23rd Annual Graduate Student Research Symposium & Exhibit

Sponsored by the Graduate Student Association and The Graduate School

April 21, 2020

Virginia Commonwealth University
April 21, 2020

Dear Participants and Guests:

I am pleased to welcome you to the 23rd Annual Graduate Student Research Symposium and Exhibit sponsored by the Graduate Student Association (GSA) at Virginia Commonwealth University. The Symposium is organized by graduate students and provides an opportunity to showcase their scholarly work and cutting edge research.

The Research Symposium and Exhibit also gives our undergraduate students, faculty, staff and the University community a chance to witness the outstanding work of our graduate students. The work being presented today covers an array of topics from many academic disciplines and is representative of the high quality of VCU’s graduate student body. I congratulate all of this year’s presenters for their contribution to the success of this important program.

I would particularly like to thank Erin Britton, chairperson of the Symposium, and the officers of the GSA who have helped in planning this Symposium. This event is an excellent example of how an active GSA can benefit all graduate students.

Thank you for attending this year’s Symposium. I hope that you enjoy the event.

Sincerely,

F. Douglas Boudinot, Ph.D.
Dean, Graduate School
The Graduate Student Association (GSA) provides many valuable services to the graduate student body at Virginia Commonwealth University (VCU). The GSA organizes numerous events throughout the academic year including Graduate Student Orientation, several Meet & Greet events and social mixers, and the Graduate Research Symposium & Exhibit in the spring. The GSA also appropriates funds for graduate student organizations to enhance the quality of the graduate student experience at VCU. The GSA also helps to place graduate students on campus wide committees, where they represent the voice and express the concerns of VCU’s graduate student body.

Our Mission:
The purpose of the GSA is to serve as an advocate for the issues and needs of the graduate students at VCU. The GSA is committed to facilitating programs that enhance the academic skills, professional development, and social environment of all graduate students. There is no fee to join the GSA, every graduate student is a member and eligible to participate in and contribute to the GSA and GSA activities. However, the GSA sponsored events are not limited to only graduate students – all students and faculty are welcome.

Executive Committee:
The purpose of the GSA Executive Committee is to represent, advocate, facilitate communication and provide social activities for the VCU graduate community. The Committee is responsible for distributing 10% of the SGA Activities fees to graduate student organizations.

2019–2020 GRADUATE STUDENT ASSOCIATION OFFICERS

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GSA Council:
The purpose of the GSA Council members is to represent VCU graduate schools, programs, and departments by relaying student concerns to the GSA and the Executive Committee. The GSA is looking for representatives from each school to form the Graduate Student Council. Applications may be found at: https://graduate.vcu.edu/life/graduate-student-association/.

More Information:
For more information on how to join the GSA and our numerous events please visit: https://graduate.vcu.edu/life/graduate-student-association/.

Connect with us on:
RamsConnect: https://vcu.campusgroups.com/student_community?club_id=21903
Facebook: Facebook.com/VCUGraduateStudentAssociation
Twitter: VCU_GSA
Instagram: VCU_GSA
Email: gsa@vcu.edu
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Kapton films are widely utilized in harsh radiation environments where radiation resistant insulating materials are required. For space applications, Kapton polymers are used on satellites as substrates for solar arrays and outer layers of thermal systems. Kapton is also used in nuclear power plants as wire insulation. Kapton materials can be exposed in nuclear reactors to a reactive chemical environment in addition to severe radiation. It is of utmost important to understand how Kapton materials behave under high irradiation conditions and mitigate radiation damage effects. High-energy electrons can deposit ionizing dose and electric charge deeply inside Kapton materials. The charge accumulation grows over time and may exceed the dielectric strength of Kapton resulting in the electrostatic discharge that may cause extensive material damage. The dose deposition and electrostatic charging of Kapton irradiated with electrons has been studied using the Monte Carlo stepping model implemented in the Geant4 software toolkit. The secondary radiation emission (photo-, Auger-, Compton-electrons, and fluorescence photons) generated by primary electrons is taken into account in the redistribution of dose and charge deposition within a Kapton film. The results of this study are the profiles of dose and charge deposited by primary and generated secondary electrons and photons within a thin film of Kapton as a function of its depth. The results also provide insights into distributions of dose and charge in Kapton films under various incidence angles and energies of electrons.

**Background:** As future crewed, deep space missions are being planned, it is important to assess how spacecraft design can be used to minimize radiation exposure. Collectively with shielding material, vehicle shape and astronaut position must be used to protect astronauts from the two primary sources of space radiation: Galactic Cosmic Rays (GCRs) and Solar Particle Events (SPEs).

**Methods:** The On-Line Tool for the Assessment of Radiation in Space (OLTARIS) version 4.1 analysis package is used to evaluate and analyze this detailed radiation field. Developed by the National Aeronautics and Space Administration's (NASA) Langley Research Center, the tool enables engineering and research related space radiation calculations. Each configuration is evaluated in whole body effective dose equivalent (ED). This research evaluates 70 aerospace materials, 2 vehicle shapes and 3 astronaut positions.

**Results and Conclusions:** The material analyses show that for metals, aluminum outperforms and therefore is the most feasible metal for deep space travel. But when evaluating all materials, polyethylene outperforms all feasible aerospace materials. The vehicle shape and astronaut position analyses show that moving a human phantom closer to a wall does significantly decrease the ED. This pattern is not dependent on material nor boundary condition, but the mean shielding thickness a source ray must travel through for the GCR boundary condition. For shielding thicknesses greater than 30 g/cm² for polyethylene and 100g/cm² for aluminum, the
results suggest that having astronauts’ habitats and work areas located further from the center will help protect astronauts longer from deep space radiation.

**Johane Bracamonte**  
*Elastic Foundations as Heterogeneous Adventitial Boundary Condition for the Assessment of Aortic Wall and Peri-Aortic Stiffness from Dense-MRI Data Using Inverse FEM Approach*

**Background**: The establishment of in vivo, patient-specific, and regionally resolved techniques to quantify aortic properties is key for improving risk assessment in clinical practice and scientific understanding of cardiovascular growth and remodeling. Many in vivo studies quantify vascular stiffness using Pulse Wave Velocity. This method provides an averaged measure of stiffness for the entire aorta, ignoring variations in wall stiffness and boundary conditions. Previous studies using Displacement Encoding with Stimulated Echoes Magnetic Resonance Imaging (DENSE-MRI) suggested that the infrarenal abdominal aorta (IAA) deforms heterogeneously throughout the cardiac cycle.

**Method**: Herein, we hypothesize that the aortic wall strain heterogeneity is driven in healthy aortas by adventitial tethering to perivascular tissues that can be modeled with elastic foundation boundary conditions (EFBC) using a collection of linear-springs with a circumferential distribution of stiffness. Nine healthy-human IAAs were modeled using patient-specific imaging and displacement fields from SSFP and DENSE MRI, followed by assessment of aortic wall properties and heterogeneous EFBC parameters using inverse Finite Element Method (FEM).

**Results**: In contrast to traction-free boundary condition, prescription of EFBC reduced the nodal displacement error by 60% and reproduced the DENSE-derived strain distribution. Estimated aortic stiffness was in agreement with previously reported experimental test data. The distribution of normalized EFBC stiffness was consistent among all patients and spatially correlated to standard peri-aortic anatomical features.

**Conclusion**: Results suggest that EFBCs can be generalized for human adults with normal anatomy. This approach is computationally inexpensive, making it ideal for large-population clinical research and incorporation into computational cardiovascular fluid-structure analyses.

**Amir R. Esmaeili**  
*A Facile, Fast, and Low-Cost Method for Fabrication of Micro/Nano-Textured Superhydrophobic Surfaces*

**Background**: Alkyl ketene dimer (AKD) is frequently used in paper industry as an inexpensive sizing agent. The formation of a fractal structure after curing the solidified AKD for an extra-long time (4 - 6 days) results in superhydrophobicity. In this study, a facile and low-cost method was utilized to turn AKD’s surface superhydrophobic in a very short period of time.

**Method**: We fabricated a superhydrophobic layer by dipping glass and paper substrates in molten AKD and then treating them with ethanol after solidification. The samples were characterized by X-ray diffraction, Scanning electron microscopy, Fourier transform-infrared spectroscopy, X-ray photoelectron spectroscopy, Confocal laser scanning microscopy, and dynamic contact angle goniometry.

**Results**: The results show that briefly treating the coatings, obtained from isothermally heated AKD melt at 40°C for 3 min, with ethanol leads to superhydrophobicity with an advancing and receding contact angle of 158.7±1.4° and 156.8±0.9°, respectively. By increasing the melt
temperature to 70°C and heating time to 6 h followed by ethanol treatment, the advancing and receding contact angles increased to 163.7±1.3° and 162.6±1.2°, respectively.

**Conclusions:** This enhancement in superhydrophobicity is due to the formation of entangled irregular micro/nano textures that create air cushions on the surface resulting in droplet state transition from Wenzel to Cassie. In this method, ethanol can be used several times, and the energy consumption becomes very low. Based on the other techniques in this field, our method has eliminated the complex equipment and procedure applied in the fabrication of a superhydrophobic AKD.

**Andrea Ferrer Vega**  
*Development of a Targeted and Controlled Nanoparticle Delivery System for FoxO1 Inhibitors*

**Background:** Poly (lactic-co-glycolic acid) (PLGA) and polyethylene glycol (PEG) are polymers approved by the United States’ Food and Drug Administration. Drugs for various medical treatments have been encapsulated in PLGA-PEG nanoparticles for targeted delivery and reduction of unwanted side effects.

**Methods:** A flow synthesis method for PLGA-PEG nanoparticles containing FoxO1 inhibitors and adipose vasculature targeting agents was developed. A set of nanoparticles including PLGA and PLGA-PEG-P3 unloaded and drug loaded were generated. The particles were characterized by DLS, fluorescence spectroscopy, TEM, and dialysis. Endotoxin levels were measured using the LAL chromogenic assay. Our approach was compared to over 270 research articles using information extraction tools.

**Results:** Nanoparticle hydrodynamic diameters ranged from 142.4 ±0.4 d.nm to 208.7 ±3.6 d.nm while the polydispersity index was less than 0.500 for all samples (0.057 ±0.021 to 0.369 ±0.038). Zeta potentials were all negative ranging from -4.33 mV to -13.4 mV. Stability testing confirmed that size remained unchanged for up to 4 weeks. For AS1842856, loading was 0.5 mg drug/mL solution and encapsulation efficiency was ~100%. Dialysis indicated burst release of drug in the first 4 hours.

**Conclusion:** PLGA encapsulation of AS1842856 was successful but unsuccessful for the two more hydrophilic drugs. Alternative syntheses such as water/oil/water emulsion or liposomal encapsulation are being considered. Analysis of data from published papers on PLGA nanoparticles indicated that our results were consistent with identified process-structure relationships and few groups reported endotoxin levels even though in vivo testing was performed.

**Yuma Miyai**  
*PAT for Continuous Pharmaceutical Manufacturing and Pharmacy on Demand*

The manufacturing of medicines is most commonly conducted using batch processing with the active pharmaceutical ingredient (API) and drug product manufacturing often segregated and performed at different sites and countries. The final drug product is typically shipped and/or stockpiled awaiting administration to a patient. Our project is called Pharmacy on Demand (POD) and the group focuses on the development and optimization of portable continuous pharmaceutical manufacturing systems, with the goal of manufacturing medicines anywhere, anytime. Our current project aims to manufacture 1000 ciprofloxacin tablets in 24 hours via end-to-end processing of raw materials, whilst meeting the rigorous quality standards set by the Food and Drug Administration. Process analytical technology (PAT) was introduced by the FDA to
achieve quality assurance and quality control to ensure that safe and effective drugs are available to the people in the United States. Implementation of PAT for our continuous manufacturing system was identified as a critical aspect of producing stable and quality API and ensuring the process robustness. This work will discuss the deployment of PAT at various stages of the continuous API synthesis, specifically the use of FTIR for developing concentration prediction models using chemometrics analysis. The real-time process monitoring of the continuous API synthesis and PLS model analysis for achieving the goal of producing high quality API using the portable pharmaceutical manufacturing system, Pharmacy on Demand.

**Sayantan Pradhan**  
*Photolithographic Micropatterning of Organic, Flexible Biomaterials and Its Applications*

A current trend in biodevices has involved a shift from traditional rigid platforms to flexible and stretchable formats. These flexible devices are expected to have a significant impact on future healthcare, disease diagnostics and therapeutics. However, the fabrication of such flexible devices has been limited by the choice of materials. Biomimetic composites of naturally derived and synthetic polymers provide exciting opportunities to develop mechanically flexible, physiologically compliant, and degradable bioelectronic systems. Advantages include the ability to provide conformal contact at non-planar biointerfaces, being able to be degraded at controllable rate, and invoking minimal reactions within the body. These factors present great potential as implantable devices for in-vivo applications, while also addressing concerns with “electronic waste” by being intrinsically degradable. In this work, we present a combination of photo-crosslinkable silk proteins and conductive polymers to precisely fabricate flexible devices and cell culture substrate. A facile and scalable photolithography is applied to fabricate flexible substrates with conductive and non-conductive micropatterns which show tuneable electrical and mechanical properties. We also demonstrate an approach to engineer flexibility in materials through the creation of patterned defects inspired from Kirigami- the Japanese art of paper cutting. Mechanically flexible, free-standing, optically transparent, large-area biomaterial sheets with precisely defined and computationally designed microscale cuts can be formed using a single-step photolithographic process. As composites with conducting polymers, flexible, intrinsically electroactive sheets can be formed. Through this work, the possibility of making next-generation, fully organic, flexible bioelectronics is explored.

**Sarah Saunders**  
*Perfusion Cell Seeding and Expansion in Dual Mechanical Stimulation Bioreactor for In Vitro Tissue Development*

**BACKGROUND:** Engineered tissues are an exciting potential source of small diameter vascular grafts due to limited supply and patency of available alternatives. Engineered tissue vascular grafts (ETVGs) will provide physiological function that resembles native arteries and maintain the required mechanical properties as they integrate with host tissue. Mechanical stimulation during incubation encourages proper cell alignment and increases extracellular matrix deposition. The enhanced organization of the engineered tissue leads to improved compliance over synthetic alternatives without sacrificing strength and may lead to better integration in vivo.  
**METHODS:** We have developed a bioreactor that mechanically trains grafts during incubation. To test the seeding efficiency of the bioreactor, rat vascular smooth muscle cells (VSMC) were seeded onto electrospun PCL scaffolds by perfusion at various cell concentrations then incubated
for 1 week under static conditions. We assessed gross morphology with H&E; collagen with picrosirius red; and VSMC density with DAPI. ETVGs were further evaluated with mechanical testing and scanning electron microscopy to evaluate mechanical and microstructural properties.

**RESULTS:** Cells were successfully seeded evenly onto the luminal surface of electrospun PCL scaffolds. Cells remained viable and continued to proliferate and deposit ECM throughout incubation.

**CONCLUSIONS:** Progress in the ETVG paradigm requires a systematic approach toward better understanding of the cause-effect interplay between implant properties, host reactions, and their modulation with controllable parameters. Future directions involve the assessment of the effects of mechanical training on growth and remodeling of engineered tissues in vitro and subsequent effects on the foreign body response post-implantation in a murine model.

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**Lili Tian**

*A Diffusion Effect Correction Method for Pulsed Neutron Capture Well Logging*

**Background:** The pulsed neutron capture (PNC) well logging technique is a widely used nuclear well logging approach to identify saturated oil and gas underneath thousands of meters down the earth surface. However, neutron diffusion effect contributed considerable bias to the sigma estimation in the PNC well logging, in which the sigma is used as a figure of merit to identify the hydrogen carbon enriched materials. Thus, efforts must be made to correct the diffusion effect to achieve an accepted sigma prediction in PNC logging.

**Methods:** In this work, we proposed an efficient diffusion effect correction method that utilized the parameters of the capture gamma ray counts ratio (RCAP) and the gamma ray counts ratio of inelastic scattering to capture (RIC) measured with the gamma ray decay time spectrum to fulﬁl the correction goal. A combined correlation of RCAP and RIC is developed to reflect both the scattering and absorption contribution to the diffusion coefficient, which is subsequently employed to correct the diffusion effect.

**Results:** Computational experiments based on Monte Carlo simulations demonstrated the sigma calculated with the new correction method has shown to be more accurate than the non-corrected apparent sigma in the PNC logging.

**Conclusions:** A diffusion effect correction method is proposed for a more accurate sigma calculation. Two parameters of RCAP and RIC are used to correct the diffusion effect. After the correction, more accuracy sigma results are calculated.

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**Harrison Wenzel**

*Spatio-Temporal Evolution of Warm Dense Plasmas: Molecular Dynamics Modeling*

The exo-atmospheric detonation of nuclear device would be of great impact on the material integrity of orbiting satellites. The spectral energy distribution of high intensity X-ray flux, ~1028-1035 photons/(cm²·s), originating from a nuclear blast is described by the Planck's blackbody function with the temperature from 0.1 keV to 10 keV. Particular damage would occur to the multi-layered, solar cell panels of satellites. However, the X-ray flux incident upon the solar panels is inversely proportional to the square of the distance from a point where a weapon was detonated. For example, the X-ray flux is reduced by a factor of 10-10 at the distance of 100 km. Even accounting for this geometric factor, the enormous power density, ~0.1 - 104 GW/cm³, absorbed within a few microns of a Ge slab of solar cells produces the extreme
pressures and temperatures. The X-ray induced blow-off and Warm Dense Plasma (WDP) formation on the surface of materials, particularly in a gap between the unshielded Ge elements is initiated. In this work, the profiles of deposited energy and power density produced by cold X-rays (~ 1 keV) in the multi-layered materials are calculated using the Monte Carlo method within the Geant4 software toolkit. The power density is used as an input for the Molecular Dynamics (MD) modeling of WDP formation and expansion into vacuum. The MD computational model is implemented within the LAMMPS software toolkit. The spatio-temporal evolution of WDP as well as its temperature, stress, and mass density distribution are investigated for different X-ray irradiation conditions.

**Cheng Zhang**  
*JxB Force Effects on Beryllium Melt Splashing in Fusion Devices*

Instability and disruption of high-temperature plasma in fusion devices may result in the edge-localized modes (ELMs) and lead to melting of plasma facing components (PFCs) causing their damage. Beryllium (Be) is used as a first wall for PFCs due to its low density, high strength, and high thermal conductivity. However, melting of Be on the surface of first wall is of a great concern as splashing of a molten Be layer will result in the plasma contamination and termination of fusion reaction. Therefore, it is important to understand the physics mechanisms characterizing the splashing of Be from a pool under the plasma impact in a strong magnetic field as that in the International Thermonuclear Experimental Reactor (ITER). The computational model that combines the volume of fluid (VoF) and magneto-hydrodynamic (MHD) models is used to simulate the effects of thermal, viscous, gravitational and surface tension forces on the molten Be layer. The additional source terms representing the external and thermo-emission currents are also implemented. These currents are taken into consideration as they contribute to the electromagnetic JxB force and may result in faster melt motion, redistribution, and splashing. In this work, the effects of JxB forces on splashing of molten Be, development and growth of waves, and ejection of molten droplets are examined. The stimulation results show the motion of molten Be layer and development waves at the vapor-melt interface. Results may complement the experiments at Joint European Torus (JET) and studies of PFCs melt layer phenomenon for ITER program.

**College of Health Professions**

**Tia Jackson**  
*An Examination of Virginia WIC Staff’s Attitudes and Knowledge Towards the Brush, Book, Bed Oral Health Program*

**Introduction:** Families who are low income and have low oral health literacy tend to have poor oral health. The Brush, Book, Bed (BBB) program helps caregivers establish a consistent night routine for their children that includes brushing teeth, reading, and an age-appropriate bedtime. BBB has been shown to increase oral hygiene behaviors and therefore oral health outcomes. Studies have shown that children who participate in Women, Infants, and Children, (WIC) programs are more likely to access dental services. This study examined local Richmond,
Virginia (VA) WIC staff on their current oral health knowledge and views on implementing BBB.

Methods: A 10-question pre-assessment survey was administered to 11 WIC staff. The pre-assessment evaluated WIC staff’s knowledge of children’s oral health and their confidence levels toward counseling clients on dental care. After the pre-assessment, a short presentation on BBB and children’s oral health was given. Following the presentation, a 19-question post-assessment was conducted to determine how much information WIC staff retained and changes in their confidence levels.

Results: All participants improved their scores on the post-assessment after the BBB presentation showing a 17% improvement. The percent of staff that felt very confident in advising clients on their children’s oral health grew by 19%. Across the sample, 100% of participants reported that BBB would benefit their clients and implementing it in their office would be feasible.

Conclusion: Findings from the current study demonstrate that WIC staff are receptive to the goals of BBB and believe that its implementation could help their clients.

Brooke Saba McDowell
Perceptions of Using Smart Speaker Technology for Improving the Health and Wellness of Older Adults Living in a Low-Income Community

There is a growing interest in the usage of smart speakers in various settings with older adults for improved quality of life and health. Residents who live within a low-income housing development may benefit from the use of smart speaker technology for creating a more engaging and healthier lifestyle. Because technology acceptance is critical; this study aims to examine smart speaker acceptance among low-income senior housing residents.

A cross-sectional survey (n=46) was conducted to assess smart speaker acceptance, perceived usefulness, perceived ease, and privacy concerns. Individuals were recruited through varying methodologies, including group information sessions, sign-up sheets, word of mouth, contact cards, and fliers.

Descriptive analysis indicated study participants were 51% male; 63% Black/African American, and 87% completed a high school degree/GED or less. The technology survey results indicated that 66% were smartphone users, 51% had laptops, 87% heard “of an Echo Dot or Alexa,” and 89% reported that a reminder of medical appointments would be helpful. Also, 96% agreed it would be helpful to use the smart speaker if they had fallen, to alert someone. Technology can be helpful to older adults living in low-income environments. Most study participants reported that a smart speaker would be helpful in the case of a fall and that it would be helpful to use as a medication reminder system. This research can be used as guidelines for designing smart speaker-based health interventions for older adults and is an important step towards understanding the perception of smart speaker technology.

Bhushan Thakkar
Factors that Promote and Challenge Recovery through the Postpartum Transition for Women in Treatment for Opioid use Disorders as Reported by Health Care Providers

BACKGROUND: Opioid related deaths are becoming a leading cause of pregnancy associated mortality, the majority occurring postpartum. The mother-infant dyad affected by Opioid use Disorders (OUD) requires specialized care that focuses on its unique needs. Providers across
multiple fields commonly work together with families affected by OUD and coordinate these tailored treatment plans. They also have the opportunity to follow families longitudinally throughout the prenatal and postpartum periods within a continuity of care model. No study has evaluated provider perspectives that should be incorporated into treatment advancements to optimize clinical outcomes for the mother-infant dyad.

**METHODS**: This is a secondary data analysis from an ongoing study to develop and test a patient education tool. Nine Healthcare providers (OBGYN’s, Pediatricians, Nursing Staff, Counselors and Social Work) were recruited to complete a semi-structured interview. Interview guides were developed a priori based on the study objectives. Interviews were recorded, de-identified and analyzed using the “editing style” approach.

**RESULTS**: Two major themes were identified. Challenges for OUD recovery included: Stigma and mistrust surrounding role of providers and health care system, lack of information about prenatal and post-partum use of medications for OUD and during delivery. Promoting factors included: Role of support system including Peer Recovery groups, Being in treatment program for OUD and Mother-infant attachment and bonding.

**CONCLUSIONS**: This study provides valuable insights into the aspects of treatment and health care systems that promote or inhibit continued treatment engagement and optimal outcomes.

