



Abstract Book

2018 Georgia Clinical & Translational Science Conference

February 22, 2018 - February 23, 2018

Chateau Elan

Braselton, Georgia

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Schedule of Events

Thursday, February 22, 2018			
Time	Agenda Item	Topic	Speaker / Presenter
12:00 pm	Lunch and Networking	Welcome and Introduction	W. Robert Taylor, MD, PhD
SESSION 1: What Can the Georgia CTSA Do For You?			
1:00 pm	Evaluation & Quality	Evaluation & Continuous Improvement, Quality & Efficiency, Regulatory Knowledge & Support & Georgia Research Alliance Members Core Facilities MOU	Eric Nehl, PhD; Carlton Dampier, MD; and Michael E. Zwick, PhD
1:20 pm	Education	Translational Workforce Development / Research Education	Henry Blumberg, MD and Linda McCauley, RN, PhD
1:35 pm	Collaboration & Coordination	Liaison to Trial Innovation Centers, Recruitment Center, Collaboration & Multi-disciplinary Team Science	Neal Dickert, Jr., MD, PhD and Kathy Griendling, PhD
2:05 pm	Clinical Research Support	Clinical Research Network / Pediatrics	Guillermo Umpierrez MD and Anne M. Fitzpatrick, PhD, MSCR, APRN
2:20 pm	Community Engagement	Community Engagement / Integrating Special Populations	Tabia Akintobi, PhD and Brian Rivers, PhD, MPH
2:40 pm	Expert Assistance	Coordinating Center, Informatics, and Biostatistics, Epidemiology & Research Design	Andrew C. West MBA, MHA; Andrew Post, MD; and John J. Hanfelt, PhD
3:00 pm	Translation Support	Pilot Grant Funding	Nael McCarty, PhD
3:15 pm	BREAK		
SESSION 2: Translating Science into Practice			
3:30 pm	Innovation Catalyst	Resources of the Innovation Catalyst	Carolyn C. Meltzer, MD
3:40 pm	NCATS Perspective on SBIR/STTRs	Securing Seed Funding: Support for Biotech Entrepreneurs and Researchers	Lili Portilla, MPA
4:05 pm		Case Studies	H. Timothy Hsiao, PhD
4:40 pm	Translational Assistance from Georgia CTSA Institutional Tech Transfer offices and GRA	Moderated Discussion	Carolyn C. Meltzer, MD and technology transfer representatives
4:55 pm	Special Presentation	Collaborative Opportunities with Georgia Tech Capstone Design: Transforming Clinical Problems into Healthcare Solutions	James Stubbs, PhD
5:00 pm	Reception / Poster Viewing		

Schedule of Events

Friday, February 23, 2018			
Time	Agenda Item	Topic	Speaker
8:00 am	Breakfast and Networking		
SESSION 3: Scientific Session I			
Moderators: Nader H. Moniri, PhD (Mercer University), Bradley G. Phillips, PharmD, BCPS, FCCP (University of Georgia)			
9:00 am	Selected Oral Abstract Presentation	GT Health Data Analytics Platform: An Open Source Framework for Health Analytics and FHIR Application Development	Jon Duke, MD Georgia Institute of Technology
9:15 am	Selected Oral Abstract Presentation	Canine Spontaneous Hemoperitoneum: a Naturally Occurring Model of the Coagulopathy of Trauma	Benjamin Brainard, VMD University of Georgia
9:30 am	Selected Oral Abstract Presentation	Health Equity via the Integrated Care Leadership Program	Sharon Rachel, MA, MPH Morehouse School of Medicine
9:45 am	Selected Oral Abstract Presentation	LIN28B Promotes Neuroblastoma Metastatic Dissemination	Selma Cuya, PhD Emory University
10:00 am	Selected Oral Abstract Presentation	Oral Emergency Contraception Access and Patient Counseling: Are There Differences Between Metropolitan and Nonmetropolitan Pharmacies in Georgia?	Rebecca Stone, PharmD University of Georgia
10:15 am	Selected Oral Abstract Presentation	Cancer Mortality Risk Reductions for Replacing Sedentary Time with Physical Activities	Erika Rees-Punia, MPH University of Georgia
10:30 am	Poster Viewing / Break		
11:00 am	Keynote Presentation	Influenza Vaccination by Microneedle Patch: Results from a Phase 1 Clinical Trial	Introduction: Andres Garcia, PhD Speakers: Mark R. Prausnitz, PhD and Nadine Rouphael, MD
11:45 am	Lunch / Poster Viewing		
12:30 pm	KL2 Panel Discussion	Discussion with Former KL2 Scholars About Their Experiences - What Worked for Them in Their Career Development	Moderators: Henry M. Blumberg, MD and Igho Ofotokun, MD
SESSION 4: Scientific Session II			
Moderators: Ming-Hui Zou, MD, PhD (Georgia State University), David Hess, MD (Augusta University)			
1:00 pm	Keynote Presentation	The Significance of Resilience in Translational Research	Herman A. Taylor, Jr. MD
1:45 pm	Break / Poster Viewing		
2:15 pm	Special Presentation	Georgia Center for Diabetes Translation Research	K.M. Venkat Narayan, MD, MSc, MBA
2:30 pm	Selected Oral Abstract Presentation	Genome-Wide Association Study of Prediabetes Progression	Changwei Li, MD, PhD University of Georgia
2:45 pm	Selected Oral Abstract Presentation	Identification of Candidate Variant for Short Stature and Insulin Resistance	Trenell Mosley, BS Emory University
3:00 pm	Selected Oral Abstract Presentation	Hypoglycemia Associated with Insulin use During Treatment of Hyperkalemia Among Emergency Department Patients	Bobby Jacob, PharmD Mercer University
3:15 pm	Selected Oral Abstract Presentation	Ebola Virus Persistence in Ocular Tissues and Fluids (EVICT) Study: Ebolavirus RT-PCR Results and Cataract Surgery Outcomes	Jessica G. Shantha, MD Emory University
3:30 pm	Selected Oral Abstract Presentation	Direct Electrical Stimulation of the Lateral Hypothalamus Consolidates Wake and Ameliorates Cataplexy in a Mouse Model of Narcolepsy Type 1.	Anna Rogers, BS Emory University
3:45 pm	Selected Oral Abstract Presentation	Associations Between Inflammatory Markers and Negative Symptoms in Individuals with Schizophrenia: Converging Evidence	David Goldsmith, MD Emory University
4:00 pm	Awards Ceremony		

Keynote Speakers

Mark R. Prausnitz, PhD and Nadine Rouphael, MD

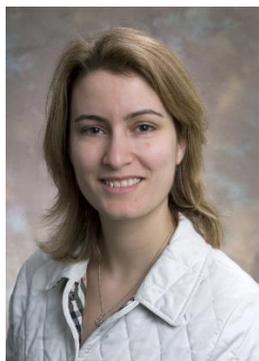
11:00am, Friday, February 23rd



Mark Prausnitz is Regents' Professor and J. Erskine Love Chair in Chemical and Biomolecular Engineering at the Georgia Institute of Technology. He earned a BS degree from Stanford University and a PhD degree from MIT, both in chemical engineering. Dr. Prausnitz and his colleagues carry out research on biophysical methods of drug delivery, which employ microneedles, ultrasound, lasers and other physical means to control the transport of drugs and vaccines into and within the body.

A major area of focus involves the use of microneedle patches to apply vaccines to the skin in a painless, minimally invasive manner. In collaboration with Emory University, CDC and other organizations, Dr. Prausnitz's group is advancing microneedle patches from device design and fabrication through pharmaceutical formulation and pre-clinical animal studies and into studies in human subjects. The Prausnitz group has also developed hollow microneedles for targeted drug delivery in the eye in collaboration with Emory University. Other projects including the use of laser-activated nanoparticles to facilitate intracellular delivery of molecules, design of ionic liquids as pharmaceuticals and adaptation of microneedle technology to extract fluid from the skin for diagnostic and monitoring purposes.

In addition to research activities, Dr. Prausnitz teaches an introductory course on engineering calculations, as well as two advanced courses on pharmaceuticals. He also serves the broader scientific and business communities as a frequent consultant, advisory board member and expert witness, and has co-founded four start-up companies.



Dr. Rouphael is an Associate Professor of Medicine in the Division of Infectious Diseases. Her career is devoted to clinical, translational research in infectious diseases and particularly in vaccine for the past 10 years. She serves as the Emory VTEU (Vaccine and Treatment Evaluation Units) co-PI and the Hope Clinic network Director and the clinical Core PI of the Emory Clinical of the Human Immunology Project Consortium (HIPC) both NIH funded. For all networks, she has served as the overall or the site PI/co-PI for more than 30 studies, has chaired many committees and authored 60 publications. She has particular interest in novel vaccine delivery (studies using microneedle patch with GA tech), immunosenescence, system biology approach to vaccinology. She has experience in *Clostridium difficile* treatment and prevention, *Streptococcus pneumoniae* epidemiological, clinical and basic research studies as well as antimicrobial resistance and is part of the Emory Resistance Center

Keynote Speaker

Herman A. Taylor, M.D., MPH, FACC, FAHA

1:00pm, Friday, February 23rd



Dr. Taylor is a recognized leader in cardiology with broad experience in areas including invasive practice/research. He serves as the Director and Endowed Professor of the Cardiovascular Research Institute at Morehouse School of Medicine. He is Board certified in Internal Medicine and Cardiovascular disease. Over the last decade, Dr. Taylor has focused predominantly on preventive cardiology, leadership of the landmark Jackson Heart Study (JHS) and related observational research projects. In 1999, he was appointed Principal Investigator and Director of the Jackson Heart Study, the largest epidemiological study of African Americans and cardiovascular disease of its kind ever undertaken. While in that role Dr. Taylor was the first to hold three simultaneous positions with the institutions funded by the NIH to administer the Study: Professor of Medicine and an attending cardiologist (and the inaugural holder of the Aaron Shirley Endowed Chair for the Study of Health Disparities) at University of Mississippi Medical Center; Visiting Professor of Biology in the Division of Natural Sciences at Tougaloo College; and, Clinical Professor of Epidemiology and Preventive Medicine at Jackson State University. In addition to establishing an internationally significant resource for the study of cardiovascular disease, the JHS evolved successful teaching and community service components linked to the study. As the Director of the Cardiovascular Research Institute (CVRI) at Morehouse School of Medicine (MSM), Dr. Taylor is responsible for providing leadership in educational, research and clinical initiatives of MSM. With formal training at Harvard Medical School (MD), University of North Carolina (internal medicine residency), the University of Alabama at Birmingham (cardiology fellowship), and the Harvard School of Public Health (MPH), his career as a scientist and clinician has been spent seeking to understand causes and develop approaches to prevention of cardiovascular disease (CVD), with a focus on eliminating disparities and inequities among populations, and advancing cardiovascular health for all.

Highlighted Oral Abstract Presentations

Friday, February 23rd

9:00 am; Presenter: Jon Duke, MD (Georgia Institute of Technology)

GT Health Data Analytics Platform: An Open Source Framework for Health Analytics and FHIR Application Development

Duke JD, Starr RS, Hilton CA, Braunstein M

Introduction: The Georgia Tech Health Data Analytics Platform was designed to expedite collaborative research in data analytics and application development. The platform focuses on three processes: 1) harmonization of data from diverse sources; 2) clinical phenotyping and analytics; and 3) FHIR-based application development.

Methods: HDAP leverages the OMOP CDM for transformation of EHR and claims data from diverse sources. As a result, diverse datasets can be made available through a common format. In order to perform a clinical analysis, whether descriptive, comparative, or predictive, phenotyping must be conducted to define exposures and outcomes. HDAP leverages the OHDSI Atlas framework to create these phenotypes. Analyses are then performed either via a Jupyter notebooks, via direct R code, or via the Atlas interface.

Application development is supported by HDAP FHIR servers for all OMOP data sources. Using FHIR, researchers can access clinical data via RESTful APIs and create decision support or other applications. These applications are then hosted via Docker on the HDAP servers. All HDAP applications and their associated code are persisted for use by other researchers in the future.

Results: The HDAP platform has been deployed and tested using over 30 projects and is now accessible to all GT students and faculty as of January 2018.

Conclusion: The GT Health Data Analytics platform provides a common framework that may be leveraged across the GaCTSA to increase standardization, collaboration, and reuse of research artifacts.

Translation Impact: HDAP is a fundamentally translational tool designed to go from data and analytics to real-world application development and deployment that can benefit patients and providers.

9:15 am; Presenter: Benjamin Brainard, VMD (University of Georgia)

Canine Spontaneous Hemoperitoneum: A Naturally Occurring Model of the Coagulopathy of Trauma

Brainard BM, Fletcher DJ, Rozanski E, deLaforcade AM, Brooks MB

Introduction: Uncontrolled bleeding is a recognized complication of acute trauma, however optimized transfusion and medical management strategies are not yet defined. Spontaneous hemoperitoneum (SHP) is a canine syndrome that results in shock from acute hemorrhage. Affected dogs develop hemoperitoneum after rupture of abdominal neoplasia and, analogous to human patients, may require acute resuscitation, high volume transfusion, and surgical intervention for successful outcomes.

Methods: Samples were collected from 28 dogs with SHP at initial presentation for measurement of plasma [lactate] and hemostatic profiling, including platelet count, PT, aPTT, fibrinogen, antithrombin, protein C, d-dimer, thromboelastography [TEG], and TEG lysis parameters with and without addition of 50U/ml of tissue plasminogen activator [tPA] [LY30/50, LY30]]. Values were compared with 28 healthy breed-matched controls.

Results: SHP dogs displayed hypocoagulability (prolonged PT and aPTT, decreased TEG MA) and hyperfibrinolysis (increased LY30/50) compared to controls. Measures of hypocoagulability were related to decreased protein C activity, while hyperfibrinolysis was related to lactate concentration. Among 18 dogs discharged following surgery, LY3050 was associated with increasing doses (mL/kg) of fresh frozen plasma ($P=0.03$), but none of the parameters were significantly associated with the dose of red blood cells.

Conclusions: Dogs with SHP demonstrate hemostatic derangements typical of the acute coagulopathy of shock and trauma in people. Activation and depletion of protein C appear to be a common mechanism for both species.

Translational Impact: Canine SHP represents a novel model system to evaluate transfusion strategies and the role of antifibrinolytic therapy for this condition.

9:30 am; Presenter: Sharon Rachel, MA, MPH (Morehouse School of Medicine)

Health Equity via the Integrated Care Leadership Program

Rachel SA, Bastien GB, Cooper SI, Wrenn GL

Introduction: The Integrated Care Leadership Program (ICLP) builds capacity within clinical sites to integrate behavioral health and primary care. The goal is to promote health equity among vulnerable populations by strengthening capacity among providers and clinics to implement and sustain integrated practice. Participants enhance leadership skills and competencies through: 1) the ICLP online curriculum; 2) monthly webinars; 3) knowledge-exchange through a virtual community of practice; 4) monitoring organizational readiness; and 5) analyzing clinical data for changes in patient outcomes.

Methods: ICLP conducts internal/program-level and external/clinic-level process and outcome evaluation. Process evaluation examines delivery of intended information and skills, quality improvement (QI), and participant experience. Outcome evaluation includes lessons learned, program sustainability, organizational readiness, project impact, clinical outcomes, and integrated practice sustainability.

Results: Nineteen sites from 11 states enrolled in the ICLP from 2016-2017; 14 sites completed the program. Universal depression screening rates increased. Organizational readiness was generally high; sites needed support with staff capacities, resource use, and simplifying steps in integrated care. QI activities included building staff collaboration, improving readiness, new patient intake procedures and clinical workflows, cross-site collaboration, and enhancing patient engagement.

Conclusion/translational impact: Integrated care improves patient mental health, well-being, and overall quality of life, as well as increasing staff satisfaction and cost-savings. ICLP enables participating sites to take a more robust approach to measurement-based care.

