism, (3) progress has been made (4) a relationship broken, (5) the nightstick and quick-trigger-finger justice , (6) conversation rules the nation, (7) Black lives matter movement is legitimate, and (8) Black lives matter, but the movement is flawed. Sample limitations and implications for future research are discussed.

Black Solidarity with the People of Palestine

Presenter's Name: Jaquial Durham
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The purpose is of this study is intent to explore the history and contemporary implications of Black substantive solidarity with the people of Palestine. The historical and contemporary implications of United States (U.S.) Black and Palestinian substantive solidarity are rooted in the theory and practice that informs the use of force in a colonial context. This idea is anchored in the practice of controlling and the "Other". In this paper, the author presents the parallel experiences and perspectives of African descendants in the U.S. and the Palestinians of Palestine that is rooted a deep socio-political, cultural, racialized marginalization.

Student engagement in higher education: Exploring the interrelationships of student engagement components and their relationship with positive school outcomes

Presenter's Name: Linell Edwards
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Few studies have systematically examined the relationships among student engagement components. Frederick's et al. (2004) conceptualization of the student engagement construct served as the theoretical framework for the current study. Student engagement is a multidimensional metaconstruct consisting of three interrelated components: emotional engagement, behavioral engagement, and cognitive engagement. The purpose of the present survey study was to address the deficiencies in the student engagement literature at the college level by introducing a modified comprehensive measure of engagement at the college level as well as testing a proposed model of interrelationships among engagement components and proximal school outcomes. The first goal of the present study was to establish a comprehensive measure of student engagement for college students. The second goal was to evaluate the relationships among engagement components themselves and to investigate the thesis that emotional engagement serves as a key contributor to the engagement process. The final goal was to examine the relationship

between the three engagement components, perceived gains in development, institutional commitment, and academic achievement. The Cronbach's alpha for each scale ranged from .73 to .89. Preliminary data analysis found each student engagement component significantly predicted gains in development, with cognitive engagement being the strongest predictor. Preliminary data analysis also revealed cognitive engagement as the only significant predictor of institutional commitment. A path analysis will be conducted to examine the direct and indirect effects of each student engagement component on perceived gains, institutional commitment, and cumulative GPA. Implications and directions for future research will also be discussed.

Prevalence of Parkinson Disease in Hospitalized Patients with Congestive Heart Failure

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BACKGROUND/OBJECTIVES: Parkinson Disease (PD) is the second most common neurodegenerative disorder after Alzheimer's disease and affects approximately seven million people globally and one million people in the United States. Approximately 630,000 people in the United States had diagnosed PD in 2010, with the diagnosed prevalence likely to double by 2040. The proportion in a population at a given time is about 0.3% in industrialized countries. PD is more common in the elderly and rates rises from 1% in those over 60 years of age to 4% of the population over 80 (19 There is little or no study done on the effects of patients and hospital characteristics on the outcomes of inpatient with chronic heart failure (CHF). **METHOD:** The current prevalence and factors that affect the inpatient with both CHF and PD conditions were investigated using a longitudinal datasets from the National Inpatient Samples. ICD 9 codes (CHF-331, PD 332) were used for the extraction of the main diagnosis. **RESULTS:** These results show that the occurrence of CHF in males with PD (5,712 (53.14%), is less as compared to population without Parkinson disease (322,218 (46.79%) ($p<0.0001$); similar pattern was seen with females (5036 (46.86%) vs non Parkinson (365,351 (53.21%) ($p <0.0001$). CHF occurred less in whites with Parkinson disease (8,454 (82.24%) vs non Parkinson disease (495848 (74.52%) ($p<0.001$). DISCUSSION & **CONCLUSION:** The results from this study may be helpful in prioritizing care to PD patients with or without CHF.

Underlying Causes of Xenophobic Violence in South Africa

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South Africa is relatively fresh out of Apartheid: Jim Crow laws ended in 1954, many African countries received their independence in the 1960s, while Apartheid ended in 1994. The country still feels the consequences of that period in many ways, such as the unequal distribution of resources, and lower socioeconomic levels of Black and Coloured people in the country. The dissatisfaction of the indigenous South Africans is being expressed in many ways, but one alarming form this dissent has taken is xenophobic attacks on immigrants from other African countries in South Africa. Xenophobic attacks have been going on since 1994, but gained sufficient media coverage and public outcry after a spate of attacks in 2015. The most common reason that was cited for the attacks was that immigrants take away jobs from South Africans. This project set out to understand the interactions between South Africans and immigrants, and ascertain other causes of the bad blood between the two groups. These goals were achieved through conversations and interviews with South Africans and immigrants, direct observation of interactions between the two groups, and literature review. It was found that some immigrants, especially those from Nigeria and the Congo, are involved in illegal businesses that are frowned upon by South Africans. South Africans are also influenced by the words of their rulers and leaders in their actions. It is hoped that these findings will help repair the bonds lost between the two African communities.

Childhood Trauma and Adult Mental Illness

Presenter's Name: Mayowa Fageyinbo
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According to the National Alliance on Mental illness (NAMI), over 43 million adults in America suffer from some psychiatric illness. Moreover, research has found that adverse childhood experiences can lead to mental health issues later on in life. Such adverse experiences include but are not limited to: neighborhood violence, physical, sexual and emotional abuse, neglect, single-parenthood, parental conflict, and drug or alcohol use. The consequences of having a mental illness can be fatal; According to the American Journal of Psychiatry (2010), more than 90 percent of people who commit suicide were suffering from some form of mental illness at the time. Furthermore, depression remains as a leading cause of death among young adults. In order to evaluate how adverse childhood experiences lead to adult mental illness, I will perform a meta-analysis of several articles and studies that relate to this topic. I will use the data in these articles and studies to arrive at a conclusion on my hypothesis. The results of this research may be used to influence public awareness on mental illness as well as influence school policy on mental health services and early intervention.

Awkward at HBO: The Adaptation of Issa Rae's Awkward Black Girl Web series for Mainstream Television

Presenter's Name: Jasmin Goodman
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There is a void in the literature about the adaptation of Web series for television. As these Web series, which often serve as a site of cultural production for marginalized communities, are adapted for television by major Hollywood studios, there is a research concern that the authentic cultural representations will be replaced with the traditional, stereotypical Hollywood narratives. This content analysis examined the portrayals of authentic Blackness between Issa Rae's Awkward Black Girl and its adaptation for television, HBO's Insecure. Using the framing theory, this study examined the individual speaking roles of all ethnic minority characters. The researcher coded the entire series of Awkward Black Girl and the only season of Insecure for series name, series ownership type, and the presence of historical and contemporary stereotypes. Findings suggest that although the show owner represents a significant role in the series development process, HBO's Insecure maintained the authentic representation of Blackness seen in the YouTube Web series, Awkward Black Girl.

The Power of Light in Design to Heal Our Internal Balance

Presenter's Name: Natasha Graves
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People are always influenced by their surroundings and evolving around it. Science has proven that our Architectural environment is one of the most influential factors – in the end product of our transformation. The environment comes with a multitude of external factors as well, but science proves lighting helps and heals people. There have been recent advances with technology and biology that have helped to create coves where certain plants are in constant regeneration and bloom. Creating controlled environments where the plant's anatomy is convinced that it is always in its production season does this. What if architecture could create the same sense of perpetual seasons emotionally? It has been proven that there are certain characteristics for optimal happiness – a prescribed amount of light, air, plants, etc. – so why not recreate this symbiosis for people dealing with emotional struggles as simple as anger or sadness to mental disorders like depression and anxiety? After analyzing several design strategies, the research will define a prototype of a room or facility designed with the highest amounts of natural light and artificial substitutes in the event of gloomy weather would essentially create a world that make people happier.

The Effects of African Self-Consciousness on Self-Esteem in African American college women

Presenter's Name: Aisha Gray
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Coauthors: Jermaine Robertson

For African American women, loving themselves has been seen as an act of rebellion since the era of African enslavement in America. To this day, and due to the overwhelming images of the European standard of beauty

in the media, African American women find it difficult to have a favorable attitude toward themselves and how they look naturally. But is it possible that one's identification with and conscious expression of their Black racial identity can mitigate the effects of the media and the wider, European American controlled society? This study explores whether African American women's racial identities, as measured by the African Self-Consciousness Scale (Baldwin, 1984), have an effect on their attitude toward the self, as measured by the Rosenberg Self-esteem Scale (Rosenberg, 1965). The researcher surveyed one hundred and ninety-eight (198) African American female college students to determine the relationship between these variables. Preliminary results indicated that there was a strong relationship between African-Self Consciousness and self-esteem.

Economic Community of West African States' (ECOWAS) Inclusion in the International Council of Harmonization (ICH) Initiative: Overcoming Barriers to Pharmaceutical Global Regulatory Harmonization

Presenter's Name: King Gyasi
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Background: The production of medications both domestically and globally requires regulatory oversight to ensure that products are safe and effective. Pharmaceutical industry global regulatory harmonization (IRH) establishes a common set of regulations regarding technical requirements for the safety, efficacy, and quality of medications between different countries. Members of the International Council of Harmonization (ICH) include two of Africa's main economic communities, The East African Community (EAC) and the South African Development Community (SADC). However, the Economic Community of West African States (ECOWAS) is not included in the ICH initiative due to several barriers. Our research explores current strategies and barriers that impact IRH between ECOWAS and the ICH. **Methods:** We will conduct a literature review and interview experts from the U.S. FDA and members of various regulatory bodies within the ECOWAS to analyze barriers to regulatory harmonization on the basis of politics, resource availability, differing levels of regulatory development, and implementation strategies. **Preliminary Results:** Based on our initial findings, the lack of a mutually-recognized regulatory framework within the ECOWAS, in addition to the lack of resources to achieve ICH's safety, quality and efficacy standards are barriers that need to be overcome in order to advance membership in the ICH. **Conclusion:** The establishment of centralized regulatory guidelines within the ECOWAS and assistance with resources and technical support from the World Health Organization (WHO) are milestones that need to be attained in order to effectively achieve the globally-recognized ICH regulatory standards.

Does the Low Number of African American Attorneys in the U.S. Correspond with the Number of Young Aspiring Lawyers?

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According to The Slate, African Americans make up about 4.8 percent of the lawyers in the U.S, yet they also make up around 40 percent of those imprisoned in America. Black people are being imprisoned at alarming rates for less significant crimes than others races and there is hardly anyone to advocate for them. The purpose this research project is to determine the number of African American students interested in pursuing a degree in law. Data covering what majors incoming college freshmen are interested in and common future career plans will be analyzed. Also, a survey of HBCU college students will be completed to determine their interest in various legal professions. The findings will be used to investigate if the level of interest Black college students have in the law field is related to the low of number of practicing Black lawyers in the U.S and give some explanation behind their interest or disinterest.

Mind and Body: Exploring Emotion, Emotional Regulation, and Heart Rate Variability

Presenter's Name: Ricco Hill
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Coauthors: Nomi-Kaie Bennett

Previous studies that have examined heart rate variability (HRV) in relation to emotion have found changes in HRV to be sensitive to the presence of a number of emotional states including psychological stress. But less is known about how HPV changes in response to different emotional coping strategies. This secondary data analysis examines the HRV of African American college students recalling experiences in which they have felt stress, anger, and joy. This builds upon the original research which found significant differences in mean heart rate within emotional states between those who implement cognitive reappraisal versus emotional suppression as coping strategies. By observing HRV more in-depth insight is given as to how both the parasympathetic and possibly sympathetic nervous systems operate under these varying emotional conditions. We will determine how these autonomic responses are affected by emotional regulation strategies.

"…[M]akes it seem more real": A Qualitative Exploration of the Sexual Health of African American Adolescents with HIV-Positive Mothers

Presenter's Name: Tyriesa Howard
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Presentation Type: Oral Presentation
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Background: This qualitative study used an interpretative phenomenological analysis (IPA) approach to explore the lived experiences with sexual health of African American adolescents impacted by maternal HIV. HIV disproportionately impacts the African American population and adaptive or maladaptive behavioral responses to maternal HIV have the potential to impact the overall long-term sexual health outcomes of adolescents resulting in positive sexual health (self-efficacy) or negative sexual health (self-destruction). **Methods:** Guided by a social constructivist perspective, concurrent data were collected using semi-structured individual interviews with six African American adolescents ages 15-17 years who have an HIV-positive mother and one key informant focus group was conducted with eight African American adolescents ages 13-18 years who are HIV peer educators. Data were analyzed using a six-step heuristic framework including two cycles of coding followed by categorization of the codes into overarching themes. NVivo qualitative data analysis software supported data analysis. **Results:** The findings provide the context for African American adolescents' lived sexual health experiences as influenced by maternal HIV. The themes describe how adolescents found out about their mother's HIV-positive status, maintained a relationship with their HIV-positive mother, discussed and practiced safe sex, and expressed desires for specialized programs for their families. **Conclusion:** Implications from this study include considerations for direct practice, community practice, social work education, social work in public health, and research and methodological implications associated with services necessary to meet the diverse needs of adolescents and families affected by HIV.

A Descriptive Study on the Effect of Social Media on Interpersonal Relationships for Students at Howard University

Presenter's Name: Jelissa Jackson
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Prevalent to current times, the use of social media for emerging adult populations have drastically grown. Popular apps such as Facebook, Snapchat, Twitter, Instagram, and Tumblr have a significant relationship to individual personality traits and the interpersonal relationship people have with one another. This study is going to investigate how personality traits, attachment, interpersonal relationships, self-esteem, and some mental health are related to the use of these dominant social media sites. Using data collected from Howard University students through online surveys. This study will solely focus on the relationships among attachment styles, personality traits, interpersonal competency, and social media use. Future directions for research and practical implications are also discussed.

The Effects of Alcohol on the GPA of African American College Students: College Habits Affecting Academic Success

Presenter's Name: Niara Jackson
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Presentation Type: Oral Presentation
Faculty Advisor: Ralph Gomes
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Many studies exist examining the effects of alcohol consumption on the academic achievement of college students. However, most studies are done on an overwhelmingly white male population, and very little information exists concerning minority students. The purpose of this study was to identify the relationship between alcohol consumption and academic success in minority students on an HBCU campus. Theoretically, this study could contribute to current theory by revealing differences in the effects of alcohol on students of color. Practically, this study reinforces that minority subjects are statistically significant and will help to inform resources offered to underrepresented populations. I hypothesized that similar to the results of studies done on different racial groups, HBCU students' academic achievement would be negatively affected by their alcohol consumption. Survey research was used on a convenience sample of students at an HBCU. The independent variables were frequency of alcohol consumption, as well as amount of time spent partying, amount of stress due to school issues, amount of time spent preparing for class, and amount of time studying. The dependent variable was a student's GPA, measured on a 4.00 scale. The findings of this research confirmed the hypothesis that alcohol consumption has a negative effect on HBCU students' academic success. The focus of this research was to see if these findings would be consistent with research done in the past on different demographics, which they in fact are.

Differences in Clinical Symptoms Between Public and Boarding Schools in the District of Columbia

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In high school, students can experience a number of stressors that can negatively affect their mental health and sleep. The present study assessed levels of depressive, PTSD, anxiety, and insomnia symptoms in a sample of inner city high school teens. De-identified data of (N = 174) students from two public high schools (n = 147) and one public charter school (n = 27) in the Washington, D.C. area were utilized for this study. During the school day, each student completed a behavioral health assessment at their school. The following empirically-validated scales were utilized to assess the student's symptom levels: PHQ_9-A, PTSD Primary Care Symptom Checklist, GAD screener, and Insomnia Severity Index. Overall, 67.4% of students reported depressive symptoms, 94.6% reported anxiety symptoms, and 91.8% reported insomnia symptoms (SD = 4.48). Based upon this data, it is clear that access to mental health services is necessary in school settings.

Global Child Trafficking: A Review of the Literature

Presenter's Name: Emerald Jones
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Child trafficking is an important social issue that affects children throughout the world. Considering the geographical contexts of child trafficking, this paper aims to: identify and examine select theoretically driven studies on child trafficking, introduce the Marxist feminist perspective as a unique theoretical framework for highlighting sexual exploitation and capitalism in correlation to the oppression and subjugation of women. Acknowledging from a feminist lens how society is male-dominated and most children are trafficked for sexual reasons majority of the time. Lastly proposing a future research agenda to guide more theoretically driven scholarly work in child trafficking in both developing and industrial societies.

Colorism among African Americans influences Attractiveness and Personality-Trait Stereotypes

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Background: Color biases among African Americans have influenced perceived personality traits of black individuals whose skin tone is categorized as being light versus dark. **Methods:** Participants were asked to complete one of four booklet types, each containing the same pictures of four light and four dark skinned women. Next, participants indicated to what degree each woman exhibited specified characteristics. Grouped photos of the light skinned and dark skinned women were rated the same in order to assess general group stereotypic expectations. **Results:** The results indicated a statistically significant effect of skin tone on ratings of attractiveness, with respondents reporting individually pictured light skinned women more attractive than individually pictured dark skinned women. For personality trait measures based on individual stimulus, light, versus dark, skinned women were rated as being more arrogant and angrier. Also, light, versus dark, skinned women were rated as being less friendly, less happy, less kind, and less trustworthy. For group stimulus pictures, light, versus dark, skinned groups of women were rated by participants as being quicker tempered, more sexually aggressive, and more selfish. Similarly, light, versus dark, skinned groups of women were rated by participants as being less intelligent and less reliable. **Conclusions:** Results indicate that today's African American students do appear to exhibit beliefs associated with colorism notions. Attractiveness may account for the negative stereotypic traits for lighter skinned African Americans as it does for attractive persons in general.

Relationship Between Physical Activity, Personality, and Eating Behaviors on BMI in Black Women

Presenter's Name: Keri Kirk
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Coauthors: Denée Mwendwa, PhD, Regina Sims, PhD

Black women are disproportionately impacted by lifestyle diseases and obesity. Adequate physical activity (PA) can reduce individual risk for obesity; however, many Black women are not meeting the recommended weekly PA frequency that promotes wellness. Furthermore, maladaptive eating behaviors have been found to be predictors of obesity for this group. Personality characteristics like neuroticism and extraversion have been linked to obesity in Caucasian women. Less is known about how personality traits and eating behaviors, two factors that are associated with increased BMI in Caucasian women, interact to impact sedentary behaviors that influence BMI in Black women. The current study addressed the following questions: 1) Does the relationship between physical activity and BMI vary as a function of personality for Black women? 2) Does the relationship between personality and physical activity vary as a function of eating behavior styles for Black women? A community-based sample of 106 Black women completed the NEO Personality Inventory-Revised (NEO PI-R), Eating Style Evaluation survey (ESE), and a physical activity frequency questionnaire. Height and weight were also obtained. Fifty-five women were included in analysis due to missing cases. Hierarchical regression showed that the relationship between physical activity frequency and BMI was not influenced by the personality characteristics of extraversion, openness, agreeableness, or conscientiousness. However, there was a significant interaction between neuroticism and haphazard meal planning (B= -.474, p=.01) and between extraversion and haphazard meal planning (B=-.418, p=.01). Future studies are needed to examine the moderating effects of eating behaviors and personality in Black women.

Racial Disparities at Intervention Points in the Juvenile Justice System

Presenter's Name: Timothy Klipp-lockhart
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Since 1988, under the Juvenile Justice and Delinquency Prevention Act (JJDPA), states are required to address disparities with youth in the juvenile justice system at all intervention points in case processing (e.g., arrests, confinements; Sentencing Project, 2016). The most recent data show that in a ten year period, the rate of youth who were committed to facilities fell by 47 percent (Sickmund et al., 2015). Arrest is the first point of entry into the juvenile justice system. Youth of color are 2.3 times as likely than their white peers to be arrested across a range of offenses (Office of Juvenile Justice and Delinquency Prevention, 2015), despite few racial differences in offending behavior (Lauritsen, 2005). Although there has been a decrease in total numbers of youth for overall arrests and commitments, the disparities for African American youth and youth of color have grown. This poster presentation will examine published literature on disparities through intervention points in the

system given these persistent racial disparities. Prior research has been dedicated to the decrease of youth committed to juvenile facilities overall, but not fully to this specific issue. The presenters will address the implications of this by outlining a research agenda for issues that still need to be examined. For example, while policymakers and practitioners may celebrate the drops in juvenile incarceration and falling rates of arrests, we still do not know why the changes that have been made are helping white communities at a faster pace than communities of color.

Assessing the Financial Impact of Misdemeanor Court Fines and Fees in a Midwestern State

Presenter's Name: Karen Kolivoski
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A Department of Justice report suggests that between 60-90% of people in the criminal justice system are impoverished (U.S. Department of Justice, Bureau of Justice Assistance, 2000). If a person cannot pay court costs, including fines and fees, they may experience a cycle of debts and arrests. There is a dearth of research related to fines and fees, and especially their impact on vulnerable populations. This study utilized a public, online court database from one Midwestern state and U.S. Census data to examine statewide fines and fees for first-time misdemeanor offenders. The researchers used a random sample of the first criminal misdemeanor in every county in one state in 2010 (N = 77). Variables included those related to demographics, offense characteristics, and fines and fees. Due to the online database's data limitations, U.S. Census variables on poverty and household income for each county were utilized as a proxy for financial impact. The main methods of analysis were frequencies and descriptive statistics. Results showed that hearings that are supposed to occur to assess a defendant's ability to pay may be underutilized. Also, there exists a wide range between counties regarding household income and percentages of poverty, as well as a wide range of fines and fees ordered to pay between counties. Findings support that there are variations on impact depending on socioeconomic status exist and should be considered. This study supports that additional research is needed to assess the impact of fines and fees in greater detail.