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**College of Humanities and Sciences**

**Junaid Ahmed**

*Temporal Behavior of the Individual Soft Microparticles: Understanding the Detection by Particle Impact Electrochemistry*

Emerging progress of the Particle Impact Electrochemistry (PIE) technique has opened a novel field of detection and characterization of many analyte particles. PIE comprises detection of changes in current when collisions of individual micro or nanoparticles are linked with an electrochemical event at the surface of an ultramicroelectrode (UME). Being a rapid, low cost, and analyzing of one analyte at a time, PIE is widely used to characterize the shape, size distribution, and catalytic activity of nanoparticles. To explore the scope of PIE for the detection of soft microparticles (absence of crystalline structure), ferrocene (Fc) trapped toluene-in-water emulsion droplets was used as a model with ultramicroelectrode. Droplets were analyzed by tracking the oxidation of Fc inside the droplet in the presence of an ionic liquid acting as emulsifier and conductivity enhancer. The droplet diameter was determined electrochemically using Faraday’s law. PIE was able to characterize the polydisperse size distribution of the droplets successfully. A 3D lattice random walk simulation indicated the stochastic nature of the droplet motion. Unlike nanoparticles, the droplets have slow kinetics and the collision dynamics associated with adsorption on the electrode surface. The adsorbing droplet generated similar spike-like electrical signals in real-time experiments that follow the bulk electrolysis model. These findings will facilitate the characterization of polydisperse microparticles including bacteria, which also adsorb and have similar size and density as the droplets in this work. Finally, because electrolysis time spans from hundreds of milliseconds to a second, single events of such duration are detectable with present-day instrumentation in contrast to non-adsorbing nanoparticles that have nanosecond collisions.
**Farah Aslanzadeh**  
*Older Adults in Primary Care: Reports of Cognitive Concerns in Primary Care Psychology Visits*

**Introduction:** The prevalence of mild cognition impairment (MCI) among older adults (≥65) is estimated to range between 10-20% (Langa & Levine, 2014). Integrated primary care allows opportunities for interdisciplinary consultation, screening, and intervention. The aim of this study is to explore the percentage of older adults reporting cognitive concerns during their first primary care psychology visits. It is hypothesized that these rates will mirror prevalence rates in other older adult community dwelling samples in primary care settings.

**Methods:** A patient sample of older adults (≥60) was introduced to services following a referral from their primary care physician. Clinicians then identified problems that were discussed in session, including “cognitive concerns.” Descriptive statistics will be used to assess the percentage of older adults with “cognitive concerns” in this sample, compared to other community dwelling samples.

**Results:** 267 older adults were identified within a larger sample of patients who received primary care psychology services. The percentage of older adults who were referred for “cognitive concerns” was 10.5% (n = 28), with 12.7% (n = 34) reporting “cognitive concerns” during their visit. Interestingly of the 28 older adults referred by their provider for “cognitive concerns,” less than 50% (n = 13) of those patients reported “cognitive concerns” as one of their problems in session.

**Discussion:** This sample of older adults reported cognitive concerns in primary care psychology sessions at a rate that falls within the range identified in other community dwelling samples. Future research could further improve upon identification and screening of older adults with cognitive concerns by psychologists in primary care settings, as intervention for MCI can improve quality of life and may delay progression of dementia (Campbell et al., 2018; Eshkoor et al., 2015).

**Farah Aslanzadeh**  
*Screening for Cognitive Impairment in Primary Brain Tumor Patients: A Preliminary Investigation with the MMSE and RBANS*

**Background:** The Mini-Mental State Examination (MMSE) is regularly used to screen for cognitive impairment and dementias in medical settings. However, the MMSE has been shown to be less sensitive to mild cognitive impairment (MCI), such as that commonly seen among primary brain tumor (PBT) patients. More comprehensive screening tools, such as the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS), may be more suitable for identifying impairment in PBT patients. This study compared these two measures and conducted preliminary analysis of the sensitivity and specificity of the MMSE to cognitive impairment in PBT patients.

**Methods:** Data included neuropsychological evaluations of PBT patients (N = 81, Mage = 49, 49% female, 96% Caucasian) at an academic medical cancer center. Measures included the MMSE-2 and RBANS. Descriptives, Pearson’s correlations, chi-square, and tests of sensitivity and specificity were calculated.

**Results:** The MMSE and RBANS were moderately correlated (p < 0.01). When using established cut offs, significantly fewer patients were impaired on the MMSE (33%) than the RBANS (52%; $\chi^2= 17.57$, p = <.01). When evaluating the sensitivity of the MMSE-2 to
cognitive impairment on the RBANS, defined as one or more impaired indices, sensitivity was 38.2% (95% CI = 26.71% to 50.82%) and specificity was 92.3% (CI = 63.97% to 99.81%). The positive predictive value of the MMSE-2 was 96.3% (CI = 79.43% to 99.43%). The negative predictive value was 22.2% (CI = 18.29% to 26.72%). Accuracy of the MMSE-2 was 46.91% (CI = 35.73% to 58.33%).

**Discussion:** The RBANS detected significantly more impairment than the MMSE. While the MMSE was accurate when scores suggested impairment, sensitivity was limited, suggesting a high rate of false negatives. More comprehensive screeners such as the RBANS may have greater clinical utility in screening PBT patients for cognitive impairment. Future research should examine the relative specificity of screener measures in this unique population. In sum, if clinicians rely solely on the MMSE, as is common practice in many medical centers, patients who could benefit from additional services may go unnoticed.

**Kathryn Behrhorst**  
*Suicidal Ideation and Self-injury Prevalence and Impairment in an Urban Integrated Primary Care Clinic*

**Introduction:** Suicide is the second leading cause of death for adolescents (Rosenbaum & Ougrin, 2019). Pediatric primary care staff are often the first line of intervention for youth presenting with suicidal thoughts and NSSI (Taliaferro et al., 2013). The primary aim of the current study was to describe reported suicidal ideation, attempts, and NSSI in youth presenting to an urban integrated primary care setting.

**Methods:** Within an outpatient pediatric primary care clinic, patients were referred by medical staff and introduced to behavioral health services. Patients were asked about their history of suicidal thoughts/attempts and NSSI (Mage = 12.63; SD = 4.51; 66.3% female, 66.3% Black; 69.6% Medicaid). Patients were also screened using the Pediatric Symptom Checklist-17 (PSC-17; Gardner et al., 2007) and Top Problems (Weisz et al., 2001).

**Results:** Seventeen percent of patients endorsed a history of either suicidal ideation/attempts or NSSI. Chi-square analyses identified a significant association between patient race and suicidal ideation/attempts [$\chi^2(6) = 13.56$, $p = .035$]. The sample’s mean internalizing score on the PSC-17 fell within the clinical range (M = 6.13, SD = 2.49). Further results reflecting findings, interventions used, and top problem areas will be presented.

**Conclusion:** Results highlight a demand for establishing and sustaining effective screening and engagement in mental health treatment for youth suicidality and self-injury in integrated care settings. Future directions will be discussed.

**Deon Brown**  
*Contextual Emotion Expression: Profiles of African American Report in the Family and on Campus*

**Background:** African American culture has long been known for its emphasis on emotion expression (Boykin, 1986). However, African Americans have learned to restrict emotion publicly due to pervasive stereotypes (Consedine & Magai, 2002). It’s likely that such behavior is learned in the family, in which parents alert children to racial discrimination that is typically associated with context (Dunbar et al., 2017). Thus, African Americans are likely to vary emotion expression according to context. The current study explored emotion expression in the family and public context.
Methods: 188 African American/Black college students from 3 different types of college campuses. The sample was 62.4% female, 35.4% male, and 2.2% genderqueer/gender non-conforming. Data were collected via an online survey with all self-report measures. Contextual differences in emotion expression were explored via latent profile analysis (LPA).

Results: Five profiles emerged: More Positive and Negative Submissive Expression (n = 49; 26%), More Family Expression (n = 8; 5%), Low Family and Campus Expression (n = 24; 13%), More Campus Positive and Negative Dominant Expression (n = 45; 24%), and More Positive and Less Negative Dominant Expression (n = 63; 33%). Racial discrimination significantly predicted profile membership for the More Campus Positive and Negative Dominant Expression profile in particular.

Conclusions: African American youth express emotion differently in the family context compared to campus, particularly in the face of racial discrimination. The patterns of emotion expression revealed here are helpful in terms of evaluating outcomes of African American’s emotion-related behavior as taught in the family.

David Bussell
The Culture of Capital: Value as a Relative Condition

Background: I am a cultural theorist focused primarily on capitalisms as cognitive, behavioral, and productive conditions. I have self-published two books on this topic, titled ‘Distruments’, and ‘Assemblies & Other Essays’. I am currently working on my third, titled, ‘Everything A Waiting Midnight’.

Methods: Interdisciplinary inquiry into political, poetic, and philosophical texts by Ana Tsing, Sylvia Wynter, Yannis Ritsos, Sylvia Wynter, and Christina Sharpe.

Results: A book length series of essays and theses, which bridge the gap between my second and third major texts, ‘Assemblies’ and ‘Everything A Waiting Midnight’.

Conclusions: This work attempts to create a constellation of the works before it, while declaring an additional sphere of nuanced critique into the works on and against capital which came before it: that is, that the culture of capital is a culture of discipline-of-life, entirely, and develops, first and foremost (even before that which is the ‘commodity’) a cinema of discipline, which sets the scene for the reproduction of a world where everything has a price. This price is nothing less than life, itself.

Alexander Chiu
The Effects of a High Fat Meal on Blood Flow Regulation during Arm Exercise

A diet high in saturated fats results in endothelial dysfunction and can lead to atherosclerosis, a precursor to cardiovascular disease. Exercise training is a potent stimulus though to mitigate the negative effects of a high saturated fat diet; however, it is unclear how high-saturated fat meal (HSFM) consumption impacts blood flow regulation during a single exercise session.

PURPOSE: This study sought to examine the impact of a single HSFM on peripheral vascular function during an acute upper limb exercise bout.

METHODS: Ten young healthy individuals completed two sessions of progressive handgrip exercise. Subjects either consumed a HSFM (0.84 g of fat/kg of body weight) 4 hours prior or remained fasted before the exercise bout. Progressive rhythmic handgrip exercise (6kg, 12kg, 18kg) was performed for 3 minutes per stage at rate of 1 Hz. The brachial artery (BA) diameter
and blood velocity was obtained using Doppler Ultrasound (GE Logiq e) and BA blood flow was calculated with these values.

**RESULTS:** BA blood flow and flow mediated dilation (normalized for shear rate) during the handgrip exercise significant increased from baseline in all workloads, but no differences were revealed in response to the HSFM consumption.

**CONCLUSION:** Progressive handgrip exercise augmented BA blood flow and flow mediated dilation in both testing days; however, there was no significant differences following the HSFM consumption. This suggests that upper limb blood flow regulation during exercise is unaltered by a high fat meal in young healthy individuals.

**Maria de Jesus Cisneros-Elias**  
*Empowering Latina/o Families to Navigate College Access*

**Background:** With the education crisis of Latinas/os, it is important to understand ways to increase access to college for the most vulnerable youth (Gándara & Contreras, 2009). To investigate strengths that promote college accessibility in underserved Latina/o families, the current qualitative study assessed the following: (1) Prior to beginning the intervention program and after the intervention program what forms of capital did families possess? (2) How did participating in the program change adolescents’ perception of their parents’ capital? (3) How did adolescents use agency to apply what they learned in college information intervention over time?

**Methods:** Latina/o parent-adolescent dyads (N = 11) participated in a college knowledge program in California. Sample included girls (67%) and 11-16 years of age (M = 14.0, SD = 1.78). Five of 11 families were interviewed 6-months post-effects of the intervention program. Research study used grounded theory inductive analysis approach (Corbin & Strauss, 2015).

**Results:** Question 1, Latina/o adolescents expressed aspirational, familial, navigational, and social capital before and after the intervention. Question 2, After participating in the intervention, adolescents expressed familial support through a combination of tangible (drop me off at school) and intangible (want me to be a good man) acts. Question 3 focused on the 6-month post-effects of the intervention program. Adolescents expressed agency by actively meeting requirements to apply to college and understanding the path they need to reach their educational goals.

**Conclusion:** Discussion will focus on the importance of college information intervention programs in increasing Latino/a youth’s education experiences.

**Ashley Darling**  
*Determining the Impact of Increased Physical Activity on Improving Sleep Quality in Young Adults*

Disturbed sleep has been linked to an increase in cardiovascular disease (CVD) risk. Although physical activity (PA) is often associated with high sleep quality, little is known about PA’s effectiveness to improve different aspects of sleep and the mechanisms to which it can improve sleep quality. Purpose: The study sought to determine the ability of increased PA to improve sleep efficiency (SE) in healthy young adults. Methods: Nineteen young adults (25±4 yrs) wore an accelerometer (Actigraph GT3x-BT) for a total of three weeks to record daily PA and sleep variables. Subjects maintained normal PA levels for the first week (BL), then increased their step count by an average of 5,000 steps/day across the next two weeks (W1 and W2). Heart rate
variability (HRV) and blood draws were collected weekly to assess sympathetic activity and inflammation, respectively. Results: The PA intervention resulted in increases (p < 0.001) in step-count for both W1 and W2 when compared to BL. No differences were observed in SE, HRV, and inflammation levels across time. A positive association was observed between the change in SE from BL to W1 (r = 0.81, p < 0.001) and BL to W2 (r = 0.52, p = 0.02) when compared to initial SE. Conclusion: Although young healthy individuals appear to lack improvements in SE with an increase in PA, those with the lowest SE had the greatest improvements. These findings suggest that although increasing PA can improve sleep quality, a “ceiling effect” may occur when sleep quality is adequate.

Kevin Decker
Effects of High Dietary Sodium Intake on Blood Flow Regulation During Exercise

PURPOSE: Dietary sodium intake guidelines is ≤2,300 mg/day yet is exceeded by 90% of Americans. This study examined the impact of a high sodium diet on blood flow regulation during exercise.

METHODS: Six males (25 ± 2 years) consumed dietary sodium intake guidelines for two weeks, with one week salt-capsule supplemented (HS: 6,900 mg/day of sodium) and the other week placebo-capsule supplemented (LS: 2,300 mg/day of sodium). At the end of each week, peripheral hemodynamic measurements [blood flow (BF), shear rate (SR), and flow mediated dilation (FMD/SR)] of the brachial and superficial femoral artery were taken during handgrip (HG) and plantar flexion (PF) exercise, respectively. Each exercise workload was 3 minutes and progressed by 8 kilograms until exhaustion.

RESULTS: There were no differences between LS and HS in blood pressure (82 ± 4 v 80 ± 5 mmHg; p = 0.3) or heart rate (56 ± 6 v 59 ± 10 bpm; p = 0.4). HG and PF exercise increased BF, SR, and FMD/SR across workload (p < 0.03 for all), but no difference between diets (p > 0.05 for all).

CONCLUSION: Despite previous reports that HS impairs resting vascular function, this study revealed that peripheral vascular function and blood flow regulation during exercise is not impacted by a HS diet.

Eryn Delaney
The Links between Sexual Victimization and Health among Sexual Minority College Students: Examining Social Support as a Moderator

The current study tested how sexual victimization was associated with depressive symptoms, post-traumatic stress disorder (PTSD) symptoms, and alcohol use disorder (AUD) symptoms among 234 diverse college students who self-identified as lesbian, gay, bisexual, queer, and asexual (LGBQA). Additionally, social support was tested as a moderator. Findings indicated that sexual victimization was related to greater depressive symptoms, PTSD symptoms, and AUD symptoms. In addition, perceived social support moderated the relation between sexual victimization and depressive symptoms, however, in a direction contrary to hypotheses. In particular, higher sexual victimization was associated with greater depressive symptoms among LGBQA students with higher levels of social support (b = .29, p = .00), and was not significant among LGBQA students with lower levels of social support (b = .13, p = .26). The current study highlights the need to consider the detrimental effects of sexual victimization on health outcomes.
among LGBQA college students, as well as the mechanisms through which social support may be influencing these relations.

**Katherine Dempster**  
*Expressed Emotion, Mental Health, and Functioning in Families of Children with and without Asthma*

**Introduction:** Expressed emotion (EE), the affective attitudes and behaviors of one toward another, can affect caregivers’ behaviors toward their child. Research examining associations between EE and child/family outcomes is mixed; these associations may be affected by other influences such as the presence of a chronic disease or parent mental health. In this study of families living in an urban area, we examined associations between EE and child outcomes (anxiety/depressive symptoms) and family functioning, with parent anxiety as a covariate. We evaluated child asthma status as a moderator in these associations as the presence of a chronic illness may strengthen the association between EE and child/family outcomes.

**Methods:** 96 children (mean±SD age=8.83±2.03 years, 48.9% female, 92.6% African American; 47 with asthma) and their parents (81.3% annual household income<$25,000) completed an observational study including interviews and questionnaires. Measures included the Multidimensional Anxiety Scale for Children (MASC), Children’s Depressive Symptoms Inventory (CDI), Self-Report Family Inventory (SFI), Generalized Anxiety Disorder scale (GAD-7), and Five-Minute Speech Sample (FMSS) coded for EE. To examine study aims, regression analyses were conducted using PROCESS macro version 3.1. Asthma status (yes/no) was examined as a moderator.

**Results:** EE was associated with child anxiety symptoms, child depressive symptoms, and family functioning, controlling for parent anxiety symptoms (F(1,70) =6.74, p=.011; F(1,69) =7.803, p=.007; F(1,68) =8.637, p=.004). Asthma status did not moderate any of the associations.

**Conclusions:** Results suggested that high levels of caregiver EE were associated with child mental health symptoms and family functioning, but asthma status did not moderate associations. It is possible that regardless of additional family demands related to asthma, EE is associated with child mental health and family functioning. Further examination into other systemic stressors that may moderate these associations is warranted, as well as the impact that minimizing parent anxiety might have on overall EE.

**Emily Donovan**  
*Daily Sleep Quality is Associated with Daily Cognition in Late-Life*

**Background:** Older adults often face sleep disturbance or cognitive decline that goes beyond the scope of normal aging. The present study examined the relationship between self-reported sleep quality and self-reported daytime attention in a community-dwelling sample of older men at the between-persons and within-persons levels of association.

**Methods:** Thirty-eight participants (Mage=75.36 years, SDage=7.51 years, range=66-90 years) completed a twice-daily sleep diary for one week. Sleep quality and attention were assessed using a single-item 0-10 rating scales from the morning diary (“How was the quality of your sleep last night?”) and from the evening diary (“How was your attention today?”). A two-level multilevel model was parameterized with days nested within individuals to examine whether nightly sleep quality predicts an individual’s daily attention rating.
**Results**: A multilevel model predicting self-reported attention revealed (1) older individuals who reported better sleep quality reported having better daily attention \([\text{Beta}=0.64, \, t(248.15)=10.12, \, p<0.001]\) and (2) following a day of above-average sleep quality, older individuals experienced above-average attention \([\text{Beta}=0.16, \, t(259.79)=2.75, \, p=.006]\).

**Conclusion**: Not only was overall sleep quality associated with self-reported attention, but a good night's sleep was associated with better self-reported next-day attention. Results point to the potential importance of fluctuations in sleep quality for daytime functioning. Interventions aimed at improving nightly sleep consistency may be worth exploring as methods to improve daytime cognitive functioning in older adults.

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**Isis Garcia-Rodriguez**  
*Legal Status Effects on Latinx Parent Well-Being*

Despite heightened levels of parenting stress and psychological distress experienced by many immigrant-origin families in the United States, little is known about the resiliency of Latinx families, particularly in today's political climate. This research presents the results of a pilot study examining the effects of legal stressors on parent-child relationships and parent well-being in Latinx immigrant families. Taken from the Latinx Immigrant Family Stories and Strengths project, this mixed-methods study was informed by the integrative risk and resilience model for understanding the adaptation of immigrant-origin children and youth (Suarez-Orozco, Motti-Stefanidi, Marks, & Katsiaficas, 2018). The pilot included a sample of 30 adult parent participants with various legal statuses and migration experiences. Qualitatively, participants shared their experiences of legal vulnerability, fears or concerns of deportation, and coping mechanisms. Quantitatively, scores for parental stress, psychological distress, post-traumatic stress disorder (PTSD) symptoms, and resilience were collected. Following a, sequential explanatory design (Creswell et al., 2003), quantitative data were analyzed for relationships among study variables. A case-oriented research comparative strategy (Eckstein, 1975; Mahoney & Goertz, 2004; George & Bennett, 2005; Gerring, 2006) was then used to qualitatively examine the migration and resiliency experiences of the two cases with lowest and highest levels of resilience according to the Brief Resilience Scale (BRS; Smith et al., 2008) scores. Results suggest that, on average, parents experienced normal to high rates of parenting-related stress, low levels of psychological distress, moderate to severe symptoms of PTSD, and low to average levels of resiliency. Parents identifying as undocumented experienced higher rates of parental stress \((r = 0.49, \, p<.05)\) and psychological distress \((r = 0.41, \, p<.05)\) compared to their liminally legal and documented peers. Although the trauma experienced by many immigrant-origin parents in the study was markedly high, resilience was fostered and expressed, and was exemplified through our high-resilience case analysis. Participants’ stories expressed throughout this study spoke volumes about the complex and often times traumatic lived experiences that many foreign-born parents face. Implications for comprehensive, detailed, and longitudinal future research is discussed.

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**Stephen Gibson**  
*‘Black Father’ Regard Beliefs: Socio-demographic Correlates and Associations with Involvement*

**Background**: Awareness of negative existing societal perceptions about Black fathers remains salient (Coles & Green, 2010), may shape fathers’ parenting motives and behaviors in complex
ways (Cooper et al., 2019). The current study has two aims—1) explore demographic and contextual correlates of Black fathers’ regard beliefs and 2) examine how fathers’ own personal beliefs about Black fathers as well perceptions about societal views about Black fathers are related to involvement.

**Methods:** Participants were 506 African American fathers (M= 40.60 years; SD= 10.23) with children between 8 and 17 years of age (M=12.36; SD= 2.92). Scale items were adapted from the MIBI (Sellers et al., 1997) to develop the Black Father Regard (BFR) scale. Specifically, the public and private regard subscales were adapted to reflect beliefs about Black fathers’ perceptions of how others and fathers’ personally-held beliefs.

**Results:** Regression models, including key sociodemographic variables, discrimination stress and BFR dimensions, were computed. Fathers of boys reported less positive personal beliefs about Black fathers (BFR-PRV) ($\beta$= -.11, $p< .05$). Regarding BFR-PUB, discrimination stress was related to less positive personal beliefs about Black fathers ($\beta$= -.17, $p< .05$) and less positive perceptions of others’ views about Black fathers ($\beta$= -.15, $p< .05$).

**Conclusions:** Results suggest that fathers’ social characteristics and other social identities may impact their perceptions of others’ views about Black fathers. Child characteristics and discrimination experiences appear to be more strongly related to personally-held beliefs about Black fathers. Implications and potential limitations to be further discussed.

Neha Goel

*The Ill-Defined Middle: Body Image and Eating Disorder Concerns among South Asian American Women*

**Background:** Eating disorders (EDs) affect individuals across all racial/ethnic stratifications, yet significant treatment disparities exist. South Asian Americans (SAA), a specific subset of individuals traditionally categorized within the larger umbrella group of “Asians,” have been notoriously neglected in the ED literature. Currently, very little information exists on the etiology and presentation of EDs within these communities. This study used focus group methodology to identify culturally-relevant body image and ED constructs for SAA women.

**Methods:** Using a qualitative descriptive approach, thematic analysis determined salient themes related to body image and EDs, and perceptions of barriers and facilitators of treatment. Seven focus groups were conducted and N=54 participants were recruited. Participants reported a mean age of 20.11 years (SD=2.52), and BMI of 24.01 kg/m2 (SD=5.20). The coding team (n=4) independently coded each transcript and met twice to discuss findings. After the first meeting, a codebook was drafted and used to code the remaining transcripts. The final codebook incorporated group feedback and only consisted of codes present in at least half of the transcripts.

**Results:** Themes for body image (n=5), EDs (n=5), barriers (n=6) and facilitators (n=3) of treatment were identified. Analyses revealed that SAA women are subjected to multiple appearance ideals (e.g., light-skin ideal), experience unique cultural stressors related to living in the U.S., and perceive relatively high expectations and pressures from multiple social domains, including parents and community members. Both generalized and social stigma about mental health, lack of knowledge about EDs, and healthcare providers’ biases were important barriers to treatment-seeking.

**Conclusions:** Participants recommended that clinicians facilitate intergenerational conversations about mental health, create ED psychoeducational health campaigns, and train providers in culturally-sensitive practices for detecting and treating EDs.
**Mallory John**  
*Synthesis and Catalytic Activity of Transition Metal Phyllosilicates from Laser Ablation in Liquid*

**Background:** Rising levels of greenhouse gases in our atmosphere such as CO2 are contributing to global rises in temperature, acidification of the oceans, and more extreme weather conditions. Hydrogenation of CO2 to form carbon-based products is of great importance to reduce CO2 levels and generate carbon-based compounds that can be used for industrial purposes. Copper- and nickel- based nanocatalysts have promising catalytic activity toward CO2 hydrogenation, and have great interest to replace expensive and rare Pt- and Pd-based catalysts.

**Methods:** Focusing high powered laser pulses onto the surface of a silicon wafer immersed in liquid solutions containing nickel nitrate or copper nitrate in alkaline media leads to the formation of Cu, Ni or copper-nickel phyllosilicates (PS). The laser pulses remove Si atoms from the wafer, allowing them to interact with the surrounding liquid where the Cu2+ or Ni2+ ions incorporate themselves into the forming phyllosilicate structure. The well-dispersed Cu and Ni atoms throughout the structure lead to a highly catalytically active material.