9:45 am; Presenter: Dongdong Chen, MS (Emory University)

LIN28B Promotes Neuroblastoma Metastatic Dissemination

Chen D, Cox J, Annam J, Weingart M, Essien G, Rathi K, Khurana P, Cuya SM, Schnepf RW

Introduction: LIN28B is an RNA binding protein that blocks the processing of the let-7 family of tumor suppressors. When deregulated, LIN28B promotes tumorigenesis across diverse histotypes. We previously demonstrated that LIN28B induces neuroblastoma proliferation. However, in addition to increased proliferation, high-risk neuroblastoma exhibits a striking proclivity for widespread metastases. Thus, in this study, we investigated how LIN28B influences neuroblastoma metastasis.

Methods: We used gain and loss of function approaches to genetically manipulate transcripts of interest in neuroblastoma cells, and then measured effects on self-renewal, proliferation, invasion, and downstream signaling. We generated GFP-luciferase expressing neuroblastoma cell line models in which LIN28B levels were manipulated, injected these lines into the tail veins of NSG mice, and tracked dissemination using an IVIS Spectrum system.

Results: Depletion of LIN28B significantly delayed the onset of tumor metastasis, reduced tumor burden, and extended mouse survival (103 days versus 50 days, $p < 0.0001$) compared with control cells expressing scrambled shRNA. LIN28B increased tumorsphere number and size, linking self-renewal to metastatic dissemination. Overexpression of let-7 only partly mimicked LIN28B depletion, suggesting that the promotion of metastasis by LIN28B is not fully let-7 dependent. Interestingly, Gene Set Enrichment analysis showed that LIN28B signaling was most strongly and positively correlated with BRCA1 signaling in both MYCN and non-MYCN amplified tumors.

Conclusions: LIN28B promotes self-renewal and metastasis of neuroblastoma.

Translational Impact: This study suggests that targeting LIN28B/let7 signaling may improve the treatment of patients with high-risk neuroblastoma.

10:00 am; Presenter: Rebecca Stone, PharmD (University of Georgia)

Oral Emergency Contraception Access and Patient Counseling: Are There Differences Between Metropolitan and Nonmetropolitan Pharmacies in Georgia?

Stone RH, Ernest D, Scutt B, Hur S, Rafie S

Introduction: Oral emergency contraception (EC) is available as OTC or prescription levonorgestrel (LNG) and prescription ulipristal acetate (UPA). Studies indicate pharmacies may not have LNG available in the OTC aisle or UPA stocked, and often provide incorrect EC access and counseling information.

Methods: This prospective, randomized, telephone-based survey evaluates differences in oral EC access and patient counseling accuracy between metropolitan (M) and nonmetropolitan (NM) pharmacies in Georgia (GA). Of GA retail pharmacies, 25% were randomly selected and stratified across the NCHS Urban-Rural County Classification Scheme. Researchers posed as adult females inquiring about EC. Data collection included description of available EC, efficacy window, and counseling points. Statistical analyses completed with SPSS.

Results: Researchers called 600 pharmacies: 515 (67% M vs 33% NM) were reached. When asked “do you have something I can use after sex to not get pregnant?,” most pharmacists responded “Yes” and identified LNG (78% M vs 72% NM, $p=0.11$). Of these, M pharmacies more often indicated LNG is stocked (82% vs 64%, $p<0.001$), available on the OTC aisle (54% vs 43%, $p=0.047$). Metropolitan pharmacies less often described an incorrect (<72 hours) efficacy window (11% vs 21%, $p=0.03$). Very few pharmacists identified UPA as an alternative (4% M vs 1% NM, $p=0.11$).

Conclusions: Women continue to face barriers accessing and receiving accurate EC counseling. Approximately 25% of GA pharmacies reported no EC available. Pharmacies carrying EC, especially NM, often did not have EC readily available on the OTC aisle and provided incorrect efficacy window counseling.

Translational impact: This data identifies the need for development of additional pharmacist EC education.

10:15 am; Presenter: Erika Rees-Punia, MPH (University of Georgia)

Cancer Mortality Risk Reductions for Replacing Sedentary Time with Physical Activities

Rees-Punia E, Evans EM, Gapstur SM, Patel AV

Introduction: Physical inactivity is a well-established risk factor for chronic disease mortality. Evidence also suggests that excess sitting may be an independent risk factor for mortality; this may be due to the displacement of physical activities with sedentary behaviors. This study examined the cancer mortality risk reduction associated with substituting 30 minutes of daily sitting time for an equivalent duration of physical activity.

Methods: Participants included 101,757 men and women in the Cancer Prevention Study-II. An isotemporal substitution approach to Cox proportional hazards regression was used to estimate adjusted hazard ratios and 95% confidence intervals for cancer mortality associated with the substitution of 30 minutes-day⁻¹ of sitting with light or moderate/vigorous intensity physical activity (LPA, MVPA).

Results: During 14 years of follow-up, 9,055 participants died of cancer. Among the least active, the replacement of 30 min-day⁻¹ of sitting with LPA was associated with an 11% reduction in risk of cancer mortality (0.89, 0.83-0.95), while replacement with MVPA was associated with a 40% reduction in risk (0.60, 0.45-0.58). Risk of cancer mortality was reduced for the moderately active only when sitting was replaced with MVPA (0.62, 0.45-0.84). For the most active, replacement of sitting time was not associated with a significant reduction in risk (1.03, 1.00-1.06 LPA; 1.00, 0.98-1.01 MVPA).

Conclusion: Among less active participants, replacement of sitting with LPA or MVPA was associated with longevity, although associations were strongest when sitting was replaced with MVPA.

Translational Impact: For those not meeting physical activity guidelines, replacing modest amounts of sitting with even light activities, such as walking, can be beneficial.

2:30 pm; Presenter: Changwei Li, MD, PhD (University of Georgia)

Genome-Wide Association Study of Prediabetes Progression

Li C, Liu T, Shen L, Shen Y, Zhang M, Wei J, Li S

Introduction: Genomic studies of prediabetes progression are lacking.

Methods: We conducted the first genome-wide association study of prediabetes progression (to diabetes or normal glycaemia) among 2,205 white participants of the Atherosclerosis Risk in Communities (ARIC) study. Single SNP-based analysis was performed by logistic regression models, controlling for age, gender, body mass index, and the first 3 genetic principal components. Gene-based analysis was conducted by combining SNP-based p values using Effective Chi-Square (ECS) test method. Promising findings were further evaluated for replication among 1,146 participants of the Framingham Heart Study (FHS). Analysis results across ARIC and FHS were combined using inverse-variance-weighted meta-analysis method for SNPs and Fisher's method for genes.

Results: We identified 5 novel genes that are associated with prediabetes progression using gene-based analyses, including SGCZ (ARIC $P=9.93 \times 10^{-6}$, FHS $P=2.00 \times 10^{-3}$, Meta $P=3.72 \times 10^{-7}$) at 8p22, HPSE2 (ARIC $P=8.26 \times 10^{-19}$, FHS $P=5.85 \times 10^{-3}$, Meta $P<8.26 \times 10^{-19}$) at 10q24.2, ADGRA1 (ARIC $P=1.34 \times 10^{-5}$, FHS $P=1.13 \times 10^{-3}$, Meta $P=2.88 \times 10^{-7}$) at 10q26.3, GLB1L3 (ARIC $P=3.71 \times 10^{-6}$, FHS $P=4.51 \times 10^{-3}$, Meta $P=3.16 \times 10^{-7}$) at 11q25, and PCSK6 (ARIC $P=6.51 \times 10^{-6}$, FHS $P=1.10 \times 10^{-2}$, Meta $P=1.25 \times 10^{-6}$) at 15q26.3. eQTL analyses indicated that these genes were highly expressed in tissues related to diabetes development. Single SNP-based analysis didn't find any novel locus.

Conclusion: We identified 5 novel genes relevant to prediabetes progression.

Translational Impact: Findings of our study help to understand the mechanisms of prediabetes progression, and can be used to identify prediabetic individuals who are more likely to progress to diabetes, so that early interventions can be targeted.

2:45 pm; Presenter: Trenell Mosley, BS (Emory University)

Identification of Candidate Variant for Short Stature and Insulin Resistance

Mosley TJ, Wilcox WR, Zwick ME

Introduction: We identified two Middle Eastern sibling probands presenting with short stature, particularly of the hands and feet, and insulin resistance. The probands are offspring of unaffected consanguineous parents. We hypothesized the phenotypes are the result of a novel autosomal recessive disorder and predicted both probands should be homozygous for the same identical-by-descent allele.

Methods: To identify candidate variants, we performed whole-genome sequencing and two orthogonal analyses: 1) a genome-wide search for rare, high-CADD ($MAF \leq 0.001$; $CADD \leq 15$) variants homozygous in both cases, and 2) rare, high-CADD variants located in runs of homozygosity where both samples were homozygous for the same allele

Results: The analyses converged on nine variants. One variant in the DUSP7 gene (g.52050873:T>C; hg38) is rare in the general population ($MAF=0$) and is predicted to be a tyrosine to cysteine missense mutation (p.Tyr401Cys). DUSP7, a dual-specificity phosphatase, interacts with the growth hormone receptor (GHR) and MAP kinase (MAPK) pathway, which both interact with the insulin pathway. We also showed that the DUSP7 variant is heterozygous in both parents and not homozygous in the unaffected siblings.

Conclusion: The DUSP7 variant is a strong candidate for this disorder. Future steps include conducting molecular studies to determine if the observed mutation functionally or structurally disrupts the DUSP7 protein.

Translational Impact: Investigation of this putative causal variant will provide insight into the dynamics of dual-specificity phosphatases in developing chondrocytes and the insulin pathway, while broadly elucidating the mechanisms influencing the insulin pathway, the etiology of insulin resistance, and bone development.

3:00 pm; Presenter: Bobby Jacob, PharmD (Mercer University)

Hypoglycemia Associated with Insulin Use during Treatment of Hyperkalemia among Emergency Department Patients

Jacob BC, Peasah SK, Shogbon AO

Introduction: Hypoglycemia is a common adverse event associated with insulin during treatment of hyperkalemia in hospitalized patients. The objective of this study was to determine the incidence of hypoglycemia associated with insulin use during treatment of hyperkalemia among patients seen in the emergency department. Methods: This was a retrospective, chart-review study that was IRB approved. Adult patients who received intravenous regular insulin as a result of an order from the emergency department hyperkalemia order set were eligible for inclusion. Primary endpoints were incidence of hypoglycemia (blood glucose <70 mg/dL) and severe hypoglycemia (blood glucose <40 mg/dL). Blood glucose was checked within 24 hours of insulin administration. Results: A total of 172 patients were included. The incidence of hypoglycemia was 19.8% (n=34) and the incidence of severe hypoglycemia was 5.2% (n=9). Hypoglycemic patients had a significantly lower median blood glucose at baseline compared to those who did not develop hypoglycemia [83.5 (72.0 – 112.0) mg/dL vs. 123.0 (96.0 – 167.0 mg/dL), $p < 0.0001$]; however, no difference was noted between groups in the average insulin dose administered (0.12 ± 0.1 units/kg vs. 0.11 ± 0.1 units/kg, $p = 0.6175$). Conclusion: There is a concerning risk of hypoglycemia associated with insulin use during treatment of hyperkalemia in the emergency department. Standard insulin doses may not be appropriate in some cases like patients with lower baseline blood glucose. Translational Impact: Further clinical studies in emergency department settings are warranted to develop safer hyperkalemia treatment protocols including appropriate dosing of insulin and dextrose that may mitigate this high risk of hypoglycemia.

3:15 pm; Presenter: Jessica G. Shantha, MD (Emory University)

Ebola Virus Persistence in Ocular Tissues and Fluids (EVICT) Study: Ebolavirus RT-PCR Results and Cataract Surgery Outcomes

Shantha JG, Mattia J, Yeh S

Introduction: The EVICT Study aims to determine the prevalence of EBOV RNA detection in ocular fluids and to establish the safety, feasibility, and outcomes of cataract surgery in EVD survivors.

Methods: The EVICT Study enrolled survivors requiring ophthalmic surgery. Demographics, ocular and medical history were collected, and an ophthalmic exam performed. Laboratory investigations included EBOV RT-PCR on ocular fluid, and EBOV IgG. Patients requiring cataract surgery underwent manual small incision cataract surgery (MSICS) and were evaluated at 6 weeks and 3 months.

Results: 76 EVD survivors were screened and 27 were enrolled. Median age was 19 years (interquartile range [IQR]: 15-34) and 67% were female. Median time from EVD diagnosis was 34.5 months (IQR: 14-49). Indication for enrollment was visually significant cataract (25), blind painful eye (1), and subluxed lens (1). Median visual acuity (VA) was 3 (IQR: 2.25-3). Cataract type included uveitic (16,64%), anterior capsular plaque (4,16%), combination (2,8%), posterior subcapsular (2,8%), and cortical (1,4%). Signs of uveitis were noted in 26 study eyes. Ocular fluid tested negative for EBOV RNA by RT-PCR in all 27 patients. MSICS was performed in 16 eyes. One patient underwent enucleation. All patients were anti-EBOV IgG antibody positive. Median Preoperative logMAR VA was 3 (IQR 2.25-3) with improvement at 6 weeks to 1.39 (IQR 0.55-2.00, $P < 0.0001$) and 3 months to 0.60 (IQR 0.23-2.00, $P < 0.0005$).

Conclusions: EBOV RNA was not detected in ocular fluid in EVD survivors.

Translational Impact: Cataract surgery was feasible, safe, and restored vision. These findings have important implications for EVD survivors and their eye care providers for future ocular surgical interventions.

3:30 pm; Presenter: Anna Rogers, BS (Emory University)

Direct electrical stimulation of the lateral hypothalamus consolidates wake and ameliorates cataplexy in a mouse model of narcolepsy type 1

Rogers AR, Aiani LM, Pedersen NP, Willie JW

Introduction: Narcolepsy type 1 is caused by loss of orexin neurotransmitter signaling and is characterized by sleep-wake fragmentation, intrusion of rapid-eye-movement sleep (REMS) during wake, and cataplexy, an abrupt loss of muscle tone elicited by strong emotions. We tested whether direct electrical stimulation of medial prefrontal cortex (mPFC) or lateral hypothalamus (LH) would provide benefit in a mouse model of narcolepsy type 1.

Methods: We implanted 6 orexin-ataxin3 transgenic mice with nuchal EMG electrodes and surface frontal-parietal EEG electrodes for recording. Stereotactic bipolar stimulation electrodes in LH and mPFC were also implanted. We collected

video/EEG/EMG data in freely behaving mice using a Pinnacle Technologies, Inc. acquisition system and analyzed recordings with Spike2 software (Cambridge Electronic Design, Ltd). After initial threshold stimulation testing, mice were subjected to 3 hours of continuous stimulation during the active phase. Data was analyzed in 10 second epochs using standard criteria for REMS, non-REMS, wake, and cataplexy.

Results: Continuous LH stimulation consolidated wakefulness, increasing time spent in wake by 15-27%. Stimulation also decreased cataplexy frequency thus reducing time spent in cataplexy by 86-100%. By comparison, mPFC stimulation produced no consistent behavioral change in any animal. Behavior was grossly normal across stimulation conditions in both groups. Conclusion: This preliminary study suggests specificity and effectiveness of LH stimulation for narcolepsy, although further exploration of stimulation parameters, additional targets, and longer-term effects is required. Our findings constitute the first evidence that deep brain stimulation could provide an innovative therapy for narcolepsy type 1.

3:45 pm; Presenter: David Goldsmith, MD (Emory University)

Associations between Inflammatory Markers and Negative Symptoms in Individuals with Schizophrenia: Converging Evidence

Goldsmith DR, Cotes RO, Miller BJ, Treadway MT, Walker EF, Miller AH

Introduction: Negative symptoms of schizophrenia are predictive of poor function and outcome in patients with schizophrenia and tend to not be responsive to antipsychotics. Inflammation may be one potential mechanism underlying these symptoms.

Methods: Three cohorts of patients were studied: 1) patients with deficit schizophrenia (n =17), non-deficit patients (n=39), and healthy controls (n=28); 2) individuals at clinical high risk for psychosis (CHR; n=80); 3) patients with treatment resistant schizophrenia (TRS; n=10). Linear regression models were used to examine the relationship between inflammatory cytokines and negative symptoms.