A Comprehensive Database of Histone Deacetylase Inhibitors to Induce Latent HIV-1 Reactivation

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Highly active antiretroviral therapy (HAART) can effectively decrease the patient's total burden of human immunodeficiency virus (HIV), maintain function of the immune system, and prevent opportunistic infections that often lead to death. However, a small proportion of latently infected cells can live dormant in the peripheral blood and other tissues for years as a reservoir. Due to its slow decay rate, this reservoir has been regarded as the main barrier to virus eradication with antiretroviral drugs. In recent years, histone deacetylase inhibitors (HDACIs) have been found to be able to induce HIV-1 expression in latently infected cells. They could activate latent HIV-1 by up-regulating the acetylation level of H3 and H4 at the nuc-1 region of HIV-1 LTR, thus become potential drug candidates for eradicating the latent HIV reservoir. But, there is a lack of resource to collecting, maintaining and analyzing the data of HDACIs on this important application. Hence, we initiated the efforts of constructing a comprehensive database of HDACIs to induce latent HIV-1 reactivation. To our best knowledge, it is the first public database that provides useful information such as experimental systems, molecular models, in vitro and in vivo experimental reports, proof-of- concept studies, clinical trials, pathway identification and the most important to us, the chemistry of HDACIs. The data in the database were collected from scientific publications using a combination of our text-mining method and iterative, manual validation processes. The database will be published soon at the domain of howard.edu.

Considerations for the Mini-Mental Status Exam in an African American Sample in a Primarily Urban Setting

Presenter's Name: Sharlene Leong
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The Mini Mental Status Exam (MMSE) is a 30-question assessment used in health settings to provide an initial assessment of cognitive functioning (Crum, Anthony, Bassett, & Folstein, 1993). A raw score of 23 or below is currently indicative of cognitive decline (Alz.org, 2012). The MMSE loses sensitivity when evaluating ethnic minorities or those with lower education levels (Bohnstedt, Fox, & Kohatsu, 1994; O'Bryant et al., 2008) leading to a disproportionate number of cognitively-normal ethnic minorities inaccurately considered cognitively impaired or with overestimation of disease severity for age-related dementias. For example, current literature finds that the average raw MMSE score in African Americans is about 23±7.4 (Bohnstedt et al., 1994; Pedraza et al., 2012). However, such studies have created MMSE norms for various ethnic minorities suffer from an oversampling of Caucasians and have focused on archival data (Pedraza et al., 2012). Formulas have been suggests to adjust MMSE scores to consider level of education and age (Mungas, Marshall, Weldon, Haan, & Reed, 1996), however it is unclear if these are being used in diagnostic settings. This study sample was comprised of ethnic minorities, primarily African Americans, collected recently. We compared the current adjustments in literature to raw scores used in practice in this sample. We found a significant difference between the adjusted and raw MMSE scores in the African American subject population. The next step in our research is to use similar methods to derive an equation of MMSE adjustment for our sample.

Representations of Blacks in British Television: From Past to Present

Presenter's Name: Ashley Lewis
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In early 2013, the British Academy Film and Television Awards (BAFTA) failed to recognize the achievements of any Black British actors or actresses both as on-screen talent as well as content producers at their annually filmed event. Comparable to the American Emmy Awards, BAFTA celebrates achievements of British actors and actresses. However, much like the American Oscar Awards, BAFTA is known to deprioritize the contributions of people of color. BAFTA's apparent oversight of Black British television entertainers in this year raised questions not only about the current visibility of Blacks in British Television, but also the history of Blacks in British Television. While institutional factors that affect the visibility of Blacks in mainstream British programming are pertinent to note, what should also be illuminated are the social implications of the roles that Black Britons have filled in British television and how these roles have influenced varied social dynamics in Britain's turbulent racial history and vice versa, especially during periods of the mass migration of Blacks to Britain. Therefore, the following literature review discusses the televised representations of Blacks in Britain, paying special attention to emerging stereotypes and their origins. The literature review also visits major time periods in British history including the post WWII migration of Blacks to Britain, and the Thatcher Era (1975-1990), periods of time where negative discourse about Blacks in Britain were exaggerated and reflected in British programming. Furthermore, this review of literature discusses missing gaps to be filled concerning Blacks in British television presently.

Adverse Childhood Experiences, Racial Identity, and Cardiac Autonomic Dysregulation

Presenter's Name: Christian Mallett
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Background: Dong et al. (2004) found that those with higher ratings of adverse childhood experiences (ACE) were more likely to have ischemic heart disease. Purpose: The focus of the present study was ACE prevalence and cardiac autonomic dysregulation. A second aim of this study was to examine how attitudes about one's racial identity may strengthen the hypothesized relationship between ACE prevalence and cardiac autonomic dysregulation. **Method:** Howard University undergraduates (N = 201) participated in this study. Participants completed consent forms and questionnaires including the ACE Scale (n = 143) and the Cross Racial Identity Scale (n = 201). The ACE Scale included 10 items regarding different types of abuse (verbal, physical, emotional, etc.) and household dysfunction (divorce, incarcerated parent, parent who abuses substances, etc.). Each participants' number of adverse experiences was summed for

an ACE composite score (M = 2.40, SD = 2.05). The Cross Racial Identity Scale included subscales of Black identity attitude clusters relating to the Cross Nigrescence Theory: Self-Hatred (α = .86), Miseducation (α = .84), Afrocentricity (α = .85), and Multiculturalist (α = .77). Participants returned to the laboratory, and researchers employed an impedance cardiograph to assess resting heart rate variability for fifteen minutes. **Data Analysis:** A moderation analysis will be conducted to determine mitigating effects of Black identity attitudes on the relationship between HRV and ACE.

The Turning Point of Formerly Incarcerated African American Men

Presenter's Name: Zipporah Mccoy
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This exploratory study will explore the turning point of formerly incarcerated African American men between the ages of 18 and 75. Turning point in this research is defined as the decisive change African American men made, which resulted in ending criminal trajectory and recidivism. The study will analyze qualitative data from in-depth, face-to-face, semi-structured interviews and focus group sessions that are designed to expose the turning point of formerly incarcerated District of Columbia and Virginia citizens. Ten in-depth, face-to-face, semi-structured interviews and three focus groups at two different sites with twenty-four participants will be conducted. The two aims of this investigation are the following: 1) determine the perceptions that formerly incarcerated African-American men have about how obtaining a college degree contributes to desisting (ending) criminality and recidivism; and i.e, describe what African American men— from their perspective—cite as being most helpful in desisting criminality and recidivism. 2) explore how beliefs and attitudes impact perceived decisions to obtain a college education. The findings will have implications for colleges, universities, reentry programs, and social policy initiatives that seek to assist formerly incarcerated African American men's reentry into American society.

The Effects of Class Attendance on Grade Point Average After Controlling Selected Socio-demographic Variables

Presenter's Name: Romie Michel
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Faculty Advisor: Ralph Gomes
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Background: This study was conducted to employ a hypothetical analytic model to add insight and depth into the relationships between class attendance and grade point average among undergraduate students attending Howard University during the 2016 spring semester. In doing so, the study examines the relationships among variables such as class attendance, extra curricular activities, proximity to campus, major, hours slept, classification and study habits. The researcher hypothesizes that class attendance will have a negative impact on grade point average after adjusting these six related variables. **Method:** Randomly selected Howard University students were asked to complete a survey that included questions relevant to this study. Upon completion all data was computed into the SPSS statistics database. **Findings:** The findings revealed that 32.6 % of students were between 3.00-3.39 grade points and 13% of them experienced difficulty making it to class on time. 61% of students between 3.40-3.79 grade points experienced no difficulty making it to class on time. 9.8% of students had the highest grade point averages of 3.8 to 4.0. Of those students 4% experienced difficulty making it to class on time. Thus, the lack of class attendance revealed a negative effect on grade point average. **Conclusion:** According to the data results we can conclude that these related six related variables can negatively effect students' grade point averages.

Sri Lankan National Integration and Reconciliation in the quest for Justice

Presenter's Name: Kasun Millawithanachchi
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Sri Lanka is a former British Colony formally known as Ceylon. It is currently a democracy, which was drawn into a civil war that lasted almost 30 years and ended in 2009. Currently, the country is attempting to reconcile its differences in order to move forward towards a more just

society for all of its citizens. The government, under the leadership of President Maithripala Sirisena, has decided to build a more inclusive society, which would fully integrate its people and ethnic groups into society. In order to accomplish this end, the government has established an administrative agency with the task of developing a strategy and tactics to reconcile various nations' people in the quest for social justice. Social justice in the Sri Lankan context means more fair and equitable use of the country's resources to improve the quality of life of its people. **Methods:** to develop an analytical model to assess the agencies' performance in its reconciliation efforts in selected sectors of the economy, the paper will focus only on the comparative analysis of the education sector in four schools in four districts at the high school level. Future research will focus on other sectors of the economy in the quest for social justice. **Conclusion:** The analytical model will be submitted to the reconciliation commission as a way to assess implementation performance in each sector of the economy based upon explicit conditions to achieve success in reconciliation efforts.

A Seat At The Table: Resurfacing Black Women Writing the Black Radical Tradition through Poetry

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"If they don't give you a seat at the table, bring a folding chair."

—Shirley Chisholm

Recording artist Solange recently channeled the sentiments of Chisholm in her 2016 album A Seat At The Table. Solange, like many other Black singers and artists, used her craft to express distress during critical times in African Diaspora history. Poets like Gil Scott Heron or Howard's own LeRoi Jones, better known as Amiri Baraka, have broken ground with revolutionary poetry, but women have often been left out of the radical literature conversation. Sonia Sanchez and Nikki Giovanni, members of the Black Arts Movement, are some of the only women revolutionary poets remaining. While others have not self-proclaimed the title poet, they contributed a great deal to the literature and cultural history as they confronted the black freedom struggle against white supremacy. Their words may not have always been metaphors, haikus, or similes, but they've ignited change to various movements. By resurfacing the poetry of Black radical women within the African Diaspora not only highlights their incredible lives, but also presents the solidarity that many of the women shared. Having a seat at the Black radical tradition table will add Black women into the narrative that Cedric Robinson's Black Marxism excluded them from. Despite the historical erasure of Black women within African Diaspora research, the poetry of liberation, empowerment, and Black feminism will show that women have not only brought folding chairs to the table, but have been the head of tables throughout nineteenth-century history.

High Public Regard and Race Tailoring Increases Attention When Fellow Blacks Might Threaten that Regard

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Black buying power is projected to reach $1.4 trillion dollars by the year 2020 in the U.S. So marketing experts have begun to tailor places of business and advertising to win over Black consumers. The current study examines the effects of race tailoring on how much Black participants attend to information about a business. An experimental study measured attitudes toward a department store, with two manipulations, a manipulation of race tailoring of the businesses, and a manipulation of argument quality designed to assess the amount of thought and attention toward the department store. One aspect of racial identity was measured as well. Public regard indicates the person's perception of how others view the Black race, positively or negatively. It was predicted that Blacks with high public regard would pay more attention to businesses tailored to other Blacks, because they were more concerned about threats to high public regard. Results showed that those with high public regard responded to Black tailored businesses with increased attention to information about the business. When the store either did not have other Blacks present or if the person was not concerned about maintaining high public regard, then the amount of attention to information was less. This suggests a new tailoring effect driven by concern for how the group is perceived in public made by other groups.

Heart to Serve: Using Simulation to Increase Healthcare Student Engagement in Health Disparities Research

Presenter's Name: Tamara Owens
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Coauthors: Debra Ford

"While the diversity of the American population is one of the Nation's greatest assets, one of its greatest challenges in reducing the profound disparity in health status of its racial and ethnic minority, rural, low—income, and other undeserved populations" (NIH, 2016). Research is key in understanding and addressing the depth and breadth of disparate care. Engaging healthcare students in research during training may build sustainable research infrastructure to address those diseases which disproportionately affect disadvantaged and minority population. The HUHS Simulation & Clinical Skills Center designed health disparities simulation workshops targeting medical and dental students specifically to increase their awareness and interest in health disparities research. The goal was to provide student attendees with 'up-close' and realistic views of what health disparities may look like from the patient's perspective. The scenarios demonstrated socio-economic, cultural and bias-based dynamics of the patient, provider and healthcare system interactions in multiple healthcare settings. The workshop objectives were to demonstrate the impact of health disparities on issues around:

- efficiency of healthcare access
- trust in the healthcare system
- understanding of healthcare information
- appropriate utilization of healthcare information

The hypothesis is that given an opportunity to acquire knowledge and observe a simulated patient encounter there is a greater chance students will engage in health disparities research. The study theoretical framework is based on the social cognitive theory and its key concepts of attention, retention, reproduction, motivation, performance, and self-efficacy. All attendees completed a post workshop survey. The results will be presented.

The Effects of Racial Discriminatory Experiences and Promoting Resiliency

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Objectives: To investigate the effects of racial discriminatory experiences and discover protective factors that could promote resiliency. **Methods:** Data was collected on 77 undergraduate students. Participants completed consent forms and questionnaires including: demographic information, racial experiences, racial beliefs, coping mechanisms, and depression symptoms. Regression analysis was conducted using SPSS to test the hypothesis that being bothered by being discriminated against mediates the relationship between the frequency of discriminatory experiences and the amount of depression symptoms. **Results:** The results of the regression analysis indicated that discrimination frequency was a significant predictor of being bothered by discrimination, b=.727, SE=.126, p=.000, and that being bothered by discrimination was a significant predictor of depression symptoms, b=.114, SE=.057, p=.049, which supports the meditational hypothesis. Discrimination frequency was still a significant predictor of depression symptoms after controlling for the mediator, b=.247, SE=.058, p=.0001, but was reduced when the mediator was included, b=.165, SE=.069, p=.021, consistent with partial mediation. Approximately 27% of the variance in depression symptoms was accounted for by the predictors (R2=.2774). The indirect effect was tested using a bootstrap estimation approach with 5000 samples. These results indicated the indirect coefficient was significant, b=.083, SE=.048, 95% CI=.0204,.2043. **Conclusion:** These data demonstrate that higher experiences of discrimination are related to higher reports of depression symptoms, mediated by how bothered people are by these discriminatory experiences. In response to this finding, we will conduct further analyses to investigate potential protective factors that could promote resiliency to the development of depressive symptoms when experiencing discrimination.

Effects of the Estrous Cycle on Post-Footshock Sleep in Female Mice

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Background: Women are more likely than men to develop posttraumatic stress disorder (PTSD) following trauma exposure. Sleep has been implicated in the development of PTSD. Studies have suggested that estradiol plays a role in both women's response to stress and sleep. Animal models have an advantage in examining effects of stress on sleep in a specific hormonal state. However, previous animal sleep studies for PTSD tested only male animals; therefore, this study examined effects of the estrous stage at stress exposure on sleep in mice. **Method:** Electroencephalogram (EEG) was continuously recorded in female C57BL/6 mice two days before and after a footshock session in which fifteen footshocks (0.5 mA, 0.5-sec duration, 1-min interval) were administered. Four mice received footshocks during the metestrous stage, when ovarian hormones are low, and five during the early light period of proestrus, when estradiol is high. EEG data were scored to identify wake, rapid-eye-movement (REM), and non-REM (NREM) sleep. **Results:** Wilcoxon test revealed that in metestrous animals, sleep efficiency (percentage of time asleep in recording period), percentage of NREM sleep, and the number of REM bouts in dark periods decreased from baseline to post-footshock Day1 (all z=-2.023, p=.043). Similarly, sleep efficiency and REM bouts in light periods decreased from baseline to post-shock Day2 (both z=-2.023, p=.043). No significant changes were observed in proestrous animals. **Conclusion:** Changes in sleep after footshocks were observed only in metestrous animals, suggesting that estradiol may prevent stress-induced sleep disturbances.

The Empowerment of Black Women Across The Diaspora

Presenter's Name: Sytonia Reid
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In the 21st century, continental African women and women throughout the African Diaspora often find themselves in similar historical and social positions. In Ghana, a leading West African nation in industry and societal modernization, Black Ghanaian women have through generations, watched their society evolve according to the influence of pre-colonial, colonial, and independent standards. What unites Black women in America and Black women in developing nations like Ghana is the persistence of inequality in terms of economic opportunity, representation in roles of leadership, and agency over one's physical body and future. The research gathered over a 10-day trip to Ghana in May 2016 sought to identify the factors by which Ghanaian women are empowered and disempowered by their society. The researcher kept a daily log in which notes from conversations, key observations, and data were recorded and categorized according to the social factor the information addressed: economy, politics, education, healthcare, and culture. The perspectives and experiences gathered from the women the researcher met in the cities of Accra and Kumasi, yield two major implications: (1) education proves to be one of the most effective and life-changing sources of empowerment, and (2) Ghanaian culture historically assigns women to positions of partnership and leadership in their community, though this representation is not reflected in Ghana's institutional sectors. As African-American women continue to benefit from educational opportunities, this comparative research aims to understand the similarities and differences between women across the African Diaspora who are navigating through societies to pursue improved lives.

The Exploration of the Effects of Contraceptive Use on the Mental Health of African-American College Women in Relation to their Counterparts on Howard University's campus

Presenter's Name: Camille Robinson
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Research shows that the methods in which contraceptives are used, as well as the decision-making behind the use of contraceptives can lead to the development of depression, anxiety and other mental health disorders in women. Different factors of contraceptive use, especially contraceptives with hormonal aspects, have different impacts of potential rates

of psychological functioning and disorder. The purpose of this research study is to determine whether there is a higher direct correlation between contraceptive use, specifically birth control, and overall mental health in African-American college women when compared to their counterparts on Howard University's campus. **Methodology:** In a randomized double-blind survey design, approximately 75 African-American female students, 75 Latino female students and 75 female students who identify as another race and are between the ages of 18-25 at Howard University will participate in the research study. Statistical data will be gathered through a self-reported questionnaire utilized by an online survey (google forms platform). The self-reported questionnaire will be distributed through the following social media platforms: Groupme, Instagram, Facebook, Twitter and Linkedin. Based on the variables observed, the investigators will use the Statistical Package of Social Sciences (SPSS) to analyze the results. **Conclusions:** Ultimately, the goal is to assess the correlation between contraceptives, specifically birth control, and the overall mental health of the African-American participants in relation to their counterparts to provide solutions for the research community.

Studies of a Trap Scholar: The Birth of Trap Music and Its Effects on Hip Hop

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Hip Hop has risen to the forefront of universal popular culture, while remaining an important cultural factor and mode of expression in the global black community. What happens in Hip Hop reflects and influences it's world and the "streets," therefore it is important to document the changes within this historical art form and how it affects our communities. This essay is an evaluation of the phenomenon of "trap music," a newly popularized genre of the most recent decades. Trap music is a Southern style of Hip Hop cultivated in cities such as Atlanta, Georgia and Memphis, Tennessee. This style of music has intricate, upbeat rhythms that elevate the energy of the listener, while the lyrics reflect the lives, thoughts and ambitions of drug dealers or "trappers." Many Hip Hop outsiders and/or advocates of politically conscious rap may discredit trap music as a valid aspect of musical expression. My research will evaluate trap music as a valid sub-genre of Hip Hop, by examining its origin, as well as it's positive and negative effects on the African American community. As a style of music brought to the mainstream by artists like Gucci Mane and Future, there is a question of what changes trap music is igniting in the Hip Hop community and pop-culture as a whole.

Disincentivized and Demobilized: An Olsonian interpretation of the 2013 Shahbag Movement

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This paper evaluates the 2013 Shahbag protests in Bangladesh through the lens of social movement theory, specifically that put forward by Mancur Olson in The Logic of Collective Action and the resource mobilization school of social movement theory that has been built upon it. Then it concentrates on the 2013 Shahbag movement and the Hefazat-e-Islam countermovement. The 2013 Shahbag movements was a failed social movement because it lost the previous advantages its ideological predecessors had secured for secularism and facilitated the rise of Islamism in the form of Hefazat-e-islam. The paper will then explore the reasons of the failure of the movement through Olson's ideas of by-product theory and special interest theory. The real world effects of the failure of the movement are also addressed in the last section of the paper.

Gender Differences and the Impact of Exposure to Violence on Alcohol, Drug Use, and HIV Risk Behaviors among African American Young Adults

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While research has documented the impact of exposure to violence on drug use and HIV risk behaviors, less is known about what forms of violence most affect drug use and HIV risk behaviors, and how the effects vary by the type of violence and by gender. Data were drawn from a sample

of 440 African American young adults ages 18-25 living in Washington, DC. We first conducted factor analysis of the exposure to childhood and community violence scales to identify domains or types of violence. We then conducted a series of regression analyses to assess how the various types of childhood and community violence affected dependent variables representing drug use and HIV risk behavior factors. Women and men differed in the types of violence to which they were likely to have been exposed. Women were significantly more likely to have been exposed to personal violence and attack, which explained a mean of 75 percent of the total variance in lifetime ATOD (Alcohol, Tobacco and Other Drugs) and age of first ATOD use and 65.8% of the total variance explained in the model for behaviors that obviate a need to worry about HIV. Men, in contrast, were more likely to have been direct victims of violence. Experiencing gun use or seeing violent deaths explained 51.6 percent of the total variance, 69 percent of the total variance in the model for male marijuana use and 38.2% of the total variance explained in attitude towards condom practice.

Race Relations and Self-Esteem

Presenter's Name: Denae Sampson
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Self-esteem typically is a result of one's environment and how that causes them to view themselves. How receptive people are towards a person can be a determining factor of how they feel about themselves. A variable that often causes people to feel different ways about one another often comes down to race. Although race is nothing more than a phenotype of skin color, this is the cause of much tension in many places. This racial tension can cause harsh treatment and inequalities that can affect a child's self-esteem from an early age. This study investigates the self-esteem of African Americans as it correlates to the levels of racial tension that they have experienced. Researchers gathered information from 55 college aged participants on the level of racial tension in the areas that they were brought up in and the effects that this has had towards their self-esteem. The results showed that there is a direct correlation in the areas that people are socialized in and the amount of self-esteem that they possess. The data collected indicates that although participants who stemmed from areas with higher racial tension in fact did have lower self-esteem, it astonishingly was not at a significant level.