**Results:** The Cu-PS and Ni-PS nanostructures were synthesized, and the formation mechanisms from different experimental parameters were investigated. The Cu-PS selectively converted CO2 to methanol below 500ºC and formed methanol and methane above 500ºC.

**Conclusions:** The synthesis of Cu-PS and Ni-PS nanostructured catalysts were achieved using a reactive laser ablation in liquid technique, and the products displayed catalytic activity toward the hydrogenation of CO2, with temperature-dependent selectivity toward methanol and methane.

**Wedyan Kattan**  
*A Content Analysis of #Saudi_Arabia and #Saudis: Saudi Stereotypes on Twitter in Relation to Orientalism and Framing*

Based on framing theory and Orientalism theory, this dissertation explores how Saudi stereotypes are covered on Twitter. This study aims to recognize stereotypes of Saudi Arabia and Saudis hold 15 years after the attacks of September 11, 2001 and most recent stereotypes hold after several political incidents in the region, such as, Yemen war. The scope of this study sheds light on the way stereotypes of Saudis are framed in new media by examining the Western tweets on Twitter, drawing an analogy between the past and the present view in the age of social media. Thus, the main research question to be addressed in this study is how have Saudis been presented on Twitter recently?

With the purpose of gaining a detailed understanding of how Saudis are portrayed on Twitter, this study provides a literature review of academic sources that address stereotypes of Muslims and Arabs in general, and Saudis in particular. Through quantitative content analysis, the dissertation analyzes how English-language tweets by Western users represent and framed Saudi stereotypes under the hashtags #Saudi Arabia and #Saudis during the selected timeframe.
**Marie Kreck**  
*Scoring Sound: The Role of Notation in a Musical Event*

**Background:** While art, entertainment, and technology trend towards the audiovisual, towards the synesthetic, it remains difficult to encompass multi-sensory media in any single analytical framework. Sound studies has always grappled with sound’s apparent subjugation to image. Eidsheim’s “music as vibrational practice” accounts for music as a “thick event,” thereby bridging some gaps between the senses, but she declines to incorporate musical notation into her model.

**Methods:** Drawing on Helmreich's theory of transduction and on focused studies on composition, notation, and interpretation, I examine the role of notation in the composition and performance of Western art music in order to revise the model of music as a thick event to encompass notation.

**Results:** As a transformation of temporal sound into fixed image, notation is naturally limited. It also carries the baggage of colonialist attitudes in early ethnomusicology. However, in Western art music, notation is essential to the process of composition and therefore to the act of music making. The cultural weight of the score creates an illusion of objective representation which is emblematic of Western art music’s problematic belief in the werktreue – an original, ideal form of a musical work accessible to a performer with sufficient historical knowledge – and a wider culture of naïve listening. By positioning notation as the means of composition (rather than transmission), we can untether ourselves from the idea of a work existing prior to the score.

**Conclusion:** For musical analysis, this model implies a focus on how the cultural context of a performance shapes the work.

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**Ebony Lambert**  
*Shedding Psychological Light on the Racial Disparities in School Disciplinary Measures: The Role of Dehumanization as a Potential Mechanism*

Schools should be safe and supportive spaces for all students, yet Black students tend to face biased treatment in the education system, which often results in harsh disciplinary measures. This research examined the role of animalistic dehumanization (i.e., perceiving others as animal-like and uncultured and denying uniquely human characteristics), in predicting choice of harsher disciplinary measures for Black students as opposed to White students. It was hypothesized that individuals who dehumanize Black students to a greater degree would be more likely to believe that Black students need to be disciplined through harsher measures. Both Study 1 (in which dehumanization was assessed) and Study 2 (in which dehumanization was experimentally manipulated) failed to provide evidence supporting the role of dehumanization in differential choices of school disciplinary measures for Black vs. White students. However, both studies provided evidence suggesting that dehumanization of, and negative attitudes toward, Black Americans are still prevalent and related in American society, and that animal learning perceptions and paradigms influence participant perceptions of threat from students and disciplinary decisions. These findings indicate a need for continued investigation of racial stereotypes about students when assessing racial disparities in school discipline.

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**Rebekah Lavender**  
*Six Weeks of Resveratrol Improves Cardiovascular Health in Patients with COPD*
BACKGROUND: Chronic obstructive pulmonary disease (COPD) is the third leading cause of death worldwide. One-third of people diagnosed with COPD die of cardiovascular (CV) complications as opposed to pulmonary. Despite these odds, there are no therapies that mitigate this important health issue. Resveratrol, a naturally occurring antioxidant, improves CV health in other populations. However, there is currently no literature on resveratrol in patients with COPD. The purpose of this pilot study was to test if six weeks of resveratrol supplementation could improve CV health in patients with COPD.

METHODS: A randomized, double-blind, pilot trial was completed in 8 patients with COPD. Participants were given either resveratrol (n=5; 500 mg) or placebo (n=3) for six weeks. CV health was measured before and after treatment through arterial stiffness and 6-Minute Walk Test (6MWT).

RESULTS: Six weeks of resveratrol improved arterial stiffness in patients with COPD through reductions in augmentation index and pulse pressure amplification. Improvements in total 6MWT distance were also observed after six weeks of resveratrol. No changes after placebo were observed in any of the measurements.

CONCLUSIONS: Our results suggest that six weeks of resveratrol improves markers of CV health in patients with COPD. Future studies are warranted to expand this pilot study and understand the potential role of resveratrol in COPD CV health.

Xiao Ling

L1 Regularized L1-Norm Best-Fit Line Problem

Background: Conventional Principal Component Analysis (PCA) is a widely used technique to reduce data dimension. PCA finds linear combinations of the original features capturing maximal variance of data via Singular Value Decomposition (SVD). However, SVD is sensitive to outliers, and often leads to high dimensional results. To address the issues, we propose a new method to estimate best-fit one-dimensional subspace, called l1-norm Regularized l1-norm.

Methods: In this article, we describe a method to fit a lower-dimensional subspace by approximate a non-linear, non-convex, non-smooth optimization problem called l1 regularized l1-norm Best-Fit Line problem; minimize a combination of the l1 error and of the l1 regularization. The procedure can be simply performed using ratios and sorting. Also, we present applications in the area of video surveillance, where our methodology allows for background subtraction with jitters, illumination changes, and clutters.

Results: We compared our performance with SVD on synthetic data. The numerical results showed our algorithm successfully found a better principal component from a grossly corrupted data than SVD in terms of discordance. Moreover, our algorithm provided a sparser principal component than SVD. However, we expect it to be faster on multi-node environment.

Conclusions: This paper proposes a new algorithm able to generate a sparse best-fit subspace robust to outliers. The projected subspaces sought on non-contaminated data, differ little from that of traditional PCA. When subspaces are projected from contaminated data, it attains arguably significant both smaller discordance and lower dimension than that of traditional PCA.

Kyle Mason

Non-Medical Use of Prescription Drugs and HIV Risk Behaviors in Young Adults in Kosovo

Previous studies have found associations of non-medical use of prescription drugs (NMUPD) and HIV risk behavior in young adults, gay and bisexual men, and transgender women; however,
most studies were conducted in the United States and other developed countries. The present study evaluates the association between NMUPD and HIV risk behavior among young adults referred for substance use treatment in Kosovo. Participants were recruited by research staff at a non-governmental organization providing substance use treatment in Kosovo. Young adults (age 18-29) referred for substance use treatment who could complete a survey in Albanian were eligible for inclusion. Chi square tests were used to test differences in reported risk behavior by NMUPD, and sequential logistic regression was conducted to determine the independent relationship between NMUPD and unprotected sex in the past 3 months, controlling for demographic factors and use of alcohol and marijuana. Results suggest considerable NMUPD among young adults referred for substance use treatment in Kosovo. Nearly half of respondents (49.8%) reported lifetime NMUPD. Individuals with a history of NMUPD reported higher rates of HIV risk behaviors compared with individuals who did not report NMUPD. NMUPD remained a significant predictor of unprotected sex in the past 3 months in adjusted results (OR = 2.15 (95% CI=1.16, 3.97), p < .05). Consistent with previous investigations, NMUPD was robustly associated with both sexual risk and injection risk behaviors in this under-examined sample. Agencies aiming to reduce substance use in this population should also attend to HIV risk behaviors.

Alexandra Merritt

_Intracultural Empathy in the Context of Critical Consciousness Development_

**Background:** For the past several decades scholars have examined adolescents’ increasing awareness of systemic oppression and desire to act as change agents as critical consciousness development. Though, there remains a gap in the literature concerning critical consciousness development and socioemotional competence. Since learning about systemic inequality and the marginalization of one’s ethnic-racial group is an inherently emotional process, it is important for researchers to explore the socioemotional outcomes related to critical consciousness development among ethnic-racial minority youth.

**Conclusion:** This presentation will focus on _intracultural empathy_ which we describe as a culturally-relevant manifestation of empathy that is directed toward members of a shared cultural/ethnic/racial group. More specifically, intracultural empathy is the understanding and sharing of emotion between ethnic-racial ingroup members motivated by the desire to ameliorate social injustices targeting one’s own ethnic-racial community. We propose that the affective-cognitive experience that adolescents have when they become more aware of the context of systemic oppression and how it relates to the social standing of their ethnic-racial group may facilitate greater intracultural empathy. Previous literature suggests that greater critical reflection or critical social analysis may facilitate critical action through increased “emotional faculties” (Watts et al., 2002). Thus, in this presentation we will further delineate intracultural empathy gained from critical consciousness from other forms of empathy. In addition, we will discuss the utility of intracultural empathy in understanding critical consciousness development among ethnic-racial minority adolescents such as the potential for novel insight into how identity-activated affect and processing (i.e. intracultural empathy) may aid youth interventions.

Samantha Mladen

_Outcomes of Interdisciplinary Pain Management for Chronic Opioid Users in Safety Net Primary Care_
**Background:** Integrated interdisciplinary pain management (IPM) is proliferating for chronic non-malignant pain. Although primary care physicians (PCPs) are often the first point of contact for patients with chronic pain, limited studies exist examining IPM in primary care settings with limited resources and/or medically underserved patient populations.

**Method:** Participants were patients (n= 27) with long-term opioid-intensive management of chronic pain actively receiving care from an IPM team within a safety net primary care clinic. Participants ranged in age from 33 to 76 (M= 54, SD= 11); were 56% African American/Black, 7% Latinx, and 37% White; and 67% female. Participants began receiving IPM from their PCP and a behavioral health clinician; data from some patients prior to IPM will be presented. Various pain-related outcomes were measured approximately every two months. Additionally, patients’ Morphine Daily Equivalents (MDE), IPM engagement, and exposure to specific behavioral interventions were reviewed.

**Results:** Behavioral interventions and longitudinal assessment of pain outcomes from one year of follow-up, including assessment of interactions and mechanisms, will be presented. At baseline, MDE ranged from 20 to 720 (M= 238, SD= 187) with high pain interference scores out of 10 (M= 7, SD= 2). On the Opioid Risk Tool, 22% were high-risk, 19% moderate risk, and 59% low risk. Self-efficacy was low (22% severe, 30% moderate, 33% mild, 11% minimal impairment) and pain catastrophizing was high (37% severe, 30% moderate, 33% mild). Preliminary data indicate diverse patient pain profiles, but trends suggest improving self-efficacy, increasing engagement in IPM, and interest in decreasing medication usage.

**Discussion:** Preliminary results offer hope for effective chronic pain management with IPM. Continued measurement of patient experiences will allow for longitudinal assessment of trends, mechanisms, and interactions, in a sample with poor baseline pain functioning scores. Additionally, “lessons learned” will be offered for providers interested in implementing IPM.

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**Zoe Neale**

*Gene-by-Intervention Effects on Alcohol Dependence Symptoms in Emerging Adulthood*

**Background:** Genetic predispositions may help to explain differential response to prevention/intervention. The present study examines whether polygenic risk moderates the effect of a prevention program on alcohol dependence (AD) symptoms.

**Methods:** The sample includes 468 participants from a longitudinal study of a program aimed at preventing externalizing behaviors in middle schoolers (Dishion et al., 2003). AD symptoms were assessed at age 18-19. Polygenic risk scores (PRS) were derived using summary statistics from an independent genome-wide association study of risky behavior (Linnér et al., 2019).

**Results:** In European Americans (EA, n = 274), we observed a significant main effect of PRS (β = .15, p = .017), but not intervention (β = .09, p = .113) on AD symptoms. There was also no evidence of an interaction between PRS and condition. When stratified by condition, there was a significant effect of PRS on AD symptoms for EA control (β = .181, p = .047) but not EA intervention participants (β = .121, p = .158). For the African American (AA, n = 194) subsample, we observed no significant results.

**Discussion:** Findings suggest that risky behavior PRS are significantly associated with AD symptoms in a sample of EA young adults. Stratified analyses suggest the intervention may diminish the impact of PRS on AD symptoms in EA participants. Null findings for AA subsample may be due to reduced power and the discovery sample ancestry background. Overall, results provide modest evidence for differential intervention effects related to polygenic risk in EA young adults.
Chimdindu Ohayagha
Is Helping Really Helping? Health-Related Quality of Life after TBI Predicting Caregiver Depression Longitudinally in Latin America

Studies have shown that psychosocial sequelae of traumatic brain injury (TBI) predict emotional well-being of caregivers. Previous research examining the mental health of caregivers and the health-related quality of life (HRQoL) of people with TBI have primarily been in the US. Very little research has been conducted to uncover the relationships between HRQoL of people with TBI and caregiver mental health longitudinally, or in low-middle income Latin American countries. The aim of this study was to evaluate how HRQoL after TBI predict caregiver depression longitudinally in Latin America.

Three multiple regressions were conducted to examine which aspects of patient HRQoL at baseline predicted caregiver depression. At baseline, the overall model significantly predicted caregiver depression, F(8, 105) = 2.62, p = .012, R² = .18. Patient mental health was the only significant unique predictor of caregiver depression at baseline, p = .021, β = -.34. The overall model predicting 2-month caregiver depression was significant, F(8, 101) = 3.21, p = .003, R² = .22. Only mental health, p = .016, β = -.36, was a significant unique predictor. The overall model predicting 4-month caregiver depression was significant, F(8, 98) = 2.70, p = .010, R² = .19.

Results suggest that TBI patient HRQoL can predict caregiver depression among Latin American caregivers before and during the first 4 months after hospital discharge. Across all three time points, caregiver depression was significantly predicted by patient HRQoL. These findings suggest that within the cultural framework in Latin America, there is a strong relationship between functional and psychological impairments after TBI and depression outcomes in Latin American caregivers. The results highlight the importance of uncovering these relational distinctions and may infer early detection of mental health needs and psychological intervention considerations for Latin American caregivers.

Kristen O'Loughlin
Stakeholder Input on an Enhanced Care Planning Tool Addressing Unhealthy Behavior, Mental Health Needs, and Social Risk

Background: Many patients with multiple chronic conditions (MCC) have social risks, mental health needs, and/or unhealthy behaviors. These interfere with their ability to manage their MCC. A care planning tool was created to help address these needs; this study solicited feedback from stakeholder groups and incorporated it into improving the tool.

Methods: Instrument: The Enhanced Care Planning (ECP) tool screens patients for social risks, mental health needs, and unhealthy behaviors. They are shown where their responses revealed risk, then select 1-2 to improve upon. Next, patients set personal goals and select strategies to support them. Patients are supported by the clinical care team and a community health worker to connect them to community resources.

Procedures: Four stakeholder groups provided feedback on the ECP tool: community members, community service professionals (CSPs), researchers, and patients. A community review board of community members reviewed the ECP process. Researchers and CSPs then reviewed ECP content. Feedback was incorporated into revisions of the ECP content and process, then patients provided final feedback.
**Results:** All stakeholder groups provided unique feedback. Community members desired visuals, the ability to individualize and receive support throughout the process. Researchers and CSPs recommended removing jargon. While researchers were interested in specific evidence-based strategies, CSPs suggested strategies with anecdotal support. Patients expressed positive overall impressions of the tool, interest in using it, and increased awareness of domains that influence their health.

**Conclusion:** Feedback from all groups significantly altered the ECP tool’s design and is likely to improve its usability and impact.

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**Anna Beth Parlier-Ahmad**  
*Multidimensional Recovery among an Opioid Use Disorder Treatment Population*

**Background:** Given the current opioid crisis, recovery from opioid use disorder (OUD) warrants attention. SAMHSA’s working definition of recovery highlights dimensions that support recovery including health, home, community, and purpose. Recovery capital captures factors that support recovery within these dimensions and has been associated with recovery outcomes. Prior research highlights possible gender differences in recovery outcomes.

**Objective:** 1) Describe and compare recovery capital among an OUD outpatient treatment population by gender; 2) Identify the relationship between recovery capital and length of time in treatment within this population.

**Methods:** Patients (n=126) taking medication for OUD at a single outpatient substance use treatment clinic completed an electronic, cross-sectional survey (July-September 2019). The Brief Assessment of Recovery Capital (BARC-10) assessed recovery components. Length of current treatment episode was abstracted from Virginia’s Prescription Monitoring Program. Descriptive statistics were calculated. Chi square and Mann Whitney-U were used to test differences by gender. Multivariate linear regression was conducted.

**Results:** Participants (n=126) were 45.3% men and 54.7% women. Most identified as Black (67.7%) and were single (69.0%). Compared to men, women were younger (38.87 ± 11.31 vs. 47.07 ± 12.12; p<.001) and more likely to be unemployed (60.9% vs. 42.1%; p=.037). Mean BARC-10 score was 45.08 (±9.73) and did not vary by gender. Several BARC-10 individual items within the purpose recovery dimension differed by gender (p<.05). More social support was associated with higher BARC-10 score (p<.001); length of treatment was not (p=.599). 

**Conclusions:** Recovery capital was high and gender differences minimal. Individuals receiving medication for OUD can initiate and sustain recovery.

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**Elliottnell Perez**  
*Sleep, Caregiver Burden, and Life Satisfaction in Parkinson’s Disease Caregivers from Mexico and the US*

**Introduction:** Sleep problems are frequently reported by caregivers of individuals with Parkinson’s disease (PD) and are associated with greater caregiver burden and poorer caregiver life satisfaction. The primary aim of this study was to examine the pattern of associations among PD patient and caregiver sleep problems, caregiver burden, and life satisfaction in PD caregivers. A secondary aim was to assess whether the pattern of associations differed between Mexican and US caregivers.
Methods: Secondary analyses were performed on data obtained from 253 caregivers (age M=59.92, SD=14.66). A composite score was produced for caregiver and patient sleep problems. The Zarit Burden Interview (ZBI) and Satisfaction with Life Scale (SWLS) measured caregiver burden and life satisfaction, respectively. A structural equation model (SEM) was developed to examine the pattern of associations among sleep problems, caregiver burden, and life satisfaction. An invariance design was employed to assess differences in the associations between Mexican and US caregivers.

Results: Fit indices suggested the SEM fit the data adequately. Path coefficients among all variables were significant (p≤.005), except between patient sleep problems and life satisfaction. Three significant indirect effects were found: caregiver sleep problems were negatively associated with life satisfaction via caregiver burden (p=.003); patient sleep problems were positively related to caregiver burden via caregiver sleep problems (p=.005); and life satisfaction via caregiver burden and caregiver sleep problems (p=.002). Despite noninvariance of error terms for the ZBI (z=2.92) and SWLS (z=3.37) between Mexican and US caregivers, the model was generally invariant across countries.

Conclusions: Patient sleep problems were associated with caregiver sleep problems, leading to increased burden in caregivers and poorer life satisfaction. The findings highlight a potential opportunity for empirically-supported sleep interventions in both individuals with PD and their caregivers which may initiate a cascade of salubrious effects on caregiver burden and overall life satisfaction.

Sarah Pittman

Life Satisfaction: Measurement Invariance and Correlations with Adolescent Adjustment

Background: Low life satisfaction during adolescence has been associated with adjustment problems. There are few well-validated measures available to assess adolescents’ life-satisfaction. The purpose of this study was to investigate the structure of the Life Satisfaction Scale, evaluate its measurement invariance across sex and race/ethnicity, and investigate its associations with related constructs.

Methods: Participants were 3,340 adolescents from rural middle schools in Florida. Half the participants were female, 51% were White, 15% were Black, and 22% were Latinx. Adolescents completed the Life Satisfaction Scale, the Children’s Report of Exposure to Violence scale, and the Problem Behavior Frequency Scale.

Results: Confirmatory factor analysis found support for a single factor representing overall life satisfaction, and strong measurement invariance across race, but not across sex. There were significant differences in item thresholds such that girls at the same level of life satisfaction as boys, were more likely to endorse higher responses to items assessing satisfaction with school, with themselves, and with their friendships. Life satisfaction had significant negative correlations with violence exposure, problem behavior, and peer pressure for drug use.

Conclusion: Findings suggest that the Life Satisfaction Scale may be suitable for assessing life satisfaction across different groups of adolescents. Examining sex differences must be done cautiously as life satisfaction may have different meanings to boys and girls. The inverse correlations between life satisfaction, violence exposure and problem behavior across groups highlights the importance of developing sound measures to assess this important construct and determine how it relates to youth adjustment.
**Mickeal Pugh, Jr.**  
*Predicting Caregiver Burden Over the First 4 Months After TBI in Latin America: A Multi-site, Multi-Country Study*

Disparities in TBI exist between developed and developing regions, and this neurological condition typically requires caregivers to provide aid and functional support for those with TBI (Hyder, Wunderlich, Puvanachandra, Gururaj, & Kobusingye, 2007). Latin America, among these global regions, has elevated risks of both sustaining TBI and poorer post-TBI functioning (Bonow et al., 2018). Previous literature has shown the poor cognitive, mental health, and social functional outcomes following the injury (Deloche, Dellatolas, & Christensen, 2000), but research has minimally explored both longitudinal trends of these outcomes, and if functional outcomes of the injury differentially predict caregiver burden. The aim of the current study was to examine if deficits in cognitive/executive functioning, depression, and social disadaptation among individuals with TBI in Latin America predict longitudinal trajectories of caregiver burden. A sample of 109 Latin American caregivers of individuals with a newly sustained TBI, from three hospitals were included in the study. In order to evaluate this series of relationships, Hierarchal Linear Modeling (HLM) assessed whether key features of TBI (e.g., depression, cognitive dysfunction, and social disadaptation), at baseline, predicted longitudinal outcomes of caregiver burden. Study findings showed that social disadaptation significantly predicted caregiver burden trajectory. Further, results showed that caregiver burden trajectories generally decreased over time, and men reported greater caregiver burden compared to women. These findings highlight unique trends among post-TBI caregivers in Latin America and suggest that future research should assess mechanisms that influence these trends.

**Hadley Rahrig**  
*Mindfulness Training Effects on Neural Responses to Aggression: An fMRI Experiment*

Aggression, the intention to harm someone against their will, is a serious public health concern. However, evidence suggests that aggression may be mitigated through behavioral interventions, among which mindfulness training has emerged as a promising candidate. Mindfulness fosters receptive attention towards experiences and has reduced retaliatory aggression. To determine if these effects are facilitated by brain-based changes in emotion regulation, this study (N = 22) investigated the neural mechanisms of brief mindfulness training on retaliatory aggression in a randomized controlled trial. Post-intervention fMRI assessments during a behavioral aggression task showed that when ostensibly provoked by a stranger, mindfulness training (MT) promoted greater vmPFC reactivity relative to reappraisal training (RT) (FDR-corrected p < .001), and when given opportunity to aggress, MT trainees showed less activity in dmPFC and dACC regions (FDR-corrected p < .05). These results suggest that mindfulness and reappraisal training regulate emotional responses to retaliatory aggression via distinct executive control mechanisms.

**Scott Ravyts**  
*Validation and Clinical Usefulness of a Sleep Health Scale in Late-Life*

Sleep health is a multidimensional construct of sleep and wakefulness which can be conceptualized as the opposite of sleep dysfunction. Assessing sleep health is particularly relevant among older adults who disproportionately experience sleep-related adverse outcomes. Yet empirically-validated sleep health scales are lacking. The objectives of the present study...
were to assess the psychometric properties of a newly designed measure of sleep health (RU-SATED) among older adults and examine the association between sleep health and well-being in late-life. Data included 773 older adults (M=67.68, 52% female) who completed an online survey of their sleep and health. Respondents completed the six-item RU-SATED scale, the Insomnia Severity Index (ISI), and the Satisfaction with Life Scale (SWLS). Sleep health scores ranged from 1 to 12, (M=8.13, SD=2.68), with higher scores indicating better sleep health. Exploratory factor analysis revealed a one-factor model. Confirmatory factor analysis showed that a one-factor model was associated with model fit indices in the adequate range. Additionally, a hierarchical linear regression indicated that sleep health was positively associated with life satisfaction (β=.25, p<.001) and accounted for significant variance in life satisfaction above and beyond insomnia severity (ΔR2=.04, p<.001). In conclusion, RU-SATED appears to be a valid measure of sleep health among older adults with potentially useful clinical applications. Future research would benefit from examining the association between sleep health and other relevant health outcomes, as well as assessing the prospective ability of sleep health to predict relevant outcomes above and beyond traditional measures of sleep quality or insomnia.