Results: Tumor necrosis factor (TNF) was significantly increased relative to non-deficit patients and healthy controls, and predicted total negative symptoms ($\beta=0.31$, $p=0.012$), alogia ($\beta=0.30$, $p=0.024$), and blunted affect ($\beta=0.31$, $p=0.018$). Baseline concentrations of TNF significantly predicted negative symptoms, including anhedonia, apathy, and loss of interest, at the 6-month ($\beta =0.25$, $p=0.011$) and 12-month follow-up ($\beta=0.39$, $p=0.001$) in CHR individuals. In the TRS sample, IL-1 β was correlated with passive/apathetic social withdrawal ($r = 0.657$, $p = 0.039$), disturbance of volition ($r = 0.686$, $p = 0.029$) and the global avolition-apathy score ($r = 0.751$, $p = 0.012$).

Conclusion: Taken together, these data show the predicted relationship between inflammatory markers and negative symptoms and demonstrate the reproducibility of monocytic-derived cytokines as associated with negative symptoms across samples of patients with schizophrenia and individuals at high risk for psychosis. Cytokines may impact brain reward circuitry, and could represent novel treatment targets for motivational deficits and negative symptoms of schizophrenia.

Poster Presentations
Thursday, February 22nd

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2	Ruchi Yadav PhD	University of Georgia	Serum levels of new autoantibodies correlate with airway obstruction in cystic fibrosis patients: novel systemic markers of lung disease?
3	Luqi Shen, MS	University of Georgia	Smoking status modified the effect of leptin on blood pressure: a Mendelian randomization study
4	Adam Gates, BS	Mercer University	Drug Induced Skin Reactions: Assessment and Management
5	Angela Shogbon Nwaesei, PharmD, BCPS	Mercer University	Student Pharmacist Clinical Interventions in Optimizing the Care of Patients with Stroke or Transient Ischemic Attack at a Community Hospital.
6	Loretta Reyes, MD	Emory University	Elevated Arginase Activity and Left Ventricular Hypertrophy (LVH) in Children with Chronic Kidney Disease (CKD)
7	Ashish Advani, PharmD	Mercer University	InpharmD: A Mobile Drug Information Center Offering Customized Evidence
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Advani, Ashish PharmD (Mercer University) POSTER: 7

InpharmD: A Mobile Drug Information Center Offering Customized Evidence

Advani AA

The average physician has three questions per hour; two of which cannot be answered via an existing static drug information resource.

When medical decisions are made based on subjective determinants in favor of objective ones, commercial influence (including actual commercials) is a larger factor, and costs rise while quality falls. The way we make medical decisions has led to the United States rising to #1 in the world in healthcare spending and falling to #37 in healthcare quality.

InpharmD is a website and app that connects healthcare providers with customized, evidence-based information from a nationwide network of academic Drug Information Centers (DICs), optimized with automation and machine learning. Today, it is a platform serving more than 10,000 providers at 11 hospitals, via four DICs.

When healthcare decisions are made based on objective evidence rather than subjective determinants, quality is expected to increase and cost is expected to decrease. Preliminary data will be shared.

Alwhaibi, Abdulrahman PharmD (University of Georgia) POSTER: 1

Targeting Akt1- β catenin pathway in the advanced prostate cancer regulates tumor and vascular reciprocity and promotes cancer metastasis

Alwhaibi A, Gao F, Shenoy PR

Introduction: PI3K/Akt pathway is believed to be an excellent therapeutic target for various cancers. However, recent studies have unearthed surprising effects on targeting Akt in advanced cancers, thus revealing a context and stage specific effect of Akt in cancer.

Methods: Primary human lung endothelial cell line (HLEC) was used to study the effect of Akt1 inhibition on endothelial barrier integrity and the invasion of human metastatic PCa cells (PC3 and DU145) using electric cell-substrate impedance sensing (ECIS) and modified transwell invasion assay, respectively. VEcadherin-CreAkt1 mouse model was generated to study the effect of Akt1 inhibition on tumor growth and metastasis in vivo after subcutaneous and tail vein administration of RM1 cells, respectively. β catenin inhibitors (IWR-1 and ICG-001), immunofluorescence and Western blotting were utilized to delineate the underlying mechanisms of endothelial Akt1 loss in promoting PCa metastasis.

Results: We demonstrate that blocking endothelial Akt1 compromises endothelial barrier integrity, shown with loss of tight junction proteins, Claudin5, ZO1 and ZO2, and promotes PCa invasion in vitro. Furthermore, whereas loss of endothelial Akt1 didn't affect tumor growth from RM1 cells, lung metastasis was significantly elevated in VEcadherin-CreAkt1 compared to control mice. Pharmacological inhibition of β catenin restored tight junctions, inhibited cancer cells invasion in vitro and reduced lung metastasis in vivo.

Conclusion and Translation impact: Targeting Akt1 in the tumor blood vessels disrupts the endothelial barrier integrity, which facilitates PCa cells invasion and lung metastasis. Research on finding cure for metastatic prostate cancer (mPCa) must consider the impact of treatment on tumor endothelial cells.

Bajaj, Lotika (Mercer University) POSTER: 15

Novel particulate vaccine against gonorrhea

Bajaj L, Gamal W, Gala R, Zughaier S, D'Souza MJ

Introduction: Gonorrhea is one of the most common sexually transmitted infections caused by Gram-negative Diplococcus bacteria, Neisseria gonorrhoea. The treatment for gonorrhea involves use of antimicrobials but development of drug resistance is a great threat to public health and therefore novel methods for prevention of gonorrhea infection are needed.

Methods: In the present study, we formulated spray dried microparticles with pre-crosslinked BSA to deliver and evaluate efficacy of formalin fixed whole cell of gonorrhea bacteria as vaccine. The microparticles were characterized for size, charge and poly dispersity index (PDI). In-vivo efficacy of this vaccine, was checked in 4-6 weeks old Balb/c mice. One group received subcutaneous gonorrhoea microparticulate vaccine (GnH MP), second received subcutaneous gonorrhea vaccine in suspension and third received blank BSA microparticles (N=6). Blood samples were collected every 2 weeks after dosing and antibody levels were measured using indirect ELISA for IgG antibodies.

Results: The percent yield for vaccine particles was 89 % w/w. Vaccine particles were 4.5 μ m and PDI was 0.447 with a charge of -25.1 ± 5.79 mV. An increase in specific antibody levels was observed in mice beginning at week 4 in particulate vaccine groups.

Conclusion: Vaccine particles were prepared and in-vitro and in-vivo characterization was successfully done.

Translational Impact: This vaccine shows promise since the whole cell vaccine can be used without modifications in humans after appropriate scale up. By using the whole cell bacteria, all the antigens are preserved.

Bignell, Whitney E. PhD, RDN, LD (University of Georgia) POSTER: 28

Inclusion of Older Adults in Georgia's Clinical Translational Science Alliance (GaCTSA)

Bignell WE, Kimbrough VE, Johnson MA

Introduction: Older adults are underrepresented in clinical trials (Herrera et al., 2010). NIH has called for integration of special and underserved populations in translational research. This presentation summarizes the need for research collaborations of GaCTSA with Georgia's Division of Aging Services, 12 Area Agencies on Aging, and more than 200 senior centers that comprise the "aging network."

Methods: Sources include biomedical literature, government and professional organizations.

Results: Georgia's older adult population will increase from 13.1% in 2016 to 20% by 2030. Georgia's senior health ranking has decreased to 41 among 50 states (United Health Foundation, 2017). Georgia ranked 40th or worse on eleven (of 41 measures): nursing home quality, financial support, food insecurity, home-delivered meals, flu vaccine, home health care workers, hip fractures, premature deaths, teeth extractions, depression, and overuse of the PSA test. Georgia's aging network through federal, state, local, and private funding provides an infrastructure to address these health disparities, including through research. Previous research shows food insecurity adversely affects health behaviors (Sattler and Lee, 2013), while interventions improved health behaviors (Lee, Fischer, Johnson, 2010). However, considerably more research is needed to identify successful strategies to improve overall health.

Conclusion: Georgia's dismal health ranking needs to be addressed through research targeted to underserved older adults.

Translational Impact: Georgia has challenges and opportunities to address health disparities in underserved older adults through collaborations of the GaCTSA with Georgia's aging network.

Daphney, Cedrick MS (Mercer University) POSTER: 10
Sex Differences in a Novel Triple Knock-In Mouse Model of Alzheimer's Disease
Daphney CD, Murnane KS

Introduction: Alzheimer's disease (AD) affects millions and costs hundreds of billions yearly. Key AD symptoms include cognitive impairment and mood disorders. Women are disproportionately affected by the disease and comprise about two-thirds of the world's AD population. Despite this, major research efforts have thus far not resulted in a single effective therapeutic for AD. To address this challenge, researchers at the Riken Brain Science Institute in Japan have produced a novel triple knock-in (KI) mouse model that displays a more human like pathology including microgliosis, astrocytosis and neuroinflammation.

Methods: In accordance, we employed both hematoxylin and eosin (H & E) and Congo Red staining methods to detect neutrophil infiltration and plaque deposition in the mouse brain. We also utilized both cognitive (Y maze) and affective (marble burying) behavioral tests to validate the Riken model. For biochemical analysis and detection of monoamine levels we used HPLC-ED.

Results: Our results indicate significant behavior deficits between sexes and genotypes in both behavior studies. We have also detected and quantified amyloid plaques in both the cortex and the hippocampus of KI mice. We have also quantified several monoamines and their metabolites including dopamine (DA), serotonin (5-HT) and norepinephrine (NE).

Conclusion: We have successfully validated the novel mouse model using behavioral paradigms and identified AD related brain pathology. However, mounting evidence suggests that neuroinflammation plays an important role in the decline of AD related cognitive ability, and mood disturbances.

Translational impact: The intent of this study is to target the neuroinflammatory pathway for novel therapeutic AD treatments by studying both sexes.

Dasht Bozorg, Behnam PharmD (Mercer University) POSTER: 8
Adhesive Matrices for Development of a Lidocaine Patch
Dasht Bozorg B, Puri A, Banga AK

Introduction: The aim of this study was to design transdermal patches formulated using drug loaded in different pressure sensitive adhesives (PSAs), and compare them for the amount of drug they can deliver across skin.

Methods: Patches were prepared by casting PSAs (acrylate, polyisobutylene (PIB), and silicone) saturated with lidocaine on release liners, drying at 75 °C for 20 min, and laminating on a backing membrane. Permeation studies across dermatomed porcine ear skin were performed using Franz cells. Receptor samples were analyzed using HPLC.

Results: Saturation solubility of lidocaine in acrylate, silicone, and PIB patches was determined to be 25%, 2.5%, and 3.5% (w/w), respectively. After 72 h, the cumulative amount permeated from acrylate was significantly higher than silicone and PIB, though no difference was observed in the first hour. The permeation flux was calculated to be 55.07, 28.94, and 11.94 $\mu\text{g}/\text{cm}^2/\text{h}$, respectively.

Conclusion: Acrylate patches contained ten times higher drug amount than silicone patches but delivery was only two fold higher, suggesting that percentage saturation of polymer is more important than the absolute drug concentration in the polymer. However, delivery does not linearly correlate to saturation; PIB patches at full saturation delivered less drug than silicone.

Translational Impact: Understanding the effect of drug saturation in PSAs used in transdermal patches can be accomplished using dermatomed skin ex vivo and this will allow to screen several PSA formulations so that the best formulation is then taken into clinical studies.

Deppen, Juline BS (Emory University) POSTER: 21
Quantitative Characterization of a Porcine Peripheral Artery Disease Model to Test an Engineered Encapsulated Mesenchymal Stromal Cell Therapy
Deppen J, Wang L, Goodman MM, Voll RJ, Qiu D, Leatherday C, Oshinski JN, Levit RD

Introduction: Peripheral artery disease (PAD) is a significant age-related medical condition. Cell therapy clinical trials have been inconclusive in regenerating vasculature in PAD patients. A large animal preclinical PAD model has not been standardized nor quantitatively characterized. Alginate-encapsulated mesenchymal stromal cells (eMSCs) promoted regeneration in small animal

PAD models. We aim to create and characterize a porcine PAD model and visualize the viability, retention, and distribution of eMSCs in PAD models.

Methods: A PAD model pilot study was conducted in swine. Gait analysis with a walkway was performed pre- and post-model creation to quantify functional deficits. Arterial spin labeling (ASL) magnetic resonance imaging (MRI) measured perfusion in hind limbs. Porcine MSCs were lentivirally transduced for visualization with positron emission tomography (PET).

Results: Automated gait analysis detected abnormalities at Day 1 post-model creation that returned to baseline at Day 6. ASL MRI successfully quantified microvascular perfusion in hind limb skeletal muscle, but no trend was observed over time. Revascularization of the ischemic limb was detected at Day 43. Transduced porcine MSCs expressed a functional reporter protein that enables uptake of a PET tracer.

Conclusion: These preliminary studies laid the groundwork for future eMSC efficacy studies. Gait analysis and ASL MRI will be valuable tools to quantitatively assess eMSC efficacy in a more severe porcine PAD model. Engineered porcine MSCs show promise for detection via PET in small and large animals over time.

Translational Impact: The large animal model and characterization methods could facilitate the transition from bench to bedside for many PAD therapies, increasing clinical trial success.

Dilernia, Dario PhD (Emory University) POSTER: 12

Improved Detection of HIV Drug Resistance Using Long-Read Next Generation DNA Sequencing

Monaco C, Wilkins D, Zapata L, Hunter E, Salomon H, Dilernia D

Introduction. Every person living with HIV needs to get tested for drug resistance in order to optimize treatment and prevent failure. The current approach to test resistance is based on sequencing of HIV's pol gene using classic Sanger sequencing, which has a detection limit of 20%. This means that resistance mutations might go unnoticed if present at a low frequency in the viral quasispecies. Our goal was to test the sensitivity of a new approach based on long-read Next-Generation DNA sequencing that implements a novel analytical algorithm developed by our team.

Methods. The HIV pol gene was RT-PCR amplified from RNA extracted from 40 samples collected from HIV-positive individuals under treatment failure. Single-Molecule Real-Time sequencing (Pacific Biosciences, Inc.) was implemented to sequence the PCR amplicons. Every sample was sequenced twice. Data analysis was carried out using our Multi-layer Directed Phasing (MDP) algorithm.

Results. Drug resistance was detected in 34 of the 40 patients, which included mutations that confer resistance against each of the four major classes of antiretroviral drugs (NRTI, NNRTI, PI and INI). Four of the 40 samples had at least one resistance mutation at a frequency lower than 20% and four other samples had a resistance higher but close to that value. All the mutations identified were consistent between sequencing replicates.

Conclusion. HIV pol sequencing using SMRT technology allows detecting resistance mutations at frequencies as low as 5%.

Translational impact. Based on our results, approximately 10-20% of HIV-positive patients under treatment failure might benefit from getting a SMRT-based drug resistance test.

D'Souza, Martin J. (Mercer University) POSTER: 17

Novel Microneedle Based Microparticulate Ovarian Cancer Vaccines

Gala RP, Mulla NS, D'Souza MJ

Introduction: The aim of this study was to monitor cell-based immune response developed by microparticulate ovarian cancer vaccine when administered via dissolving microneedles for transdermal routes in murine models and correlate it with tumor retardation observed in tumor challenge study.

Methods: The microparticles were made up of cellulose polymers. Alum and MF59 were used as adjuvants to enhance the immune response. The microneedles were formulated using polymers such as hydroxy propyl methyl cellulose acetyl salicylate (HPMCAS) and poly vinyl alcohol (PVA) along with sugars such as maltose and trehalose for their dissolving properties.

Results: The total protein concentration of lysate was 1.56 ± 0.5 mg/ml. The particle size range was 800-3500 nm. Zeta potential was 12.54 ± 2.1 mV. The size and zeta obtained was found to be suitable for particle uptake by macrophages. Tumor

development was retarded in the vaccinated groups as compared to non-vaccinated group ($p < 0.001$). Serum IgG levels were elevated in all vaccinated groups. When serum IgG1 titers (indicative of Th2 response) were analyzed, there was an elevation in titers in mice treated with vaccine.