The Future of Probabilistic Severe Weather Forecasting: A Case Study of the 2016 Hazardous Weather Testbed

Presenter's Name: Shadya Sanders
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The weather enterprise has invested billions of dollars improving technologies to create more accurate and timely forecasts with the intention of preventing loss of life and property. While these investments have greatly improved our knowledge of weather systems and their potential impact on our global community, the impact of machinery alone has a maximum. For decades, the National Weather Service has issued weather discussions and warnings in an all capitals textual format resulting in a yes or no, deterministic warning paradigm. It is known throughout the weather community that there are communication issues with the current "Watch, Warning, Advisory" method for the publics and solutions to this are desperately needed. There is conflicting evidence that using numerical forecasting is useful for publics, however recent work has found that given a functional understanding of the information given, people make better decisions with probabilistic data than without (Morss 2008). A mixed methods approach is used in this preliminary study to investigate how emergency managers, forecasters, and broadcast meteorologists understand and react to severe weather forecasts (lightning, severe wind, hail, and tornadoes) presented as probabilities. This initial look at what probabilistic forecasting means to weather experts that deal directly with the public can give insight to the future of the weather enterprise, as well as a deeper knowledge of decision making during life-threatening situations. The effects of subjective numeracy, differences in cognitive preference, comfort with ambiguity, and desirability of numerical over textual forecasts are considered.

Oppressed but never Enslaved: Youth Unemployment at the Hands of a Post-Apartheid Nation

Presenter's Name: Brittany Scott
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Unemployment in South Africa has been a prevalent socioeconomic issue, especially among the country's youth

for many years. According to the World Bank, nearly 52.6% of South African youth ages 15-24 are unemployed, with the largest group being Black South African youth. The question arises as to what is causing the high unemployment rates for this age group in a rapidly emerging country, especially for the Blacks in the country. This research study explores the multi-layered impacts of unemployment among South African youth. Through participant observation and interviews in the Langa and Nyanga Township in Cape Town as well as Alexandra, Soweto, and Johannesburg South Africa, my findings suggest that the systemic oppression stemming from Apartheid has played a crucial role in the unemployment among Black South African youth. With a sample size of 20 participants, through my research, it is evident that inequalities in education, barriers to enrollment, and parental background have created and perpetuated the gaps in unemployment. From the finding, it is crucial that South African policymakers consider the impact education has on unemployment, and push to create evidence based policies to address the issue.

Metabolic Syndrome, Inflammation, and it's Implications on Cognitive Functioning in a Community Sample of African Americans

Presenter's Name: Kanesha Simmons
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Research has shown that Metabolic Syndrome (MetS) has adverse effects on cognitive functioning. Studies have illustrated that pro-inflammatory cytokines such as interleukin-1a (IL-1a), interleukin-6 (IL-6), and C-Reactive protein (CRP) mediate this relationship. African Americans are disproportionately affected by MetS and at greater risk for earlier onset and accelerated decline in cognitive functioning. Few studies have examined this relationship in African Americans. The current study investigated the relationship between MetS and cognitive functioning in an African-American community sample. The study also determined if the association between MetS and cognitive functioning is mediated by IL-1a, IL-6, and CRP and whether it is moderated by gender and socioeconomic status (SES). The study consisted of 214 African Americans in the Washington, D.C. metropolitan area. Participants underwent a medical examination conducted at the General Clinical Research Center at Howard University Hospital. Blood serum was collected using venipuncture procedure to determine cholesterol, triglyceride, IL-1a, IL-6, and CRP levels. Weight, height, and blood pressure were also taken. Participants completed a full health history, as well as a battery of psychosocial and neurocognitive measures, which included the Stroop, Trail-making A, and Trail-making B. Results showed no significant main effects of MetS on cognitive functioning. However, the relationship between MetS and cognitive functioning was mediated by Il-6 and CRP. This relationship was not moderated by gender or SES. Results emphasize the important role of inflammation as a mechanism by which MetS impacts cognitive functioning. Future research should consider the role of inflammation when determining risk for cognitive impairment.

Television, The Media, and the Portrayal of Mental Illness.

Presenter's Name: Jaidah Sizer
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When you have breakdowns do you wonder if you fall under mental illnesses? Television and the media have their own meaning to mental illnesses. Mental illness is a wide range of conditions that affect mood, thinking, and behavior. With television and media being mainstream, a lot of well known figures, like Kanye West and Kid Cudi have been portrayed to have mental illness. This has become a new trend in society, and tons of movies and television shows have been projecting their vision of mental illness. With 450 million people being affected by mental disorders, one in four people in the world, a questionnaire will be developed for young adults from ages 18-22. It will have a series of questions of how the media portrays mental illness, to see if the person answering the questions suffers from mental illness, and to get their opinion on the representation of mental disorders on television. This will be shown the results to two different audiences; the audience who suffers from mental illness, and to people who will be informed what is shown on television is not necessarily a correct depiction of your own mental health. In conclusion, this study will show what is real and what is imaginary. This is also a rostrum for people who hurt from mental disorders. This is to show that mental illness cannot just be portrayed as a trendy epidemic for television, it is something much more than that.

Color, Caste, and the Public Sphere: A study of black journalists who joined television networks from 1994-2014

Presenter's Name: Indira Somani
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Coauthors: Natalie Hopkinson

Network television newsrooms, because of their position straddling the worlds of entertainment and public service, are particularly revealing sites to examine how black aesthetics and identity continue to be policed in both the private workplace and the public sphere. Grounded in social identity, black feminism, intersectionality, acculturation, and assimilation theories, this study analyzes the experiences of 23 black journalists aged 23-42 and their struggles to suppress, and in some cases, erase their black identity in order to conform to hegemonic white norms about hair, skin color, grooming, age, sexuality and class. Through in-depth interviews with black network executives, anchors, reporters, producers, associate producers and assignment editors from NBC, CBS, ABC, CNN and FOX who graduated from college between 1994-2014, participants reveal how anti-black norms are re-enforced by mentors, colleagues as well as superiors. The broadcast journalists accept that conforming to white supremacist cultural norms is necessary to career advancement. However, conformity also comes at a psychological, monetary and physical cost to the black journalists. This study reveals obstacles that remain a generation after the Civil Rights Movement mandated workplace protections for women and racial minorities and the 1968 Kerner Commission Report urged the racial integration of the nation's newsrooms. Beyond newsroom culture, this study has widespread implications for the way reality is shaped and the maintenance of America's racial caste system.

Health Care Providers HIV Stigma... A Major Public Health Debacle

Presenter's Name: Shirin Sultana
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Coauthors: Patricia Houston, Edwin Powell, Javed Khan, Michael Kharfen, Sohail Rana

Objectives: Studies in developing countries show high prevalence of HIV stigma among healthcare workers that are implicated as a barrier to access to care. Little data has been published for the US. We assessed prevalence of HIV stigma among providers in Washington, DC where HIV remains epidemic. **Methods:** Using a validated instrument, 330 providers in an inner city hospital were surveyed. Frequency of responses to key stigmatizing attitudes were summarized, and compared using Pearson Chi-Square test. **Results:**Stigmatizing attitudes were high, with 66% displaying at least one negative thought, belief or behavior. Of clinicians, 31% reported using double gloves for HIV patients. Older individuals and support staff had more stigmatizing responses. **Conclusions:** The high prevalence of stigmatizing attitudes/behavior is alarming. Stigma is reported to be associated with poor engagement in care. Comprehensive interventions to decrease stigma are needed to improve access, linkage and engagement in care for HIV. **Policy Implications:** HIV Stigma is a major public health problem with serious implications on outcomes. Nationwide monitoring for stigma among providers and interventions to eliminate this barrier to optimal treatment are needed.

A Critical Discourse Analysis of "Minority Women for Trump" Campaigns on Social Media

Presenter's Name: Wei Sun
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Political communication in digital age has brought new insights and challenges to American citizens across parties, genders and ethnicity. The 2016 Presidential election has drawn global attention just as previous US presidential campaigns. Moreover, with two opposing and controversial candidates for the presidency, voters are divided across a wide range of issues. This research is interested in various minority women for Trump campaigns on social media sites, in the time frame when Trump's lewd comments about women were made headlines from before the third Presidential debate till Election Day. Selective and sampled articles and tweets/ retweets from Facebook and Twitter between October 18 and November 8 will be scrutinized. The theoretical framework will be minority discourse by Mohamed (1987) and feminist

theory. A critical analysis will be used as a method to analyze these online debates /discussions will look at how minority women supporters and non-supporters construct and destruct Trump's political discourses and images. Gendered and minority discourses will be discussed. The political experiences of minority members will be analyzed.

Nana's Need: How to Protect the Baby Boomer Generation Now Eligible for Medicare

Presenter's Name: Heidi Thomas
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The baby boomer generation has reached the age of retirement and eligibility for Medicare. The future viability of the American healthcare system and the Medicare program are dependent upon the health of the baby boomer generation and their access to quality health care. Their access to quality health care is dependent upon consumer protections in the health insurance market that will ensure beneficiaries maintain coverage comparable to Medicare and do not fall victim to unfair or deceptive marketing and advertising practices. While the Medicare program has undergone a number of expansions to include private health insurance and increase the quality health care provided to its beneficiaries, there has been limited attention to the problem of fraud perpetrated on older citizens eligible for this program. Congress, the National Association of Insurance Companies, and the Centers for Medicare & Medicaid have worked together to implement regulations for private health insurance companies that are contracted with Medicare in order to ensure consumers are protected and actually receive the quality coverage intended. Nonetheless, beneficiaries are often vulnerable if ever in the market for a health insurance plan that is not contracted with Medicare, as the regulations do not apply. The objective of this paper is to address how increased consumer protections for the elderly population in the marketplace for private health insurance will work to keep the aging baby boomer generation healthy, and in turn, help to sustain a robust American health care system.

United States Humanitarian Intervention: To Lead or to Empower Others?

Presenter's Name: Andrea Tyree
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The United States' approach to humanitarian intervention has received an abundance of criticism. These critiques include the effectiveness of the interventions, the underlying justifications for intervention and the concept of the United States are the "world's police." Yet what should be the center of the discussion is whether the United States, and the international community it partners with, has been successful in resolving these crises and preventing new ones. This topic is particularly prevalent in the Middle East where the United States has significantly increased its presence in the past few decades for reasons such as humanitarian intervention. Furthermore, it should be discussed whether humanitarian crises are more effectively resolved when one nation leads the intervention, or when an organization of numerous nations, like the United Nations (UN) or North Atlantic Treaty Organization (NATO), leads. Though there are faults to both methods, this paper will argue that the United States needs to place less focus on directly intervening in an impending or ongoing humanitarian crisis and begin to place more emphasis on supporting and empowering international organizations to intervene. This paper will argue that this method must be used foremost in the Middle East when resolving humanitarian crises through international intervention. Not only will this paper review how the United States became a dominant presence in the Middle East and the justifications for international intervention, it will also analyze previous interventions in Libya and Afghanistan to support the aforementioned argument.

Defining and understanding patient-provider communication in news stories from the Black Press: A content analysis.

Presenter's Name: Sean Upshaw
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Patient-provider communication is one of the vital components to the United States health care system. Some

scholars described patient-provider communication as a verbal contractual portion of health care that allows the patient to describe symptoms or problems related to their health status. In some instances, patient-provider communication emphasizes lived experience as a form of information (data) that transforms into a collaborative partnership. One of the many avenues where patient-provider communication phenomena manifest is through news stories. This paper will explore how media representation of patient-provider communication in news stories can influence and shape public discourse among African Americans through second-level agenda setting theory through the lens of the Black Press. Furthermore, this paper will employ a qualitative content analysis to accurately describe how the Black Press impacts the reader's perception and cognitive process of patient-provider communication within the realm of Black culture.

Challenging the system: A history of Women's activism in communication policy

Presenter's Name: Alisa Valentin
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Coauthors: Carolyn Byerly

This research examines women's structural relationship to the news media and communication industry in the United States. It is explored through an examination of legal developments since the 1970s, which was a monumental time for activism. This era was post- Civil Rights Movement and the beginning of the second wave of the feminist movement. Both of these movements were significant for the strides made by women attempting to shatter the glass ceiling in the media world. In this research, the authors sought to examine laws, federal communication policies, lawsuits and court rulings to trace women's efforts to gain greater access to jobs in media and to own media companies. The results of this examination were analyzed through a feminist political economy lens. The discussion emphasizes that women used their agency through activist organizational power and the court system to challenge exclusionary nature of the media in terms of both upward mobility in employment as well as access to ownership. The discussion also demonstrates how the FCC has created an accidental ebb and flow model of acting against the public interest of women. Additionally, this research shows how women's progress in media has continually been hindered by deregulation. In an era in which activism is necessary for change, this analysis provides a timely historical lens through which to understand how women and other marginalized populations can organize and use the court system to challenge an unfair status quo of inequality and injustice.

Regional Financial Integration-Empirical Study for East African Community

Presenter's Name: Maryam Vuai
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Objective: This research focus on empirical analysis of financial sector for five member states in the East African Community (EAC). Financial integration is pivotal for the flow of financial funds among member states in the process of regional integration for the purpose of forming single currency by the year 2024. Regional financial integration is significant for this research because it will provide a clear picture of financial depth in the region, and the extent it has achieved. It is imperative to have a well-integrated financial system and deepening in spirit of facilitation monetary flows and other transactions for trade and exchange purpose. **Methodology:** This research will use beta-convergence methodology to measures the speed of convergence, and compared results across sample period in the financial sector. Futhermore, this research will implement sigma-convergence methodology to measures the cross sectional dispersion of financial sector at any point in time. **Data:** Variables that will be investigated are treasury bills rates, lending rates, and interbank rates for the five member states. For beta convergence, the model will use country dummies as proxies, defined as Before-EAC, Pre-EAC, and Post-EAC. This will capture changes for the time period of 1993 to 1999, 2000 to 2006, and 2007-2015. Sigma convergence will measure the cross sectional standard deviation of each examined interest rates in time t. **Preliminary Results:** Results indicate three of the member states exhibit convergence with the interest rates especially with the Post-EAC stage. On the other hand, the dispersion decrease as time moves forward Post-EAC phase.

African American Women in connection to Human Trafficking in the United States

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Sex trafficking, as defined by the National Institute of Justice, is the "commercial sex act induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age". Sex trafficking is a profoundly researched topic, although, there is very little scholarship as it relates to sex trafficking and using one's ethnicity as a variable in the United States. Sex trafficking among African American women within the United States is wildly under-reported yet in some instances they are more likely to be victims of human sex trafficking than other ethnicities. Melissa Farley highlights the connection between the negative stereotypes surrounding voluntary prostitution and sex trafficking. This relation creates an outlook on African-American women more of perpetrators than actual victims. As a result, African American women are reported as victims of sex trafficking at a lower rate than other races the United States.This research paper will connect the harmful effects of prostitution, stereotypes and past abuse to sex trafficking and why African American women are more susceptible to entering into the exchange. The methods used for this research are quantitative data from national statistics and literary-based research from various scholars.This study will focus solely on African American women of all ages in the United States. Initial research suggests that due to the misguided sentiments concerning African American women, they are not included in many studies pertaining to sex trafficking because of their association with voluntary prostitution.

An Exploratory Study on Coping Mechanisms, Academic Performance and Personality Traits for Howard University Undergraduate Black Males

Presenter's Name: Megan Ware
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The purpose of conducting this study is to provide research and insight on the dropout and retention rate of black males at Howard University, with the hopes to discover the barriers withholding males from graduating and informatively preventing these circumstances from occurring. Although Howard admits a high number of black male students, the graduation rate of the Black male students is not as persistent as the Black female students who attend HU. This study is not only critical to Howard's community, but it is also important to the black community because the college graduation rate of black men has a direct impact on impoverished neighborhoods within the black community. Hopefully, the findings of this study will introduce future plans in response to issues affecting Black undergraduate men from graduating at HU and contribute to increasing the graduation rates.

Does Racial Bias in the News Coverage of Crimes Affect Racial Attitudes in Society?

Presenter's Name: Sydney Williams
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Although today's media outlets attempt to promote the inclusion of all races, genders, religions, and backgrounds, news media coverage continues to reflect the lack of diversity in today's newsrooms. According to Pew Research Center, Blacks comprise less than five percent of newsroom jobs (Vogt, 2016). Historically, the news media have been notorious for negatively representing African-Americans as perpetrators while victimizing whites, even in instances where the former are innocent and the latter committed a crime. John R.K. Howard, for example, is a 19-year-old white male who assaulted a Black student with a coat hanger. The media depicted him as an athletic and studious young man, and Howard was acquitted of all charges. It is hypothesized that the lack of diversity in American newsrooms are partially responsible for the continuous emphasis of white biases and values in the media. This research will evaluate whether the negative representations of Blacks in the news media influences racial attitudes and perceptions of African-Americans in society. The results of this research will indicate whether negative media representations of race contribute to implicit racial bias in society.

Association Between Location and Hypertension Among Individuals in the Cobb Collection 70 Years Ago to Present, A Statistical Approach

Presenter's Name: Tamea Williams
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Hypertension is an ailment in which the continuing force of the blood against your artery walls is high enough that it may eventually cause additional health problems, such as heart disease. The frequency of hypertension in African-Americans is the highest in the world. African Americans can improve the chances of not acquiring the disease by understanding the risks and taking healthier steps in their diet and physical activity. Nevertheless, residents in vulnerable communities who don't have access to affordable clinics or fresh foods are more likely to bear the burden of chronic diseases. The Cobb Collection is the largest skeletal collection of African American remains. The Cobb Collection is a significant tool used to analyze the historical background of health disparities to approach this project. This study investigates the connection between living in certain areas around Washington, DC about 70 years ago to presently to analyze environments and how this can correlate to hypertension prevalence in possibly disadvantaged areas.

Translational & Clinical Sciences

Stealth Polymeric Nanoparticles Fabricated by Dispersion Polymerization for Combination Drug Loading Suitable for Breast Cancer Treatment

Presenter's Name: Yvonne Abbey
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Combination chemotherapy is a treatment method that utilizes the synergistic or additive effects of two or more chemotherapeutic agents in cancer treatment. The realization of the complexity and heterogeneity of cancer cells has led to interest in combination therapies that simultaneously target multiple key pathways in carcinogenesis. Further, cancer cells possess a broad-ranging capacity to activate compensatory signaling pathways to overcome barriers presented by a single agent therapy. To facilitate simultaneous targeted delivery of two anticancer drugs (Paclitaxel and 17-AAG) we designed and fabricated acid-sensitive stealth polymeric nanoparticles capable of degradation in the acidic lysosomal compartment of cancer cells to release the anticancer agents. Aside from targeting anticancer drug(s) loaded nanoparticles to the biophase, stealth nanoparticles are capable of modifying the intrinsic pharmacokinetics of the drugs to improve efficacy and reduce side effects as well as overcome drug resistance caused by the efflux pump (p-glycoproteins). The objective of this work is to synthesize and characterize stealth polymeric nanoparticles loaded with Paclitaxel and 17-AAG degradable in the acidic lysosomal compartments of cancer cells and to study the in vitro availability. A pH sensitive crosslinker and ε-caprolactone macromonomer were synthesized and characterized by 1H NMR, LCMS, and GPC. They were used in the fabrication of combination drugs-loaded nanoparticles using dispersion polymerization technique. The nanoparticles were characterized for particle size (using dynamic light scattering), morphology (using scanning electron microscope (SEM)) and drug release (using HPLC). The stealth polymeric nanoparticles are suitable for the delivery of combination anticancer drugs.

Timing Of ERCP And Inpatient Mortality Among Patients Hospitalized For Cholangitis

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Background: Biliary decompression with endoscopic retrograde cholangiopancreatography (ERCP) is often indicated in patients hospitalized for acute cholangitis. Our aim was to determine the association between timing of ERCP (procedure day), hospital length of stay (LOS) and inpatient mortality in patients hospitalized for cholangitis. **Methods:** From the 2013 National Inpatient Sample (NIS) data, we extracted the data for all the patients who had a primary admission diagnosis of cholangitis and had an ERCP during the same admission. Multivariate logistic regression and linear regression analyses were used to assess the relationship between ERCP procedure day, LOS, and inpatient mortality adjusting for disease severity, age, gender and comorbidities. **Results:**We identified 218 cases of cholangitis who underwent ERCP. The sample was 50.5% female. The mean age was 62.4 years (range: 11 – 90). Median LOS was 4 days (range: 1 – 65), mean LOS was 6.47 days. Median ERCP procedure day was 1 (range: -1 – 25), mean ERCP procedure day was 2.06. The mortality rate was 2.29%. ERCP procedure day was significantly associated with LOS (Coefficient of regression: 1.58, p value <0.001), but not with inpatient mortality. Age was independently associated with inpatient mortality (OR: 1.26, p value: 0.041). **Conclusion:** Timing of ERCP procedure in patients admitted for cholangitis is associated with hospital LOS but not with inpatient mortality. Early ERCP predicts a shorter LOS.

Evaluation of Vancomycin Dosing and Monitoring at an Urban, Community Hospital in Washington, D.C.: A Pre- and Post-Intervention Study

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Background: Achievement of therapeutic serum levels, appropriate dosing regimens, and de-escalation of therapy are critical when treating patients with pathogens that may have reduced susceptibility to antibiotics. This is a drug use evaluation, performed pre- and post-intervention, to assess the appropriateness of vancomycin initial dosing & frequency, timing of troughs, and de-escalation of therapy at Howard University Hospital (HUH). Objective: The objective of this research is to optimize vancomycin administration at an urban, community hospital in Washington, D.C. Other aims to be achieved from this study include: (1) update the vancomycin protocol at HUH, (2) educate healthcare practitioners, and (3) improve vancomycin prescribing practices at HUH. **Method:** Patients with vancomycin orders were identified in computerized physician order entry system, Sorian Clinicals. Monitoring data collected included initial and maintenance vancomycin dose and frequency, target trough (10-15 or 15-20 mg/L), value of trough, time of trough, and changes in renal function. Interventions will be made (update to vancomycin protocol, education), and post-evaluation will be conducted. The primary outcome of this study is frequency of appropriate initial vancomycin dose and dosing interval. **Preliminary Results:**The total number of vancomycin orders from July 17, 2016 to November 28, 2016 is n=342. Initial vancomycin dosing followed the HUH dosing reference 71% of the time. Initial frequency based on renal function followed the hospital dosing reference 78% of the time. True troughs and random troughs were drawn 23.4% and 28.4% of the time, respectively. The majority of the non-therapeutic levels were sub therapeutic (68.5%).