Rebecca Smith
*Pathways to Risk to Alcohol Outcomes: An Examination of Peer Substance Use as a Moderator or Mediator of Genetic Predispositions*

**BACKGROUND:** College students have high rates of risky alcohol use (White & Hingson, 2013). Participation in risky behaviors is known to be genetically influenced (Linnér et al., 2019). Environments can moderate genetic propensity or serve as mechanisms by which genetic propensity is realized (Dick & Kendler, 2012). Peer substance use (SU) is a strong environmental predictor of college students’ own use (Borsari & Carey, 2001). We examined whether peer SU moderated or mediated genetic predisposition toward risky behaviors to predict alcohol use among college students.

**METHODS:** Data came from Spit for Science (N=9,911; Dick et al., 2014). The sample was limited to European ancestry individuals (n=2,873). Participants reported their alcohol use and perceptions of peers’ SU. Genetic predispositions were indexed using polygenic risk scores (PRS) derived from a genome-wide association study of risky behaviors (Linnér et al., 2019). We used PROCESS (Hayes, 2019) to examine whether peer SU moderated or mediated the association between PRS and alcohol use, controlling for sex and the first two ancestral principal components.

**RESULTS:** Peer SU (β=0.42, p<.001, ΔR2=0.178) and PRS (β=0.06, p=.017, ΔR2=.010) independently predicted increased alcohol use. Peer SU did not moderate the association between PRS and alcohol use (β=-0.03, p=.196). PRS was not associated with peer SU (β=0.04, p=.186), and there was no indirect effect of PRS on alcohol use via the peer SU pathway (indirect effect: β=0.02, 95%CI [-0.01,0.04]).

**CONCLUSION:** Peer SU and genetic predisposition associated with risky behaviors influence alcohol use among college students. This can inform targeted prevention/intervention programs.

Danyel Smith
*Food Choice as a Signal of Racial Identity*

**Objectives:** This study experimentally assessed food preference as one potentially important racial identity cue particularly for Black Americans, which in turn impacts interpersonal relations
both between ethnicities/races (i.e., inter-group) and within ethnicity/race (i.e., intra-group). We hypothesized that preference for “Soul Food,” which is historically significant to Black Americans, as opposed to “Fresh Salad,” would be associated with stronger racial identity and induce more positive reactions among Black participants but more negative reactions among White participants.

**Methods:** Undergraduate students (N = 365) viewed one of four online profiles that were ostensibly completed by a Black Student. Student gender (i.e., DeShawn vs. LaKeisha) and student food preference (Soul food vs. fresh salad) were manipulated experimentally within the online profiles.

**Results:** Consistent with the prediction, preference for “Soul Food” was associated with stronger perceived racial identity, regardless of participant race. Additionally, Black participants responded more positively when “Soul Food” was preferred. In contrast, there was no evidence that White participants reacted differently to the Black students based on food preference.

**Conclusions:** Food preference serves as one indicator of racial identity among Black Americans. Further implications are discussed.

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**Jennifer Tennison**

*A Monumental Controversy: Changing Perceptions Towards Confederate Monuments on Richmond, Virginia’s Monument Avenue from the Civil Rights Era to Modern Times*

**Background:** In recent years, symbols of the Confederacy in public spaces have been hotly debated. Richmond’s Monument Avenue, a boulevard lined with monuments to five different Confederate figures, has been central to the conversation over the years due to its prominence and symbolism as a shrine to the Lost Cause. With this said, the idea that Monument Avenue is a controversial site is nothing new. The avenue has been embroiled in controversy since its inception in 1890. However, it was not until the Civil Rights era that a shift became apparent in the way that Richmonders perceived the street.

**Methods:** An array of primary sources including newspapers, magazines, city government reports, and archival documents have been analyzed. In addition, academic scholarship on related topics aided analysis of the primary source documents.

**Results:** By 1977, Richmond’s city council members became a majority African American for the first time in history. As African Americans’ political power increased, calls to democratize Monument Avenue became increasingly loud. This resulted in the 1996 placement of the Arthur Ashe monument.

**Conclusions:** The changing perceptions toward Monument Avenue over time is the result of the growing political power of African Americans in Richmond and around the country. As African Americans have increasingly held more power to make their opinions known and enact changes to the street itself through political channels, other groups in society have also come to the realization that Confederate monuments are offensive to many as they were constructed in part to assert white supremacy.

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**Nathaniel Thomas**

*Prosocial Tendencies Mediate the Influence of Emotion Regulation and Parenting Styles on Polysubstance Use*

**BACKGROUND:** Substance use is common, heritable, and associated with negative outcomes in emerging adults. Previous work suggests that parenting styles are associated with substance use behavior. However, the specific pathways through which these associations operate are not yet well understood. One such pathway is mediated by emotion regulation and prosocial tendencies.

**Methods:** The study employed a correlational design with data collected from a large, nationally representative sample of emerging adults. The measure of emotion regulation was assessed using the Difficulties in Emotion Regulation Scale (DERS). Parenting styles were assessed using the Parenting Styles and Outcomes Questionnaire (PSQ). Prosocial tendencies were measured using the Prosocial Behavior Inventory (PBI). The influence of emotion regulation and parenting styles on substance use was examined using structural equation modeling (SEM).

**Results:** The results indicated that emotion regulation mediated the relationship between parenting styles and substance use. Specifically, the use of authoritative parenting was associated with better emotion regulation, which in turn was associated with lower levels of substance use. Conversely, the use of permissive parenting was associated with poorer emotion regulation, which was related to higher levels of substance use.

**Conclusions:** The findings highlight the importance of emotion regulation in the relationship between parenting styles and substance use. They also suggest that interventions aimed at improving emotion regulation may be effective in reducing substance use among emerging adults.

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**Conclusions:** The findings highlight the importance of emotion regulation in the relationship between parenting styles and substance use. They also suggest that interventions aimed at improving emotion regulation may be effective in reducing substance use among emerging adults.
use outcomes. The current study examines whether the association between parenting styles and substance use is mediated by emotion regulation and prosocial tendencies in a large sample of emerging adult college students

**METHODS**: Subjects were drawn from a longitudinal study of behavioral and emotional health at a large, urban university in the U.S. Mid-Atlantic region (n=755). Structural equation modelling was used to examine the mediated association between parenting styles and polysubstance use through emotion regulation and prosocial behavior after adjusting for heritable familial risk. All analyses controlled for age, sex, and race/ethnicity

**RESULTS**: Parenting style marked by high involvement, low autonomy-granting, and low support for emotion expression predicted lower emotion regulation ($\beta=-0.398 \ [-0.559, -0.237]$). Emotion regulation predicted greater prosocial tendencies ($\beta=0.214 \ [0.019, 0.408]$). Prosocial tendencies predicted lower polysubstance use ($\beta=-0.149, \ [-0.251, -0.047]$). Parenting style did not predict prosocial tendencies directly ($\beta=-0.026 \ [-0.176, 0.124]$) and emotion regulation did not predict polysubstance use directly ($\beta=0.045 \ [-0.076, 0.167]$). A significant indirect effect was identified, such that parenting style predicts emotion regulation, emotion regulation predicts prosocial tendencies, and prosocial tendencies predicts polysubstance use ($\beta=0.013 \ [0.001, 0.037]$).

**CONCLUSION**: Parenting styles influence substance use outcomes in emerging adulthood via a mediated pathway through emotion regulation and prosocial tendencies. Encouraging parenting styles marked by autonomy-granting and support for emotion expression early in development may improve a constellation of outcomes throughout development.

Chloe Walker

**SES, Race, and Neighborhood Racial Composition as Predictors of Genetic Literacy and Feelings about Receiving Ancestry DNA Results**

**Background**: Ethnic-racial minority individuals and individuals with lower socioeconomic status are underrepresented in genetics research, especially personalized genetic information (Knerr, Wayman & Bonham, 2011). White individuals make up a larger part of the personalized genetic information market (Kolor et al, 2012) as do individuals who have a higher SES (Roberts et al., 2017). For young adults, receiving ancestral DNA results may be linked with learning new information about one’s ancestral history, positive cultural experiences and positive well-being (Hoschild & Sen, 2015). Given the disparities that exist, paired with the potentially positive implications, it is important to understand the mechanisms underlying genetic literacy and feelings about one’s ancestry DNA results among young adults.

**Methods**: 115 young adults 18-25 participated in a longitudinal study on their experiences associated with receiving ancestry and health 23andme results. We used data collected from Time 1. Most participants were female (68.7%) and identified as an ethnic/racial minority student (66%).

**Results**: Findings indicated that higher SES predicted more genetic literacy among ethnic/racial minority young adults ($b = .26, \ p < .05$), but was not significant among White young adults. Furthermore, among young adults who lived in a mostly White neighborhood, higher SES was linked with more positive feelings about receiving ancestry DNA results ($b = .33, \ p < .05$); this finding was not significant for young adults in mostly ethnic/racial minority or mixed neighborhoods.

**Conclusion**: This work highlights the importance of focusing on individuals from socioeconomically and racially diverse backgrounds when testing mechanisms underlying receiving personalized genetic information.
Jennifer Weggen

*Vascular Dysfunction and Posttraumatic Stress Disorder: Examining the Role of Oxidative Stress and Sympathetic Activity*

**Purpose:** The physiological manifestations of posttraumatic stress disorder (PTSD) have been associated with increased risk of cardiovascular disease (CVD) independent of negative lifestyle factors. The goal of the study was to better elucidate the mechanisms behind the increased risk by examining peripheral vascular function and the possible role oxidative stress and sympathetic nervous system (SNS) activity may play.

**Methods:** Sixteen individuals with PTSD and twenty-four healthy age and sex-matched controls (CTRL) (aged 24 ± 4 years) participated in the study. The PTSD group participated in two visits, consuming either a placebo or antioxidants prior to their visits. Arm vascular function was assessed via flow mediated dilation of the brachial artery (BAFMD) and evaluated with Doppler ultrasonography. SNS activity was measured using heart rate variability.

**Results:** Though brachial artery function showed no difference between groups, arm microvascular function was significantly lower (p = 0.02) and SNS activity was significantly higher (p = 0.02) in the PTSD group when compared to the CTRL group. Following the acute AO supplementation, these differences were no longer significantly different (microvascular function, p = 0.16; SNS activity, p = .007) when compared to the CTRL group.

**Conclusion:** Young individuals with PTSD demonstrated arm microvascular dysfunction and higher sympathetic activity, which was attenuated by an acute AO supplementation to the level of the healthy controls. This study revealed that the modulation of oxidative stress, via an acute AO supplementation, improved vascular dysfunction in individuals with PTSD, potentially by reducing the substantial SNS activity associated with this disorder.

Samuel West

*Worth the Wait: Validation of the Aggression Choice Questionnaire*

People generally prefer smaller, immediate rewards to larger, delayed rewards (delay discounting). Neuroimaging evidence has indicated that acting aggressively in response to provocation demonstrates patterns of neural activity consistent with receiving a reward (Chester et al., 2016). Despite the evidence for retaliatory aggression as a rewarding experience, only one recent effort has examined aggressive behavior in an inter-temporal context (Chester et al., 2019). We synthesized delay discounting and aggression-as-reward literatures by developing a self-report questionnaire based off the Monetary Choice Questionnaire (MCQ; Kirby, Petry, & Bickel, 1999) - the Aggression Choice Questionnaire (ACQ). Participants (N = 963) across four studies completed the ACQ and MCQ measures. Results provide evidence for the ACQ’s psychometric properties via variability, test-retest reliability, and significant correlations with other relevant variables (e.g., angry rumination). Exploratory analyses regarding participant rates of conflict, perceptions of the ACQ, mouse trajectories, and data from studies currently ongoing will also be discussed. Overall, we conclude that participants do engage in the delay discounting of revenge, but that some individuals prefer to bide their time in service of inflicting greater harm.
**Kelcie Willis**  
*For I Know the Plans I Have for You: God Locus of Control, Spiritual Change, and Death Anxiety in Primary Brain Tumor Patients*

**Background/Purpose.** Primary brain tumor (PBT) patients risk experiencing death anxiety given the high mortality rate of their diagnosis. In line with Terror Management Theory (TMT), many diagnosed with cancer utilize religion as a method of coping with the disease. However, previous literature on the relation between death anxiety and religion in cancer patients indicates mixed findings of either a negative relationship or no association. To the authors’ knowledge, no study has analyzed these two constructs together in PBT patients. The current study sought to address this gap by investigating the relationship between religiosity and death anxiety in an understudied population.

**Methods.** Adult PBT patients (N = 56, Mage = 49.38, 51.8% female, 71.4% Caucasian, months since diagnosis = 55.34) completed measures of religiosity and death anxiety at their routine medical appointment at an academic medical center, including: The God Locus of Health Control Scale (GLHCS), Posttraumatic Growth Inventory (PTGI), Death and Dying Distress Scale (DADDS), and the Death Distress Scale (DDS). Descriptives and Pearson correlations were utilized.

**Results.** The results revealed that while the GLHCS was not significantly related to either measure of death anxiety, the Spiritual Change subscale of the PTGI was positively correlated to both the DADDS (r = .56, p < .001) and the DDS (r = .41, p = .01).

**Conclusions and Implications.** Results suggest that certain proxies of religiosity may be more closely associated with death anxiety than others. Although there was no evidence in our sample that PBT patient’s God locus of control was related to death anxiety, those who reported higher levels of death anxiety endorsed greater spiritual change (i.e., I have a stronger religious faith). Considering TMT, perhaps feelings of death anxiety prompt one to strengthen their religious beliefs. Future longitudinal analyses addressing the direction and course of these relationships are warranted.

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**Lesley Winchester**  
*Let’s Talk: A Study of the Impact of Gendered Racial Socialization on African American Adolescent Girls’ Mental Health*

This study sought to 1) explore the relationship between internalized gendered racial oppression (IGRO) and depression, anxiety and stress symptoms, and 2) examine whether messages of gendered racial pride and empowerment (GRPE) impacted this relationship for African American Girls. 287 Black adolescent girls (MAge = 15.40) completed questionnaires assessing the study variables of interest as part of a larger parent-teen dyadic study. To test the hypothesis that GRPE socialization moderated the relationship between IGRO socialization and indicators of psychological wellbeing (i.e., depressive, anxiety, and stress symptoms), a series of hierarchical multiple regression analyses were conducted. Models of the main effects of IGRO and GRPE on depression (R2 = .04), anxiety (R2 = .04), and stress (R2 = .04) were significant (all ps < .001), suggesting these variables accounted for significant variance in the mental health symptoms. For depression, increases in both IGRO (b=.83, p < .001) and GRPE (b=.20, p < .05) were associated with increases in reported depression symptoms. However, examination of the interaction (b=-.16, p < .01) via simple slopes suggested that as Black girls reported higher levels of GRPE, the negative impact of IGRO on depressive symptoms was attenuated. Indeed, at the highest levels of GRPE, the effect of IGRO on depressive symptoms was reduced to non-
significance. Similar patterns emerged for teen anxiety and stress, with increased IGRO associated with increasing symptom endorsement and increasing GRPE attenuating this effect. Implications and future directions regarding gendered racial socialization of Black teenaged girls are discussed.

**Anna Wright**  
*Profiles of Adjustment among Children in Institutional Care in Ghana: Predictors of Positive Functioning*

Worldwide, there are 132 million orphans – children who have lost one or both parents. An estimated 2 to 8 million children globally live in institutional care for a large portion of their developmentally influential years. Placement in institutional care often leads to physical, mental, social, and emotional developmental delays and setbacks. Despite extensive literature documenting the deficits and delays in children raised in institutional care, there is a dearth of literature evaluating positive adjustment outcomes among these children. Recent studies have begun investigating predictors of positive adjustment for children residing in institutional care, as well as interventions that may prove to be beneficial for this population. This work is important given that the problem of eliminating institutional care and providing decent, stable, family-based care for all children globally has not been solved. The present study used cluster analyses to identify patterns of adjustment demonstrated by 100 youth ages 7-17 in institutional care as well as 100 of their peers from two-parent households in Accra, Ghana. Results revealed that four distinct patterns were present for both groups, across anxiety, depression, educational attainment, and perception of overall quality of life. Patterns indicated that youth may struggle in one area while still functioning within the typical range in another. Analysis of variance (ANOVA) was used to evaluate whether patterns of adjustment were predicted by varying levels of promotive factors (social support, emotion regulation, self-efficacy, and coping strategies). Findings suggested that significant promotive factors were present for both groups, and predicted more positive functioning, though promotive factors differed by group. Implications of these findings are discussed.

**Sandra Yankah**  
*Empirical Relationships among Trauma Exposure, Anxiety Sensitivity, and Post Traumatic Stress Disorder*

This review synthesized and critically reviewed empirical studies that assessed relationships among trauma exposure, anxiety sensitivity (AS), and Post Traumatic Stress Disorder (PTSD). Across the literature, the prominent theory conceptualized anxiety sensitivity as a causal risk factor within two competing models. One model posited that individuals with dispositionally high AS prior to experiencing a potentially traumatizing event (PTE) have a greater likelihood of developing PTSD after trauma exposure. The second model theorized that the introduction of a PTE raises an individual’s baseline level of AS, leading to the development and maintenance of PTSD symptoms. Emerging research highlighted the possibility of reciprocal relationships, as well as moderating and mediating variables (e.g., age, gender) that cause differential relationships among the variables of interest. The majority of studies to date used a cross-sectional study design, and primarily relied on a descriptive approach that solely highlighted correlations between AS and PTSD. Consequently, the current state of the literature is still unable to authoritatively discern whether AS causes PTSD, PTSD increases AS, or if the two
variables have a bidirectional relationship. Accordingly, extant evidence has only demonstrated that AS is a variable risk factor for the development and maintenance of PTSD symptoms. Current limitations within the literature, clinical implications, and suggestions for future research are discussed.

L. Douglas Wilder School of Government and Public Affairs

Sombo Chunda
Navigating Housing as an International Student: My Own Experiences

Conversations around housing and eviction in the United States of America (USA) often focus on local people. Even within the context of institutions of higher education, the narratives of housing appear to focus on everyone else other than international students. In this poster presentation, I will (i) give an overview of the scholarship on housing as it relates to international students, (ii) highlight the challenges around housing that international students face when they migrate to another country to study, and (iii) share my own experiences with securing housing as an international student in the State of Virginia. This presentation is important because it brings international students into focus in the conversation around housing and calls for future research on how students navigate different realities when they leave their home countries to pursue further studies. Research on housing experiences of international students is relevant for informing university policy makers who seek to understand how they can make their institutions more inclusive.

Amy Clifton-Mills
Adverse Childhood Experiences (ACE’s) & Mental Disorders/Suicide Attempts

Research has consistently shown that offender populations have higher rates of mental disorders, including history of suicide attempts, and that adverse childhood experiences (ACE’s), including parental substance abuse, physical, sexual, and emotional abuse, explain much of this association. As the population of incarcerated offenders with mental disorders continues to increase, it is important to analyze the role of trauma among jail inmates. Using a jail-based population from a mid-Atlantic county, we analyze the relationship between self-reported ACE’s and mental disorders, including history of suicidal behaviors. We discuss the results and conclude with a general discussion of the policy implications of the findings for the treatment of mental disorders and trauma responses, and more specifically, we discuss the implications for future jail-based treatment programs.

Shabana Shaheen
Asian Americans and Identity: Scratching the Surface of Census Data

Asian Americans have been the fastest growing racial group in the United States in the past two decades, with subgroup ethnic groups in particular changing immensely (Ramakrishnan, Wong, Lee, & Lee, 2016). Literature on Asian Americans articulate how the constant arrival of new immigrants and the diverging trajectories of their migration stories from Asia to the United
States has a distinct impact on Asian American communities. For this proposal, my research question is: Do Asian Americans identify pan-ethnically for the same reasons? The first National Asian American Survey (NAAS) called the Pilot National Asian American Political Survey (PNAAPS) conducted in 1998 was published in 2000. The pilot study was followed by surveys conducted every four years to coincide with presidential election years. The 2016 National Asian American Survey was conducted by the National Asian American Survey. This is a national survey, with the findings being representative of Asian Americans in the United States as a whole. Telephone interviews were conducted in 2016 from August 10 to September 29. The survey instrument included questions about social attitudes, political behavior, policy attitudes, social identities, and immigrant background. The latter two are particularly relevant to proposed study. The instrument also contained demographic questions inquiring about age, gender, race, language, country of birth, citizenship status, religion, marital status, educational level, employment, household income, and size of household. Surveys were conducted in eleven different languages including English.

In total, 4,787 interviews of Asian Americans, a nationally representative sample, were conducted through a telephone survey lasting approximately 25 minutes. Out of the 22,011 individuals sampled, there was a response rate of 21.8 percent. Over nine nations of origin are represented among the 4,787 respondents including: Vietnamese, Native Hawaiian/Pacific Islanders, Korean, Chinese, Asian Indian, Filipino, Hmong, Japanese, and Cambodian. The survey instrument was divided into 8 sections or modules preceded by a screener module asking about language preference, age, gender, country of birth and whether they consider any part of their background to be Asian or Asian American. Specific questions from the survey instrument relevant to my research question come from the screener module and module 2: life priorities and identity salience. Using those questions and demographic information collected in the survey I will conduct a statistical analysis to answer the question of Does the level of importance of panethnic identity differ by nation of origin?

Office of Research and Innovation

Aamna Ikram
*Exploration of Innovation in Women's Healthcare Technologies in America*

**Background:** In recent years, healthcare technologies for women has become a rapidly growing industry, but it is still a marginalized field within innovation. In the last two years, the money invested in technologies for women and research has increased by sevenfold. Unfortunately, this only accounts for 10% invested in technology for women of all possible technology investor funds and only 4% is invested for advances in women’s healthcare from the total healthcare and research funding.

**Methods:** An analysis was conducted to understand how drastically innovation within this area has changed along with possible influences that shaped those changes spanning from the 1800’s to present day in America. This was done through a study of medical technologies for women in the specific fields of cardiac health, reproductive services, and pharmaceuticals within each century. This research was carried out through the examination of research papers, historical documents, laws, patents and medical journals.

**Results:** Trends of the era, like the industrialization, women’s suffrage movements, and entry of women into the workforce were shown to have a large impact on the development of healthcare
technologies for women. Although equality is still not achieved in the amount of time or money paid yet, there is a distinct improvement from prior years.

**Conclusion:** This study was not only conducted to understand the past, but also to see how new trends may impact the continued advancement of technologies. The face of innovation is changing and with that there will be paramount changes in the types of innovation created.

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**Urszula Warncke**

**NLRP3 Inflammasome Activation May Contribute to Paclitaxel-Induced Peripheral Neuropathy in Mice**

**Background:** One of the major dose-limiting side effects of several anticancer drugs including paclitaxel (Taxol®) is Chemotherapy-Induced Peripheral Neuropathy (CIPN). CIPN symptoms include mechanical and cold allodynia, numbness, tingling, painful burning sensations and a decrease in the density of intraepidermal nerve fibers. Hypothesis/Goals: The objective of the present study was to characterize the modulatory role of NLRP3 inflammasome in the initiation and maintenance of CIPN induced by paclitaxel.

**Methods:** First, we assessed the expression of NLRP3 inflammasome in the L4-L6 spinal cord region by double-immunofluorescence staining with anti-NLRP3, ASC, and caspase-1 antibodies in C57Bl/6J mice exposed to paclitaxel. Then, paclitaxel-induced neuropathy in NLRP3 Wild Type (WT) and Knock out (KO) mice was characterized. C57Bl/6J mice were treated with a selective NLRP3 inflammasome inhibitor (JC-124, 100mg/kg) to determine if pharmacological inactivation of the protein complex would prevent paclitaxel-induced neuropathy. Mechanical sensitivity was measured by manual von Frey test, and cold hypersensitivity with acetone test. Changes in the density of peripheral nerve fibers represent a hallmark of CIPN; therefore, we studied the changes in peripheral nerve fiber density in hind foot pads following paclitaxel treatment using immunohistochemistry. Additionally, we tested if JC-124 interfere with paclitaxel-induced apoptosis. A549 and H460 non-small cell lung cancer cells were treated with JC-124, paclitaxel, or the combination of JC-124 and paclitaxel for 48 hours. The number of viable cells was monitored over 5 days via trypan blue exclusion.

