67th Annual Student Research Day
September 27, 2023

ABSTRACT BOOK

MEHARRY MEDICAL COLLEGE
# Meharry Medical College
## 67th Annual Student Research Day
### Wednesday, September 27, 2023

### Schedule At-A-Glance

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<th>Time (CST)</th>
<th>Activity</th>
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<td>8:00 AM – 8:15 AM</td>
<td><strong>Opening</strong> - LaMonica Stewart, PhD Associate Dean for Academic Affairs, SOGS</td>
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<tr>
<td>8:15 AM – 8:30 AM</td>
<td><strong>Welcome</strong> Sonja Harris-Haywood, MD Dean SOM</td>
<td>Cal Turner Auditorium</td>
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<td>8:30 AM – 9:30 AM</td>
<td><strong>Concurrent Oral Sessions</strong></td>
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<td>School of Medicine- Clinical/Translational and School of Dentistry</td>
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<td>School of Medicine- Basic Science and School of Applied Computational Sciences</td>
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<td>School of Graduate Studies - PhD</td>
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<td>9:45 AM - 11:00 AM</td>
<td><strong>Poster Session 1</strong></td>
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<td>11:00 AM - 12:00 PM</td>
<td><strong>MSRE Panel</strong></td>
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<td>Moderator: Gernie Batey</td>
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<td>Panelists: Camille Neal, Latifah Henry, Mallika Rao, Darry Oliver</td>
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<td>12:15 PM - 1:15 PM</td>
<td><strong>Lunch</strong></td>
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<td><strong>Poster Session 2</strong></td>
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<td>3:00 PM - 4PM</td>
<td><strong>Keynote Seminar</strong></td>
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<td>“Below the Belt’ Cancers: A Surgeon-Scientist’s Perspective”</td>
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<td><em>Dineo Khabele, MD</em></td>
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<td>Mitchell and Elaine Yanow Professor of Obstetrics and Gynecology</td>
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<td>Chair, Department of OB/GYN</td>
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<td>Washington University at St Louis</td>
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<td>4:05 PM - 4:15 PM</td>
<td><strong>Closing Remarks</strong></td>
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<td>Jamaine Davis, PhD</td>
<td>Cal Turner Room 212</td>
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<td>Course Director, Medical Student Research</td>
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<td>4:15 PM - 5:15 PM</td>
<td><strong>Personal Statement Workshop</strong></td>
<td>Cal Turner Room 212</td>
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<td>Dr. Evangeline Motley</td>
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<td>5:00 PM - 7:00 PM</td>
<td><strong>Summer Internship Info Sessions</strong></td>
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DINEO KHABELE, MD
Mitchell & Elaine Yanow Professor, Tenure, and Head
Department of Obstetrics and Gynecology
Washington University School of Medicine (WUSM), St.
Louis, MO

Dr. Khabele is a highly accomplished physician-scientist and leader in the field of gynecologic oncology. She embodies inspirational leadership in medicine and science driven by her vision and mission to deliver inclusion, diversity and excellence in clinical service, research, education, and community engagement. She not only leads cutting-edge translational research, she continues to provide high quality clinical care, while advancing the next generation of clinicians and scientists from diverse backgrounds. Her ability to move research generated in her own laboratory to a Phase I/II clinical trial is not common and speaks to the scientific rigor and quality of her work. She has also developed tissue biorepositories of de-identified clinically annotated tissue samples and patient-derived xenograft models to validate molecular biomarkers. Her innovative research program focuses on the problem of chemotherapy-resistant tumors that are least likely to respond to any known therapy. She has made seminal contributions to science in the following areas: 1) investigation of epigenetic drugs as chemosensitizing agents in ovarian cancer, 2) the role of histone deacetylase 3 (HDAC3) inhibition in genomic instability, DNA damage, and replicative stress, and 3) targeting inflammatory pathways in ovarian cancer. She is well recognized as a collaborative leader with an entrepreneurial mindset as she has pioneered clinical and research programs at multiple academic medical centers. Dr. Khabele serves on multiple medical and scientific advisory boards and serves as a peer-reviewer for a range of women’s health, cancer, and basic science journals. She has presented her work at national and international meetings and is a sought-after speaker. In recognition of her scientific achievements, she was inducted into the American Society of Clinical Investigation in 2019.

Dr. Khabele is dedicated to paying it forward by training the next generation of physicians and scientists to bridge gaps between scientific advances and implementation, and she founded the first accredited gynecologic oncology fellowship in the state of Kansas. Her advocacy research and work focuses on reducing health disparities and promoting health equity in medicine and science. She serves on multiple medical and scientific advisory boards, including the National Institutes of Health, the Ovarian Cancer Research Alliance, and the Foundation for Women’s Cancer. Her work as Chair of the Healthcare Disparities and Health Equity Committee and a member of the Executive Committee for the Society of Black Academic Surgeons has focused on increasing the number of Black/African-American physicians and scientists as a strategy to for achieving health equity for all. As one of the few Black women tenured professors and chairs in academic medicine, she is committed to mentorship/sponsorship of people who have been marginalized in medicine and science, particularly those with interests in women’s health, women’s cancers, and health equity.
Meharry Medical College 67th Annual Student Research Day
Concurrent Oral Sessions – Detailed Schedule

Oral Session 1: School of Medicine- Clinical/Translational and School of Dentistry
Cal Turner Auditorium

8:30 – 9:45 AM

Student Presentations

Ihuna Amugo (SOD) - CHATGPT TO HELP DENTAL STUDENTS RETAIN KNOWLEDGE AND ENHANCE PERFORMANCE

Jacob Carter (SOD) - ENTERIC NEURONAL AND GLIAL GENE PATHWAYS AND THEIR IMPORTANCE IN MAINTAINING GASTROINTESTINAL HEALTH

Malikka Rao (SOM) - DETERMINING THE UNIQUE CHALLENGES OF TREATING TUBERCULOSIS IN IMMUNOCOMPROMISED PATIENTS

Sasha Choupa (SOM) - RISK FACTORS FOR THROMBOSIS IN PREGNANT PEOPLE WITH SICKLE CELL DISEASE: A MULTINATIONAL STUDY

Stanton Davis (SOM) - THE ASSOCIATION OF SEGREGATION WITH TRIPLE-NEGATIVE BREAST CANCER TREATMENT AND MORTALITY

Tenesha Boyd (SOM) - USING DIGITAL HEALTH TO HELP PREDICT OBSTRUCTIVE SLEEP APNEA RISK IN DIAGNOSING DEPRESSION

Courtney Campbell (SOM) - STEREOTACTIC BODY RADIATION THERAPY IN HEPATOCELLULAR CARCINOMA PATIENTS WITH SEVERE LIVER DISEASE

Oral Session 2: School of Medicine- Basic Science and School of Applied Computational Sciences
Cal Turner Center Room 212

8:30 – 9:45 AM

Student Presentations

Aleesa Man (SACS) - HARNESSING THE POWER OF VOCAL BIOMARKERS IN COVID-19 DETECTION UTILIZING MACHINE LEARNING TECHNIQUES
Kameron Woodard El (SOM) - EVALUATING ANDROGEN DEPRIVATION THERAPY USING INDUCED-PLURIPOTENT STEM CELLS

Bhonesa Kirpal (SOM) - THE MOLECULAR MECHANISM OF CARDAMONIN ON PDL-1 EXPRESSION IN TRIPLE NEGATIVE BREAST CANCER CELLS

Tiana Billups (SOM) - FHF2 MODULATION OF CHEMOTHERAPY-INDUCED NEUROPATHIC PAIN

Gernie Batey (SOM) - CHARACTERIZING THE EFFECT OF FATTY ACID AMIDE HYDROLASE INHIBITOR-2 (FIN2) IN HEPATOCELLULAR CARCINOMA

Grace Ugwueke (SOM) - EXPRESSION AND LOCALIZATION OF KDM6A IN TUMORS AND THE SURROUNDING PREMALIGNANT SKIN

Oral Session 3: School of Graduate Studies – PhD
Cal Turner Center - Room 201

8:30 – 9:45 AM

Student Presentations

Joanie Martin (SOGS) - RESTRICTION ACTIVITY OF APOBEC3G AND URACIL DNA GLYCOSYLASE DURING EARLY HUMAN IMMUNODEFICIENCY VIRUS TYPE-1 INFECTION

Kayla Rayford (SOGS) - TRYPANOSOMA CRUZI ALTERS EXPRESSION OF PIRNAS COMPUTATIONALLY PREDICTED TO TARGET PROFIBROTIC AND INFLAMMATORY MOLECULES DURING ACUTE INFECTION OF PRIMARY HUMAN CARDIAC FIBROBLASTS

Tonie Farris (SOGS) - LOSS OF MITOCHONDRIAL PROTEIN FUS1/TUSC2 CAUSES EARLY COGNITIVE AND MOLECULAR CHANGES ASSOCIATED WITH ALZHEIMER'S DISEASE (AD)-LIKE DEMENTIA

Zaniya Mark (SOGS) - MORPHOLOGIC CHANGES AND EXPRESSION OF EPITHELIAL TO MESENCHYMAL TRANSITION (EMT)-RELATED MARKERS IN HUMAN HPV-IMMORTALIZED ECTOCERVICAL CELLS EXPOSED TO CIGARETTE SMOKE CONDENSATE

Evan Chaudhuri (SOGS) - DETERMINATION OF TRANSFECTION EFFICIENCY OF TWO (FORMULATIONS)
DEGRADABLE LIPID NANOPARTICLES (DLPS) IN PRIMARY T-CELLS AND MACROPHAGES

Richaundra Randle (SOGS) - GAMMA INTERFERON-INDUCIBLE PROTEIN 16 REGULATES HYPOXIA-INDUCED APOLIPOPROTEIN L1 EXPRESSION IN HUMAN PODOCYTES

Lakendria Brown (SOGS) - IN VITRO MDR1 EFFLUX RATIO CORRELATED TO THE IN VIVO FREE DRUG PENETRATION

Oral Session 4: School of Medicine - Community and & School of Graduate Studies – MPH
Cal Turner Center Room 203

8:30 – 9:45 AM

Student Presentations

Alisha Puri (SOGS) - THE USE OF GEOGRAPHIC INFORMATION SYSTEMS (GIS) TO EVALUATE THE ASSOCIATION OF GESTATIONAL DIABETES WITH MATERNAL OBESITY IN AFRICAN AMERICAN AND HISPANIC WOMEN ACROSS THE UNITED STATES

Doresha Robinson (SOGS) - POLYCYCLIC AROMATIC HYDROCARBONS IN SALIVA SAMPLES OF PEOPLE FROM UNDERREPRESENTED POPULATIONS: IMPLICATIONS FOR PUBLIC HEALTH

Jayla Williams (SOGS) - GEOSPATIAL ANALYSIS OF HYPERTENSION PREVALENCE AND ITS ASSOCIATED FACTORS IN DAVIDSON COUNTY, TENNESSEE

Stacey Scotton (SOM) - RACE AND MISSED REFERRAL, IS THERE AN ASSOCIATION

Michelle Kaimenyi (SOM) - THE IMPACT OF BREASTFEEDING PATTERNS ON PHYSICAL GROWTH OF AFRICAN AMERICAN INFANTS

Cristen Flewellen (SOM) - THE BRAVE STUDY: UTILIZATION OF A CENR MODEL TO EVALUATE THE IMPLEMENTATION OF BREAST CANCER RISK ASSESSMENT

Elizabeth Bernatowicz (SOM) - ASSESSING PARENT NON-COMPLIANCE WITH HPV VACCINATION

Nafisa Alamgir (SOM) - GENETIC AND MOLECULAR TESTING IN OVARIAN CANCER PATIENTS
DOULA CARE TO IMPROVE PREGNANCY OUTCOMES: A SYSTEMATIC REVIEW AND META-ANALYSIS

Nnenna E. Achebe MSc1, Yasmin Dias MD2, Michelle Doering, MLIS3, Rachel Paul MPH2, Megan Lawlor, MD2, Nandini Raghuraman, MD, MS2, Jeannie Kelly, MD, MSCE2, Ebony B. Carter MD, MPH2

1Meharry Medical College, School of Medicine, Nashville, TN, 2Department of Obstetrics and Gynecology, Washington University School of Medicine, St. Louis, MO, 3Becker Library, Washington University School of Medicine, St. Louis, MO

The rate of Caesarean sections (C-sections) in the United States is all-too-high at nearly one-third of all deliveries. Doulas serve as a conduit of communication between medical personnel and pregnant patients during pregnancy, labor, and the postpartum period. The purpose of this meta-analysis was to examine existing trials and observational studies in the literature to determine if doula services decrease C-section rates. We also sought to determine their impacts on other pregnancy-related outcomes including the rates of spontaneous vaginal delivery, need for analgesics, use of epidural, and instrument-assisted deliveries. We conducted a search of electronic databases for randomized control trials and observational studies that compared prenatal care plus doula services to standard prenatal care. Data about the primary outcome of Caesarean-section (CS) rates and additional secondary outcomes were extracted from the eighteen studies (10 randomized control trials and 8 observational studies) that met the criteria. STATA SE software was used to generate pooled relative risks and I² for doula care versus standard care practice. The risk of C-section was less among patients that had doula care during their pregnancy and compared to those who received standard care (16 studies: pooled rates 18.7% with doula care vs. 30.7% standard care; pooled RR 0.32; 95% CI 0.25-0.40). Additionally, those with doula care were slightly more likely to have an instrument-assisted vaginal delivery (9 studies: pooled rate 5.7% vs. 5.3%; pooled RR 0.13; 95% CI 0.08-0.21). The use of doula care is associated with a 68% less likelihood of undergoing a C-section compared to standard care and a slightly higher chance of using instruments to support vaginal delivery. The results of this study indicate the promise doula care in addition to traditional prenatal care has regarding reducing C-section rates in the United States.

This research project was supported by the Lilly Grant; WU Provost.

FACTORS INFLUENCING ORGAN DONATION AUTHORIZATION IN DECEASED ADULT AND PEDIATRIC PATIENTS

Samuel Ademisoye BS1, Austin Brown MS2, Marty Sellers MD., MPH3

1School of Medicine, Meharry Medical College, 2Tennessee Donor Services, Nashville, TN

Organ donation is a necessary aspect of healthcare that saves the lives of patients with irreversible organ damage. There are currently over 100,000 patients on the donor waiting list (Health Resources & Services Administration, 2023). However, there are not enough organs to meet the demand. The purpose of this study is to investigate the factors influencing authorization for organ donation in
deceased pediatric and adult patients. Electronic health records were utilized for this study. Univariate analysis was performed to identify the significance of multiple variables, while multivariate analysis was performed to identify if variables remained significant in the presence of one another. Race was associated with authorization likelihood for both pediatric and adult patients. Caucasian patients were the most likely to be authorized, which is consistent with previous literature (Goldberg et. al, 2013). In adult patients, specifically, race and timely referral were associated with authorization likelihood. Age was negatively associated while a timely referral was positively associated. This study identified specific factors that are associated with the rates of authorization in pediatric and adult patients. Caucasian patients were more likely to be authorized in both populations. This finding highlights the importance of reaching out to minority communities to improve attitudes toward organ donation and trust in the medical system. Timely referrals significantly increased the likelihood of authorization in adult patients. A timely referral occurs when hospital staff notifies an organ procurement organization about a potential organ donor who has met specific clinical triggers before care is de-escalated. This is the one variable in this study that can be modified, as an earlier call can help ensure that more lives are saved through a donor. Future studies should investigate hospital referral policies and methods needed to improve rates of timely referrals.

Poster A-3
RESOURCES AND PROCESSES AVAILABLE FOR LARGE VESSEL OCCLUSION STROKE IN RURAL VERSUS URBAN REGIONS

Diandra Adu-Kyei1, Jaan Nandwani2, Laura Stein3

1School of Medicine, Meharry Medical College, Nashville, TN, 2Icahn School of Medicine at Mount Sinai, New York, NY, 3Department of Neurology, Icahn School of Medicine at Mount Sinai, New York, NY

Stroke is a leading cause of disability and death in the United States. Endovascular thrombectomy (ET) has become the standard of stroke care for large vessel occlusion acute ischemic stroke (AIS), which accounts for a disproportionate share of post-stroke occlusion acute ischemic stroke (AIS), which accounts for a disproportionate share of post-stroke disability, as ET is associated with greatly improved functional outcomes compared to medical management. However, ET is a resource intensive and highly specialized therapy that not all hospitals can provide, especially those in more rural areas. The objective of this project is to describe resources and processes available for large vessel occlusion stroke in rural regions compared to their urban counterparts. We hypothesize that the hospitals in rural areas are more frequently limited by insufficient personnel and procedural infrastructure than their urban counterparts. We performed a cross-sectional nationwide survey of acute stroke leadership (stroke directors or coordinators) at hospitals that treat AIS patients with thrombolysis or thrombectomy about their perceptions of barriers and facilitators to stroke care delivery. We used descriptive statistics to report hospital resources and processes by region. We found that of the hospitals surveyed, those in rural regions had fewer specialists necessary to provide interdisciplinary ET care. More than 50% of rural hospitals did not have a dedicated stroke response team and were not pursuing higher stroke center certification because they were unable to deliver the care required. Approximately 48% of these hospitals could perform ET 24/7, compared to >75% of their urban counterparts. These results show the need to ensure adequate access to specialized personnel in acute stroke care at rural hospitals, balancing the overall clinical demand within these resource-limited regions. While this is a small sample, future studies could engage stakeholders in rural regions to further explore solutions to these inequities.
This project was supported by the American Heart Association Grant A-857015/Stein/2021 and by the Center of Excellence COE/Office of Dean, Meharry Medical College School of Medicine, Grant Number: D34HP16299.

Poster A-4
ANXIETY IN MEDICAL STUDENTS CROSS-SECTIONAL STUDY

Mishgan Afzali1, Eris Steele2, Sanika S. Chirwa2

1School of Medicine, 2Department of Neuroscience, and Pharmacology, School of Medicine, Meharry Medical College, Nashville, TN

Medical school training can be a very challenging and stressful time for many students, but not many have looked closely at the effects on the mental health of the students especially early in their education. One of the most prevalent outcomes in these students is anxiety, which can lead to poor sleep quality and an increase in cortisol levels. Poor sleep and high cortisol levels can further increase anxiety, creating a harmful cycle. There is also very little known if anxiety changes as you progress in your training. We hypothesized that second year medical students will have higher anxiety levels than entering first year medical students. 18 female medical students from Meharry Medical College were recruited to complete a Penn State Worry Questionnaire, Pittsburgh Sleep Quality Index, and provide serum cortisol. Data analysis was performed using a one tailed t-test and linear regression using GraphPad Prism. The difference in anxiety between first year medical students and second year medical students was insignificant with p-value of 0.13. Free cortisol levels and total cortisol levels also had insignificant differences with p-values 0.20 and 0.38, respectively. A linear trend was found between a high anxiety score and worse sleep quality score in both groups of students. First year medical students also showed a linear trend with high anxiety scores and high free cortisol levels, but the second year medical students did not. Although our results were not consistent with our hypothesis, we did discover trends with anxiety in relation to poor sleep quality and increased free cortisol levels that require further studying with a larger sample size. In addition, the second year medical students were on summer break, and the results could differ during a school semester.

This project was funded, in part, by the NIH grant U54MD007586.

Poster A-5
JUSTIFICATION FOR AN NIAAA-FUNDED ALCOHOL RESEARCH CENTER AT MEHARRY MEDICAL COLLEGE

Oladeji O. Akinbamowo1, Michael C. Caldwell2,3

1School of Medicine, 2Meharry Medical College, 3Office for Research and Innovation, Nashville, TN

Alcohol abuse is a public health affair that is one of the most persistent issues in the global community. Greater than 140,000 people die from alcohol annually, making alcohol the fourth leading cause of preventable death in the United States. Alcohol deaths from liver cirrhosis are 1.27 times more likely in African Americans than White Americans (NIAA, Alcohol-related emergencies and deaths in the United States 2023). In addition, there is a 10% higher rate of death from alcohol abuse in the African American despite overall lower rates of alcohol use (NIAA, Alcohol-related emergencies and deaths in the United States 2023). Even though fewer African Americans and other minority groups use alcohol than White- Americans they have worse alcohol-related outcomes. There is some data that
shows that black men do not get the same cardioprotective benefits from alcohol that White- Americans get from drinking alcohol (Jackson et al., 2015). There is also data showing that the environmental context that which alcohol is consumed may also differ in some communities leading to more severe consequences (from drinking) (Jackson et al., 2015). A survey was conducted among Alcohol researchers at the Researchers Society for Alcoholism Conference 2023 and first-year medical students and Data analysis was performed with Statistical Package for Social Sciences. There was statistical significance and results show that both first-year medical students generally agree (P<.05) that alcohol research is not only important but that alcohol research focused on minorities is also pertinent. This shows that there may be support for a Comprehensive Center for Alcohol Research, Education, and Treatment at Meharry Medical College.

This project was supported by the Center of Excellence COE/Office of Dean, Meharry Medical College School of Medicine, Grant Number: D34HP16299.

**Poster A-6 (Oral)**

**GENETIC AND MOLECULAR TESTING IN OVARIAN CANCER PATIENTS**

**Nafisa Alamgir, BA**¹, Jasmine Jiang, BE², Julia Gelissen, MD³ and Gloria Huang, MD, FACOG⁴

School of Medicine, Meharry Medical College, ¹ Nashville, TN, School of Medicine, Yale University², Yale New Haven Health³,⁴ New Haven, CT

Cancer mortality rate differences are increasing between racial groups, with a 5-year survival rate for Black women diagnosed with ovarian cancer is 36%, compared to white woman with 46%. Identifying individuals with genetic predisposition to ovarian cancer after diagnosis allows for better awareness for the patient and their family. Black or African American women are not being diagnosed or treated at similar rates as White women, therefore, they are not receiving the appropriate genetic referrals. However, after diagnosis, patients are more likely going to be referred to a genetic counselor due to the CDC recommendation. The purpose of this research is to investigate the referrals, timeliness and outcomes of genetic and molecular testing among women diagnosed with ovarian cancer at Yale New Haven Health (YNHH), as well as possible barriers between diagnosis and referral/consultation with a genetic counselor. A retrospective chart review was conducted with patients from 2017 to 2022. The dataset contains approximately 500 patients, however, these preliminary results are from 64 patients. The patients were treated at YNHH. Navigation of the electronic medical records were done to fill out a RedCap database. Results indicate that there are not any patients coming to YNHH within the lowest fifth quintile, income below $14,859, indicating poor diagnosis. Alongside, Black woman are not being diagnosed or treated at YNHH at high rates, which perhaps align with the mean income by quintile differences seen in patient demographic. Majority of patients are being referred to a genetic counselor, aligning with the CDC recommendation of referring ovarian cancer patients if there is personal or family history of ovarian cancer. This concludes that better accessibility for ovarian cancer diagnosis is needed for socioeconomically disadvantaged patients, and more awareness is needed for genetic referrals for ovarian cancer patients, although majority of patients are being referred.

This project was supported by the Center of Excellence COE/Office of Dean, Meharry Medical College School of Medicine; Grant Number: D34HP16299.
ELF5 EXPRESSION IN SQUAMOUS CELL CARCINOMAS OF THE UPPER AERODIGESTIVE TRACT DIFFERS IN AFRICAN AMERICANS AND EUROPEAN AMERICANS

Avani Alapati¹, Otto Mullings¹, Billy Ballard², Michael Izban², Dana Marshall²

¹Meharry Medical College, School of Medicine; Nashville, TN, ²Meharry Medical College, School of Medicine, Department of Pathology, Anatomy and Cell Biology; Nashville, TN

Head and neck squamous cell carcinoma (HNSCC) is derived from squamous cells of the mucosal epithelium of the oral cavity, pharynx, and larynx. In 2023, 66,920 people will be diagnosed with HNSCC in the United States. Human papilloma virus (HPV) is often associated with HNSCC diagnoses. There is a higher incidence and poorer prognosis in African Americans diagnosed with HNSCC compared to European Americans. This study hypothesizes that there are significant differences in gene expression between HPV-negative African Americans and European Americans with HNSCC, leading to a difference in the underlying mechanisms that drive the progression of HNSCC, which in turn cause a worse prognosis in African Americans. In order to study these differences in gene expression, transcriptome studies from the Gene Expression Omnibus (GEO) database were explored. The GSE55550 study provided gene expression data in HPV-negative African Americans and European Americans with HNSCC. After analyzing this study, bioinformatic analysis was conducted via WebGestalt. Through this analysis, specific pathways containing significantly overexpressed genes were exposed. Specifically, the gene, ELF5, was isolated and significantly increased in African American patients. Samples from HNSCC patients at Nashville General Hospital were taken and stained for ELF5 using Hematoxylin and Eosin (H&E) stain and immunohistochemistry (IHC). These samples were analyzed to determine statistical differences that existed between races, specifically European Americans and African Americans. The transcriptome analysis using GEO yielded 4048 user IDs that were statistically significant using a p-value < 0.05. These genes were submitted to WebGestalt which resulted in a list of pathways in which the genes participate. There was an FDR of 0.15513 and a p-value of 0.0098 for the PDGF pathway. This analysis revealed that there is a statistically significant difference in the expression of ELF5 in African American patients compared to vs. European American patients with HNSCC. This study introduces the possibilities of genetic differences that could lead to a higher incidence and poorer prognosis of African Americans with HNSCC compared to European Americans with HNSCC.

Poster A-8

THE POTENCY OF NATURAL KILLER CELLS AGAINST EPSTEIN-BARR VIRUS-INFECTED LYMPHOBLASTOID CELLS

Oliver C. Alexander¹,², Josselyn K. Pena², Sheri M. Krams² and Olivia M. Martinez² ¹Meharry Medical College, School of Medicine, ²Department of Surgery, Transplant Immunology, School of Medicine, Stanford University, Palo Alto, CA

This study investigated the potency of natural killer (NK) cells against Epstein-Barr virus (EBV)-infected lymphoblastoid cells (LCLs). Peripheral blood mononuclear cells (PBMCs) from EBV-naïve and EBV-positive donors were enriched for NK cells, while LCLs were generated by infecting B lymphocytes with EBV. Flow cytometry-based assays were employed to assess the cytotoxicity of NK cells against LCLs, measuring cell viability, degranulation markers, and intracellular cytokine production (interferon-γ and tumor necrosis factor-α). The cytotoxicity assay permitted the assessment
NK cell ability to target and eliminate EBV-infected LCLs. It involved incubating NK cells with LCLs and subsequently analyzing the changes in LCL viability. Furthermore, the degranulation assay, another flow cytometry-based assay, was employed to evaluate the degranulation capacity of NK cells. The assay involved the detection of specific degranulation markers on the surface of NK cells. Flow cytometry-based assays revealed that NK cells exhibited robust cytotoxicity against EBV-infected LCLs, resulting in significant reduction in LCL viability. NK cells also demonstrated increased degranulation and secretion of cytotoxic cytokines upon LCL stimulation. These cytotoxic effects were mediated, in part, by the recognition of activating ligands on LCLs through NK cell receptors. Based on these comprehensive findings, it can be inferred that NK cells possess potent anti-EBV activity against infected lymphoblastoid cells. This discovery holds great promise for potential therapeutic implications in managing EBV-associated malignancies, as NK cells could be harnessed as a valuable tool for targeted therapy against these types of cancers.

This Project was supported by the Stanford REACH Program.

**Poster A-9**

**SURGEON ERGONOMICS**

**Alexis Allen**¹, Riley Young², Marisa Latham³ and Kimberly Kho⁴

¹School of Medicine, ²Meharry Medical College, Nashville, TN
³The University of Texas Southwestern Medical Center, ⁴Department of Obstetrics and Gynecology
Dallas, TX

When compared to labor intensive occupations such as coal mining, the health care industry has one of the highest rates of work-related musculoskeletal disorders (WMSDs). Work-related musculoskeletal disorders are injuries or disorders (of the muscles, tendons, nerves, joints, cartilage, and spinal discs) in which the work environment or performance of work contribute significantly to the condition; and/or the condition is made worse or persists longer. Although surgeons undergo extensive education and training with surgical equipment, there is a decrease in surgeon ergonomic training and effectively using the equipment. The objective of this study was to evaluate the prevalence of WMSDs among gynecologic surgeons and quantify the amount and types of education regarding surgical ergonomics in this population. The study included an electronic survey completed by those currently in gynecologic surgery fellowship and attending OB/GYN generalists and surgical subspecialists. To protect privacy, the survey is anonymous and compiled into the REDCap database. Approximately 305 participants completed the survey, with 76.70% being female surgeons. Relatively 64.60% were minimally invasive gynecologic surgeons, and 65.60% of surgeons chose conventional laparoscopic as their most frequent route of surgery performed. Results showed that 95.70% of participants have experienced pain and musculoskeletal disorders during or after surgery. For ergonomic training, data showed that 71.80% of surgeons had not received ergonomics training. These results are consistent with the hypothesis that a lack of surgeon ergonomics training has contributed to the increase of chronic pain and WMSDs experienced by surgeons. More data collection is to come. Further studies will involve intervention and put to test an ergonomics training course to evaluate its impact on WMSDs.

This project was sponsored by Center of Excellence COE/Office of Dean, Meharry Medical College School of Medicine, Grant Number: D3HP16299.
Poster A-10
DOES THE IMPACT OF SOCIAL DETERMINANTS OF HEALTH VARY DEPENDING ON THE COMPLEXITY OF THE DISEASE?

Lilly Aloczy¹², Mark F. Berry MD²

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Social determinants of health (SDH) parameters have been associated with cancer care, but the relationship of SDH and disease severity is not as well understood. We hypothesize the SDH impact on non-small cell lung cancer (NSCLC) care increases with treatment complexity. The impact of SDH on treatments and outcomes of stage 1A (where definitive therapy is single modality, local treatment) and stage 3A (where treatment is more complex, multimodality) on NSCLC were evaluated with logistic regression, Kaplan-Meier curves, and cox proportional hazard methods. We found that early-stage patients were more likely to receive definitive care if they had positive SDH factors (92% vs 67.2%, p<0.001). Patients with more advanced stage cancer were also more likely to get definitive therapy if they had positive SDH. Positive SDH was also an independent predictor of receiving definitive care where other clinical characteristics were considered in both early stage (odds ratio 1.47, 95% confidence interval, 1.40-1.54; P<.001) and late stage (odds ratio 1.346, 95% confidence interval, 1.289-1.406; P<.001) groups. Patients who had positive SDH overall had better 5 year survival in both the stage 1A group (58.2% vs 54%, p<0.001) and the stage 3A group (22% vs 20.6%, p<0.001). Positive SDH was associated with improved survival in the multivariable cox model for both the early (hazard ratio 0.91 [95% CI, 0.89-0.93], p<.05) and late-stage groups (.96 [95% CI, 0.95-.99], p<.05). In conclusion, SDH has similar impacts on NSCLC treatment and outcomes in both early and more advanced stages. Efforts to mitigate SDH effects must include all patients and cannot be focused on disease severity.

This project was supported by T35 funding provided by the Stanford Cardiovascular Institute (CVI) and the Stanford Medicine REACH-HBMC Summer Research Program.

Poster A-11
INVESTIGATING THE ROLE OF VITAMINS IN PROSTATE CANCER RISK AMONG AFRICAN AMERICANS

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Prostate Cancer is the second most common cancer in men and the fifth leading cause of death in the world. It is imperative to understand the cause, the risk factor, the pathologic mechanism, and the factors in reducing the risk of prostate cancer. Previous studies have shown certain vitamins and minerals are associated with a reduced risk of prostate cancer. In this study, we assess whether vitamins will have an effect on prostate cancer risk among African Americans. A case-control study was conducted in Washington, District of Columbia and Nashville, Tennessee. There were 264 participants involved in the study. The participants were divided into 3 groups: prostate cancer (n=56), elevated PSA (n=377) and control (n=163). Dietary intake was measured by using a validated food frequency questionnaire. Food items rich in vitamin D, vitamin E, selenium, and lycopene were identified. Chi
square tests were performed to evaluate the association between vitamins and prostate cancer risk. There is a statistically significant association between the consumption of certain food items such as beef, pork, eggs and decreased prostate cancer risk \( (p<.05) \). There is also a statistically significant association between the consumption of salmon, cod liver oil, peanuts, mushrooms, orange juice and prostate cancer risk increase \( (p<.05) \). When aggregated, there was no significant correlation between the consumption of vitamin D, vitamin E, lycopene, selenium and decreased prostate cancer risk. Results of our case-control study suggest dietary restriction of certain meats as prostate cancer risk reduction strategy cannot be suggested. Increasing annual intake of food high in vitamin D, vitamin E, selenium, and lycopene cannot be suggested as a way to decrease prostate cancer risk. Diet modification interventions should focus on dietary moderations.