Conclusion: Based upon the vaccine response data, the tumor retardation was found to be effective upon transdermal administration. Vaccination using individualized tumor cells may prove to be an efficient treatment for patients in future.

Translational Impact: Customized immunotherapeutic strategies may serve as an alternative method to control the recurrence or progression of ovarian cancer. Microneedle based transdermal delivery systems provide a needle-free, patient compliant immunization strategy.

Evans, Ellen M. PhD (University of Georgia) POSTER: 13
Higher Protein Weight Loss Diet and Exercise Training Effects on Strength and Physical Function in Overweight Inactive Older Women

Evans EM, Reed RA, Straight CR, Berg AC, Rowe DA, Johnson MA

Introduction: Obesity negatively impacts lower extremity physical function (LEPF) in older adults. Exercise and a higher protein diet are both known to independently and positively impact body composition, muscle strength, and LEPF during weight loss; however, their potential interactive effects are not established in older women.

Methods: Women ($n=61$, $BMI=31.1 \pm 5.1$ kg/m², 69.2 ± 3.6 y) completed a 6-month weight loss program after randomization to: 1) higher protein diet (PRO, ~30% energy from protein; $n=20$), 2) PRO plus exercise (PRO+EX; $n=19$), or 3) conventional protein control diet plus EX (CON+EX, ~18% energy from protein; $n=22$). EX was supervised, multi-modal and 3 sessions/week. Body composition was measured via DXA; muscle leg strength by dynamometry; and LEPF via 6-min walk (WALK) and 8-foot up and go (UPGO) tests.

Results: Changes in weight (-7.5 ± 4.1 kg; $-9.2 \pm 4.8\%$) and fat/lean mass did not differ among groups (all $P > 0.05$). Despite weight loss, muscle strength improved in PRO+EX and CON+EX, whereas it declined in the PRO group ($P < 0.001$). The PRO group had attenuated improvements compared to both PRO+EX and CON+EX in WALK and UPGO (both $P < 0.01$). Change in muscle strength independently predicted changes in WALK ($\beta=0.45$) and UPGO ($\beta=-0.39$) explaining 24% and 18% of the variance (both $P < 0.05$), respectively; change in weight was not a predictor ($P > 0.05$).

Conclusion: Exercise during weight loss is critical to preserve strength and enhance LEPF; however, a PRO diet does not impact body composition, muscle strength, or LEPF changes when combined with EX.

Translational Impact: Sustainable interventions for weight loss for older women that emphasize exercise, especially strength training, to prevent disability remains a public health priority.

Gates, Adam BS (Mercer University) POSTER: 4
Drug Induced Skin Reactions: Assessment and Management

Gates A, Nykamp D

Objective: The assessment and management of drug induced skin reactions (DISR) is in most cases a diagnosis of exclusion. However, there are measures in place to rule out a drug induced hypersensitivity reaction.

To document the most common reactions, to identify specific types of reactions and the offending agents, and to successfully treat the reactions, updated and concise information is needed.

Data Sources: A literature search was performed using PUBMED, DERMNET NEW ZEALAND, VISUALDX, and NATURAL MEDICINES COMPREHENSIVE DATABASE to locate relevant articles. Additionally, peer-reviewed textbooks were consulted for evidence-based standards of care. Lastly, drug prescribing information and LEXICOMP were used for dosage recommendations.

Study Selection / Design: The information provided, gathered from quality sources, peer-reviewed textbooks, was compiled to outline some of the most common drugs that produce reactions as well as available treatment options. Articles selected were between March 2008 and May of 2017. The information selected was reviewed regarding its impact to the article and accuracy in the related subject.

Results: Concise information is presented to explain signs and symptoms of a drug-induced skin reactions. A method to categorize the reactions, and the most common medications that cause a specific reaction, and the treatment options for specific reactions is presented. Tables are used to allow for quick reference making the research a valuable tool for health professionals.

Conclusion: Drug-induced skin reactions are encountered in both the ambulatory and acute care settings. The ability to recognize and make treatment recommendations regarding a drug-induced hypersensitivity reaction is important in the patient-care setting.

Gillis, Eric L. Ph.D. c, MPH (University of Georgia) POSTER: 14
Assessment of Cognitive Trajectories to Predict Cognitive Status

Gillis E, Li C

Introduction: More than 10% of persons aged 65 years and older are affected by mild cognitive impairment. The goal of our study was to assess the validity of using trajectory analysis to accurately determine cognitive status among participants of the Health and Retirement Study (HRS).

Methods: We performed secondary analyses to the cognition data collected from 12 waves of biannual surveys during 1994-2014 among 11,043 participants of the HRS. Cognition trajectories were modeled against follow-up time using the SAS Proc Traj procedure. We then combined the trajectories with the Aging, Demographics, and Memory Study (ADAMS), an ancillary study of HRS, in which, dementia and cognitive impairment were diagnosed by PhD-level psychologists. The validity of using consistent low cognition trajectory to predict cognitive impairment was evaluated by calculating sensitivity, specificity, positive predictive value and negative predictive value using the diagnosis in the ADAMS as the gold standard.

Results: We identified that 33.1% of the HRS participants had consistently low cognition over follow-up time. The consistent low trajectory had a sensitivity and specificity of 85% and 70%, respectively, to identify cognitive impairment. In addition, the trajectory had a positive predictive value of 80% and a negative predictive value of 77%.

Conclusion: Our findings indicated that trajectory analysis had very good validity in the identification of cognitive impairment. This procedure facilitates a graphical presentation of data that is easily understood and displays the repercussions of distinct trajectories of decline.

Translational Impact: Trajectory analysis of cognition can be used to identify individuals at greater risk of dementia in large-scale population based studies.

Gills, Kelli (Morehouse School of Medicine) POSTER: 22
Assessing Knowledge Gaps & Barriers Regarding Treatment of Substance Use Disorders in the Vietnamese Community

Gills K, Choumika S

Introduction: It is known that Vietnamese individuals constitute 35% of the DotHouse Health patient total, located in the Dorchester area of Boston, MA. Yet, only one Vietnamese patient, out of 53 patients is enrolled in the center's Office Based Opioid Treatment (OBOT) clinic. The objective of this study it to conduct a quantitative and qualitative assessment of Vietnamese substance use among DotHouse patients; to gain more knowledge about opiate-based treatment programs and their effectiveness in the patient population; to create a comprehensive bilingual pamphlet for patient and staff use developed from survey findings.

Method: 15 staff members and Vietnamese patients completed a three part survey and interviews.

Results: Analysis of the survey responses revealed that the interviewees were not aware of treatment resources at DotHouse, had not seen advertisements of OBOT, knew someone who has been diagnosed with a substance use disorder, and/or were not familiar with Narcan. Majority of the respondents were also ambivalent to medication for alcohol.

Conclusion: Survey responses and interviews helped to reveal some of the underlying issues that preclude the OBOT clinic's utilization. These include the following: language barrier, lack of knowledge about substance abuse, lack of knowledge about the OBOT clinic and cultural stigma. Through the knowledge gap and barrier assessment the OBOT clinic staff were able to receive culturally appropriate recommendations that can be used to address the needs of the clinic.

Translational Impact: Cities nationwide are currently facing an opioid epidemic. Overall, this study provided a better understanding of confounding variables that promote the under-utilization of clinical services within underserved communities.

Gills, Kelli (Morehouse School of Medicine) POSTER: 23

Assessing Geographic and Ethnic Related Barriers to Receiving Treatment for Chronic Diseases within the Clinic

Gills K

Introduction: Chronic diseases is one of the leading ailments contributing to thousands of disabilities and death. Over 110 million individuals have been diagnosed with one or more chronic health conditions including hypertension, coronary artery disease, stroke, and diabetes. Although preventable, chronic diseases have plagued the poverty-stricken areas of Georgia, contributing to over 130,000 hospitalizations per year. These numbers have trickled into the metro- Atlanta area affecting various uninsured patient populations, including those at the Healthy Equity for All Lives (H.E.A.L) student run free clinic (SRFC). The objective of this study is to identify the extended risks and barriers that contribute to the detrimental effects of chronic diseases within the H.E.A.L clinic. Also, to alleviate these barriers through implementation of tangible patient resources.

Method: The main approach was to obtain data through a three-part survey that was administered to the H.E.A.L patient population and administration. This survey collected viable geographic information, assessed the surveyors knowledge of chronic diseases and behavioral habits.

Results: There has been a variety of identified health risk that contribute to the onset of chronic diseases: obesity, smoking, unhealthy dietary habits and the lack of exercise. Other indirect risk include lack of education and resources, such as transportation and specialty care.

Translational Impact: This study provided HEAL with tangible info graphics and other resources. Through implementation of these resources, it is possible to decrease the generational cycle of preventable chronic diseases.

Hutto, Tami (Emory University) POSTER: 19

Maximizing Mentorship for Research Based PhD Students and Faculty through the Atlanta Society of Mentors

Hutto TE, Laurie S

In an effort to gauge community interest, pilot a workshop series for different audiences, share perspectives with each other, and raise awareness of resources and approaches, we started the Atlanta Society of Mentors, in 2016. We have held monthly meetings and have executed 5 workshop series (~30 workshops ~150 unique participants). All content were focused on the faculty-trainee relationship. Some driving questions: How do you approach productivity issues? How do you manage different styles and needs? How do you hold others and yourself accountable?

The mentee and mentor both bring elements of their lives and mindsets into their work that can positively, or not so positively, affect each other's ability to effectively communicate, understand, and execute as expected. Though, there are many common foundational elements needed for good mentoring relationships, there is no one-size-fits-all approach that can be taught to ensure successful outcomes for everyone. Therefore, exposing faculty and trainees to a variety of perspectives and frameworks (Self-Management/Conflict Management), they will ultimately be better equipped to assess and respond to challenges and differences.

Lessons learned:

- There are communities of faculty who want this support and will participate
- Balance series with discussion and content delivery
- Participants found having the same people each week (requiring commitment) was important and useful
- Length needs to be least 1.5 hours to allow ease into the topic and allow proper discussion without rushing
- Consider developing materials in the form of a workbook/binders/journal so participants can organize resources and insights

Kimbrough-Allah, Mawiyah (Clark Atlanta University) POSTER: 27
Differential Role of PTEN in Transforming Growth Factor β (TGF- β) Effects on Proliferation and Migration in Prostate Cancer Cells

Kimbrough-Allah MN, Millena AC, Khan SA

Introduction: Transforming growth factor - β (TGF- β) acts as a tumor suppressor in normal epithelial cells but as a tumor promoter in advanced prostate cancer cells. PI3-kinase pathway mediates TGF- β effects on prostate cancer cell migration and invasion. PTEN inhibits PI3-kinase pathway and is frequently mutated in prostate cancers. We investigated possible role(s) of PTEN in TGF- β effects on proliferation and migration in prostate cancer cells.

Methods: Expression of PTEN mRNA and proteins were determined using RT-PCR and western blotting in RWPE-1 and DU145 cells. We studied the role of PTEN in TGF- β effects on cell proliferation and migration in DU145 cells after transient silencing of endogenous PTEN. We determined the role of PTEN in cell proliferation and migration after over-expression of PTEN in PC3 cells which lack endogenous PTEN.

Results: TGF- β 1 and TGF- β 3 had no effect on PTEN mRNA levels but both isoforms increased PTEN protein levels in DU145 and RWPE1 cells indicating that PTEN may mediate TGF- β effects on cell proliferation. Knockdown of PTEN in DU145 cells resulted in significant increase in cell proliferation which was not affected by TGF- β isoforms. PTEN overexpression in PC3 cells inhibited cell proliferation. Knockdown of endogenous PTEN enhanced cell migration in DU145 cells, whereas PTEN overexpression reduced migration in PC3 cells and reduced phosphorylation of AKT in response to TGF- β .

Conclusion: PTEN plays a role in inhibitory effects of TGF- β on cell proliferation whereas its absence may enhance TGF- β effects on activation of PI3-kinase pathway and cell migration.

Translational impact: Enhanced TGF- β effects on proliferation and migration and loss of PTEN may lead to the identification of therapeutic strategies for prostate cancer patients.

Kinsey, Joshua Davis Pharm.D. (Mercer University) POSTER: 20
Adherence to Hydroxyurea Suspension and Rates of Hospitalization in Pediatric Patients with Sickle Cell Disease

Kinsey JD, Gonzalez RP

Introduction: The role of hydroxyurea (HU) in decreasing complications associated with sickle cell disease (SCD) has been well established in clinical trials. However, few studies show the role of adherence with improved outcomes. The primary purpose of this study was to assess the relationship of adherence to HU and rates of hospitalization. The secondary objective was to assess causes of non-adherence.

Methods: Designed as a retrospective, cross-sectional study, participants of this study completed a voluntary survey to assess adherence behaviors and any recent hospitalizations. Patients were divided into two groups (adherent and non-adherent) based on proportion of days covered (PDC) calculation. Results from the survey were also used to assess the occurrence of hospitalizations and evaluate the secondary endpoint.

Results: There were N=103 total patients enrolled in this study with 50 patients in the adherent arm (defined as PDC \geq 80%) and 53 patients in the non-adherent arm (defined as PDC < 80%). In the adherent arm, only 26% reported hospitalization in the past six months while 54.7% of patients in the non-adherent arm reported the same. When comparing the PDC based on whether patients reported "yes" for past hospitalization or "no", there was a difference of -11.62 in PDC which was statistically significant ($p = 0.0016$).

Conclusion: Adherence to HU (PDC \geq 80%) is associated with significantly lower rates of hospitalizations compared to non-adherence (PDC < 80%).

Translational Impact: Patients who were adherent to HU therapy reported hospitalizations 25% of the time; while patients who were non-adherent reported hospitalizations 56% of the time. Healthcare providers should encourage patients to remain adherent to HU therapy to decrease hospitalizations.

Laver, Travis VMD, PhD (University of Georgia) POSTER: 29
NF-kappaB is Aberrantly Activated and Localized in Feline Injection Site Sarcoma

Laver T, Lee B

Introduction: Feline injection site sarcomas (FISS) are highly invasive tumors that are most effectively treated with aggressive surgical excision; however, many cats present with non-resectable FISS. In such cases, there is a distinct need for new molecular targets and therapeutics.

The NF-kappaB (NF-kB) pathway is aberrantly activated in a variety of tumors, contributing to malignant behavior. Recent reports demonstrate proteasome inhibitors such as bortezomib can blunt NF-kB pathway activation.

Methods: Immunoblot - Ten micrograms of protein (nuclear or cytoplasmic fraction) isolated from FISS cell lines (JB or JBLM) was evaluated for NF-kB expression and sub-cellular localization via immunoblot.

Cell Proliferation Assay – JB cells were seeded at 6,000 cells per well in 96 well plates, allowed to grow for 24 hours under standard conditions, and subsequently treated with increasing concentrations of bortezomib or DMSO (vehicle) for 48 hours. The cells were then evaluated for viability using the Alamar Blue method.

Results: Immunoblots in FISS cells reveal moderate levels of total NF-kB p65, predominantly localized to the cytoplasm. Likewise, there are moderate levels of phospho-S536 p65, predominantly localized to the nucleus. Cell viability assays reveal a dose-dependent decrease in cell viability FISS cells treated with bortezomib (IC50: 29 nM).

Conclusion: These results identify aberrant NF-kB activation and localization in FISS cell lines. Further, they demonstrate that the JB cell line is sensitive to bortezomib. This finding may be due, in part, to the known effects of bortezomib on the NF-kB pathway.

Translational Impact: These results suggest that proteasome inhibition may be a viable therapeutic for non-resectable FISS.

Newsom, Lydia C. PharmD, BCPS (Mercer University) POSTER: 16
Correlation of Statin Intensity and Clinical Outcomes Following Coronary Artery Bypass Grafting Surgery

Newsom LC, Micheletto J, Paciullo CP

Introduction: Guidelines recommend high intensity statins following recent coronary artery bypass graft (CABG) surgery. However, clinical studies are limited. This study characterizes the impact of statin intensity on patient outcomes following CABG surgery.