**Results:** Results show that paclitaxel-induced mechanical hypersensitivity (2 mg/kg, i.p. one injection/day for 4 days) in male and female WT mice was lost in NLRP3 KO mice. In addition, female but not male NLRP3 KO mice treated with two cycles of Paclitaxel (16 mg/kg cumulative dose mg/kg) showed a decrease in the mechanical sensitivity threshold but returned to normal level. Additionally, paclitaxel increased the expression of NLRP3 in the L4-L6 spinal cord region in mice. Interestingly, administration of JC-124, a selective NLRP3 inflammasome inhibitor, prevented CIPN in C57BL/6J male mice treated with a cycle of paclitaxel. Finally, JC-124 neither promoted proliferation of non-small cell lung cancer cells nor interfered with paclitaxel-induced antitumor effects after in vitro and in vivo administration.

**Conclusion:** Our data suggest that NLRP3 inflammasome may play a significant role in the development of paclitaxel-induced nociceptive behavior in mice. Additionally, the selectivity of JC-124 for NLRP3 renders it a potential therapy to mitigate and/or prevent CIPN.
School of Business

Mauli Dalal
Relevance of Health-Related Hashtags on Twitter: A Text Mining Approach

BACKGROUND: Social media platforms facilitate user interaction and impact decision making. Users prefer to use hashtags while sharing posts. Knowing the sentiment towards diabetes, blood pressure, and obesity is fundamental to understanding the impact of these information on patients and their families. The study seeks to determine the relevance of health-related hashtags on Twitter and analyze sentiments about diabetes, obesity, blood pressure.

METHOD: Tweets were retrieved using synonyms for “diabetes”, “hypertension” and “obesity”. The extended knowledge discovery in data mining (KDDM) model guided our research with research objectives defined in the ‘research problem understanding’ phase. The ‘information seeking’ from Uses and Gratifications Theory (UGT) determined the success and text mining assessment criteria. Text pre-processing was done using tokenization, stop word removal, and stemming. The research objectives, text mining goals, and success criteria were answered using ‘Uses and Gratifications Theory’ (UGT).

RESULTS: Total 6749 tweets were extracted using RStudio. 36.41% were about blood pressure, 0.25%-diabetes, 24.43% -obesity and 6.99% -combination of two or more terms. Additional topics such as cholesterol, chia seeds, postpartum, diet, exercise were identified. Upcoming conferences like ‘#ipna’, ‘#review’, ‘#APCH2019’, ‘#cardiotwitter’ were identified. Increased user engagement – about managing blood pressure, diabetes, obesity across different age groups, as well as the consequences of increased cardio exercise for obese and diabetic users were encouraging. Tweets about advertisements specific to clothing for oversized individuals-initiated conversation among users about monitoring self-health.

CONCLUSIONS: Sentiment analysis can thus increase our understanding about user engagement on such platforms and potentially help improve managing public health strategically.

Isaiah Harvin
Influence of Symbolic Product Design on Brand Attitudes: A Semiotic Perspective

Product design is an area that has witnessed increased managerial focus (Brakus, Schmitt, and Zarantonello, 2009). However, very few studies focus on symbolic product design—one of three dimensions of product design alongside functional and aesthetic design. The current research puts forth a conceptual framework that examines the symbolic product design effects of discount store products on consumers’ decision-making processes—specifically their brand attitudes towards such products. The conceptualization, which is based on semiotic theory, suggests that implied symbolic product design signals contained in package transparency (transparent vs. non-transparent), package shape (traditional vs. non-traditional), and package materials (paper vs. plastic) can influence how consumers form their initial brand attitudes towards a discount store product. Three propositions are presented along with a proposed study design that utilizes eye-tracking methodologies. Ultimately, product managers and discount store managers can use this information to drive product reach, engagement, and activation which would ultimately drive business goals. Additionally, this study highlights the importance of the discount segment as it relates to SPD and highlights key propositions for further scholarly testing and investigation.
Anthony Jones

“You Try, and You Try, and You Try, and You Fail”: Experiences of Underemployed African Americans with Intellectual Disability in Urban Community Vocational Support Centers

Background: Among individuals with I/DD, the underemployment rate of young adult African Americans is nearly twice that of Whites. It is predicted that by expanding our paradigm of inquiry to reflect the complexity of intersectional identities (ability, race, SES, and urbanicity), stakeholders interested in interrogating the underemployment disparity may better refine their analyses and intervention implementation.

Methods: Five African American adults with I/DD aged 18 to 30 years old who were actively seeking employment placement through two urban vocational support centers and their caregivers were recruited for this study. Each participant completed a semi-structured interview about their current and past experiences navigating vocational support services as African Americans with I/DD. Interpretive phenomenological analysis was used to unpack participants’ experiences and the meanings ascribed to them.

Results: Nearly all participants expressed an implicit or explicit requirement to “sell oneself” in a way that demonstrated conformity with dominant group social norms or cultural expectations. Additionally, it was noted that participants underutilized services for fear of appearing too dependent, and when employed, expressed recurring anxieties over being fired due to their disability.

Discussion/Conclusion: Findings demonstrate that there is a nexus of largely imperceptible factors that continue to unfairly disadvantage African Americans with I/DD seeking community employment through urban support services. Future research should explore how theoretical perspectives that center the experiences of folx at the intersections of multiple historically marginalized identities, namely Black feminism and critical disability studies, frame the persistent inequities experienced by young, urban, African Americans diagnosed with I/DD.

Beatrice Lele

Perception of Family, Levels of U.S. Acculturation and School Contextual Effects on School Achievement of Second-Generation Immigrants: A Multilevel Modeling

Background: Students’ academic achievement is influenced by several factors from individual characteristics to contextual factors. In addition to these factors, second-generation immigrant children are faced with acculturation effects that impact on their achievement.

Purpose: The purpose of this study was to examine the individual, family, and contextual effects on the academic achievement of second-generation immigrant children.

Methods: This was a quantitative research where a two-level Hierarchical Linear Modeling (HLM) was used. The data used in the study comes from Children of Immigrants Longitudinal Study (CILS) which was done with 5,262 respondents. This data was collected through interviews and surveys. The relevant variables in the study were GPA which was the dependent variable, and individual characteristics, perception of family, levels of acculturation (level one variables), school contextual effects (level two variables) were the independent variables.
Results: Grade level, gender, length of stay in the U.S, Family Social Economic Status and levels of U.S acculturation; the individual characteristics all measured as level one predictors were positive and significant predictors of GPA. Contextual factors of the school population, minority population all measured as level two predictors were significant and negative predictors of GPA, while School Social Economic Status also a level two predictor was a positive and significant predictor of GPA.

Conclusions: Family Socioeconomic Status, levels of U.S acculturation (children’s proficiency in English, children’s perception of family) and school Social Economic Status were strong and significant positive predictors of GPA.

Robyn Lyn
When Whiteness is Invisible to Those who Teach: Teacher Training, Critical Professional Development, and the Intersection of Equitable Education Opportunities

Background: Non-White teachers comprise 18% of the teaching force with faster burnout rates than White teachers. Teachers of Color (ToC) are exhausted. Institutionally, pre-service teacher education (TE) and in-service teacher professional development (PD) neglect the experiences and perspectives of non-White teachers. Critical Professional Development (CPD) “frames teachers as politically-aware individuals who have a stake in teaching and transforming society; dialogical; honors relationality/collectivity; strengthens racial literacy; recognizes critical consciousness & transformation as an ongoing process” (Mosely, 2018, p. 271).

Q1: What type of critical TE and PD is needed to transform the racialized education system?
Q2: What are the benefits of transformational critical TE and PD for educators?

Methods: I did a systemic literature review of TE and PD in peer-reviewed journal articles.

Results: The results of the literature review found several themes including a lack of any racial or structural analysis; recruitment of ToC happens simultaneously with the enabling and reifying of racist beliefs; there is no education for ToC helping them navigate the racist educational system and conversations; there is no safe space in schools or the academy, e.g., “White space is unsafe – all schools are white space”; ToC experience racial violence every day in schools.

Conclusions: White teachers and administrators should listen to and believe ToC; critically and reflectively question their assumptions and biases; become an accomplice, a co-conspirator, not just an ally; become more observant of the ways that race and racism are operating in schools and classrooms; and engage in tough conversations about inequity at work.

Toshna Pandey
Teacher-Student Racial Match

While the pressure on educators to meet standards of academic excellence while serving an increasingly diverse student population is constantly rising, the teaching workforce remains predominantly white. These disparate statistics and disproportionately high over-policing of students of color is often caused due to teachers’ lack of familiarity with diverse student cultures and their racial identity. As a result, teachers are more likely to rate student behaviors more positively if it matches their own. Thus, the need for student-teacher racial-match is instrumental in student development, teachers’ self-efficacy, and fostering positive relationships between these parties. The present study aims to use multivariate statistics to measure teacher-student interaction, student engagement, and teachers’ self-efficacy pre and post a Tier II practice-based
coaching intervention. Outcomes will help guide future interventions by highlighting the
significance of student-teacher racial match.’

Nicole Peterson
The Mediating Impact of Teacher Self-efficacy When Responding to Problematic Student
Behaviors

Teachers’ ability to respond to students’ challenging behaviors have both short- and long-term
effects on student outcomes. One factor that influences a teacher's responses is their self-
efficacy, or perception of their ability to respond when challenged. This quantitative
investigation uses data collected from a tier two coaching intervention provided to teachers who
have students with or at risk for emotional behavior disorder due to demonstrating patterns of
challenging behavior. Specifically, the relationship between self-efficacy, perceptions of
intensity of behavior, and teacher’s self-reporting of practice use as mediating variables will be
explored. Outcomes will help guide the design and implementation of intervention programs
focused on change in teacher behavior.

Fa Zhang
Examining Two-Level Opportunity and Motivation Factors that Predict Science Achievement
among Grade 8 Students

Background: This study drew from and contributed to two major areas of literature, by using the
TIMSS 2015 dataset to examine 1) opportunity factors using proximal indicators that represent
science learning opportunities, 2) student motivation that is theoretically aligned to key
constructs in EVT and SDT motivation theories, and 3) two-level motivation and OTL variables
using MLM to understand person and context-factors that predict students’ science achievement.
Methods: MLM was used to examine the relationship between OTL, self-concept,
belongingness, and science achievement at the student-, classroom-, and cross-level interactions.
Results: The strength of the relationship between science self-concept and science achievement
is seven times larger than that of belongingness, indicating the alignment with the general trends
that expectancy-related beliefs are a stronger predictor of academic achievement than other
motivational factors. A positive interaction effect was also revealed in the classroom-mean self-
concept. However, the degree of relationships between OTL and science achievement needs
further examination and debate. The results of the negative insignificant relationship between
OTL and science achievement were inconsistent with the hypothesized relationship. This might
result from the construct of OTL in this study that included only student-reported their
instructors’ effectiveness in science teaching.
Conclusions: The results of this study, in line with previous empirical studies, suggest further
empirical evidence that self-concept and belongingness have a positive predictive effect on
science achievement. Further research should construct a more comprehensive set of science-
specific learning opportunities, such as teacher-reported inquiry-based instruction in science,
hands-on science activities, and time for science instruction.
Jacob Ziemba
*Deafness: Disability or Culture? Best Practices Regarding Controversial Interventions for Deaf and Hard of Hearing Students*

**Background:** Many people in the deaf community view deafness as a distinct culture, with its own unique language and history. They reject the use of assistive technologies which can restore hearing for themselves and their children. However, some members of the medical and legal communities consider it unethical to deprive a child of these interventions. Learn more about this emerging conflict, as well as best practices for working with deaf and hard of hearing students in a school environment.

**Methods:** Peer-reviewed journals and popular publications were consulted to gather information about attitudes towards interventions such as the cochlear implant from members of the deaf community, as well the legal and medical communities. Education journals were consulted to gather information about best practices when working with deaf and hard of hearing students.

**Results:** There are strong opinions on both sides of this issue, with various arguments being made both for and against the use of interventions like the cochlear implant. From the perspective of K-12 educators and school counselors, making sure that students feel safe and supported at school.

**Conclusions:** It is not necessary for K-12 educators and school counselors to have opinions on specific assistive technologies. It is important for them to be aware of best practices for working with deaf and hard of hearing students, and to support and respect the decisions of deaf families with regards to their culture.

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**School of Medicine**

VIRALI BHAGAT

*SPAG17 is Important for Protein Trafficking in Mammalian Spermiogenesis*

**Background:** The SPAG17 gene is known to encode a protein localized in the central pair complex (CPC) of the axonemal sperm flagella and believed to play a role in sperm flagella motility. Spag17 co-localizes with Golgi vesicles, the acrosome, manchette microtubules, and the sperm tail and its deletion are known to cause deformities in these areas. The delivery of some axonemal proteins and intra-flagellar transport during spermiogenesis is also disrupted. In addition, proteins important for sperm tail development fail to localize in the manchette in the absence of SPAG17. This suggests that SPAG17 is involved in the intracellular trafficking of proteins.

**Methods:** Immunofluorescence studies were performed with testes collected from both WT and SPAG17 KO mice to visualize proteins of interest.

**Results:** Several proteins were analyzed to determine if they localize with manchette microtubules in the SPAG17 KO. GOPC, AZI1, DDB1, and INCENP failed to localize with manchette microtubules in absence of SPAG17 suggesting they depend on SPAG17 for protein trafficking. Other proteins, including LRGUK and BBS4, localized with manchette microtubules in the SPAG17 KO suggesting they do not depend on SPAG17 for their transport.

**Conclusions:** GOPC, AZI1, DDB1 and INCENP are proteins important for sperm tail development and they fail to localize in the manchette in the SPAG17 KO. These results suggest that SPAG17 is involved proteins trafficking during spermiogenesis.
Robert Blanco

Addressing Minority Health Disparities in Richmond: Results from a Health Needs Assessment of a Southside Community

**Background:** Evidence shows the effectiveness of integrating community health workers (CHWs) into care models serving high-risk patients to reduce emergency department (ED) use, increase primary care use, and address adverse social determinants of health (SDH). The Southwood Resource Center, part of a network of clinics established by Richmond City Health Department, utilizes CHWs to address disparities affecting underserved populations through primary care referrals and additional resource linkages. Local student-volunteers in partnership with CHWs conducted a community needs assessment to identify patient resource gaps, aid in design and implementation of SDH interventions, and examine the relationship between chronic disease management and ED use reductions.

**Methods:** English and Spanish-language surveys were conducted during patient visits to the SRC, in addition to other settings to facilitate representative sampling. A total of 134 responses were received, with Blacks (34%) and Hispanic/Latinos (65%) well represented.

**Results:** Significant social determinants identified by the needs assessment included housing stability, and transportation and food access. Respondents indicated need for support managing chronic conditions including heart disease, diabetes, mental health, and asthma. 1 in 3 respondents (31%) reported using the ED for primary care, and nearly 2 in 3 (66%) reported not having a family doctor. Barriers to health care included cost (35.6%), insurance status (50.4%) and transportation access (29.6%).

**Conclusions:** CHWs play an important role in identifying community strengths and resource gaps and linking patients to additional resources. Opportunities for service improvements include bilingual care coordination, chronic care management, health insurance navigation, food subsistence resources, and transportation support.

Kennedy Bradley

The Association of Parents' Marital Status and Past Year Prescription Pain Reliever Misuse

**Background:** Research has shown single parents often endure hardships making them more susceptible to substance misuse, yet few studies have assessed the relationship between parents’ marital status and prescription pain reliever (PPR) misuse. This study examines the association between parents’ marital status and past year PPR misuse.

**Methods:** Respondents of the 2017 National Survey on Drug Use and Health with at least one child were included. Chi-square analyses examined differences in sociodemographic variables by parenting status. Multivariate logistic regression was used to assess parents’ marital status and PPR misuse adjusting for age, race, sex, employment, insurance, income, and accounting for complex sampling design. Stratified analyses were conducted to examine sex as an effect modifier.

**Results:** Of the 1,296 parents (5.8%) reporting past year PPR misuse, 73.1% were single. Females were more prevalent among single parents reporting PPR misuse (55.1% vs. 44.9%), and less prevalent among married parents, (44.8% vs. 55.2%). Overall, single parents were 39.2% more likely than married parents to misuse PPRs (aOR=1.39, 95%CI=1.01-1.92). Although frequency of misuse was higher among single women in the unadjusted analysis,
stratified odds of PPR misuse appeared similar for males (aOR=1.67, 95%CI= 1.06-2.61) and females (aOR=1.17, 95%CI 0.82-1.69).

**Conclusion:** Although single parents have greater odds of PPR misuse compared to their married counterparts, sex does not appear to be an effect modifier of this association. Understanding the implications of PPR misuse among parents is crucial to aid development of interventions targeted to reduce the prevalence of PPR misuse in more vulnerable populations.

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**Holly Byers**

*DYRK1A and the Cell Cycle*

The ability to halt the cell cycle is critical for cells to maintain tissue and organ size, to suppress tumors and abnormal growth, and exists as a helpful mechanism to pause the cell cycle for DNA repair. DYRK1A is (dual specificity tyrosine-(Y)-phosphorylation regulated kinase 1A) a human gene found on the long (q) arm of chromosome 21, which is known to be involved with nervous system development, cell growth and division, and neuronal differentiation. In glioblastoma cells grown in vitro (T98G cell line), there are three copies of DYRK1A, which have dosage-dependent effects on the cell, including association with cognitive delays in Down Syndrome (Trisomy 21), and relevance to cancer (loss of DYRK1A leads to oncogenic transformation of fallopian tube epithelial cells by Ras and p53). In terms of DYRK1A’s role in the cell cycle, it is known as a putative tumor suppressor, mainly through its critical role in phosphorylating a Serine 28 residue on protein LIN52, leading to the formation of the DREAM complex. DREAM promotes exit from the cell cycle and cell quiescence (arrest in G0 phase). Surprisingly, DYRK1A-KO (knockout) cells actually slowed down cell proliferation, which is an unexpected result when knocking out a tumor suppressor. Through several experiments, involving cell cycle flow cytometry, western blotting for protein cell cycle markers, and EdU staining to determine whether these cells were actively undergoing DNA synthesis, we were able to determine that DYRK1A-KO T98G cells were entering the cell cycle and undergoing DNA synthesis more slowly than control cells.

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**Carmen Camarena**

*Guadecitabine, in Combination with Cyclophosphamide, Promotes Anti-Cancer Immunity in BALB/c Mice Bearing 4T1 Mouse Mammary Carcinoma*

**Background:** The extremely high mortality rate of patients diagnosed with triple negative breast cancer makes it one of the deadliest forms of cancer. Due to the heterogenous nature of tumors, complete clearance is not achieved, and clonal selection occurs resulting in tumor cells evading the immune system. I aim to design a therapeutic intervention that is able to elicit an effective immune response against the tumor and instill immunological memory to eradicate primary and metastatic lesions. I hypothesize that the combination of Guad and Cyp will synergize and promote anticancer immunity via increased expression of neo-tumor antigens and depletion of MDSCs and Tregs.

**Methods:** Guadecitabine (Guad), is a second-generation DNA methyltransferase inhibitor (DMNTi) that has been reported to increase antigenicity and deplete myeloid-derived suppressor cells (MDSC’s). Cyclophosphamide (Cyp) is a chemotherapy that has been shown to deplete regulatory T-cells (T-regs). Both MDSC’s and T-regs suppress antitumor immunity. BALB/c mice were challenged with 4T1 tumor cells subcutaneously in the mammary fat pad region. 4T1-
bearing mice were administered low-dose Guad and Cyp for ten consecutive days. Tumor growth
curves, tumor-infiltrating lymphocytes (TILs) were measured and MDSC’s and T-regs levels
were assessed by flow cytometry.
**Results:** Results from this experiment showed significant synergy between Guad and Cyp with
both drugs reducing the tumor size over monotherapy.
**Conclusions:** Further analysis of the data along with future experiments will elucidate if this
synergy is driven by the depletion of MDSC’s and T-regs alone or the increase in tumor
antigenicity inducing increased numbers of TILs.

**Stanley Cheatham**  
*The Role of Rifaximin in the Development of Antinociceptive Tolerance to Morphine*

Recently, studies have implicated changes in the gut microbiome in the development of
antinociceptive tolerance to morphine. Morphine induces significant translocation of bacteria and
bacterial products which serve as a causative agent of various disease states originating in the
gut. Rifaximin has the ability to modulate the gut bacterial communities, prevent inflammatory
response, and modulate gut barrier function. The goal of this study is to evaluate the protective
effects of rifaximin in the development of antinociceptive tolerance to morphine and to elucidate
the potential underlying mechanism. Rifaximin (100mg/kg) was administered once daily via oral
gavage to mice implanted with a 75 mg morphine pellet for 6 days. Anti-nociceptive tolerance
was measured by the warm water tail immersion assay on day 6 to determine a baseline and
again post 30 minutes of a challenge dose of 10 mg/kg morphine. Morphine antinociception in
the tail-immersion assay was quantified as the percentage of maximum possible effect (%MPE),
such that:  
\[ \text{%MPE} = \frac{(\text{challenge time} - \text{baseline time})}{(10 - \text{baseline time})} \times 100 \]  
In the morphine pelleted and rifaximin treatment group (n=5) post morphine challenge dose there was an
observed 47.38% MPE indicative of a return of morphine to an efficacious state. While in the
morphine pelleted and vehicle group (n=5) morphine only produced a 21.3% MPE. This data
suggests that rifaximin may play a role in the development of tolerance to morphine. Current
studies are evaluating the effect of twice daily treatment of rifaximin for a period of 10 days on
the development of antinociceptive tolerance to morphine.

**Sarah Collins**  
*Stress-Reduction Interventions to Reduce Hypertension Among African American Women: A
Systematic Review*

**BACKGROUND:** Chronic stress is a potential root cause of racial/ethnic disparities in
cardiovascular disease. This review assesses literature surrounding effective stress-reduction
interventions to reduce hypertension—a CVD risk factor—among African American women
aged 18-35.
**METHODS:** We performed a systematic literature search of stress reduction strategies that
effectively reduce blood pressure among African American women. Using PubMed as the
primary search tool, we employed the keywords: “blood pressure”, “hypertension”, “women”,
“black”, “African-American”, “stress”, “meditation”, “stress-coping”, “stress-management”, and
“faith-based”. We found additional publications through manual bibliography searches. Articles
were excluded if they were published before the year 2000; did not include an intervention pilot
study or RCT; did not study black women within the context of the US; and if blood pressure
was not an outcome. Two reviewers independently screened the articles, which were selected based on consensus. Data were extracted for evidence tables for relevant articles.

**RESULTS**: We identified 106 articles in total. Of those, 24 articles met inclusion criteria. Among these, none specifically addressed women in the 18-35-year-old age range. Meditation (n=19) and faith-based (n=5) interventions emerged as a potentially effective methods for reducing blood pressure among African American women.

**CONCLUSIONS**: Chronic stress remains a persistent threat to the hypertension outcomes of black women over the lifespan. This systematic review of the literature found that faith-based strategies and meditation are effective stress reduction techniques for African American women with existing hypertension. However, much is to be known about the effectiveness of these strategies for younger African American women.

**Morgan Driver**

*The Future of Returning Genetic Test Results for Psychiatric Conditions*

**Background**: Genome-wide association studies are rapidly advancing our understanding of the genetic architecture of complex psychiatric conditions. In order to use findings from these studies for enhanced clinical prediction, we need to gain a better understanding of the issues surrounding the return of complex genetic results.

**Methods**: We review the current literature on genetic literacy in the population, the public’s interest in receiving genetic test results for psychiatric conditions, how individuals react to and interpret their genetic results for psychiatric conditions, and gaps in our knowledge that will be critical to address before returning genetic results for psychiatric conditions.

**Results**: We find that in hypothetical scenarios genetic test results indicating increased risk for a psychiatric condition lowers an individual’s confidence to control behavior, reduces self-agency, and negatively impacts affect. Individuals may believe that a change in behavior is important, but there is little evidence that genetic test results indicating increased risk for a psychiatric condition are associated with behavior change. The negative impact of results indicating an increased risk may stem from common misconceptions of complex disorders that exist in approximately 25% to 35% of individuals studied.

**Conclusions**: Individuals with these misunderstandings about the role of genetic factors in complex disorders may have a belief in genetic determinism, the idea that behaviors and characteristics are determined solely by one’s genetic information. Regardless of one’s genetic knowledge, a majority of people are interested in receiving genetic feedback for psychiatric conditions, highlighting a need for effective communication of these genetic test results.