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Poster A-12

NITINOL STAPLES FOR MANDIBULAR FRACTURE FIXATION

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Mandible fractures are the second most common type of craniofacial fracture, with an incidence of 38% of all craniofacial fractures. While titanium plates have remained the gold standard for repairing mandibular fractures, they have disadvantages that may be addressed using less invasive techniques. Nitinol staples, used extensively in orthopedic procedures, hold promise, yet investigation into their application in craniofacial surgery remains limited. This ongoing study will test maximum mechanical stress forces and deflection of cadaveric mandibles— 4 repaired with titanium plates and screws and 4 repaired with nitinol staples. We will compare measurements of average operative time, deflection under standard mastication force (10 N), and the maximum amount of force that can be applied before implant failure. Although we hypothesize nitinol staples will demonstrate lower maximum mechanical stress forces and deflection compared to titanium plates, we propose the experimental forces withstood by nitinol staples will be enough to withstand maximum forces similar to/greater than those generated during normal mastication. For preliminary testing, osteotomies were performed on 3 saw bone mandibles and subsequently repaired with 2 nitinol staples each. They were then loaded onto the MTS Bionix 858 multipurpose servohydraulic machine, which applied gradually increasing pressure. The maximum amount of force applied before implant failure was measured, recorded, and compared to published controls. Preliminary data demonstrates nitinol staples withstand lower maximum stress forces compared to titanium plates and screws. Nonetheless, the maximum forces recorded are appropriate for normal mastication. We anticipate similar results with cadaver mandibles once testing is underway. If the final results of our \textit{in vitro} study do indeed support the initial saw bone data, our findings have the potential to support the integration of nitinol staples into practice with the intent of improving patient outcomes and enhancing the efficacy and longevity of implants used during mandibular fracture repairs.

This project was supported, in part, by VICTR Grant VR69481.
Acute appendicitis is the most common indication for emergency surgery in children\(^1\). Approximately 30% of patients are found to have perforated appendicitis, which increases the risk of post-operative complications including abdominal abscess formation, surgical site infections, and increased length in hospital stay\(^2\). Standard treatment includes laparoscopic appendectomy followed by post-operative intravenous (IV) antibiotics in hospital\(^1\). Currently, the two most commonly used post-operative antibiotic regimens used in the literature are ceftriaxone and metronidazole (CM) and piperacillin/tazobactam (PT). A review of the literature does not show a clear trend in the comparison between the use of CM and PT. A study protocol was developed a priori and published on PROSPERO. MEDLINE, Embase, Emcare and The Cochrane Central Register of Control Trials were searched as per a structured search strategy developed with a medical librarian. Two researchers independently screened abstracts and full-texts and performed data extraction on the selected articles. Outcome data were meta-analyzed whenever possible using Review Manager with a random effects model. The observational studies suggest that PT is associated with a higher Deep Surgical Site Infection (DSSI) occurrence, but a lower occurrence of readmission to hospital, compared to CM. Interestingly, the RCT suggests the opposite. Collectively, this meta-analysis suggests a slightly higher occurrence of DSSI and lower occurrence of hospital readmission with postoperative PT. However, given the high heterogeneity between the included studies, these data are difficult to combine. Overall, the optimal post-operative antibiotic regimen for perforated appendicitis in patients <18 years old remains unclear. These results are significant in providing impetus for further randomized controlled trials comparing the use of post-operative CM and PT after laparoscopic appendectomy for perforated appendicitis in pediatric patients.
genomic DNA extracted from plasma-depleted whole blood are sequenced. By comparing mutations in the tumor that are not present in the genomic DNA, possible mutations are identified. We then analyze cfDNA to detect these somatic mutations. Although no DNA has been analyzed for mutations at this stage, we demonstrated that we successfully isolated DNA and measured its concentration. Intriguingly, we observed significantly higher concentrations of cfDNA in patients with positive margins (p=0.020). However, we cannot conclusively say if this cfDNA originates from the tumor itself or other sources. Nevertheless, the analysis of cell-free DNA in surgical washings shows promise as a potential biomarker for identifying patients with positive margins. Our ultimate goal is to sequence the tumor and matched germline DNA to pinpoint mutations and create personalized panels for detecting tumor mutations in surgical washing DNA. We are optimistic that the levels of tumor DNA will correlate with positive margin results, providing a valuable tool for future prognostic assessments.

Poster A-15
INTENSITY OF PRENATAL CANNABIS USE AND ITS EFFECT ON MATERNAL ANXIETY AND DEPRESSION

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Cannabis use among pregnant women in the US has become the most used drug during pregnancy. Mental health is a common reason for cannabis use and but cannabis use is also reported to contribute to feelings of anxiety. The objective of this project is to describe reasons for prenatal cannabis use (PCU) and describe the relationship between intensity of cannabis use and maternal prenatal stress and depression. Reasons for cannabis use were determined based on survey data. Intensity of use was rated on a four-point scale based on self-report surveys on the frequency of cannabis use; these were substantiated by urine drug screens (UDS). Stress and depression symptoms were determined by participant’s scores on the Perceived Stress Scale (PSS) and the Edinburgh Postnatal Depression Scale (EPDS) completed at each trimester of pregnancy. We found that primary reasons cited for PCU were nausea/vomiting, hunger, and anxiety. High intensity cannabis use was significantly associated with using to address mental health symptoms. Higher intensity users had significantly higher average prenatal scores on the EPDS and PSS surveys. Despite higher-intensity cannabis use being associated with anxiety and depression, there was not a significant relationship between higher-intensity use and a reduction in anxiety and depression during pregnancy. Therefore, PCU for mental health reasons did not result in alleviated mental health symptoms among mothers in this sample.

This project was supported by NIH, National Institute on Drug Abuse (NIDA) R01 DA046224-04.

Poster A-16
SOCIAL DETERMINANTS OF HEALTH AND COARCTATION OF THE AORTA IN NEONATES BORN AT LUCILE PACKARD CHILDREN’S HOSPITAL

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Marginalized communities obtain healthcare within a system that perpetuates persistent and glaring health disparities. As a result, they may receive suboptimal care, ultimately leading to poor, yet avoidable, outcomes. These outcomes are amplified by implicit biases possessed by medical professionals and have also caused delays in pediatric diagnoses and treatment. Previous research has demonstrated an intrinsic partiality for white patients and those from higher socioeconomic statuses among pediatric surgical clinicians (Amdani et al., 2022). The objective of our research is to examine the intersection between a patient's treatment course and these unconscious prejudices. We hypothesized that there would be statistically significant differences in neonatal outcomes, specifically length of stay (LOS), time NPO/absence of feeding, and mortality observed in neonates born at Lucile Packard Children’s Hospital when our population was organized based on race/ethnicity, insurance status, primary language, and the use of an interpreter. Chi square and two sample t-tests were conducted using R (programming language). A statistically significant difference was observed in the LOS of Hispanic neonates when compared to their White counterparts in multiple neonatal subpopulations. Notably, an increased LOS was also seen in children with public insurance when compared to those with private insurance plans. Prolonged LOS was still seen in Hispanic infants in sensitivity analyses accounting for genetic anomalies and major congenital heart defects that can prolong hospitalization. No significant differences were noted between groups when time NPO was evaluated, which is likely due to strict pre-operative criteria. White neonates were more likely to change their delivery location to Stanford. Collectively, these findings could be the result of implicit clinician biases. Identifying these preconceptions will help Stanford’s continuing educational efforts and allow the university to better socially and financially support families impacted by provider attitudes.

This project was supported by the HMBC-REACH Program.

**Poster A-17**
HYPERTENSIVE DISORDERS IN PREGNANCY:
DIFFERENCES BY HISPANIC ETHNICITY & BLACK RACE

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Over the last twenty years, maternal mortality rates have increased in the US despite technological advancements and improved clinical interventions (Declercq et al., 2020). In the US, Black mothers bear the greatest burden due to a multitude of drivers that disproportionately impact minority communities (Hoyert 2021). Persistent societal inequality, generational racial trauma, implicit bias, lack of insurance coverage and decreased access to reproductive healthcare services are structural mechanisms that further perpetuate these disparities (Njoku et al., 2023). Additionally, chronic conditions, like hypertension, and hypertensive disorders in pregnancy are a leading cause of maternal mortality and morbidity globally (Petersen, 2019). In addition to maternal mortality, hypertensive disorders are a major risk factor for adverse infant outcomes including fetal growth restriction, stillbirth and preterm birth (Battarbee et al. 2020). Disparities in pregnancy research focuses predominantly on select aggregated groups: non-Hispanic Black, non-Hispanic White and non-Black Hispanic patients. However, this methodology overlooks the variation that exists among patients of the same self-reported race or ethnicity. For example, there is a significant heterogeneity in diabetic morbidity
among Hispanic subgroups (Haelle, 2022). Mexican and Puerto Rican patients are more likely to die from diabetes-related complications than Cubans. We hypothesized that the aggregation of Hispanic subgroups masks the risk of hypertensive disorders in pregnancy for Hispanic-Black people. Using a California statewide dataset of vital records linked to hospitalization discharge data from 2007 to 2018 (N=3,055,451) we found that non-Hispanic Black people had 75% increased odds of a hypertensive disorder in pregnancy (adjusted odds ratio: 1.75; 95% confidence interval: 1.74-1.78) and Hispanic-Black people had 31% increased odds (adjusted odds ratio: 1.31; 95% confidence interval: 1.24-1.38) as compared with non-Black Hispanic people. These results are consistent with our hypothesis and demonstrate the need to collect data disaggregated by race and ethnicity to better investigate health inequities.

Financial support was provided by the Stanford Maternal Child Health Research Institute and the Stanford Medicine REACH-HBMC Summer Research Program.

**Poster A-18**

ASSESSING THE EFFECTS OF PRN NIFEDEPINE ORDER FOR TIMELY TREATMENT OF SEVERE HYPERTENSION IN PERINATAL MOTHERS

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Untreated severe hypertension during pregnancy can lead to major complications for both mother and fetus. Timely treatment is important to reduce a wide range of complications including stroke, placental abruption, pulmonary edema, and maternal-end organ damage. The American College of Obstetricians and Gynecology recommends treating acute-onset severe hypertension with first-line therapy within 30-60 minutes of onset to reduce the risk of maternal morbidity and mortality. However, delayed treatment is common, which emphasizes the need for immediate action. To improve patient health outcomes, Vanderbilt University Medical Center initiated a quality improvement (QI) program in 2020, as part of a broader statewide effort known as the Tennessee Initiative for Perinatal Quality Care. This program introduced a nurse-driven PRN order to manage severe hypertension, which aimed to improve the timeliness of treatment and alleviate the need to notify a physician. The objective of this study is to assess the effectiveness of incorporating a PRN order for Nifedipine in terms of improving the timely and appropriate treatment of patients with severe hypertension within 60 minutes of diagnosis confirmation. Data was collected through a retrospective chart review of all birthing patients who had experienced sustained severely elevated high blood pressure. Medical records of women with severe hypertension were accessed to determine the timing of severe blood pressure, the timing of treatment, and the type of antihypertensive medication used. According to the data, there was a noteworthy increase in the administration of antihypertensive medication within 60 minutes for severe perinatal hypertension during the last quarter of 2023 as compared to the baseline (p <0.00001). Timely treatment was associated with a reduction in the risk of severe maternal morbidity. The implementation of the QI initiative for severe perinatal hypertension associated with antepartum, intrapartum, and postpartum conditions has resulted in significant improvements in the delivery of appropriate and timely treatment. Our findings support the current recommendations to administer antihypertensive treatment in a timely manner to all women with severe hypertension.

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CHARACTERIZING THE EFFECT OF FATTY ACID AMIDE HYDROLASE INHIBITOR-2 (FIN2) IN HEPATOCELLULAR CARCINOMA

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Hepatocellular carcinoma (HCC) is one of the deadliest malignancies due to its lack of effective therapeutic interventions. The risk of HCC increases greatly with pre-existing morbidities such as metabolic disorders and substance misuse of nicotine and alcohol. As the prevalence increases in the population, strategies to inhibit disease progression are vital. Thus, the characterization of the metabolic processes within hepatocytes has become a focal point of potential intervention. In previous studies, the Evasion lab identified fatty acid amide inhibitor-2 (FIN2) from a metabolism/protease inhibitor screen as a potential compound to study in HCC. Our study focuses on the effects of inhibiting fatty acid amide hydrolase (FAAH) function in hepatocytes by administering FIN2, which is proposed to inhibit FAAH, to transgenic activated β-catentin (ABC) zebrafish. Wild-type (WT) zebrafish were crossed with ABC zebrafish, and larvae were exposed to titrated concentrations of FIN2 or empty vehicle, from 3-6 days post fertilization (dpf). Imaging of larvae at 6 dpf demonstrated that FIN2 had significantly decreased the larval liver size (LLS), which is a prognostic indicator for liver cancer development. Next, we exposed WT or ABC zebrafish to either FIN2 or empty vehicle, with or without a high-fat diet (HFD), consisting of 4% cholesterol and 8% palmitic acid from 6-13 dpf. We found that FIN2 could ameliorate the effects of either ABC or HFD, but not both. FIN2 was able to significantly decrease the liver size in ABC larvae on a normal diet or decrease the steatosis seen in WT fish on an HFD. These findings support the hypothesis that FAAH inhibition has an effect on the tumorigenic mechanism of HCC progression. This potential characterization of its involvement in lipid metabolism will allow for further structural analysis of these byproducts and encourage therapeutic target production.

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TIMELY REFERRAL OF DECEASED ORGAN DONORS INCREASES ODDS OF LIVER AND HEART TRANSPLANTATION

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Solid organ transplantation is the preferred therapy for end-organ failure but there is a critical organ supply shortage. While 17 transplant candidates die daily in the United States, waitlist mortality differs based on the life-saving organ transplant (s) needed. Considering that patients in need of liver, heart and lung transplants have a higher risk of pre-transplant death, it is important to identify and optimize factors that increase the availability of these organs. Deceased donors provide the majority of transplanted organs while timely referral of donors increases the number of donors available. We investigated the likelihood of organ transplants following timely or late referral of deceased donors.
We performed a retrospective analysis of a prospectively collected dataset from three organ procurement organizations (OPO). Data were collected from January 2018 to May 2023 and included all in-hospital deaths from a total of 167 hospitals. A total of 2,898 organ donors were identified, and a two-part analysis was performed to identify predictors of kidney, heart, liver, lung, intestines and pancreas transplantation. Results show that timely referral increases the odds of heart transplant (odds ratio 4.2; 95% CI 1.4 to 12.8; p =0.012), liver transplant (odds ratio 2.9; 95% CI 1.6 to 5.5; p =0.001) and trended significant for lungs. Considering that the patients in need of these particular organs have the highest risk of mortality, timely referral can reduce waitlist mortality.

This project was supported, in part, by Tennessee Donor Services.

Poster A-21
IDENTIFYING HEALTH METRICS TO GUIDE EQUITABLE CARE IN RADIATION ONCOLOGY

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Cancer is the second leading cause of death in the United States, with an estimated 2 million new cases annually (Tonse, et al., 2022). Although significant advances have been made in radiotherapy, well-documented racial disparities exist in delivery of care, advanced imaging, and radiation modalities, leading to adverse health outcomes for minority cancer patients (Washington, et al., 2022). We hypothesize that modifiable barriers will be identified for time of initial diagnosis to start of the first treatment, treatment completion rates, and differences in advanced imaging and treatment modalities for patients who received radiotherapy at Stanford Cancer Centers. Once we identify these barriers, our aim is to create health equity metrics and continuously track patients to eliminate the disparities. To this end, we intend to analyze treatment modality, treatment intent, time to diagnosis, time to treatment, and imaging and how this correlates with demographic and socioeconomic factors including race, ethnicity, gender, age, treatment site, and payor. We performed cohort analyses to establish pre-COVID and post-COVID baselines using patient data retrieved from retrieved from the ARIA® oncology information system and Epic, an electronic health records system from January to June of 2019 and 2022. Our preliminary results suggest that there are differences in advanced treatment between our 2019 and 2022 cohorts. We found that in 2019, more Medicare patients received advance treatment when compared to the other payor types. However, in 2022, the number of Medicare patients receiving conventional vs. advanced treatment seemed nearly equal. Future direction includes identifying the strongest correlates for barriers to equitable care and leveraging machine learning models to assist in clinical decision-making to address deviation from the recommended standard of care. Lastly, we aim to use real-time electronic health records and navigational services to address the social needs of patients.

This project was supported, in part, by Stanford Medicine REACH-HBMC Summer Research Program.

Poster A-22 (Oral)
ASSESSING PARENTAL HESITANCY WITH HPV VACCINATION
According to the CDC, more than 42 million Americans are infected with Human papillomavirus (HPV) currently, with about 13 million infected per year. As of August 2021, studies showed 21,700 women and 15,600 men affected by HPV-associated cancers per year. The 9-valent (Gardasil 9) vaccine currently available has shown to prevent up to 90% of HPV associated cancers and genital warts. Since nearly 1/3 of parents do not start or complete the HPV vaccine series for their children, the goal of this project was to understand and evaluate parents’ concerns and communication needs related to the lack of completion of the HPV vaccine series. This study’s novelty lies in being the first to explore vaccine concerns and communication needs and implement these findings into the existing HPVVaxFacts intervention to be assessed in a pilot, prefeasibility study. Parent participants were recruited from ResearchMatch, an online database that connects potential study participants with research. A multi-methods study with brief online surveys and interviews via Zoom were conducted with 50 parents, with 35 analyzed for the purposes of this poster presentation. The Health Belief Model was used to evaluate themes and content within trends in perceived barriers, perceived benefits, and reducing hesitancy to continue the vaccine series with their child. Findings demonstrated that the most significant barriers to continuing the vaccine series were side effects, child hesitancy, and safety of the vaccine. Protection against infection was mentioned 21 times and protection from different types of reproductive and oral cancers was mentioned 35 times throughout the interviews. The largest categories of reducing hesitancy were found to be the family doctor’s approval/openness to questions, increased knowledge about HPV and the vaccine, and a need for positive testimonials from other parents and children who had received the vaccine.

This work was supported by the American Cancer Society (Award Number: ACS DICRIDG-21-071-DICRIDGT)

**Poster A-23 (Oral)**

**FHF2 MODULATION OF CHEMOTHERAPY-INDUCED AND NEUROPATHIC PAIN**

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The widespread use of narcotics for chronic pain relief has contributed to a nationwide crisis, creating an urgent need to develop alternative therapies (Kuehn, 2017). Nav1.7 has emerged as a promising target to manage pain (Dib-Hajj et al, 2013). Gain-of-function mutations in this channel leads to inherited erythromelalgia, a chronic pain syndrome involving burning pain in the hands and feet. Loss-of-function mutations lead to congenital insensitivity to pain (Waxman, 2006). This definitive genetic data has proved Nav1.7 a critical component of the pain signaling pathway, and an opportune target for future therapy development. Fibroblast growth factor homologous factor 2 (FHF2) has been shown to bind to, and modulate the activity of Nav1.7 (Effraim et al., 2019), and to modulate the excitability of DRG neurons (Effraim et al., 2022). Overexpression of FHF2 reduces DRG neuron excitability (an in vitro proxy for pain) putatively via Nav1.7, both under basal conditions and in the presence of a cocktail of inflammatory mediators (Effraim et al., 2022). Given this ability to modulate
neuronal excitability, FHF2 gene therapy is an attractive approach to targeting Nav1.7 because it might allow for a greater degree of selectivity, than small molecule drugs given the structural similarities between the Navs. This study investigated whether this FHF2-mediated approach can also be applied to chemotherapy-induced pain; specifically, paclitaxel, which is known to cause peripheral neuropathy likely via Nav1.7 (Li et al., 2018). Here we demonstrate, utilizing multielectrode array (MEA) and optogenetics techniques, that paclitaxel does increase DRG neuronal excitability in our assay; and that overexpression of FHF2 leads to attenuation of DRG neuronal excitability. Given this data, FHF2 gene therapy might have broad applications in the treatment of several different types of pain, which would be very impactful given the urgent need for novel pain treatments.

Poster A-24
PRAME IMMUNOHISTOCHEMISTRY EXPRESSION AS A DIAGNOSTIC AND PROGNOSTIC TOOL FOR INFLAMMATORY JUVENILE CONJUNCTIVAL NEVUS

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Inflamed juvenile conjunctival nevi (IJCN) are common, often benign, conjunctival lesions that typically develop during puberty or early adulthood. IJCNs can be worrisome of having malignant potential during initial clinical examination due to their atypical histology and rapid growth. However, further histologic examination reveals numerous eosinophils mixed with diffuse lymphocytic infiltrate distinguishing IJCNs from melanoma. Preferentially expressed Antigen in Melanoma (PRAME) is a promising diagnostic marker to help identify clinically challenging melanocytic lesions including IJCN. We aim to evaluate the utility of PRAME in diagnosing inflammatory juvenile conjunctival nevi and in differentiating these lesions from melanomas. In archives from 2021–2023, we analyzed 11 cases previously diagnosed as IJCNs. Samples were immunostained with anti-PRAME antibody (ab219650, Abcam). Using Serkonia et al’s scoring system, we scored PRAME reactivity as: 0 for no staining, focal 1+ for 1–25% staining, focal 2+ for 26%–50% staining, focal 3+ for 51%–75% staining, or diffuse 4+ for >76% staining.(9). Uveal melanoma with diffuse PRAME expression was used as an on-slide positive control. 2 of 11 cases had focal 1+ PRAME labeling. 9 of 11 cases had focal 0 PRAME labeling. Staining was faint and observed in <5% of nuclei. A mean follow-up period of 21 months showed no recurrence in both patients, while a follow-up period of 3.3 months showed the same for the PRAME negative cases. PRAME may be valuable in differentiating between conjunctival melanomas and IJCNs. Negative PRAME expression may also be a good prognostic marker for IJCNs. This can help clinicians rule out melanoma in the eye. Additionally, determining that PRAME is not expressed in benign mimics may broaden the possibility of using PRAME as a target for melanoma therapies.

This project was supported, in part, by HBMC-REACH

Poster A-25
UNDERSTANDING HOW COMMUNICATION DYNAMICS BETWEEN ALLIED HEALTH PROFESSIONALS (AHP) AND METASTATIC CANCER PATIENTS CAN INCREASE THE USE OF ADVANCED CARE PLANNING
Engaging in advance care planning (ACP) conversations with patients, especially those who may have a shorter life expectancy due to old age or disease prognosis, is an efficient and compassionate way to ensure that patients feel supported during their final stages of life. Often times, primary care physicians feel burdened by requests to engage in emotional conversations seeing that their time spent with patients is already very limited. In addition, physicians may not have adequate training to facilitate conversations surrounding end of life care. Allied Health Professionals (AHP) can help bridge this gap by initiating meaningful ACP conversations with patients who may be near the end of life. For our study, we were interested in exploring the communication dynamics between AHPs and metastatic cancer patients who were contacted to engage in advance care planning conversations. Our goal is to better understand how certain patient/provider demographics affect response rate and what, if any, changes can be implemented to help increase patient response rate. For our study, we retrospectively reviewed the demographics of patients who were contacted by AHPs to engage in advance care planning conversations from 2020 to 2023. We examined trends between race, age, and sex and what, if any, factors influenced the response rate of metastatic cancer patients. The results from our 2021 data showed that race played a significant role in which patients responded to Allied Health Professionals, with Black patients reporting a higher response rate. In addition, we also observed differences between cancer clinics with the Thoracic and CCSB clinics reporting patients with higher response rates. Our findings support our hypothesis that differences can be observed between the response rates of patients who belong to certain demographic groups.

Poster A-26
INCREASING CONFIDENCE IN HPV VACCINE

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HPV causes approximately 26,600 new cancer cases every year in the United States. HPV vaccination initiatives have helped lower HPV infection rates. However, vaccination rates still remain incredibly low. Less than 40% of adolescents that qualify for vaccination have completed a full series. Community engagement through focus groups, interviews, pre and post online surveys of parents have been shown to improve attitudes toward vaccinations. This is a qualitative survey study using non-numerical data collected through interviews in order to further understand the reasoning of HPV vaccine hesitant parents when deciding to either opt out of vaccination or fail to complete the vaccine series. The study seeks to implement educational strategies such as the testing of a website that works to close the information gap, the amount of available knowledge regarding HPV vaccination compared to the level of knowledge parents actually have. These strategies are implemented with the goal of addressing prevailing concerns of vaccine hesitant parents with knowledge and consequently assessing their level of hesitancy before and after providing the requisite information through the interview process. The goal of this study is to both educate and aid in parent’s decision making when deciding to vaccinate their children for HPV. There is limited community-based research available on HPV vaccination hesitancy amongst parents. The approach of using educational materials along with a webpage is new in addressing vaccine hesitancy with regards to HPV. HPV vaccination rates are low despite its
availability. HPV related cancer also accounts for approximately 26,000-36,000 cases annually. This research could help increase HPV vaccination rates in order to lower HPV related cancers in the future. We found that knowledge played a critical role in improving attitudes toward the HPV vaccine and that improving the knowledge quality of vaccine participants may improve vaccination rates.

**Poster A-27**

USING DIGITAL HEALTH TO HELP PREDICT OBSTRUCTIVE SLEEP APNEA RISK IN DIAGNOSING DEPRESSION

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Obstructive sleep apnea (OSA) is a form of sleep-disordered breathing where episodes of a complete collapse of the airway or partial collapse happen while sleeping. This can lead to a decrease in oxygen saturation or arousal from sleep and cause fragmented sleep which can lead to poor sleep health. Sleep health is essential for overall quality health and poor sleep can lead to adverse outcomes in cardiovascular health, mental health, cognitive health, driving safety, and even mortality. Measuring sleep traditionally through the use of polysomnography (PSG) and other sleep assessments has been proven difficult to track sleep. Polysomnography can have some limitations such as inaccuracies due to the equipment and a participant may have poor sleep due to a new sleeping environment. The use of digital devices, such as Fitbit and Apple Watch, allows for tracking sleep objectively in a more personalized way and on a larger scale. These devices track sleep data such as awakening times, sleep duration, sleep variability, and even snoring patterns. The REFRESH study is an app where clinically relevant sleep data from digital devices were tracked among 383 patients that signed up. Patients also took self-surveys assessing OSA risk (high or low) for sleep apnea, using the Berlin questionnaire, the PHQ-9 survey assessing depression, and the insomnia severity survey. In this study, it was found that patients with high OSA risk have a higher score for depression compared to patients who have low OSA risk. It was also found that patients with a higher severity of insomnia, compared to the patients with no or mild insomnia were seen to have higher scores on the depression scale. These findings show that OSA should have the same level of importance as insomnia as a sleep disorder that can cause decreased overall quality of health, especially mental health.

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**POSTER A-28**

TIMELY REFERRAL AND ORGAN AUTHORIZATION ACROSS RACE/ETHNICITY

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Organ donation is a lifesaving procedure that saves thousands of lives every year. The impact of this procedure is stunted by the continuous organ supply imbalance. In 2022, over 100,000 patients sat on the organ transplant waiting list while less than 40,000 deceased donor transplants were performed. This study aims to address ways to decrease the gap seen between the waitlist and transplants performed. The purpose of this study is to determine an association between timely referral and
increased organ authorizations. Timely referral is when a medical specialist calls an OPO to discuss the potential for donation of a patient before de-escalation of care. The effects of timely referral on the General, Caucasian, African American, Hispanic, Asian, and Native American population were calculated using Chi-square analysis. We found that timely was significant in the General (N = 3948, p < 0.001), Caucasian (N = 2562, p < 0.001), and Hispanic (N = 481, p = 0.003) populations. Multivariate analysis was then used to determine the significance of timely referral when calculated against other significant factors. In Caucasians, the odds of authorization increased 5.29-fold for patients who received a timely referral (p < 0.001). In Hispanics, the odds of authorization increased 2.75-fold for patients who received a timely referral (p = 0.022). The effects of timely in Caucasians were expected as they lead the charge in organ authorization and donation. The findings of the Hispanic population were surprising. Minorities generally have negative attitudes towards organ donation, so an insignificant association was expected. This research lays the groundwork for future studies to examine the impact of timely referral on a larger scale. With further validation of this study, hospitals can become more aware of their impact on the survival of waitlist patients. And by doing so, more lives can be saved.

This project was supported, in part, by Dr. Marty Sellers and Tennessee Donor Services.

**Poster A-29**

**SLEEP QUALITY AND CORTISOL AWAKENING RESPONSE IN MEDICAL STUDENTS**

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The cortisol awakening response (CAR) is thought of as the body’s way of preparing for the anticipated stresses of the day. Although data on the CAR is variable, it is generally agreed upon that acute sleep deprivation is associated with an increased CAR, and chronic sleep deprivation is associated with a lesser, more dampened CAR. Medical students are subject to many stresses that potentially affect their sleep and thus, their cortisol awakening response. Researchers tested the hypothesis that second-year medical students would have worse sleep quality and a more blunted cortisol awakening response than first-year medical students at Meharry Medical College School of Medicine. Participants wore an actigraphy watch for seven days that monitored their sleep. Participants also completed numerous surveys, including the Pittsburgh Sleep Quality Index. Participants collected their own saliva samples at pre-determined times throughout the day to obtain data for the cortisol awakening response. After performing an unpaired, two-tailed t-test, results showed insignificant differences between the first and second-year medical students in both sleep quality and the cortisol awakening response. Though this study shows there is no statistically significant difference in sleep quality and the cortisol awakening response amongst first-year and second-year students, the data does show that second-year medical students on average trended towards poorer sleep quality and a lower cortisol awakening response than first-year medical students. Trends of this study give us reason to believe that there are factors in medical school that negatively impact students as they continue throughout their many years of schooling. Future results from the continuation of this study can help shape the school curriculum and the stressful expectations medical students are expected to fulfill.

This project was supported by the Center of Excellence COE/Office of Dean, Meharry Medical College School of Medicine, Grant D34HP16299, and Dr. Sanika S. Chirwa, Meharry Medical College School of Medicine, NIH Grant U54MD007586.
STEREOTACTIC BODY RADIATION THERAPY IN HEPATOCELLULAR CARCINOMA PATIENTS WITH SEVERE LIVER DISEASE

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Hepatocellular carcinoma (HCC) patients with advanced liver disease, defined by their Child Turcotte Pugh Score, have not been considered as candidates for radiation therapy. In the present study, we assess the treatment outcomes of late class B and class C patients with HCC treated with Stereotactic Body Radiation Therapy (SBRT). Our hypothesis was that SBRT was well-tolerated by these patients with advanced liver disease. This study is a retrospective analysis of treatment outcomes of 24 patients diagnosed with HCC and treated with SBRT between the years 2014-2023. Data was collected regarding the patients’ demographics, underlying liver disease, prior radiation treatments, SBRT treatment, and pre- and post-treatment lab values used to assess liver function over time. There was no change in CTP and MELD-Na scores across time points. There was an increase in ALBI score between pretreatment and 1-3 months post treatment. Four patients received liver transplants and three of those four experienced a decrease in CTP score and improvement in liver function. The median duration of survival after treatment was 20 months. Ten patients died within one year of radiation treatment. 3 patients were lost to follow up and 3 patients received recent treatment and, therefore, did not have all post treatment values documented. These results demonstrate that SBRT did not worsen liver disease in patients. Future studies should compare patients who tolerated treatment well with those who had less favorable treatment outcomes. This would help to predict which patients with advanced disease would benefit most from this treatment.