A systematic Review of the Effects of Hibiscus Sabdariffa on Metabolic Syndrome

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Introduction: Metabolic syndrome (MetS), is characterized by abnormal clearance of postprandial triglyceride (TG) and underlying condition for cardiovascular disease. The role of nutrition in this syndrome is not well characterized. The Hibiscus sabdariffa L. (Hs, roselle; Malvaceae) plant is traditionally used as a food item, a flavoring agent, herbal hot and cold beverages, and has medicinal properties shown to have remedial effects on MetS. AIM: To examine the effect of Hs to reduce MetS, its biomarkers and risk using a systematic review analysis (SR). **Methods:** Eight studies of twenty-two articles screened met the inclusion criteria after searching different literature databases, using keywords; hibiscus sabdariffa, sour tea, metabolic syndrome, hypertension, Type 2 diabetes and hyperlipidemia. **Results:** Qualitative analysis was used to determine that 579 subjects participated in all 8 studies that met the inclusion criteria. The findings clearly show that Hs lowers blood pressure, total cholesterol LDL, serum TG and an increase in HDL concentration. One study showed that participants with MetS who consumed HS had significantly reduced glucose, and total cholesterol levels, increased HDL levels and improved TAG/HDL ratio a marker of insulin resistance. **Conclusions:** The result of this systematic review suggest that Hs has a great potential to reduce the risk factors associated with MetS, with no reported adverse effects although further studies are warranted. The number of clinical, in vitro and in vivo studies that the mechanism of action or bioactive characteristics of Hs extracts are few and limited. More studies are required.

HPV, HIV and male gender as major risk factors for anal neoplastic transformation in African Americans

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Background: Human Papilloma Virus (HPV) is the most common sexually transmitted infectious agent. The incidence of HPV related anal cancers increased among HIV infected people. Aim: To assess risk factors of anal lesions among African Americans in an inner city hospital. **Methods:** We

reviewed medical records of 386 African-Americans with anal lesions at Howard University Hospital from Jan. 2007 to Dec. 2016. Demographic, clinical and pathological data including; HPV, HIV, HCV (hepatitis C virus), diabetes mellitus (DM), hypertension (HTN) and body mass index (BMI) were collected. Statistical analysis was performed using Chi-square and Student's t-test. **Results:** 289 (75%) patients were male, with median age of 44 years and BMI of 25.8 kg/m2. The frequency of condyloma, high grade dysplasia, squamous cell carcinoma (SCC) and adenocarcinoma was 202 (52%), 30 (8%), 31 (8%) and 8 (2%), respectively. The frequency of HPV, HIV, and HCV was 257 (67%), 155 (40%) and 12 (3%), respectively. HPV and HIV were risk factors for condyloma, dysplasia and squamous cell carcinoma ($P<0.05$). Eleven percent of patients had diabetes (DM) and 23% had hypertension (HTN). **Conclusion:** Our results show that majority of patients with condyloma are male and young with HPV and HIV infection.

Microenvironmental Responsive Polymeric Nanoparticles Fabricated By Dispersion Polymerization for The Delivery of Bioactive Agents

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We studied microenvironmental responsive nanoparticles that are capable of rapid degradation in the mildly acidic environments in the endosomes and lysosomes of tumor tissues but are more stable in the physiological pH. Three pH-sensitive acetal crosslinkers were synthesized and characterized by 1H NMR, 13C NMR, FT-IR and high resolution mass spectroscopy. The nanoparticles were fabricated by dispersion polymerization technique. Hydrolysis studies were carried out on the crosslinkers and blank nanoparticles, and drug release studies were done on docetaxel-loaded nanoparticles in acetate buffer (pH 5.0) and phosphate buffer saline (pH 7.4). Statistical experimental design used was randomized complete block design followed by analyses of variance with F-test of significance. Pairwise comparison test was used to locate specific differences among parameters of the crosslinkers and the nanoparticles. Scanning electron micrographs showed the formation of spherical particles. Particle size analysis showed that the nanoparticles are within nanometer range with negative zeta potential. Hydrolysis and drug release studies showed that the rate of hydrolysis was faster at pH 5.0 compared to pH 7.4, which confirms the pH-responsiveness of the crosslinkers. Hydrolysis and drug release studies were dependent on the structure of the acetals: Di(2-methacryloyloxyethoxy)-[2,4,6-trimethoxyphenyl] methane crosslinker showed the fastest rate of hydrolysis, followed by di(2-methacryloyloxyethoxy)-[2,4-dimethoxyphenyl] methane and di(2-methacryloyloxyethoxy)-[4-methoxyphenyl] methane. The docetaxel-loaded nanoparticles were internalized into cancer cells within 2 hours and the nanoparticles were as effective as free drug against prostate cancer cells. They are suitable for the delivery of bioactive agents to overcome the side effects related to toxicity of of anticancer drugs.

Development, Characterization and In Vitro Testing of Brinzolamide-Loaded Polylactic-co-glycolic acid (PLGA) Nanoparticles

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Background: The goal of any glaucoma therapy is to lower intra-ocular pressure (IOP). Brinzolamide, a carbonic anhydrase inhibitor, is used as a second-line medication for the treatment of ocular hypertension and POAG. Studies have shown the drug to be effective at lowering IOP. However, due to its poor water solubility, the drug is commercially available as Azopt ®, a 1% ophthalmic suspension. Adverse events such as blurred vision, ocular irritation, discomfort and bitter taste are associated with the use of the marketed brinzolamide formulation. The goal of this study is to formulate, characterize and test brinzolamide-loaded PLGA nanoparticles. **Methods:** Brinzolamide-loaded PLGA nanoparticles were prepare by oil-in-water (O/W) emulsion-solvent evaporation method. Particle size and zeta potential were determined by DLS. Morphology of the nanoparticles was determined by SEM. Encapsulation of the drug was verified by FT-IR and HPLC. In vitro drug release profile was assessed using the dialysis method. Intracellular localization of the nanoparticles was assessed by confocal microscopy using Rho-123 loaded nanoparticles. Cytotoxicity of the formulation was assessed on SIRC and SV40 HCEC cell lines. **Results:** Particle size and polydispersity for brinzolamide-loaded PLGA nanoparticles ranged from 129.6nm ± 1.5, PI 0.108 ± 0.047 to 350.9nm ± 8.5, PI 0.113 ± 0.085. **Conclusion:** Brinzolamide-loaded nanoparticles were successfully developed, characterized

and tested. Preliminary data shows intracellular localization of the nanoparticles. Formulations appears to be relatively non-cytotoxic to cells with reference to untreated and blank nanoparticles.

Fixation of pediatric clavicle fractures: Safety, efficacy, and feasibility for the ambulatory setting.

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Background: Ambulatory surgical centers (ASCs) are an increasingly popular approach to lowering costs by managing patients in an outpatient setting. Here, we evaluate the safety and success of open reduction and internal fixation (ORIF) of the clavicle, still an understudied procedure in the pediatric population, and appraise the feasibility of performing clavicle ORIF at ASCs. **Methods:** We reviewed and analyzed the records of 76 pediatric patients who underwent clavicle ORIF 2011-2015. Patients discharged the day of surgery were defined as feasible for ASC management, and factors relevant to ORIF safety and success were examined including complications and recovery. **Results:** The patients had a mean age of 15.3 ± 2.0 years. 29 (38.2%), were discharged the day of their operation, and 73 (96.1%) were discharged after one night or less. Seventeen (22.4%) experienced postoperative complications, including anesthesia/parasthesia near the operative site, constipation, 5 cases of hardware problems (3 necessitating removal), and 1 nonunion. All 40 patients followed 8 or more weeks postoperatively regained full range of motion. Two of the patients successfully underwent ORIF at an ASC without incident. **Conclusions:** The lack of serious complications, and the strong clinical outcomes seen in our large patient group, suggest that clavicle fixation is a safe and effective procedure in the pediatric population. Over a third of patients were discharged the same day, suggesting that a significant proportion of our patients could have been managed in an ASC.

Sleep-disordered Breathing and Rapid Eye Movement (REM) Sleep Arousals in African Americans with Posttraumatic Stress Disorder

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Sleep complaints are a central symptom of PTSD. However, research surrounding the relationship between sleep and PTSD remains controversial. Fragmented or reduced REM sleep has been observed early during the course of PTSD. An additional consideration regarding sleep disruption in PTSD is the high rates of sleep-disordered breathing (SDB) that have been identified in some but not all studies of PTSD. The purpose of this study is to investigate the link between SDB events (specifically those linked to arousal) and sleep stages for those with PTSD. This preliminary analysis of the ongoing study includes 33 African American participants (ages 18-35) who were evaluated for PTSD using the Clinician-Administered PTSD Scale and divided into three groups: current PTSD (n = 8), PTSD resilient (met criteria for a criterion A trauma but not for full PTSD diagnosis, n = 13), and no previous trauma (n = 11). Each participant had overnight polysomnography (PSG) recordings, which were scored according to the American Academy of Sleep Medicine's guidelines. Preliminary analysis revealed no significant differences between any specific events or breathing-related arousals in REM between the three trauma groups. However, there appears to be a trend of higher percentages of apnea arousals occurring in REM for the current PTSD group compared to the other groups ($F = 1.006$, $df = 14$, $p = .371$). Although any conclusions about the sample would be premature, as the sample size continues to expand, this research may illuminate potential relationships between PTSD and sleep disruptions in specific sleep stages.

Distinctive variants in African American with colorectal neoplasia

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Purpose: African Americans have a higher incidence and mortality from colorectal cancer. This disparity might be due, in part, to the type of mutations in driver genes. In this study, we examined alterations specific to APC, MSH3, and MSH6 genes using targeted exome sequencing (TES) to determine distinctive mutations in the course of neoplastic transformation. **Experimental Design:** A total of 140 AA colon samples (30 normal, 21 adenomas, 33 advanced adenomas and 56 cancers) were used as our discovery set on an Ion Torrent platform. A subset of the discovery set consisting of 36 samples was used as a validation set on an Illumina platform. Bioinformatics analyses were performed and novel validated mutations are reported. **Results:** Two novel MSH6 variants were validated that were mapped to an intron between exons coding for the MutS-V region near the MSH2 binding site. For MSH3, 4 known variants were validated and were located in exon 10 (3 nonsynonymous) and exon 18 (1 synonymous). As for APC, 20 variants were validated with 3 novel variants: 2 stopgain and 1 nonsynonymous. These variants mapped to the Armadillo repeats region, to the last 15-amino acid (aa) repeat region, and between the second and third 20-aa repeats region, respectively. **Conclusion:** We defined novel variants that target DNA mismatch repair and APC genes in African Americans with colorectal lesions. A greater frequency of mutations in genes encoding DNA mismatch repair functions and APC likely play major roles in colorectal cancer initiation and the higher incidence of the disease in AA.

Rheumatic Heart Disease in Sickle Cell Disease in Sub-Sharan Africa

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BACKGROUND: Rheumatic Heart disease (RHD) still remains a major public health and clinical concern in Africa with about 50% of the world RHD burden; incidence varies from 5-36% with higher incidence in rural areas where there is limited access to antibiotics and delay in diagnosis of rheumatic fever. We sought to demonstrate the incidence of RHD in SCD patients. **METHOD:** We evaluated 208 hydroxyurea naive consecutive SCD patients aged 10-52 years who were clinically stable at steady state and 94 healthy non-matched controls who were studied in Nigeria in a cross-sectional manner. SCD patients were required to have electrophoretic and or liquid chromatography documentation of major sickling phenotypes. The Ccontrol group was required to have a non-sickling phenotype. Cardiac measurements were performed with transthoracic echo (TTE) for both systolic and diastolic functions according to American Society of Echocardiography guidelines. **RESULTS:** Interestingly nNone of SCD patient has any form of valvular heart disease. This was similar in the control group but the controls wereas largely hospital workers and medical students and mostly hads access to medical care. The SCD cohort was mostly from low socioeconomic groups visit with less than 5% of life-time transfusion and less than 20% life-time of access to doctors. **CONCLUSION:** Although the frequency with which RHD occurs in patients with SCD is unknown, it appears to be remains quite rare. Also, it is not unlikely that like malaria, balanced genetic polymorphisim or some other genetic basis leading to evolution of the sickle cell trait may provide some degree of protection to RHD. More research is needed to explain this.

Is the rate of Sessile Serrated Polyp/Adenoma different in African Americans?

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Introduction: Up to 30% of colorectal cancers develop via serrated pathway. African Americans (AA) suffer a disproportionate burden of colorectal cancer. The aim of this study was to evaluate clinicopathological features of AA patients diagnosed with sessile serrated adenoma/polyp (SSA/P). **Method:** We conducted a retrospective study of all colonoscopies at Howard University Hospital, from 2010 to 2015, 83% were AA (n=10027/12085). Pathology reports confirmed 4070 AA patients with polyps including 252 SSA/Ps. Demographic and clinical variables (i.e. sex, age, BMI, anatomic location, clinical symptoms, polyp size, and reason

for colonoscopy) were collected at colonoscopy. **Result**: The median age was 56 with interquartile range (IQR) of 51 to 62 years, 54% were female, and 48% had a BMI ≥ 30 kg/m^2. The most common reason for colonoscopy was screening (53%), whereas the most prevalent reasons for diagnostic colonoscopies were changes in bowel habits (18%) and gastrointestinal bleeding (17%). Total number of SSA/Ps were 338, 9% (n=29/338) had some grade of cytological dysplasia. 24% had more than 2 polyps, 76% of patients had left-sided SSA/Ps, in comparison to 14% of right-sided polyps and 10% of bilateral SSA/Ps. Median SSA/P size for all locations was 0.6 centimeter. **Conclusion:** The prevalence of SSA/P in AA patients were 2.5% (n= 252/10027), which is higher than the Caucasians and its diagnosis accounts for 6% of all polyps. SSA/Ps were predominantly left-sided, as opposed to published literature. Most patients in our study were diagnosed through screening colonoscopies emphasizing the value of follow-up and surveillance colonoscopy in asymptomatic patients.

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. **Methods:** We examined 200 patients and their parents for HP. HP is defined as those with a 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). **Results:** Of 200 adult patients with pancreatitis (median age 55), 64 (32%) were diagnosed with adult onset of HP. From the 64 patients with a positive mutation on the trypsinogen (PRSS1) gene, 34 had one parent with a mutation of the trypsinogen gene (PRSS1). From the 34 adult patients who had parents with mutations of the trypsinogen gene (PRSS1), and 37 (19%) were heterozygous for ATM gene mutation, 39 (61%) recalled their babies or young children having been diagnosed with epigastric pain, severe vomiting and nausea both after birth and during early childhood. From the 37 patients who were diagnosed with having the mutations in the ATM, (PRSS1) gene and HP, 11 (30%) indicated that one of their parents has been diagnosed with pancreatic cancer. **Conclusions:** Patients with HP who have a heterozygous mutation of the ATM gene have a higher incidence of developing pancreatic cancer. Better risk models and genetic panel screening could contribute to a precise diagnostic and preventive interventions early in the life of individual patients.

Radiographic Evaluation of Scrotal Pain with Pathological Correlation: A Pictorial Review

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Background: Scrotal pain can be caused by trauma, ischemia, neoplasm and other etiologies. Pediatric scrotal pain is mostly due to testicular torsion, whereas in adults it is mostly due to epididymitis. A thorough history including onset, location, and pain intensity is often the first step in diagnosing the many causes of scrotal discomfort, and Duplex and color Doppler sonography (Doppler sono) remains the gold standard infor its evaluation.

Methods: We performed a comprehensive review of the existing worldwide medical literature and clinical cases at Howard University Hospital concerning:

- Causes of scrotal pain with different etiologies in varying age groups
- The radiographic appearance of scrotal pathology on different imaging modalities
- Various features demonstrated on pathological correlation

Results:

- Multiple maladies cause scrotal pain and can be distinguished by acute vs. chronic presentation
- Doppler sono has high sensitivity in diagnosing testicular torsion as a cause of scrotal pain and sometimes distinguishes testicular tumors from nontumorous lesions

- Sonographic evaluation of the testes, epididymitis, contents of the spermatic cords, and scrotal wall are critical in identifying the underlying cause of scrotal pain
- Heterogeneous appearance of the testis can be a risk factor for poor outcomes in pain caused by testicular torsion

Conclusion: Scrotal pain is a common medical entity requiring a high degree of clinical suspicion and, at times, a rapid diagnosis. Radiographic imaging plays a vital role in distinguishing the various underlying etiologies of scrotal pathology. Familiarity with the differential diagnosis and their radiographic features will, therefore, allow quick assessment for surgical versus nonsurgical management.

How Does the Estrous Cycle Influence Fear Conditioning in Female Mice?

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Background: Women, compared to men, have an increased risk for posttraumatic stress disorder (PTSD) after a traumatic experience. Recent studies have shown that estrogens influence women's responses to stress. Rodent models allow for the manipulation of stress exposures to coincide with estrous cycle stages in females. In this study, we examined whether the estrous cycle stage affects conditioned fear memory in female mice. **Methods:** Female C57Bl/6 mice underwent a contextual fear conditioning session on either the morning of proestrus (when estradiol levels are high) or metestrus (when estradiol and progesterone levels are low). For the first videotaped session, mice received 15 electric footshocks (0.5 mA, 0.5 sec duration, 1.0-min interval) after a 10 min acclimation period in a standard footshock chamber. Two estrous cycles later, the mice were returned to the chamber, and behaviors were videotaped for 10 minutes without any footshock. The freezing behavior of 8 mice (4 proestrous and 4 metestrous) was scored for the first 10 min of each session. **Results:** Mice exposed to footshocks during metestrus had higher mean baseline-corrected freezing percentage (2nd session - 1st session freezing percentage) than mice exposed during proestrus (76% vs 49%). Results are similar when freezing percentage was computed each 5-min epochs of the 10-min period. (1st 5-min epoch - 44 vs 77% and 2nd epoch – 54 vs 74%). **Conclusion:** Higher estrogen levels may have attenuated the acquisition of fear memory, suggesting protective effects that estradiol may have on the development of PTSD in women.

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30 day admissions in the Post-HAART era in a urban teaching institution: The impact of compliance and ART use

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Background: There are no well-defined data to see trends of readmission in hospitals serving predominantly African American HIV-infected persons. The goal of this study is to describe patients with opportunistic infection and those without and to identify the impact of opportunistic infection along with other factors such as compliance and co-morbid conditions on 30-day readmissions. **Methods:** A retrospective chart review was conducted among all HIV-infected patients who were admitted between January 2011 and December 2014. The primary outcome of this study was any 30-day readmission. Other factors evaluated included primary diagnosis, presence of opportunistic infections, socio-demographic variables, compliance on antiviral therapy, length of stay, and prior history of co-morbidities. Descriptive statistics were estimated for all study variables. Bi-variable associations between 30-day readmission and study factors were estimated using chi square, Fisher's exact and independent t-tests. All analyses was conducted using SAS 9.3 at an alpha of 0.05. **Results:** There were 1350 HIV-infected persons who were admitted during the study period. There were 791 males (59%). The number of patients with opportunistic infection was 326 and without 1024. The mean age for opportunistic infection was 46 ± 12 years old, the mean length of stay was 9 ± 11 days and majority of the population were males (54.29%). The mean age for non-opportunistic infections was 47 ± 12 years old, the mean length of stay was 4 ± 6 days, and majority of the population were males (59.96%). **Conclusion:** We hypothesize that HIV-infected persons who suffer from chronic illnesses and are noncompliant will have more readmissions.

Perspectives on supported employment for dually diagnosed clients on medically assisted therapy for opioid use disorder

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Objective: Dually diagnosed individuals with opioid use disorders have barriers to recovery including lack of employment. The employment rate is less than 15% within this population. This study aims to evaluate patients' perspectives on a supported employment model offered within the Howard University Mental Health Center. **Methods:** Dually diagnosed patients receiving buprenorphine/naloxone through the Howard Mental Health Center located were recruited from a larger study. Semi-structured interviews with a subset (N=15, 8 males) were completed. Two groups were assessed: working and non-working. Those not working included actively seeking vs. not-actively seeking employment. Interviews were audio-recorded and transcribed. Qualitative analysis was used to determine prominent themes/patient perspectives. **Results:** Approximately 20% were working. Of those not working, 20% were seeking employment. Themes for not seeking employment included concerns due to histories of long work gaps, mental health stigma and age discrimination, and delivery of employment services. **Conclusions:** Employment problems persisted despite the implementation of the employment program. Greater job readiness preparation and program fidelity may improve employment.