Methods: Patients with CABG surgery performed at Emory Healthcare between 1/1/2015 and 12/31/2015 were included in the study. Patients with recent percutaneous coronary intervention, those who died within 30 days of CABG, or those without 6 months of follow up after CABG were excluded. Electronic medical records and the Emory University Institutional STS Adult Cardiac Database were reviewed to collect demographics and clinical outcomes. Patients were stratified based on statin intensity prescribed at CABG surgery discharge per the ACC/AHA guidelines. The primary outcome of the study was the occurrence of major adverse cardiovascular events (MACE) including hospital admission for unstable angina, myocardial infarction, coronary revascularization, stroke, or cardiac death within one year of CABG surgery.

Results: At discharge following CABG surgery, 7.1% of patients were prescribed no statin, and 7.8%, 36.4%, and 48.7% were prescribed low, moderate and high intensity statins, respectively (N = 154). There was no significant difference between the occurrence of MACE events based on the intensity of statin therapy prescribed at discharge (18.2%, 25%, 8.9%, 12%, p = 0.43). Similarly, there was no difference in hospitalizations between groups (p = 0.23).

Conclusions: In this retrospective study, the occurrence of MACE events in the first year following CABG surgery did not differ based on statin intensity.

Translational impact: Studies with larger cohorts are needed to clarify the role of statin therapy following CABG.

Pavão, Carlos A. O. (Georgia State University) POSTER: 9
Transgender Medical Access Project: A Community Based Project Exploring Resilience
Pavão, CAO; Age, Z; Levine, D

Introduction: This study conducted interviews with transgender / genderqueer identified individuals to provide “consumer” feedback on a cultural competency training for primary care professionals developed by Adolescent Reproductive and Sexual Health Education Program. Three focus groups were conducted with transgender identified individuals. Study participants explored current best practices for medical and public health professionals on how to deliver culturally competent and appropriate medical services to members of the transgender community.

Methods: The methodological approach is Constructivist, and grounded in several critical methodological traditions (Critical Race, Queer, and Gender Theories). Three focus groups were conducted with 19 participants from Metro Atlanta (non-repeated participants). The recruitment approach was a snowball sampling and trusted social networks.

Results: A peer sharing model among the transgender community was more community transgender trusted than receiving medical advice from medical and public health professionals. In addition, how self-identified transgender classifications are understood from a medical model does not match how transgender is socially constructed.

Conclusion: Existing national medical trainings need to account for how trusted networks facilitate medical information, and how participants seek medical consultations. The current transgender medical terminology is being challenged by new transgender “identities”.

Translational Impact: Recent social acceptance and visibility of transgender individuals has led to an open conversation about how medical treatments are delivered. This study is part of an ongoing critical discussions of the medicalization of the body and its implications for public health treatments.

Pollak, Rebecca BA, BS (Emory University) POSTER: 18
The Neuropsychiatric and Behavioral Phenotypes of 3q29 Deletion Syndrome
Pollak RM, Murphy M, Epstein M, Zwick ME, Saulnier C, Mulle JG

Introduction: 3q29 deletion syndrome (3q29DS) is a rare (~1:30,000) genomic disorder caused by a 1.6 Mb deletion on chromosome 3, and is associated with high risk for Autism Spectrum Disorder (ASD), intellectual disability, anxiety, and schizophrenia; however, the full behavioral spectrum associated with the deletion has not been described.

Methods: Through Emory University’s 3q29DS registry (3q29deletion.org), we used standardized questionnaires to collect self-reported medical outcomes, ASD symptomology, and other developmental psychopathology. Statistical testing and data visualization were performed in R.

Results: Responses indicate increased prevalence of ASD diagnosis versus the general population (28.7% vs. 1.47%, $p < 2.2e-16$). 3q29DS patients who do not report an ASD diagnosis scored significantly higher on ASD questionnaires, including the Social Responsiveness Scale ($p = 8.4e-9$), Social Communication Questionnaire ($p = 0.00016$), and Achenbach Behavior Checklists ($p = 1.3e-9$) as compared to controls, indicating an increased prevalence of ASD symptomology. ASD diagnosis rate is similar between 3q29DS males and females, unlike in the general population.

Conclusion: This 3q29DS sample is significantly enriched for ASD diagnosis and ASD features, as measured by standardized ASD surveys; of note, several individuals scored in the clinical range on all scales, despite reporting no diagnosis of ASD. These results imply that either ASD is underdiagnosed or not adequately assessed in 3q29DS patients, or additional psychopathology is present that may be independently elevating scores.

Translational Impact: These findings imply that neuropsychiatric assessments should be standard of care for 3q29DS patients, as early diagnosis will improve standard of living and long-term outcomes.

Reyes, Loretta MD (Emory University) POSTER: 6
Elevated Arginase Activity and Left Ventricular Hypertrophy (LVH) in Children with Chronic Kidney Disease (CKD)
Reyes LZ, Winterberg PD, Brown LA, Harris F, Kelleman M, Morris CR

Introduction: Left ventricular hypertrophy (LVH) is common in pediatric CKD patients & is an independent risk factor for cardiovascular (CV) morbidity/mortality. Nitric oxide (NO), a vasoactive substance critical for vascular homeostasis, is

synthesized from arginine (Arg) by NO synthase. Arg can also be catabolized by arginase enzymes, thereby reducing NO bioavailability. Since the kidney plays a key role in endogenous Arg synthesis, we hypothesized that Arg bioavailability is altered during CKD and predicts CV complications.

Methods: Banked plasma from children with (n=47) & without (n=11) CKD was analyzed for metabolites of arginine biosynthesis by mass spectroscopy & arginase concentration/activity by ELISA/colorimetric assay. Data were correlated with LVH measures from echocardiograms in CKD patients.

Results: Arginase activity was significantly higher in CKD vs. healthy children (3.12 units/L vs 1.52 U/L, p=0.008). Dialysis patients had a lower arginase concentration compared to normal controls, but arginase activity was significantly increased (p=0.04). Arginase activity was increased in patients with LVH (p=0.07) and had a trending association with LVMI z-score on Spearman correlation [$r=0.339$; $p=0.06$; $n=31$].

Conclusion: In this pilot, we found arginase activity was significantly increased in children with CKD and may be associated with LVH, an observation not previously reported. Interestingly, arginase activity was disproportionately higher than its concentration in dialysis compared to pre-dialysis CKD patients, suggesting a mechanistic activation of arginase enzyme activity in dialysis patients.

Translational Impact: Increased arginase activity during CKD may divert Arg away from NO synthesis; therapeutic inhibition may improve CV complications in CKD.

Shen, Luqi MS (University of Georgia) POSTER: 3
Smoking Status Modified the Effect of Leptin on Blood Pressure: a Mendelian Randomization Study

Shen L, Cordero J, Wang JS, Shen Y, Li S, Li C

Introduction: Studies on leptin and blood pressure (BP) associations yielded inconsistent findings. The current study aimed to evaluate the effect of genetically determined leptin on BP, and to explore whether smoking status modified this effect.

Method: We conducted a Mendelian randomization analysis using baseline data for 3,780 participants of the Framingham Heart Study 3rd Generation cohort. Associations between genetic risk score (GRS) and leptin, leptin and BP, and GRS and BP were assessed, respectively, by multivariate linear regression models. Interaction between GRS and smoking was evaluated by adding an interaction term, GRS \times smoking in the models.

Result: In the age and sex adjusted analyses, log transformed leptin was positively associated with systolic BP (SBP) ($P=2.12\times 10^{-78}$), diastolic BP (DBP) ($P=1.83\times 10^{-75}$), mean arterial pressure (MAP) ($P=6.61\times 10^{-90}$), and pulse pressure (PP) ($P=1.85\times 10^{-18}$), respectively. Leptin GRS significantly increased log transformed leptin ($P=1.91\times 10^{-5}$). When stratified by smoking status, GRS was associated with reduced DBP ($P=0.007$), MAP ($P=0.01$), nominally associated with reduced SBP ($P=0.07$), but not PP ($P=0.95$) among current smokers, adjusting for age and sex. In the fully adjusted model, significant interactions between GRS and smoking were identified for DBP ($P=0.003$), MAP ($P=0.005$), and SBP ($P=0.04$) but not PP ($P=0.95$). Sensitivity analyses among participants not taking antihypertensive or glucose lowering medications revealed similar associations.

Conclusion: Our study provided evidence for a causal relationship between leptin and BP, and an interaction effect of smoking on leptin and BP associations. These data may provide novel implications regarding the relationship between smoking modified effect of leptin on BP.

Shogbon-Nwaesei, Angela PharmD, BCPS (Mercer University) POSTER: 5
Student Pharmacist Clinical Interventions in Optimizing the Care of Patients with Stroke or Transient Ischemic Attack at a Community Hospital.

Nwaesei AS, Bennett J, Odioemene C, Jacob B

Introduction: Early interventions in the management of acute ischemic stroke or transient ischemic attack (TIA) are beneficial towards decreasing morbidity and recurrent events. The purpose of this study was to evaluate the role of student pharmacists in optimizing the care of patients with acute ischemic stroke or TIA through clinical interventions performed.

Methods: Patients diagnosed with acute ischemic stroke or TIA and over 18 years old were included. The student pharmacist evaluated eligible patients and performed interventions to optimize their care including medication reconciliation, patient

education, and evaluation of medication therapy based on evidence-based stroke guidelines and Joint Commission (TJC) core measures. Primary outcome was number and types of student pharmacist interventions and the acceptance rates.

Results: Forty patients were included over a two month period. Mean age \pm SD was 69 \pm 14 years and 55% were female. Forty interventions were performed which involved medication reconciliation (27.5%), patient education (47.5%), adjustments in statin dosage (7.5%) and antithrombotic therapy (12.5%), among others. Out of interventions that involved recommendations to the healthcare team, 80% were accepted and 30% involved optimizing compliance with TJC stroke core measures.

Conclusion: Student pharmacists contributed to ensuring appropriate medication reconciliation, patient education and medication management based on evidence-based guidelines and TJC stroke core measures.

Translational Impact: This study identifies the benefit that student pharmacists, under the guidance of pharmacists, can provide in the care of patients with acute cerebrovascular events and supports further research into health outcomes including readmission rates.

Tandoh, Marina Aferiba (University of Georgia) POSTER: 26
Helminthiasis Prevalence and Disparities in Sanitary Conditions between School-Age-Children Living in Fishing and Farming Communities in Ghana

Tandoh MA, Anderson AK, Mills-Robertson F, Wilson MD

Introduction: Helminthiasis (parasitic infections due to Soil Transmitted Helminths (STH) and schistosomes) are a sub group of neglected tropical diseases (NTDS) that still persist in sub-Saharan African countries, with children being the most affected. The aim of the study was to determine the helminthiasis prevalence and disparities in sanitary conditions among school-age children (SAC) living in helminth endemic fishing (n=84) and farming (n=80) communities in Ghana.

Methods: This was a cross-sectional study that used questionnaire for data collection, and stool and urine for parasitological assessment.

Results: 164 pupils (50.6% males and 49.4% females) and their primary caregiver participated in the study. The prevalence of STH was 9.6% in the farming community but none in the fishing community (P=0.007). Conversely, 33.8% of *S. haematobium* infection was identified in the fishing versus only a single case in the farming community (1.2%) (P<0.0001). 31.7% of all children lived close to their water source; with 48.8% versus 13.8% being in the farming and fishing communities respectively (P<0.001). Hand washing after toilet use was reported by 61.0% of all children; with 86.9% and 33.8% in farming and fishing communities respectively (P<0.0001).

Conclusion: *S. haematobium* infection was significantly higher among the fishing communities, with children in those communities engaging in less healthy hygienic practices such as not washing hands after toilet use or before eating and swimming in the river than those in the farming communities. Translational Impact: Findings from this study has the potential to guide public health programs and interventions to minimize helminth re-infection rates and improve overall health of SAC in helminth endemic areas.

Thurston, Maria Miller PharmD, BCPS (Mercer University) POSTER: 25
Optimizing the Approach of Mobile Application Use to Improve Medication Adherence and Blood Pressure in Patients with Hypertension

Thurston MM, Akil A, Manigault KM, Patel SM, Newsom LC, Murnane KS

Background: This randomized, controlled trial assessed the impact of a novel mobile application to promote medication adherence in patients with hypertension.

Methods: Responses to lifestyle, medication adherence, and health literacy (s-TOFHLA) surveys, as well as refill history (CMG), demographic data and blood pressure readings were analyzed. Continuous outcome variables (CMG score, mean arterial pressure [MAP]) were investigated. Statistical analysis comparing averages in CMG/MAP between groups was conducted using Wilcoxon signed-rank and Mann-Whitney U tests and predictive models.

Results: Nine control and 24 intervention subjects completed the study. There was a significant difference between baseline and final MAP in the control group (104.7mmHg vs 88.7mmHg; P=0.02). There was a trend towards improved final MAP and CMG score in the intervention group as compared to baseline, (102mmHg vs 98.7mmHg; P = 0.46) and (0.251 vs 0.186; P=0.36), respectively. There was a trend towards improved CMG score in the intervention group, compared to control (0.186 vs

0.211; P=0.19). K-nearest neighbor predictive models achieved a correlation coefficient of 0.75 and 0.77 with a relative mean square error of 9.17 and 0.11 for MAP and CMG, respectively. Attribute selection found the intervention to be predictive of MAP. Conclusion-Although clinically relevant, trends towards improved CMG score (intervention vs control) and towards improved MAP and CMG score (baseline vs final) in the intervention group were not significantly different. Preliminary data indicate the mobile application intervention seems to result in improved clinical outcomes for hypertensive patients.

Translational Impact: Use of an engineered mobile application in a clinical setting to discern impact on health outcomes.

Tong, Li (Georgia Institute of Technology) POSTER: 24
Improving Multi-class Classification for Endomicroscopic Images by Semi-Supervised Learning with Convolutional Autoencoders

Li Tong, Hang Wu, and May D. Wang

Optical Endomicroscopy (OE) is a newly-emerged biomedical imaging modality that can help physicians make real-time clinical decisions about patients' grade of dysplasia. However, the performance of applying medical imaging classification for computer-aided diagnosis is primarily limited by the lack of labeled images, which can be expensive to obtain. To make use of the large amount of unlabeled images available for improving the classification performance, we propose to use the convolutional autoencoders that can incorporate large sets of unlabeled images. We evaluate our semi-supervised methods using a real-world endo-microscopic imaging dataset consist of 429 labeled images and 2,826 unlabeled ones. With this convolutional autoencoders based semi-supervised classification method, we improved multi-class classification performance over the supervised model using only the labeled images. To conclude, semi-supervised learning using convolutional autoencoders can utilize a large amount of unlabeled data to improve the performance of BE classification using OE images.

Wu, Daqing PhD (Augusta University) POSTER: 11
ProFine®, A Novel Nutraceutical for Controlling Prostate Cancer Progression

Mamouni K, Zhang S, Li X, Chen Y, Yang Y, Kim J, Bartlett MG, Coleman IM, Nelson PS, Kucuk O, Wu D

Introduction: The high prevalence and long latency period of prostate cancer (PCa) provide a unique opportunity to control disease progression, reduce mortality and improve the quality of life of patients with nutraceutical approaches.

Methods: We developed ProFine, a defined composition of three flavonoids (luteolin, quercetin and kaempferol). The in vitro effects and mechanism of action of ProFine were determined by molecular and cellular approaches. In vivo toxicity and pharmacokinetics were investigated in rodent models. Subcutaneous and intraosseous xenograft models of PCa were used to evaluate the in vivo efficacy of ProFine on tumor growth and survival of animals.