INVESTIGATING BLEEDING EVENTS FROM MELATONIN IN TOTAL KNEE ARTHROPLASTY PATIENTS

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Sleep and pain are bi-directionally related, particularly in the post-operative setting. Melatonin is a hormone naturally secreted by the pineal gland that helps regulate the circadian rhythms of the body. This is the primary reason why melatonin is used as a sleep aid. Prior studies have suggested that melatonin, may also have an analgesic effect. In a recent clinical trial (the SLOPE study), Jaiswal et al. tested whether 5 mg of sublingual melatonin given nightly for 28 days post-operatively would improve pain and sleep in patients who underwent elective total knee arthroplasty (TKA). During the study, patients exclusively in the melatonin group experienced major gastrointestinal bleeding requiring hospitalization. Due to this surprising outcome, we hypothesized that melatonin may have been responsible for increasing the bleeding risk in these patients. We investigated the rates of bleeding in another population of TKA patients and reviewed literature to evaluate the theoretical potential of melatonin in causing bleeding. A review of thirteen studies that included in vivo, and ex vivo experiments suggests that that melatonin may reduce the overall activation of the coagulation system, particularly during stressful events such as elective surgery. Along with this, there is an indication of
drugs interactions between melatonin and warfarin. We conducted a retrospective chart review of patients who underwent elective TKA at Scripps Hospital from 2017 – 2022. It is also important to note both groups had participants on DVT prophylaxis, steroids, and NSAIDs. With this data, we analyzed the rate of GI and non-GI bleeding events that occurred. The results showed a GI bleeding event rate of 0.6% compared to the 14% rate found in the SLOPE study. The large difference between the size of two groups could have been a reason for the in these results along with limitations such as other supplements not being documented.

This project was sponsored by Scripps Research Translational Institute.

**Poster A-32**

**ASSOCIATION OF DIABETES WITH HEALTHCARE SPENDING AND UTILIZATION AMONG MEDICARE BENEFICIARIES**

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Diabetes affects 37.3 million Americans, or 11.3% of the population. In contrast, 27.5% of the 63 million people enrolled in Medicare have diabetes. Diabetes is the most expensive chronic condition, and costs are rising. From 2012 to 2017, the cost of diabetes rose from $245 billion to $327 billion, reflecting a 26% increase. Due to the growing economic burden and significant disparities, we sought to thoroughly examine how much diabetes contributes to additional spending and utilization. This will be the first national study in recent years to comprehensively evaluate how much diabetes influences care and costs among Medicare beneficiaries. We used a 20% sample of Medicare beneficiaries continuously enrolled in Fee-For-Service (FFS) from 2012 to 2018. Our sample size was 1,228,549 people with diabetes and 3,135,473 without. We analyzed yearly mean spending for those with and without diabetes overall and by healthcare category. We also compared healthcare utilization among Medicare beneficiaries with and without diabetes. In 2012, total spending for those with diabetes vs. those without was $24,180.03 vs. $13,728.1. Differences in spending were relatively similar between 2012 to 2018. The most prominent drivers of these differences were inpatient spending ($5,716.82 vs $2,884.23) outpatient spending ($4,289.27 vs $2,564.46) drugs ($6,288.17 vs $3,266.81) and physician fees ($5,499.12 vs $3,772.01). People with diabetes also have higher rates of healthcare utilization. Hospitalizations, length of stay, and emergency department visits doubled for the diabetes group. Spending for Medicare beneficiaries with diabetes was consistently higher across all years, indicating that the spending gap has not narrowed or improved. Healthcare utilization by Medicare beneficiaries with diabetes is also consistently higher across all care settings. Prioritizing diabetes management is critical for decreasing the economic burden on the US healthcare system and preventing avoidable healthcare utilization.

This project was supported, in part, by the Harvard T.H. Chan School of Public Health.

**Poster A-33**

**AGE OF ASD DIAGNOSIS AND PRESENCE OF SERVICES PRIOR TO ASD DIAGNOSIS IN RELATION TO INSURANCE STATUS, RACE/ETHNICITY, AND PARENTAL EDUCATION**

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Autism Spectrum Disorder (ASD) is a neurological and developmental condition affecting social interactions, communication, learning, and behavior. The prevalence of the disorder has continued to increase such that 2.8% of 8-year-old children have an ASD diagnosis. ASD can be detected as early as 18 months but the average age of detection across the United States is higher. Delays in diagnosis for Autism Spectrum Disorder deprive children of receiving services that are critical for their developmental potential. Early diagnosis allows for quicker access to services that will benefit the outcomes for children with ASD. Some of these services include Applied Behavioral Analysis (ABA) and Early Start Programs (ESP) which are key in enhancing social and cognitive potential for children with ASD. The literature is inconsistent as to whether there are differences on the road to diagnosis based on a child’s background. We examined the age of ASD diagnosis and presence of ABA and ESP services prior to ASD diagnosis according to the child’s insurance status, race/ethnicity, and parental education. The study included 271 1-6-year-old California Bay Area children who received an ASD diagnosis from the Developmental Behavioral Pediatric Department at Stanford University. Medi-Cal (Medicaid) insurance and non-Medi-Cal insurance, Black or Hispanic identifying and White or Asian identifying, and children with parents with no schooling to parents with post-graduate education were used as the comparison groups. There was a statistically significant difference in presence of ABA among Medi-Cal versus Non Medi-Cal children. The findings indicate that disparities are limited in regards to diagnosis and access to services but there are still some limitations to care based on insurance status in the Bay Area children from the study.

This study was approved by Developmental-Behavioral Pediatrics Program at Stanford to access patient surveys from REDCap database. The research was funded by the HBMC-REACH Program at Stanford. Thank you to the faculty of the Developmental-Behavioral Pediatrics Program at Stanford and the MSRE faculty at Meharry Medical College.

**Poster A-34**

A SURVEY OF PHOTOPROTECTIVE PRACTICES AT A DERMATOLOGY CLINIC

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Overexposure to either UVA or UVB rays can lead to skin cancer. Additionally, those with autoimmune diseases, can have skin that is more sensitive to UV exposure leading to disease flares. The American Academy of Dermatology strongly recommends that photoprotection be included in a daily skincare routine for all skin types. The best sunscreens include an SPF of 30 or higher, broad-spectrum protection (against both UVA and UVB rays), and water resistance. It is recommended that sunscreen is reapplied every 2 hours and more frequently if swimming or sweating. However, sunscreen alone does not offer full photoprotection. Including sun avoidance (especially between 10am-2pm), wearing protective clothing, head cover, and sunglasses offers the most complete photoprotection. This study focused on understanding the photoprotective practices of patients at a dermatology clinic. A ten-question Qualtrics survey was offered to patients at a dermatology clinic in Branford, Connecticut. Patients were provided an Ipad to complete the survey before or after their
appointment. All ten questions required a response. 100 patients completed the survey. 44% indicated “prevention of skin cancer” as the primary reason for seeing a dermatologist. However, only 29% reported using sunscreen daily. Interestingly, sunglasses were the leading form of photoprotection with 56% of patients indicating that they wear sunglasses daily. Although 61 patients selected using sunscreen with SPF 35 or higher, only 28 patients use a broad-spectrum sunscreen, 25 use a water-resistant sunscreen and 0 reported reapplying their sunscreen every two or four hours. Dermatologist visits can serve as a key opportunity to educate patients about using multiple forms of sun protection daily, why it is important to reapply sunscreen, and the properties to look for when selecting a sunscreen. Increased education may reduce the incidence of sunburns, skin cancer, and autoimmune flares.

Poster A-35 (Oral)
RISK FACTORS FOR THROMBOSIS IN PREGNANT PEOPLE WITH SICKLE CELL DISEASE: A MULTINATIONAL STUDY

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Among the understudied complications of sickle cell disease (SCD) pregnancies is how to identify those at the highest risk of venous thromboembolism (VTE). The use of VTE prophylaxis during pregnancy is determined using guidelines that lack sufficient disease-specific data. This study aims to identify risk factors for VTE events in SCD pregnancies by comparing subjects with SCD who experienced a VTE event during pregnancy with those who did not. The Mount Sinai Hospital (MSH) Research Ethics Board and The Johns Hopkins Hospital (JHH) Institutional Review Board approved this retrospective study of pregnant people with SCD of ≥ 20 weeks gestation cared for at MSH, Toronto (1990–2017) or JHH (2000-2021). We stratified subjects by VTE occurrence during pregnancy. First, we described the cohort with VTE during pregnancy, including subject characteristics, VTE recurrence and pregnancy outcomes. Second, we compared cases with a first pregnancy with VTE to controls without VTE. VTE occurred in 7% of pregnancies (20/290) including deep vein thrombosis (DVT, N=9), pulmonary embolism (PE, N=8), DVT+PE (N=3).

To investigate SCD-specific risk factors for VTE in pregnancy, we compared characteristics in VTE subjects (N=17) to no-VTE subjects (N=182) by first study pregnancy with an event or first study pregnancy while enrolled in the study. VTE was associated with markers of disease severity including history of VTE before pregnancy (6/17 VTE vs 8/182 no-VTE, p<0.001), ACS during pregnancy (7/17 VTE vs 19/182 no-VTE, p<0.001), painful events requiring acute care during pregnancy (16/17 VTE vs 119/182 no-VTE, p=0.015) and hydroxyurea use before pregnancy (10/17 VTE vs 35/184 no-VTE, p<0.001). In this study, 7% of cohort pregnancies had VTE. In pregnant people with SCD, VTE is associated with VTE history, intrapartum painful events and ACS. Interventions to reduce acute events in pregnancy may help reduce VTE risk.
This project was supported in part by The American Society of Hematology, The Meharry Medical College Office of Research and Innovation and the Center of Excellence COE/Office of Dean, Meharry Medical College School of Medicine, Grant Number: D34HP16299.

**Poster A-36**

THE PROBLEM OF PAIN IN INFLAMMATORY ARTHRITIS: SOCIODEMOGRAPHIC DETERMINANTS OF PAIN INTERFERENCE

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For individuals with rheumatic disorders, pain is one of the most common and persistent symptoms that impact patients. In Rheumatoid Arthritis (RA) and Psoriatic Arthritis (PsA), pain is associated with worse health outcomes and decreased quality of life. Clinicians need to understand how pain experiences vary amongst patients to provide the best quality of care, particularly for those with rheumatic disorders. In this descriptive study, we aimed to identify the biopsychosocial correlates of pain interference in patients with RA and PsA. Data from 1036 individuals with either RA or PsA were included in the current study. We assessed both self-reported Patient-Reported Outcomes Measurement Information System (PROMIS) measures and Electronic Health Records (EHR) data from visits at Stanford Medicine Pain Management Centers from October 2013 to January 2023. Using a hierarchical clustered linear regression model, we analyzed the effects of demographic variables, PROMIS, and clinical covariates on pain interference. Demographic variables explained 5% of the variance in the model assessing pain interference. PROMIS measures accounted for an additional 57% of the variance, and clinical factors accounted for the last 4% of the variance. Our results suggest that PROMIS measures are important when assessing pain interference in patients with RA and PsA. Future research should include these measures when developing interventional efforts that improve the quality of care and life in these patients.

This project was supported, in part, by the Racial Equity to Advance a Community of Health Initiative at Stanford University.

**Poster A-37**

THE ROLE OF INTEGRIN Α6Β4 IN LUNG ORGANOGENESIS

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Integrins play a crucial role in lung organogenesis. These heterodimers are composed of α and β subunits, with 18 α and 8 β subunits capable of forming distinct integrins. Specific subunits, such as β4, exclusively bind with complement subunits like α6, while α6 can interact with both β4 and β1. Integrins have preferred extracellular matrix ligands that interact with the intracellular scaffolding of cells. Among them, integrin α6β4 plays a vital role in forming hemidesmosomes, essential for tight
adherence of epithelial cells to the underlying matrix and the establishment of epithelial polarity. Epithelial polarity is crucial for forming an apical membrane for gas exchange and a basement membrane for interactions with the extracellular matrix. We hypothesize that α6β4 integrin is essential for lung development, specifically in regulating the organization of airway epithelial cells. We hypothesize that there will be fewer airspaces per field, with an increased amount of airspace volume density. Understanding these processes is vital for comprehending neonatal development and may open possibilities for future therapeutic interventions. To investigate the influence of β4 knockout on airspace volume density and branching, hematoxylin and eosin (H+E) staining was employed. Additionally, immunofluorescence was utilized, labeling secretory airway marker scgb1a1 and ciliated cell marker α-tubulin to assess polarity. The results indicated no significant difference between the control and β4 knockout in terms of airspace volume density and branching. However, observable changes were noted in airspace polarity under immunofluorescent staining, suggesting a potential interaction between the α6β4 integrin and epithelial polarity. These findings shed light on the involvement of α6β4 integrin in regulating lung epithelial polarity and its significance in lung development and function.

This project was supported by the Vanderbilt-Meharry James Puckette Carter Program

**Poster A-38**

**COMPARING ULTRASOUND-DERIVED FAT QUANTIFICATION USING ULTRASOUND-DERIVED FAT FRACTION (UDFF) TO MAGNETIC RESONANCE IMAGING (MRI) FOR LIVER FAT QUANTIFICATION AMONG HIGH-RISK PATIENTS FOR NON-ALCOHOLIC FATTY LIVER DISEASE (NAFLD)**

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Global prevalence of NAFLD by imaging is approximately 25% [3] and NAFLD is a leading worldwide cause of end-stage liver disease and hepatocellular carcinoma. NAFLD screening even among high-risk populations is not currently performed. NAFLD screening requires an inexpensive, accessible, and reliable quantitative method for estimating fat within the liver. In this prospective research study, we compared a novel quantitative method for estimating fat in the liver called Ultrasound-Derived Fat Fraction (UDFF) to magnetic resonance imaging (MRI) as the gold standard. In this prospective research study, we enrolled 46 patients at VA Palo Alto with obesity and/or diabetes for same-day vibration-controlled transient elastography (VCTE), ultrasound (US), and MRI. Data analysis showed a fair correlation between UDFF and MRI fat fraction values with concordance correlation of 0.58 (95% CI: 0.42-0.52). However, analysis using the Bland-Altman method showed that US UDFF values remain consistently higher than MRI by 6.0% on average. Future research studies are needed to further refine the accuracy of UDFF.

**Poster A-39**

**SYMPTOM NETWORK OF ALZHEIMER'S DISEASE**

**Dasanae Davis¹, Meichen Yu²**
Alzheimer’s Disease (AD) requires a multitude of cognitive and imaging tests for accurate diagnosis. Although amyloid-b and tau deposition are necessary for the diagnosis of AD, a patient must also express clinical symptoms. Research exists categorizing clinical symptoms and their anatomical pathways, but interactions and associations of symptoms are not well understood. Understanding clinical symptoms can be useful for developing personalized treatment of AD. If certain symptoms are more implicated in the disease progression these can be targeted. We created a novel symptom network across the AD spectrum using Montreal Cognitive Assessment (MoCA) scores from the Alzheimer’s Disease Neuroimaging Initiative (ADNI) database replicating the progressive disease model. The spectrum ranges from CN (cognitive normal), SMC (subjective memory complaint), EMCI (early mild cognitive impairment), LMCI (late cognitive memory impairment) to AD. The symptom network was constructed by computing Pearson’s correlations (network links) between MoCA sub-scores spanning seven cognitive domains (network nodes). Thus, the symptom network consists of seven nodes, representing correlated cognitive domains. Total MoCA scores and the seven domains were all shown to have differences amongst relevant diagnoses. We found differences in correlations among all the domains. The visuospatial/executive and attention domains showed the strongest group differences across the AD spectrum. In addition, the correlations between visuospatial/executive and orientation first increased from preclinical stage (i.e., CN and SMC) to prodromal stage (i.e., EMCI and LMCI), to AD dementia. Most notably, memory correlations with other six domains increased radically across the AD spectrum suggesting the dominating role of memory dysfunction during the disease progression. This study implicates memory-related disease progression and its multiple notable interactions with other cognitive domains across the AD spectrum. Further, our findings suggest that the visuospatial/executive domain and memory domain might be promising candidates to target for treatments along the AD spectrum.

Poster A-40 (Oral)
THE ASSOCIATION OF RESIDENTIAL SEGREGATION WITH TRIPLE-NEGATIVE BREAST CANCER TREATMENT AND MORTALITY

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Several factors contribute to disparities in breast cancer outcomes. Previous studies demonstrated the differences in treatment and mortality among non-Hispanic Black (NHB) and non-Hispanic White (NHW) women with Triple Negative Breast Cancer (TNBC). Residential segregation has been associated with survival in women with invasive breast cancer; however, it remains unclear regarding the impact of residential segregation on TNBC treatment and outcomes. The objective of this study is to examine the association of segregation with the odds of late-stage diagnosis, receipt of cancer treatment, and mortality among women with TNBC. We’ll also examine if these associations vary by racial groups. Using the Surveillance, Epidemiology, and End Results (SEER) dataset, we identified adult women with TNBC diagnosed. We measured segregation at the county level using the Index of Concentration at the Extremes, and categorized it into quartiles. Multilevel logistic regressions were used to calculate odds ratios of late-stage diagnosis and receipt of cancer treatment (surgery, chemotherapy, and radiotherapy). Multilevel cox proportional hazard regressions were used to
calculate hazard ratios of breast cancer-specific mortality and overall mortality. When compared with patients living in most privileged counties, patients living in least privileged counties had significantly higher risks of late-stage diagnosis, breast cancer-specific mortality, and overall mortality. The impact of residential segregation on breast cancer mortality was stronger for black patients than white patients. There was a trend toward higher odds of receipt of surgical treatment for white patients living in less privileged counties, which was not observed in black patients. The findings of this study suggests that residential segregation combining racial/ethnic and economic polarizations was associated with increased risks of late-stage diagnosis, breast cancer-specific mortality, and overall mortality. This highlights the disparities in TNBC outcomes and the need for increased access to resources to advance health equity.

The study was supported by National Cancer Institute (R01CA215418) and the American Cancer Society (Denim Days Research Scholar Grant RSG-18-116-01-CPHPS)

**Poster A-41**

**SEPTIC ARTHRITIS: WHO IS AT RISK?**

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Septic arthritis is native joint inflammation that is secondary to an infection. Although the incidence of septic arthritis is rare, approximately 2-6 cases per 100,000 people, a proper diagnosis within a timely manner is essential for the health of the patient. This study analyzed patient demographics, comorbidities, treatment, and outcomes of septic arthritis cases within the Atrium Health patient population to determine risk factors that can predispose patients to septic arthritis. This is preliminary analysis of 100 patients, in a retrospective study of a total of 413 patients. The inclusion criteria for this study are that patients must have a diagnosis of septic arthritis and be older than or 18 years of age. The exclusion criteria are pathological or traumatic fractures associated with the same joint that is infected or being immunocompromised. Patient encounters and demographics were abstracted from the electronic medical record and entered into REDCap. Then we generated the frequencies associated with the abstracted data. Forty-six patients were eligible for the study. We found that 84% of the patients were male and 78% are Caucasian. Pertinent medical and social history included smoking (59%), obesity (33%), and of intravenous drug usage (IVDU [26%]). The most common septic joint was the knee (63.2%). All received operative treatment via irrigation and debridement (I&D). Of the patients that followed-up, 88% had resolved infections. The high frequency of septic arthritis within in this patient population suggests increased susceptibility of septic arthritis. Since all patients were treated operatively, we could not determine if non-operative treatment will be just as affective. Next steps will be to complete the data abstraction. Following completion, we will further explore the relationship between patient characteristics and persistent infection, identify potential indications for nonoperative management of septic arthritis and potentially identify modifiable risk factors to reduce risk of persistent infection.

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Poster A-42
CAN ONE SIZE FIT ALL? A COMPARISON OF FOUR POPULATION HEALTH SYSTEM APPROACHES TO INCREASE COLORECTAL CANCER SCREENING IN YOUNG ADULTS BY RACE AND ETHNICITY

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In 2021, the United States Preventative Service Task Force (USPSTF) updated their colorectal cancer (CRC) screening guidelines to include average-risk adults aged 45 to 49. To determine effective population health approaches to increase screening in this age group, the UCLA health system implemented and compared four screening outreach approaches. Given that CRC screening rates vary by race/ethnicity, the aim was to determine the most effective outreach approach for each racial/ethnic group. In 2022, a randomized controlled trial was conducted in a large, urban, diverse academic health system. All UCLA health system patients aged 45 to 49 at average risk for CRC and assigned to a primary care provider were randomized to one of four screening invitation strategies: 1) opt-in for fecal immunochemical test (FIT) screening; 2) opt-in for colonoscopy; 3) choice between FIT and colonoscopy; and 4) automatic enrollment into mailed FIT outreach. Invitations were sent via the electronic patient portal and mail. The primary outcome was screening completion at 6 months, which we analyzed overall and by race/ethnicity. The study found that screening uptake was highest overall and in each racial/ethnic group with mailed FIT outreach. Requesting individuals to opt into a screening modality appeared to result in lower CRC screening participation than automatically enrolling them into one. In addition, within the choice strategy group, colonoscopy was preferred in all racial/ethnic subgroups. These findings suggest that mailed FIT outreach may be the best population health approach to increase CRC screening in young adults in a large health system. We anticipate that by increasing screening rates in young individuals, we can significantly decrease CRC incidence and CRC mortality in young adults.

This project was supported by NIH/NCI R01CA271034.

Poster A-43
IMPACT OF SPINAL ACCESSORY NEUROPATHY SEVERITY ON SHOULDER SYNDROME IN HEAD AND NECK CANCER SURVIVORS

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Head and Neck cancer (HNC) survivors develop functional impairments related to their cancer and treatments including surgery and radiation. Treatment can deleteriously impact neuro-musculoskeletal structures and function long term. Spinal accessory neuropathy (SAN) is a common sequela impacting shoulder function. This is a first step towards better understanding of SAN and shoulder function in HNC survivors as the first chart review assessing SAN severity based on electrodiagnostic studies and shoulder function. The long-term goal is to improve the functional outcomes of HNC survivors with SAN. This is a retrospective chart review of patients previously treated by cancer rehabilitation physiatry who have undergone electrodiagnostic testing in the past 12 months, diagnosed with SAN, and participated in physical therapy (PT). Data collected include demographic data, cancer history, shoulder range of motion (ROM), and electrodiagnostic data for which descriptive statistics were obtained. Pearson correlation obtained for SAN severity on electrodiagnostic testing and shoulder ROM. This study included 12 participants with oropharyngeal HNC. Both shoulder forward flexion and abduction range of motion showed a trend towards improvement from PT evaluation to discharge, however, this was not statistically significant. On electrodiagnostic testing, 75% showed abnormalities in spontaneous activity and 100% showed abnormalities in the motor unit action potential of the trapezius muscle. Subanalysis was performed for the participants who had trapezius muscle motor nerve conduction studies. Results showed a strong correlation between amplitude and shoulder forward flexion and abduction ROM (R² = 0.89, 0.70). This study identified a strong correlation between amplitude and shoulder ROM. More investigation into SAN is needed, including a larger more diverse population, better understanding of PT interventions, assessment of other influential variables. The long-term goal is to develop and disseminate interventions to improve shoulder function and quality of life for HNC survivors.

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Poster A-44
PERIPHERAL INTRAVENOUS WAVEFORM ANALYSIS (PIVA) TO ASSESS VOLUME STATUS DURING THORACIC INSUFFLATION IN RATS

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Peripheral Intravenous Waveform Analysis (PIVA) is an innovative tool using Fast Fourier transformation to examine cardiac pulsation reflection in the venous system. It enables us to track a volume-pressure relationship. We tested PIVA's correlation with blood volume during hemorrhage and resuscitation in rat thoracoscopic surgery models, hypothesizing that PIVA increases with intrathoracic insufflation pressure. In the experiment, five male Sprague Dawley rats were anesthetized and intubated, with surgical cutdown for vessel cannulation. Hemorrhage and resuscitation happened via the left internal jugular vein, with Mean Arterial Pressure (MAP) and PIVA transduced via the femoral artery and vein, respectively. Fast Fourier transform was performed post hoc in MATLAB, and the amplitude of the wave corresponding to the heart rate was termed f1. After baseline measurements, rocuronium and heparin were given, and the chest punctured during lung deflation, followed by CO2 insufflation. After stabilization, the models underwent 10% volume extraction and infusion over 10
minutes each, then received an equal crystalloid volume over 10 minutes. Intrathoracic pressure was gradually increased to 5 cm H2O. Data analysis involved mixed-effects modeling and multiple comparisons where appropriate. In the hemorrhage experiment, PIVA showed a trending significance in fixed effects, \( p = .064 \), like MAP, \( p = .054 \). The most significant MAP difference was between insufflation and baseline, whereas PIVA changed minimally, but f1 showed a larger drop during hemorrhage. Venous pressure and heart rate remained unchanged. PIVA did not show significant fixed effects between treatments in the pneumothorax experiment, \( p = .56 \). Our preliminary results suggest PIVA’s potential for trending volume status during chest insufflation. It showed minimal variation during thoracic insufflation at low pressures but changed significantly at higher pressures. PIVA might not predict pneumothorax size effectively.

**Poster A-45**
THE EFFECT OF THE PCAIS-CALMODULIN INTERACTION ON THE VIABILITY OF MDA-MB-231 CELLS

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Polyisoprenylated cysteiny1 amide inhibitors (PCAIs) have been shown to suppress cell viability. Recent evidence has shown that PCAIs were developed to inhibit the effects of polyisoprenylated methylated protein methyl esterase (PMPMEase). Although PCAIs poorly inhibit PMPEase, they still exhibit potent cytotoxic effects on cells. PMPEase is involved in the posttranslational process of the RAS and related proteins. Breast cancer is a top contributor to cancer-related diseases in US women. Triple negative breast cancer (TNBC) is the most aggressive type and the most difficult to treat among breast cancer types. Previous studies have shown that the TNBC can be driven through KRAS-MAPK pathway hyperactivity. In the KRAS-MAPK pathway, KRAS is trafficked to the inner surface of the plasma membrane using a chaperone protein known as Calmodulin (CALM). In this study we aim to show the potency of the PCAIs at inhibiting the proliferation of the MDA-MB-231 cells. Based on our current findings, we hypothesize that through the binding to calmodulin, the PCAIs cause MDA-MB-231 cell death.

This project was supported, in part, by the National Cancer Institute (NCI) and National Institute of General Medical Sciences (NIGMS) of the National Institutes of Health (NIH) under Grant SC1CA190505 and by the National Institute on Minority Health and Health Disparities of the National Institutes of Health under Award Number U54 MD007582.

**Poster A-46 (Oral)**
THE BRAVE STUDY: UTILIZATION OF A CENR MODEL TO EVALUATE THE IMPLEMENTATION OF BREAST CANCER RISK ASSESSMENT

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Innovation in the science community focuses on advancement, however proves to be efficient when more individuals and community members who benefit from its success are involved. This insight led to Community-engaged Research (CEnR), a growing public health approach that incorporates more members within a community when developing specific research aims and solutions. The Breast Cancer Risk Assessment: AchieVing Equity in Breast Cancer Outcomes (BRAVE) Study is a local CEnR research program developed in collaboration by the Tennessee Department of Health partnered with the Meharry-Vanderbilt-Tennessee State University Cancer Partnership (MVTCP). The goal of this study is to increase use of risk assessment among Tennessee community clinics by offering both providers and staff education and resources on how to assess risk in younger, diverse women so they may seek earlier treatment (if needed) and have better health outcomes. If this CEnR method to assess breast cancer risk is proven effective, a higher population of women in Tennessee will understand their risk and need for appropriate follow-up. This study utilized Community Engagement Studios (CES) and Community Advisory Boards (CABs) which offered suggestions for increasing providers’ and patients’ use of risk assessment. Providers were offered educational sessions about breast cancer risk assessment and how to identify high risk women between ages 25-49 (20% or greater chance of lifetime breast cancer). Conventional digital mammography will be offered to a cohort of high-risk women with the option of MRI. Six month pre- and post-intervention data will be abstracted from charts to determine effectiveness of the CEnR model in discovering early stages of cancers. Afterwards, the study team will generate narrative workshops with breast cancer survivors for women to share their experience and raise awareness for screening.

The BRAVE study was supported by the National Cancer Institute (grants U54CA163069, U54163072, U54CA163066). C. Flewellen was supported by the MVTCP Cancer Partnership funded by the National Cancer Institute (U54CA163069).

**Poster A-47**

MESENCHYMAL STEM CELL TREATMENT AGAINST CISPLATIN-INDUCED KIDNEY INJURY

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Chemotherapy drug cisplatin is often implicated in causing intrinsic acute kidney injury. As a result, cancer patients develop increased risk of fatality from disease. In order to combat this potentially life altering side effect, use of mesenchymal stem cells as a treatment has been explored, typically at concentrations of 1.0 M. In this experiment, different dosages of MSCs were applied to a mouse model in order to determine whether MSC treatment is dose dependent and which dosage creates the most favorable therapeutic effect. Fifteen male C57BL/6 mice were injected with cisplatin to induce AKI. Seventy-two hours later, three groups of five mice were intravenously injected with umbilical MSCs at dosages of 0.5 M, 0.75 M, and 1.5 M. After forty-eight hours, the animals were euthanized, and samples of their blood and kidneys were extracted. The control group used was a healthy model that was not injected with cisplatin nor MSCs. A Luminex assay was employed to measure cytokine levels, and protein estimations were taken from kidney tissues after homogenization and centrifugation. There was a clear correlation between dosage and efficacy. Between the lower concentrations and the higher concentrations of MSCs, the higher concentrations more greatly decreased the levels of inflammatory cytokines circulating in the blood. Effective treatment of cisplatin-induced AKI with MSCs is dosage
dependent. Dosages below 1.0 M prove to be less effective at reducing inflammation than those above 1.0 M. With continued research and human trials, a novel treatment against not just cisplatin-induced AKI, but other acute or chronic kidney diseases can be created and dispensed to the appropriate populations without fear of stimulating further injury.

This project was supported, in part, by Stanford University, Racial Equity to Advance a Community of Health Initiative

**Poster A-48**

HOW COMMON ARE COMPLICATIONS AND REPEAT SURGERIES AMONG PEDIATRIC PATIENTS WHO UNDERGO ACL RECONSTRUCTION

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Anterior cruciate ligament (ACL) injuries in young people have increasingly been recognized¹. The risk of unplanned return to the OR is high among pediatric patients². Part of the reason for an unplanned return to OR is due to the high graft rupture rate³. The purpose of this study is to better understand the profiles of the patients that undergo ACL reconstructions. The impact is that understanding the factors that put patients at greater risk for ACL injury allows these patients to be better counseled. This was a retrospective study of pediatric patients treated at a single institution for ACL reconstruction in 2019. Post-operative complications were recorded, with special attention to repeat procedures. Demographic and procedural information was recorded. Complication rates were calculated. Complication profiles were then compared based upon different demographic and procedural variables. More females than males underwent an ACL reconstruction. The sports most often leading to ACL reconstruction were soccer, basketball, and football. More athletes under 16 years of age injured their ACL compared to athletes age 16 or above. Most of the patients treated for ACL injuries were white. Quadriceps tendon grafts were used more often than hamstring grafts and 12 patients had an anterolateral ligament reconstruction along with an anterior cruciate ligament reconstruction. 18/146 patients experienced 6 different complications. 10/146 returned to the OR for an unplanned procedure. No one required more than 1 return to the OR during follow-up. 3/146 experienced graft rupture requiring a revision ACL reconstruction. 7/146 experienced contralateral ACL rupture during follow-up. The majority of complications are NOT graft rupture. Complication profile differs by age. This study has given rise to a second study currently looking at a larger group, specifically to investigate the influence of ALL reconstruction on graft rupture rates.

**Poster A-49**

DIAPERS AT THE DOCTOR: A QUALITATIVE STUDY OF SOCIOECONOMIC NEEDS IN ADDITION TO DIAPER INSECURITY

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Diapers are essential for child health, but nearly one in three American families cannot afford them (Porter & Steefel p 141, 2015). The aim of this qualitative study is to determine additional unmet needs of participants in the Gardner Packard Children’s Health Center Diapers at the Doctor program. Recruitment and interviews of pre-screened families were conducted to assess their social and economic needs. Interviews occurred in-person weekly during Wednesday clinic-based diaper distributions. Caregivers (n=28) of children at Gardner Packard completed interviews in English (68%) and Spanish (32%). 41% of participants felt like they don’t have enough diapers to change their child as often as they would like. 86% of caregivers felt that they have trouble making ends meet at the end of the month. The following themes were identified: 1) Caregivers recognized unmet social needs in addition to diaper insecurity. 2) Families perceived barriers to accessing basic social needs as a burden. 3) Participants expressed frustration with government assistance programs. 4) Caregivers made reductions and trade-offs with their needed resources in order to make ends meet to support their family. 5) Participants shared what supportive resources they would like to see the Diaper Program provide for their social needs. In conclusion, diaper need among low income families is associated with other unmet basic social needs for participants in Diapers at the Doctor. The findings suggest that caregivers facing barriers to support their families would like to see the diaper program supply additional resources and connect them to agencies that can provide additional social needs. This study will be essential to the caregivers and their children to examine the unmet socioeconomic needs of current Diapers at the Doctor program participants. This will help elucidate health inequities, accessibility to resources, and financial barriers faced by the families who have children at the clinic. The overall implications of this work will be used to identify opportunities to connect participants to relevant community resources. This will limit the accessibility barriers and centralize need based resources to the clinic for families. Study limitations included small sample size, lack of generalizability and reporting bias due to sensitive material discussed during interviews.