A Pilot Study of High-Intensity Eccentric Exercise on Vascular Endothelial Function and Arterial Stiffness In Young Adult African-American Women With and Without Parental Hypertension

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Increased central arterial stiffness and induced impairments in endothelium-dependent vasodilation are independent risk factors for cardiovascular disease. Evidence regarding the effects of high-intensity resistance exercise on vascular endothelial function and central arterial stiffness is conflicting. Arterial stiffness is a moderately heritable phenotype, and greater arterial stiffness in offspring of parents with hypertension have been observed. The purpose of this study was to examine the effects of acute high-intensity eccentric exercise on vascular endothelial function and central arterial stiffness in young adult African-American women with a parental history of hypertension. Participants included 7 females with a positive parental history of hypertension, and 4 females with a negative parental history of hypertension. All participants underwent a single bout of unilateral elbow flexor exercise (non-dominate) performing 1 set of 30 repetitions. Brachial artery flow-mediated dilation (an index of endothelial function) was determined using ultrasonography. Arterial stiffness was assessed by pulse wave analysis using the augmentation index. Flow-mediated endothelial function and arterial stiffness were measured before the beginning of eccentric exercise (baseline), 24 hours, 48 hours, and 96 hours after the eccentric exercise. There was a trend for arterial stiffness and endothelial function to increase at 96 hours in the group with parental history of hypertension (0.08 vs 0.15, and 0.37 vs 0.38 respectively). This study was supported in part by Howard Univ. COAS Honor's Program and by National Institutes of Health, National Center for Research Resources, and Research Centers in Minority Institutions Program (NIH/NCRR/RCMI) Grant

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Risk Factors Related to Adolescent Obesity among African-American, Caucasian-American and Mexican-American Adolescents (Ages 12-19 years)

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Background: Adolescent obesity is one of the major global health challenges of the 21st century. In the United States, the prevalence of obesity among adolescents aged 12–19 years quadrupled from 1966 to 2003–2006, from 4.6% to 17.6%. One in six children and adolescents are obese in the U.S. Obesity rates tend to be higher and have increased more rapidly over time among Black and Hispanic children than White children. **Methods:** The data come from the 2004-2012 National

Health and Nutrition Examination Survey (NHANES). The NHANES data were collected from a sample of the civilian, non-institutionalized population of the United States. The data utilized included socio-demographic information, body measurements, dietary intake, and physical activity, blood pressure readings, blood lipid profiles,. Data analysis was conducted using the SUDAAN software package. **Results:** Regarding household income, subjects from households earning $9,999 or less, or $10,000 – 24, 999 were more likely to be overweight. Blacks were more likely to be overweight than the other two ethnic groups. For physical activity, the data found that Mexican Americans who performed tasks around the home/yard were more likely to be overweight. Lastly, subjects who participated in vigorous physical activity were less likely to be overweight. **Conclusion:** Regarding socio-demographics, the data show the number and percentage of blacks represented the largest group of overweight individuals. Males had a higher prevalence of being overweight than females. Regarding household income subjects from households earning $9,999 or less, or $10,000 – 24, 999 were more likely to be overweight.

A Historic African American Skeletal Collection Reveals Bacterial Infections

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Ancient DNA studies have significantly enhanced current understandings of human demography, health, and evolutionary processes. However, most ancient DNA analyses have focused on extinct or archaic human lineages which has left a large temporal gap in our understanding of factors that affect health and demographic processes for more recent human habitation. The abundance of skeletal collections representing historically aged human populations provide a unique opportunity to explore evidence of health, demography, and disease. We looked at a population of twenty historical African Americans who were born between 1877 and 1916 with varying life spans (Range=21-82 years) and various causes of death. DNA was extracted from dental cementum and petrous bone sites using a modified ancient DNA protocol at the University of Copenhagen. DNA libraries were constructed for qPCR for all samples. Seven samples, representing four individuals amplified the best and subsequently were indexed and sequenced. Results showed that the successfully amplified and sequenced samples shared one of two causes of death, either tuberculosis (N=3) or septicemia (N=1). After sequence curation, an taxonomic abundance analysis was conducted which revealed an enrichment of bacterial species associated with the causes of death in individuals. These findings suggest that historical samples represent a good source for understanding microbial infections in human populations over time.

The Impact of Cardiovascular Risk Factors on Pulse Pressure in African Americans with Stage I Hypertension

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Pulse pressure is the pressure gradient between systolic blood pressure and diastolic blood pressure. It can be conceptualized as proportional to stroke volume and inversely proportional to compliance of arteries. Recent studies are showing the independent prognostic importance of pulse pressure, especially with regard to coronary heart disease. Studies also indicate that age is the main risk factor for increased pulse pressure. This is because arteries lose their elasticity, and hence their compliance, with advancing age. Thyrotoxicosis, aortic valvular disease, pregnancy and anemia are also other commonly mentioned causes of high pulse pressure. Most patients with wide pulse pressure have concurrent hypertension or isolated systolic hypertension resulting from excessive stiffness of large arteries. We believe it is also important to know how other cardiovascular risk factors like obesity, diabetes and hyperlipidemia are associated with high pulse pressure. This is important because understanding the causal relationship helps to make early intervention. We collected blood pressure and laboratory data from 100 African Americans with stage I hypertension. Pulse pressure was calculated for each individual. Of the study subjects, patients with hypertension and hyperlipidemia comorbidities were found to have higher pulse pressure. Obesity, DM and smoking were not found to have significant association with high pulse pressure. In conclusion, besides advanced age, hyperlipidemia is also highly associated with high pulse pressure. This can be because of atherosclerosis associated with hyperlipidemia.

Addressing the Disproportionate Occurance of Metabolic Syndome and It's Complications among Black Americans

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Introduction: Metabolic syndrome is a strong predictor of two of the most serious and prevalent diseases in not only the United States of America but world-wide; these are diabetes mellitus and heart disease. Heart disease is the leading cause of death in the United States, as well as world-wide, and diabetes mellitus often leads to heart disease as well as many other serious, fatal conditions. **Methods:** For the purposes of this study, several peer-reviewed sources were systematically reviewed. This included statistics from the CDC, WHO, and the American Heart Association, as well as studies which analyzed health disparities regarding prevalence of metabolic syndrome. **Results:**Though cardiovascular disease (CVD) affects people from every race and background, age-adjusted death rates from CVD are 33% higher for blacks than for the overall population in the United States. Risk of a stroke is also strongly associated with metabolic syndrome; blacks have nearly double the risk of having a first time stroke than do whites. **Conclusion:** A much higher prevalence of heart disease and stroke, both complications of metabolic syndrome, has been observed among blacks. An association between cultural identity and motivation to lose weight and exercise was also seen; African American women who associated healthy behaviors with being more characteristic of white culture felt more disconnected from these behaviors and were less likely to participate. Therefore, interventions aimed at decreasing the disproportionate occurrence of overweight/obesity, and chronic illness by extension, among minorities must target the cultural preferences of the affected population.

Comparison of Cardiovascular risk assessments from the American College of Cardiology (ACC)/American Heart Association (AHA) and the Adult Treatment Panel (ATP III) in a HIV infected population: eligibility and appropriateness of lipid lowering treatment

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Objectives: The purpose of this study is to determine the performance of the AHA/ACC cardiovascular risk assessment in HIV infected patients. **Methods:** This study was an observational, retrospective, chart review study. The target Population was HIV infected patients over 18 years of age who had been seen at least once at the Center for Infectious Disease Management and Research (CIDMAR) at Howard University Hospital between January 1, 2011 to January 31, 2015, and admitted to the IC. **Results:** The average age of patients was 45.67. Of the study population, 95.5% were African American, 58.8% were male, 35.6% were current smokers, 18.7% were illegal drug users, 33% were current drinkers, 12.4% had diabetes, 74.5% were on current ART therapy, 11.2% were on current lipid lowering therapy. In our population of HIV infected patients, the ACC/AHA guidelines would recommend statin therapy to 49% of patients (P = 0.000). In our population of HIV infected patients, the NCEP ATP III guidelines would recommend statin therapy to 2.4% of patients (P = 0.001). There is a greater proportion of patients eligible for statin therapy initiation using the ACC/AHA ASCVD cardiovascular risk calculator than using the Framingham risk calculator.

Clinical Pharmacogenetic Testing in the Management of Opioid Use Disorder: A Case Series

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Background: Opioid use disorder (OUD) is characterized by a problematic pattern of opioid use leading to clinically-significant impairment or distress. Buprenorphine is often utilized in OUD management due to strong clinical evidence for efficacy. However, interindividual genetic differences in buprenorphine metabolism may result in variable treatment response, leaving some patients undertreated and at increased risk for relapse. Clinical pharmacogenetic testing may help improve patient care and OUD management outcomes. We examined five patients from an OUD management clinic in Washington D.C. where the patients were initially managed

on 28 - 32 mg of buprenorphine per day and were temporarily restricted to a daily maximum dose of 24 mg by the pharmacy benefits manager (PBM). We demonstrate the impact of pharmacogenetic testing on OUD management outcomes in these five patients. **Methods:** We reviewed the medical record, urine screening results, and pharmacogenomic testing results for five patients receiving buprenorphine for OUD management. **Results:** All five patients experienced multiple relapses to unauthorized substances at the 24 mg buprenorphine daily dose restriction and improved OUD management once the 24 mg buprenorphine daily maximum was rescinded by the PBM. The pharmacogenetic test results for each of the five patients suggested an accelerated rate of buprenorphine metabolism, which necessitated a higher daily dose of buprenorphine for adequate OUD management. **Conclusions:** Pharmacogenetic testing played an important role in improving OUD management for the five patients and has broader policy implications for insurers, payors, and regulatory bodies.

The Influence of Sleep and Perceived Stress on Difficulties with Emotion Regulation in a Diverse Sample of Adolescents and Young Adults

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Objective: Sleep and stress have been found to be independently associated with difficulties with emotion regulation. However, few studies have examined the role of both these variables together. This study examined the combined influence of sleep disturbance and perceived stress on difficulties with emotion regulation in adolescents and young adults. **Methods:** De-identified data of 118 adolescents and young adults ages 16-20 were utilized from year nine of a longitudinal study conducted at the University of Maryland College Park. **Results:** The sleep variables independently explained 19.3% of the variance in Difficulties in Emotion Regulation, while perceived stress alone explained 39%. The model with both variables combined accounted for 46.4% of the variance in Difficulties in Emotion Regulation. **Conclusions:** Results demonstrated that perceived stress and sleep disturbance together, rather than independently, better explain the presence of difficulties with emotion regulation. These results have implications for interventions targeting both sleep disturbance and stress in the reduction of emotion regulation difficulties. Future studies should consider testing the efficacy of integrating behavioral sleep medicine principles with empirically supported coping skills strategies towards the reduction of emotion regulation difficulties in teens and young adults.

Pulmonary Manifestations of Inflammatory Bowel Disease

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Background: In the past decade, many explanations for the intestine-lung caxis have been proposed, however, no definite conclusions have clearly been established. Early diagnosis of latent pulmonary manifestations are important to prevent future and more severe respiratory impairment in patients with IBD, and this can be life-saving factor for many of these patients. Objective: The manifestations in the lung often represent a confounding diagnostic problem. A detailed history and physical examination in conjunction with directed physiologic and radiographic testing will often be necessary to properly identify and treat the pulmonary complications in the IBD population. **Method:** Systematic review of literature was completed via PubMed. **Result:** Given the limited research to date, further comprehensive studies on the prevalence of intestinal involvement in COPD and of pulmonary diseases among IBD patients are warranted. The mechanisms that highlight the development of systemic inflammation in IBD and COPD patients are confounded by the complex etiologies of these conditions that can share environmental triggers and have similar immune and physiological involvement. **Conclusion:** It is imperative that pulmonologist, gastroenterologist and primary care physicians be more involved in both treating preventing and diagnosing pulmonary manifestations of IBD in their patient population by trying to work closely together for a better patient care outcome.

Does poor prognosis in African Americans with MSI-H colorectal cancer associate with altered immune markers?

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BACKGROUND: Microsatellite instability high(MSI-H) of sporadic colorectal carcinomas are usually associated with improved prognosis and high density of tumor infiltrating lymphocytes. However African Americans with MSI-H have poor prognosis. **AIM:** To evaluate whether or not expression of different immune and tumor markers individually or in combination in African American MSI-H CRC associate with the prognosis status. **METHODS:** Tissue microarray(TMA) were prepared by micro-dissection from FFPE(formalin fixed paraffin embedded) blocks of 15 MSI-H patients. Immune markers(CD8+, CD4+, Granzymes, Perforins, STAT1, IRF1 and IRF5) and PDL1 status were analysed by immunohistochemistry(IHC). Demography and clinical data including TNM, tumor grading(WHO standard), histological type of tumor, Date of diagnosis and last follow up, treatment, comorbidities, metastasis, recurrence, 5 year disease free survival and death were collected. **RESULTS:**There were 4 patients with improved prognosis(27%) with relatively high CD4 density(2 with >50% and 2 with 11-50%) regardless of PDL1 status(3+/1-), stage(II and III) and other immune markers. One of the improved prognosis patients with KRAS mutation has elevated expression of all considered immune markers besides CD4. There were 9 patients(6 dead, 3 alive) with poor prognosis, with different immune and tumor markers level(3 were PDL1+ and 5 have reltively high CD4 count) but with low level of STAT1. **CONCLUSION:** MSI-H colorectal cancer from African American have poor prognosis which may correlate with the nature of tumor associated immune response. Other factors such as MSH3 defects might cancel the positive prognosis of MSI-H status. Nonetheless, low STAT1 and low CD4 may be indicators of poorer prognosis.

Does the location and histopathological status of colon polyps affect interval colonoscopy

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Introduction: The underlying factors behind the higher incidence of mortality from colorectal cancer (CRC) among African Americans (AA) are still unknown. One potential risk factor might be missed polyps that frequently associate with short interval colonoscopy. **Aim:** To analyze if the colonoscopy scheduling is due to missed polyp, incomplete margins cuts or new polyps. **Methods:** A retrospective analysis of 15,986 colonoscopies (2010-2016) led to the detection of 6040 patients with polyps, 544 patients had multiple colonoscopies (interval colonoscopies). We analyzed demographic, clinical and histopathological features within these 544 patients and statistical analysis was performed. **Results:** African Americans made 86.8% of the study population with median age of 59 years (54-65), 51.2% were female. Most common histopathologic colonic lesions are tubular adenomas (72.2%). Most of the polyps are located in the proximal colon (ileo-cecal junction to end of transverse colon), ascending colon (45.5%) and transverse colon (32.9%). Patients with multiple colonoscopies generally displayed same type of lesions in the following OR risk: Sessile Serrated (OR=17.89, 95%CI: 7.06-45.33), Tubulovillous (OR=9.69, 95%CI: 3.31-28.43), tubular adenoma (OR=2.4, 95% CI: 2.39-4.82), hyperplastic adenoma (OR=3.39, 95%CI: 2.39-4.82) (p value <0.001). Polyp reoccurrence at the same location happened most at the ileo-cecal (OR=84.02, 95% CI: 11.14-633.79), splenic flexure (OR=9.31, 95%CI: 2.37-36.53), cecum (OR=2.34, 95%CI: 1.37-4), ascending (OR=2.14, 95%CI: 1.54-2.99) and recto-sigmoid (OR=3.10, 95%CI: 1.91-5.03). **Conclusion:** These findings reflects the effect of polyp histology and location on colonoscopy interval and mandates a vigilant follow up in patients with SSA and tubulovillous lesions in special colon anatomic locations.

In vitro Characterization of Anticancer Drug-loaded Nanoparticles

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Introduction: Nanoparticles have dimensions that are generally 1-1000 nanometers and have risen in popularity throughout the years due to its advantageous drug delivery properties. The purposes of this study are to (1) identify the duration of time a particular anticancer drug-loaded nanoparticle releases in vitro; (2) evaluate the anticancer nanoparticle drug loading; and (3) identify potency and efficacy of the anticancer nanoparticles as it relates to cancer cell cytotoxicity. **Methods:** A high-performance liquid chromatography (HPLC) was utilized in efforts to determine both the in vitro drug-release profile and the nanoparticle drug loading of CYC, WOR and CAB. Thereafter, the determination of cytotoxicity in prostate cancer-cell lines (PC-3) was evaluated via MTT Cell Proliferation assay comparing CWC to CAB the encapsulated standard therapy. **Results:** In the drug release study a biphasic release was observed with all three anticancer drug-loaded nanoparticles evaluated. The MTT assay established that both CWC and CAB drug-loaded nanoparticles showed considerable cytotoxicity when introduced to prostate cancer cells (PC-3).

MiRNA-124 Mediates Sphingosine Kinase 1 Expression, Sphingosine-1-phosphate and Ceramide Signaling Pathways in Head and Neck Squamous Cell Carcinoma

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Sphingosine kinase 1 (Sphk1) catalyzes phosphorylation of sphingosine forming sphingosine-1-phosphate (S1P), which is a key sphingolipid metabolite promoting tumor growth and survival. Thus, upregulated Sphk1and overproduced S1P are often found in various cancer cells and correlated with reduced patient survival. Here, we found that microRNA-124 (miR-124) effectively downregulates Sphk1 expression and S1P signaling pathway via specifically binding to the 3¢ untranslated region (3¢-UTR) of Sphk1 mRNA. The relationship of miR-124-regulated Sphk1 expression and sphingolipid metabolite signaling activities was evaluated in head and neck squamous cell carcinoma (HNSCC) cell line (JHU-22miR-124) with stably expressed miR-124. As expected that enforced expression of miR-124 reduced Sphk1 expression and S1P signaling activity leading to significant inhibition of cell proliferation and survival as determined by MTT, colony formation, cell cycle analysis and HNSCC tumor xenograft growth that average tumor xenograft weight in the JHU-22miR124 group (0.03 g) was significantly lower than in the JHU-22vec control group (0.10 g). Limited Sphk1 expression was also leading to ceramide accumulation and ceramide-mediated apoptosis. Proapoptotic regulators (Bax, BAD, cytochrome C, p53, PARP, and caspases) and antiapoptotic regulators (Bcl-2, Bcl-xL and MDM2,) were changed in accordance with the level of apoptosis in JHU-22miR124 cells. Taken together, miR-124 regulates Sphk1 translation and its restoration inhibits HNSCC cell proliferation and survival directly by limiting Sphk1 expression and S1P-associated cell survival, and indirectly by enhancing ceramide accumulation and ceramide-mediated apoptosis. These findings provide new information about the regulation of bioactive sphingolipid metabolites and a new target for cancer diagnosis and therapy.

Pemphigus vulgaris with laryngeal involvement in an African patient: A case report and review

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Background: Pemphigus vulgaris (PV) is a rare autoimmune disease characterized by intra-epidermal bullous lesions on the skin and mucosa due to the formation of autoantibodies against inter-keratinocyte adhesion molecules, called desmogleins. It is especially prevalent among Ashkenazi Jewish populations and in Mediterranean countries, however there are limited reports in patients of African descent. **Case Report:** We present a 60 year-old Nigerian female who was evaluated for a 4-month history of painful oral ulcers, dysphagia, odynophagia, hoarseness and hemoptysis. Physical examination and flexible laryngoscopy revealed widespread ulcerations in the oropharynx, nasopharynx, and larynx. The diagnosis was confirmed after biopsy noting classic histologic and direct immunofluorescence

findings. Dermatology and rheumatology were consulted for management. **Discussion:** Oral lesions are the most common initial presentation of PV and may precede cutaneous lesions or remain as the only manifestation of disease. Previously, laryngeal involvement in PV has been poorly characterized with only recent studies confirming its high prevalence. When left untreated, PV can cause significant morbidity and mortality, especially in patients with laryngeal involvement where there is risk of respiratory compromise. **Conclusion:** This report highlights a rare case of PV in an African patient and emphasizes the importance of taking a multidisciplinary approach when evaluating and managing PV patients. Otolaryngologists play a pivotal role in facilitating early diagnosis and accurate characterization of disease severity, therefore a full ENT examination with laryngoscopy should be performed in all confirmed and suspected cases of PV.

Do Inflammatory Mechanisms Mediate the Relationship between Executive Functions and Eating Behaviors in African Americans?

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High-fat feeding and unhealthy eating behavior patterns have been implicated in the etiology of a number of chronic diseases, such as cancer, heart disease, obesity and type-II diabetes. These illnesses disproportionately impact ethnic minorities, particularly African Americans. Evidence from a study of a community sample of African Americans suggests that impaired executive functioning is associated with poor eating behaviors, such as emotional eating and snacking on sweets. Recent research has indicated that the relationship between poor eating behaviors and disruptions in executive functioning may be mediated by neuroinflammation. Chronic inflammation may play a role in the pathogenesis of cognitive dysfunction, as well as in the disruption of neurogenesis, synaptogenesis, and dendritic remodeling. The purpose of this study is to examine whether neuroinflammation mediates the relationship between executive functioning and poor eating behaviors in African Americans. Various measures of executive functioning, the Eating Behavior Patterns Questionnaire, and a demographic questionnaire were used to assess executive functioning and eating behaviors in a community sample of African Americans. Anthropomorphic measures were also obtained, as well as IL-1a, IL-6 and TNF serum levels via venipuncture. IL-1a was found to significantly mediate the relationship between cognitive inhibition and emotional eating (B=.01 95% CI[.001, .05]), such that individuals with lower inhibition engaged in more emotional eating, in the presence of elevated inflammatory cytokines. Results suggest that neuroinflammation helps to explain the association between executive functioning and eating behavior patterns in African Americans. Further research is necessary to better elucidate these findings.

Comparison of auditory processing abilities evaluated by Non-Verbal Measures versus Standard Verbal Measures

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Some professionals state that evaluation of auditory processing should not include verbal material because this material adds components of language processing to the assessment. This can confound test findings by including both auditory processing and language processing into the processing of what the person hears. Yet, most professionals use verbal measures of auditory processing, and there are many verbal auditory processing tests available for use. One professional developed a battery of measures that do not use verbal material. This is called the TAVS developed by Alan Heath (2014). This study compares the results of the TAVS non-verbal measures and standard verbal measures of auditory processing (SCAN-3 by Robert W. Keith; SSW Test by Jack Katz; Phonemic Synthesis Test by Jack Katz). A group of young adult college students are assessed using these nonverbal and verbal measures. Findings are compared to determine whether differences occur and to see if there are any correlations between the nonverbal and verbal measures. Initial findings are indicating that there are no correlations between the measures, but there a significant differences. Thus, using nonverbal measures of auditory processing, such as the TAVS test, cannot substitute for standard, verbal based evaluation measures to look at auditory processing deficits (APD) in listeners.

Nutrition related Genetic Deficiencies: Glucose- 6-Phosphate Dehydrogenase

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Objective: To examine the nutritional implications and nutrition deficiencies related to Glucose- 6- Phosphate Dehydrogenase. **Introduction:** The changing of the structure of a gene that can be passed down into generations, due to alterations in DNA or rearrangement of larger sections of genes or chromosomes. G6PD deficiency is an X chromosome linked disorder, which often occurs in males. Women can be affected if both X chromosomes are G6PD deficient. G6PD gene is responsible for the production of G6PD enzyme, involved in the normal processing of carbohydrates. This deficiency causes the RBC to break down prematurely when exposed to oxidative stress, causing hemolytic anemia, which happens when RBC are destroyed faster than replaced. This form of anemia leads to jaundice, shortness of breath, fatigue, and rapid heart rate. G6PD deficiency can be triggered by oxidative stress from bacterial or viral infections, drugs such as antibiotics and certain foods such as fava beans and other legumes. **Methods:** At a local hospital a patient with G6PD deficiency was interviewed, the patient's medical records were reviewed, and several peer- reviewed articles were systematically reviewed. **Results:**A 66 y/o female with nutritional diagnosis of acute pancreatitis with abdominal pain and nausea/vomiting, severe dehydration, as a result of G6PD deficiency crises. Patient was NPO for evaluations and then on a full liquid diet until flare up was contained. **Conclusion:** For a patient with G6PD, a modified diet with the proper nutrients to sustain daily life is beneficial to prevent flare-ups.