Results: The three ingredients of ProFine demonstrated a synergistic effect and effectively induced apoptosis in multiple PCa cell lines. ProFine significantly affected the transcriptome of C4-2 cells, and androgen receptor (AR) was identified as a major molecular target. High-dose administration of ProFine did not show obvious toxicity. Pharmacological studies found that the three ingredients retained their individual pharmacokinetic and bioavailability profiles. Importantly, oral intake of ProFine significantly retarded the subcutaneous and intratibial growth of C4-2-Luc tumors in athymic nude mice and extended the survival of animals in the subcutaneous model. Immunohistochemistry confirmed the in vivo effect of ProFine on the expression of AR and other putative targets.

Conclusion: ProFine demonstrated potent anticancer activity in preclinical models of PCa. Translational Impact: ProFine may provide a safe, efficacious and affordable intervention to control PCa progression and can be promptly tested in clinical trials.

Yadav, Ruchi PhD (University of Georgia) POSTER: 2
Serum Levels of New Autoantibodies Correlate with Airway Obstruction in Cystic Fibrosis Patients: Novel Systemic Markers of Lung Disease?

Ruchi Yadav PhD, Arlene Stecenko MD, Balázs Rada PhD

Introduction. Chronic lung disease caused by recurrent microbial infections and accompanying inflammation is the main cause of morbidity and mortality of patients suffering from cystic fibrosis (CF). Recruited immune cells called polymorphonuclear neutrophil granulocytes fail to eliminate the infections and are major contributors to CF lung disease. The mechanism by which neutrophils release their tissue-damaging components in CF is of high clinical relevance and remains unclear. Our preliminary results indicate that neutrophil extracellular traps (NETs), an antimicrobial mechanism of neutrophils, likely play an important role in CF lung disease. The main question addressed in this study was whether an autoimmune response to NETs occurs in CF patients and correlates with lung disease.

Methods. Using serum and sputum samples isolated from CF patients, we characterized correlations of neutrophil-specific markers and novel NET-autoantibodies with CF lung disease severity.

Results. Our data show that NETs and NET-specific autoimmune markers are present in clinical samples of CF patients and their levels correlate with CF lung disease severity.

Conclusion. The results shown here suggest that NETs fail to fight respiratory pathogens in CF successfully and only represent a major, neutrophil-mediated mechanism of lung tissue damage. These data also indicate that chronic presence of NETs in CF triggers an immune response from the body that has not been well-documented until now.

Translational Impact. Our results suggest that 1) CF has an underappreciated autoimmune component mainly due to neutrophil dysfunction, 2) systemic levels of NET-specific autoantibodies could serve as novel biomarkers for CF lung disease, 3) inhibiting NET formation could reduce lung damage in CF.

Poster Presentations
Friday, February 23rd

Poster Number	Name/degree	Institution	Abstract Title
1	Christopher Zalesky	Emory University	Understanding Care Delivered to Patients with a Possible Concussion at an Urban Level 1 Trauma Center
2	Ewan K. Cobran, PhD	University of Georgia	A Pilot Study of the Independent Specialty Medical Advocate Model of Patient Navigation on Intermediate Health Outcomes in Newly Diagnosed Cancer Patients
3	Ewan K. Cobran, PhD	University of Georgia	Race and Receipt of Androgen Deprivation Therapy among Men with Metastatic Prostate Cancer
4	Aboagyewaah Oppong-Damoa	Mercer University	Nanoparticle encapsulation of oxytocin increases its brain penetrance and duration of action in vivo
5	Alex Kojo Anderson	University of Georgia	Association of pregnancy fat mass gain, fat free mass gain and infant birth weight and length
6	Alison Berg, PhD, RDN, LD	University of Georgia	Community-based educational intervention may improve cancer screening compliance in rural Georgia
7	Amit Bansal, MS	Mercer University	Design of novel cationic pDNA vaccines for immuno-contraception and rabies control
8	Amit Bansal, MS	Mercer University	Bio-fabrication of polymeric microcapsules of insulin secreting β TC-6 cells in the management of Type 1 diabetes mellitus
9	Ariathni Powell B.A.	University of Georgia	Nutritional and Health Status of Women of Childbearing Age in Accra, Ghana
10	Arietha Livingston, PhD, MPH, MBA	Morehouse School of Medicine	Bridge Builders to Health Equity: High School Community Health Workers Training Program
11	Arti Verma, PhD	University of Georgia	Akt-B-Catenin Signaling in the regulation of Endothelial To Mesenchymal Transition (Endmt) And Pathological Pulmonary Vascular Remodeling
12	Azizi Ray, Pharm.D.	Mercer University	Effects of the second generation "bath salt" cathinone alpha-Pyrrolidinopropiophenone (α -PPP) on behavior and neurochemistry in mice
13	Benjamin Brainard VMD	University of Georgia	Use of a Cyclooxygenase-2 Inhibitor Does Not Inhibit Platelet Activation or Growth Factor Release From Platelet-Rich Plasma
14	Bobby Jacob, PharmD	Mercer University	Clinical outcomes associated with potential misclassification of Clostridium difficile infection
15	Bonney Reed-Knight, PhD	Emory University	Physiological Reactivity as a Biomarker of Anxiety and Depressive Symptoms in Youth Diagnosed with Chronic Gastrointestinal Disease
16	Changwei Li, MD, PhD	University of Georgia	Associations of Ages at Menarche and Menopause with Hypertension among Middle-aged and Older Chinese Women: The China Health and Retirement Longitudinal Study
17	Chuan Zhang, MA	University of Georgia	Mathematical models to assess leg muscle mass in ambulatory children with spastic cerebral palsy using dual-energy X-ray absorptiometry
18	Clinton Canal, Ph.D.	Mercer University	Preclinical Development of a Serotonin 5-HT7/5-HT1A Receptor Partial Agonist for Autism
19	David P. Serota, MD	Emory University	Predictors of HIV pre-exposure prophylaxis uptake and persistence in a cohort of young black men who have sex with men in Atlanta, Georgia

20	DeAngelo McKinley, B.S.	Mercer University	Impact of a Pharmacist-Led Intervention Program on the Readmission Rates of African-American Men with Heart Failure
21	Devyani Joshi	Mercer University	Formulation and testing of novel particulate measles vaccines via transdermal laser ablation and in oral dissolving films (ODF)
22	Ekemini Akan MD	Emory University	Severity of Childhood-onset Systemic Lupus Erythematosus: Impact of Preceding and Co-existing Autoimmune Cytopenias. (Protocol)
23	Elisabeth Lilian Sattler, PhD, BS Pharm	University of Georgia	Effect of Dietary Approaches to Stop Hypertension Diet on Hemodynamic Markers in Advanced Heart Failure Patients
24	Erin Kaiser, BS	University of Georgia	Human neural stem cell extracellular vesicles promote acute and chronic recovery in a porcine model of ischemic stroke
25	Woojin Han, Ph.D.	Georgia Institute of Technology	Synthetic bioadhesive matrix facilitates muscle stem cell transplantation and engraftment in dystrophic diaphragm
26	Ilya Senatorov	Mercer University	Mechanisms of Homologous and Heterologous Phosphorylation of FFA4 Isoforms
27	Ipshita Menon, M.Pharm	Mercer University	Innovative RSV virus like particulate vaccines for RSV infection
28	Jacob E. Hood, M.S.	University of Georgia	Glucose Concentration Affects Fibrin Clot Structure: Morphological Characteristics and Glycation Quantification
29	Jessica A. Alvarez, PhD, RD	Emory University	High-Resolution Plasma Metabolomics Identifies Metabolic Pathways Linked to Healthful Diet Patterns
30	Jessica A. Alvarez, PhD, RD	Emory University	Certificate Program in Translational Research
31	Jung Sun Lee, PhD, RDN	University of Georgia	University of Georgia Supplemental Nutrition Assistance Program Education (UGA SNAP-Ed): Evidence-based Research and Outreach to Promote Nutritional Health of Vulnerable Georgians
32	Kalyn M. Rambacher (B.S.)	Mercer University	Cysteine-S-Sulfenation Mediates Canonical β 2-Adrenergic Receptor Function in Human Airway
33	Keegan Braz Gomes (BSc)	Mercer University	Novel Matrix Protein Virus-Like Particle (M2E VLP) Subunit Vaccine for Influenza
34	Lakshman Segar, PhD	University of Georgia	Chronic alcohol consumption induces ketonemia and prevents hyperglycemia in the mouse model of type 2 diabetes
35	Kylie M. Black	Mercer University	A Multinational Study of Patient Reported Barriers to Medication Adherence Conducted using Amazon Mechanical Turk
36	Lee Anna Deal, MEd	University of Georgia	Georgia 4-H'ers Set Their Sights on Medical School
37	Annie Nguyen Farrell, BS	Emory University	Urinary Tract Infections in Children with Kidney Allografts: Risk Factors and Clinical Consequences
38	Gina Ryan, PharmD	Mercer University	Lipoprotein subclasses and apolipoproteins in African American men with type 2 diabetes
39	Gina Ryan, PharmD	Mercer University	The relationship between of HDL-C levels and lipoprotein subclasses and Taq1B & I450V Polymorphisms in the CETP gene in African-Americans with type 2 diabetes
40	Gina Ryan, PharmD	Mercer University	Closing communication gap about medication utilization: Evaluation of patient-specific behaviors for not Bringing medication Bottles to Clinic.

41	Margaret Sahu, BS	Emory University	Preeclamptic placental stromal cells exhibit defective re-decidualization and reduced suppression of sFlt1 transcription in vitro
42	Maria C. Naskou DVM	University of Georgia	Equine platelet lysate gel: a novel matrix for mesenchymal stem cell delivery
43	Maria C. Naskou DVM	University of Georgia	Equine platelet lysate affects the immunomodulatory capacity of Mesenchymal Stem Cells
44	Maria Coronel, PhD	Georgia Institute of Technology	Local Immunosuppression for Islet Grafts via Synthetic Immunomodulatory Protein Presentation
45	Michael Arenson, MA	Emory University	Prediction of 90-Day Readmission among Kidney Transplant Recipients using Natural Language Processing
46	Michelle C. LaPlaca, PhD	Georgia Institute of Technology	Multimodal Neurological Assessment Distinguishes Deficits Between Concussed and Control Subjects
47	Neha Chitre, B.Pharm	Mercer University	Assessing the motor and non-motor symptoms of Parkinson's disease in rats using the 6-Hydroxydopamine lesion model
48	Nicole L. Metzger, PharmD	Mercer University	Development of acute kidney injury in patients with cystic fibrosis treated with tobramycin versus colistin
49	Rebecca Matthew, MPH, MSW, PhD	University of Georgia	"Promoters" as Cultural Brokers: Fostering Bridges Toward Prosperous and Healthy Communities
50	Howa Yeung, MD	Emory University	Prevalence of skin cancer risk factors and screening among men and women in same-sex and opposite-sex relationships
51	Richard Starr, BS Physics	Georgia Institute of Technology	Process to Expedite ETL to Import Datasets to the OMOP Common Data Model
52	Rokon Uz Zaman	Mercer University	Novel microparticulate vaccine formulation for metastatic breast cancer
53	Rokon Uz Zaman	Mercer University	Formulation of nanoparticulate vehicle to target drugs and therapeutic peptides across the blood brain barrier
54	Samuel Peasah PhD MBA	Mercer University	The role of pharmacists in the prevention and treatment of hospital-acquired infections
55	Sandeep Artham, Pharm.D.	University of Georgia	Pulmonary endothelial Akt1-FoxO-MMP3 signaling as a novel diagnostic and therapeutic target for ARDS: An experimental and clinical evidence
56	Selma M. Cuya PhD	Emory University	Investigating the Role of Musashi 2 in Neuroblastoma Tumorigenesis
57	Shreyas Dahotre, BSE	Georgia Institute of Technology	Multiplexed cell sorting using individually addressable and dynamic DNA gates
58	Sonalika Arup Bhattaccharjee	Mercer University	Slow Topical Delivery of Niacinamide in Microporated Skin by a Phase Inversion PLGA Gel
59	Staci Belcher, MS, RDN, LDN	University of Georgia	Sedentary Behavior and Cortical Bone in Healthy Adolescents and Young Adults: An Isotemporal Substitution Analysis
60	Sujin Lee, BA	Emory University	Proof of Concept Study for the Evaluation of Peripheral Calcium Score as a Measure of Peripheral Arterial Disease Severity
61	Sumith Yesudasan, PhD	University of Georgia	Fibrin Clot Simulation using a Reactive Coarse Grain Molecular Dynamics Method
62	T. Vivian Liao, PharmD, BCPS	Mercer University	Implementation of an analgesia protocol in critically ill trauma patients

63	Jessica Li, BS	Emory University	Long-Acting Reversible Contraceptive Uptake in Female Sex Workers and Single Mothers in Rwanda and Zambia
64	Ted M. Ross	University of Georgia	Impact of age and pre-existing influenza immunity in humans on the elicitation of anti-hemagglutinin antibodies receiving split inactivated influenza vaccines
65	Vahideh Radmard	University of Georgia	Investigation of Pressure Effect on the Surface Instability of Soft Biological Tissues
66	Vibha Bhargava, PhD	University of Georgia	Establishing Statewide Aging and Healthcare Administrative Datasets to Inform Clinical and Translational Research for Vulnerable Older Georgians
67	Yujin Kim, PharmD	Mercer University	Fabrication and Characterization of Hyaluronic Acid Microneedles to Enhance Delivery of Magnesium Ascorbyl Phosphate into Skin
68	Zhong-Ru Xie PhD	University of Georgia	Computational Study on the Drug Resistance of Paclitaxel
69	Nathalie Celestin, MPH, CHES	University of Georgia	Implementation of healthy beverage practices among child care programs in Georgia
70	Andrzej Przybyla, PhD	University of North Georgia	Arm choices behavior depends on interlimb differences in motor performance: effect of sensorimotor conditions and long-term practice.

Akan, Ekemini MD (Emory University) POSTER: 22

Severity of Childhood-onset Systemic Lupus Erythematosus: Impact of Preceding and Co-existing Autoimmune Cytopenias. (Protocol)

Akan E, Chandrakasan S, Rouster-Stevens K, Greenbaum LA, Travers C, Marion C, Singer K, Sanz I, Prahalad S

Introduction: Childhood-onset systemic lupus erythematosus (cSLE) is more severe than adult-onset SLE (aSLE). Autoimmune cytopenias (AC) including autoimmune hemolytic anemia (AIHA), idiopathic thrombocytopenic purpura (ITP) and Evans syndrome (ES) may precede or coincide with cSLE. From adult studies, it has been suggested they have a lower incidence of lupus nephritis (LN). We hypothesized that the presence of preceding or coexisting ITP, AIHA or ES at time of cSLE diagnosis predicts a milder phenotype, as indicated by less LN risk and severity which is due to the presence of protective serological, prior immunosuppressive or immunomodulatory factors.

Methods: This retrospective study will include rheumatology patients from Children's Healthcare of Atlanta at Emory, aged 2 to 16 years at time of cSLE diagnosis from January 1, 2000 to January 31, 2015, with at least 4 of the 11 American College of Rheumatology (ACR) classification criteria. We will exclude patients diagnosed with cSLE outside our center.

Results: With a sample size of 400, assuming 50% of cSLE patients without AC have LN and 22% with AC have LN, at an alpha of 0.05, we will have > 80% power to detect a significant difference. We expect that patients with co-existing AC and cSLE will differ phenotypically from other cSLE patients, will have decreased risk and severity of LN and decreased prevalence of LN in patients pretreated with immunosuppression.

Conclusion: We will determine whether cSLE patients with preceding or coexisting ITP, AIHA or ES have distinct clinical or serological phenotype.

Translational Impact: Our results will be significant in developing hypotheses for further multi-center or large database and immunological studies to determine predictive biomarkers of cSLE.

Alvarez, Jessica A. PhD, RD (Emory University) POSTER: 29

High-Resolution Plasma Metabolomics Identifies Metabolic Pathways Linked to Healthful Diet Patterns

Alvarez JA, Ferranti EP, Cai Q, Bellissimo MP, Chong EY, Bettermann EL, Yu T, Jones DP, Ziegler TR

Introduction: There are complex interactions between diet and human metabolism. We aimed to perform plasma high-resolution metabolomics (HRM) and linked metabolome-wide association studies in a working cohort of adults to identify metabolic pathways associated with Mediterranean and DASH-based eating patterns.