**Madelyn Esquivel**

*Discovery of Novel Drug Combinations that are Cytotoxic Towards Estrogen Receptor Positive Breast Cancers*

**BACKGROUND**: Estrogen receptor positive (ER+) breast cancers account for the majority of breast cancer deaths each year. Standard of care for ER+ patients includes anti-estrogens, CDK4/6 inhibitors, and chemotherapeutics. Unfortunately, long-term risk of recurrence of ER+ breast cancer is high, and these metastases are often insensitive to ER inhibitors. We hypothesize that certain classes of drugs, especially senolytic agents which target senescent cells, can effectively be combined with anti-estrogens to prevent metastatic disease expansion.
METHODS: In these ongoing studies, ER+ cell lines (MCF7, T47D) and patient derived xenograft (PDX) (HCI-011, HCI-013) cell suspension cultures are treated with a set of 1,350+ FDA-approved drugs to identify cytostatic/cytotoxic compounds. A subset of cytotoxic drugs is then combined with an anti-estrogen (Tamoxifen or Fulvestrant). Chou-Talalay analyses are being used to identify drug combinations that exhibit synergistic characteristics. Single-cell RNA-sequencing (scRNA-seq) analyses are assessing the characteristics of tumor subpopulations during ER inhibition.

RESULTS: Preliminary drug screening of ER+ PDX spheroids in vitro identified multiple agents— including senolytic agent ABT-263 (Navitoclax) – that were cytotoxic. Other effective drugs (<75% cell viability) included PI3 kinase and mTOR inhibitors, HSP90 inhibitors, and EGFR inhibitors. Other “non-cancer” drugs also show promising cytotoxic activity. scRNA-seq analyses has identified drug targets that are homogeneously or heterogeneously expressed across tumor subpopulations.

CONCLUSIONS: These initial studies have identified promising cytotoxic drug combinations that may be useful to overcome acquired anti-estrogen insensitivity.

Kennedy Goldsborough
Adolescent Berkeley Sickle Mice Display Mechanical and Thermal Nociceptive Behaviors

Background: While opioids remain the primary analgesic for severe pain associated with Sickle Cell Disease (SCD), their side effects necessitates the development of effective non-opioid analgesics to treat this condition. The Berkeley mouse model of SCD exhibits features of the disease, e.g. red blood cell sickling, hemolytic anemia, ischemia/reperfusion injury, and increased nociception, allowing researchers to study complex sickle pathobiological mechanisms and evaluate candidate analgesics. SCD is a progressive neurodegenerative disease, and patients start to experience chronic pain during adolescence, a period marked by considerable development. The goal of this project is to identify nociceptive behaviors in adolescent Berkeley mice to determine their progression.

Methods: Adolescent sickle and C57BL/6J control mice serve as subjects. Mechanical Allodynia: A series of calibrated von Frey monofilaments are randomly applied to the left and right plantar surface of the hindpaw for 3s. Lifting, licking, or shaking the paw are scored as a response. Thermal Hyperalgesia (Hot Plate): Mice are placed in a clear cylinder on a heated surface (52 C). Responses are measured as latency to lift, lick, or shake paw. Mice will be tested at 8, 9, 10, 11, and 12 weeks of age.

Results: Sickle mice demonstrate thermal and mild mechanical hypersensitivity at 8 and 9 weeks of age. Ongoing studies are being conducted to see whether this phenotype worsens over time, as it does in adolescent patients and if these mice demonstrate deep tissue sensitivity in the Grip Strength Test.

Conclusion: These data are consistent with other preclinical studies demonstrating that sickle mice demonstrate thermal and mechanical hypersensitivity.

Breanna Jeffcoat
Restoring DREAM-Mediated Cell Cycle Regulation in HPV E7 Positive Cancer Cells Suppresses Tumorigenicity

Millions of people in the U.S alone are infected with Human Papillomavirus (HPV) annually. HPV is known to be the cause of 4-5 % of all cancers including cervical cancer. HPV-positive
cancers can be very deadly with a high mortality rate, and there is currently a lack of virus-
specific treatments. Since HPV infection puts many people at risk, it is important to understand
the mechanism of the development of cancer caused by HPV. In high-risk HPV, the oncoprotein
E7 is known to cause degradation of RB-like proteins including pRb, p107 and p130 while HPV
protein E6 decreases the levels of a major tumor suppressor p53. The binding of the viral protein
E7 to p130 also disrupts the DREAM (Dimerization partner, RB-like, E2F and MuvB) complex.
DREAM complex plays a major role in regulating cell-cycle dependent transcription and its
inactivation can contribute to tumorigenesis. We found that DREAM assembly is impaired in the
HPV positive human cervical cancer cell line, HeLa. Our lab identified a mutant form of LIN52
(S20C), a major adaptor protein required for DREAM assembly, which mimics the E7 protein
and competes for binding to p130, thus restoring DREAM in HPV-positive cancer cells. In this
work we examined the effect of the stable expression of S20C-LIN52 in HeLa cells in the cell
proliferation, anchorage-independent colony growth and tumor formation, and observed
inhibition of cancer cell growth. Using Western blot analysis, we observed that the DREAM
complex assembly was significantly increased upon S20C-LIN52 expression.

Donald Jessup
The Role of the Gut Microbiome in Chemotherapy-Induced Peripheral Neuropathy

Paclitaxel (PAC) and several other chemotherapeutic agents (vincristine, platinum-based drugs,
bortezomib) are widely prescribed for treating solid tumors. These drugs induce severe sensory
peripheral neuropathy that is often accompanied by neuropathic pain resulting from damage to
peripheral nerves including sensory and autonomic neurons leading to paresthesia, loss of
sensation, allodynia and pain in the feet and hands commonly referred to as Chemotherapy
induced peripheral neuropathy (CIPN).
Recent studies have linked changes in the gut microbiome with oxaliplatin-induced mechanical
hypersensitivity. In this study, Shen et. al. 2017 reported that oxaliplatin induced mechanical
hyperalgesia was reduced in germ-free and in antibiotic treated mice that could be reversed by
restoring the gut microbiota. Furthermore, it has been shown by our lab that depletion of gut
bacteria with a cocktail of oral antibiotics results in a loss of paclitaxel-induced mechanical
hypersensitivity implicating the gut microbiome in paclitaxel – induced CIPN. However, it is
unclear how the microbiota are altered, and the specific mechanism resulting in hyperalgesia.
Our preliminary studies show that paclitaxel increases mechanical hypersensitivity and enhances
neuronal excitability in isolated dorsal root ganglia (DRG) neurons and is accompanied by
colic inflammation.
I propose a project to determine the changes in the gut microbiome by PAC treatment and
evaluate whether PAC disrupts the gut epithelial barrier permeability, induces bacterial
translocation and colonic inflammation, and its reversal by fecal transplant. Additionally, I
propose to investigate the specific ionic mechanisms by which PAC enhances DRG neuronal
excitability.

Nicole Jimenez
Bifidobacterium breve’s Unique Role in Vaginal Health and Disease

Trichomoniasis, caused by the protozoan Trichomonas vaginalis, is the most common non-viral
sexually transmitted infection (STI) worldwide. This study and others have recently shown the
vaginal microbiota of women with trichomoniasis have a distinct bacterial association with
intermediate or transitional flora. Several of these taxa have been associated with adverse health outcomes, while others remain uncharacterized. One such taxon is Bifidobacterium breve, which has probiotic properties in the gastrointestinal tract and plays a vital role in early infant gut development. In cases of trichomoniasis, B. breve was often present at very low levels, whereas in the vaginal microbiome of women who did not have a current gynecological diagnosis, it was found at much higher levels. We observed that B. breve exhibited positive correlations both with trichomoniasis- and health-associated microbes in vaginal microbiome profiles. This further supported the hypothesis that this taxon may serve differential roles in the vaginal microbiome.

We extended our studies of B. breve to a larger cross-sectional cohort of ~4000 women to understand these results with additional information. These findings elucidate the varied role of B. breve in the vaginal microbiome, which will inform future treatment and prevention strategies for trichomoniasis as well as further the foundational knowledge of Bifidobacterium species in maternal transmission.

Jackie Knight Wilt
Association between Energy Balance Behaviors and Psychological Distress among Undergraduate College Students

Background: Undergraduate college students are exhibiting increasing rates of psychological distress. Currently, 37% of students surveyed nationally screened positive for moderate psychological distress (ACHA). Moreover, health disparities including race are associated with distress (APA). Prior studies demonstrate that eating a healthy diet and being physically active (i.e. energy balance behaviors), can improve distress. This study explores relationships between energy balance behaviors and psychological distress among a sample of undergraduates.

Analyses were stratified by race to assess potential differences in relationships with distress.

Methods: A sample of undergraduate students (n=375) from one university completed the National College Health Assessment III. The Distress Questionnaire-5 screened for psychological distress. Energy balance behaviors were operationalized as total minutes for cardiovascular activity and strength training days/week, servings of fruits and vegetables/day, and energy drink consumption. Correlations assessed associations of energy balance behaviors, race, GPA and prior diagnosis of anxiety on the outcome of psychological distress scores.

Results: Overall, 36% of students screened positive for psychological distress. Psychological distress scores had significant correlations with covariates of race, prior diagnosis of anxiety and cumulative GPA. Muscle strengthening activity and energy drink consumption had small, but significant associations with psychological distress scores. Other energy balance behaviors were not significantly associated with psychological distress.

Conclusions: According to these findings, interventions to encourage muscle strengthening activity and reducing energy drink consumption may improve distress. Further research is critical to inform predictive models and interventions for undergraduate psychological distress.

Anita Kumar
Richmond City Health District (RCHD), Bon Secours Richmond City Hospital (RCH), and Virginia Commonwealth Universities (VCU) Department of Health Behavior Policy (HBP): Partnering with Community Health Workers (CHW) to Improve Community Health Outcomes and Reduce Emergency Department (ED) Use
**Background:** Frequent ED users (5%) are sicker, poorer, not satisfied with the health system and cost 20% of total ED charges.

**Objective:** A pilot study of feasibility of partnering with CHW to improve health knowledge and outcomes and reduce ED use in low income community.

**Methods:** RCH ED utilizers were randomized to intervention and control groups. CHW contacted intervention group within 10 days of ED visit, surveyed about access to care, healthy living, and knowledge about chronic disease, and offered education, referrals to insurance and social and economic support. ED utilization and cost were recorded for all patients for 6 months. Preventable ED visits were classified according to Johnston et al1 and high utilizers have 2+ ED visits. Intervention and control characteristics and ED utilizations and cost were described and compared using t-tests, ANOVA, and Chi-square at alpha=0.1. Adjusted analyses were performed using linear and logistic regressions.

**Results:** 91 and 61 randomized to intervention and control with 29 and 23 high utilizers respectively. Drop-in percent of patients with all and preventable ED visits was higher among intervention (12 and 17 percentage points, respectively). 65% of the total ED cost is preventable in the pre-intervention period. That dropped by 17 and 7% in intervention period among the intervention and control groups. The intervention estimated cost savings were $120K. Intervention group had significant improvement in self-reported general health, regular exercise, understanding of health benefits and chronic disease.

**Conclusions:** hospital, academic, and CHW partnership reduces ED utilization and cost and improves health.

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**Jyoti Lodha**

*Social Stress and Binge Drinking Alters Nucleus Accumbens Gene Expression and Behavior of Adult Mice*

**Background:** Adolescence is characterized by high levels of social interaction and increased risk-taking behavior. Disruptions of cortical development by social isolation or binge ethanol during this critical period can lead to attention, social, and cognitive deficits later in life, and increase risk for alcohol use disorders. Our goal is to identify persistent behavioral and neurobiological consequences of social stress and determine how these alterations contribute to excessive alcohol drinking.

**Methods:** Social stress was modeled by social isolation during adolescence and modulated using a novel housing environment that allows visual, olfactory, and limited physical interaction. Adolescent C57BL/6J mice were single or neighbor-housed with or without access to intermittent ethanol (15%(w/v), 2-bottle choice). As adults, mice were tested for social, anxiety-like, and cognitive behaviors and escalation of ethanol consumption.

**Results:** In both sexes, neighbor housing reduced social and basal anxiety-like behaviors as compared to single-housed mice. Neighbor housing also rescued recognition memory deficits. Social isolation doubled ethanol intake in adolescent females, but not males, as compared to neighbor-housed mice. In nucleus accumbens, ethanol drinking altered 3x as many genes in single versus neighbor-housed females. Ongoing genomic profiling identified cAMP-mediated genes were modified by social stress and ethanol drinking.

**Conclusions:** These data suggest that proximity, but reduced physical contact, in neighbor housing may partially ameliorate anxiety and cognitive deficits induced by social isolation. Further analyses will identify whether these behavioral alterations are mediated, in part, by dysregulation of gene expression in the frontal cortex, or by dysregulation of the social circuit.
Investigating the Role of AEG-1 in Mouse Models of Chronic Pain

**Background**: Astrocyte Elevated Gene 1 (AEG-1) is a multifunctional protein shown to be a regulator of transcription and multiple intracellular signaling pathways. The role of AEG-1 in cellular inflammation appears to be primarily facilitated by its direct interaction with the transcription factor NFκB, transcriptional regulator of inflammatory cytokines. May be have a potential role in models of pain, particularly chronic inflammatory and chemotherapy induced peripheral neuropathy (CIPN).

**Methods**: C57BL6/J male and female mice, 8-14 weeks old. AEG-1 wild type (WT) and global knockout (KO) male and female mice, 8-14 weeks old. Chronic Inflammatory Pain induced via i.pl. injection of 50% Freund's Complete Adjuvant (CFA) or vehicle into mouse right hind paw. CIPN induced via four 8 mg/kg, i.p. injections of Paclitaxel or vehicle (Toma, et. al). Mechanical hypersensitivity assessed via von frey filaments. Acetone Test was used to assess cold sensitivity. mRNA transcripts collected from tissues were measured via qRT-PCR.

**Results**: AEG-1 KO mice displayed protection from CFA induced mechanical hypersensitivity, thermal sensitivity, and reduces paw edema compare to WT mice. AEG-1 KO mice displayed enhanced recovery from paclitaxel induced mechanical hypersensitivity and cold sensitivity compared to WT mice. AEG-1 expression levels in the periaqueductal grey, spinal cord, and L4-6 corresponding dorsal root ganglia collected from C57BL6/J mice treated with 8mg/Kg paclitaxel or 50% CFA (3 days post injection) showed no difference from control groups.

**Conclusions**: Our data suggest that AEG-1 may be involved in inflammatory and CIPN related nociception in C57BL6/J mice.

"How Am I Supposed to Feel?": Social Support and Black Mothers' Infant Feeding Decisions

**Background**: Many of the adverse health outcomes that breastfeeding protects against disparately affect black mothers and children; however, black mothers are the least likely racial group in the U.S. to breastfeed. Black mothers have indicated that breastfeeding barriers include a lack of social support. Qualitative studies examining such breastfeeding barriers often focus on women who have unsuccessfully breastfed and fail to define the experiences of women who have successfully breastfed. This study aims to identify the impacts of social support on the infant feeding decisions of black women with varying levels of breastfeeding success.

**Methods**: Twenty-five black women were interviewed in mini-focus groups and were recruited according to three categorizations of breastfeeding duration: formula-fed only, breastfed for ≤3 months, or breastfed for ≥4 months. Focus group questions addressed mothers’ perceptions, attitudes, intentions, experiences, and perceived barriers and facilitators regarding infant feeding practices. Group interviews were audio-recorded, transcribed, and then analyzed specific to social support using a grounded theory approach.

**Results**: Mothers in all three breastfeeding categorizations reported experiences with tangible, emotional, and informational support from members across sectors of their social networks. Additionally, mothers reported dissonance between informational support received and their personal infant feeding intentions as well as a need for increased social support regardless of infant feeding method.
Conclusions: This study provides an in-depth analysis of social support as a facilitator and barrier to infant feeding decisions for black mothers. Given the findings, it is suspected that experiences with social support are integral to women’s infant feeding decisions.

Deo Mujwara
Offering the Choice of Self-Administered Oral HIV Testing (CHIVST) among Long-distance Truck Drivers in Kenya: A Trial-based Cost-effectiveness Analysis

Background: Long distance truck drivers (LDTD) are a high-HIV-risk population facing unique healthcare barriers due to continuous travel and irregular schedules, and may require targeted, resource-intensive strategies for HIV-test uptake. We conducted a trial-based cost-effectiveness of CHIVST among LDTD in Kenya.

Methods: Effectiveness data came from a randomized-controlled trial of CHIVST (n=150) versus provider-administered testing (n=155). Economic cost data came from the literature and reflected a societal perspective. Generalized Poisson and linear-gamma regression models estimated the effectiveness (relative-risk) and incremental costs (2017 I$), respectively, with incremental effectiveness calculated as the reciprocal of the absolute risk difference and reported as the number needing to receive CHIVST for an additional HIV-test uptake. We reported incremental cost-effectiveness ratios (ICERs), with 95%CIs calculated using Fieller’s theorem. Deterministic sensitivity analysis identified key cost drivers and cost-effectiveness acceptability curves assessed uncertainty in the ICER. We determined cost-effectiveness according to a willingness-to-pay threshold of 3xGDP per-capita of Kenya (I$9,774).

Results: HIV-test uptake was 23% more likely for CHIVST versus provider-administered HIV-testing, with six individuals needing to be offered CHIVST for an additional HIV-test uptake (6.25, 95%CI 5.00-8.33). The mean cost per patient was more than double for CHIVST (I$26.56 vs I$10.47). The incremental cost-effectiveness of CHIVST was I$97.21 [95%CI 65.74-120.98] per additional HIV-test uptake compared to provider-administered HIV-testing. Self-test kits and patient time were the main cost drivers of the ICER. The probability of CHIVST being cost-effective approached one at a willingness-to-pay threshold of I$140.

Conclusion: CHIVST is an efficient use of resources compared to provider-administered testing.

Amy Northrop
Roles of DDI2 in Tumorigenesis and the NFkB Pathway

Background: The NFkB pathway is remarkably pro-tumor – encouraging cancer cell behaviors like survival, proliferation, and metastasis. Therapeutically-targeting the NFkB pathway in cancer has been explored for decades, though with limited clinical success. This study has revealed a novel role for DDI2 in NFkB pathway pro-tumor activity in triple negative breast cancer (TNBC) and Ewing sarcoma (ES).

Methods: Subcellular fractionation and immunoblot were used for analysis of NFkB pathway-related protein cellular localization. NFkB target gene expression was analyzed by RNA-seq, qRT-PCR, and luciferase assay. Human TNBC and ES cell lines were used in soft agar experiments and xenografted into immunocompromised mice for in vivo analysis.

Results: RNA-seq results revealed inhibition of the NFkB pathway in MDA-MB-231 (TNBC) DDI2-/- cells. These RNA-seq results were confirmed by qRT-PCR, then replicated in EW16 (ES) cells by qRT-PCR and NIH 3T3 fibroblast (non-cancerous) cells by luciferase assay in response to NFkB pathway stimulator TNF-α. Subcellular fractionation and immunoblot revealed
decreased NFκB1 nuclear localization, an indicator of NFκB pathway activation, in MDA-MB-231, EW16, and 3T3 DDI2-/- cells with (non-cancer cells) or without (cancer cells) TNFa simulation. Soft agar assays and in vivo xenografts show a loss of tumorigenicity in MDA-MB-231 and EW16 DDI2-/- cells.

**Conclusions:** Inhibition of the pro-tumor NFκB pathway in DDI2-/- cells may cause the loss of tumorigenicity seen in vitro and in vivo. An inhibitor designed to diminish DDI2’s role in NFκB pathway activation may provide means for therapeutically crippling the overactive NFκB pathway seen in many cancers to improve patient outcomes.

**Huyen Pham**

*Differences in Treatment for Substance Use Disorders by Insurance Status: Self-Help Only Versus Medicalization Approach*

**Background:** The role of insurance on substance use disorders (SUD) treatment utilization generally is poorly understood and still less is known on how insurance status relates to the use of evidence-based treatment (i.e., medicalization approach) compared to other treatments, like single self-help groups, where the research on effectiveness is less supportive. This study examines associations between health insurance and any SUD treatment utilization as well as use of single self-help versus medicalization approach.

**Methods:** A cross-sectional study design was used. Data were from the 2015-2017, public use National Surveys on Drug Use and Health (NSDUH). Adjusted logistic regressions were used to examine the associations controlling for socio-demographics, recent major depressive episode, and survey year. All analyses used survey weights to be representative of the US population and account for the NSDUH’s complex survey design.

**Results:** After adjustment for covariates, those with publicly insured remained more likely to use any SUD treatment in the past year (odds ratio [OR] 1.82; 95% CI: 1.36-2.43), compared to those without insurance. Further, compared with uninsured, those with public insurance reported lower odds of using only self-help treatment (OR 0.42; 95% CI: 0.23-0.74) versus medicalization approach utilization.

**Conclusions:** Publicly insured persons with SUD are more likely to use SUD treatment in the past year than the uninsured. Uninsured people with SUD are more likely to use single self-help as a substitute for medicalization approach.

**Jean Reading**

*Examining Gender Differences in Young Men and Women’s Goals for a Technology-Driven Weight Loss Intervention*

**Background:** Emerging adults (EA) are at high risk for weight gain yet underrepresented in behavioral weight loss (BWL) programs. Young men are particularly challenging to recruit, representing less than 20% of samples. Understanding men and women’s personal goals for participating in a weight loss program could be key to improving recruitment messages and appeal of the program. The objective of this study is to compare young men and women’s personal goals for a BWL program.

**Methods:** Participants (N=382; 21.9+1.2 years; 83% female; BMI=33.5+4.9 kg/m2) were recruited for a weight loss intervention adapted for this age group. At baseline, participants ranked their top 3 personal goals they wanted to change during the program. Chi-square tests compared men and women on the most commonly reported goals for the program (p<.006).
Results: The most commonly reported areas for wanting to change were weight (62.7%), physical fitness (43.7%), body fat percentage (25.7%), body shape (25.1%), energy level (24.1%), and clothing size (19.6%). Weight was the most commonly ranked as a top goal (43.5%), followed by physical fitness (11.3%) and body fat percentage (8.9%). No significant differences were found between men and women for personal goals.

Conclusion: EA have a desire to lose weight and body fat and improve physical fitness when enrolled in a BWL program. While no gender differences were observed, this could be due to enrollment of a treatment seeking sample. More research is needed to understand gender differences in goals for a BWL program to improve recruitment messaging targeting young men.

Ashley Rosenberg
Impact of Diet on Colorectal Cancer

Background: Colorectal cancer (CRC) is the third most common cancer diagnosed worldwide. Modifiable risk factors such as diet have been linked to the development of CRC but results of previous research have been inconsistent. We utilized the National Health and Nutrition Examination Survey (NHANES) to determine whether the consumption of dietary variables contributed to increased diagnosis of colorectal cancer.

Methods: Participants from NHANES 2015-2016 database aged 16 years or older, with available two-day dietary and CRC information were included. Study exposure included dietary consumptions (salt, cholesterol, sugar, fat, and carbohydrates); the outcome was self-reported CRC. Descriptive analysis was performed with chi-square tests to elicit the relationship between dietary consumptions and CRC, and a multivariate logistic regression model, adjusted for sociodemographic characteristics age, race, sex, income, BMI, smoking status, dietary consumptions, and complex sample design.

Results: A total of 76,044 participants were included. Individuals with older age (66-80 years vs. <65: 74% vs. 26%; p<0.0001) and lower annual income (<$35,000 vs. >$35,000: 62% vs. 38%; p<0.0001) were more likely to have CRC. Multivariate analysis yielded no statistically significant association between each dietary variable and CRC, but further confirmed association between older age (Age 66-80 vs. <65: aOR=28.9, 95%CI=2.87-292.69; p<0.0043) and CRC.

Conclusions: A significant association was found between income, age and self-reported CRC. Although literature supports a relationship between diet and colorectal cancer, a more extensive dietary history may be needed to elicit the relationship.

Heather Saunders
Exploring the Black Box of MLTSS Care Coordination: Are Member Experiences with Care Coordinators Associated with Subsequent Utilization?

Research Objective. Virginia is one of several state Medicaid programs transitioning persons who may require long term services and supports into managed care models (MLTSS) in pursuit of improved quality. In Virginia’s managed long term services and supports (MLTSS) program, care coordinators act as primary points of contact between the member and the managed care organization (MCO) and help members access needed services inside and outside of the MCO (e.g. accessing primary care, acquiring and installing bathroom grab bars in their home or connecting to a food pantry or meal delivery service). Although policy makers postulate that care coordinators will improve quality of care through a hands-on approach to connecting to necessary services, there has been little research on this relationship. This study
uses novel data on members of Virginia’s Commonwealth Coordinated Care Plus (CCC Plus) program (an MLTSS program implemented in 2017) to examine; (1) the extent of contact and satisfaction with care coordinators among CCC Plus members, and; (2) whether these interactions with care coordinators are associated with the utilization of selected Medicaid-covered services.