Poster A-50
ASSESSING THE OUTCOME DIFFERENCE BETWEEN SPINAL ANESTHESIA AND GENERAL ANESTHESIA FOR LAPAROTOMIES IN LOW RESOURCES CENTERS

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Compared to general anesthesia, spinal anesthesia is used to care for patients in low-resource centers at a higher percentage than in high-resource countries. Laparotomies, which typically require abdominal muscle relaxation, are almost exclusively performed under general anesthesia in high-resource centers. Though spinal anesthesia has become popularized in low-resource centers, limited data show spinal anesthesia as a safe alternative to general anesthesia for laparotomies. We want to investigate the efficacy of spinal anesthesia compared to general anesthesia by examining the patients’ mortality. This study is a retrospective cohort analysis of a previously collected data, to assess the outcome difference between spinal anesthesia and general anesthesia for laparotomies in low-resource centers. We utilized data collected from 2014 to 2021 from the “Global Perioperative Outcomes” study, which consisted of key patient demographics and perioperative outcomes from thirty-two different hospitals in Kenya and Ethiopia. Our inclusion and exclusion criteria were laparotomy and non-laparotomy procedures, respectively. Unadjusted analyses were performed to compare the mortality rates of spinal and general anesthesia. Future directions include multivariate analyses to control for hospital type, ASA Status, Age, Length of surgery, Emergency status, Trauma status, and Country and calculate hospital length of stay. Of the 5,293 laparotomy cases reported, 4,470 (84%) received general anesthesia and 581 (11%) received spinal anesthesia. There were 71(1.5%) 24-h and 155 (3.7%) 7-day
cumulative mortalities reported. In the unadjusted analyses, when compared with general anesthesia, the 7-day odds of mortality were lower in patients with spinal anesthesia (OR = 0.2, CI: 0.07-0.54), while the 24-h odds of mortality were similar in patients with spinal anesthesia (OR = 0.35, CI: 0.11-1.09). While the data indicates possible association of spinal anesthesia with reduced 7-day mortality, compared to general anesthesia for laparotomies, additional analyses need to be performed to confirm this association.

Poster A-51
METABOLIC EFFECTS ON THE DEVELOPMENT
OF THE CHOROID PLEXUS CARCINOMA

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Choroid Plexus Carcinoma (CPC) is a rare type of cancer that primarily affects children between the ages of 1 and 3. Unfortunately, the main treatment for CPC is surgical resection. Our goal is to identify better targets for treatment. We will test whether CPC relies more on glycolysis than the choroid plexus (ChP) of healthy, similarly aged mice and will also test if metabolite composition changes between the CSF from mice with CPC versus the cerebrospinal fluid (CSF) from disease-free mice. To perform these tests, we will crossbreed two mouse models, Nestin-cre and fl-stop-fl-MYC, to yield our target mouse models with CPC (Nestin-Cre x fl-stop-fl-MYC). Our results will indicate if there are CSF-based biomarkers of CPC and if there are circulating metabolites that could maintain tumors. Ultimately, this will show whether CPC reacts to metabolic therapy.

Poster A-52
LIQUID EMBOLIC AGENT VS PVA PARTICLES IN CASES OF SUBDURAL HEMATOMAS
POST-MIDDLE MENINGEAL ARTERY EMBOLIZATION

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Subdural hematomas (SDH) that cause neurologic symptoms often require surgery but may not completely resolve and could even recur. Middle meningeal artery embolization (MMA) has become a relatively safe and simple endovascular procedure to prevent this recurrence. Our objective is to compare two different embolic agents; liquid embolic agent (Onyx) and polyvinyl alcohol particles (PVA) for endovascular treatment of SDH. We hypothesize that Onyx will decrease SDH thickness and minimize recurrence to a greater extent compared to PVA due to its increased durability. We conducted retrospective analyses of patients who underwent MMA embolizations for SDH treatment at two level one trauma centers in Indianapolis, Indiana between January 2021 and June 2023. Primary outcomes were failure of embolization and need for rescue surgical evacuation. A cohort of 81 patients who underwent MMA embolizations was selected. 36 embolizations were performed with Onyx (44.8%) and 45 with PVA (55.2%). The failure rate of Onyx was 15.4% with 100% of those failures...
requiring surgical evacuation. The failure rate of PVA was 20.5% with 25% subsequently requiring surgical evacuation. There was no significant difference in the primary outcomes in patients who underwent embolization via Onyx or PVA \( (p=0.602) \). SDH thickness decreased by an average of 6.5mm in both Onyx (40% reduction) and PVA (46% reduction) arms one month after embolization. No significant difference in SDH thickness was seen between PVA or Onyx \( (p=0.353) \). Results show both Onyx and PVA can be used as embolic agents in the treatment of SDH with similar surgical outcomes and reduced likelihood of hematoma recurrence. Subdural hematomas rarely spontaneously resolve and often require surgical intervention (craniotomy or craniostomy) to prevent irreversible brain injury or death. MMA embolization offers a safe, cost effective and minimally invasive solution to occlude the SDH blood supply, therefore aiding in resolution and minimizing recurrence.

**Poster A-53**

OUTCOMES OF PATIENTS TREATED WITH BOLUS ELECTRON CONFORMAL THERAPY FOR CUTANEOUS CANCERS OF THE FACE

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Treating tumors of the face with radiation therapy is challenging due to surface irregularity. One potential solution is utilizing bolus electron conformal therapy (BECT), which uses single electron beam therapy and a variable thickness bolus. This creates a more precise, homogenous dose that minimizes radiation to healthy tissue. Currently, literature on BECT outcomes for tumors of the face is minimal. In this retrospective study, we evaluate the outcomes of 20 patients treated for cutaneous cancer of the face using BECT with a custom .decimal bolus (.decimal LLC, Sanford, FL). Review of institutional records identified 20 patients. Diagnoses included squamous cell carcinoma \( (n=9) \), basal cell carcinoma \( (n=6) \), cutaneous T-cell lymphoma \( (n=4) \), and Merkel cell carcinoma \( (n=1) \). Data was collected via chart review to determine patient characteristics, treatment protocol, and outcomes. The median time between initial CT simulation and start of radiation therapy was 17 days (IQR 13-21), which is typically longer than with conventional electron treatment and non-custom boluses. Median follow-up time was 18 months (IQR 12-23). The most common acute toxicities were grade 1 fatigue (56%), grade 1 radiation dermatitis (47%), and grade 1 mucositis (47%). There were no acute toxicities above grade 3 or late toxicities reported. Nineteen patients retained local control of disease at last follow-up (95%). One patient had local recurrence 15 months post-radiation therapy, which may be due to not completing the full intended course of treatment. To our knowledge, this is the first study to describe aggregate clinical outcomes of BECT for tumors of the face. Future research with a larger number of patients and a control group is needed to attain conclusive results about efficacy. Nonetheless, this study demonstrates the potential of custom .decimal boluses to optimize radiation therapy for cutaneous cancers of the face.

**Poster A-54**

NEURONAL CELL DAMAGE IN BRANCH RETINAL ARTERY OCCLUSION AND BRANCH RETINAL VEIN OCCLUSION BY MONITORING CELL DEATH USING TUNEL ASSAY

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The severe consequences that arise from Branch Retinal Artery Occlusion (BRAO) and Branch Retinal Vein Occlusion (BRVO), and the effect of neuronal cell death post-ischemia events has not been thoroughly investigated. Hence, the purpose of this study is to monitor and quantify neuronal cell death by using TUNEL assay as a reliable method for staining apoptotic DNA fragments and using Muller cell marker to confirm and compare the level of retinal neuronal cell death in Inner nuclear layer. Vascular induction was achieved using laser induced photodynamic thrombosis. Tissue ischemia was confirmed by in vivo imaging of retinal hypoxia. Ex vivo retinal tissue cross-sections from BRVO and BRAO samples underwent TUNEL assay to detect DNA fragments undergoing apoptosis. Following TUNEL staining, a few samples were stained with glutamate synthase to detect muller cells in INL. Apoptotic cell death was confirmed and imaged using Nikon series Ti2 inverted microscope. The TUNEL assay confirmed neuronal cell death mainly located in GCL and INL in both samples of BRVO and BRAO. The fluorescence intensity of apoptotic cells was significantly higher in BRVO retinal cross sections as compared to BRAO. Additionally, apoptotic cells were more likely to be localized in INL in samples of BRVO as opposed to BRAO. This was confirmed by staining tissues with Muller cell marker. This study demonstrated the differences in neuronal cell death in a mice model of BRVO as compared to BRAO using TUNEL assay. By using specific biomarkers, it was shown the regions undergoing apoptosis were mostly GCL and INL. This discovery will allow investigators to predict the consequences and risk of neuronal cell damage from vascular occlusion in the retina which can be targeted as a potential disease monitoring tool and therapeutic agent.

This project was supported and funded by Vanderbilt Eye Institute and National Eye Institute.

Poster A-55
LONG VS INTERMEDIATE VS SHORT NAILING OF FEMUR FRACTURES

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Proximal femur fractures, commonly referred to as hip fractures, continue to be one the most common types of femoral fractures. Fractures of the femoral neck of the femur make up about 90% of all femur fractures. The other 10% of fractures belong to the subtrochanteric group. It has also been observed that the elderly population (65 and above) are particularly at high risk for proximal femur fractures. According to a previous study conducted, it is estimated that hip fractures in the elderly population will reach 500,000 by the year 2040. In the 1990s, the standard of care for such fractures shifted from the use of a sliding screw plate system to the use of cephalomedullary nails. The use of cephalomedullary nails helped to decrease surgical time, decrease risks of infection, and decrease the occurrence of re-fracture. Cephalomedullary nailing is performed using either a short nail, which is about half the length of the femur (~150 mm), or a long nail, which is the full length of the femur (>300 mm). It was previously observed that the first generation of short nails imposed additional risks when compared to long cephalomedullary nails. However, the use of long cephalomedullary nails did not come without risks of its own. This study will introduce the use of intermediate cephalomedullary nails (~235 mm) and compare those outcomes to that of short and long nails. It is hypothesized that the use of intermediate nailing will further decrease risks of complications such as re-fractures and reoperation.
EVALUATION OF INCISION TYPE IN OCCIPITAL MIGRAINE SURGERY

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Migraine surgery is an emerging practice in the treatment of refractory migraines – those unresponsive to pharmacological treatment with peripheral headache characteristics. While the surgery is effective in treating the headaches, incisions on the scalp can leave an unappealing scar. In today’s society where beauty is based primarily on sight, scars have been greatly stigmatized. This leaves those with scars feeling lesser than, and can have a lasting impact on their confidence. Studies show that the etiology of some migraines is peripheral, caused by nociceptive impulses from sensory branches of the trigeminal and occipital nerves. The points of origin are described as trigger points; areas of anatomic compression and irritation of nerves. Surgery treats the headache by decompressing the nerve and relieving irritation, thus relieving the pain. The traditional approach to relieve occipital migraines involves a 4 cm vertical midline incision. We hypothesize that a horizontal occipital incision will result in improved aesthetic outcomes and patient satisfaction. In this study, a retrospective analysis of 27 patients that had undergone occipital migraine surgery between 2020 and 2022 was conducted. Consent forms and surveys were sent to patients and participating physicians via RedCap (Research Electronic Data Capture). Our study shows no statistically significant difference in Stony Brook and Scar Cosmosis Assessment and Rating Scales (SCAR) scores between the vertical and horizontal incisions in occipital migraine surgery. But, the association between the horizontal scar and better scores lead us to believe that this incision type may be favorable. The small sample size negatively impacts the validity of this study, and since it is a retrospective study, we are limited by what previous data offers. Once the best incision is determined, patients will be able to surgically treat their migraines without the concern of aesthetic complications.

THE IMPACT OF BREASTFEEDING PATTERNS ON PHYSICAL GROWTH OF AFRICAN-AMERICAN INFANTS

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Standardized guidelines for healthy infant physical growth were jointly established by the American Academy of Pediatrics (AAP) and World Health Organization (WHO). Previous studies found that African-American infants advance faster in physical development during the first two years. Breastfeeding provides copious benefits to mothers and infants, yet less than half of infants worldwide receive early, exclusive or continued breastfeeding due to aggressive infant formula advertising. This study aimed to compare the impact of maternal feeding practices on infant physical growth. Longitudinal study with 254 African-American women in their 2nd trimester from Davidson County, Nashville, Tennessee. Recruitment through prenatal clinics and community health fairs. Participants attended four 30-minute information sessions and completed surveys at their initial visit and 1-, 3- and 6-month follow ups, covering demographics and breastfeeding knowledge, attitudes and practices. Infant weight and length obtained from well-baby clinic measurements. Breastfeeding practices self-
reported as EBF (exclusive breastfeeding), BF (breastmilk and formula) or NBF (formula only). Infant BMI measured using baby BMI calculator. Secondary analysis using Statistical Package for the Social Sciences. This study revealed significant association between infant BMI status and breastfeeding pattern at 3 months (p<0.01) and 6 months (p<0.05). Infants who EBF or BF fell within normal BMI range (5th-85th percentile). More women practiced BF at 3 months and NBF at 6 months, but there was no established pattern for EBF. Additionally, male infants from single mothers were overweight by 3 months compared to those from married mothers, whereas female infants maintained normal BMI status at 3- and 6-months regardless of their mother’s marital status. In conclusion, by 3 months, mothers were unlikely to continue EBF, resulting in more formula fed infants who are overweight. Increasing breastfeeding education and support initiatives would improve EBF rates and subsequently decrease the prevalence of overweight BMI status among infants.

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Poster A-58 (Oral)
THE MOLECULAR MECHANISM OF CARDAMONIN ON PDL-1 EXPRESSION IN TRIPLE NEGATIVE BREAST CANCER CELLS

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Triple negative breast cancer (TNBC) is more aggressive in African American patients. Immune evasion has been observed via PD-L1 expression. Targeted therapies are expensive and cost prohibitive. Cheap and easily accessible natural compounds; such as flavonoids, have anticancer properties. Cardamonin is a flavonoid found in cardamom and has shown to reduce chemotherapy resistance in TNBC lines. Our purpose was to investigate the immunomodulatory effect of cardamonin on PD-L1 expression, elucidate molecular mechanisms involved, and highlight genetic expression differences among racial disparities MDA-MB-231 (Caucasian) cells and MDA-MB-468 (African American) cells. Cardamonin (0.78-200 μM) cytotoxicity was done to determine the appropriate treatment concentration. MDA-MB-231 and MDA-MB-468 cells were treated with IFN-γ (100 ng) for one hour, then treated with cardamonin. Messenger RNA was extracted and cDNA was done in a two-steps thermal cycle. 40 cycles of PCR was done on genes NFκB 1 and 2, MUC1, STAT3, and JAK. PD-L1 ELISA was performed on collected supernatants. Cardamonin significantly decreased the cellular production of protein PD-L1 (P < 0.05) and mRNA PD-L1 (P < 0.05). Cardamonin decreased mRNA of MUC1 in both lines. Cardamonin decreased the mRNA of STAT3 in MDA-MB-231 cells at 50 μM, and decreased the expression of STAT 3 in MDA-MB-468 cells in concentrations of 25.0 and 50.0 μM. Expression of JAK mRNA was reduced in MDA-MB-231 cells; however, JAK mRNA expression increased significantly. The mRNA expression of NFKB1 decreased in both lines. Cardamonin down regulates PD-L1 in MDA-MB-231 and MDA-MB-468 lines potentially via genes; MUC-1, STAT3, and JAK1. Cardamonin modulates NFKB signaling. NFKB is a transcription factor of inflammation and immunity and is emerging as a key positive regulator of PD-L1 expression in cancer. Therefore, cardamonin may be beneficial in the therapy of PD-L1 evasive TNBC. Racial disparities must be considered as the cells respond to treatment in a different ways.

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Organ donors give the gift of life to recipients through organ transplant. Patient referral after meeting criteria for death is a major event that leads to organ transplant. Referral time is essential because it also impacts wait time for recipients in need of life-sustaining organs. Currently, in the U.S., there is a discrepancy between the number of donors and the number of recipients on the waitlist. Addressing this discrepancy will save many lives. Previous studies have shown that increasing timely referral increases the number of organ donors; however, what is unknown is the impact of timely referral on the number of organs transplanted per donor. The aim of this study was to investigate the association between timely referral and organs transplanted per donor (OTPD). Retrospective analyses of a sample of donors from 3 organ procurement organizations were conducted using Microsoft Excel and Stata for windows version 18. We found that patients referred on time had significantly more organs transplanted compared to patients referred late. These results are consistent with the hypothesis that timely referral increases organs transplanted per donor.

Critical care alarms serve to alert clinicians to patient vital signs fluctuating. However, previous studies indicate “alarm fatigue” chronically impairs clinicians’ response times and identification of audibly perceived changes. With the multitudes of stimuli in these settings, when “sympathetic fight or flight” activates, clinicians filter out monotonous alarms, increasing errors in care. This experiment evaluates clinicians’ responses to traditional versus tone-modified alarms by measuring response time and accuracy to the presented patient conditions. First, 26 consenting clinicians were gathered and informed about our auditory trial. The trial emulates a demanding ICU environment by giving multiple tasks to complete a Purdue Pegboard test and select perceived auditory conditions (ascending/descending and moderate/severe) on our Matlab application as the corresponding 4 alarms played. The original trial involves the standard ICU monitor alarms while the other employs 4 modified alarms for each created condition. Participants lastly answer a NASA Task Load Index survey designed to report subjective values assessing the experiments’ difficulty over 6 questions on a 20-point scale. The original sounds were correctly identified 82.21% with an average reaction time of 5.379 seconds. Conversely, the new sounds were correctly identified 92.55% with an average reaction time of 5.468 seconds. Unpaired t-test indicated 0.0447 value for both alarms’ correct responses and 0.6399 for reaction times. NASA-TLX surveys indicated no significant differences across each category. However, the lowest p-values of 0.206 and 0.242 were found for reported “performance” and “frustration” categories respectively. Utilizing different tones for various changing conditions in
critical care settings stands to negate “alarm fatigue” and provide clinicians a more effective way to discern alarms.

Poster A-61
MATERNAL CONGENITAL HEART DISEASE (CHD) AND ADVERSE NEONATAL OUTCOMES

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With the major advancements in treatments for CHD, there is a growing population of obstetric patients at greater risk for pregnancy complications. There have been studies assessing how maternal CHD affects maternal outcomes during pregnancy, but little is known on how this affects the neonate. This study aimed to determine the neonatal outcomes impacted by maternal CHD. We hypothesized that maternal CHDs are associated with an increased risk for adverse neonatal outcomes compared both with maternal acquired heart disease (AHD) patients and healthy patients. This was a retrospective cohort study investigating pregnancies complicated by maternal cardiac affections as compared to a healthy contemporary cohort who delivered at Stanford hospital between 2012-2023. The cardiac disease cohort was divided into two groups based on if they had congenital (N = 202) or acquired (N = 208) conditions. The healthy cohort (N = 183) had no cardiac affection. Neonatal outcomes were analyzed using chi-square and ANOVA tests. The Bonferroni test was also used to correct for multiple comparisons. P-values <0.05 were statistically significant. There was a statistically significant difference between the 3 groups analyzed for small for gestational age (SGA), NICU disposition, and mechanical ventilation. With each of these, the patients with CHDs had the greatest percentage of adverse neonatal outcomes. For gestational age, birthweight, and length of hospitalization, there was a significant difference between CHD and AHD cohorts when compared with the healthy group. This retrospective cohort study showed pregnancies affected by any cardiac disorder resulted in an increased frequency of adverse neonatal outcomes, including SGA, NICU disposition, mechanical ventilation, and neonatal death. These results highlight the importance of a neonatal emphasis during prenatal care for patients with CHDs.

Poster A-62
METHODS FOR INCREASING CLINICAL TRIAL DIVERSITY - A QUALITATIVE ANALYSIS OF COLLECTED RACE/ETHNICITY DATA IN RELATION TO PREVIOUS PARTICIPATION AND INTEREST IN CLINICAL RESEARCH AT A HISTORICALLY BLACK MEDICAL COLLEGE IN NASHVILLE, TN

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The gap in knowledge with increasing clinical trial diversity is that acknowledging clinical trial diversity as an issue rarely translates to implementing new plans for improving diversity within trials and assessing these plans. There have been implications that differential selection for clinical trials should be investigated to analyze the impact on ethnic/racial diversity (Joseph & Dohan, 2009). Additionally, barriers to diversify clinical trials are well recognized, however, sustainable solutions for
overcoming them have proved elusive (Clark et al., 2019). However, it has been hypothesized before that diversifying investigators and clinical trial staff may assist with connecting to the language, customs, and beliefs of study populations and increase recruitment of participants from diverse backgrounds (Michos et al., 2021). A large amount of the U.S. population, and those that often face the greatest health challenges, are less able to benefit from scientific discoveries because they are not adequately represented in clinical research studies and little progress has been made over the last three decades to adequately address these issues (K. Bibbins-Domingo & A. Helman, Eds, 2022). To fill this gap and to contest the lack of participation in clinical trials by minority groups, this study outlines the need for more black and diverse principal investigators. A survey was conducted amongst first-year medical students at Meharry Medical College to collect data regarding previous participation in clinical trial research and general interest in clinical trial research and clinical trial research diversity. Data analysis was performed with Statistical Package for Social Sciences. Although there was no statistical significance found, the results yielded a higher response rate in favor of interest in clinical trial research and clinical trial research diversity as opposed to disinterest. These results support the endeavor of establishing Meharry Medical College as the home of the National Center for Clinical Trial Diversity.

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Poster A-63

A NOVEL RADIOTRACER TO DETECT DOXORUBICIN-INDUCED SENESCENCE IN MOUSE KNEE JOINTS

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Cellular senescence, the irreversible state of cell cycle arrest, has been correlated with an increased susceptibility of various age-related diseases. Cell senescence can happen during any point in a human's life from in the womb to throughout adolescence and adulthood. Due to the vast roles of senescent cells and their ability to be targeted to detect various age-related diseases is of great significance and compels researchers to invest in discovering the properties of these cells. The lack of tools and techniques discovered to detect senescent cells and their qualities, creates a great need to fill this void. The goal of this study is to create a new imaging biomarker to effectively detect and identify senescent cells within human musculoskeletal tissues using PET imaging, a need that will greatly improve the outcomes of age-related diseases. To accomplish this goal, doxorubicin induced senescence model was used in mice across different age groups. The mice were injected with doxorubicin in the left knee twice over 5 days to induced senescence. The mice were then injected with 200uCI of 18F-PyGal radiotracer and whole-body PET-CT images were acquired one hour after injection of the radiotracer. Furthermore, region of interest quantification and analysis of the mice PET-CT images was used to examine the different tissues in the body which included: the brain, heart, lungs, liver, kidneys, muscle, and knee bones. Findings of this study show that the 18F-PyGal radiotracer was able to detect doxorubicin-induced senescent in the knees and was able to detect senescent cells in different tissues in mice. The development and validation of this biomarker will allow physicians to diagnose and treat geriatric patients more accurately and efficiently.
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**Poster A-64**

INCREASING THE ODDS: HOW THE MEDICAL STUDENT ORTHOPAEDIC SOCIETY (MSOS) SYMPOSIUM MAY IMPACT MATCH RATE

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Upon acceptance medical students find themselves launched into the world of medicine. With so much to do and many opportunities to choose from, these opportunities, like the MSOS, must be evaluated for their impact on student interests, and residency match rates. The study aimed to determine if publication rates correlated with the match rate of participants. It also evaluated the odds of having participated in the MSOS and matching in Orthopaedics with data from the National Resident Matching Program (NRMP) and Accreditation Council for Graduate Medical Education (ACGME). We then compared the odds of applying to residency after participating in Nth Dimensions was compared. There were 302 presentations. If the presentation was published in a journal, pertinent information was then entered into a database. To determine status of the presenter, Google was used. We then evaluated whether publication was associated with increased odds of matching into an Orthopaedic residency compared with national controls. R Studio was used to evaluate the data. Forty-two percent of the presentations were published. In the cohort, those that matched into Orthopaedics were 1.25 times more likely to have published (p-value=0.48). The odds of participating in MSOS and matching into Orthopaedics was 9.3 times more likely than not participating (p-value=<0.0001) utilizing match information from NRMP, and 17 times more likely with the ACGME (p-value=<0.0001). According to data, participants in Nth Dimensions were 15 times more likely to apply. This data should not be considered significant due to small number of participants at this time. This preliminary work effectively shows an ability to publish within short time frames that can also be used to correlate activity with success markers. A larger sample and some other data points would be necessary for better understanding of Match rates and impact on application to residency.

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**Poster A-65**

DESIGNING A FICTIONAL CLINICAL TRIAL IN OSTEOARTHRITIS & TESTING OF AN AUTOMATED SEGMENTATION SOFTWARE IN MEASURING CARTILAGE VOLUME IN EARLY VERSUS LATE-STAGE OSTEOARTHRITIS

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Osteoarthritis is a debilitating disease that causes degeneration of cartilage leading to pain, discomfort, and immobility in the joints. Although there are medications geared toward addressing the symptoms of OA, there are not currently any that address the cause of the disease. As OA progresses, the amount of cartilage in the joints decreases leading to an increase in the severity of symptoms. Current OA studies are focused on stopping the disease and preventing the degradation of cartilage. To measure the outcomes of studies, Magnetic Resonance Imaging (MRI) is often used to monitor changes in cartilage volume. MRI has proven to be a consistent and noninvasive tool for measuring the amount of cartilage in patients with OA. Chondral Quant is a software tool developed by Siemens Healthcare to automatically quantify the amount of cartilage in a joint. While MR chondral Quant is frequently accurate, cartilage segmentation may fail or produce inaccurate results. These inaccuracies can greatly increase the variability in trial data and prevent accurate assessment of trial outcomes. 3D T2 weighted GRE MRI data sets were processed by Chondral Quant and then examined for quality of their segmentation. In the initial review of the data sets it was determined that 15 out of 96 sets (15.6%) had image quality issues that may have led to poor delineation of the cartilage boundaries. These issues included suboptimal contrast, blurring, ring artifacts and motion, among others. In addition to the presence of bone marrow lesions, an increased KL score of 3 instead of 2 also had a higher tendency to produce poor results. This could be due to a variety of factors including full-thickness cartilage loss in various areas of the knee and large osteophytes often present in patients with advanced OA. The trends demonstrated by this study warrant the need for further testing in a larger sample size and point towards the importance of good quality imaging data and careful review of cartilage segmentation results.

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**Poster A-66**

**IMPACT OF NEW HIGH-SENSITIVITY TROPONIN ACS PROTOCOL IMPLEMENTATION ON HOSPITAL THROUGHPUT IN AN URBAN ACADEMIC HOSPITAL**

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Chest pain is the 2nd leading cause of emergency department (ED) visits, accounting for greater than 7 million encounters annually (1). Most patients who present to the ED with a chief complaint of chest pain have noncardiac, frequently benign illnesses (2). However, 5.5% of all chest pain visits are diagnosed with acute coronary syndrome (ACS) (3). Emergency department (ED) and hospital assessment is usually necessary to rule out serious and life-threatening causes of chest pain, such as acute coronary syndromes (ACS), causing chest pain evaluations to be time-consuming, expensive, and resource-intensive (4). Although hs-cTn has been implemented in Europe and more recently the United States, as a means to more accurately diagnosis chest pain, research on time to disposition is limited. The following study is a retrospective cohort study where six months of pre-implementation data was compared to 6 months of data post-implementation of the new hs-cTn chest pain protocol. The primary end point of this study is the evaluation of hospital throughput and time to disposition in patients presenting to the ED with at least one troponin drawn. In the pre-implementation group, the final analytical subgroup contained 9191 patients. Overall, in this subgroup of patients, 3763 (41.2%) were directly discharged from the ED, 4021 (43.7%) were admitted to the hospital, and 1407 (15.3%) were under observation. The time to disposition was 314 minutes, with 13.4% of this patients being
readmitted within 72 hours and 35.4% of patients being readmitted within 30 days. Post-implementation data is yet to be collected as a way to contrast this data. No findings or conclusions related to the pathway’s effectiveness are available at this stage.

**Poster A-67**

**POTENTIAL CONTRIBUTION OF LIVER SINUSOIDAL ENDOTHELIAL CELL EXPRESSING EPHRINB1 IN NONALCOHOLIC STEATOHEPATITIS PATHOGENESIS IN MICE.**

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Cell-cell communication between liver non-parenchymal cells plays a critical role in the promotion of fibrosis during advanced non-alcoholic steatohepatitis (NASH). One of the cell communication networks that has not been very well characterized in advanced NASH is the crosstalk between liver sinusoidal endothelial cells (LSECs) and hepatic stellate cells. We pioneered the concept of targeting the Eph/Ephrin signaling complex in inflammation and fibrosis. Herein, we sought to test the hypothesis that LSECs expressing EphrinB1 participate in NASH pathogenesis. Efnb1²/² mice were crossed with CDH5(PAC)-CreERT² mice to generate Efnb1²/² CDH5(PAC)-CreERT² mice that were subsequently injected with tamoxifen for 5 consecutive days for deletion of EphrinB1 in LSECs. These mice were then fed the Choline Deficient Amino-acid improved high-fat diet (CDAA-HFD) for 8 weeks. Histology, flow cytometry, qPCR, biochemical assays and immunohistochemistry were used to dissect the molecular mechanism underlying LSEC-Efnb1 function in NASH. Expression of Efnb1 is elevated in LSECs during NASH in mice. Deletion of Efnb1 was achieved after tamoxifen administration, as depicted by reduced expression of Efnb1 mRNA and EphrinB1 protein levels in the livers of LSEC-Efnb1⁻/⁻ mice compared to littermate (Efnb1²/²) fed the CDAA-HFD. However, we noted an increased expression of EphB receptor mRNA levels in the livers of LSEC−Efnb1⁻/⁻ mice compared to littermates fed the CDAA-HFD, which was translated into increased CDAA-HFD induced inflammation and fibrosis after deletion of Efnb1 in LSECs. Although EphrinB1 is upregulated in LSEC during NASH-fibrosis, the absence of this ligand in LSECs seems to enhance the pro-inflammatory and fibrotic response in mice fed a CDAA-HFD. LSECs expressing EphrinB1 could function as a negative regulator of hepatic fibrosis in mice.

This project was supported, in part, by Grant No. 01-00980-2000-3460.

**Poster A-68**

**HUMAN ISLET SCHWANN CELL LOCATION & ABUNDANCE IN HEALTH & DIABETES**

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Schwann cells, a subtype of glial cells, play a crucial role in controlling and monitoring the neuronal microenvironment within the peripheral nervous system. They provide essential paracrine signals and respond to appropriately tune neurotransmission or promote neuronal health, particularly under stressful conditions. In the PNS, tissue damage results in glial cell proliferation (gliosis) and alterations in their activity, which help restore and protect neuronal function. Pancreatic islets are enveloped by a subtype of Schwann cells called Peri-islet Schwann Cells (pSCs). These pSCs ensheath islet cells in a similar way that Schwann cells ensheath neurons. However, very little has been identified about their location, abundance, and how they respond to stressful conditions. We hypothesized that Peri-Islet Schwann cells interact with human islets and undergo expansion in response to stressful conditions associated with diabetes. To assess human pSCs and how they change under stressful conditions, pancreatic sections from control (healthy individuals), High BMI, Type-2 Diabetes (T2D), and High BMI with T2D donors were immunolabeled for glial fibrillary acidic protein (GFAP) & insulin. This study determined that females with High BMI & T2D have increased GFAP-positive cells in the islet periphery in comparison to the control group. Males were seen to have a decrease in GFAP-positive cells in the islet periphery of all stress conditions compared to the control group. It can be concluded that pSCs will increase in expansion in response to stressful conditions associated with diabetes (Females), and somehow have a role in the protection of β-cells in the pancreas. However, in males, the decreased expression of GFAP under stressful conditions may indicate that there may be no correlation between pSCs expansion during diabetogenic conditions. With this knowledge, we are closer to comprehending how pSCs might be targeted to aid in restoring β-cell function in people with diabetes.