Methods: Subjects were 179 adults in an Atlanta cohort with available plasma HRM data via liquid chromatography/ultra-high resolution mass spectrometry. A Mediterranean diet score (MDS) and DASH diet score (DASH-S) were determined from food frequency questionnaires. Associations between diet scores and plasma HRM were determined with multiple linear regression, adjusting for age, sex, race, and percent body fat. Pathway enrichment was performed using mummichog software.

Results: Of 10,210 detected metabolites, MDS was associated with 530 metabolites ($P < 0.05$) which were significantly enriched in 19 metabolic pathways related to amino acid metabolism, fatty acid metabolism, membrane lipid metabolism, TCA cycle, vitamin E, and xenobiotics. The DASH-S was associated with 503 metabolites, significantly enriched in 5 metabolic pathways: drug metabolism, xenobiotics metabolism, pyrimidine, aspartate, and lysine.

Conclusion: These HRM data suggest that habitual intake of a Mediterranean vs DASH-style diet differentially alters plasma metabolic pathways in adults. Adherence to a Mediterranean diet was associated with more diverse metabolic pathways spanning a range of amino acids and lipids compared to DASH.

Translational Impact: The use of plasma HRM will enable objective assessment of dietary intake and eating patterns in the study of the role of nutrition on human health and disease.

Alvarez, Jessica A. PhD, RD (Emory University) POSTER: 30
Certificate Program in Translational Research

Alvarez JA

The Certificate Program in Translational Research (CPTR) is a multidisciplinary, innovative program which provides predoctoral or postdoctoral trainees and faculty with didactic and practical training in clinical and translational research (CTR) in order to transform biomedical scientific discoveries to benefit human health. The program is sponsored by the GaCTSA. The CPTR is available to PhD and MD/PhD graduate students, postdoctoral fellows, and faculty at Emory, Georgia Tech, Morehouse School of Medicine, and the University of Georgia. The program covers a range of topics across the spectrum of CTR and is ideal for investigators seeking to gain skills in translating their findings from laboratory to bedside to community. The CPTR is designed to provide a better understanding of clinical research, CTR infrastructure and how it can be accessed, and to provide experience in interacting with other types of investigators, study subjects, and clinical patients. The CPTR can be personalized to meet a trainee's specific needs and interests. The CPTR involves didactic classes of the Emory Laney Graduate School (16 credit hours) and a clinically-related rotation. Trainees can take the course work over a single year (8 credits/semester) or spread courses over two years to limit impact on research or clinical duties. For graduate students, the CPTR does not increase time to degree. U.S. citizens, permanent U.S. residents, and non-U.S. citizens are eligible to apply, and a specific human research project is not required. Emory PhD postdocs and MD or PhD faculty employed one year are usually eligible for the Emory Courtesy Scholarship which will cover the tuition.

Anderson, Alex Kojo PhD, MPH, CPH (University of Georgia) POSTER: 5
Association of Pregnancy Fat Mass Gain, Fat Free Mass Gain and Infant Birth Weight and Length

Anderson AK

Introduction: Although gestational weight gain is reported to predict pregnancy outcome, little is known of gain in fat mass and fat free mass on pregnancy outcome. The study evaluated the associations of measured maternal gestational body fat and fat free mass gains on infant birth weight and adiposity.

Methods: This was a prospective observational cohort study. 24 pregnant women in Athens, Georgia were recruited in the first trimester of pregnancy. Data and body composition measurements (via the BOD POD) was collected at 12±2, 24±2 and 34±2 wks gestation, and 2±1 wks pp.

Results: Mean age of participants was 27.3±5.3 yrs with a mean pre-pregnancy BMI of 25.6±5.7 kgm² and an average gestational age at delivery of 38.3±0.9 wks. About 61% of participants were married, White and employed full-time. 61.1% of the infants were males, and birth weight and birth length of 3.5±0.3 kg and 52.5±2.1 cm, respectively. At 2 weeks pp, 72.2% were receiving optimal breastfeeding, 16.7% mixed feeding and 11.1% exclusively formula feeding. Infant weight, percent body fat and percent fat free mass was 3.7 kg, 10.8% and 89.2%, respectively at 2 weeks postpartum. Maternal pregnancy fat mass gain was weakly associated with infant birth weight ($p=0.056$), whereas maternal fat free mass gain was associated with infant birth weight ($p=0.001$) and length ($p=0.021$), as well as infant weight (0.007) at 2 wks postpartum

Conclusions: Maternal pregnancy fat mass gain is a determinant of infant birthweight while fat free mass gain is a determinant of birth length and weight at 2 weeks pp. Findings suggest a need for future studies with larger sample size.

Translational Impact: Findings have the potential to inform pregnancy nutrition, physical activity and weight gain for a positive pregnancy outcome.

Arenson, Michael MA (Emory University) POSTER: 45

Prediction of 90-Day Readmission among Kidney Transplant Recipients using Natural Language Processing

Arenson M, Zhang X, Kim J, Karadkhele G, Hogan J, Zhang Y, Adams AB, Patzer RE

Background: Predicting hospitalization after kidney transplant (KTX) could be used to decrease morbidity, mortality, and cost of care. Predictive models, however, are limited by the availability of predictor variables. Using Natural Language Processing (NLP), we examined whether socioeconomic data pulled from clinical Social Work (SW) notes improved predictive accuracy of 90-day readmission (90DR) among a sample of KTX recipients from a large transplant center in the Southeastern United States.

Methods: Free-text (i.e. unstructured) SW notes for 1400 KTX recipients from 2005 to 2015 were analyzed using NLP. Chi-square was used to find associations (p -value < 0.1) among frequently occurring words for patients experiencing 90DR. We then assessed predictive model performance of these novel variables using multivariable logistic regression.

Results: Among 1,400 KTX recipients, 39% were hospitalized within 90 days of discharge. Using only structured variables, the area under receiver operating curve (AUC) was 0.62 (95% CI 0.61-0.63), and 0.61 (95% CI 0.59-0.62) using only unstructured variables (Figure 1). When both structured and unstructured variables were merged, the AUC reached 0.65 (95% CI 0.63-0.68).

Conclusions: Using NLP, SW notes are associated with and can be used to improve predictive accuracy of 90DR post-KTX. The data analyzed for this project represents only 60% of all available unstructured data, and only 32 structured variables were used to build the structured-only model. However, we provide a proof of concept that the AUC is improved using NLP for KTX recipients. Other clinical notes may improve predictive accuracy of models as well.

Artham, Sandeep Pharm.D. (University of Georgia) POSTER: 55

Pulmonary Endothelial Akt1-FoxO-MMP3 Signaling as a Novel Diagnostic and Therapeutic Target for ARDS: An Experimental and Clinical Evidence

Sandeep A, Fei G, Somanath PR (Shenoy)

Introduction: Enhanced vascular permeability leads to initial exudative stage in Acute Lung Injury (ALI)/ARDS (Acute respiratory distress syndrome), where increased inflammation and edema in alveoli decreases its gaseous exchange capacity. Our previous studies along with others show the importance of endothelial Akt1 in regulating barrier function.

Methods & Results: Our in vitro studies, using ECIS technology, showed decreased real-time trans-endothelial barrier resistance in human lung endothelial cells (HLECs) after treatment with LPS. LPS decreased expression of the tight junction protein claudin-5 & promoted MMP3 expression via Akt1-FoxO1/3a signaling in Human Microvascular Endothelial Cells (HMECs), which together was the reason for disruption of barrier function in vitro and enhanced permeability in vivo. In vivo, LPS induced lung edema was significantly enhanced in EC AKT1 KO (Endothelial specific AKT1 KO) mice as compared to wild-type mice. LPS induced lung edema in EC Akt1 KO mice was reversed upon treatment with FoxO inhibitor (AS1842856) as well as ShRNA-mediated FoxO1/3a depletion in mice lungs. In vitro, LPS treatment on endothelial cells also enhanced MMP3 expression and activity. In vivo, treatment with MMP3 inhibitor (UK-356618) also rescued LPS induced lung injury in mice. Human ARDS patient blood samples showed 3-6 fold increase in MMP3 activity compared to smoking and non-smoking controls.

Conclusion & Transnational Impact: Overall, we show that LPS inhibition of Akt1 in lung endothelium leads to FoxO-mediated MMP3 expression and claudin-5 suppression, resulting in Lung edema & injury. Therefore, targeting FoxO1/3a and MMP3 could provide a potential therapeutic strategy and MMP3 activity could be used as a potential diagnostic marker for ARDS.

Bansal, Amit MS (Mercer University) POSTER: 7

Design of Novel Cationic pDNA Vaccines for Immuno-Contraception and Rabies Control

Bansal A, Wu X, D'Souza MJ

Introduction: Plasmid DNA (pDNA) vaccines have the potential to elicit an immune response against a wide range of diseases. However, the limitation of poor uptake of pDNA to antigen-presenting cells and rapid degradation of pDNA encapsulated in nanoparticles prompted us to fabricate an encapsulation free pDNA nanoparticulate vaccine.

Methods: Nanoparticles in the size range of 380-500 nm were prepared using emulsification method. In-vivo efficacy was determined in mice, serum was collected every week up to 12 weeks post vaccination and analysed for gonadotrophin release hormone (GnRH, a reproductive hormone) specific antibody. The binding of the GnRH specific antibodies was measured by avidity sodium thiocyanate-elution ELISA.

Results: Complex of pDNA and cationic nanoparticles maintained cell survival rate greater than 80.0 percent. Additionally, cellular uptake was found to be both time and concentration dependent and followed saturation kinetics with Vmax of 11.389 µg/mL.hr and Km value of 139.48 µg/mL. In-vitro release study of P/N, 1/50 showed that the nanoparticulate vaccine can sustain the release of pDNA up to 24 hrs. In-vivo, elevated levels of GnRH specific IgG, IgG2a antibody response was observed in mice administered with pDNA nanovaccine and adjuvant (Alum and MF59) compared to mice administered with pDNA and blank nanoparticles.

Conclusion: We demonstrated that pDNA PLGA-chitosan nanoparticles sustained the release of pDNA for extended period and generation of GnRH specific antibodies confirm the potential of nanovaccine to induce immunocontraception and spread of rabies virus.

Translational Impact: DNA vaccine for rabies has shown promising results in mice and can be used to induce immunocontraception and prevent the spread of rabies.

Bansal, Amit MS (Mercer University) POSTER: 8

Bio-Fabrication of Polymeric Microcapsules of Insulin Secreting β TC-6 Cells in the Management of Type 1 Diabetes Mellitus

Bansal A, D'Sa Sucheta, D'Souza MJ

Introduction: Type 1 diabetes mellitus (T1DM) is a disease, characterized by lack of pancreatic islet function. Whole tissue transplantation appears to be viable alternative in the management of T1DM. This study aims at fabrication and evaluation of alginate-chitosan microcapsules encapsulated insulin secreting β TC-6 cells using specialized spraying nozzle.

Methods: Microcapsules encapsulated with β TC-6 cells were fabricated using novel spraying device producing uniform spherical microcapsules. Microcapsules were characterized for permeability using molecular weight markers, stability, and cell viability using live dead staining kit. Microencapsulated β TC-6 cells were transplanted intra-peritoneally in diabetic mice and monitored for decrease in blood glucose level and immune acceptance.

Results: Spherical microcapsules with diameter in the range of 250-350 µm were prepared at an air flow rate of 250 L/hr. Microencapsulated β TC-6 cells in alginate capsules demonstrated prolonged viability. Group received microencapsulated β TC-6 cells maintains normoglycemia for 35±5 days before rejection. However, group received naked β TC-6 cells rejected graft within 1 or 2 days. Microcapsules produced by specialized nozzle were reproducible with narrow size distribution and in addition provides flexibility in producing different sized capsules.

Conclusion: Our findings for in-vivo study revealed that transplantation of microencapsulated β TC-6 cells may be a viable alternative in the management of T1DM with greater tolerance and acceptability.

Translational Impact: Results of preclinical in-vivo study gave us the confidence that microencapsulated allograft would have significant impact in the management of T1DM patients.

Belcher, Staci MS, RDN, LDN (University of Georgia) POSTER: 59

Sedentary Behavior and Cortical Bone in Healthy Adolescents and Young Adults: An Isotemporal Substitution Analysis

Higgins S, Belcher SL, Kindler JM, Mahar TF, Coheley LM, Laing EM, Schmidt MD, Evans EM, Lewis RD

Introduction: Excess sedentary behavior (SED) may be detrimental to bone, possibly by displacing osteogenic physical activity (PA). However, SED has also been reported to benefit bone. The aim was to examine the relationships between SED and cortical volumetric bone mineral density (Ct.vBMD) in healthy adolescents (n = 226; 18.4±2.2 years old, 59.3% female).

Methods: An isotemporal analysis was used, in the context of the displacement hypothesis, to illustrate the effects of substituting 30 minutes of PA for SED on bone. Accelerometry (Actigraph GT3X+) was used to assess PA and SED. Tibia

cortical bone and muscle cross-sectional area (MCSA) were assessed via peripheral quantitative computed tomography. Analyses were adjusted for age, race, sex, tibia length, relative lower body force, and MCSA.

Results: Participants spent 10.5 ± 1.2 hrs daily in SED ($M \pm SD$), with 40% being distributed into short bouts (<5 min), 50% in medium bouts (5-30 min), and 10% in long bouts (>30 min). Time spent in moderate-to-vigorous PA (MVPA) was 52 ± 30 minutes daily. Replacing 30 minutes of total or medium SED with MVPA appeared to be detrimental to Ct.vBMD, predicting a reduction by 3.97-4.08 mg/cm³ (unstandardized $\beta = -4.08$, $p = .021$ and $\beta = -4.83$, $p = .007$, respectively). There were no effects of replacing short or long SED bouts. Conclusion: In healthy adolescents and young adults, replacing SED time with MVPA may be detrimental to bone mass. Though paradoxical, findings are consistent with recent reports suggesting that SED in healthy youths may benefit cortical bone.

Translational Impact: With strong evidence for the positive impact of MVPA on bone and fracture prevention, these results need to be confirmed to better understand the influence of SED, as well as its distribution, on bone.

Berg, Alison PhD, RDN, LD (University of Georgia) POSTER: 6
Community-Based Educational Intervention May Improve Cancer Screening Compliance in Rural Georgia

Berg A, Chatterjee S, Koonce J, Turner P

Introduction: Cancer is the second leading cause of death in the US. Despite clear guidelines, many people do not get screened for cancer, particularly those living in rural areas. The Cooking for a Lifetime of Cancer Prevention Cooking School (C4L) program educates rural Georgians about recommended breast, cervical, and colorectal cancer screenings, and nutrition and physical activity guidelines for cancer prevention. This study examines whether participation in C4L is associated with breast, cervical, and colorectal cancer screening compliance.

Methods: Participants of C4L and nonparticipants completed a researcher-designed questionnaire administered 10 – 14 weeks post C4L intervention to assess demographics and cancer screening history. T-tests were used to compare screening participation between participants and non-participants.

Results: The sample ($n = 255$) was 100% female (52 ± 14 y, 37% Black, 12% Hispanic, 7% uninsured). Preliminary results indicate C4L program participants were significantly ($P < 0.01$) more likely to meet screening guidelines for breast and colorectal cancer compared to nonparticipants. When asked about their intention to be screened for breast, cervical, and colorectal cancer in the future, no significant difference was found.

Conclusion: Preliminary analyses suggest participation in an Extension cancer prevention education program (C4L) is associated with greater compliance with breast and colorectal cancer screening recommendations among rural Georgians. This study is ongoing and scheduled to conclude in Sep 2018.

Translational Impact: Improving cancer screening participation will require community-clinical collaboration. Community-based educational programs, like C4L, may be an important piece to improving screening compliance.