**Study Design.** As part of an evaluation of Virginia’s MLTSS program, a representative mail survey was conducted (1,042 complete, a 34.7 percent response rate) to assess non-institutionalized members’ experiences with their care coordinators and MCOs. Included in the survey were measures of; (1) having any meeting with the care coordinator; and (2) whether members were satisfied with the services provided by the care coordinator. Survey data were linked to Medicaid claims data to obtain measures of: (1) any utilization of the emergency department (ED); (2) any utilization of non-emergent Medicaid transportation services; and (3) any receipt of durable medical equipment (DME). Each outcome pertained to the 12-month period following survey receipt of each sampled member. Associations between utilization and care coordinator contact were examined with logistic regressions and controlling for other demographic and health-related variables that were included in the survey.

**Population Studied.** Non-institutionalized members of Virginia Medicaid’s MLTSS program are included in this analysis.

**Principal Findings:** Most members report at least one meeting with their care coordinator (77 percent) and 75 percent of those rate the help that they received from their care coordinator as good, very good, or excellent. Meeting with a care coordinator is positively associated with receipt of non-emergent Medicaid transportation and ED use (p<0.001). However, meeting with a care coordinator is not associated with receipt of DME services. There is no association between member satisfaction with their care coordinator’s services and any of the measured utilization outcomes.

**Conclusions.** This study sheds some light into the black box of MLTSS care coordination and its relationship with member utilization. Results suggest that care coordinators help members access non-emergent medical transportation and perhaps guide them toward the ED, when needed. Implications for Policy or Practice. Care coordination in MLTSS programs is believed to be a key component in achieving MLTSS program goals but, to date, there are relatively few studies of their effectiveness. This study provides a method to explore these relationships and provides important information for shaping current policy in states who have transitioned to MLTSS models.

**Spiro Stilianoudakis**

*Dental Services Utilization among Medicaid-Enrolled Pregnant Women in Virginia*

**Background:** Oral health is an integral part of prenatal health care for pregnant women. To address the health inequalities and improve the oral health of pregnant women in Virginia, the Governor implemented a dental benefit for Medicaid eligible pregnant women in March 2015. This study evaluated the impact of this newly implemented benefit on dental service utilization among Medicaid-enrolled pregnant women.

**Methods:** Medicaid eligibility and dental claims data for fiscal years 2015-2018 were obtained from the Department of Medical Assistance Services (DMAS). Multiple logistic regression analysis was used to assess the relationship between clinical and demographic characteristics with the odds of having visited a dentist between 2015-2018.

**Results:** A total of 103,981 pregnant women were enrolled for >90 days and were eligible for receiving comprehensive dental care under the Medicaid dental benefit policy. Of all eligible
women, only 16% reported as having a dental visit during 2015-2018 period. In the adjusted model, black women had 15% lesser odds of having a dental visit compared to white women and each additional month of enrollment increased the odds of dental visit by 9%. Likewise, pregnant women located in Health Professional Shortage Areas (HPSAs) had 12% lower odds of having visited the dentist compared to their counterparts.

Conclusions: Despite the availability of dental benefit for Medicaid-enrolled pregnant women, only one out of six eligible women utilized dental care. To improve oral health use among this population, it is crucial to understand the barriers that impede the use of Medicaid dental benefit.

Dongjin Suh
Centering High Risk Pregancies Interprofessionally (CHRPI) to Reduce Racial Disparities in Pregnancy Outcomes

Background: Despite the steady rise in use of prenatal care, significant racial disparities exist in pregnancy-related outcomes. This calls for innovative prenatal care to improve pregnancy outcomes in racial minorities. CHRPI is an innovative prenatal care model designed to address risk factors and manageable conditions particularly prevalent in African Americans that threaten their course of pregnancy.

Methods: CHRPI is an outpatient model (Fig. 1) that will accept pregnant moms with risk-factors outlined by the ACOG. They are initially evaluated by a Maternal Fetal Medicine physician where management is outlined. Then, patients are placed in groups of 4 according to their expected course of pregnancy, social, and medical needs. Between medical appointments, patients will attend sessions facilitated by a multidisciplinary team to receive education on nutrition, insulin management, alarming symptoms and more. Additionally, patients will have opportunity to address individual social and medical needs with licensed clinical social workers and mid-level providers outside of groups. Lastly, CHRPI’s care extends as far as 6 months postpartum to reassess newly diagnosed conditions or risk-factors to protect future pregnancies and establish primary care upon exiting the program.

Results: Compared to traditional care of high-risk patients (Fig. 2), proposed CHRPI model is expected to decrease rate of maternal and infant mortality, pre-term birth, NICU admissions, and patient satisfaction.

Conclusion: CHRPI aims to reduce racial disparities in maternal and infant mortalities associated with high-risk pregnancies by utilizing an innovative multidisciplinary group approach with significant emphasis on nutrition, education, and primary care to protect future pregnancies.

Dongjin Suh
Digital Footprints of Medical Specialties: Insight about Social Media Utilization from Annual Meetings of Vascular Surgery and Interventional Radiology

Background: Twitter is a popular social media platform used to capture social events, promote discussions among attendees, expand professional network at large medical conference. However, its utilization by attendees and hashtags associated with annual meetings have not been studied. We hypothesize that there will be discrete differences in Twitter utilization between two medical specialties.

Methods: Tweets with “#VAM19” and “#SIR19ATX” 30 days before and after respective meetings were collected. 150 most liked tweets from each specialty were compared. Items
analyzed included number of likes, retweets, replies and number of hashtags. Hashtags were further classified into one of 5 domains: Specialty-Identifying diversity, education, medical care, and procedures.  

RESULTS: Top 150 most liked tweets from the SVS and SIR annual meetings were posted by 63 and 79 distinct users and contained 272 and 442 hashtags respectively. On average, tweets from the SIR annual meeting had significantly higher number of hashtags per post, likes, replies, and retweets (p<0.0001). Furthermore, tweets from SIR had significantly higher proportion of hashtags associated with its specialty, diversity, and education than ones from SVS (p<0.05). However, no difference was found in proportion of hashtags associated with procedure and medical care.  

CONCLUSION: Despite similar number of active providers, SIR seems to utilize Twitter at a greater capacity than SVS as evidenced by significantly higher number of likes, replies, retweets, hashtags and proportion of hashtags associated with its specialty, diversity, and education. These data should encourage the SVS to establish a strategy for better utilization of social media at annual meetings.

Aminatta Tejan-Kamara  
*The Immediate and Persistent Effects of Binge Ethanol Exposure on Myelin Related Protein (MBP) Expression in DBA/2J Mice*

**Background:** Binge drinking is the most lethal of drinking patterns, responsible for 77% of all U.S. alcohol misuse costs. Adolescents have increased sensitivity to ethanol’s rewarding properties and decreased sensitivity to ethanol’s aversive effects likely allowing for their increased binge drinking as compared to adults. Ethanol consumption during adolescent neurodevelopment can lead to immediate and lasting neurobiological consequences, specifically in the still developing prefrontal cortex (PFC).

**Methods:** Adolescent DBA/2J mice (PND 29-42) were intermittently dosed with 4g/kg ethanol through oral gavage. Markers of puberty onset and sexual maturation were tracked in males and females throughout adolescence and adulthood to assess if ethanol affects sexual development. To assess immediate and persistent effects of binge ethanol exposure on brain development, PFC was harvested in adolescence (PND 43) and adulthood (PND 66), cryosectioned, and immunostained for myelin basic protein (MBP). Western blotting was conducted to provide a complementary quantitative technique to further assess the effects of binge ethanol exposure.

**Results:** We expect adolescent binge ethanol will robustly decrease MBP protein expression immediately after exposure and this will persist into adulthood. While ethanol will likely not delay sexual maturation, this measure will be correlated to myelin expression as a marker to assess potential sex differences in PFC development.

**Conclusion:** The intent of these studies will be to provide a rigorous assessment of the molecular effects of binge ethanol exposure in adolescence.

April Williams  
*Clinical Reconciliation of Patient Social Context and Implementation of Preventive Care Guidelines*

**Background:** Preventive care practice guidelines are disseminated regularly through federal and scientific groups as a way of promoting best practices and evidence-based health promotion. Yet rates of their implementation are historically low and complex, with cited barriers including
limits on physicians’ time, knowledge or attitudes; and external factors related to the guideline itself, the clinical environment, or patient factors. The objective of this qualitative research is to understand how primary care clinicians and staff reconcile perceived patient-level factors and implementation of preventive care guidelines.

**Methods:** Key informant interviews (n=23) with 14 clinicians and 9 office managers from 14 primary care clinics were analyzed using a grounded theory approach. Codes were categorized, then reviewed using conventional content analysis to determine thematic content.

**Results:** The importance of using communication tools; convenience for access to preventive services; and weighing the evidence when deciding how to proceed with preventive care emerged as themes related to understanding how providers reconcile between patient factors and implementation of preventive care guidelines.

**Conclusions:** The interviews used in this study provide some rich context to address the research objective: how providers reconcile between what they perceive to be patient factors and how they go about providing preventive care according to guidelines. The hope for this study is to identify key themes to instigate future exploratory research and provide evidence to target improvements in patient care.

**Kofoworola Williams**

*Prevalence of Mental Health Disorder Symptoms and Rates of Help-seeking Among University-Enrolled, Black Men*

**Background.** Though Black men in college are at increased risk of developing mental health disorders (MHDs), they continue to underutilize mental health resources. As much of the MHD literature is limited, this study examined the prevalence of MHD symptoms and rates of health services utilization among university-enrolled, Black men and compared these rates to White men and Black women.

**Methods.** We analyzed data (N ~ 2500) from a longitudinal, research study at a mid-Atlantic, public university. Measures included mental health disorder symptoms (measured by the Symptom Checklist 90) and campus health service utilization (counseling center, health services, etc.). We conducted descriptive analyses to determine prevalence and utilization rates; Mann Whitney U tests to compare prevalence rates to White men and Black women, and Chi-squared tests to compare rates of utilization.

**Results.** In Year 1, greater than 60% of students from each group reported at least one anxiety symptom and greater than 80% reported at least one depressive symptom. By Year 4, reporting rates decreased significantly for Black men (49.6%) but remained high for White men (69.1%) and Black women (63%); p <0.000. For depression, results were similar; however, only significant differences between Black men (72.7%) and Black women (87.1%); p<0.000. Black men (20.4%), though reporting high levels of symptoms, still utilized counseling services at lower rates compared to White men (37.76%); p = 0.024.

**Conclusion.** Black men underutilize available campus health resources despite reporting one or more symptoms associated with anxiety and depression. Further research and prevention efforts are needed.
School of Pharmacy

Sulaiman Alhudaithi
Local Lung Targeting of Tumor Associated Macrophages Combined with Cytoreductive Therapy Decrease Tumor Burden in a Secondary Lung Cancer Model

Backgrounds. The efficacy of a locally administered small molecule colony stimulating factor 1 receptor inhibitor (CSF-1Ri), PLX3397, alone or in combination with cytoreductive therapy (paclitaxel) in reducing the tumor burden of an in vivo model of secondary lung cancer was investigated in this work. Local administration of immunotherapy to the lungs may enhance lung biodistribution of such therapies and reduce potential unwanted off-target toxicity. In addition, combination of such therapy with low dose standard of care chemotherapy may offer improved anti-tumor effects.

Methods. Murine breast cancer cells (4T1, known to be highly metastasized to the lungs) were transduced to express the genes luciferase and tdTomato, and cells were injected to female Balb/c mice before being treated with PLX (intratracheally administered), paclitaxel (intravenously given), or the combination therapy. Both ex vivo bioluminescent imaging and lung weights were used to evaluate tumor burden. Western blot was performed using lung tumors to assess the effect of PLX3397 on its molecular target (phosphorylated CSF-1R). Immunofluorescence and Flowcytometry were utilized to examine the impact of treatment on tumorigenic tumor associated macrophages (M2 TAM).

Results. Single-agent treatment partially decreased tumor burden, while combination therapy led to a significant reduction in tumor burden. PLX3397 significantly inhibited the expression of phosphorylated CSF-1R and reduced the number of M2 TAM without affecting the total macrophage population, thereby increasing the anti-tumorigenic (M1)/M2 ratio.

Conclusion. Tumor burden reduction upon local administration of PLX3397 to the lungs correlates with the marked inhibition of the molecular target and the decrease in M2 TAM.

Rashed Almuqbil
Dendrimer Conjugation Enhances Tumor Penetration and Cell Kill of Doxorubicin in 3D Coculture Lung Cancer Models

Background: Doxorubicin (DOX) is a potent chemotherapeutic widely used for solid tumors (1). Despite high efficacy in 2D cell culture, DOX efficacy does not translate to in vivo lung cancer models (2). Major side effects such as cardiotoxicity may be alleviated with nano-based drug delivery systems (nanoDDS). However, tumor penetration of DOX and DOX-nanoDDS is largely unknown and is an additional barrier to effective clinical therapy (3). Here we describe a nanoDDS capable of enhancing the penetration of DOX.

Methods: DOX was conjugated to generation 4 poly(amido-amine) dendrimers through (GFLG) tumor-liable bond. G4SA-GFLG-DOX was synthesized/characterized. spheroids were formed of (A549) lung adenocarcinoma cells and (3T3) fibroblasts. Spheroids were characterized for ECM components with immunohistochemistry. Confocal microscopy was used to evaluate the penetration, internalization, and colocalization of DOX and G4SA-GFLG-DOX. MTT assay and Caspase 3/7 to assess 2D and 3D cytotoxicity. Flow cytometry to determine cells uptake.

Results: DOX conjugation to dendrimer resulted in G4SA-GFLG-DOX with ~5.5 DOX, 10±1 nm hydrodynamic diameter, and a -17±3 mV zeta-potential. Spheroids of (A549:3T3) were
ECM-rich, developed ECM containing collagen-I, hyaluronan, laminin, and fibronectin. While DOX and G4SA-GFLG-DOX had similar toxicities in 2D model, G4SA-GFLG-DOX demonstrated a 3.1-fold greater penetration into spheroids compared to DOX and correlated to a greater efficacy as measured by caspase 3/7 activity. Also, flow cytometry showed higher uptake of G4SA-GFLG-DOX in cancer cells compared to fibroblasts. **Conclusion:** The work demonstrates enhanced penetration of DOX, via dendrimer conjugation, into an ECM-rich 3D lung cancer model. The enhanced penetration of G4SA-GFLG-DOX correlated with greater antitumor efficacy.

Suad Alshammari

*Development of an R Script for Simple Lipidomic and Metabolomic Data Analysis*

**Background:** Metabolomic and lipidomic studies generate vast quantities of data that are often analyzed in a closed software environment with little to no access to the underlying algorithms. As a result, data processed via different software pipelines yield different results thus leading to a widespread problem of low reproducibility within these fields. To address this problem, we are developing LipidAnalyst; an R based lipidomics software pipeline. As a part of this project, we are creating a simple statistical analysis and graphing module in R to generate accurate, reproducible, high-resolution figures.

**Methods:** R scripts were developed under version 3.5.3 with the capability to undertake statistical analyses (e.g. ANOVA) and post-hoc tests (e.g. Tukey). Additional code plotted resultant information as high resolution violin and box plots that depicted statistical significance. Thereafter, lipidomic and metabolomic data were analyzed by this code and compared against commercial software and Metaboanalyst, a primary software used in metabolomic and lipidomic research.

**Results:** Code generated in house demonstrated the same results as those generated using commercial software (e.g. JMP 14.0 Pro) but were different from results obtained by using the MetaboAnalyst pipeline.

**Conclusions:** This study demonstrated the prevalent danger of using closed-source software pipelines for the analysis of lipidomic and metabolomic data without validating the analysis outcomes via open-source software. Open source software such as LipidAnalyst, that has also been independently validated using multiple data sets, can then be published with the results to enable transparency of data analysis and improve the replicability of results across different labs.

Monther Alsultan

*A Pre-Transplant Blood-Based Lipid Signature for Prediction of Antibody-Mediated Rejection in Kidney Transplant Patients*

**Purpose.** The aim of this study is to demonstrate the potential of the pre-transplant lipidome to predict post-transplant antibody-mediated rejection (AMR) in kidney transplant patients.

**Methods.** Patients were selected from a prospective observational cohort of a single-center adult kidney transplant center in the United States. The study included 16 kidney transplant patients who develop AMR within 2 years post-transplant and 29 stable control (SC) kidney transplant patients who did not develop AMR at any time within the post-transplant follow up. Selection of group differences on the day of transplant was determined by t-test analysis. Stepwise forward method was used to create Linear Discrimination Analysis with regularized correction (RLDA).
Changes over time were estimated using sparse partial least square. T-test was performed to compare two-time points for the same group and groups at matched time points.

**Results.** A comparison of lipids classes on the day of transplant revealed PLs relative concentration differences between SC and AMR. Phosphatidylcholine (PC) was significantly diminished in AMR, while there was a trend for increased of lysophosphatidylcholine (LPC). AMR group showed significantly lower of phosphatidylethanolamine (PE), lysophosphatidylethanolamine (LPE), plasmanylethanolamine (PE-O), and plasmenylethanolamine (PE-P). Further data analysis confirms the presence of a sustained lipid metabolic difference between SC and AMR over time that distinguish between the patients with favorable and non-favorable transplant outcomes.

**Conclusion.** This study demonstrates the potential of the pre-transplant lipidome towards determining AMR in kidney transplant patients, raising the possibility of using this information in risk stratification of patients about to undergo transplant.

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**Sachpreet Bajaj**

*An Analysis on Social Media Platforms and Consumer Engagement for Top Pharmaceutical Companies*

**Background:** USA and New Zealand are the only two countries legally allowed to promote direct-to-consumer pharmaceutical advertising (DTCPA) for medications. This may include but not limited to television, magazine, and radio promotions. However, with utilization of social media and its ability to quickly reach more people per post there is an incentive to use such platforms for information sharing. In addition, customers’ have the ability to engage with posts by leaving comments, liking and sharing posts. This makes it possible for two-way communication to be researched as how to how information being presented to the consumers and their response.

**Methods:** Three different social media platforms (Facebook, Instagram and Twitter) of top pharmaceutical companies will be analyzed on pertinent characteristics of types of posts posted (product claim, reminder or help-seeking ad) and consumer engagement. Descriptive and thematic analysis will be conducted on consumer’s comments on this component of engagement.

**Results and Conclusion:** Quantitative and qualitative data points will be collected to comprehend the way top pharmaceutical companies utilize marketing techniques towards to consumers via social media platforms. Results and conclusions will be analyzed and be presented in this poster.

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**Sveda Hashimi**

*Paroxetine is Pro-inflammatory in Human Brain Microvascular Endothelial Cells*

**BACKGROUND:** Paroxetine is an antidepressant that is widely used. However, Paroxetine possesses anticholinergic properties which may contribute to cognitive decline in older adults. Surprisingly, the mechanisms of the cognitive decline of anticholinergic drugs in older adults remains elusive. A hypothesis is that a loss of cholinergic signaling is pro-inflammatory in the brain. We designed experiments to determine if Paroxetine is pro-inflammatory in Normal Human Brain Microvascular Endothelial Cells (NHBMECs).

**METHODS:** NHBMECs were grown at 5% CO2, 37C and 95% relative humidity until 90% confluent. NHBMECs were treated with the RNA free water as control, Paroxetine as 1.67x 10^4 mM/mol, IL1B 2ng/ml for 24 hours. RNA was isolated, converted into CDNA, and gene
expression determined via RT-PCR. Statistical analysis was performed via ANOVA and post-hoc Tukey’s with a significant p-value < 0.05. Experiments were completed on 10-04-19. The mRNA expression studies were performed on 11-01-19.

**RESULTS:** NHBMECs exposed to Paroxetine for 24 hours demonstrated elevated expression of CCL2 and CXCL5. NHBMECs exposed to Paroxetine + IL1B demonstrated synergistic elevations in CCL2 and CXCL5.

**CONCLUSION:** Our result suggests that Paroxetine may have pro-inflammatory properties within this subset of human brain cells. Therefore, our preliminary data suggests the possibility of pathological pro-inflammatory mechanisms associated with Paroxetine. Further evaluation of different populations of normal human brain cells are warranted.

**Younan Ma**  
*Dendrimer-based Antibiotics for the Treatment of Bacterial Biofilms*

**Purpose:** Cystic Fibrosis is an inherited disease involving bacterial biofilm that establish in the respiratory system. One of the mechanisms of antibiotic resistance of bacterial biofilm is lack of drug penetration, due to the existence of extracellular polymeric substance (EPS) in the biofilm. The purpose of this study is to synthesize polyester dendrimer tobramycin conjugates with different surface charges, and to explore how such characteristics impact the penetration of these conjugates through the bacterial biofilms and the mucosal layer in the airways.

**Methods:** Tobramycin (Tobra) was conjugated to amine-modified generation 4 polyester dendrimer (G4OH-NH2), via a hydrolysable bond. Dendrimer-tobramycin (G4OH-Tobra) and their PEG-modified analogs (G4OH-Tobra-PEG) were prepared, to achieve both a positively charged and neutral carriers. Minimum inhibitory concentrations (MIC) of free tobramycin, G4OH-Tobra and fully hydrolyzed G4OH-Tobra against planktonic P. aeruginosa were assessed. Bacterial biofilm was grown in a flow chamber. Penetration of FITC-conjugated G4 and their PEGylated analogs through biofilm was measured as a function of time using confocal microscopy, and the diffusion through biofilm was investigated using Fluorescence Recovery After Photobleaching (FRAP).

**Results:** G4OH-Tobra and G4OH-Tobra-PEG were synthesized and characterized via MALDI-TOF and 1H-NMR. Fully hydrolyzed G4OH-Tobra has a comparable MIC to free Tobra (both 1µg/mL). Neutral dendrimer conjugate (G4OH-NH2-FITC-PEG) showed extensive and rapid penetration through the bacterial biofilm grown in a flow chamber, relative to positively charge dendrimer conjugate (G4OH-NH2-FITC). Similarly, the diffusion coefficient of G4OH-NH2-FITC-PEG was significantly higher than that of G4OH-NH2-FITC in synthetic mucus.

**Conclusion:** Reducing surface charge of the dendrimer-Tobra conjugates via PEGylation promotes penetration and diffusion through bacterial biofilms and synthetic mucus. The biological activity of Tobra is maintained during conjugation and subsequent release. These results suggest that dendrimer-Tobra conjugates with appropriate surface chemistry may be used to improve cell kill in bacterial biofilms.

**Joshua Morriss**  
*Molecular Predictors of Anakinra Treatment Success in Heart Failure Patients with Reduced Ejection Fraction*

**Background.** Kineret (Anakinra) is an interleukin-1 antagonist that is under investigation for its novel clinical application treating patients that have heart failure with reduced (<50%) ejection
fraction (HFrEF). A prior study from our group indicated that Anakinra may restore heart function by addressing dysregulations in HFrEF metabolic pathways. Herein, we attempt to elicit Anakinra’s effects on both metabolome and lipidome.

**Methods.** Lipids and metabolites that had previously been quantified by mass spectrometry (MS) from patients (n=49) who had ≥2 mg/L of high-sensitivity C-reactive protein (hs-CRP) were mTIC normalized and transformed. We conducted a stepwise Linear Discriminant Analysis (r-LDA) to test Anakinra (2 and 12 weeks) vs placebo for separation from combined baseline. Metabolic pathway analysis was performed with Fisher’s exact test algorithm for detection of over-represented and enriched analytes. Univariate analysis (one tailed t-test p<0.05) compared placebo and Anakinra after 12-weeks for effect(s). Metaboanalyst 4.0, JMP Pro 14.0, and a proprietary package in R (version 3.4.4) were the software for all analyses and data wrangling.

**Results.** Analytes such as acylcarnitines C10:0 and C16:0 and hsCRP showed significant improvements after 12 weeks of Anakinra, leading to improved mitochondrial function, reduced inflammation, and overall better health outcomes. Statistically significant (p<0.05) pathways including the citrate cycle, cysteine and methionine metabolism, galactose metabolism among others were associated with treatment.

**Conclusions.** We were able to determine significant alterations to metabolomic and lipidomic concentrations after 12 weeks of Anakinra therapy. Our biochemical analyses verify that Anakinra did improve heart function within our HFrEF pilot cohort.

**Vasco Pontinha**  
*A Pre-Transplant Blood-Based Lipid Signature for Prediction of Antibody-Mediated Rejection in Kidney Transplant Patients*

**BACKGROUND:** Medication non-adherence is a major obstacle to improving healthcare outcomes in chronic diseases. Group-based trajectories methods (GBTM) have been used to identify adherence trajectories. However, medication adherence is not an isolated behavior. It is influenced by factors that many current interventions fail to address. Measures like PDC and MPR are well established proxy-measures of medication adherence but have several limitations. They are insensitive to temporal changes and classify patients dichotomously (e.g., PDC > 80%).