This project was supported, in part, by the NIH Grant 2T35DK007383-44, through the NIDDK Program (National Institute of Diabetes and Digestive and Kidney Diseases).

Poster A-69
TRANSCRIPTOMIC ANALYSIS OF HPV-NEGATIVE OROPHARYNGEAL TUMORS HIGHLIGHT MOLECULAR DIFFERENCES BETWEEN AFRICAN AMERICAN AND WHITE PATIENTS

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One of the most aggressive malignant tumors, head and neck squamous cell carcinoma (HNSCC), is diagnosed in about 1 million new cases worldwide each year. Between 50 and 60 percent of HNSCC patients survive the first five years post-diagnosis. Even after adjusting for socioeconomic variables, African Americans with HNSCC live half as long as their European American counterparts. This implies that a biological difference to account for this mismatch exists. It is critical to discover efficient biomarkers for the early detection of HNSCC. Two possible differences are that of genetic expression and levels of protein synthesis of HNSCC. Protein indicators can be drivers or passengers of cancer pathogenesis and could be used as indicators. To help uncover these, this study consists of three parts: Transcriptomic analysis, Bioinformatic analysis, and Validation. Transcriptome studies from the Gene Expression Omnibus (GEO, https://www.ncbi.nlm.nih.gov/geo/) database were queried to studies that provide HNSCC tumor data by grade and ethnicity. GSE 55550 was selected for its suitable number of subjects. Thereafter, Bioinformatic analysis consisted of an Overrepresentation analysis of the mined dataset from GSE 55550 by using WebGestalt (https://www.webgestalt.org/) to determine any significant pathways outlined by the set of significant genes found in in the study, yielding the STMN1
gene. It produces Stathmin, a major cytosolic phosphoprotein that plays a critical role in controlling mitotic spindle and microtubule dynamics. Stathmin overexpression in primary HNSCC is associated with poor overall survival, but the biology of Stathmin is unconfirmed when comparing by ethnicity. Finally, Validation consisted of ImmunoHistoChemical polyclonal antibody probing for Stathmin in tumor samples of African American and European American patients of Nashville General Hospital. This study confirms a greater activity of Stathmin-I protein in tumor cells but fails to provide evidence of different levels between the tumors of African American and European American patients studied.

**Poster A–70**

**THE INFLUENCE OF SPIRITUAL BELIEFS ON CONTROL OVER VOICE-HEARING EXPERIENCES**

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Auditory verbal hallucination (AVH) is a perceptual or auditory-like experience lacking corresponding external stimuli. Traditionally, it has been associated with mental illnesses like schizophrenia. However, not everyone who hears voices needs help and lacks the ability to control their voices. There are two methods of controlling the voices such as engagement (direct) and non-engagement (indirect) control. A previous study identified those with a spiritual framework had a higher degree of control over their voices. Many participating individuals with control had significant spiritual beliefs, pointing to the possibility that some varieties of beliefs may influence the development of control or improvement in quality of life. However, previous study has not investigated how the level of spirituality may be associated with certain types of control within non-clinical voice hearers without a diagnosis of psychosis and clinical voice hearers with a diagnosis of psychosis. In addition, this study further investigated how the presence/absence of a diagnosis of psychosis within the same spiritual level differs on the degree of control and engagement and non-engagement methods of control. The retrospective cross-sectional study included 153 individuals from the Control Over Perceptual Experiences (COPE) Project. The Yale COPE scale was utilized to measure the method of control. The Brief Multidimensional Measures of Religiousness/ Spirituality (BMMRS) was used to measure spiritual level. Those who were very spiritual individuals directly engaged with their voices more than those who were slightly/not spiritual in both voice hearers. Voice hearers without a diagnosis and with a spiritual framework utilized direct engagement control methods compared to those with a diagnosis that utilized non-engagement methods of control. Spirituality and the content of the voices may play a role in shaping beliefs of the voices, which may be associated with the methods people may utilize to control their voices.

**Poster A–71**

**BARRIERS AND FACILITATORS TO GENETIC COUNSELING AND TESTING AMONG BLACK WOMEN WITH BREAST CANCER: PERSPECTIVES FROM PATIENTS AND PROVIDERS**

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Black women disproportionately experience negative morbidity and mortality breast cancer-related outcomes compared to women from other racial and ethnic groups. However, genetic counseling and testing (GCT), important for screening susceptibility genes, cancer prevention, and guiding cancer treatment, is severely underutilized among Black women at increased risk for being diagnosed with later-stage breast cancer compared to White women. The objective of this research was to analyze patient and provider perspectives of barriers and facilitators to GCT among Black women to provide insight into how to advance GCT equity and reduce cancer-related health disparities. We conducted qualitative interviews and focus groups to elicit determinants to provider recommendations for GCT in Black women with breast cancer and gain insight into the thoughts about and experiences with GCT of Black women diagnosed with breast cancer. Qualitative analysis of transcripts indicated the most notable overall barriers and facilitators: insurance/costs, patient knowledge, logistics, and patients’ feelings toward GCT. Providers and patients discussed topics related to out-of-pocket costs and concerns about insurance denials, the impact of patient’s health literacy on medical decision-making, point-of-care testing, and patients being overwhelmed. However, providers identified several additional determinants that could be contributing to GCT disparities in Black women, including financial toxicity, inadequate GCT documentation within the Electronic Health Record, and patients’ feelings of guilt and fear. These findings support our hypothesis that analyzing patient and provider perspectives on barriers and facilitators to recommendation and referral patterns for GCT will help advance research into opportunities to evaluate interventions that can facilitate increased GCT utilization among Black women with breast cancer to promote health equity, reduce disparate health outcomes, and encourage the formation of new standards of care. Next steps include incorporating these findings into testing of an in-clinic National Comprehensive Care Network (NCCN) guideline screening intervention.

This project was supported, in part, by the Lilly Grant and Siteman Investment Program.

Poster A-72

IMPACT OF IN-PERSON ENROLLMENT FOR CANCER PATIENTS

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The leading cause of death worldwide is cancer. By 2023, the expected incidence would be ~22 million. Real World Evidence involves the utilization of Real-World Data. Due to the dire need for collection of the Real-World Evidence of treatment-induced toxicities, we are testing an online patient-reported outcome platform that the patient can use as an online diary of their symptoms. This will provide additional educational information about their symptoms that will allow for the management of mild to moderate symptoms at home. With the integration of patient-reported outcomes within the patient’s clinical care, there has been an established associated increase in survival rates compared with conventional care of patients with metastatic breast cancer. This clinical study aims to provide an online platform that captures the patient's symptoms and well-being weekly for any therapeutic regimen. This also provides an opportunity to gauge the likelihood of a patient’s enrollment in the clinic compared to contact through the phone. This project design consisted of 100
patients enrolled to participate by research staff through their scheduled clinic appointment or a phone call for a 1-year study. In the assessment of the patient’s symptom severity, each patient was assigned a weekly ~15-minute patient-reported outcome (PRO) survey. Although the phone enrollment phase was not completed, we were able to complete the in-person enrollment. We found that 48 patients were available for enrollment. Out of those 48 patients, 11 were enrolled in our study. Several factors contributed to the enrollment rates such as psychosocial issues, language barriers, emotional state, diagnosis news, and application interface difficulties during their completion of surveys. Future steps of this study involve beginning the phone enrollment phase and comparing the ages of participants with answered phone calls.

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Poster A-73
SUBCUTANEOUS ADIPOSE TISSUE GENE EXPRESSION AND ECTOPIC LIPID DEPOSITION OVER TIME IN PERSONS WITH HIV

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People with HIV (PWH) can survive decades on modern antiretroviral therapy. Unfortunately, there is an increased risk of cardiometabolic diseases among an aging HIV population. The first year of ART has the potential to provide information that could lead to prevention of increased adiposity and excessive fat deposition in the intra-abdominal area, liver, and skeletal muscles. All 40 clinic patients were 21 years or older with HIV, who were non-diabetic, pre-diabetic, or diabetic. The goal of the analysis is to identify the subcutaneous adipose tissue (SAT) genes that change over time in tandem with changes in circulating cholesterol and CT measurements of ectopic fat deposition. Linear Mixed effects model of the paired changes between SAT gene expression and the dependent variables will be conducted; adjusting for age, sex, race, BMI, study group, duration of ART. Data was collected from HIV, Adipose Tissue Immunology, and Metabolism (HATIM) study visits 1 and 2. When looking at CT images of visceral, pericardial, and liver fat volume with SAT genes overtime, 4 genes stood out: FABP6, SLC27A1, CD36. These genes displayed statistically significant interaction term and p-value. This means that there is a significant effect over time of the CT variables in relation to the genes. These genes had a positive coefficient of interaction meaning that the significance effect grew over time. Additionally, the coefficient of main effect was negative for all these variables meaning that they were downregulated as fat depots increased. SLC27A1 down regulation was implicated in both liver and pericardial fat volume increase overtime. Potential gene therapy focusing on SLC27A1 could potentially reverse the harmful effects of ART.

Poster A-74
INVESTIGATING THE UTILITY OF PLASMA PROTEINS AS SURROGATES FOR TRUNCAL FAT MEASUREMENTS AND TYPE 2 DIABETES PREDICTION IN THE UK BIOBANK STUDY

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Abdominal adiposity, a key predictor of insulin resistance (IR) and Type 2 Diabetes (T2D), is typically quantified by measurements of truncal fat volume and percentage using Magnetic Resonance Imaging (MRI) and Dual Energy X-ray Absorptiometry (DEXA) respectively. Although these techniques are considered the gold standard, they are costly and less accessible. We previously studied thirteen IR-associated proteins and found the plasma levels of two proteins (IGFBP2 and FABP4) predict up to 70% of MRI-and DEXA-measured truncal fat in a multi-ethnic Stanford cohort. We also previously identified 255 plasma proteins associated with IR in a meta-analysis of Stanford and two European cohorts (RISC and ULSAM). It is unclear if any of these IR-associated proteins can also track truncal fat and T2D. In this study, we analyzed 78 of 255 previously identified IR-associated proteins in 5,000 non-diabetic individuals from UK Biobank. Through a bidirectional stepwise regression analysis, we identified thirteen plasma proteins associated with MRI-measured truncal fat volume ($R^2 = 0.58$) and ten with DEXA-measured truncal fat percentage ($R^2 = 0.61$). Next, we assessed the predictive performance of these proteins and abdominal adiposity measures (BMI, MRI- and DEXA-measured truncal fat) for T2D in an independent UK Biobank dataset ($N$ cases = 264, $N$ controls = 765). Notably, BMI performed similarly to gold standard measures of abdominal adiposity in predicting T2D (AUCBMI = 0.80, 95% CI = 0.77-0.84; AUCLR = 0.78, 95% CI = 0.74-0.81; AUCDXA = 0.77, 95% CI = 0.73-0.81), but proteins associated with DEXA- and MRI-measured truncal fat outperformed all abdominal adiposity measures in predicting T2D (AUCLR = 0.87, 95% CI = 0.84-0.8; AUCDXA proteins = 0.86, 95% CI = 0.83-0.89). Our study provides evidence for the potential of plasma proteins as cost-effective and more accessible biomarkers that could outpace conventional abdominal adiposity measurements for T2D prediction.

**Poster A-75**

**INHIBITORY EFFECTS OF AFATINIB ON TUMORIGENIC CHEMOKINES IN TRIPLE NEGATIVE BREAST CANCER CELLS**

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Triple-negative breast cancer (TNBC) is the most aggressive form of breast cancer, leading to metastasis and high mortality. Compared to other breast cancer subtypes, TNBC cells express higher levels of epidermal growth factor receptor (EGFR), indicating that EGFR-mediated signaling plays a critical role in TNBC progression. Therefore, tyrosine kinase inhibitors (TKIs) may block EGFR-mediated signaling, potentially attenuating TNBC progression. This study was designed to investigate the effects of TKIs on cytotoxicity, EGFR-mediated signaling, and cytokine signature in TNBC cells. Human basal-like MB468 and mesenchymal-like BT549 cells were selected for TNBC cell model. Cytotoxicity, western blot, and proteomic assays were performed for cell proliferation, signaling pathways, and cytokine signature, respectively. Half-maximal inhibitory concentrations (IC$_{50}$) from the cytotoxicity studies were determined: 168.5 μM for erlotinib, 31.4 μM for gefitinib, 4.1 μM for lapatinib, and 1.6 μM for afatinib in MB468 cells; 382.2 μM for erlotinib, 46.8 μM for gefitinib, 21.6 μM for lapatinib, and 5.8 μM for afatinib in BT549 cells. Afatinib was selected as the most effective TKI among tested TKIs for further studies. Afatinib reduced AKT/PI3K and ERK activation in both
cell lines and downregulated epithelial-mesenchymal transition (EMT) proteins, such as vimentin and N-cadherin in BT549 cells. The cytokine signature revealed that afatinib downregulated CD147, FGF2, GDF-15, and MIF, up and down changed CD71 and uPAR in BT549 cells and reduced CD147 and PDGFB in MB468 cells. Afatinib could attenuate tumorigenic cytokines in TNBC cells, involving reduced AKT/PI3K and ERK activations and EMT capability, which promises the potential use of afatinib in TNBC progression with change of immune contexture.

This project was supported by grants from NCI/NIH (SC1CA200519 & P50CA098131) and MVTCP (U54CA163069).

**Poster A-76**

IMPROVING TRANSTHORACIC ECHOCARDIOGRAPHY FOR THROMBUS DETECTION

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Atrial appendage (LAA) thrombus development is more likely to occur in atrial fibrillation (AF) patients. The gold standard for ruling out LAA thrombus prior to cardioversion is transesophageal echocardiography (TEE), which helps to prevent thrombus dislodgment and stroke. Compared to non-invasive transthoracic echocardiography (TTE), TEE is an invasive treatment that is more expensive. However, because of its proximity to the LAA, TEE generates ultrasound images of higher quality than TTE. We have previously demonstrated that the ultrasound image quality can be improved by using deep neural networks (DNNs) for ultrasound beamforming. Therefore, we hypothesize that DNNs can be employed to improve visualization of thrombus in the LAA. Patients with atrial fibrillation were scanned to gather in-vivo echocardiography data, which was then used to train a DNN to suppress sources of acoustic clutter that degrade ultrasound images. The DNN was then applied to image frames from the data set that were not used for training in order to assess improvements in ultrasound image quality. The harmonic imaging TTE data for one patient with a LAA thrombus was processed both with the conventional delay-and-sum (DAS) ultrasound beamforming method and the newly proposed DNN framework. Generalized contrast-to-noise ratio (gCNR), a quantitative image metric, was then computed to determine how distinguishable the thrombus was from its surroundings in the image. DAS achieved a gCNR of 0.65 while the DNN achieved a significantly higher gCNR of 0.80. A gCNR of 1 indicates two data distributions have no overlap. We showed that using our DNN framework, it is possible to significantly improve TTE image quality for LAA thrombus visualization. TTE may be a feasible alternative to TEE for ruling out LAA thrombus in patients with atrial fibrillation as a consequence of advancements in DNN technology.

This project was supported by the National Heart Lung, and Blood Institute (R01 HL156034)

**Poster A-77**

GENETIC VARIANTS OF THE ABCA7 LIPID TRANSPORT DISPLAY DIFFERENCES IN ATP HYDROLYSIS
Alzheimer’s disease (AD), the most common cause of dementia in older adults, disproportionately affects African Americans with an incidence rate as much as three times higher, compared to other racial/ethnic groups. Multiple factors contribute to this racial disparity however, an in-depth understanding of the biological or genetic contributions does not exist. Compelling evidence indicate that genetic variants of the lipid transport protein, ABCA7, is more strongly associated with AD in African Americans. ABCA7 is a membrane transporter that utilizes the energy of ATP to shuttle phospholipids out of the cell and is well known to regulate lipid homeostasis. Several single nucleotide polymorphisms (SNPs) have been identified but their impact on ABCA7 function have not been tested. Two of SNPs tested in this study have been reported to confer increased risk of AD in African Americans, and one SNP is suggested to be protective. Here we demonstrate that the three missense ABCA7 variants localize to the plasma membrane, have comparable expression in mammalians cells and display varied ATP hydrolytic activity. These results suggest that the impact of genetic mutations that are found in ABCA7 may result in attenuated transport of key phospholipids, which may disrupt lipid homeostasis. These results provide a framework for targeting mechanisms that can increase phospholipid levels as an effective strategy mitigating AD disparities.

This project was supported by the Center of Excellence COE/Office of Dean, Meharry Medical College School of Medicine, Grant Number: D34HP16299, the Alpha Omega Alpha Carolyn L. Kuckein Student Research Fellowship., NIMHD U54MD007586, and the Alzheimer’s Association AD Strategic Fund: APOE Biology in Alzheimer’s (ABA-23-975038).

**Poster A-78**

**DIFFERENTIAL EXPRESSION OF ENDOTHELIN-L (ET1) AND ITS RECEPTORS, ENDOTHELIN RECEPTOR TYPE A (ETAR) AND ENDOTHELIN RECEPTOR TYPE B (ETBR) BETWEEN SUBJECTS WITH NORMAL, TRIPLE NEGATIVE, AND NON-TRIPLE NEGATIVE BREAST CANCER**


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The neuropeptide hormone, endothelin (specially, ET-1) plays an important role in the invasiveness of breast cancer. High ET-1 levels are associated with decreased disease-specific survival. Very few studies highlight the differential expression of ET-1 and its receptors ETAR and ETBR among triple negative breast cancer (TNBC), non-TNBC, and normal phenotypes. The purpose of the present study was to find out whether the expression of ET-1, ETAR and ETBR is higher in TNBC cells versus non-TNBC and normal cells. An association between higher expression of ET-1 axis and promotion of aggressive TNBC phenotype could represent ET-1 axis as useful biomarkers of TNBC prognosis and potential therapeutic targets. Our hypothesis is that expression levels of ET-1 and its receptors might play an important role in the development and progression of TNBC cells as compared to non-TNBC and normal cells. We aimed to assess the possible prognostic and predictive values of ET-1, ETAR
and ETBR by studying their mRNA expression and protein levels in TNBC and non-TNBC via formalin fixed paraffin embedded breast tissue from 4 subjects with TNBC and 4 normal subjects, representing non-TNBC. Western blot, immunofluorescent, and immunohistochemical analysis served to quantify the differential expression. Results from Western Blotting showed ET1 levels were 81.6% higher, ETAR levels were 35% higher, and ETBR levels were 30% higher in TNBC vs non-TNBC cell lines. Immunofluorescence revealed greater intensity of ETBR in all cell lines compared to ETAR, greater expression of ET-1 and ETBR in TNBC cell lines, HCC-1806 and MDA-231, and greater expression of ETBR in the nucleus of all cell lines and of all proteins in MDA-231. Immunohistochemistry visually depicted greater staining of ET1, ETAR, and ETBR and quantitatively showed approximately 20% higher ET1, 40% higher ETAR, and 20% higher ETBR positive cells in TNBC vs normal breast tissue. Due to the similar results obtained from Western blot analysis with cell lines and immunohistochemical analysis with breast tissue, our hypothesis that expression of ET-1 and its receptors is higher In TNBC than non- TNBC and control is validated and thus could guide subsequent investigations for targeted pharmaceuticals against these biomarkers in TNBC.

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**Poster A-79**

EXAMINING CYTOCHROME P450 GENETIC VARIATIONS WITHIN A STUDY POPULATION

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Cytochrome P450’s (CYP450) are liver enzymes that are involved in drug metabolism. They are polymorphic and have many single nucleotide variations (SNV’s) and copy number variations (Zhou et al, 2017). Two major enzymes that are of importance to us are CYP2C19 and CYP2D6. Both enzymes process selective serotonin uptake inhibitors (Bousman et al, 2023) while CYP2D6 processes certain opioid medications (Farley et al, 2022). Due to genetic variations in these enzymes, some patients could potentially not be experiencing the full benefit of their drug treatment. This study aims to evaluate if patients with certain genotypes/phenotypes are on the correct drug regimen. Eligible participants were those who had been diagnosed with depression and were taking an SSRI or are post-operative and have been put on a opioid medication or have been experiencing chronic pain for more than three months and on an opioid medication. Consenting participants completed a thirty-minute survey and provided a blood sample. Patients were randomized into one of two groups that determined the time point at which their provider received their genetic test results and recommendations based on the guidelines from the Clinical Pharmacogenetics Implementation Consortium (CPIC®). Recommendations were shared with the participants and their provider. Regression analysis was done to determine if participants with certain phenotypes were or were not aligned with their current medical treatment. For CYP2D6, there was found to be a significant relation between being a normal metabolizer and being aligned with their drug recommendation and a significant relation between being of a variant phenotype and not being aligned with their recommendation. A similar relationship was found for CYP2C19 normal phenotypes and intermediate phenotypes however there was not a significant relationship between the other variant phenotypes and needing to change their drug
recommendation. The latter findings indicate that pharmacogenetics can reveal important genetic information of a patient with a potential for clinical application.

**Poster A-80**  
THE IMPACT OF UNG2 ON THE A3G MEDIATED INHIBITION OF HIV-1 REPLICATION

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Uracil DNA Glycosylase (UNG or UDG) is a DNA repair enzyme that performs an essential base excision repair function in preventing mutagenesis caused by cytidine deamination, the process by which an organism’s DNA changes, resulting in gene mutation. Regarding HIV-1 infection, it is still debating the role of UNG in HIV-1 replication. While some reported UNG is essential for HIV-1 replication, some reported that UNG inhibits the production of HIV-1’s cDNA by triggering the base excision repair (BER) pathway and removing uracil from DNA (uracilation), thus preventing viral integration. In this study, using the CRISPR Cas9 technology, we knockout UNG in human Magi and CD4+ T cell lines. Using these cell lines, we interrogated the role of UNG in HIV-1 replication. We found viral infectivity increased when UNG was knocked out in Magi cells. These results suggest that UNG inhibits HIV-1 replication as a host restriction factor. This study will lay a foundation for revealing a novel antiviral mechanism of UNG and shed light on future antiviral development.

This project was supported, in part, by The Meharry Medical College Center for AIDS Health and Disparities Research.

**Poster A-81**  
CONCORDANCE BETWEEN SELF-REPORTED VISION IMPAIRMENT AND OBJECTIVE VISION: THE NATIONAL HEALTH AND AGING TRENDS STUDY

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Self-reported visual impairment is helpful in clinical and research settings of ophthalmic conditions. Epidemiological studies that use self-reported data may be used in implementing policy and allocating funding. This project's primary goal is to assess the accuracy of self-reported data in predicting objective vision measurements and see which factors, if any, influence discordance between the measurements. To conduct this study, data from the 2021 National Health and Aging Study (NHATS) was used. NHATS represents people over age 65 who are recipients of Medicare. The programs STATA and R were used to conduct statistical analysis. Multivariate linear regression, as well as mixed-effect models, were used to analyze data. Rasch analysis was also used to quantify survey answers for regression models. The results showed that race, gender, marital status, age, mental health, and income are all factors that can influence discordance between measurements. For underreporting, the most statistically significant findings were associated with age over 90, being Black or Hispanic, being socially isolated, and having dementia. The study did not expect to find these findings, but compared to previous research, this study reflected previous results. People belonging to marginalized
groups were more likely to underreport visual impairment. This poses an issue in the clinical diagnosis of visual impairments and in the production of research that can impact communities already overlooked by the healthcare system. Underreporting may be due to a mistrust of physicians or an inability to notice changes in daily life. When interpreting research related to self-reported data, factors that may increase overreporting and underreporting should be considered to get a complete picture of visual acuity in clinical and research settings. Overall, these results were consistent with our hypothesis that subjective measurements of impairment cannot replace objective measures.

This project was funded by a grant from the National Institute of Health.

**Poster A-82 (Oral)**

DETERMINING THE UNIQUE CHALLENGES OF TREATING TUBERCULOSIS IN IMMUNOCOMPROMISED PATIENTS

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Despite global efforts to reduce the development of tuberculosis disease or active tuberculosis (TB), TB remains a significant public health concern. In 2020, approximately 10 million new cases of TB disease were reported. Immunocompromising conditions can stifle host immune response, rendering individuals more susceptible to developing tuberculosis disease. In this context, immunocompromised patient may display an inadequate immune response to TB due to immunosuppression, exhibit graft-related drug toxicities, and experience treatment delays due to negative interferon-gamma release assays (IGRA) and false negative sputum smears. Due to interactions between immunosuppressive medications and anti-TB drugs, immunocompromised patients may experience breaks in treatment and require therapy modifications. This study aimed to assess the differences between TB disease diagnosis, presentation, treatment, and outcomes between immunocompromised and immunocompetent patients. A retrospective chart review of patients with a positive Acid-Fast Bacilli (AFB) culture/smear or positive M. Tuberculosis PCR test at Stanford Health Care from January 2013 to January 2023 was conducted. Data regarding demographic information, risk factors (comorbidities, immunosuppressive medications, social risk factors), diagnostic evaluations (AFB culture/smear, PCR, QuantiFERON, and various imaging) at multiple time points through disease progression, treatment regimens, and outcomes were collected by electronic medical record (EMR) review. This study revealed that unusual presentations of TB disease are common in both immunocompromised and immunocompetent hosts. In this cohort, immunocompromised hosts developed TB at a greater median age than their immunocompetent counterparts. Immunocompromised patients also exhibited a significantly increased likelihood of a negative QuantiFERON result at the time of first positive culture. Compared to immunocompetent patients, immunocompromised patients displayed a significantly greater need for non-standard treatment regimens and exhibited higher proportions of drug resistance. This study highlights the challenges in diagnosing and treating immunocompromised patients compared to their immunocompetent counterparts.

This project was supported by Stanford University School of Medicine, Division on Infectious Diseases and Geographic Medicine.
RISK OF RADIATION PNEUMONITIS IN PATIENTS RECEIVING TREATMENT WITH TKIS AND THORACIC RT CONCURRENTLY

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Radiation pneumonitis is an acute inflammation of lung tissue that can occur after radiation therapy or stereotactic body radiotherapy (SBRT) for cancer. It is one of the significant complications/toxicities of thoracic radiation. Studies examining the risk of radiation pneumonitis have been conducted and have offered helpful information. EGFR-tyrosine kinase inhibitors (EGFR-TKIs) have been developed to block the EGFR pathway, inhibiting cancer cell growth. Kim et al. found that EGFR-TKI activates STAT3 in non-small cell lung cancer cells, which is triggered by interleukin-6 (IL-6). IL-6 is an inflammatory cytokine and targets anti-cancer drug resistance in EGFR-TKI-treated cancer cells. The results showed that EGFR blocking could increase IL-6 in cancer cells, potentially contributing to the development of acute interstitial pneumonia. Although research has been done regarding the risk of radiation pneumonitis following radiation therapy, further research should be done to validate these findings and determine whether current treatment options should be modified to mitigate the risk of radiation pneumonitis. Our study aims to examine the risk of radiation pneumonitis in patients with lung cancer receiving combination treatment that includes radiation therapy and treatment with TKIs (erlotinib or osimertinib) concurrently and compare it with those whose who had TKIs held and only received radiation therapy. We conducted a retrospective study to evaluate patients with primary or metastatic lung cancer treated with SBRT at Stanford Hospital, with clinic dates ranging from 2002 to 2020. We re-examined a subset of 16 patients in the control group through chart review for pneumonitis. Of the 16 patients, we only found five to have no events of radiation or TKI-induced pneumonitis, and the other 11 patients had an incidence of pneumonitis at some during or after treatment. We also plan to answer lingering questions about safe doses of TKIs and safe intervals between TKIs and RT.
spine. In this study, the primary goal was to determine the difference between the length of stay and the reoperations rate postoperatively. The authors retrospectively reviewed clinical and radiological data from 195 patients who received full-endoscopic (99 patients), or tubular (96 patients), decompression surgery for their lumbar canal and lateral recess stenosis from Jan 2021 to April 2023. Length of stay in hours and reoperation rates six months postoperatively were compared among the two groups using independent t-test and Fisher exact test, respectively. The overall clinical success rate was 100%. All groups showed favorable clinical outcomes. Regarding surgical outcome, in terms of length of stay, the distributions of Group A (44.27 hrs. SD 95) were not statistically different compared to Group B (58.98 hrs. SD 86) (p = 0.26). Regarding the reoperations rates, for Group A were higher (13% - 13/99) than in Group B (5% - 5/91) however, this difference was not statistically significant (p = 0.47). This study suggests that the length of stay for both approaches may be similar, but the reoperation rate may be higher after the tubular decompression approach. To fully demonstrate these findings, more powered observational and controlled study designs are encouraged.

**Poster A-85**

**THE IMPACT OF MATERNAL DEPRESSION ON THE TREATMENT OF SEVERE ACUTE MALNUTRITION IN CHILDREN WITH SICKLE CELL DISEASE IN NORTHERN NIGERIA**

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Malnutrition and sickle cell anemia (SCA) result in high childhood mortality rates in Nigeria. Although maternal depression is an established risk factor for malnutrition in younger children, little research focuses on how older children or malnutrition treatment outcomes are specifically impacted. This study addresses the gap in maternal depression research by aiming to determine the relationship between severity of maternal depressive symptoms and malnutrition treatment outcomes in older children with SCA. By addressing this gap in knowledge, we hope to identify another risk factor for poor malnutrition treatment outcomes, as well as address maternal mental health in populations where mental health services and screenings are not widely available. We conducted a prospective cohort study as an ancillary study to our 12-week feasibility trial for managing severe acute malnutrition in children aged 5-12 with SCA in Nigeria (NCT03634488). At each clinic visit, participants had anthropometric measurements taken and mothers of participants completed a depression screen using the Patient Health Questionnaire 9 (PHQ-9).

At baseline, 25.7% of mothers (26 of 101) screened positive for at least mild depression (score of 5 or above). The baseline maternal PHQ-9 score was associated with the child's BMI z-score after 12 weeks of malnutrition treatment (β=-0.045, p=0.041). Children of mothers with a PHQ-9 score of 8 or above had a significantly lower mean change in BMI z-score (-0.01 vs. 0.54; p=0.008) than those of mothers with a PHQ-9 score below 8. We demonstrate for the first time that maternal depressive symptoms
negatively impact malnutrition treatment outcomes in older children. We also demonstrate a possible threshold baseline PHQ-9 score that can serve as a clinical tool when assessing children for challenges in malnutrition treatment.

Poster A-86
COVID-19 WORRY IN WOMEN

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COVID-19 has had an immense global impact and it is well recognized that it has disproportionately affected women. This study focused only on women participants and the relationship between their level of worry about COVID-19, and the rate at which they were infected with COVID-19. Studies have shown that psychological challenges are capable of changing or weakening different aspects of our immune system (Segerstrom et al., 2006). 1,058 women answered questions about their worry pertaining to COVID-19 as part of the Research Goes Red initiative started by the American Heart Association. We approached this by ranking the levels of worry, placing women at different worry levels based on their answers. Our purpose was to understand the impact COVID-19 had on these women participants. We hypothesized that there is a statistically significant difference in the level of worry of women who were infected with COVID-19 and women who were not infected with COVID-19. Also that women infected with COVID-19 had a higher level of worry than the women who were not infected. Statistical computing methods were used to analyze the data from the Research Goes Red Registry. The levels of worry for each participant were quantified and cross analyzed to see how many of these participants were infected with COVID-19 and how many were not. Through analytics we were able to conclude that there was not a statistically significant difference in levels of worry between the women who were infected with COVID-19 and the ones who were not infected. This is important since it gives us more insight into the Research Goes Red registry. Now that we know there isn’t a significant difference in worry when it comes to infection with COVID-19 we can go on to look at other aspects like geographical location or level of education for example.