1,25-dihydroxyvitamin D3 inhibits Oral Squamous Cell Carcinoma Cells Growth through Regulation of miRNA Expression

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It is reported that two out of every 100 cancers diagnosed (2%) are oral and oropharyngeal squamous cell carcinoma (OSCC). 1,25-dihydroxyvitamin D3 (1,25(OH)2D3) is a pleiotropic hormone, which is able to regulate many genes in various tissues. Many in vitro and in vivo studies showed promising results of 1,25(OH)2D3 on many cancers. MicroRNAs (miRNAs) are a class of small non coding RNAs that bind to imperfect complementary sites in the 3′-untranslated region of target mRNAs to decrease mRNA stability and protein translation. There are very limited studies the effects of 1,25(OH)2D3 on the regulation of miRNAs, and there is no study that examined the global miRNA expression profiles by 1,25(OH)2D3 in OSCC. Thus, to gain more insight into the actions of 1,25(OH)2D3 on OSCC, we have investigated 1,25(OH)2D3-associated apoptosis, cell cycle arrest, proliferative effect and miRNA profiles in OSCC cells using flow cytometry and western blotting methods. We found that 1,25(OH)2D3 inhibited the growth of human JHU-22 OSCC cells in a dose-dependent manner with IC-50 of 1.56 x 10-6 M. High levels of apoptotic cells and apoptotic biomarkers were increased in the cells treated with 1,25(OH)2D3. MicroRNA expression profiles at three different time points (9, 24, 48h) were obtained using nanoString method. Over 20 miRNAs were upregulated and 23 miRNAs were downregulated more than two folds by 1,25(OH)2D3 treatment compared with untreated cells. These candidate miRNAs directly/indirectly response to 1,25(OH)2D3 function. In conclusion, 1,25(OH)2D3 inhibits the growth of oral squamous cell carcinoma through the regulation of certain miRNAs.

Calcinosis Cutis as a Complication of Morphea

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Morphea with calcinosis cutis is a rare presentation which is difficult to treat once calcifications are present in the skin. Unlike many cases where calcification is linked to trauma or inflammatory disease process, calcinosis cutis may also occur spontaneously. We report a case of long standing morphea in an individual who developed idiopathic calcifications. A 63 year old Caucasian male Veteran presented to an academic dermatology center with a 16 year history of a progressive fibrosing eruption involving his chest, face and scalp. He described an asymptomatic thickening and hardening of his

skin with associated associated alopecia and more recently, spontaneous ulceration of involved areas of his scalp. He had previously been evaluated at a Veteran's Affairs (VA) hospital where two biopsies were obtained, one from his chest within the past few months and a second, over a decade ago, of his scalp that were "inconclusive" per the patient. He had not received treatment as he was told this was not a malignant process. Cutaneous examination revealed symmetric subcutaneous, cord-like plaques of the upper chest in a V-like distribution with overlying hyperpigmentation as well as firm, mobile, subcutaneous, plate-like plaques with symmetric involvement of the pre- and post-auricular skin, as well as the temples and parietal scalp with no overlying epidermal changes. Currently the most effective treatment for morphea complicated by calcinosis cutis is surgical excision. At present, the best recommendation is early treatment of morphea to avoid calcinosis cutis as a complication.

A Preliminary Study of Acute Aerobic Exercise on Total Peripheral Resistance During Mental Stress in Young Adult African Americans

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Background evidence accumulation concludes that specific "triggers" such as psychological stress may elevate total peripheral resistance and contribute to the greater rates of hypertension in African Americans. Aerobic exercise exerts an antihypertensive effect. The goal of this study was to investigate the influence of acute aerobic exercise on total peripheral vascular resistance during mental stress in young adult African Americans. We measured total peripheral resistance during the StroopColor Word Test. Participants included 3 women and 2 men (between 18 – 24 years). Following randomized conditions of a 30-minute cycle ergometry exercise at 60% peak oxygen uptake or rest, participants performed a three-minute computerized StroopColor Word Test. The total peripheral resistance estimate was obtained as the quotient of mean arterial pressure, in millimeters of mercury, divided by a derived estimate of cardiac output, in liters per minute, and expressed as dyn.s.cm-5. The total peripheral resistance delta scores for baseline and mental stress were not significantly different between the aerobic exercise and control conditions (24 vs 0, p = .08). Our preliminary data shows total peripheral resistance during mental stress is not altered by acute moderate intensity aerobic exercise in sedentary young adult African Americans. This study was supported in part by Howard Univ. COAS Honors Program and by National Institutes of Health, National Center for Research Resources, Research Centers in Minority Institutions Program (NIH/NCRR/RCMI) Grant 2G12RR003048 to Howard University.

Outcomes of Hospitalized Patients Diagnosed With Congestive Heart Failure: Patients and Hospital Characteristics

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Background: There are approximately one million hospital admissions for heart failure (HF)per year in the US, resulting in a healthcare cost of $37.2 billion. The cost derives mainly from by inpatient services including length of stay (LOS). The impetus has been to decrease LOS while improving patient outcomes. Highest-cost were associated with urban and teaching hospitals. Highest-cost of hospitalization was also associated with longer LOS and higher in-hospital mortality (5.6% vs 3.5%) when compared with lowest- cost hospitalizations. There is little or no study done on the effects of patient and hospital characteristics on the outcomes of inpatient with chronic heart failure (CHF). **Method:** We investigated on the current prevalence and factors that affect the inpatient with CHF using a longitudinal dataset from National Inpatient Samples. ICD 9 codes (CHF- 428) was used for the extraction of the independent and dependent variables. **Results:** There were 697,334 men and women hospitalized with CHF (46.88% male & 53.12% female with a mean age of 76.08 years). The mean LOS was 6.03 days with an average charge of $76,764 per patient. Among them, 46.4% were admitted to urban teaching hospitals, 29.33% had diabetes and 57.91% had a household income of less than $48,000 per year. The mean LOS was 6.03 days with an average charge of $76,764 per patient. **Conclusion:** Our project may be helpful in identifying links between clinical outcomes and patient/ hospital characteristics which could

eventually lead to improved patient outcomes, decreased LOS and lower re-hospitalization rates.

Identification of HIV Drug Transporter Targets on Primary Human CD4+ T Cells and vaginal epithelial cells

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Background: Attachment of HIV to the human CD4+ T Cells, incorporation of viral enzymes and genetic material constitute the primary steps of HIV infection. The purpose of the study is to screen the primary human T cells and transfected vaginal epithelial cells (VK2) for the presence of prominent ABCC class of drug efflux transporters: Multi Drug Resistance Associated Proteins (MRPs), Pglycoprotein (P-gp) and Breast Cancer Resistance Protein (BCRP). **Methods:** Molecular screening was performed by RT-PCR gene expression followed by sequencing analysis. Functional screening was performed by 3H-Tenofovir uptake in the presence of specific MRP inhibitor (MK571), P-gp inhibitor (Pgp-4008) and BCRP inhibitor (Fumitrimorgin-C). Intracellular radio labeled drug concentrations were analyzed by liquid scintillation counter. **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%), 50 μM Pgp4008 (215.4±9.2%) and 50 μM Fumitrimorgin (192.1±18.38%) compared to control (100±6.65%). **Conclusion:** The results, for the first time demonstrated the molecular and functional expression of multiple ABCC drug fflux 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.

Quality of Life, Patient Satisfaction, and Psychological Distress in Ethnically Diverse Patients with Hormone Receptor Positive Breast Cancer

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Background: Hormone-Receptor-Positive (HRP) breast cancer is a form of cancer in which receptors for cancer cells may receive signals from estrogen or progesterone that promote their growth. After receiving primary therapy (i.e., surgery, chemotherapy, and/or radiation), patients often receive Adjuvant Endocrine Therapy to help prevent return of the cancer by lowering the amount of estrogen and/or progesterone in the body or blocking the hormones from attaching to the breast-cancer cells. However, these therapies have side effects that can affect patient-rated quality of life (QoL). Patients who report optimal treatment satisfaction from their patient/physician relationships may exhibit greater QoL. A potential mechanism explaining the relationship between patient satisfaction and QoL is psychological distress. That is, optimal patient satisfaction could foster less psychological distress and therefore promote optimal QoL. The relationship between patient satisfaction and QoL, as well as the mediating effect of psychological distress has yet to be explored in HRP-BC patients (especially among ethnically diverse HRP-BC patients). Purpose: Study aims include examining QoL in HRP-BC patients, as well as the impact of patient satisfaction on QoL. Furthermore, psychological distress will be examined as a mediator between the patient satisfaction and QoL relationship. **Methods:** Six hundred HRP-BC women (representing a variety of ethnic backgrounds) completed baseline measures of demographics, QoL, patient satisfaction, and psychological distress. **Results:** Results from the baseline assessment will be presented addressing all study aims. Implications: This study will allow us to draw inferences about how patient satisfaction impacts psychological distress and ultimately QoL in HRP-BC patients.

Efficacy and Safety of Azelaic Acid 15% Gel versus Hydroquinone 4% Cream in the Treatment of Melasma

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Background: Melasma is a chronic hyperpigmentation of the face for which there are few effective treatments. Hydroquinone (HQ) 4% is often employed as monotherapy or in combination with corticosteroids and/or retinoids. Azelaic acid (AA) is a naturally occurring dicarboxylic acid that inhibits tyrosinase and decreases abnormal melanocyte proliferation. This study is the first to compare efficacy and safety of AA 15% gel with HQ 4% cream in the treatment of moderate-severe melasma. **Methods:** Subjects were randomized 1:1 in double-blind fashion to either treatment. Study medication was applied twice daily for six months. Monthly evaluations included Mexameter M&E readings, Melasma Area & Severity Index (MASI), Physician Global Assessment (PGA), Patient Global Assessment Score (PtGAS), and adverse events. **Results:** PGA improved for HQ subjects at Months 3, 4, and Final Visit. Scores were significantly higher for AA versus HQ subjects at Months 1, 2, and 4. PtGAS improved for AA subjects at Months 1, 4, 5, and 6 while HQ treated subjects were better than Baseline at Months 3, 4, and 5. MASI scores improved significantly for AA-treated subjects at Months 1, 2, 3, 4, and Final Visit. Mexameter M mean scores improved from Baseline for AA at Months 5 and 6, and improved over HQ at Month 5. E mean scores improved from Baseline for AA at Month 1, and for HQ at Month 6. Safety was comparable between treatments. **Conclusion:** Each treatment showed improvements from baseline for efficacy parameters. Mean MASI scores were significantly improved at five visits for AA and one visit for HQ. AA 15% gel is shown to be a reasonable, safe therapeutic option for the treatment of melasma.

Orthodontists and Speech-Language Pathologists: Investigating the Need for IPP and IPE

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Orthodontists and Speech-Language Pathologists are specialists who may be involved in the assessment and treatment of clients presenting with structural deficits of the oral musculature. This client population may also present with concomitant speech-sound disorders. While these unique clients may benefit from the pertinent services of both an Orthodontist and a Speech-Language Pathologist, previous studies demonstrate a lack of knowledge among professionals as to which client cases require a referral to speech or orthodontic services. Early research chronicled disclosures of the need for interdisciplinary care among Speech-Language Pathologists and Dentists in order to co-treat patients as a means to address complex client needs (Erksine, 2015; Palmer, 1948; Subtelny, 1962). This presentation will highlight the need for Interprofessional Practice (IPP) and Interprofessional Education (IPE) within the fields of Orthodontics and Speech-Language Pathology based upon a survey completed by practicing professionals and students. The aforementioned survey assessed the ability of Orthodontists and Speech-Language Pathologists to recognize and refer patients across their specialties. The study's results revealed the need for interdisciplinary IPP and IPE among Orthodontists and Speech-Language Pathologists. The presentation will explore the following learner objectives: 1) Orthodontists' and Speech-Language Pathologists' level of preparation in recognizing the need for client referral to their opposing specialty; 2) The rate at which Orthodontists and Speech-Language Pathologists refer clients to each other's specialty; 3) Orthodontists' and Speech-Language Pathologists' perceived proficiency in referring clients across their specialties.

Small molecule development for innate immunity-derived inflammatory disorders

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Uncontrolled activation of NLRP3 inflammasome has been identified as a major contributor in the development

and progression of wide array of inflammation-associated disorders, such as Alzheimer's disease, Type 2 diabetes, alcohol-use disorders, etc. Recent reports suggest that NLRP3 is a druggable target and its inhibitors may be therapeutically useful in the clinical management of aforementioned inflammation-associated disorders. However, lack of crystal structure of NLRP3 inflammasome has proven to be a major limitation in the development of its small molecule inhibitors. Using a combination of computational and classical medicinal chemistry techniques, we initially developed a library of small molecule NLRP3 inhibitors. We screened their in vitro biological activity using Francisella tularensis, a Gram-negative bacterium which has been previously described as robust activator of NLRP3 inflammasome. Two of our eight analogs displayed good anti-inflammatory activity in the initial biological screening. They were also found to be relatively non-toxic in propidium iodide toxicity assay. Based on our promising initial results, we are seeking the application of these compounds in alcohol use disorders. Current research efforts are focused on the development of second generation analogs via systematically varying the structures of our most potent analogs. Our rationale for the structural variations, schemes leading to gram-scale synthesis, in vitro activity will be discussed in detail. We feel confident that development of small molecules will allow for the advancement of new therapeutic interventions and will expand our knowledge of the molecular mechanisms involved in pathogenesis of these disease states.

Assessing Anticoagulation Control using Time within Therapeutic Range (TTR)

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Anticoagulation with warfarin is effective therapy for the prevention and treatment of thromboembolic disorders. However, adverse events occur when the international normalized ratio (INR) is not within therapeutic range.The percentage of time within therapeutic range (TTR) assesses the quality of anticoagulation control on warfarin therapy with maximum efficacy observed at a TTR ≥ 65%2,3. Specifically, African American patients have a lower TTR compared to Caucasian patients (47.8% vs. 55.2%), and a higher risk of thromboembolic events. Pharmacist-managed anticoagulation clinics have proven to be superior compared to usual medical care in the prevention of major bleeding events and hospitalizations related to warfarin therapy. The purpose of this retrospective study is to determine the effectiveness warfarin therapy using TTR in a pharmacist-managed ambulatory clinic in an African-American predominant area. Patients ≥18 years of age on warfarin therapy with at least 4 clinic visits between September 2015 and September 2016 were included in the study. Age and gender were collected in addition to INR and TTR. Mean TTR was calculated using the Rosendaal method of linear interpolation and compared to mean TTR observed in large randomized controlled trials (ranging from 57-65%). A total of 106 patients were included in the study. 50% of the study population was male and age ranged from 22-93 years (mean 62.9 years). The mean TTR was 47.7% (±27.8%). The results of this study do not indicate there is opportunity for improvement regarding anticoagulation control among patients at the HUH Anticoagulation Clinic.

Inhibition of HIV-1 Infection in Humanized Mice and Metabolic Stability of Protein Phosphatase-1-targeting Small Molecule 1E7-03

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We recently identified 1E7-03 compound that targets host protein phosphatase-1 (PP1) and inhibits HIV-1 in vitro. Here, we investigated inhibition of HIV-1 infection in vivo by 1E7-03, analyzed its metabolic stability and tested antiviral activity of its degradation products (DPs). 1E7-03 quickly degraded as determined by pharmacokinetic (PK) analysis into a major degradation product 1 (DP1) and DP3. DP1 and DP3 were synthesized and tested for PP1 binding, HIV-1 inhibition activity and cellular permeability. While DP1 and DP3 bound PP1 in vitro and efficiently competed PP1-binding RVxF-motif containing peptide, their anti-viral activity was significantly reduced due to inefficient cell permeability. Antiviral efficacy of 1E7-03 was evaluated in NSG-humanized mouse model infected with dual tropic HIV-1 89.6 strain. Comparison to the previously described F07#13 compound showed efficacy of 1E7-03 in this mouse model significantly reducing plasma HIV-1 RNA. We synthesized a DP1 analog, DP1-07, which showed improved cell permeability compared with DP1 and good PK property. However, its HIV-1 inhibitory activity was 10-time less

efficient than 1E7-03 both in vitro and in vivo, indicating that the full side chain of 1E7-03 is essential for its anti-HIV activity. Finally, we tested 1E7-03 stability in plasma obtained from various species and detected good stability in human, monkey and ferret plasma but not in guinea pig or mouse plasma. Thus 1E7-03 is likely to be stable in higher primates or ferrets but not in rodents. Our study suggests that 1E7-03 is a good candidate for future testing in non-human primate animal models.

Survey Regarding Evaluating Children for Auditory Processing for Parents and Professionals

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Parents and professionals often feel that children may have auditory processing deficits (APD). When they seek evaluations for these children, they are told that children cannot be evaluated because they are below 7 years of age. A review of the literature and research on this topic reveals that there is no evidence to support an age limit, especially that children below 7 years of age cannot be evaluated for auditory processing. Also, what is not known is what professionals (not audiologists and speech-language pathologists) understand about the lowest age at which a child may be evaluated. This research asks parents and professionals not audiologists or speech-language pathologists to complete a survey investigating their understanding and attitudes regarding an age limit for children to be evaluated for APD. This survey asks the parents and professionals to identify the lowest age level they have been told that children can be evaluated. Additionally, information regarding where parents and professionals learned about the age limit, and what they feel may be problematic waiting for a child to be this age level before evaluating the child when there are suspicions that the child has auditory processing deficits (APD). Preliminary results indicate that parents and professionals are told by audiologists (mostly) that you cannot test children below 7 years of age. Parents and professionals feel that waiting until the age of 7 can be harmful for the child. They often seek audiologists who will test young children.

Estimation of Fracture Risk in an HIV-Infected Population in the District of Columbia

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The World Health Organization released the Fracture Risk Assessment Tool, otherwise known as FRAX, in 2008. The FRAX model was designed using extensive data from multiple population-base cohorts. FRAX is used to predict fracture risk using clinical risk factors such as age, sex, race, height, weight, BMI, history of fragility fracture or parental hip fracture, use of oral glucocorticoids, rheumatoid arthritis, current smoking, and alcohol intake. FRAX is now being used in the assessment and treatment of special populations such as HIV-positive patients. This is a prospective analysis, which will be conducted on all HIV infected patients who have been registered for at least one visit starting 05/20/2015 at the Center for Infectious Disease Management and Research (CIDMAR) at Howard University Hospital. We anticipate that the study will last 12 months This study will utilize quantitative data and qualitative data collection. The study will be conducted over 12 months. Participants who are HIV-positive and above age 18 that receive medical care starting 05/20/2015 at Howard University Hospital CIDMAR clinic will be recruited upon check-in after written consent is obtained. They will complete a survey that will gather information about patient demographics. After completing the pre-survey, the participant's information will be entered into the WHO Fracture Risk Assessment Tool, which we believe to be a valid tool, to determine their 10-year fracture risk.

Using Medical Nutritional Therapy to Address Health Disparities in Diabetes Management

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Introduction: Diabetes is a metabolic disease involve problems with the insulin production. Type 2 diabetes (T2DM) contributes to 95% of all diabetes incidence. Ethnic minority including Hispanic Americans, African Americans, and Native Americans have the highest prevalence of T2DM. The health disparities are multifactorial; main barriers include socioeconomic status, education level, and low quality of care. Medical nutrition therapy (MNT) has been shown to promote life quality and longevity in T2DM populations through diet modification, lifestyle and behavior change, as well as increase physical activity. MNT is also important in preventing the development of T2DM complications. Individuals with T2DM require life-long self-management, therefore, nutrition education should be provided with most up-to-date knowledge and information. **Method:** Date was collected from Howard University Hospital through patient's medical chart, and interview with the patient and family member. A 58-year-old Hispanic American male with diagnosis of unstable angina, T2DM, CAD and hypertension. Nutrition care process was applied, nutrition education was provided briefly, and nutrition intervention was recommended. **Results:** Patient is expected to have normalized glucose level and A1C level if adherent to the glycemic control diet. Patient will develop the ability to make healthier food choices after complete the nutrition education and counseling. **Conclusion:** A carbohydrate consistent diet was provided during the hospital stay. Nutrition education regarding of glycemic index, and carb counting was provided. MNT along with psychosocial support would be an effective approach in diabetes management.

Exploring Health Disparities in Dental Care Providers' Delivery of Tobacco Use Treatment

Presenter's Name: Chinyere Mbadiwe
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Background: The United States Public Health Service Guideline for Treating Tobacco Use and Dependence recommends that all health care providers implement the 5As model ("ask", "advise", "assess", "assist" and "arrange") when treating a patient who is a tobacco user (Fiore, 2008). Dental health providers are ideally situated to address tobacco use among their patients however, the tobacco use treatment clinical practice guidelines are under-utilized by dental health providers. Non-compliance with the clinical practice guidelines may lead to treatment and tobacco-related disparities among patients. **Objective:** To determine if disparities are present among varying racial and ethnic groups when being asked about tobacco use and advised to quit tobacco use by dental health providers per clinical practice guidelines. **Methods:** Data were collected as part of a larger cluster randomized clinical trial focused on evaluating three system-level strategies to improve implementation of tobacco use treatment guidelines. Patient exit interviews (Pbert, 1999) were conducted with 1,015 smokers in 13 dental clinics across New York City, assessing delivery of the 5As by dental health providers. Likelihood of being asked about tobacco use and advised to quit were analyzed by race (as compared to whites), ethnicity (as compared to non-Hispanics), English proficiency, smoking frequency, and oral morbidities. **Results:** Tobacco users who identified as black were most likely to be asked about tobacco use and advised to quit by their dental health provider. Tobacco users who identified as Hispanic were least likely to be asked about tobacco use by their dental health provider as compared to their non-Hispanic counterparts.