**OBJECTIVES:** An analysis of medication adherence should consider the longitudinal complexity of adherence behavior, as well as the characteristics of the patient, the disease, etc. No previous study has investigated the longitudinal variances of the predictors of medication adherence. This study determines longitudinal group trajectories and its adherence predictors, such as healthcare services utilization, other patient and disease data.

**METHODS:** The analysis is based on a multi-trajectory GBTM. Data from the Medical Expenditure Panel Survey data from 2016-2017 will be used. The economic burden of non-adherence will be estimated for each trajectory group, as well as for indicators of healthcare resource utilization.

**RESULTS:** A multi-trajectory group-based model produces a matrix-like graph demonstrating the degree to which each predictor variance influences medication adherence.

**CONCLUSIONS:** The resulting model will allow forecasting the evolution of medication adherence behavior, as well as the identification of groups of patient profiles and factors that most influence adherence. The findings from this study inform pharmacy practitioners for developing targeted medication adherence interventions.
Veronica Taylor

Characterization of Cardiovascular Risk Factors of People Living with HIV in a Veteran Population

**Background:** CVD is the leading cause of death in PLWH. HIV positive individuals have a 1.5-2-fold greater risk of CVD compared to uninfected individuals, even if complete viral load suppression is achieved. HIV-associated CVD has tripled over the past 20 years, yet scant data is available describing this population. We have characterized CVD risk factors and treatment in PLWH in order to assess and improve cardioprotective treatment.

**Methods:** A retrospective EMR review was conducted for HIV positive patients enrolled at the McGuire VAMC between 12/2018 and 12/2019. Patients were excluded if labs were older than one year from follow-up. Patient demographics was collected along with characterization and treatment of their HIV, hypertension, diabetes, and dyslipidemia. Patient CVD status and risk factors were analyzed, and cardioprotective agent appropriateness was assessed.

**Results:** 242 patients were included in this study. Overall, 91% had HIV viral load ≤ 200. 25% of patients had diabetes, of which 51% were controlled. 86% of patients achieved a blood pressure goal of ≤ 140/90. 40% of patients achieved LDL ≤ 70, with 56% of patients on a statin. 14% of patients had past history significant for cardiovascular event.

**Conclusion:** Characterization of CVD in PLWH should be a high priority and treatment should be closely monitored due to the rising disease state burden. Lack of large clinical trials outlining treatment strategies in this aging population has hindered appropriate patient care. Intensified and targeted cardioprotective strategies are needed due to a high proportion of patients with uncontrolled CVD risk factors.

Hanming Zhang


**Background.** Lung cancer is the leading cause of cancer death in both man and women. In the clinic, platinum-based cytoreductive agents have been wildly used in all stages of the disease. The purpose of this study was to develop biodegradable polyester dendrimers that offer controlled release of platinum-based chemotherapies, and to develop an in vivo mice lung cancer model.

**Methods.** Generation 4 polyester dendrimer (G4OH) was surface modified with succinic anhydride and polyethylene glycol. Cisplatin and Oxaliplatin was conjugated to modified dendrimer (G4OH-Cis/G4OH-Oxa) and their loading efficiency was optimized. An engineered Lewis lung carcinoma cell line was used for 2D MTT assay, 3D Caspase 3/7 activity assay as well as in vivo tumor model development. Healthy black 6 mice were used to test the maximum tolerated dose of both free cis and G4OH-Cis.

**Results.** All the dendrimers had a hydrodynamic diameter at 4-5 nm. Cisplatin loading efficiency was highest at 11.3±1.0% Wt/Wt and had a release t1/2 at least 46 hours. In 2D single culture model G4OH-Pt had higher IC50s as compared to free forms. In 3D coculture model, conjugated Pt elicited same level of caspase 3/7 activity as compared to their free form counterparts. In vivo, G4OH-Cis was more tolerable than free cisplatin. Finally, an orthotopic, immunocompetent lung cancer model was successfully created with high reproducibility.

**Conclusion.** Surface modified polyester dendrimers with high platinum loading in the form of cisplatin and oxaliplatin were prepared, characterized and determined to be safer. A mouse bearing lung cancer model was developed.
**School of Social Work**

**Thomas Buckley**

*The Association between Sense of Community and Quality of Life for Older Adults in Puerto Rico Two Years after Hurricane Maria*

**Background:** Psychological sense of community (SOC) may be an especially salient factor in explaining wellbeing outcomes for older adults, especially in Latin American cultures which often revolve around community involvement and support. Hurricane Maria devastated Puerto Rico in 2017, resulting in altered community structure and social life. We draw on the Ecological Theory of Aging to test the proposition that older adults’ sense of community influences their quality of life.

**Methods:** We collected data in Puerto Rico among adults age 60+ two years after Hurricane Maria (N=154). SOC was measured with the Brief Sense of Community Scale (range 0-32, mean= 24.75, SD= 6.04), and quality of life was measured with EUROHIS-QOL 8-item index (range 0-32, mean= 21.61, SD=5.92). Multivariate linear regression was used to test the association between SOC and quality of life, including covariates.

**Results:** Increased SOC was significantly associated with higher quality of life (B=0.270, p<0.001). Other significant predictors included increased mental health symptoms associated with lower quality of life (B=-0.557, p<0.001), and poor self-rated health associated with lower quality of life (B=2.964, SE=7.17, p<0.001).

**Conclusion:** These findings indicate SOC may be an important concept for quality of life of older adults in Puerto Rico, and this may be due to cultural and age-related factors. Furthermore, SOC may be important for regions that have experienced a large-scale natural disaster as a protective factor against adverse outcomes. Future research and interventions should continue to examine this association and look for ways to promote SOC in these contexts.

**Anna Cody**

*Unpacking Children’s Participation: Perspectives of Caseworkers and Youth*

**Background:** Children’s participation is characterized as a process where children’s views are considered and are taken seriously. Participatory processes enhance children’s subjective well-being and thus have been found to be of critical importance for children in the child welfare system, who may have experienced complex traumas which impact their mental and emotional health.

**Methods:** This study uses a constructivist grounded theory approach to gather caseworker and young people’s perspectives about children’s participation in child welfare care and safety planning. Semi-structured interviews were conducted with child welfare caseworkers (N=13) and young people (N=9) with lived experience of child welfare.

**Results:** Young people expressed that they wanted caseworkers to take time to get to know who they are, beyond what their casefile indicates. They also suggested that caseworkers consider how they can empower children through access to youth-friendly information about their case and offering real options in the planning process. Caseworkers shared the importance of building relationships with youth and hearing their perspectives, however, system level requirements...
(including paperwork and timescales) seem to get in the way. Relational-moments occurred outside of the formal child welfare structures and were heavily dependent on the caseworker investing their personal resources and time.

**Conclusions:** Findings highlight how children’s participation in child welfare care and safety planning is not prioritized at the system level. Policies attempting to promote children’s participation appear to be largely ineffective due to a lack of resources and support for caseworkers to meaningfully engage children and youth in decision-making.

**John Gyourko**  
*Credit Checks for Youth in Foster Care: Detecting, Addressing, and Preventing Child Identity Theft*

**Background:** Identity theft poses serious risks for youth in foster care. Sensitive personal information often passes through many hands as young people move through various foster care placements. When their personal information is misused, financial abuse victims may have fraudulent or erroneous credit history linked to their identities. As youth transition to adulthood, damaged credit may inhibit access to housing, transportation, employment, and loans. To prevent and address financial abuse, federal law requires annual credit checks for youth ages 14 to 17 in foster care. Though nearly a decade has passed since this mandate was enacted, few studies have investigated credit check outcomes and consequently little is known about the incidence of problematic credit issues among youth in foster care.

**Methods:** This study analyzed the credit records of 5,006 youth in foster care. Credit records were reviewed for potentially fraudulent activity, and demographic data were extracted from the Adoption and Foster Care Analysis and Reporting System. Nonparametric Kruskal-Wallis and Mann-Whitney U tests were conducted to explore relationships between credit activity and demographic variables (e.g., gender, race).

**Results:** Of the 5,006 youth in Virginia’s foster care system who received credit checks during this study’s 45-month review period, 7.21% (N = 361) had potentially fraudulent credit record irregularities. Most detected credit activity was linked to financial services, telecommunications, and medical debt. Youth gender and race were significantly associated with credit activity type and debt amount.

**Conclusion:** Findings underscore the importance of building capacity for child welfare agencies to effectively address financial abuse.

**Aaron Kemmerer**  
*The Importance of Peer Influence for LGBTQ+ Youth in Rural Communities*

**Objectives:** To explore the experiences and narratives of LGBTQ+ youth in rural North Carolina. To elaborate on the influence of peer support and impact of peer victimization for LGBTQ+ youth in rural North Carolina.

**Methods:** Data was collected from eleven young people who were interviewed from 2019-2020 at an LGBTQ+ youth center in rural North Carolina. The interviews were coded and analyzed using narrative analysis on a team of interraters; the team consisted of four members from VCU School of Social Work: the principle investigator, two doctoral research assistants, and an MSW research assistant.
**Results**: Analysis of the interviews, though still in process, so far highlights the impact of the dual impact of participants’ peers --- simultaneously pointing to LGBTQ+ youth experiences with both peer victimization (as a risk factor) and peer support (as a resilience factor).

**Conclusions**: Peer support is vital for LGBTQ+ youth in rural communities and may help offset the negative impact of peer victimization.

**Claire Luce**

*Stress, Grief, and Coping: Development of the Ambiguous Loss Scale and Validation with People Experiencing Pet Loss*

**Background**: This study details the development and validation of a measure of ambiguous loss (Boss, 1999), defined as an unclear or undetermined loss that affects the way that individuals cope and grieve, making it difficult to find acceptance or resolution after the loss.

**Methods**: We developed a 22-item Ambiguous Loss Scale with three theoretically-justified subscales: (a) psychological stress, (b) frozen grief, and (c) coping. We recruited participants via convenience sampling and collected data using REDCap (N = 907). After removing missing data, we split our sample (Sample 1 N = 224, Sample 2 N = 223) and conducted confirmatory factor analyses (CFAs) in both samples for three theoretically-informed models.

**Results**: Results of the CFAs indicated that, in both samples, the correlated three-factor model was the best fit for these data. After modifications, the final instrument contained 14 items (Sample 1: χ2(74)=278.277, p>.05; CFI = 0.964, TLI=0.955; RMSEA=0.111, SRMR=0.043; Sample 2: χ2(74)=253.776, p>.05; CFI=0.972, TLI=0.966; RMSEA=0.104, SRMR=0.037). The items significantly loaded on the factor, with coefficients ranging from 0.593-0.904. Evidence of construct validity was found with significant relationships in expected directions with the Pet Bereavement Questionnaire.

**Conclusions**: These findings support the Ambiguous Loss Scale among people who have experienced pet loss. Future studies are needed to replicate and build on these findings in order to expand and/or refine the Ambiguous Loss Scale.

**Angela Matijczak**

*Do Positive Engagement with Pets and Exposure to Animal Cruelty Moderate Associations Between Intimate Partner Violence Exposure and Children’s Behavioral Problems?*

**Background**: Exposure to intimate partner violence (IPV) in childhood is associated with a host of behavioral problems. Given that perpetrators of IPV often abuse animals in the home, children in these households navigate a duality: experiencing benefits associated with pets while simultaneously being at risk for exposure to animal cruelty (AC). The current study examines whether and to what extent the associations between IPV exposure and children’s behavior problems are moderated by positive engagement with pets and AC exposure.

**Methods**: The sample included 204 children aged 7-12 years (47% female; 77.5% ethnic minority), recruited from IPV agencies. Multiple moderation analyses evaluated whether the association between IPV exposure and several domains of behavior problems varied by children’s positive engagement with pets and AC exposure.

**Results**: Positive engagement with pets significantly moderated the relationship between IPV exposure and internalizing problems [b= -.15, t(195)= -2.66, p=.008] and posttraumatic stress symptoms [b= -.13, t(195)= -2.24, p=.026]. Additionally, AC exposure moderated the association between IPV exposure and anxious/depressed symptoms [b= .32, t(195)= -2.41, p= .01].
Neither positive engagement with pets or AC exposure moderated the association between IPV exposure and externalizing problems.

**Conclusions:** These findings highlight the complex impact of pets on children exposed to IPV. While positive engagement with pets may serve as a protective factor for internalizing problems, AC exposure exacerbated anxious/depressed symptoms. Additionally, these results suggest that pets may play a less significant role in the development of externalizing problems.

**Laura Swan**  
*Provider-Level Barriers to Engagement with Family Planning in Appalachia: Focus Group Interviews in the Context of the Opioid Epidemic*

**Background:** Although Appalachian women face challenges related to accessing healthcare, the reproductive health needs of women in Appalachia remain understudied. This presentation will report findings from a qualitative study of Appalachian stakeholders regarding the region’s unmet family planning needs in the context of the opioid epidemic.

**Methods:** Three focus group interviews were conducted remotely with community stakeholders in the Appalachian region (N=16), who were recruited using purposive sampling. The interviews were guided with structured questions designed to elicit information about family planning needs and the opioid epidemic. Using Braun and Clark’s (2012) approach to thematic analysis, data were analyzed to identify five pre-determined healthcare access themes.

**Results:** Interview responses were categorized into five overarching categories representing aspects of healthcare access, as conceptualized by Levesque et al. (2013): (1) approachability (ability to perceive the need for care), (2) acceptability (ability to seek care), (3) availability and accommodation (ability to reach services), (4) affordability (ability to pay for services), and (5) appropriateness (ability to engage in services). This presentation will focus on the fifth theme, discussing provider-level barriers to care and patients’ ability to engage in family planning. Subthemes related to appropriateness included patient-service fit, provider training, and provider bias in service delivery.

**Conclusions:** These results highlight stakeholders’ perceptions of a service gap for community members in need of both family planning and substance use services. There is also a need for providers to be better prepared to meet the needs of their patients and to minimize bias in service delivery.

**Kristen Tully**  
*Satisfaction of Care: Eating Disorders and Pregnancy*

**Background:** This study is designed as a needs assessment to examine the satisfaction scores of pregnant women with histories of eating disorders and their experiences with health care professionals. The study will survey post-partum women who have had lived experiences with eating disorder behavior during their pregnancy. The goals of this research are to determine if there are any significant differences of services provided by health care professionals during pregnancy for women with a history of eating disorders, to identify the needs of pregnant women with a history of eating disorders, and to empower women who are participants in the study to feel validated and heard when sharing about their experiences with health care professionals.

**Methods:** This research study will be a mixed methods design with both qualitative and quantitative data. The hypothesis of this study is, that there will be a significant difference between health care professions in satisfaction of health care treatment women received during pregnancy.
their pregnancy. A survey will be disseminated via email and social media. Data will be collected nationally.

**Results:** Data collection will take place between March 5th and March 26th, 2020. Results will be available in April.

**Conclusion:** This research is meant to inform the eating disorder field on the experiences that women with histories of eating disorders have during their pregnancies. A targeted health care intervention can then be created to educate health care professionals on how to treat patients with eating disorders.

**Taylor Wilkerson**  
*Understanding Alzheimer’s Disease Knowledge in Low-Income, Richmond, VA Community Dwelling Older Adults*

**Background:** Different populations of individuals demonstrate varying levels of Alzheimer’s disease (AD) knowledge, as well as commonly held misconceptions about the nature of the disease and its risk factors. Older adults often demonstrate lower scores on Alzheimer’s disease knowledge scales and African American adults are often specifically not aware of their higher Alzheimer’s risk status compared to other racial groups. In addition, African American older adults are more likely to receive the fewest AD interventions.

**Methods:** We measured the Alzheimer’s knowledge of twenty community-dwelling elders at two separate time points (baseline and 6-month follow-up) as part of a larger study on AD health coaching. Participants (n=20) were recruited from low-income communities within the Richmond, Virginia (RVA) area; the sample was 85% African American individuals (n=17), 45% female (n=9) and 55% male (n=11). Participants completed demographic measures, true/false AD knowledge measures, a relational ageism scale, and questions about their health and habits.

**Results:** Similar to previous research, this population of older adults held common misconceptions about AD, including the ideas that mental exercise can prevent Alzheimer’s disease (20% answered correctly) and individuals with Alzheimer’s are incapable of making decisions about their care (30% answered correctly). In this sample, the majority of African American older adults were aware of the fact that they make up the population at the highest risk for developing Alzheimer’s disease (80% answered correctly). Analyses also found no significant relationship between AD knowledge and health outcomes, alcohol consumption, or education.

**Conclusion:** AD knowledge needs to be better addressed in low-income, racially diverse older adults.

**VCU Life Sciences**

**Alex Belt**  
*Zebrafish Model of MLL-Rearranged Acute Myeloid Leukemia*

**Background:** Acute myeloid leukemia (AML) is the second most common type of leukemia. Standard treatment includes chemotherapy as well as stem cell transplantation, but for aging patients and those with impaired immune function these rigorous therapies are not always
possible. Furthermore, AML patients harboring a chromosomal rearrangement involving Multiple Lineage Leukemia (MLL) exhibit far worse prognoses than patients without. Given these circumstances new therapies must be developed.

**Methods:** Danio rerio (zebrafish) has emerged as a powerful model organism for investigating human blood malignancies due to the conservation of hematopoiesis between humans and zebrafish. We developed a transient transgenic model exhibiting AML characteristics by microinjecting single-cell zebrafish embryos with a tissue specific MLL-ENL expression construct.

**Results:** We found that the expression of MLL-ENL induced a clustered expansion of MLL+ and pu.1+ myeloid cells on the yolk sac at 48 and 72 hours post fertilization (hpf). To characterize our transient AML model, we treated MLL-ENL expressing embryos with either one of or a combination of two drugs that are currently being used in human AML drug trials, Venetoclax and Flavopiridol. We found that treatment with either drug reduced the myeloid expansion induced by the expression of MLL-ENL, and that co-treatment reduced the observed myeloid expansion even further.

**Conclusions:** Although further analysis is required, these data suggest that we successfully developed a transient transgenic AML model in zebrafish. Furthermore, these data suggest that Venetoclax and Flavopiridol co-treatment could yield better outcomes for AML patients than treatment with either drug individually.

**Daniel Bustamante**

*Multilevel Variance Components and Brain Volume Mediation of Life Stress on Post-Traumatic Stress Disorder Symptoms in Children via Regularization*

Alterations of volume in brain regions of interest (ROIs) are associated with post-traumatic stress disorder (PTSD). Most of the extant neuroimaging research in PTSD has studied adults. The present study extends this research by using data from children (N=11,869, Mage=9.92) from the ABCD study, a multisite longitudinal long-term study of brain development and childhood health in the U.S. Traumatic events (TEs) and PTSD symptoms were measured through the K-SADS for DSM-5. Values of brain ROIs were assessed using structural MRI measures. The unidirectional model was able to detect the small differences from site variance in sMRI mediators (subc: VS<.009, SE<.004; cort: VS<.009, SE<.004). Additive genetic factors explained 23.49% of the variance in TEs, 41.73% in subcortical and 19.94% in cortical mediators, and residual 21.01% in PTSD symptoms. Environmental factors explained most of the variance in TEs (C=.61, E=.16) and PTSD symptoms (resC=.19, resE=.21), as well as unique environmental factors in the cortical mediators (cort=.66). TEs highly influenced PTSD symptoms (.92). However, the indirect effect of TEs on PTSD symptoms through the mediation of volume in brain ROIs was small to non-influential at this age (subc=-.0003-.001, cort=-.001-.002). Several estimates of mediation effects were notably higher than most. Regularization via elastic net is implemented to train the mediation model to reduce bias and noise from overfitting, and to select the ROIs with mediation effects that explain the data with increased sparsity.

**Ann Kee**

*Selective Serotonin Reuptake Inhibitors Suppress IL-33 Mediated Mast Cell Function*

**Background:** Roughly 235 million people suffer from asthma worldwide, according to data from 2017 from the World Health Organization. Asthma is characterized by increased mucus
production, airway hyperresponsiveness and airway obstruction, all contributed to by mast cell involvement. Interleukin 33 (IL-33) is an inflammatory cytokine that promotes allergic disease by activating ILC2, Th2 cells, and mast cells. IL-33 is increased in asthmatics, and its blockade suppresses asthma-like inflammation in mouse models. There is considerable evidence of links between depression and inflammation. Selective serotonin reuptake inhibitors (SSRIs) are effective anti-depressants with well documented off-target effects. Because SSRIs also have anti-inflammatory effects, we tested the hypothesis that SSRIs can attenuate mast cell function.

**Methods:** Bone marrow derived mast cells (BMMCs) were obtained flushing out cells from femurs removed from BALB/c mice and cultured in CRPMI with IL-3 and SCF for three weeks prior to in vitro experimentation. Mice were injected intraperitoneally twice with Fluoxetine and once with IL-33 in vivo.

**Results:** We show that SSRIs reduce IL-33 mediated cytokine production in mouse bone marrow derived mast cells in vitro and reduce inflammation in vivo.

**Conclusion:** These data indicate that SSRIs may be effective therapeutics for mast cell-associated diseases.

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**Marie Vergamini**

*Comparative Shoulder Morphology in Extant Cercopithecidae*

Morphological variation in forelimb bones has been tied to substrate use in Cercopithecidae. Studies of the distal humerus and proximal ulna (Rector et al., 2018) suggest that African and Asian monkeys’ locomotor repertoires can be distinguished through analysis of variation of the elbow joint. Given that the scapula may be directly involved in weight-bearing during locomotion - similar to the elbow - the relationship between morphological variation and arboreality in the glenoid cavity, acromion, and coracoid process may be analogous.

Using a Microscribe, 25 landmarks were collected to capture the shape of the scapula from a sample of 50+ extant Cercopithecidae. Each species was placed in a locomotor category including ground quadrupedalism, branch quadrupedalism, arm-swinging, and branch quadrupedalism, and branch and ground quadrupedalism based on their primary locomotor strategy during traveling. Variation was analyzed using 3D geometric morphometric PCA, PGLs, and phylogenetic ANOVAs to determine if differential substrate use can be identified through analysis of shape variation in the scapulae of Cercopithecidae.

Results suggest that scapular morphology is more variable in branch quadrupedal cercopithecids than ground quadrupedal ones. However, variation in the scapula can be used to successfully differentiate ground quadrupeds and branch quadrupeds in modern Cercopithecidae. As a valuable factor in the ecology of these primates, this locomotor behavior contributes information on niche differentiation, resource competition, and community organization in living and fossil primates.

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**Eric Vornholt**

*Network Preservation Reveals Shared and Unique Biological Processes Associated with Chronic Alcohol Abuse in NAc and PFC*

**Background:** Excessive alcohol consumption has become a growing public health concern worldwide due to the potential development of alcohol dependence (AD). Prolonged alcohol abuse leads to dysregulation of the mesocorticolimbic pathway (MCL), effectively disrupting executive functioning and the allostatic conditioning of reward response.
Methods: We utilized weighted gene co-expressed network analysis (WGCNA) and network preservation using a case/control study design (n=35) to identify unique and shared biological processes dysregulated in AD in the prefrontal cortex (PFC) and nucleus accumbens (NAc). We used correlation and regression analyses to identify mRNA/miRNA interactions and local expression quantitative trait loci (cis-eQTL) to identify genetic regulatory mechanisms for networks significantly associated with AD.

Results: Network analyses revealed 6 and 3 significant modules from the NAc and PFC, respectively (Bonferroni adj. p≤0.05). Network preservation revealed the upregulation of immune response processes in the two brain regions, whereas cellular morphogenesis/localization and cilia-based cell projection processes were uniquely upregulated only in the NAc. We observed 4 significantly correlated module eigengenes (ME) between the significant mRNA and miRNA modules in PFC, and 6 significant miRNA/mRNA ME correlations in NAc, with the mir-449a/b cluster emerging as a potential regulator for cellular morphogenesis/localization dysregulation in this brain region. Finally, at FDR of 5%, we identified, 37 mRNA and 9 miRNA in NAc, and 17 mRNA and 16 miRNA in PFC cis-eQTLs, which potentially mediate alcohol’s effect in a brain region-specific manner.

Conclusion: In agreement with previous reports, we observed a generalized upregulation of immune response processes in subjects with AD, that highlights alcohol’s neurotoxic properties, while simultaneously demonstrating distinct molecular changes in subcortical brain regions as a result of chronic alcohol abuse. Such changes further support previous neuroimaging and physiological studies that emphasize the distinct roles PFC and NAc play in the development of addictive behaviors.