Poster A-87
LEVERAGING HUMAN PANGENOME TO DETECT FUNCTIONAL VARIATION UNDERLYING ADOLESCENT IDIOPATHIC SCOLIOSIS

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Genomics shapes our understanding of disease and inheritance patterns. However, analysis tools used to guide discoveries are notably flawed. The Reference Genome (GRCh38.p13) is the most widely used resource in genetics; however, it only includes haplotypes from about twenty people, with 70 percent of the sequence from one individual (Wang et al., 2022). Because GRCh38 does not represent human genetic variation, it introduces alignment biases. The result of these biases is that GRCh38 works more effectively for some analysis than others. Human Pangenome Reference Consortium seeks to address
The Human Pangenome Reference is a comprehensive reference. It is a higher quality genome selected to maximize represented diversity. It was constructed from 47 individuals from 26 ethnically distinct populations. Sequencing technologies have advanced to produce higher quality data, but is limited by the design of GRCh38. The aim of this study was to determine if using the Pangenome improves our ability to call variants clinically relevant to Adolescent Idiopathic Scoliosis (AIS). Musculoskeletal disorders such as Marfan’s syndrome, Loeyes Dietz and Ehler Danlos Syndrome are associated with known genetic mutations and commonly present with scoliosis. Based on this we can infer, there is probably a genetic basis for AIS. Whole genome and exome sequencing was performed 296 cases and 309 controls, including family members. Candidate gene priority was dependent upon risk scores, current literature and patient information. We developed a system to prioritize variants detected with GRCh38 and determined gene function through literature review. The overall hypothesis will take longer to be tested.

This project was funded, in part, of Lily Grant and Washington’s University St Louis, Office of Provost.

Poster A-88

RACE AND MISSED REFERRAL, IS THERE AN ASSOCIATION?

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To reduce racial disparity in organ transplantation, potential donor referrals were examined to see if there is an association between race and missed potential donor referrals. Between 2018-2023 over 60,000 death records from hospitals affiliated with 3 Organ Procurement Organizations were analyzed with Chi Square testing, T testing, and Logistic Regression. A statistically significant difference was found between White, Black and Hispanic percentages of missed referral. At 19% Whites had the highest percentage of missed organ donor referral. This was followed by Hispanics and Blacks at 16% and 14% respectively. There is an association between race and the occurrence of missed referral, but it doesn’t agree with what is known about racial disparity in organ transplantation. Concerning missed referrals, White %’s > Hispanic %’s > Black %’s. Racial bias in the referral period is not a contributor to inequitable access to transplantation in our 3 donation service areas.

Poster A-89

PERPETRATOR RELATIONSHIPS AND SUICIDAL IDEATION AMONG CHILD SEXUAL ABUSE VICTIMS

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Current literature demonstrates victims of sexual abuse are at higher risk for suicidality, including self-harm, suicide attempts, and suicidal thoughts. Victims of child sexual abuse (CSA) experience the same risk, but little research has been published on CSA and suicidality/suicidal ideation (SI). Previous

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studies have found that in cases of CSA the relationship between the victim and perpetrator affects the victim’s psychiatric disposition, specifically in cases of incest. The purpose of this study is to 1) epidemiologically describe cases of suicidality following CSA and 2) identify if there is an association between the presentation of SI and the victim-perpetrator relationship. This study utilized patient disclosures of CSA or problem sexualized behaviors collected by the Child Assessment Center (CAC) at Nationwide Children’s Hospital (NCH). Subsequent NCH health records were accessed through the electronic health record (EHR) to assess suicidality. Four years of CAC data included 813 cases of children 10-17 years old who were treated for suspected CSA. Analyses focused on patient characteristics and the relationships between victims and their alleged perpetrators. Of the 813 CAC cases reviewed, 392 children reported a relative as their alleged perpetrator. Forty-six children (11.7%) who reported a relative as the alleged perpetrator presented with SI, while 45 children (10.7%) who reported a non-relative as their alleged perpetrator presented with SI. Using Chi-square tests, it was determined that there was not a significant association between relationship with alleged perpetrator and SI. Results indicate that the alleged perpetrator’s relationship to the victim of CSA does not impact risk of suicidality or presentation of SI within 90 days of CSA assessment. Because neither group was found to present with SI more than the other, it is important to provide mental health intervention and support as well as SI screenings to all victims of CSA after disclosure and assessment.

Research support and special thanks to the National Student Injury Research Training Program of the Center for Injury Research and Policy at Nationwide Children’s Hospital, funded by the Child Injury Prevention Alliance (CIPA).

**Poster A-90**

**CONCENTRATIONS OF HUMAN ALPHA DEFENSIN 5 INCREASE COLLAGEN IV ALPHA 3 LEVELS IN COLONIC EPITHELIAL CELLS**

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Inflammatory Bowel Disease (IBD) is characterized by chronic inflammation that causes intestinal tissue damage, which may manifest as excessive ulcers, intestinal stenosis, or fistulas. Human alpha defensin 5 (HD5) is an antimicrobial peptide that is expressed in paneth cells of the ileum: the final section of the small intestine. In patients with Crohn’s Colitis, overexpression of HD5 has been seen in inflamed tissue of the colon. Preliminary data in our lab indicate that HD5 increases cell death and decreases wound healing in colonic epithelial cells. With this in mind, the goal of this experiment is to understand how HD5 affects the expression of Collagen IV Alpha 3 (COL4a3). We hypothesized that the presence of HD5 in the colon decreases the expression of COL4a3, which in turn slows wound healing. Colonic epithelial cells will be treated with 0.5 μg of HD5, followed by protein and RNA extraction after 48 hours. COL4a3 expression levels will be measured with qPCR and western blotting. We found that when treated with 0.5 μg of HD5, cells exhibited better wound healing compared to untreated cells: contrary to what had been hypothesized. This is supported by our western blot and qPCR results, in that cells treated with HD5 exhibited higher expression of COL4a3 mRNA and protein. This suggests that understanding the interaction between HD5, COL4a3, and wound healing may provide a better approach to combat IBD.

**Poster A-91**

**THE IMPACT OF PEDICLE SCREW TAPPING ON BREACHED SCREW RATE**
Pedicle screw fixation has been implemented in the treatment of spinal deformities for many years. Although pedicle screw fixation is widely used, it does pose some risks. The screws placed may become breached and endanger nearby structures causing neurological or vascular deficits. One method used to increase the efficacy and safety of pedicle screw insertion is pedicle screw tapping. This procedure involves preparing the pedicle tract for final screw fixation by dilating the tract by 1 mm to enhance screw grip and identify proper screw placement. The aim of this study is to investigate the significance of pedicle screw tapping. This study hypothesizes that performing pedicle screw tapping during pedicle preparation and after pedicle screw cannulation with a probe allows for the identification of breached pedicle walls thereby ensuring the safety of pedicle screw placement. We obtained information on the total number of screws placed and the frequency of both screws placed and breached screws at each spine level. We performed a retrospective analysis of the medical records of 288 patients at the pediatric center at Washington University School of Medicine in St. Louis. 20 out of 4776 total screws placed were deemed breached after pedicle screw tapping, or 0.4% of the total screws placed. It was also shown that the rate of breached screws can vary by spine level. The results showed that pedicle screw tapping may indeed reduce the rate of breached screws by increasing the screw’s grip in the pedicle tract and enabling the surgeon to use tactile feedback to identify the best place to insert the screw.

Poster A-92
INVESTIGATION INTO THE ASSOCIATION BETWEEN TIMELINESS OF DECEASED ORGAN DONATION REFERRAL AND RACE ABSTRACT

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Previous literature has reported African American families were less likely to be approached with options for organ donation by healthcare providers and OPO staff. Such behavior potentially contributes to the racial inequity that exists in access to transplantation, given that minority recipients are more likely to receive an organ from a minority donor. Much time has passed since the publication of previously mentioned studies and so, it is unclear if current OPO referral behavior demonstrates racial bias towards people of color. With this background in mind, the aim of this study is to investigate if an association between race and timeliness of referral for deceased organ donation exists within 3 OPO’s. A retrospective analysis was done on a combined data set of prospectively collected patient deaths records (n=60,387) over the past 5 years from 3 OPOs: TDS, NMDS, and SDS. Patient age, race, and sex were considered as potential influencers on timeliness of referral outcomes. Results showed African American deceased donors had a 3.6% chance of having a late referral. African Americans were less likely to have a late referral compared to Caucasians, Hispanics, and Native Americans (P<0.001). Being an African American deceased organ donor yielded a 45% chance of having a timely referral (CI= 95% P<0.001). Hence the study concludes there is an association between timeliness of referral for deceased organ donation however, racial bias is not a contributor to inequitable access to transplantation within the 3 OPO’s. Our data suggests the referral period in the
organ donation timeline isn’t a strong determinant to the racial inequity in organ transplantation among our 3 OPO’s.

This project was supported, in part, by Tennessee Donor Services.

**Poster A-93**

A NOVEL COMBINATION THERAPY FOR TREATING BRAF<sup>V600E</sup>-MUTANT ANAPLASTIC THYROID CANCER

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Anaplastic thyroid cancer (ATC) has one of the highest mortality rates of all human malignancies, accounting for 40% of all thyroid cancer deaths, with a median survival period of 6 months. Current treatment for ATC is a combination of BRAF and MEK inhibition, associated with drug resistance. Combination BRAF inhibition and ferroptosis induction medication treatment has been proposed for the treatment of BRAF<sup>V600E</sup>-mutant ATC. This study analyzes the effect of ferroptosis induction in combination with BRAF inhibition on cellular proliferation at 48 and 72 hours in BRAF<sup>V600E</sup>-mutant (resistant) 8505C and SW1736 ATC cell lines. BRAF<sup>V600E</sup>-mutant anaplastic thyroid cancer cell lines 8505C and SW1736 were plated on 96-well cell culture plates and treated with different dosages of dabrafenib (BRAF inhibitor) and RSL3 (ferroptosis inducer). To assess the cell death of different treatment groups, Cytoquant cell proliferation assays were performed at two separate time points (48 and 72 hours). Combination ferroptosis induction (RSL3) and BRAF inhibition (Dabrafenib) in the 8505C-R cell line demonstrated a stronger synergistic effect on cell survival after 72 hours of incubation compared to single dose treatments of the same cell line. Single dose of RSL3 drug treatment at 48 hours in the SW1736 cell line showed the highest cell death when compared to cells in the same cell line treated with Dabrafenib and combination drug treatment. Combination therapy has no significantly higher cell killing impact than RSL3 only treatment. The unique concept of combining a BRAF inhibitor and a ferroptosis inducer is expected to produce better results than earlier treatments. This treatment departs from the conventional strategy of targeting BRAF alone or in a single signaling pathway moves toward combining treatment to yield a more robust and synergistic anticancer effect, thus prolonging the lives of people living with anaplastic thyroid cancer.

This project was funded by the National Cancer Institute.

**Poster A-94**

VALIDATING TSSF IN PATIENTS WITH BOTHERSOME TINNITUS

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Tinnitus is the perception of sound in the absence of any external stimuli. Tinnitus has been estimated to affect 15% of the global population. Because tinnitus symptoms in each individual vary in loudness,
Pitch, and psychoacoustic characteristics, the emotional and mental status of the individual is impacted differently. Currently, various tools are used to characterize self-reported tinnitus severity, such as the Tinnitus Functional Index (TFI) and Tinnitus Handicap Inventory (THI). The current standard methods of characterizing subjective tinnitus can take significant time to complete, resulting in patient fatigue and burden when monitoring changes in tinnitus severity related to treatment. The 10-question tinnitus severity short form (TSSF) was developed by combining five questions each from THI and TFI. To apply the TSSF properly, validation techniques are required to demonstrate the psychometric integrity of the TSSF. Our research aimed to assess the reliability and validity of TSSF. During the evaluation of construct validity, we found a strong correlation between TSSF and tinnitus catastrophizing scale (r=0.81) using 1-way analysis of variance analysis. Furthermore, we observed that participants with bothersome tinnitus had higher TSSF scores (difference=29.4 points, 95% CI: 24.8 to 34.0) than participants with non-bothersome tinnitus. As measured by Cronbach alpha of 0.96, the TSSF was shown to have very good internal consistency. The results of our study suggest that TSSF is a reliable and valid patient-reported outcome measure in participants affected by bothersome tinnitus. The results are consistent with the hypothesis that the TSSF would be validated in a new cohort of participants.

This project was supported, in part, by the National Center for Advancing Translational Sciences at the National Institute of Health grant TR002344.

**Poster A-95**

**COMPARISON OF THE EFFICACY OF FLUOROSCOPIC AND ULTRASOUND GUIDED HIP ASPIRATION FOR PERIPROSTHETIC JOINT INFECTIONS**

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Image guided aspiration is a method that is both diagnostic and used for treatment for periprosthetic hip aspirations (PIIs). The most used methods through ultrasound guidance and fluoroscopic guidance. Since there is still a lack of consensus on which method is preferred, this study serves to add to this discussion. The purpose of this study is to compare the efficacy of ultrasound-guided (US) and fluoroscopic-guided (FL) hip aspiration for suspected periprosthetic joint infection (PJI) in patients with total hip arthroplasty (THA). This is being studied to determine which modality has higher diagnostic performance and support the use of that method over the other. This is a retrospective study where THA patients who underwent ultrasound hip aspiration between January 2011 - December 2022 were compared to patients who received fluoroscopy hip aspirations between January 2021 - December 2022. Demographic information in addition to clinical, serum, synovial, and intraoperative parameters were reviewed from clinical charts and recorded for all patients. The 2018 Musculoskeletal Infection Society Criteria was used as the standard of reference. Diagnostic performance was compared by evaluating the sensitivity, specificity, and accuracy of each modality. After analysis of the results, Ultrasound is a more efficacious method of imaging guidance for THA aspiration in patients with suspected PJI. There is existing literature related to this topic. Studies have been done that discuss the value of utilizing fluoroscopy in the setting of suspected PJI and another that demonstrates that ultrasound performs better than fluoroscopy. This is significant due to the higher frequency of use of fluoroscopy over ultrasound in these cases. The results if this study can provide an argument that ultrasound should be used more frequently to provide more efficacious outcomes for patients with suspected PJI.
**Poster A-96 (Oral)**

**EXPRESSION AND LOCALIZATION OF KDM6A IN TUMORS AND THE SURROUNDING PREMALIGNANT SKIN**

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Cutaneous squamous cell carcinoma (cSCC), a keratinocyte carcinoma, is amongst the most common cancers in humans. Typically, cSCC is curable by surgical excision, but some cases of cSCC recurrence ultimately metastasize which significantly elevates mortality risk. KDM6A is a known tumor suppressor gene that is commonly mutated in multiple cancer types, including cSCC. It is unknown when this mutation takes place as 50% of cases have changes in protein expression level or localization. KDM6A in basal cell carcinoma (BCC), another keratinocyte carcinoma, has been shown to have a mutation in 8% of cases. Despite this information, the effect of KDM6A in basal cell carcinoma has not been researched.

In this study, we will explore the role KDM6A has in the pathogenesis of cSCC, BCC and the surrounding skin. The aim of this study is to evaluate human tissues for KDM6A expression and localization in keratinocyte lineage cells. All tissue samples underwent immunohistochemistry (IHC) and immunofluorescence (IF). Staining for DAPI, KDM6A, and K14 were conducted. After the tissue staining, each sample was examined under the microscope and data analysis was made from these images. A deficiency in KDM6A expression was seen starting in the peritumoral stage of cSCC but in half the cases, there were no clear patterns for KDM6A nuclear localization. There were no consistent patterns for both localization and expression of KDM6A in BCC due to lack of cases studied. This study will be vital in laying the foundation for future studies to address the mechanisms involved in skin cancer formation and hopefully lead to new strategies to prevent the development and progression of cSCC and BCC.

This work was supported by the Lilly Grant through Washington University School of Medicine-Meharry Summer Research Program.

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**Poster A-97**

**GLIOBLASTOMA MULTIFORME TUMOR VOLUME AND PERSISTENCE OF CHIMERIC ANTIGEN RECEPTOR T CELLS FOLLOWING TREATMENT**

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Glioblastoma Multiforme (GBM) is one of the most common and aggressive high-grade primary brain tumors that arises from the glial cells of the central nervous system and occurs most often in the frontal and temporal lobes. Despite current treatment options, long-term prognosis of GBM remains low with...
no significant improvement rates. Chimeric antigen receptor (CAR)-expressing T cells target the B cell marker CD19 and have shown increased efficacy in B cell lymphomas, and lymphoblastic leukemias suggesting benefits in GBM. This study aims to quantify the persistence of CAR-T cells in the context of GBM tumor volume following neurosurgical debulking procedure. A radiology software known as the mint Lesion was utilized to provide Tumor Response Assessment by Criteria (TRAC) reports that consist of volumetric measurements of the tumor lesions (target enhancing lesions, non-target enhancing lesions, and non-target non-enhancing lesions). Fluorescence-activated cell sorting (FACS) analysis takes a sample mixture of cells and sorts them into different populations based on specific biomarkers and characteristics. B7-H3 CAR-T cell persistence was increased in patients with a larger post-surgical tumor volume (3.04% Subject 001 with 2438 mm² volume and 2.38% Subject 003 with 224 mm² tumor volume). However, the number of CAR-T cells per 1 mm² was significantly reduced in patients with a larger post-surgical tumor volume (0.0012 cells/mm² Subject 001 and 0.010 cells/mm² Subject 003). This study shows that although there is an overall increased CAR-T cell persistence for a larger tumor volume, the number of CAR-T cells per 1 mm² is significantly smaller for larger tumor volumes, while illustrating that a larger post-surgical tumor bulk volume is correlated with an increased CAR-T cell persistence within 1-week post-infusion. These findings provide novel information and complement other correlative studies as part of the Phase 1 interventional clinical trial for glioblastoma patients.

This project was supported and funded by the Stanford Medicine REACH-HBMC Summer Research Program.

**Poster A-98**

**FORECASTING BIOPHARMA SUPPORT FOR THE NATIONAL CENTER FOR CLINICAL TRIAL DIVERSITY AT MEHARRY MEDICAL COLLEGE**

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The National Center for Clinical Trial Diversity (NCCTD) at Meharry Medical College (MMC) aims to increase patient diversity in clinical trials by educating underrepresented minority clinicians. The success of this initiative depends on key sponsors and stakeholders. Analyzing the biopharma landscape for potential partnerships is crucial, with businesses with high Good Pharma Scorecard scores playing a crucial role in increasing clinical trial diversity. The NCCTD, housed at an HBCU medical school, aims to bridge the gap by identifying top biopharma companies and predicting their support and collaboration. The purpose of the study was to assess biopharmaceutical companies for potential partnership with NCCTD using an updated readiness scale and regression analysis. Data was collected from various sources, including company websites, databases, and Fierce Pharma's Big Pharma Revenue Report. Statistical analysis was conducted on 24 big pharma companies, focusing on structured outcome measures such as commitment to training diverse clinical trial investigators and participants, public expressed commitment to clinical trial diversity, and a readiness-to-invest scale for partnership with the NCCTD. Simple linear regression was used to test if a company's revenue significantly predicted readiness-to-support. Simple linear regression was used to test if a company's revenue significantly predicted readiness-to-support. It was found that revenue did not significantly predict readiness-to-support NCCTD. The study does not support the idea that revenue predicts readiness to support NCCTD, but there are limitations and opportunities for improvement. The NCCTD, which is housed at an HBCU medical school, hasn't been analyzed to see which pharmaceutical companies would be most ready or likely to partner with it.
This project was supported by the Center of Excellence COE/Office of Dean, Meharry Medical College School of Medicine, Grant Number: D34HP16299 & Clinical Research Associates (CRA)

**Poster A-99**

**SLEEP QUALITY OF MEDICAL STUDENTS**

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This observational, cross-sectional study analyzes sleep quality, duration, and efficiency of medical students. We predicted that second year (M2) medical students would have worse sleep quality, decreased sleep duration, and decreased sleep efficiency when compared to first year (M1) medical students. The Pittsburgh Sleep Quality Index (PSQI) was used to measure sleep quality in the past month. The PSQI also measured estimated sleep duration and estimated sleep efficiency. The actigraphic wristwatch obtained objective sleep measures for 7 nights. The actigraph watch recorded actual sleep duration and efficiency. Participants wore the actigraph watch for 8 days, and completed the PSQI on day 8. No significant differences were found between the PSQI scores of M1 and M2 students. Average PSQI score of M1 students was 5.4 and average PSQI score of M2 students was 6.0. A PSQI score <5 is considered good sleep quality. Only 7 out of 18 participants had good sleep quality; 2 M1 students and 5 M2 students. A one-tailed unpaired t-test was performed and found a P value of 0.3509. No significant differences were found between estimated and actual sleep duration or efficiency. This indicates that participants had an accurate estimation of their sleep quality. Neither sleep duration or sleep efficiency had statistically significant differences between M1 and M2 students using one-tailed unpaired t-tests. It is important to note the small sample size (n=18) of our study. We will continue to collect data and increase the number of participants. Studies that investigate sleep quality of medical students have not compared subjective data to objective actigraph data. The literature has repeatedly found poor sleep quality in medical students (Alotaibi et al., 2020) (Chen et al., 2020). Further research is needed to determine the causes of this and determine ways to improve sleep quality among medical students.

This project was supported, in part, by Center of Excellence COE/Office of Dean, Meharry Medical College School of Medicine, Grant Number: D34HP16299

**Poster A-100 (Oral)**

**EVALUATING THE CARDIOVASCULAR TOXICITY OF ANDROGEN DEPRIVATION THERAPY USING INDUCED-PLURIPOTENT STEM CELLS**

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Prostate cancer is the most prevalent malignancy in men in the United States. According to the National Cancer Institute, there will be an estimated 288,000 new cases of prostate cancer in 2023, which is 14.7 percent of the new case cancer burden in the United States.\(^1\) The standard treatment for prostate cancer is Androgen Deprivation Therapy (ADT). Leuprolide, a gonadotropin-releasing hormone (GnRH) agonist, is the most used ADT drug agent and is coupled with an androgen receptor blocker, such as bicalutamide, to mediate the mechanistic upregulation of testosterone observed at the start of therapy. Despite its therapeutic benefit against prostate cancer progression, ADT causes an increased risk of cardiovascular mortality in patients with or without pre-existing cardiovascular disease. Consequently, cardiovascular disease is the most common non-cancer-related cause of death in men with prostate cancer. Current literature shows that leuprolide is associated with an increase in cardiovascular disease; however, the mechanism is poorly understood. Endothelial cells derived from induced pluripotent stem cells (iPSC-EC) were used to test the cytotoxicity of leuprolide and bicalutamide to the endothelium. Using reactive oxidative species (ROS) production, cellular migration and proliferation, and angiogenesis, endothelial cell function was measured. Here we report that leuprolide failed to show evidence of endothelial cell damage; however, bicalutamide showed increased ROS production, alteration of angiogenesis, and obliterated cell migration and proliferation. Though we observed no evidence that leuprolide exhibits no direct toxicity to endothelial cells, its effect on the myocardium must be studied. Additionally, the cardiovascular toxicity observed clinically by leuprolide may be mediated by hormonal imbalances following medical castration, in which testosterone is known to be cardioprotective. On the contrary, iPSCs treated with bicalutamide exhibited severe cellular toxicity. Thus, iPSCs may be used to predict patient-specific drug toxicity and personalize cancer therapeutics.

This project was supported in part, by American Heart Association Strategically Focused Research Network.

SCHOOL OF APPLIED COMPUTATIONAL SCIENCES

Poster B-1 (Oral)
HARNESSING THE POWER OF VOCAL BIOMARKERS IN COVID-19 DETECTION UTILIZING MACHINE LEARNING TECHNIQUES

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The global outbreak of the coronavirus has been one of the most devastating public health emergencies in the past century, revealing a need for greater infrastructure and tools to respond to and prevent public health emergencies. The rapid development of artificial intelligence-based technologies has strengthened the capacity of health care providers to respond effectively and efficiently to public health crises. In this research, we are looking at how machine and deep learning algorithms can be leveraged to detect COVID-19 rapidly and non-invasively via cough audio analysis. A persistent cough is one of the most common symptoms of COVID-19 and can appear within 2 to 14 days after exposure to the virus. A cough recording can be converted into digital signals that can be analyzed by predictive algorithms to determine a COVID-19 positive or negative detection. This application of artificial intelligence provides an opportunity for early detection and treatment, curbing the spread of the virus. The proposed work describes the approach and preliminary experiments that show promising results for COVID-19 detection leveraging vocal biomarkers.
CHATGPT TO HELP DENTAL STUDENTS RETAIN KNOWLEDGE AND ENHANCE PERFORMANCE

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ChatGPT (Chat Generative Pre-Trained Transformer) is a powerful large language model-based artificial-intelligence tool with diverse applications, including serving as a substitute teacher, paper editor, and personal tutor. While its potential has been explored in various academic fields, such as English, software development, and medicine, there is limited research on its implementation in dentistry. In our study, we utilized our current dental course materials, syllabi, and textbooks to investigate ChatGPT’s potential benefits for dental students. The traditional educational curriculum primarily relies on lecture-based courses, where instructors impart knowledge through presentations and discussions. Our research focused on how ChatGPT could complement this approach by providing targeted information, assisting in understanding, and addressing knowledge gaps through interactive questioning. To evaluate ChatGPT’s efficacy in dental education, we conducted an extensive literature review, analyzing previous studies in different educational contexts. We formulated questions aligned with dental course materials and objectives to ensure ChatGPT’s relevance to the specific needs of dental students. Our research encompassed various dental courses, including operative dentistry, nutrition, periodontics, oral radiology, and biology of disease. By applying ChatGPT in these courses, we harnessed its capabilities to generate step-by-step instructions, summaries, and questions to supplement traditional learning methods. We collected and analyzed data on students’ interactions with ChatGPT, assessing usage patterns, engagement levels, and perceived benefits. Our results indicate that ChatGPT has the potential to enhance students’ understanding and knowledge retention. In addition, we found that ChatGPT can effectively provide instructional support and generate relevant content for dental students. In conclusion, our research highlights the novel application of ChatGPT in dentistry and contributes to the limited literature on ChatGPT’s implementation in dental education. Our findings can be used to enhance dental students’ learning experiences, ultimately improving their academic success and future careers. This research was funded by the National Institute of Minority Health Disparities (NIMHD) under grant number U54MD007586.

ENTERIC NEURONAL AND GLIAL GENE PATHWAYS AND THEIR IMPORTANCE IN MAINTAINING GASTROINTESTINAL HEALTH

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The enteric nervous system (ENS), comprised of enteric glia and neuronal cells, controls gastrointestinal functions, including motility, secretion, and local immunity. This study aims to investigate the function of isolated genes and their involvement in oral and gastrointestinal diseases.

Primary enteric neuronal crest (pENC's) cells were isolated from adult female mice (9–10-week-old C57BL/6J [WT, n=4]) intestines. A single-cell RNA sequencing method quantified the expression of over 20,000 individual genes from these cells. Differential gene expression analysis yielded 503 genes with statistically significant upregulation using a p-value of 0.0001 (10^-4). Web-based statistical overrepresentation analysis (ORA) was conducted using WebGestalt, GeneMANIA, and The Kyoto Encyclopedia of Genes and Genomes (KEGG) database to identify transcripts mapping to functional pathways. Five functional pathways were chosen considering their significance to oral and GI diseases: inflammatory bowel disease, taste transduction, insulin resistance, glutamatergic synapse, and the MAP kinase pathway. Many of these genes were found to be expressed in both enteric glial and neuronal cells. The 503 genes were organized into Venn diagrams according to the overlap of expression from the 5 identified ORA pathways, resulting in 29 genes/transcripts of interest. 12 genes had higher expression in enteric neurons, and 17 had higher expression in the enteric glial cells. These genes have varying levels of overlap within these 5 pathways. However, they all have essential roles, from regulating cell growth and propagation to controlling smooth muscle contractions along the GI tract. Many of these genes are associated with numerous conditions, including various types of cancers, due to higher expression levels noted in some genes. This includes colorectal cancer, glioblastoma, and liver cancer. Dysfunction of these genes leads to GI and oral problems alongside many other health conditions that can have lasting impacts.

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The enteric nervous system (ENS), comprised of enteric glia and neuronal cells, controls gastrointestinal functions, including motility, secretion, and local immunity. Since the oral cavity is the beginning of the GI tract, it is likely that the genes isolated from the ENS will also affect oral health. The purpose of this study is to determine which genes are upregulated in enteric glial and neuronal cells. Primary enteric neuronal crest (pENC’s) cells were isolated from adult female mice (9-10-week-old C57BL/6J [WT, n=4]) intestines. The cells were stained to determine glial and neuronal cell markers and sorted respectively using a flow cytometer cell sorter (BD biosciences). Differential expression analysis and visualization was performed using the normalized count file using the visual genomics analysis studio (VGAS). The genes were obtained using NextGen sequencing. The genes were entered in Microsoft Excel and were narrowed down using the filters p-value of (10^-4) and a
protein fold change greater than or equal to log base 2 of 0.585. The Kyoto Encyclopedia of Genes and Genomes (KEGG) database was also utilized to analyze the pathways and the backgrounds of the genes that were found to relate to the enteric glial and neuronal cells. Our data generated from scRNA-seq isolated 23,795 genes from the enteric nervous system of adult female mice. We have identified 503 genes with a significant fold-change in enteric glial cells vs neuronal cells. Our data indicate there are genes that are specifically upregulated in enteric neuronal and glial cells. Studying the effects of these genes can explain how they affect oral and gastrointestinal health.

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**Poster C-4**

**EFFECTS OF TOPOISOMERASE II A INHIBITION ON ORAL CANCER CELL METABOLISM AND CANCER STEM CELL FUNCTION**

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Topoisomerase IIα (TOP2A), an enzyme involved in DNA replication, transcription, recombination, and chromatin remodeling and has been implicated in a variety of human cancers. Role of TOP2A regulation in oral cancer progression is understudied. OP2A plays an oncogenic role in oral cancer cell progression by regulating cancer cell metabolism and stem cell function. To elucidate the effect of TOP2A inhibition on cancer cell metabolism and cancer stem cell self-renewal function. SCC25 oral cancer cell line was maintained in DMEM/F12/Hydrocortisone. For metabolic stress assay, SCC-25 cells are in a microplate. Following overnight incubation, cells were treated with etoposide for 48hrs. For mitostress assay, oxygen consumption rate was determined in cells incubated in medium with glucose, sodium pyruvate, and L-glutamine. Cells were equilibrated in non-CO2 incubator and mitochondrial inhibitors were injected in the sensor cartridge. For the glycolysis stress test, 2-DG inhibits glycolysis to acquire baseline extracellular acidification rate. Western blotting was performed in cell lysates prepared from etoposide treated and control cell line using 1% SDS hot lysis buffer containing inhibitors. Proteins were placed onto nitrocellulose membranes. Membrane was blocked with a milk solution and probed with proteins. Loading control β-actin was used. TOP2A’s inhibition from etoposide decreased mitochondrial respiratory parameters: basal respiration, spare respiratory capacity, ATP production. Survivin and IL-6 showed a significant decrease after TOP2A inhibition. Conversely, the protein expression of cancer stem cell markers Oct-4 and Sox 2 were not altered. Inhibition decreased the mitochondrial respiratory parameters but not the glycolytic function of oral cancer cells. Likewise, the protein expression significantly decreased after inhibition. The signaling was not impacted after inhibition. TOP2A inhibition is efficacious in inhibiting the proliferation of OSCC by decreasing metabolism. Further research on survival signaling and cell cycle events are warranted.

Dental student research is supported by the HRSA-COE funding (D34HP00002) to the School
Opioids, in particular, disrupt signaling in the peripheral and central neurological systems, resulting in euphoria and slowed respiration, which may lead to death. In dentistry, opioids are utilized as pre- or post-operative pain control therapy for patients having surgery. As of 2021, it is estimated that dentists make 15.8% of opioid prescribers and prescribe 8.6% of opioid medications in the United States (Heron, 2021). Wisdom teeth pain and extractions, gingival surgeries, and dental implant placements are the main dental procedures that may require opioid prescriptions. It is recorded that dentists prescribe opioids to more adolescents than medical providers (Reynolds, 2019). An estimated 36.9% of 17- and 18-year-old’s who misused prescription opioids from 2007 through 2010 misused medications from their own prescriptions; notably, 27% of those prescriptions were from dentists (Heron, 2021). The history of opioid abuse and dependency resulted from the most common start of medical prescriptions, many of which were unnecessary. The reduction of unnecessary opioid prescriptions to dental patients can reduce the risk of opioid-related abuse and misuse.: Our research design consists of peer-reviewed literature of data that supports evidence of the relation of opioid misuse and abuse, to the prevalence of prescriptions by practicing dentists. We discovered that dental office visits are a gateway to civilians being exposed and granted access to controlled substances, which has led many people to being victims of addiction and dependence. It is important for dental professionals to be on board with playing a part in the recovery of the opioid crisis. With the help of research, there will be ongoing reasoning and edification of how dentists contribute to the access of opioids to citizens who freely use substances for personal and recreational use.