Syllable structures and word lengths in Mexican Toddlers

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The process of performing word shape analysis helps to determine the frequency of syllabic patterns in childrenðs speech (Ingram & Ingram, 2001). While most studies have addressed English language speakers, information with regard to Spanish word shapes and syllable structures in children is needed. Further, word shapes and syllable structures vary from one Spanish dialect to another. In this study, cross-sectional language samples of infants and toddlers from a corpus of mother-child dyads from Mexico in the CHILDES database were used. Word shape and syllable analysis were used to determine developmental trends in Mexican Spanish speaking children. The analysis outcomes provide developmental trend information that may be used for assessment and treatment purposes. It further points to the need to address Spanish dialectal differences when performing assessments.

Examining the role of Medical Nutrition Therapy to Address the Health Disparities of Metabolic Stress and Sepsis

Presenter's Name: Tahja Miller
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Metabolic Stress is one of the top ten causes of death in the United States according to the Center for Disease Control and Health Provision, but is also one of the most under looked diseases nutritionally. Approximately 2.5 million individuals had sepsis upon death. Between 650,000 and 750,000 individuals between 1999-2012 had acquired severe sepsis in more than a year with 70% of individuals having underlined comorbidities and 60% ofindividuals being 65 years of age and older. It is especially important to note that African Americans have a higher occurrence of gram-positive infections, which is strongly correlated with increased risk of sepsis. For the purpose of this study, several peer review sources were systematically reviewed to determine how the Nutrition Care Process positively affects the health of an individual with sepsis. A case study was also instituted for evidence-based data. The data from the case study was collected and assessed using the Nutrition Care Process by assessing the patient's medical chart, interviewing the patient and family which help obtain anthropometric data. These processes helped the researcher effectively institute a nutrition intervention that was patient specific.

Acute Aerobic Exercise Does Not Alter Heart Rate Variability During Mental Stress in Young Adult African Americans

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Mental stress is an important problem and about half of work related illnesses are directly or indirectly related to stress. Exposure to stress suppresses cardiac parasympathetic activity and the sympathetic nervous system is activated. Heart rate variability is a measurement of cardiac autonomic function, and used as an indicator of cardiovascular health. The goal of this study was to investigate the effect of acute aerobic exercise on heart rate variability during mental stress in young adult African Americans. We measured heart rate variability using time domain (RMSSD) during the Stroop Color Word Test (SCWT). Participants included 4 women (19-22 years) and 2 men (21-25 years). Following randomized conditions of either a 30 minute cycle of ergometry exercise at 60% peak oxygen uptake or no exercise, participants performed a three minute computerized SCWT. The RMSSD delta values for baseline and mental stress were not significantly different between the aerobic exercise conditions and control conditions of no exercise (9.4 vs. 15.8, $p = 0.28$). Our preliminary data shows cardiac autonomic neural activity during mental stress is not altered by a single bout of moderate intensity aerobic exercise in young adult African Americans. This study was supported in part by Howard Univ. COAS Honor's Program and by National Institutes of Health, National Center for Research Resources, and Research Centers in Minority Institutions Program (NIH/NCRR/RCMI) Grant 2G12RR003048 to Howard University.

Clinical Pharmacogenetic Testing as Clinical Decision Support for Diabetes Management in a Ghanaian Cohort

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Background: Diabetes mellitus is a noncommunicable, chronic disease that carries a significant global public health burden. Although several medications are available to treat diabetes, some patients do not achieve their treatment goals and comorbid mood disorders further complicates the management. Clinical pharmacogenetic testing may help to improve treatment selection and optimization of diabetes medications. We seek to determine the prevalence of comorbid mood disorders in diabetics at the Korle Bu Teaching Hospital National Diabetes Management and Research Centre in Accra, Ghana and whether pharmacogenetic testing improves treatment outcomes. **Methods:** We interviewed 165 patients using the Patient Health Questionnaire (PHQ)-9 and the My Mood Monitor (M3) assessment tools to screen

for mood disorders. Glycated hemoglobin A1c (HbA1c) was used to assess diabetes management. Genetic material was collected by buccal swabs for pharmacogenetic testing. Univariate analyses, Pearson correlations, and regression analyses will be conducted to determine relationships between diabetes, mood disorders and pharmacogenetics. **Preliminary Results:** HbA1c readings ranged from 4.0 to over 13.0%, with a mean of 8.6%. Comorbid mood disorder was identified via PHQ-9 score in 10.9% (n=18) of patients and via M3 score in 12.7% of patients (n=21). Patients with a PHQ-9 score of 10 or greater (moderate or greater depression) had a strong correlation (Pearson correlation coefficient = 0.95) with HbA1c levels but was not statistically significant. **Conclusions:** Comorbid mood disorder is prevalent in our patient population and pharmacogenomic testing may shed light on dosing and medication optimization in diabetics.

Effects of Acute Aerobic Exercise on Mood Responses and Prefrontal Cortex EEG Asymmetry in Young Adult Women and Men

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Clinical and laboratory observations suggest that frontal EEG asymmetry reflects individual differences in the regulation of an elicited emotion, a biological marker of affective style. We tested the effect of acute aerobic exercise on mood responses and prefrontal EEG asymmetry in young adult women and men. Participants included 7 women and 7 men. We assessed prefrontal EEG asymmetry and self-reported affective responses as measured by the Profile of Mood States using the Total Mood Disturbance during randomized conditions of 30 minutes cycle ergometry exercise at 60% peak oxygen uptake or rest. The signal was amplified with a gain of 22,000, analogically filtered between 0.01 Hz (high-pass) and 100 Hz (low-pass), and sampled at 240 Hz using a BrainMaster Atlantis ll EEG acquisition system. Asymmetry for the alpha, beta, delta, theta, and gamma frequency bands were extracted in the prefrontal areas of the brain cortex (Fp1 – Fp2). Within females the total mood disturbance was significantly lower after exercise (34 ± 8.4 vs 12.8 ± 7.5, p= 0.02), no difference was observed within males. Within males and females no significant differences were noted in EEG asymmetry bands for alpha, beta, delta, gamma, and theta waves. Our findings suggest acute aerobic exercise exerts a greater influence on mood responses in females than males. This study was supported in part by Howard University COAS Honor's Program and by National Institutes of Health, National Center for Research Resources, and Research Centers in Minority Institutions Program (NIH/NCRR/RCMI).

The Role of Medical Nutrition Therapy in the Reduction of Cardiovascular Risk for Patients with Dialysis Dependent Chronic Kidney Disease

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For patients with dialysis-dependent chronic kidney disease, complications from the comorbidity of congestive heart failure are a major cause of death. The pathophysiological progression of said comorbidity stems from improper management of ESRD as it is related to a patient's diet. Through the blood and bodily fluid, kidneys provide a homeostatic environment for the organs to thrive in. In ESRD, renal function has severely decreased, homeostasis has been compromised and a proper diet is now a major form of defense in maintaining the health of organs like the heart, blood vessels and fluid balance. The methodology for collecting for this study was through an interview with the patient, nursing staff and his social worker. Information was also collected from the patient's chart and a systematic review of peer-reviewed sources. After assessing the patient, it was found that he had complications of Chronic Kidney Disease with fluid overload that exacerbated his Congestive Heart Failure and lead to shortness of breath. A nutritional diagnosis of undesirable food choices related to lack of access to recommended foods as evidenced by bilateral shortness of breath, fluid overload was given. Altered nutrition lab values of BUN 46, Creatinine 8 and patient stated that he could not read or cook and ate fast food "cheeseburgers" daily were used to confirm the diagnosis. The treatment for ESRD involves dialysis that acts as a fake kidney to regulate bodily fluids. However, without a proper diet, patients can experience complications of unbalanced bodily.

Predictors of duodenal biopsy at endoscopy of patients with anemia

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Esophagogastroduodenoscopy (EGD) is an important diagnostic tool in the evaluation of anemia. The work up for iron deficiency anemia should include duodenal biopsies for diagnosing diseases such as Celiac Disease (CD). We investigated rates of duodenal biopsies among patients with anemia and evaluated factors associated with duodenal biopsy during EGD. We reviewed the records of 224 patients who underwent EGD for anemia in our endoscopy suites from 2012 to 2015. 83 (37%) patients had duodenal biopsies performed. Females were more likely to get duodenal biopsy (44.3% vs 29.4%, OR = 1.90; 95%CI: 1.09-3.32). Patients who had concomitant EGD and colonoscopy were more likely than those who had EGD alone (40.2% vs 21.6%, OR = 2.44; 95%CI: 1.06-5.63). Performance of gastric biopsies (45.2% vs 6.4%, OR = 12.10; 95%CI: 3.62-40.42)was associated with increased duodenal biopsies. Conversely, GI fellows' participation was associated with less likelihood of obtaining duodenal biopsies (26.9% vs 45%, OR = 0.45; 95% CI: 0.25-0.80). Black race (36.8% vs 36.8%, OR = 1.00; 95% CI: 0.38-2.64)was not associated with duodenal biopsies. Histological analysis of duodenal biopsies did not reveal any case of Celiac disease in our predominantly Black patient population (n=204, 91.48%). Our study shows that duodenal biopsy rates are low in the evaluation of patients with anemia. No case of CD was found. Surprisingly, when GI fellows participated in EGDs, they were less likely to obtain duodenal biopsies. This is an area of quality improvement that needs to be implemented in the training of GI Fellows.

Airflow Obstruction, Cognitive Function and Mortality in a US National Cohort: NHANES-III

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Background: The quality of life and prognosis of patients with chronic obstructive pulmonary disease (COPD) is influenced by comorbidities including cognitive impairment. However, the effect of cognitive impairment on mortality in COPD patients remains unknown. **Methods:** Utilized the Third National Health and Nutrition Examination Survey (NHANES III), a national survey of non-institutionalized residents of the United States, to measure forced expiratory volume in the first second (FEV1) and forced vital capacity (FVC). Identified items on cognitive function with mortality follow-up data; 4,365 elderly persons aged 60 and over were selected. **Results:** The FEV1/FVC less than the Lower Limit of Predicted Ratio (LLP) defined airflow obstruction and Composite Cognitive Function Score (CCF) ≤4, cognitive impairment. Of the total, 3,078 had neither airflow obstruction (FEV1/FVC<LLP) nor cognitive impairment (CCF≤4). 766 had FEV1/FVC<LLP only, 413 had CCF≤4 only and 108 had both FEV1/FVC<LLP and CCF≤4. Weighted Cox proportional hazards regression revealed an increased hazard ratio (HR) in persons with FEV1/FVC < LLP only and in persons with CCF ≤ 4, only respectively compared with persons with neither. In persons with FEV1/FVC ratio < LLP, CCF≤4 was not a significant predictor of mortality (HR=0.91, CI=0.60-1.40). In contrast, a significant predictor of mortality (FEV1/FVC ratio ≥ LLP) was found (HR= 1.22, CI= 1.02-1.45). **Conclusion:** Elderly persons with either airflow obstruction or cognitive impairment or both had increased all-cause mortality when compared to those with neither. After adjusting for confounders, cognitive impairment was not predictor of increased mortality in persons independent of airflow obstruction.

Genitourinary Paraganglioma: Demographic, Pathologic, and Clinical Characteristics in the Surveillance, Epidemiology, and End Results (SEER) Database (2000-2012)

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Extra-adrenal paragangliomas (PGL) are infrequent, benign, neuroendocrine tumors arising from chromaffin cells of the autonomic nervous system. While most develop within the

head, neck, and trunk, they have rarely been reported in the genitourinary (GU) tract. Due to the paucity of literature on the rates of GU paraganglioma, our study aims to describe demographic, pathologic, and clinical characteristics of GU PGL and compare them to non-GU sites of PGL. Population based information on PGL from SEER 18 was used to compare data on GU and non-GU PGL diagnosed from 2000 through 2012. Descriptive analysis was performed. Of the 299 cases of PGL retrieved, 20 (6.7%) arose from the GU tract. GU PGL were less common in whites compared to PGL at other sites (p=0.034). As expected, most GU PGLs (83.3%) were located in the bladder. Only 50 % of GU PGLs were organ confined at the time of presentation. There were 2 (10%) cause-specific deaths in GU PGL group. All PGLs were treated with surgery. Non-GU PGL tumors arose mostly within the endocrine system, and resulted in deaths in 24% of patients. GU PGL represents around 7% of all PGL cases, and is found less commonly in whites compared to non-GU PGL. Bladder represents the most common site of involvement. Surgery is the mainstay of treatment of GU PGLs.

Differential Diagnoses of Oral Mucosal Lesions in The Pediatric Patient

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Purpose: The purpose was to present a literature review of rare oral mucosal lesions found in pediatric patients to help guide the practitioner towards developing differential diagnoses and subsequent treatment decisions. **Methods:** A review of the published literature for diagnosis and treatment of oral mucocutaneous lesions was conducted from the following databases: PubMed®; MEDLINE; Science Direct; and Clinical Key. A case review of a patient with clinical mucocutaneous lesions, unresponsive to treatment is included for further rationale and discussion regarding the need for proper differential diagnoses to lead to proper definitive treatment decisions. **Results:** The biopsy results of the case review revealed a diagnosis consistent with Mucous Membrane Pemphigoid. **Conclusion:** Pediatric dentists must be well versed in the knowledge of mucosal lesions and accept a multidisciplinary approach for the proper management of those disorders seen in children.

Are Endometrial Polyps Associated with Colorectal Neoplasia? A study in a Minority Population

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Background: Previous studies have evaluated the association between colon and endometrial polyps in relation to Lynch syndrome. However, the association between these polyps is not well characterized among African Americans, a population at a high risk for colorectal cancer. **Aim:** To investigate the prevalence of colon polyps among African Americans with endometrial polyps. **Patients & Methods:** We reviewed the pathology reports of 599 patients (2004-2015) suspected of having endometrial polyps and retained those that had confirmed endometrial polyps and underwent colonoscopy (n=106). Colonoscopy reports for these 106 were reviewed for colon polyps presence. A control consisting of the colonoscopy population from 2010 to 2015 was used to determine colorectal polyps' prevalence independently of endometrial lesions. **Results:** Among the 106 patients with endometrial polyps, 67 (63%) had colorectal polyps as well. The prevalence of colon polyps within the control population was 41% (4,070 polyps/10,027 colonoscopies). This reflects a higher colon polyp rate in patients with endometrial polyps. There were 24 tubular adenomas, 21 hyperplastic, 6 mixed and 16 undocumented polyps in the endometrial polyp group. Upon age groups categorization, 5% of colon polyps were in patients 31-40 years, 15% in patients 41-50 years, 40% in patients 51-60 years, 31% in patients 61-70 years and 9% of in patients 71-80 years. Overall, 60% of the colon polyps in the endometrial polyps group occurred before age 60. **Conclusion:** Endometrial lesions may be associated with colonic neoplasia. Therefore, and as such further studies are needed to determine whether females with endometrial polyps would benefit from surveillance.

Utility and Safety of ERCP in the Elderly

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Background: The present study sought and compared the utility and safety of ERCP in the elderly and younger people. *Methods*. Our study involved 780 patients undergoing diagnostic and therapeutic ERCP between 2010 and 2011; among them, 558 patients were less than 70 years old and others were 70 years old or older. The patients were prospectively identified and data including clinical and biochemical features, ERCP procedures, ERCP diagnosis, and ERCP complications were gathered on them prospectively. **Results:** Clinical manifestations were comparable in young and older groups except for hepatosplenomegaly and constipation that were more prevalent in the elderly. Laboratory findings were similar in both groups other than mean levels of alkaline phosphatase, hemoglobin and albumin levels, which were higher in the elderly group. Selective biliary cannulation was technically more successful in the younger than in others (89.0% versus 81.8%). Common bile duct stone was the most frequent diagnosis in both young and older groups (36.6% and 45.9%, resp.), whereas ERCP was reported to be normal in 13.4% of the younger and 5.0% of the elderly patients. Post-ERCP complications were observed in 4.8% of patients aged less than 70 years in comparison with 2.3% of patients aged over 70 years. The most frequent complication was pancreatitis that was significantly more developed in young than older patients (3.6% versus 1.5%; OR: 8.216). **Conclusion:** Diagnostic ERCP is safe and well tolerated in the elderly and even associated with significantly less risk than the younger.

Pleomorphic Liposarcoma of the Neck: A Case Report and Literature Review

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Sarcomas are rare, making up less than 1% of all malignancies. Of all sarcomas, liposarcomas are the most common, accounting for 17-25% of sarcomas in adults. While liposarcomas are relatively common in deep soft tissues of the extremities and retroperitoneum, only a small percentage occur in the head and neck. The neck appears to be the most common site of presentation within the region, and there is a male predilection. Histologic grade is the primary indicator of prognosis. Complete surgical resection produces the best survival rates, and adjuvant radiotherapy may reduce local recurrence rates. Due to the rarity of liposarcomas in this anatomical region, there is limited data available in the literature regarding the history, presentation, treatment, and prognosis. A small number of retrospective case series studies have been completed as well as a greater number of single or multi-patient case studies. Here we present a case report of high-grade pleomorphic liposarcoma with myxoid and round cell features of the lateral neck (posterior triangle) and provide a review of the current literature regarding the evaluation and management of head and neck liposarcomas.

A Cost Effectiveness Evaluation of Ixekizumab in Treatment of Moderate to Severe Psoriasis Compared to Other Biologics

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Background: The estimated annual cost of biologics such as adalimumab, ustekinumab, infliximab and used in the treatment of moderate to severe psoriasis ranges from $36,000 to greater than $50,000 per patient. Ixekizumab is a recently approved biologic approved for treatment of psoriasis with higher efficacy than other biologics. The objective of this study is to evaluate the cost effectiveness of Ixekizumab in comparison to other biologics. **Method:** TreeAge Software was used to develop a decision tree with multiple Markov nodes to determine the costs and effectiveness of biologic therapies used for the treatment of moderate to severe psoriasis utilizing a healthcare system perspective. An incremental cost effectiveness ratio (ICER) was derived to determine the cost per quality adjusted life year (QALY) gained by using ixekizumab in comparison to other therapies. The ICER was determined by dividing the difference in cost over the difference in effectiveness. **Results:** Ixekizumab was associated with incremental cost of $61,937, $54,186, and $16,328 when compared to infliximab, adalimumab, and ustekinumab respectively. Moreover, ixekizumab was associated with an incremental increase in QALYs of 0.017,

0.046 and 0.17 compared to infliximab, adalimumab, and ustekinumab respectively. When comparing ixekizumab to the other biologics the ICER was at least $900,000 in each case which is well over the accepted U.S. threshold of $100,000 per QALY gained. **Conclusion:** Ixekizumab had the highest efficacy but it does not demonstrate good economic value according to cost effectiveness thresholds. Ixekizumab may be more appropriate as an option in psoriasis refractory to other treatments.

Immune reconstitution inflammatory syndrome(IRIS)Presenting as Progressive multifocal leukoencephalopathy(PML)

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PML is a severe demyelinating disease of the CNS that is caused by reactivation of the polyomavirus JC virus. PML occurs almost exclusively in immunosuppressed individuals. In HIV patients PML may present after CD4 cell counts drop. PML usually manifests with neurologic deficits including altered mental status, motor deficits, limb ataxia, gait ataxia, and visual symptoms. We present a case of PML worsened by IRIS. A 69 years of male from Eritrea presented with worsening of vertigo and unsteady gait which started 4 months prior. Patient was found to be HIV positive, CD4 was 56 and HAART was initiated with improvement of count to 93. Six weeks after initiation of treatment patient reported worsening of vertigo and gait disturbances. CSF PCR was positive for JC virus . MRI Brain showed enhancing lesions. Patient was continued on HAART with subsequent clinical improvement. Follow up MRI showed radiologic improvement. Although HAART has improved the clinical outcome of patients with HIV infection who have PML, it has also been associated with new onset or clinical worsening of PML. There are also some reports indicate treatment of PML with HAART is associated with increased mortality. It is crucial to consider IRIS in patient who is recently started on HAART with worsening clinical condition. For various reasons PML has been rarely reported in HIV-infected patients in India and Africa. Further studies in those regions can be done in order to study factors such as host genetic differences.

Knowledge, Attitudes, Experiences, and Willingness to Participate in Clinical Genetic Testing and Genetic Research Among Women of African Descent

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Experts agree that the field of genetics has the potential to "revolutionize" medicine. With a rapidly advancing genomic revolution underway, it is important that diverse populations participate in clinical genetic testing and genetic research. However, participation of persons of African descent in clinical genetic testing and genetic research is considerably low. Low participation rate hampers the ability to identify genetic basis of diseases disproportionately affecting this population. It is critical to understand this population's knowledge, attitudes, experiences and willingness to participate in clinical genetic testing and genetic research. The present investigation examined these issues among an urban sample (N=194) of women of African descent. Results indicated that 12.9 % of the women rated themselves as having "poor" knowledge of clinical genetic testing. Most (80.4%) had never had clinical genetic testing performed but were willing to have their genetic profile analyzed and/or participate in a genetic research project to learn their susceptibility to certain diseases (e.g., cancer, Alzheimer's.). An overwhelming majority felt that clinical genetic testing could provide important information (96.9%) and would lead to improved treatment for diseases (93.3%). However, 42.9% reported that confidentiality of clinical genetic testing can be a problem and 46.9% felt that information from clinical genetic testing can be used to discriminate against minorities. One-half (50.5%) viewed it important for persons of African descent to participate in genetic research. Additional studies are needed to help identify the role these factors may play in this population's willingness to participate

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Survey Regarding Evaluating Children for Auditory Processing for Audiologists and Speech-Language Pathologists

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Many professionals (audiologists and speech-language pathologists) feel that one cannot assess auditory processing for children below 7 years of age. However, a review of the literature and research on this topic reveals that there is no evidence to support this age limit. This survey asks audiologists and speech-language pathologist to identify factors associated with evaluation of children for auditory processing focusing on the lowest age professionals evaluate such factors in children or refer children for such assessments. Additionally, information will be collected regarding what professionals feel may be problematic waiting for a child to be this age level before evaluating the child for auditory processing when there are suspicions that the child has auditory processing deficits (APD). At this point, outcomes are revealing that a large number of audiologists and speech-language pathologist do NOT recommend or test children below the age of 7 years, yet the results suggest that the majority of audiologists and speech-language pathologists believe that waiting might be harmful for the children, but they do not believe there are tests to appropriately evaluate children for APD below 7 years of age. Review of the research demonstrates that almost all measures of auditory processing have norms down to the age of 5 years and a good number have norms down to 4 years of age. There is a need to educate audiologists and speech-language pathologists of which tests they can use to assess APD in young children.