This project was supported, in part, by Center of Excellence/Office of Dean, Meharry Medical College School of Dentistry, Grant Number: D34HP00002
exhibited clinical and histologic evidence of promoting periodontal tissue regeneration. Demonstrated improvements in clinical attachment levels, probing depth reduction, and radiographic bone fill underscore their positive impact on periodontal health. Patient-specific variables, like smoking and defect/site-related characteristics, including morphology and gingival biotype, markedly affect the potential success of periodontal regeneration. Complex Intrabony defects, characterized by extensive loss of bony height, proximity, and wall count, pose challenges to predictable regeneration. Consequently, a synergistic use of therapies becomes indispensable for optimal outcomes. Furthermore, maintaining achieved progress post-regenerative therapy for periods exceeding ten years mandates a combination of professional maintenance and rigorous home care. Periodontal regeneration in intrabony defects can be effectively facilitated through diverse regenerative approaches. Successful outcomes hinge upon a comprehensive strategy integrating proficient oral hygiene and supportive periodontal maintenance, ensuring sustained benefits. Acknowledging patient-specific and defect-related nuances empowers clinicians to select regenerative therapies, elevating the potential for successful periodontal tissue regeneration.

**Poster C-7**

**EFFICACY OF AI-BASED GRAMMAR AND DENTAL-SPECIFIC ESSAY CORRECTION USING CHATGPT**

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This study investigates the potential of ChatGPT (Chat Generative Pre-trained Transformer), a recently developed advanced AI language model, in advancing grammar correction capabilities, particularly within the realm of dental education. While limited research conducted on ChatGPT’s grammar correction ability due to its novelty, this study aims to shed light on its effectiveness in both general and dental-specific contexts. The study scrutinizes ChatGPT's ability to rectify errors in essays written by first-year dental students, encompassing grammar mistakes and dental-specific inaccuracies. This aligns with the need for precise communication in dental practice, given its specialized vocabulary and terminology. Using a sample of 5 essays from dental students at Meharry Medical College, the study conducts a detailed error analysis. ChatGPT's corrections are manually assessed and compared with the original essays. Our experimental results show ChatGPT's proficiency in correcting both general grammar and dental-specific errors, underlining its potential as a valuable tool for dental education. While limitations such as the small sample size and potential subjectivity in error assessments are recognized, this study lays the foundation for further research and paves the way for future investigations into AI's role in enhancing communication and learning within specialized domains.

**Poster C-8**

**THE ROLE OF FUSOBACTERIUM NUCELATUM IN ORAL CANCER DEVELOPMENT: A LITERATURE REVIEW**
Fusobacterium Nucleatum (F. nucleatum) is a common oral bacterium involved in the formation of dental plaque on teeth and is linked to periodontal disease. F. nucleatum adheres and interacts with other microbial species, tissue cells, and has been detected in gastrointestinal cancer. To date, there is unclear data on the role of the oral pathogen F. nucleatum in oral cancer development. We aim to elucidate the role F. nucleatum in tumorigenesis, particularly as it pertains to oral cancer development, by reviewing the published data. PubMed and Scopus databases were searched for English language literature related to the research question. The following key words were used: Fusobacterium Nucleatum, oral cavity, cancer. Conference papers and review articles were excluded, and only original research papers were screened for relevance and included in the results. Initial database search revealed 60 original articles on Pubmed and 208 on Scopus. Preliminary analysis of relevant papers revealed elevated levels of F. nucleatum in samples obtained from the oral cavity in the presence of gingivitis, periodontal disease, and endodontic lesions. There is an increased prevalence of F. nucleatum in patients with head and neck squamous cell carcinoma (SCC) including oral SCC. Data on the prognostic value of F. nucleatum in oral cancer were conflicted. F. nucleatum could advance carcinogenesis and stimulate tumorigenic growth via a variety of signaling pathways including Toll-like receptors (TLR) signaling via the IL-6-STAT3 axis, chemokines, and E-cadherins. F. nucleatum is a gram-negative, anaerobic bacillus commonly found in the human mouth and gastrointestinal tract. Although the presence of F. nucleatum may worsen the prognosis of cancer survival in other diseases such as colorectal cancer, there are conflicted results of whether the bacterium influences cancer survival in patients with oral SCC. Additional in-depth research at both bench and bedside is warranted to investigate the direct role of F. nucleatum in oral SCC.

Dental student research is supported by the HRSA-COE funding (D34HP00002) to the School of Dentistry, Meharry Medical College, Nashville, Tennessee.

Poster C-9
KNOWLEDGE IS POWER: INCREASING THE DENTAL PUBLIC HEALTH RESIDENCY PIPELINE AMONG UNDERREPRESENTED MINORITY GROUPS

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This research aimed to address the limited availability of advanced training in Dental Public Health (DPH) at dental schools, specifically targeting Meharry Medical College dental students. Our study sought to improve students' understanding of the DPH specialty and identify barriers encountered during the DPH residency application process. Monthly virtual seminars, facilitated by the University of Rochester Medical Center (URMC), were conducted over a one-year period. A pre- and post-survey, consisting of 10 items, were distributed to all dental students (D1-D4) at Meharry Medical College School of Dentistry via SurveyMonkey. The survey assessed students' knowledge of the DPH residency process and identified barriers, particularly among underrepresented minority students. To encourage participation, students who completed both surveys and attended at least 2 seminars received a $15 Amazon Gift Card. Among the survey participants, 77.5% were female, 30% were D3 students, and 75% had limited knowledge of careers in dental public health. Furthermore, 75% expressed discomfort with applying to tuition-based DPH residency programs, and 65% lacked the financial
resources to apply for such programs. These findings highlighted the responsibility of dental institutions to educate future DPH professionals. Additionally, seminars and interventions play a crucial role in increasing the DPH Residency Pipeline and equipping students with the necessary competencies for a successful DPH residency application process. Efforts to address barriers, particularly financial limitations, are essential in promoting dental public health residency programs among underrepresented minority dental students.

This project was supported, in part, by an AAPHD small grant.

SCHOOL OF GRADUATE STUDIES

Poster D-1
ANTIGEN-PRESENTING CELL CORTISOL SIGNALING PROMOTES SALT-SENSITIVE HYPERTENSION IN HUMANS

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Salt-sensitivity of blood pressure (SSBP) is a condition in which high sodium intake causes shifts in blood pressure that are associated with cardiovascular disease and mortality. Recent studies from our lab indicate that increased sodium concentrations activate antigen-presenting cells (APCs), leading to SSBP. Cortisol is known to be correlated to SSBP, but the mechanism of hypertensive pathogenesis is still yet to be understood. We hypothesize that within salt-sensitive individuals, urine cortisol promotes SSBP via ENaC stabilization by activating glucocorticoid receptor (GR) in APCs. To test this hypothesis, we performed bulk RNA-sequencing on monocytes after high-salt exposure and noticed an increase in GR expression. Additionally, we performed single-cell CITE-Seq analysis on peripheral blood mononuclear cells isolated from hypertensive individuals after a rigorous inpatient salt-loading and salt-depletion protocol over a 72-hour period. On the second day when high-salt treatment was introduced, we observed an increase in GR expression within APCs. Conversely, we observed a drop in GR expression on the third day when salt was depleted from the APCs in salt-sensitive but not salt-resistant individuals. We also demonstrated a significant positive correlation in urine cortisol and cortisone levels with changes in systolic blood pressure and pulse pressure, and we observed a negative correlation in plasma cortisol and cortisone with these blood pressure changes. These results suggest that renal cortisol signaling plays an important role in SSBP pathogenesis.

Poster D-2
MAPPING THE CELLULAR COMPOSITION OF RESECTED CORTICAL TUBERS AND PERITUBERAL TISSUES

Jerome S. Arceneaux¹, Rohit Khurana², Asa A. Brockman², Mary-Bronwen L. Chalkley², Laura C. Geben³, Robert P. Carson³,⁴,⁵, Bret C. Mobley⁶, Kevin C. Ess²,⁴,⁵, and Rebecca A. Ihrie²,⁷
Tuberous sclerosis complex (TSC) arises due to heterozygous mutations in \textit{TSC1} or \textit{TSC2} and affects approximately 1 in 6000 births. Neuropsychiatric symptoms of this disorder include autism spectrum disorder (ASD), developmental delay, intellectual disability, and epilepsy. Mutations in \textit{TSC2} are often associated with worse symptoms and severity. Epilepsy in TSC patients is often refractory to drug treatment, sometimes requiring surgical resection. Within resected brain tissues from patients with TSC, detection of enlarged “balloon cells” is diagnostic for this disorder. Analysis of tubers and perituberal tissues indicates seizures in TSC originate in the perituberal tissues, and “balloon cells” may exhibit loss of heterozygosity (LOH) of \textit{TSC1/2} in otherwise heterozygous tissue. Though mutations in \textit{TSC1/2} lead to epilepsy and cause mTORC1 hyperactivation, unified criteria to identify “balloon cells” and infer their lineage are lacking, and these diagnostic cells have not been studied across broad TSC cohorts at the protein level. In addition, how “balloon cells” may influence their microenvironment to produce epileptogenic foci is poorly understood. Using a custom antibody panel, where each of thirty-six (36) antibodies was successfully tested on known positive and negative controls, we have identified through immunofluorescence probable colocalization of lineage markers as well as signaling readouts of mTORC1 hyperactivation. In addition, we developed customized machine-learning workflows that 1) identify prospective “balloon cells” with 93% precision and 69% efficiency within archived cortical tubers and 2) can map the cytoarchitecture and signaling perturbations within tissue samples, with a specific focus on “balloon cells” and their immediate neighbors. These data will comprise a rich dataset for understanding the abundance, structure, and signaling activity of progenitor-like, neuronal, and glial cells within archived tubers and perituberal tissues, enabling quantitative comparisons of TSC with other mTORopathies and assaying possible therapeutic targets.

\textbf{Poster D-3} \\
\textit{TRYPANOSOMA CRUZI} EXTRACTS ALTER TRIPLE NEGATIVE BREAST CANCER TRANSCRIPTOME PROFILE

\textbf{Destiny Ball}\textsuperscript{1}, Kayla J Rayford\textsuperscript{2}, Ayorinde Cooley\textsuperscript{2}, Pius Nde\textsuperscript{2} and Amos M Sakwe\textsuperscript{1} \\
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Breast cancer (BC) is categorized into five subtypes: normal breast, Luminal A, Luminal B, HER2+, and Triple negative. Triple negative breast cancer (TNBC) is the most malignant BC subtype, and is diagnosed in up to 20% of all breast cancers. Compared to other invasive cancer types, TNBC cells lack estrogen, and progesterone receptors, as well as human epidermal growth factor receptor 2 (HER2), resulting in resistance to treatments targeting these receptors. Therefore, patients are more prone to relapse, suggesting an urgent need for nonconventional therapeutics to antagonize tumor progression. Epidemiological data suggests that patients infected with some protozoan parasites have lower incidents of cancer. \textit{Trypanosoma cruzi}, an intracellular protozoan parasite, has been reported to have anti-tumor properties, including inhibition of proliferation, immune evasion, and metastasis, in breast cancer models. However, the molecular mechanisms underlying the \textit{T. cruzi} induced anti-tumor capabilities are not well understood. In this study, we evaluated the transcriptomic profiles of two morphologically distinct TNBC cell lines following treatment with cytosolic and crude membrane extracts.
extracts of *T. cruzi* (Tuhaluen strain, clone MMC20A). We isolated total RNA for RNA-seq, performed *in silico* analysis, and validated mRNA expression of selected genes by RT-qPCR. Although both cytosolic and membrane extracts attenuated TNBC viability, the epithelial (basal-like) MDA-468 cells were more sensitive to membrane extracts of *T. cruzi* compared to the mesenchymal-like BT-549 TNBC cells. Both cytosolic and membrane parasite extracts significantly affected the expression of 1138 and 1277 genes in MDA-468 and BT-594 TNBC cells, respectively. We observed that in both cell lines, the membrane extracts were more potent than the cytosolic extracts: 977 versus 421 genes in MDA-468 cells and 1027 versus 862 genes in BT-549 cells, respectively. Gene ontology and KEGG pathway analysis revealed substantial enrichment of MAPK, Cytokine-Cytokine Receptor signaling, and AGE-RAGE proinflammatory signaling pathways. Of the 86 genes validated by RT-PCR, proinflammatory genes such as *JUNB*, *JUND*, *FOSB* and tumorigenic biomarkers such as *EGR1* and *RAGE* were found to be upregulated. Taken together, our study strongly supports evidence of anti-tumor properties of *T. cruzi* protein extracts, which can be exploited to identify novel biotherapeutic interventions for patients with aggressive TNBC.

This project was supported, in part, by NIH/NIGMS SC1GM139814 and NIH U54MD007586.

**Poster D-4**

SPATIAL ANALYSIS OF AIR POLLUTION AND ITS ASSOCIATION WITH COPD AND ASTHMA PREVALENCE: A GIS-BASED STUDY

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Air pollution is a pressing global concern that has well-documented adverse effects on public health. The purpose of this study is to use Geographic Information Systems (GIS) in order to investigate the relationship between air pollution, and the prevalence of Chronic Obstructive Pulmonary Disease (COPD) and Asthma based on specific geographic regions in New York City, NY on a census tract level. A comprehensive spatial analysis was conducted in order to assess the distribution of key air pollutants such as particulate matter 2.5 (PM2.5), nitrogen dioxide (NO2), and sulfur dioxide (SO2). GIS tools were instrumental in mapping these pollutants and identifying specific hotspots of high pollution concentrations while simultaneously determining underlying social and environmental risk factors of these regions. GIS data based on the distribution of COPD and Asthma cases among the population were also analyzed to explore potential associations between air quality and respiratory health outcomes. Preliminary findings reveal a relationship between elevated air pollution levels and increased prevalence of COPD and Asthma in specific geographic regions. These findings have significant implications for public health interventions and urban planning strategies. Identifying high-risk areas can inform targeted efforts to reduce air pollution and improve respiratory health outcomes, particularly in the hotspot regions mentioned. By integrating GIS technology with health data, this study contributes to our understanding of the complex interplay between environmental factors and the prevalence of respiratory diseases, ultimately aiding in the development of evidence-based policies and interventions aimed at mitigating the health effects of air pollution.

**Poster D-5**

THE ROLE OF ANNEXIN A6 IN THE INVASIVENESS OF TRIPLE-NEGATIVE BREAST CANCER
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Triple-negative breast cancer (TNBC) is a subtype of breast cancer that lacks three major receptors: estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER2). It is further characterized by aggressive tumor growth, chemotherapeutic resistance, higher likelihood of relapse, and overall worse prognosis when compared to other breast cancer subtypes. Women of African ancestry tend to be most severely impacted by this disease when compared to Caucasian women, especially among premenopausal women. Clinically, mortality from most cancers is due to the complex process known as metastasis in which tumor cells migrate from their original solid tumors and initiate secondary tumorigenesis in distant organs such as the lymph nodes, lungs, bone, brain, and liver. TNBC, however, is especially difficult to treat due to the lack of hormone receptors and molecular heterogeneity of the tumor, thus limiting the efficacy of numerous therapeutics. Annexin A6 (AnxA6) is a multifunctional calcium (Ca²⁺)-dependent scaffolding protein that, in TNBC, has been implicated in cell proliferation, motility, and drug resistance. It is currently unclear whether altered AnxA6 levels differentially influence the expression of molecular markers of invasion, immune response, and breast cancer stem cells. We hypothesize that high levels of AnxA6 contribute to greater invasive potential for TNBC cells. To test this hypothesis, we isolated the invasive fractions from parental TNBC cell lines, and from non-silencing control AnxA6 expressing and AnxA6 targeting short hairpin RNA transfected (AnxA6 downregulated) model mesenchymal-like and basal-like TNBC cells. We show that invasive fractions from mesenchymal cells express higher levels of vimentin while those from epithelial cells express lower levels of E-cadherin. Epithelial cells lack while mesenchymal-like TNBC cells express the immune checkpoint biomarker PD-L1. Thus far, our data suggest that PD-L1 expression in vimentin-enriched invasive fractions is dependent on AnxA6 with potential implications in immunotherapy.

This project was supported by NIH/NIGMS SC1GM139814, and an Education Gift from Dr. Bernard Crowell.

Poster D-6
QUANTITATIVE PROTEOMICS TO STUDY ALZHEIMER’S DISEASE IN AFRICAN AMERICAN/BLACK ADULTS

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Alzheimer’s Disease (AD) is the sixth leading cause of death in the United States for people ages 65+, however, the African American community is disproportionally burdened with higher incidences of AD diagnosis. Proteomics can help further understanding of molecular contributors to AD through the analysis of post-mortem tissues. The goal of this study is to quantify protein expression changes between cognitively normal (CN) and AD patients within the African American/Black adult population, which few proteomics studies have explored. Post-mortem pre-frontal cortex (PFC) tissues (N = 115) were collected from African American/Black adults enrolled in the Rush Alzheimer’s Disease Center Clinical Core/Minority Aging Research Study/Religious Orders Study/ Memory Aging Project (Rush ADC Clinical Core/MARS/ROSPMAP) late-life AD cohort. Samples were grouped into batches of 16 for preparation with an automated bottom-up proteomics workflow consisting of tandem mass tag pro (TMTpro) reagents. Quality control channels were added to each 18-plex batch (N = 7) and labeled peptides were fractionated and analyzed with high-resolution liquid chromatography-tandem mass spectrometry (LC-MS/MS). Typically, ~4000 proteins are identified in a single batch and identified proteins belong to various biological pathways. This presentation will focus on differences in proteins observed between CN and AD patients and discuss implications of protein pathways towards AD pathogenesis. Additionally, a discussion of how these pathways inform patient heterogeneity and disparities in this population will be included.

This project was supported, in part, by TN Doctoral Scholars Grant, and the National Institutes of Health (R01AG064950, RASR).

Post D-7 (Oral)
IN VITRO MDR1 EFFLUX RATIO CORRELATED TO THE IN VIVO FREE DRUG PENETRATION

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In vitro assays can be used to spare animal studies when the in vitro data can suitably categorize in vivo outcomes. For in vitro assays to be used as a surrogate for in vivo studies a relationship must be established relating the in vitro output to the in vivo outcome. In this study, we hypothesized that relationship between the in vitro efflux ratio in the MDCK-MDR1 V2 assay and the unbound drug concentration in brain relative to blood (Kp_u,u) could be established. To establish a relationship, Novartis compounds with in vivo brain pharmacokinetic data were first identified. This list of compounds was subsequently narrowed to include compounds that also had available brain and plasma protein binding data. The data set enabled the estimation of in vivo brain Kp_u,u without conducting further animal studies. From the set of compounds, a randomly selected subgroup was then assayed and assessed for efflux in the MDCK-MDR1 V2 assay. Our results showed, initial measurements illustrated similar efflux data between work performed in Cambridge and the validation data for the assay performed in Basel. Further efflux measurement of an additional diverse set of Novartis molecules was carried out to achieve a broad distribution of efflux ratios with respect to Kp_u,u. Analysis of the data highlighted an apparent relationship between the in vitro MDCK-MDR1 V2 efflux ratio and the in vivo Kp_u,u, where compounds demonstrating an efflux ratio <2 generally had Kp_u,u values>0.5. By contrast, when the efflux ratio was >10, the Kp_u,u value approached the level of blood contamination in brain. In essence, our MDCK-MDR1 V2 assay established a more clearly defined in
vitro-in vivo relationship that may assist in molecular selection of compounds capable of penetrating the blood-brain-barrier to engage central nervous system targets.

This work was supported, in part, by Pharmacokinetics Sciences in vitro ADME, Novartis Institutes for Biomedical Research, Cambridge, MA.

**Poster D-8**

**DETERMINATION OF TRANSFECTION EFFICIENCY OF TWO (FORMULATIONS) DEGRADABLE LIPID NANOPARTICLES (DLPS) IN PRIMARY T-CELLS AND MACROPHAGES**

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Chimeric Antigen Receptor (CAR) technology has been historically used as a cellular therapy to combat cancer by engineering T-cells which specifically execute an immune response against target cancer cells. Novartis produced the first FDA approved CAR-T therapy, Kymriah, in 2015, however the therapy remains an expensive and limited option for many patients. Recently, lipid nanoparticle (LNP) packaging technology, popularized in the 2020 vaccines against SARS-CoV2 by the likes of Moderna/Pfizer/Biontech, has been used to package biomolecules such as mRNA for delivery to cells. LNPs consist of an array of designed lipids to deliver biomolecule cargo safely and efficiently. Here, we combine the two technologies of CAR and LNPs to develop a novel CAR delivery system and reprogram T-cells in vivo. We examine the capacity for two formulations of LNPs to deliver mRNA cargo to both T-cells and Macrophages. We evaluate delivery of mRNA encoding for green fluorescent protein (GFP) via flow cytometry and microscopy. Additionally, our studies reveal enhancement of mRNA delivery through use of an “improvement reagent”. Collectively, these findings establish the necessary groundwork to show the feasibility of this novel gene therapy technique.

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**Poster D-9**

**HAPLOINSUFFICIENCY OF 3P- SYNDROME, EPILEPSY, AND NEURODEVELOPMENTAL DELAY DUE TO A MICRODELETION OF SLC6A1 AND SLC6A11 AND PROPOSED 4-PHENYLBUTRYATE RESCUE**

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GABA transporters are responsible for the reuptake of γ-aminobutyric acid (GABA) from the synaptic cleft. GABA transporter 1 (GAT-1), encoded by SLC6A1, is abundantly expressed in GABAergic neurons and astrocytes, and GABA transporter 3 (GAT-3), encoded by SLC6A11, is primarily expressed in astrocytes. Mutations in GAT-1 encoding SLC6A1 are associated with a wide spectrum of neurodevelopmental disorders, such as epilepsy syndromes, intellectual disabilities, and autism. While the association of SLC6A11 with disease is uncertain, both SLC6A1 and SLC6A11 are located at the same 3p25.3 chromosome region. A proximal microdeletion of SLC6A1 and SLC6A11 resulting in haploinsufficiency has previously been reported and is reoccurring; however, the functional consequence of the loss of GAT-1 and GAT-3 is unknown. Haploinsufficiency occurs following an inactivation or deletion of a single copy of a wild-type gene that negatively affects normal function. The goal of this research is to characterize the functional consequence of the microdeletion of SLC6A1 and SLC6A11 related to 3p- syndrome and a possible rescue with pharmacochaperoning approach such as 4-phenylbutyrate acid (PBA).

**Poster D-10**

ANALYZING OPIOID-RELATED MORTALITY AND ITS IMPACT ON LOWER SOCIOECONOMIC STATUS COMMUNITIES USING GIS DATA

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Opioids are medications prescribed by doctors to treat persistent or severe pain. Normally, those who use opioids recover from surgery as it attaches to the opioid receptors’ proteins on nerve cells in the brain, spinal cord, and other parts of the body which then block pain messages sent from the body. Although they effectively relieve pain, opioids are known to be highly addictive. The Opioid-related deaths have become a major public health crisis, now being described as an epidemic, its mortality rates have risen to alarming levels in the last few years. In 2021, the CDC recorded 106,699 drug overdose deaths occurring in the United States. Over 75% of these deaths involved an opioid. Opioid-related deaths often occur at higher rates in lower socioeconomic status (SES) communities. The objective of this research was to examine the opioid related mortality rate and how it impacts those who are a part of lower socioeconomic statuses in communities. Stated by WHO, people with low socio-economic status are at higher risk of opioid overdose. Socioeconomic status is the social standing or class of an individual or group, it combines education, income, occupation, wealth, and one’s environmental factors. While research has highlighted the increase of opioid mortality, less attention has been paid to its intersection with socioeconomic status (SES). This study employs Geographic Information Systems (GIS) data to explore the geographical patterns of opioid-related deaths and their implications for communities with lower SES. We conducted a comprehensive analysis of opioid-related mortality data from CDC, CDC Wonder, etc. covering the current period of updated resources. Utilizing GIS techniques, we mapped and examined the data to identify hotspots of opioid-related deaths. As we integrated SES indicators, including income levels, education, and employment opportunities, to assess their correlation with opioid mortality rates.

**Poster D-11**

DIVERSITY OF TISSUE-SPECIFIC NK CELL ANTI-TUMOR EFFECTOR FUNCTION ACTIVITY

Zerick Dunbar¹,²,³, Anil Shanker¹,³,⁴,⁵
Natural killer (NK) cells are critical immune players in cancer progression. Clinical studies have demonstrated a strong role of NK cells in cancer immunosurveillance, and the number of infiltrating NK cells in tumor tissues has been shown to have a significant relationship to a patient’s cancer prognosis. However, the beneficial immunoregulatory and cytotoxic functions of NK cells have yet to be fully harnessed in clinical settings partially due to an incomplete understanding of NK cell activity in peripheral organs. The origins, phenotypes, and functions of tissue-resident versus circulating NK cells remain active topics within NK research. The objective of this work is to elucidate tissue-specific NK cell diversity and function in solid lung tumor microenvironments. Based on preliminary data, we hypothesize that NK cells from different tissue locations display unique functional profiles that can predict NK effectiveness in solid lung tumors. Our data show the biological diversity among NK cells from distinct locations that reflect differences in NK cell interactions with lung tumors. This inference is supported by the heterogeneity of NK cell specific cluster of differentiation marker expression based on flow cytometry analyses using the C57BL/6 WT LL/2 murine metastatic tumor model. Our analysis showed significant differences in the expression percentages and median fluorescence intensity of effector function-associated markers CD244, CD335, CD314, CD18, and IFNAR1 both among tissue locations and in response to solid LL/2 tumors in vitro and LL/2 tumor cell injections in vivo. Differences in both NK cell cytotoxicity and fluorescence intensity upon tumor interaction among different NK-residing tissue locations were also noted. These data combined with immunoregulatory functional marker data underscore the importance of tissue-specific NK cells in solid tumor microenvironments which could lead to advancements in translational NK cell-based cancer immunotherapy approaches for improved patient outcomes.

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remodeling, and wound healing. However, the molecular regulation of PEPD remains largely unknown. We identified overlapping binding sites for the transcription factors Kruppel-like factor 6 (KLF6) and Specificity protein 1 (Sp1) in the human and mouse PEPD promoter and demonstrated that KLF6/Sp1 transcriptionally regulates prolidase expression. By cloning the PEPD promoter into a luciferase reporter and through site-directed deletion, we pinpointed the minimal sequences required for KLF6 and Sp1-mediated PEPD transcription. Inhibition of Sp1 abrogated KLF6-mediated promoter activity, suggesting that Sp1 is required for the basal expression of PEPD. We further studied the regulation of prolidase by KLF6 and Sp1 during transforming growth factor β1 (TGF-β1) signaling since both KLF6 and Sp1 are key players in TGF-β1 mediated collagen biosynthesis. Mouse and human fibroblasts exposed to TGF-β1 resulted in the induction of PEPD transcription and protein expression. Accordingly, inhibition of TGF-β1 signaling abrogated the transcriptional activity of KLF6 and Sp1 on the PEPD promoter. Chromatin Immunoprecipitation studies demonstrated that KLF6 and Sp1 directly bind to the PEPD promoter sequences, and this binding is enhanced by TGF-β1 treatment. Finally, immunofluorescence studies provided strong evidence that KLF6 colocalizes with Sp1 to regulate prolidase expression and enhance collagen synthesis. Knockdown of prolidase also resulted in decreased collagen synthesis. Collectively, our results identify key regions of PEPD promoter for KLF6/Sp1-mediated transcriptional regulation and its effect on collagen synthesis, thus describing the molecular mechanism of prolidase expression.

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**Poster D-13**

LOSS OF MITOCHONDRIAL PROTEIN FUS1/TUSC2 CAUSES EARLY COGNITIVE AND MOLECULAR CHANGES ASSOCIATED WITH ALZHEIMER’S DISEASE (AD)-LIKE DEMENTIA

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The underlying mechanisms driving the development of the different forms of dementia remains elusive and yet to be precisely identified. Calcium (Ca2+) regulates neuronal plasticity underlying learning, memory and neuronal survival. Chronic dysregulation of Ca2+ could lead to brain cell degeneration. Our group has found that mitochondrial protein TUSC2 (Tumor Suppressor Candidate 2), initially named Fus1, is involved in regulation of mitochondrial/cytoplasmic Ca2+ fluxes in cells. Fus1 protein assists in Ca2+ uptake and extrusion. Here we examined the role of Fus1 in memory and neuroimmunity in the Fus1⁻/⁻ mouse model. We used 4-5 month old Fus1⁻/⁻ and Fus1⁺/+ mice. Mice underwent a battery of behavioral test. Independently, immunophenotyping (via flow cytometry) and molecular pathways analyses (via immunoblotting) were performed. Fus1⁻/⁻ mice showed impaired short-term spatial memory (p<0.05), and long-term memory (p<0.05). Immune analysis of Fus1⁻/⁻ brain immune subsets showed changes associated with neurodegeneration. Western Blot analysis of hippocampal tissue revealed increased tauopathy in Fus1⁻/⁻ brain. In addition, prominent activation of mTOR pathway (higher S6 phosphorylation), as well as increased levels of Calbindin (Ca2+-binding protein) were seen in Fus1⁻/⁻ brains. Overall, Fus1 deficiency plays a pivotal role in the development of pathological processes leading to cognitive impairment and AD.
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**Poster D-14**
PROBING THE FUNCTIONAL INTERACTIONS OF RNAs IN EXTRACELLULAR VESICLES

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Normal and diseased cells secrete extracellular vesicles (EVs) from the plasma membrane and late endosomal compartments, and these vesicles can contain proteins, including diverse RNA binding proteins, lipids, and RNAs, including mRNAs, miRNAs, and other noncoding RNAs (ncRNAs). EV-RNA research is a growing field as ncRNAs, particularly miRNAs, are being investigated to further elucidate their potential as therapeutic targets and biomarkers for various cancers. Currently, it is difficult to functionally distinguish RNA from other EV cargoes such as DNA, proteins, and lipids. In general, RNAs are present in cells and EVs as RNA-RNA binding protein (RBP) complexes, so one approach to inactivate RNA could be by crosslinking RNA to RBPs using UV irradiation. I hypothesize that EV-RNA undergoes protein remodeling after delivery into recipient cells, and that this exchange of RBPs mediates RNA function. Therefore, by preventing RNA from dissociating from donor RBPs and interacting with recipient RBPs through UV crosslinking, EV-RNAs should lose function in recipient cells. In order to achieve this, donor cells will be treated with 4-thiouridine (4-SU), EVs will be purified and crosslinked with 365 nm light, treated to recipient cells, and the effect of crosslinked RNA in recipient cells will be observed. 4-SU is a photoreactive nucleoside analog, that after incorporation into the nascent RNA transcript can crosslink RNA to interacting RBPs in the presence of UV light. I will also use this crosslinking method to identify specific RBPs that are crucial for EV-RNA delivery and function in recipient cells. This approach will directly address the question of whether EV-RNA function after delivery to recipient cells is mediated by an exchange of RBPs. I plan to test miRNA, siRNA, and mRNA function using this method, and also identifying the critical assortment of RBPs associated with EV-RNA function.

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**Poster D-15**
SPATIAL PROTEOMICS REVEALS BREAST CANCER CELLS ARE REPROGRAMMED IN THE ENDOSTEAL NICHE AND EXPRESS DORMANCY AND CELLULAR STRESS MARKERS

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Breast cancer cells frequently metastasize to bone and home to the endosteal niche (bone surface), where they are thought to lay dormant until reactivated. However, our knowledge of how tumor cells are impacted by the bone microenvironment is limited, as the spatial integrity of bone is often compromised for analyses. To assess how tumor cells are reprogrammed by the bone in situ, we performed Digital Spatial Profiling (DSP) on tumor bearing bones from 6-wk-old female C57Bl/6 mice two weeks after inoculation with E0771 mouse mammary carcinoma cells by intracardiac injection (n=3/group) and evaluated tumor cells residing in the marrow or at the bone surface. Mice were treated with α-PD-1 every 3-4 days, which resulted in larger tumors within the bone microenvironment, suitable for DSP analysis. Antibodies for 70+ proteins involved in immune activation, cell death, proliferation, and cell stress, were hybridized to formalin-fixed paraffin-embedded tibial sections, then released and quantified within regions of interest (ROIs, n=8-12/bone) using Nanostring GeoMx/nCounter instruments. We used DAPI, pan-cytokeratin, and α-CD45 to identify nuclei, tumor, and immune cells respectively. We found increased γH2AX (13.5%, p<0.0148) and decreased MEK1 (16.6%, p<0.0068) in tumor cells localized to bone surface (n= 32 ROIs/group), compared to tumor cells in the marrow, suggesting the endosteum increases tumor cellular stress leading to DNA damage and reduced proliferation. MEK1 regulates ERK1/2, and low ERK1/2 induces breast cancer dormancy; our data suggest this may be linked to cellular stress. Androgen receptor (AR) was also enriched in endosteal tumor cells (41.7%, p<0.0420) and has been linked to poor outcomes in breast cancer, suggesting dormant AR+ tumor cells at the bone surface may be a potential source of metastatic recurrence. Taken together, our data suggest that the endosteal niche reprograms breast cancer cells into latency but promotes expression of markers that may ultimately reduce survival.

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Poster D-16
DIAGNOSIS OF SALT SENSITIVITY OF BLOOD PRESSURE USING CIRCULATING MONOCYTE ISOLEVUGLANDINS AND CXCL8 SIGNALING IN RESPONSE TO ELEVATED SODIUM IN VITRO

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Salt sensitivity of blood pressure (SSBP) is when blood pressure changes parallel to salt loading/depletion and is an independent risk factor for cardiovascular disease. There is currently no feasible diagnosis, limiting identification of therapeutic targets. Our studies indicate that changes in production of isolevuglandins (IsoLGs) in antigen presenting cells (APCs) parallel changes in blood pressure following salt-loading and depletion in humans and are associated with chemokine signaling. We hypothesized that in vivo responses to salt-loading/depletion leading to IsoLG production in APCs are mirrored in vitro. To test this hypothesis, we isolated peripheral blood mononuclear cells from known salt-sensitive and salt-resistant people and treated them with either normal(140 mmol/L) or high(190 mmoL) salt for 24 hours in vitro. Using flow cytometry, we found that classical monocytes
from salt sensitive people had a significant increase in IsoLGs (25.15 ± 7.41 vs 14.52 ± 8.60, p = 0.0022) after 24 hours of high salt treatment. To determine mechanisms, we also performed bulk RNAseq on in vitro high salt treated monocytes and CITeseq on PBMCs following the salt-loading/depletion protocol. We found that salt-loading/depletion was associated with parallel changes in the expression of various CXCL chemokines in vitro and in vivo. Specifically, the changes in levels of CXCL8 (p = 0.01553, r = 0.8067) correlated with changes in diastolic and systolic blood pressure from salt loading to depletion. We also found by using ELISA, that CXCL8 is upregulated upon high salt intake. This datum suggests that moving forward in vitro responses of IsoLGs and chemokine production to salt treatment could serve as a feasible diagnosis for salt sensitivity of blood pressure and as a connection between high salt intake and metabolic switching.

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Poster D-17
EXPLORATION ANALYSIS OF TRIPLE NEGATIVE BREAST CANCER (TNBC) IN THE NCI GENOME DATA COMMONS

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Triple Negative Breast Cancer (TNBC) is a disease that causes about 685,000 deaths globally annually. While Caucasian women are statistically more susceptible of getting TNBC, African American women are statistically more susceptible to dying from TNBC. Therefore, it is extremely important to explore the factors involved in this health disparity. Overall, the project aims to explore TNBC in the NCI Genome Data Commons database. Public, collected data from this database will be used to run a transcriptomics analysis of differentially expressed genes in African American women versus Caucasian women. WEBGESTALT will then be used to see the different pathways from the differentially expressed genes and to make more commonalities between the two sets of genes. After, GeneMania will be used to see more connections between the differentially expressed genes gathered via physical interaction, co-expression, co-localization, etc.

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Poster D-18
MORPHOLOGIC CHANGES AND EXPRESSION OF EPITHELIAL TO MESENCHYMAL TRANSITION (EMT)-RELATED MARKERS IN HUMAN HPV-IMMORTALIZED ECTOCERVICAL CELLS EXPOSED TO CIGARETTE SMOKE CONDENSATE

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High-risk human papillomavirus (HR-HPV) such as HPV16 is a major known risk factor for cervical cancer (CC). Studies revealed that cigarette smoking is also associated with CC; however, the underlying molecular mechanism(s) remains unclear. Tobacco components have been found in the cervical mucus of women smokers. Our objective was to determine the potential effects of cigarette smoke condensate (CSC; 3R4F) on human ectocervical cells (HPV16 Ect/E6E7). HPV16 Ect/E6E7 cells were exposed to CSC at concentrations of 1 x 10^{-6} \mu g/mL-100 \mu g/mL. Cell proliferation was measured by MTS assays. Cell morphology was determined by light and transmission electron microscopy, and expression of EMT markers E-cadherin (CDH1) and vimentin (VIM) were evaluated by immunofluorescence (IF), confocal microscopy, and western blotting, Cell Migration was measured by using a wound-healing assay. Results: CSC induced increased proliferation in ectocervical cells at 1 x 10^{-6} \mu g/mL-10 \mu g/mL for 24h, 48h, and 72h. Cells exposed to CSC (10 \mu g/mL) had morphologic changes that consisted of a loss of their “cobblestone” appearance with a shift toward a “spindle-like” morphology. Ultrastructural changes showed CSC-treated cells were enlarged nearly 1.5 times that of controls. Additionally, these cells had decreased surface filopodia, and cytoplasmic swelling. We found a significant reduction in E-Cadherin expression in CSC-treated cells, compared to controls at 24h, which remained reduced at 72h and 168h. We found CSC-treated (10 \mu g/mL) cells migrated and completely closed the wound space by 72h compared to controls. Our data suggest that CSC induces EMT in human cervical epithelial cells. CSC can induce EMT in ectocervical cells which may be a molecular mechanism important in the progression of CC.

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Poster D-19
RESTRICTION ACTIVITY OF APOBEC3G AND URACIL DNA GLYCOSYLASE DURING EARLY HUMAN IMMUNODEFICIENCY VIRUS TYPE-1 INFECTION

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Human apolipoprotein B mRNA-editing enzyme, catalytic polypeptide-like 3G (APOBEC3G, A3G), is a member of the cytidine deaminase family that has been identified as a host restriction factor. It restricts human immunodeficiency virus type 1 (HIV-1) replication by targeting HIV-1 reverse transcription and converting cytosine to uracil in minus–stranded HIV-1 DNA, ultimately inducing lethal G to A hypermutations in nascent viral DNA. Uracil DNA Glycosylase (UNG or UDG) is a DNA repair enzyme that performs an essential base excision repair function in preventing mutagenesis caused by cytidine deamination, the process by which an organism’s DNA changes, resulting in gene mutation. Regarding HIV-1 infection, it has been reported that UNG inhibits the production of HIV-1’s cDNA by triggering the base excision repair (BER) pathway and removing uracil from DNA (uracilization), thus preventing viral integration. However, it is still debating whether the antiviral function of A3G and UNG are interconnected during HIV replication. In this study, using the CRISPR Cas9 technology, we knockout UNG in human CD4+ T cell lines. Using these cell lines, we
interrogated UNG and A3G antiviral function against wildtype HIV-1. We found both G to A hypermutation rate and viral infectivity increased in an A3G dependent manner when UNG was knocked out. These results suggest that UNG antiviral function depends on the presence of A3G. This study will lay a foundation for revealing a novel antiviral mechanism of UNG and shed light on future antiviral development.

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**Poster D-20**

THE MECHANISM OF FUS1/TUSC2-MEDIATED CANCER IMMUNOSURVEILLANCE

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Tumor suppressor candidate 2 (TUSC2/Fus1) was first discovered as a tumor suppressor gene (TSG) located within the frequently deleted chromosomal region 3p21.3, in patients with non-small cell lung carcinoma (NSCLC) and mesothelioma, as well as in other types of cancer. Studies on Fus1 from its discovery until now have showed that it plays a vital role in normal immune function and its loss leads to autoimmune disease as well as impaired innate immune responses. In addition, Fus1 plays an anti-aging role, protecting olfaction, hearing, cognition, etc. On the cellular level, Fus1 regulate mitochondrial calcium homeostasis, ROS production, energy metabolism and other functions linked to mitochondria. Fus1 loss has been studied profoundly in NSCLC, breast, ovaries, and thyroid cancers. Restoration of Fus1 expression in Fus1-deficient cancer cells decreases cellular proliferation and induces apoptosis. The exact mechanism of Fus1 function in immune cells is not fully understood. The primary objective of this project is to understand the mechanism by which Fus1 affects immune cell activities. The first aim of this project is to Characterize the immune cells and tumor-infiltrating leukocytes (TILs) in Fus1-deficient vs Fus1-proficient environment. It is addressed by dissection of two groups of mice, one is Wild Type (WT), the other is Fus1 Knockout (KO). Lymph nodes and spleens were harvested from each group, immune cells were plated and stained by specific fluorescent labeled antibodies against markers that identify immune cells, their activation statuses, and markers of specific functions like checkpoint molecules on T cells and macrophages. These stained cells were run on flow cytometry machine and the data output were analyzed using FlowJo software. The numbers of B lymphocytes and macrophages are high in Fus1 KO mice when compared with WT mice, while the expression of PD-L1 is lower in Fus1 KO macrophages. CD4 T cells and T reg cells are slightly lower in number in Fus1 KO mice when compared with WT mice, while granulocytes are high in KO mice. Th1, Th2, and Th17 showed no difference between the two groups of mice. PD1 and PD-L1 on CD8 T cells also showed no big changes between the two groups of mice. This preliminary data from the two groups of mice (Fus1 WT and Fus1 KO) under naïve conditions are showing the initial differences between the immune cells due to the effect of Fus1 loss. It will help us to understand the immune response of these mice when we challenge them with cancer cell lines inoculation.

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TARGETING SIALIC ACIDS WITH STREPTOCOCCAL ADHESIN PROTEINS

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Sialylated glycans (sialoglycans) are important for many biological functions and are ubiquitous in both bacterial and mammalian cells. When found on mammalian cell surfaces one function is to act as ligands for sialic-acid-binding immunoglobulin-like lectins which suppresses autoimmunity. Likely linked to the attenuation of the immune response, aberrant glycosylation is associated with initial oncogenic transformation and promotes metastasis. This could make sialoglycan detection on cell surfaces a new way to distinguish cancer cells. Unfortunately, sialoglycans are challenging to identify using traditional antibody probing due to poor immunogenicity. Mass spectrometry is another glycan characterization technique; however, it is unreliable because the process causes a breakdown of linkages between the monosaccharides. Hence, better ways to detect the presence of sialoglycans is needed. In this work, we used bacterial sialoglycan-binding proteins as an engineering scaffold to build a library of probes specific for cancer-associated sialoglycans. The first target sialoglycans are 6-sulfo sialyl LewisX and sialyl LewisX, which are over-represented in colon and breast adenocarcinomas. The starting scaffolds are the Siglec-like binding region (SLBR) from Streptococcus sanguinis strain SK678 (SLBRSK678) and Streptococcus gordonii strain UB10712 (SLBRUB10712). SLBRSK678 and SLBRUB10712 are broadly selective and bind to several sialylated glycans. Here, we have engineered SLBRSK678 and SLBRUB10712 to create SLBRUB10712E285R/Q354D and SLBRSK678E298R/Q367D, both of whom are more selective for a single sialoglycan, 6-sulfo sialyl LewisX. This change is shown through an ELISA assay where an almost 2-fold decrease in binding to other sialoglycans was measured, indicating that SLBRUB10712E285R/Q354D and SLBRSK678E298R/Q367D are more selective for 6-sulfo sialyl LewisX than their wildtype counterparts. Additionally, we determined a 2.1-angstrom resolution structure of SLBRUB10712E285R/Q354D using X-ray crystallography. Overall, these findings are the starting point that will lead us toward a library of detection probes that could be used as a new screening technique for better detection and identification of sialoglycans.

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CYCLOPHILIN A PROMOTES HIV-1 PRE-INTEGRATION COMPLEX (PIC) FUNCTION

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Poster D-22
Cyclophilin A (CypA) promotes HIV-1 infection by directly binding to the viral capsid (CA). CypA stabilizes the viral capsid and regulates the utilization of capsid binding host factors to facilitate HIV-1 reverse transcription and nuclear entry. Disruption of CypA-CA interaction also influences HIV-1 integration into the host chromosomes. However, a direct role of CypA on post-nuclear entry steps of HIV-1 infection remains largely unknown. Our laboratory reported that CA is functionally associated with the HIV-1 preintegration complex (PIC) and plays a direct role in PIC-mediated viral DNA integration. Recent studies also suggest that an operationally intact HIV-1 capsid enters the nucleus and reverse transcription is completed after nuclear entry. Therefore, we tested whether CypA-CA interaction directly affects viral DNA integration. To test this, we extracted PICs from CypA deficient Jurkat T cells (CypA−/−) inoculated with wild-type HIV-1 particles. We detected a marked reduction in viral DNA integration activity of PICs from CypA−/− cells compared to those from CypA+/+ cells. Notably, PIC activity was also stimulated in the presence of purified CypA protein. To further probe CypA’s role in PIC function, we extracted PICs from TRIM5α−/− and CypA−/−+TRIM5α−/− cells. We observed that TRIM5α depletion minimally affected PIC activity. However, PICs extracted from CypA−/−+TRIM5α−/− cells retained markedly lower integration activity relative to the wild type cells but the integration activity was higher when compared to CypA−/− cells. These results strongly suggest a functional role CypA in HIV-1 PIC function. Studies are currently underway to define whether the effects of CypA on PIC-mediated integration are direct or due to lower viral DNA synthesis and/or lower efficiency of nuclear entry. Collectively, these studies will define a direct role of CypA on post-nuclear entry steps of HIV-1 infection.

**Poster D-23**

**SHARED GENETIC ARCHITECTURE AND PLEIOTROPY OF UTERINE FIBROIDS AND BLOOD PRESSURE TRAITS**

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Uterine fibroids (UF) are among the most common gynecologic diseases in females of reproductive age, having an estimated cumulative prevalence of 70%, and are the leading cause of hysterectomy in the U.S. UF are highly heritable among 1st relatives (~70%) however, genome-wide association studies only capture a small proportion of fibroid risk. There is a need to better understand the genetic liability of risk for UF and risk factors, like hypertension (HTN). In efforts to understand causal relationships between UF and HTN, we conducted a Bi-Directional, Two Sample Mendelian Randomization (MR) analysis and evaluated the genetic correlations across blood pressure (BP) trait loci and UF. We used
data from two cross ancestry genome wide association study (GWAS) meta-analyses, one of UF (44,205 cases and 356,552 controls), and another of BP phenotypes (including diastolic BP [DBP], systolic BP [SBP], and pulse pressure [PP], N=447,758). Linkage disequilibrium score regression (LDSC) was used to evaluate genetic heritability and correlation of BP phenotypes and UF. Genetic instruments for the MR analysis were selected from summary level data of BP traits and UF by linkage disequilibrium clumping of genome wide significant SNP’s ($P<5e-8$) with an $r^2$ threshold of 0.1. LDSC results indicated a positive genetic correlation between DBP and UF (0.140, $P=0.0004$), and SBP and UF (0.076, $P=0.016$), and PP and UF (0.008, $P>0.05$). MR using BP traits as exposures and UF as the outcome showed that DBP and pulse pressure both increase risk for UF (b=0.024, $P=0.002$ and b=-0.010, $P=0.0008$, respectively). These data suggest that there is a relationship between BP and UF where an mmHg unit increase in blood pressure increases risk for UF, providing evidence pointing to possible shared biological pathways between the conditions.

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**Poster D-24 (Oral)**

**THE USE OF GEOGRAPHIC INFORMATION SYSTEMS (GIS) TO EVALUATE THE ASSOCIATION OF GESTATIONAL DIABETES WITH MATERNAL OBESITY IN AFRICAN AMERICAN AND HISPANIC WOMEN ACROSS THE UNITED STATES**

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Maternal obesity in the United States has been identified to be a preceding linkage to multiple pregnancy complications and adverse outcomes. Maternal obesity is associated with a six-fold risk for gestational diabetes mellitus (GDM). Mothers diagnosed with GDM are more likely to develop hypertension and pre-eclampsia during their course of pregnancy. Over the years, the rate of maternal obesity has risen from 26.1% in 2016 to 29.0% in 2019. Specifically, maternal obesity differs across the many states dependent on factors such as age, race, education, and socioeconomic status. Studies have shown that mothers of Hispanic origin and Non-Hispanic African American women are at a greater risk for maternal obesity. To date, the use of Geographic Information Systems (GIS) has not been utilized to evaluate the association of GDM with maternal obesity in minority populations in the United States. Spatial epidemiology is crucial in assessing risk factors contributing to the increased prevalence of GDM in mothers. The aim of this study will be to utilize GIS to model the various demographic and sociocultural factors contributing to GDM in minority maternal populations across the United States using available Natality data for 2016-2021 (CDC Wonder).

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**Poster D-25 (Oral)**

**GAMMA INTERFERON-INDUCIBLE PROTEIN 16 REGULATES HYPOXIA-INDUCED APOLIPOPROTEIN L1 EXPRESSION IN HUMAN PODOCYTES**

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Genetic risk variants (RVs) of Apolipoprotein L1 (APOL1) have been strongly associated with an increased risk of non-diabetic kidney diseases and kidney failure in African Americans. These RVs primarily affect podocytes, the crucial cells maintaining the kidney's filtration barrier. According to genome-wide association studies, environmental factors contribute significantly to this association. Recent studies show that hypoxia, or low oxygen tension, upregulates the expression of APOL1 in kidney podocytes. However, the underlying molecular mechanism still needs to be fully understood. The objective of this research is to identify molecular components that regulate APOL1 gene activation in response to hypoxia. To achieve this goal, we exposed human conditionally immortalized AB8/13 glomerular podocytes to roxadustat, a known inducer of hypoxia, or subjected to controlled hypoxic conditions (1% oxygen). We then analyzed changes in APOL1 expression using qPCR and immunoblotting. Our findings revealed that the DNA sensor IFI16 and hypoxia-associated transcription factor HIF-1α are critical components of hypoxia-induced APOL1 expression. We further confirmed the roles of IFI16 and HIF-1α by using siRNA-mediated knockdown and CRIPSR-Cas9 knockout assays. We identified four HIF-1α binding sites within the APOL1 promoter/enhancer sequence through ChIP-qPCR assays. We also determined the cellular localization and interactions between IFI16 and HIF-1α using subcellular fractionation, immunoprecipitation, and western blotting. Collectively, our results strongly indicate that, under hypoxic conditions, IFI16 and HIF-1α cooperate to promote APOL1 expression in human podocytes. These results are consistent with our hypothesis that hypoxic stress leads to upregulation of APOL1 RVs, further exacerbating glomerular podocyte damage. As there are currently no approved therapies specifically targeting APOL1-associated kidney disease, our research may present potential therapeutic targets. By preventing or reducing hypoxia-driven expression of APOL1, we could potentially mitigate the pathogenesis of kidney disease in African Americans carrying APOL1 RVs.

**Poster D-26 (Oral)**

**TRYPANOSOMA CRUZI ALTERS EXPRESSION OF PIRNAS COMPUTATIONALLY PREDICTED TO TARGET PROFIBROTIC AND INFLAMMATORY MOLECULES DURING ACUTE INFECTION OF PRIMARY HUMAN CARDIAC FIBROBLASTS**

Kayla J. Rayford¹, Ayorinde Cooley¹, Ashutosh Arun¹, Siddarth Pratap¹, Pius N. Nde¹

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*Trypanosoma cruzi*, the etiological agent of Chagas Disease, causes severe morbidity, mortality, and economic burden worldwide. Though originally endemic to Central and South America, globalization has led to increased parasite presence in most industrialized countries. About 40% of infected individuals will develop cardiovascular, neurological, and/or gastrointestinal pathologies. Cardiomyopathies induced by chronic parasite infection include hypertrophy, fibrosis, and heart failure. Accumulating evidence suggests that the parasite induces alterations in host gene expression profiles to facilitate infection and pathogenesis. The molecular mechanisms of cardiac remodeling induced by *T. cruzi* remain to be fully understood. The role of regulatory gene expression machinery, particularly small noncoding RNAs, during *T. cruzi* infection, has yet to be elucidated. In this study, we aim to evaluate dysregulation of a class of sncRNAs called piRNAs during early phase of *T. cruzi* infection in primary human cardiac fibroblasts by RNA-seq. We found about 26,496,863 clean reads (92.72%), which mapped to the human reference genome. *T. cruzi* challenge dysregulated expression
of 441 unique piRNAs. *In silico* analysis showed that some of these piRNAs were computationally predicted to target and potentially regulate expression of genes including *IL6, SOCS3, SMAD2, EGR1, ICAM1, CX3CL1,* and *CXCR2,* which have been implicated in parasite infection, pathogenesis, and other cardiomyopathies. We validated the expression of these selected piRNAs and their targets during early parasite infection phase by stem loop qPCR and RT-qPCR, respectively. Further studies are needed to evaluate the exact function of these piRNAs in target gene regulation, which can lead to identification of novel biomarkers and therapeutic targets. Our findings will enhance our understanding of early molecular mechanisms contributing to *T. cruzi* cardiac pathophysiology.

This work is supported by: 1SC1AI27352, F31AI167579, 2T32AI007281-31, 2T32HL007737-26, 5R25GM05994, and U54MD007586.

**Poster D-27**

POLYCYCLIC AROMATIC HYDROCARBONS IN SALIVA SAMPLES OF PEOPLE FROM UNDERREPRESENTED POPULATIONS: IMPLICATIONS FOR PUBLIC HEALTH

Doresha Robinson, Leslie R. Halpern, Janet H. Southerland, Ritu Chauhan, Samuel E. Adunyah, Pandu R. Gangula, Aramandla Ramesh

Polycyclic Aromatic Hydrocarbons (PAHs) are a family of pollutants, released into the environment as a result of combustion activities, which include burning of municipal refuse, coke, graphite electrode, and aluminum manufacturing activities. People working in petroleum industry, firefighting, road paving, jet fuel handling, and coal mining operations represent some of the occupational exposure cohorts that are at risk. Additionally, intake of PAHs is also greater in smokers and barbecued meat eaters. For the past several years, our laboratory has been doing research on the distribution, environmental and biological fate of these toxicants. During the course of an IRB-approved study, we analyzed saliva samples from 63 female participants (37 African Americans, and 26 non-African Americans), who visited Meharry dental clinic for receiving treatment for their injuries arising from Intimate Partner Violence (IPV). The concentrations of PAHs detected in saliva of IPV samples in non-African Americans were generally within the range of these toxicants reported for saliva from elsewhere. On the other hand, the concentrations were high in some IPV positive samples, and more profoundly in African Americans. Our findings call for the need for using saliva as a potential “diagnostic rheostat" to screen for toxicants that may precipitate disease in female victims of IPV. Toxicovigilence is necessary in order to understand the interaction among individual, socioeconomic, lifestyle and occupational factors leading to disparities in health outcomes.

**Poster D-28**

THE KDM5 INHIBITOR PBIT REDUCES PROLIFERATION OF CASTRATION-RESISTANT PROSTATE CANCERS VIA THE INDUCTION OF SENESCENCE

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The compound KDM5 family inhibitor 2-4(4-methylphenyl)-1,2-benzisothiazol-3(2H)-one (PBIT) is an inhibitor of lysine-specific histone demethylases that has been suggested as a potential lead compound for cancer therapy. It has been reported that PBIT suppresses the proliferation of human
breast cancer cells. Previous work by our group demonstrated that PBIT also reduces the viability of early-stage prostate cancers. This study aimed to characterize the anti-tumor effects of PBIT within two castration-resistant human prostate cancer cell lines: the androgen receptor (AR) positive C4-2B cells and the PC3 cells, which express little to no AR. Our group initially demonstrated via quantitative RT-PCR analysis that PC3 and C4-2B cells express varying amounts of KDM5A, KDM5B, and KDM5C, the therapeutic targets of PBIT. Presto Blue assays were next performed to determine whether PBIT alters cell proliferation. Micromolar concentrations of PBIT significantly reduced prostate cancer cell proliferation in a time- and concentration-dependent manner. Data from Cell Death ELISAs suggest that 10 μM PBIT does not significantly induce apoptosis within C4-2B or PC3 cells. However, PBIT did appear to increase the amount of senescence associated beta-galactosidase staining within cells, which is a marker of cellular senescence. Flow cytometry analyses revealed PBIT also altered cell cycle progression. Furthermore, PBIT exposure modified protein levels of the senescence and proliferation markers Lamin B1, Cyclin D1, and p21. Together, these data strongly suggest that the PBIT significantly reduces the proliferation of the more aggressive castration-resistant prostate cancer via cellular senescence.

Acknowledgements: These studies were supported by the NIGMS RISE Grant (R25GM059994), MMC-VICC-TSU Cancer Partnership grant (U54CA163069) and Meharry Clinical and Translational Research Center (MeTRC) grant (U54MD007593).

Poster D-29
GEOSPATIAL ANALYSIS OF HYPERTENSION PREVALENCE AND ITS ASSOCIATED FACTORS IN DAVIDSON COUNTY, TENNESSEE

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Hypertension, a significant public health concern, is a leading cause of cardiovascular diseases and mortality worldwide. This study employs a geospatial approach to analyze the prevalence and risk factors associated with hypertension in Davidson County, Tennessee. Geographic Information Systems (GIS) technology is employed to integrate and analyze existing health and demographic data, allowing for a comprehensive assessment of spatial patterns and potential correlations. Utilizing publicly available datasets from health agencies and census reports, we examine the distribution of hypertension prevalence across different neighborhoods within Davidson County. Additionally, demographic, socioeconomic, and environmental variables are considered to identify potential risk factors contributing to hypertension rates. Spatial statistics, including hotspot analysis and spatial regression, are applied to determine statistically significant clusters and associations. Preliminary findings reveal distinct spatial patterns of hypertension prevalence, indicating areas of higher and lower rates. Through spatial regression analysis, we explore relationships between hypertension and variables such as age, income, access to healthcare facilities, and environmental factors. These findings provide insights into the multifaceted nature of hypertension and its connections to the built environment and social determinants of health. The implications of this research are twofold. First, the identification of high-risk areas can inform targeted public health interventions, resource allocation, and community-based initiatives aimed at reducing hypertension prevalence. Second, the integration of GIS technology with existing health data demonstrates the utility of geospatial analysis in enhancing our understanding of complex health issues. In conclusion, this study underscores the importance of geospatial analysis in public health research, particularly in understanding the spatial distribution and potential determinants.
of hypertension in Davidson County, Tennessee. By leveraging existing data and GIS tools, we contribute to the evidence base for informed decision-making and interventions to address hypertension and its associated disparities. Further research could delve deeper into the identified correlations and explore causal relationships between risk factors and hypertension prevalence.
RESOURCES FOR MEDICAL STUDENT RESEARCH EXPERIENCE (MSRE)
Medical Student Research Experience (MSRE) Program Partners

Being in 2011, we have established formal partner programs that provide summer internships specifically for Meharry medical students. This list has expanded over the years and we aim to work to continue its growth. Details about each institution and program can be found using the links below.

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Useful Resources for MSRE (AY1) students

Summer Internship Websites:

https://www.hopkinsmedicine.org/som/offices/research-scholarship/funding/

https://mec.aamc.org/cim-cr-web/#/user

Writing Research Abstracts

https://writingcenter.unc.edu/tips-and-tools/abstracts/


https://writingcenter.gmu.edu/writing-resources/different-genres/writing-an-abstract

How to Make Posters

https://posters.wsu.edu/making-posters-with-powerpoint/

https://www.stemcell.com/efficient-research/scientific-poster-presentations

https://students.dartmouth.edu/ugar/news-events/designing-research-poster
Inclusive & Innovative.
Join us.

alleninstitute.org/careers
YALE SCHOOL OF MEDICINE
SUMMER RESEARCH PROGRAM

Yale School of Medicine Summer Research Program is a free, residential 8-week research experience for first-year medical students to participate in cutting-edge research in various fields. Each student will be matched with a faculty mentor, work on an independent research project, and participate in the life of the lab.

This program will accept up to 4 medical students from Meharry Medical College.

PROGRAM DATES: MAY 31 - JULY 26, 2024

RESEARCH FIELDS
- Anesthesiology
- Dermatology
- Obstetrics and Gynecology
- Pediatrics
- Psychiatry
- General Surgery
- Surgery Subspecialties
- Yale Cancer Center

CURRICULUM
- Cutting-edge Research
- Mentorship Opportunities
- Professional Development
- Community Engagement
- Residency Preparation

APPLICATION INFO
- Opens: December 1, 2023
- Closes: January 12, 2024

INFO SESSIONS
- Virtual information sessions via Zoom on:
  - November 14, 2023 at 6pm EST
  - January 9, 2024 at 6pm EST
- Zoom link for both sessions: https://yale.zoom.us/j/9658844839?from=addon

CONTACT INFO
- medicine.yale.edu/dice
- dice@yale.edu

BENEFITS
- $5,000 stipend
- Housing provided on YSM Campus
- Travel funds provided
Pathology Integrated Scientific and Clinical Experience for Students

The PISCES program aims to provide medical students between their first and second years with an intensive 8-week research and clinical experience under the mentorship of a University of Utah faculty member. The program provides opportunities for students to develop a holistic mentoring relationship with a U of U faculty member, have a laboratory-based research experience in the field of immunology, microbiology, or cancer, and a related clinical shadowing experience in Anatomic or Clinical Pathology.

The 2024 8-week program will run late May to late July with a stipend of $5,000. Housing on campus and roundtrip travel to Salt Lake City are provided by the program at no charge to students. Extracurricular activities include trips to National Parks in Southern Utah and Park City.

Mentor Expectations:
- Provide a welcoming, inclusive environment for the students
- Commit to developing a relationship with the student where mentoring will last past the summer, i.e. provide recommendation letters for residency applications, etc.
- Commit to getting to know the student and their cultural background in order to provide mentoring based on the students
- Contribute to the development of critical scientific thinking skills

Pictures and more information: [https://medicine.utah.edu/pathology/summer-research-programs](https://medicine.utah.edu/pathology/summer-research-programs)
E-mail Drs. Keke Fairfax, Kim Evason, and Allison Carey to apply or with questions: pisces@path.utah.edu
Scripps Research Translational Institute (SRTI) conducts innovative studies at the forefront of precision medicine, in the areas of digital health, clinical genomics, and community engagement. We welcome medical student research interns to join our investigational teams for an exciting summer of patient-centered research. 8-10 weeks at our institute will include designing and conducting a unique research project, translational science seminars, intern journal club, faculty round table chats, and clinical experiences with a physician scientist mentor. Stipend, travel and housing expenses are covered.

Examples: The following 3 mentors recently hosted medical student summer researchers in the projects described.

**POWERMOM** – United States maternal mortality is an unacceptable outlier. With POWERMOM, Dr. Lase Ajayi uses an app and wearable sensors to study maternal health disparities. App users have the opportunity to track their individual trends over time and compare their unique data to reference populations during the same gestational week.

**SCRIPPS WHITTIER** – The Scripps Whittier institute conducts community engaged research in San Diego focusing on diabetes education, care, and prevention. Together with community health champions, Dr. Athena Philis-Tsimikas incorporates educational programing and digital health devices into projects that examine ways to improve metabolic health, with an emphasis on underserved patient populations. Their newest projects – continuous glucose monitoring in the hospital and integrating behavioral health into diabetes clinic – welcome summer interns.

**ASPIRIN ALLERGY DESENSITIZATION PROGRAM** – Many patients miss the important benefits of aspirin due to aspirin allergy, and others have aspirin-exacerbated respiratory disease (AERD) that causes debilitating or even life threatening airway inflammation. Dr. Edsel Abud, a clinician scientist in Scripps' Internal Medicine Residency Research Track, will join the Allergy Division to study methods for diagnosing and alleviating the symptoms and signs of aspirin sensitivity.

Contact information: Summer Program: SRTI Education Website (E) suri@scripps.edu
Scripps Clinic & Scripps Green Hospital: Training Opportunities for 4th Year Medical Students

A Month of Cutting Edge Clinical Training

- Endocrinology
- Heart Failure
- Hematology/Oncology
- Hepatology
- Nephrology
- Intensive Care Unit
- Infectious Disease
- Integrative Medicine
- Rheumatology

For details on each rotation option, please visit Scripps Clinic and Scripps Green Hospital Medical Student Rotations. (E) medstudentrotations@scrippshealth.org