Evaluation of Knowledge, Interest, and Readiness of Student Pharmacists in Prescribing Oral Contraceptives in Washington, D.C.

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Objectives: With an impending law in D.C. legislation regarding the prescriptive authority of pharmacists over oral contraceptives; student pharmacist knowledge, interest, and readiness has become of great interest. Concerns of education and motivation of pharmacists as well as pharmacy students have been raised.To determine knowledge, interest, and readiness of D.C. pharmacy students, a survey will with questions specifically targeting these areas will be administered. It is hypothesized that there will be a large majority of students who have knowledge, interest, and readiness in prescribing of oral contraceptives, but there will be a lack of confidence and a request for additional training. **Methods:** A cross-sectional survey consisting of 34 questions will be administered among 50 pharmacy students at Howard University in their fourth year of the pharmacy program. The primary outcomes assessed in this study will include awareness of the new legislation, perceptions on the nature of collaborative practice, clinical knowledge around oral contraceptives, prescribing interest for oral contraceptives, and willingness to prescribe oral contraceptives. Data collection will be via self-administered survey with items adapted from a previously published study. Descriptive statistics including means and percentages of all study variables will be reported. Associations between study outcomes and participant characteristics will be evaluated using chi square and independent t-tests. All data will be assessed using SPSS version 23 at an alpha of 0.05.

Implementing Universal Health Coverage in African countries with South Africa as a focus country: What can Africa learn from itself?

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In 2005, The World Health Assembly urged all health systems of the world towards providing Universal Health Coverage (UHC) as the solution for lack of access to affordable quality health care especially in low-income countries. Since then, UHC has been largely adopted by the western world. Conversely, many African countries lag in successfully implementing a scheme that covers the health needs of the majority of their population. A promising future for South Africa lies in its enactment of the National Health

Insurance (NHI) scheme intended to reach full coverage of its citizens by 2030. The purpose of this study is to analyze the national health insurance plan introduced in South Africa by cataloging its effects on the health care delivered by George Mukhari Academic Teaching Hospital, the second largest public hospital in South Africa. The idea is that this scheme, if successful, can serve as a model for other African countries. Implementations that are being undertaken in South African healthcare such as transforming nursing policy, training doctors in Cuba and strengthening hospital leadership are potential templates for others. This study documents the progressive efforts of South Africa's NHI towards a full health coverage on the basis of research articles analyses and data collected from interviewing professional healthcare workers in Africa. The findings may be useful in guiding health policy legislators in other African countries in their approach towards implementing an effective UHC reform.

Impact of embedding professional political engagement activities in curriculum on student knowledge and attitudes

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The purpose of this groundbreaking work being completed at Howard University is to investigate if the implementation of educational modules about professional engagement and political advocacy will cause a change in participants' knowledge, attitude, and behavior. The study will explore the relationship between occupational therapy students' participation in educational modules and their knowledge of and interest in professional engagement. The methods consist of administration of a pretest survey to the master level one students, followed by an educational module given by the master level two students, and then a posttest survey will be completed by the master level one students. The study will focus on the impact of embedding educational programs in the curriculum on the occupational therapy student's knowledge and interest in professional engagement within occupational therapy. Master level two occupational therapy students who have already completed both surveys will complete a follow-up survey five years after graduation. The study is designed to provide other occupational therapy educators with tools to embed professional engagement activities into their curricula in hopes to increase the numbers of occupational therapy practitioners advocating for these issues within the field.

The Role of Medical Nutrition Therapy in Addressing Health Disparities Associated with Obesity

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Introduction: National CDC statistics indicate that 35% of American adults are obese. This incidence of obesity is higher in African Americans, Hispanics, and individuals of lower socioeconomic status, with increased risk of T2DM, HTN, CVD, & dyslipidemia. Medical Nutrition Therapy (MNT) is a tool used to treat nutrition related problems and acts as an integral component in addressing obesity and nutrition status. **Objective:** The purpose of this case study is to demonstrate how MNT can be used to improve the health status of an obese patient. **Participant/Setting:** A 52 y/o African American female was admitted to a hospital with morbid obesity, viral gastroenteritis, diarrhea, and a draining soft tissue abscess s/p craniotomy. **Methods:** Food & nutrient history, biochemical data, anthropometric measurements, and physical findings were obtained via patient interview and review of medical chart. These findings were used to develop the proposed intervention. **Proposed Intervention:** A low fat, low sodium diet, and weight loss of 1-2 lbs/ week was recommended to manage obesity. Probiotics was proposed to restore healthy gut flora. Increased protein in the form of double meat portions, zinc (220mg QD) x 14days, and vitamin C (500mg QD) was recommended for wound healing and immune support. **Conclusion:** The proposed outcome of this case study is weight loss of 1-2 pounds per week and improved GI health, immunity, and wound healing. Such outcomes demonstrate the effectiveness of MNT in addressing illness, obesity, and associated health disparities, and distinctly highlights the impact it can have in improving an individual's overall health.

Dasatinib Induced colitis: A rare case of chemotherapy side effect

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Introduction: Dasatinib is a widely used therapy for chronic myeloid leukemia. Although gastrointestinal bleeding has been widely reported with dasatinib therapy for CML, colitis appears to be a much rarer event. Here we report a rare case of colitis associated with dasatinib therapy. **Case report:** The patient is a 60-year-old Hispanic female with Chronic Myelogenous Leukemia (CML), Philadelphia chromosome positive, since 2007, who was initially treated with Gleevec. The patient developed multiple side effects of Gleevec in 2010 and treatment was switched to dasatinib 100 mg once daily. The patient had age appropriate screening colonoscopy in 2010, before the start of dasatinib, which was unremarkable. In 2012, patient start having abdominal pain with bloody diarrhea. She had a repeat colonoscopy for bloody diarrhea in 2014 and showed diffused colitis. The patient was started on mesalamine, and the intensity of the colitis symptoms decreased. The patient continued to be in remission of her CML on dasatinib. Her colitis symptoms continued to manifest intermittently. The patient subsequently developed hematochezia and iron deficiency anemia. Colonoscopy was done for the 3rd time in 2016, and the patient continued to exhibit diffuse colitis which was confirmed by biopsy. **Discussion:** Dasatinib therapy is well tolerated, but side effects such as myelosuppression, peripheral edema, skin rashes, and gastrointestinal symptoms have been reported. Commonly reported gastrointestinal side effects include diarrhea, nausea, vomiting, anorexia, and gastrointestinal bleeding. Colitis as a side effect of dasatinib is rarely reported. We are reporting a rare side effect of dasatinib causing colitis.

Georgetown-Howard Universities Center for Clinical and Translational Science (GHUCCTS)

Dysregulation of Energy Regulating Hormones and MicroRNAs: A Model of Metabolic Dysfunction

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This study is aimed to identify the relationships between type 2 diabetes mellitus (T2DM) related circulating miRNAs and energy regulating hormones in pre-diabetic and type 2 obese diabetic African-American adults. Patients were recruited from the Howard University Hospital Diabetes Treatment Center. The expression of nine previously reported T2DM-related circulating miRNAs was quantified using qRT-PCR. Radioimmunoassays were employed to determine plasma hormone concentrations of total ghrelin, leptin, vitamin D (25(OH)D) and C-peptide. Pearson's correlation was performed to identify significant relationships between circulating miRNAs and hormone concentration. Non-diabetic controls were found to have significant relationships between miRNA-15a and 25(OH)D ($r=0.8061$, $p=0.0157$), miRNA-223 and 25(OH)D ($r=0.7207$, $p=0.0437$), and miRNA-375 and total ghrelin ($r=-0.960$, $p=0.039$). In pre-diabetics, we found significant relationships between miRNA-15b and total ghrelin ($r=-0.7980$, $p=0.0315$) and miRNA-15b and C-peptide ($r=0.783$, $p=0.00373$). We found a significant correlation between miRNA-15a and leptin ($r=0.7943$, $p\leq0.0001$) in the T2DM group. The novel findings of this study provide insight into the relationship between circulating miRNAs and hormones associated with the development and progression of T2DM. The relevance of these findings is highlighted by the overlap of targeted messages of the selected miRNAs with various pathways associated with T2DM, including insulin signaling.

Paging Dr. Lasagna: Why Early Inpatient Rehab Trial Recruitment Rate is in Single Digits

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Introduction: Lasagna's Law, that the prevalence of a disease falls to 10% of your estimate the day you start recruitment, is relevant for stroke rehab trials. Data describing the problem are limited for very early trials (within 30 days) since most trials focus on more chronic survivors and moderate upper-extremity (UE) impairment (NIHSS motor arm > 0). Very early trials are important for rehab because animal data suggest very early intervention may improve recovery. We thus provide estimates on barriers to recruitment for very early rehabilitation trials in the US. **Methods:** We used screening data for the Phase II Critical Periods After Stroke Study RCT, designed to identify when after stroke patients are most responsive to motor training. Starting Aug 2014, 893 patients eventually admitted to inpatient rehab were screened (5 ±2 days post stroke). **Results:** We enrolled 4.3% of those screened, at 15.5 ±4.9 days post stroke. Participants had ischemic/hemorrhagic stroke within 28d, and moderate UE impairment (NIHSS motor arm > 0 and manual muscle test score >2- on shoulder flexion/abduction). The largest % were excluded for being "too mild" (35.7%, NIHSS motor arm = 0), or "too late" (18%, unable to receive first study-related treatment < 30 days of stroke). A smaller percentage were "too severe" (3.6%, UE motor assessment scale <3, or dense sensory loss). Another subset were excluded for medical reasons (19.7%, prior/non- motor stroke, cognition, neglect, ataxia), and a smaller subset for other reasons (17.8%, non-English speakers, early discharge, age < 21). Additional UE motor assessment in a subset of the "too mild" group revealed motor deficit (Action Research Arm Test score = 47.7 ±12, max = 57, MCID = 5.7) in spite of their NIHSS motor arm score = 0. Thus, some individuals are excluded from trials because the NIHSS misses UE motor impairment. **Conclusion:** Frequent barriers to recruitment for inpatient rehab trials include persistent but too mild UE motor impairment and delayed admission to inpatient rehab.

For early intervention studies, screening and treatment must begin in the acute hospital setting. Further, there is a patient subset whose motor impairment persists, but is too mild for most trials. These mildly affected individuals warrant more investigation.

Violence impacts allostatic load IgE and Epstein Barr Virus levels in urban youth

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Allostatic load is the cumulative wear and tear experienced by the immune system in response to chronic environmental stressors. Many studies have observed increased allostatic load in African American populations in comparison to their European American counterparts. A key environmental stressor in the lives of young African Americans is the occurrence of violence. This violence impacts not only criminal justice interventions, but also the physical and mental health of African American communities. Understanding how the experience of violence contributes to allostatic load is a critical step in parsing and ultimately reducing its effect on at risk young adults. Previous work has shown that there are gender effects to the experience of violence and to cortisol concentration variation. Urban study participants (N=557, women= 274, men= 283) were queried about their experience of community, interpersonal and intimate partner violence as well as assessed on key indicators of mental health state. We include five stress biomarkers typed in study participants: C reactive protein, IgG, IgE, IgA, IgM and Epstein Barr Virus Viral Capsid Antigen (EBVVCA). We find that familial violence is most correlated to elevated IgE levels (R=0.37) and EBVVCA is strongly correlated to perceived anxiety with their local environment (R=0.87). Naïve Bayes implemented machine learning reveals that 'ability to cope' responses predict elevated stress biomarker levels and allostatic load index values.

The tyrosine kinase inhibitor pazopanib is a potential therapeutic for the tauopathies

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Background: Tauopathies are neurodegenerative disorders associated with pathological changes in the microtubule-associated protein 'tau'. There are currently no treatments available for these diseases. Our laboratory has shown tyrosine kinase inhibition to be a novel therapeutic approach for the treatment of neurodegenerative disorders with successes both *in vitro* and *in vivo*. We hypothesize that pazopanib, an FDA-approved renal cell carcinoma drug and inhibitor of the tyrosine kinases VEGFR, PDGFR-α, PDGFR-β, and c-KIT, is a potential therapy for the tauopathies. **Methods:** Pazopanib levels were measured by mass spectrometry. For drug treatment, TauP301L and non-transgenic littermates were treated with 5mg/kg pazopanib (approximately half the clinically-used dose) or vehicle (DMSO) intraperitoneally (IP) for 3-4 weeks. Phosphorylated tau levels were measured by Western blot and enzyme-linked immunosorbent assay in brain homogenates, and immunohistochemistry in 20μm brain sections, fixed in 4% paraformaldehyde. Serum was collected to assess kidney and liver function. Inflammation was measured using MILLIPLEX® ELISA. Cell death was measured by silver stain and cresyl violet stain. **Results:** Pazopanib penetrates the brain at approximately 50% of the clinical dose for renal cell carcinoma, following a single IP injection. Following pazopanib treatment, TauP301L mice showed significant decreases in levels of phosphorylated tau (AT180, human p-tau T181). There were no significant differences in weight, kidney function, liver function, cell death, or measured inflammatory markers between treatment groups. **Conclusions:** Pazopanib (5mg/kg) is a safe, well-tolerated drug that significantly decreases levels of phosphorylated tau in TauP301L mice. Future studies will elucidate the mechanisms by which pazopanib clears p-tau.

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STAG2 as a Prognostic Biomarker for Predicting Post-TURBT Recurrence in Non-Muscle Invasive Urothelial Carcinoma

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Background: At diagnosis, most bladder cancers are non-muscle-invasive, however these lesions are very likely to recur and we are unable to predict which lesions will do so. Therefore, follow-up of bladder cancer is extensive. Because of the reduced survival and increased complications of advanced disease and the intensive post-diagnosis surveillance protocol, it is imperative that a reliable prognostic indicator be determined. In 2011, we identified inactivating mutations in STAG2 in a variety of human tumors. A large screen then found that nearly a quarter of urothelial carcinoma tumors had complete loss of STAG2 expression. Finally, we determined the STAG2 expression status in a panel of 34 urothelial carcinomas and found that STAG2 loss was significantly associated with increased disease-free survival. Therefore, we hypothesized that STAG2 may serve as a prognostic biomarker in early urothelial carcinoma. **Methods:** Since the original cohort was small, we have since expanded our study in order to confirm our original findings. STAG2 expression status was then correlated with clinical pathological and tumor characteristics. **Results/Conclusions:** Samples that lacked STAG2 expression were much less likely to recur than those that stained positive (p=0.026). This study validated our original findings and provides key evidence that STAG2 may serve as a prognostic biomarker in non-muscle invasive urothelial carcinoma.

Metabo-Therapy for RARRES1-Depleted Epithelial Cells Using Repurposed Mitochondrial Metabolism Inhibitor Metformin

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One of the driving mechanisms of cancer progression is the reprogramming of metabolic pathways in intermediary metabolism. The Warburg effect, where cancer cells predominantly use aerobic glycolysis rather than oxidative phosphorylation to produce ATP, was long thought to be the main pathway to initiate and increase tumor burden. However, compelling new evidence shows that there is metabolic heterogeneity among and within tumors. Mitochondrial respiration can play a major role in tumor progression as many different cancers contain a subpopulation of slow-cycling tumor-initiating cells that are multidrug resistant and dependent on oxidative phosphorylation. These cells represent a target for cancer therapy. However, the identification of endogenous regulators of mitochondrial respiration is understudied. Depletion of the tumor suppressor retinoic acid receptor responder 1 (RARRES1) occurs in many different cancers, including colon cancer, prostate cancer and breast cancer. Remarkably, by using proteomics, metabolomics, cellular and molecular analyses, we find that RARRES1-depleted epithelial cells are resistant to all studied modes of cell death, implying an effect on a fundamental cell process. Our preliminary data also show that depletion of RARRES1 causes an increase in mitochondrial respiration and ATP production, thus enhancing biosynthetic pathways that drive the pathogenicity and survival of cancer. For therapeutic purposes, we tested the ability of the FDA approved and mitochondrial metabolism inhibitor, metformin, on the RARRES1-depleted epithelial cells and we were able to successfully reverse the metabolic phenotype of these cells. These data lay the foundation for metabo-therapy of the many tumor types that exhibit RARRES1 depletion.

Dietary Fat Stimulates Growth of Pancreatic Cancer Growth Through The Cholecystokinin Receptor

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BACKGROUND & AIMS: Epidemiologic studies have found that the incidence of pancreatic cancer is greatest in countries that consume diets high in fat. The gastrointestinal peptide cholecystokinin (CCK) is released from the duodenum in response to dietary fat. CCK has also been shown to stimulate growth of pancreatic cancer through the CCK receptor that is over- expressed on pancreatic cancer cells. The aim of this investigation was to determine if dietary fat promotes growth of pancreatic cancer through the actions of CCK at its receptor. **METHODS:** The effects of dietary fat on growth of murine Panc02 pancreatic cancer xenografts were studied in three different systems with immune competent mice: 1) pharmacologic blockade with a CCK receptor antagonist, 2) genetic knockout of the CCK receptor by CRISPR, and 3) in genetically engineered mice lacking the CCK peptide (CCK-KO). After injection of 2x10 6 Panc02 cells subcutaneously, mice were fed either a high

fat diet or a control diet for 37-42 days. Tumor volumes and weights were measured and histology performed. **RESULTS:** Dietary fat significantly increased the size of pancreatic cancer xenografts and this effect was reversed by CCK receptor blockade. Receptor antagonist therapy also significantly reduced tumor associated fibrosis and increased the influx of CD8+ lymphocytes in the microenvironment. Panc02 cancer cells lacking CCK receptors failed to respond exogenous administration of CCK in vitro and to dietary fat in vivo.Dietary fat did not stimulate Panc02 tumor growth in CCK-KO mice. **CONCLUSIONS:** The mechanism by which dietary fat stimulates growth of pancreatic cancer is by CCK and this effect is independent of obesity.

Loss of Resistance to Angiotensin II (Ang II) Induced Hypertension in the Jackson Laboratory Recombination Activating (Rag1) Gene Null Mouse on the C57BL/6J Background

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Background: The phenotype of resistance to Ang II induced hypertension in the T cell deficient Jackson Laboratory male mouse with a targeted mutation in the Rag1 gene on the C57BL/6J background (B6.Rag1$^{-/-}$-M), which was reported by five independent laboratories including ours prior to 2015, has been lost. **Methods:** In order to determine if the 'loss of resistance to Ang II induced hypertension' in the B6.Rag1$^{-/-}$-M is due to a change in T cell state spleen weights and T cell frequency were assessed in these mice purchased from Jackson Laboratory in 2015-16. Mean arterial pressure (MAP) was determined by radio-telemetry in B6.WTM and B6.Rag1$^{-/-}$-M in these same mice (n=68/group), as well as determination of their Rag1 genotype. **Results:** The time course and magnitude increase in MAP induced by two weeks of Ang II infusion at 490 ng/kg/min was identical between B6.Rag1$^{-/-}$-M and wild type littermates (B6.WTM) purchased in 2015-16. Moreover, there was no difference in the time course or magnitude increase in MAP between these mice at the lowest dose of Ang II (200 ng/kg/min) that caused an increase in blood pressure over a two week infusion period. This loss in resistance to Ang II induced hypertension is independent of T cells; the Rag1 gene remains disrupted and the mice remain T cell deficient. **Discussion:** The phenotypic change in B6.Rag1$^{-/-}$-M has implications for investigators using this Jackson Laboratory strain to study mechanisms of T cell modulation of Ang II dependent blood pressure control. These findings also serve as a reminder that the universal drive for genetic variation occurs in all animals including inbred mouse strains and that spontaneous mutations can lead to phenotypic change, which can compromise experimental reproducibility over time and place. **Funding source(s): NIH grants - TL1TR001431 (AVP), UL1TR001409 (KS) and R01HL119380 (KS, HJ).**

An analysis of how consumer physical activity monitors are used in biomedical research

Stephen P. Wright and Kathryn Sandberg

Background: Sedentary lifestyle and lack of physical activity are well established risk factors for chronic disease and adverse health outcomes, so biomedical researchers are very interested in measuring physical activity, and a relatively new tool is the consumer physical activity monitor. Many have accuracies similar to that of research grade monitors for measuring steps. **Aim**: To analyze how consumer physical activity monitors are currently used in biomedical research. **Methods:** Searches were conducted in Ovid Medline, PubMed Medline, clinicaltrials.gov, and NIH RePORTER using search terms including Fitbit, Jawbone, Apple watch, Garmin, Polar, Microsoftband, Misfit, Nike, Withings, and Xiaomi. Results were quantitated by category: condition/topic, intervention, enrollment status, study type and design, age, grant mechanism, and primary outcome. **Results:** Fitbit is used in more than 80% of studies. There are 127 clinical studies using Fitbit devices listed in clinicaltrials.gov. Forty-eight have been completed while 79 are ongoing. Some studies have already published their findings. Forty papers cited in Ovid MEDLINE report use of a Fitbit device. NIH is now funding research that uses consumer physical activity monitors, and the NIH RePORTER shows the number of grants using Fitbit is rapidly increasing. **Conclusion:** The current state and potential growth of this technology is transforming biomedical research and is enabling us to ask new and more granular questions about activity and sleep in health and disease.

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