Bhargava, Vibha PhD (University of Georgia) POSTER: 66
Establishing Statewide Aging and Healthcare Administrative Datasets to Inform Clinical and Translational Research for Vulnerable Older Georgians

Lee JS, Bhargava V

Introduction: Older population is rapidly increasing in Georgia and impoverished older Georgians have heightened burden of chronic conditions and disability. To maximize the reach and impact of existing public assistance programs for older adults, rigorous program evaluation should be a part of the standard administrative process. Linkages of aging and healthcare administration data can establish best available statewide datasets and infrastructure to identify health problems and healthcare needs and to evaluate the impact of programs for vulnerable older Georgians.

Methods: Based on the successful collaboration among UGA, GA Department of Human Services Division of Aging Services (DAS), GA Department of Community Health (DCH), and the Centers for Medicaid and Medicare (CMS) since 2007, we established the first-ever statewide secondary dataset by merging GA Aging Information Management System (AIMS) and Medicare Claims data 2008-09 for 4,653 low-income older Georgians. We continue to establish a more comprehensive dataset by linking GA AIMS, Medicare, and Medicaid data for about 30,000 low-income older Georgians.

Results: The process of establishing the dataset provides conceptual and methodological guidance on linking and utilizing data from distinct sources. The resulting data were used to examine the food and healthcare insecurity status and the impact of the public assistance programs.

Conclusion: This project demonstrates the feasibility and utility of the statewide aging and healthcare administrative data to monitor the impact of the programs in Georgia.

Translational Impact: The statewide aging and healthcare administrative data will inform the design, implementation, and evaluation of translational research to promote healthy aging in vulnerable older Georgians.

Bhattacharjee, Sonalika Arup (Mercer University) POSTER: 58
Slow Topical Delivery of Niacinamide in Microporated Skin by a Phase Inversion PLGA Gel
Sonalika AB, Christian H, Ajay KB

Introduction: Topical delivery of niacinamide (log P -0.37) is unfavorable by conventional means. A novel formulation exploiting the ability of poly(lactic-co-glycolic acid) (PLGA) to gel in situ was developed to deliver niacinamide in microporated skin. The effect of different grades of PLGA and depths of microporation was also studied.

Methods: Formulations consisted of PLGA, dimethylsulfoxide and polyethyleneglycol 400 with 4% w/v niacinamide. EXPANSORB® DLG 50-2A (15-30 kDa) and EXPANSORB® DLG 50-8A (80-130 kDa) grades of PLGA were used. In vitro drug permeation studies with different microneedle treatment conditions was performed. Confocal microscopy was used to characterize the microchannels. Statistical analysis using student's t test ($p < 0.05$) was performed.

Results: Successful gelation was observed in situ. Permeation was significantly reduced by 46.05% with lower molecular weight PLGA, and 99.27% with higher molecular weight. However, the amount of drug retained in skin ($194.45 \pm 34.57 \mu\text{g}/\text{cm}^2$ and $167.29 \pm 15.85 \mu\text{g}/\text{cm}^2$) was similar. Comparison between the microneedle treatments revealed no significant difference in the amount of drug permeated, but higher amounts were retained in skin with 0.5 mm needles, applied for 5 seconds ($8214.89 \pm 419.83 \mu\text{g}/\text{cm}^2$).

Conclusion: Topical delivery of niacinamide was successful with slow and sustained release of the drug. Higher molecular weight of PLGA and treatment with 0.5 mm needle length for 5 seconds showed better delivery.

Translational Impact: The study employed a handheld microneedling device used for cosmetic use, to deliver niacinamide from a novel formulation. The strategy developed shows promise to translate from bench to bedside and provides an alternative for the delivery of other molecules into skin.

Black, Kylie M. (Mercer University) POSTER: 35
A Multinational Study of Patient Reported Barriers to Medication Adherence Conducted using Amazon Mechanical Turk
Black KM, Augustine JM, Murnane KS

Introduction: Poor adherence to prescribed medication continues to be a major public health problem. To better understand the reasons for medication nonadherence, we conducted an online medication adherence assessment among a multinational, multi-disease state study population.

Methods: This study assessed medication-taking behaviors among 250 adults who currently take medication(s) for chronic illnesses using the validated Adherence Barriers Questionnaire. Participants completed an online survey through the internet marketplace Amazon Mechanical Turk (AMT). Questionnaire scores were analyzed to explore demographic characteristics associated with poor medication adherence. The reported disease states and prescribed medications were tabulated to fully characterize the population of Amazon Turk users.

Results: The majority of participants were in the 31-50 age range (50.2%), female (70.7%), Caucasian (75.9%), and living in the United States (87.6%). Younger participants ($p < 0.001$), those of Asian race ($p = 0.004$), residing in India ($p < 0.05$), and with an annual income of less than \$10,000 ($p < 0.025$) reported significantly more barriers. Psychiatric, cardiac, and endocrine disorders were most commonly reported.

Conclusions: AMT appears to be an excellent source of recruiting participants for medication adherence studies that can elucidate differences across groups. This system can inform the design of interventions tailored for high-risk populations.

Translational Impact: Collecting data across a large and diverse subject population through AMT affords an unprecedented opportunity to identify key patient-specific factors associated with medication nonadherence. This kind of study may yield new insights that provide for effective medication adherence interventions.

Brainard, Benjamin VMD (University of Georgia) POSTER: 13
Use of a Cyclooxygenase-2 Inhibitor Does Not Inhibit Platelet Activation or Growth Factor Release from Platelet-Rich Plasma

Ludwig HC, Birdwhistell KE, Brainard BM, Franklin SP

Introduction: Prior or concurrent treatment with cyclooxygenase (COX) inhibitor drugs may impair the quality of platelet-rich plasma (PRP) produced for therapeutic purposes. Many patients who are candidates for PRP therapy for treatment of musculoskeletal injury are also using COX-2 inhibitors. We aimed to assess the effects of a COX-2 inhibitor (carprofen) on platelet activation and anabolic growth factor release from canine PRP.

Methods: PRP was prepared from 10 healthy dogs. Dogs received carprofen for 7 d, after which PRP preparation was repeated. PRP was also prepared 3 days after discontinuation of carprofen. PRP was either unactivated or activated with human γ -thrombin (HGT). Flow cytometry evaluated platelet expression of CD62P and platelet-bound fibrinogen using the canine activated platelet-1 (CAP1) antibody. Supernatants in separate samples were assayed for transforming growth factor- β 1 (TGF- β 1), platelet-derived growth factor-BB (PDGF-BB), and thromboxane B2 (TXB2) concentrations.

Results: There were no significant effects of carprofen on % platelets positive for CD62P or CAP1 or on concentrations of TGF- β 1, PDGF-BB, or TXB2. Activated samples had significantly greater activation and growth factor concentrations than unactivated samples.

Conclusion: Carprofen did not impair platelet activation, growth factor release, or TXB2 production in canine PRP when using HGT as an activator. These results suggest that there is no need to withhold a COX-2 inhibitor before PRP preparation. Translational Impact: Studies are warranted to determine whether COX-2 inhibitors affect platelet activation and growth factor release from human PRPs. Naturally-occurring musculoskeletal disease in dogs can be used as a model to evaluate products for efficacy prior to human use.

Braz Gomes, Keegan (BSc) (Mercer University) POSTER: 33
Novel Matrix Protein Virus-Like Particle (M2e VLP) Subunit Vaccine for Influenza

Braz Gomes K, Braz Gomes K, Kang SM, D'Souza MJ

Introduction: We investigated the efficacy and protectivity of a matrix-2 protein virus-like particle (M2e VLP) vaccine and administered it transdermally in a pre-clinical mouse model for influenza.

Methods: The M2e VLP was encapsulated into a polymer matrix along with adjuvants Alhydrogel® and MPL-A®. This combination was then spray dried into microparticles. For testing in-vivo, 4-6 week old C57BL/6 mice were vaccinated with one prime and two booster doses intramuscularly (I.M.) or transdermally (T.D.) using microneedles. Mice were then challenged with A/Philippines/2/82 (H3N2) (4x10³ PFU) live influenza virus. Blood samples were collected for determination of antibody titers and T cell phenotypes were examined in the primary and secondary lymphoid organs. Whole lung tissue was collected following challenge for determination of viral load.

Results: The mice vaccinated with M2e VLP, M2e VLP MP, and M2e VLP MP + MPL-A® + Alhydrogel® resulted in elevated levels of IgG, and IgG1 beginning at week 7. Mice that were immunized with the M2e VLP MP and M2e VLP MP + MPL-A® + Alhydrogel® demonstrated high expression of CD4+ and CD8+ T cells. The lung viral titers were 10-fold lower in the M2e VLP MP + MPL-A® + Alhydrogel® vaccinated mice compared to M2e VLP and M2e VLP MP.

Conclusion: Since the current licensed vaccines against influenza are facing numerous challenges associated with production time, antigenic changes, route of administration, etc., we developed a flu vaccine with the M2e VLP that was easy to formulate, stable, immunogenic, safe and protective.

Translational Impact: Our transdermal influenza VLP vaccine using the conserved M2e protein could potentially serve as a feasible alternative to the currently available trivalent and quadrivalent influenza vaccines.

Canal, Clinton Ph.D. (Mercer University) POSTER: 18
Preclinical Development of a Serotonin 5-HT7/5-HT1A Receptor Partial Agonist for Autism
Canal CE, Felsing DF, Perry CK, Liu Y, Booth RG

Autism spectrum disorder (ASD) affects approximately 1 in 68 children, and is characterized by persistent difficulties with social interaction and communication and the presence of restricted, repetitive patterns of behaviors.

There are no drugs approved to treat core symptoms of ASD, but their discovery could improve quality of life for autistic persons. Numerous studies show that the serotonin (5-hydroxytryptamine, 5-HT) system is critically linked with ASD, and targeting select 5-HT receptors may be therapeutic for ASD. Here we present the development of "(2S)-5-FPT", a novel 5-phenyl-2-dimethylaminotetralin, that uniquely targets serotonin receptors. (2S)-5-FPT is a partial agonist at 5-HT7 and 5-HT1A receptors that reverses repetitive and stereotyped behaviors and enhances social interactions after peripheral administration in mouse behavioral models of ASD. (2S)-5-FPT also shows favorable pharmacokinetics and low 5-HT receptor-related side-effect profiles. Our preclinical data suggest 5-FPT is a promising new medication candidate for ASD. This work spawned the start-up company, Seropeutics LLC, which aims to begin clinical trials with 5-FPT in the near future.

Celestin, Nathalie MPH, CHES (University of Georgia) POSTER: 69
Implementation of Healthy Beverage Practices among Child Care Programs in Georgia
Cotwright CJ, Celestin N, Birch L

Introduction: One major contributor to childhood obesity is the high intake of sugar-sweetened beverages (SSBs). A viable solution to decreasing childhood obesity is increasing access to water and other healthy beverages. This study examined the implementation of beverage policies in child care programs in Georgia.

Methods: Our 18-month study included electronic and paper survey distribution to a sample of 3,540 child care programs in Georgia. The sample was stratified by participation in the Child and Adult Care Food Program (CACFP), geographic region, and program type. The Georgia Child Care Wellness Survey of Child Care Providers of 0-5 Year Old Children examined current policy implementation, the quality of beverages served, and barriers to policy implementation. A subset of respondents participated in semi-structured interviews to further explore barriers, facilitators, and training needs.

Results: Survey respondents (N=974) were evenly distributed among the six geographic regions in Georgia. Sixty seven percent of the respondents were enrolled in CACFP. Regardless of CACFP participation, 75% of respondents reported following the 2017 CACFP meal pattern guidelines. Statistically significant relationships were noted between programs participating in CACFP and those serving SSBs ($\chi^2(2) = 15.309, p < 0.001$). Child care programs participating in CACFP were less likely to serve SSBs. Qualitative findings revealed the need for the development of a beverage policy training for child care providers in Georgia.

Conclusion: Results will be applied to further promotion of CACFP and state licensure requirements related to healthy beverages.

Translational Impact: Findings will be used to develop training for beverage policy implementation in partnership with the Georgia Department of Early Care and Learning.

Chitre, Neha B.Pharm (Mercer University) POSTER: 47
Assessing the Motor and Non-Motor Symptoms of Parkinson's Disease in Rats Using the 6-Hydroxydopamine Lesion Model

Chitre NM, Wood B, Ray A, Spry R, Hibicke M, Rambacher K, Hayslett R, Moniri NH, Murnane KS

Introduction: Parkinson's Disease (PD) is the second most common neurodegenerative disease throughout the United States. The symptoms of PD include impairments in both motor functions, such as rigidity, tremor, and postural instability, as well as non-motor functions, such as mood and cognitive deficits. The motor symptoms of PD arise due to the selective destruction of nigrostriatal dopamine (DA) synthesis in nerve terminals of the striatum, including within the caudate putamen. Polyunsaturated omega-3 fatty acids have been associated with stimulation of neurotransmitter synthesis and with anti-inflammatory and neuroprotective roles towards limiting neuronal destruction in cell culture and animal models, including in PD. Likewise, compounds that target cannabinoid and serotonin systems have demonstrated similar effects.

Translational Impact: Such compounds have also been shown to have beneficial effects on mood and cognition. Because of these findings, there is growing interest in examining the role of polyunsaturated omega-3 fatty acids in both the motor and non-motor symptoms of PD.

Methods: To address this issue, we have generated and validated a 6-OH-DA lesion model of PD. We have validated that model using conventional neurochemical and behavioral assays for PD in rats, including rotational behavior and electrochemical determination of tissue levels of dopamine.

Results: In a separate series of studies, we developed a testing paradigm for use in Parkinsonian rats that allows for assessments of motor and non-motor function within the same subject.

Conclusion: We will now use our validated procedures to assess the beneficial effects of polyunsaturated omega-3 fatty acids, cannabinoids, and serotonergics on the motor and non-motor symptoms of PD.

Cobran, Ewan K. PhD (University of Georgia) POSTER: 2
A Pilot Study of the Independent Specialty Medical Advocate Model of Patient Navigation on Intermediate Health Outcomes in Newly Diagnosed Cancer Patients

Cobran EK, Merino Y, Roach B, Bigelow SM, and Godley PA

Introduction: This study examined the associations between an independent specialty medical advocate (ISMA) model of patient navigation and intermediate patient health outcomes (e.g., satisfaction with cancer-related care, coping, anxiety, depression, and self-efficacy) for newly diagnosed cancer patients.

Methods: We conducted a pre-post intervention study of 26 newly diagnosed cancer patients. Participants were recruited between April 2013 and December 2015 through a national partnership between LIVESTRONG Cancer Navigation Service (LIVESTRONG Navigation) and NavigateCancer Foundation. Participants also received a one-hour initial telephone consultation and then a navigation care plan was developed for the study period. Paired t-test was conducted to assess changes in participant's intermediate health outcomes at baseline and six weeks after the study intervention.

Results: Overall, there was a statistical significant reduction in anxiety at baseline (mean, 2.92; Standard Deviation [SD], 0.82) compared to 6-weeks post-intervention (mean, 2.48; SD, 0.62), $p < 0.05$; and depression at baseline (mean, 2.45; SD, 0.19) compared to 6-weeks post-intervention (mean, 2.00; SD, 0.81), $p < 0.05$. There was no statistical significant difference in coping at baseline and 6-weeks post-intervention.

Conclusion: The ISMA model of patient navigation appears to be associated with significant reduction in anxiety and depression. Further studies are needed to evaluate the ISMA model of patient navigation on long-term patient outcomes. Translational Impact: The ISMA model of patient navigation intervenes on traditional clinical setting deficits by providing unbiased practical guidance through various stages of the cancer experience.

Cobran, Ewan K. PhD (University of Georgia) POSTER: 3
Race and Receipt of Androgen Deprivation Therapy among Men with Metastatic Prostate Cancer

Cobran EK, Chen RC, Chen X, Reeves J, Godley P, and Shah S

Introduction: The Medicare Modernization Act (MMA) drastically reduced reimbursement for androgen deprivation therapy (ADT) in 2005. Using the Surveillance, Epidemiology, and End Results-Medicare linked database, we evaluated the associations between race and median time to receipt of ADT among men with metastatic prostate cancer before and after the passage of the MMA.

Methods: A total of 1,846 African-American and 9,462 Caucasian men diagnosed with metastatic prostate cancer from 2000 through 2011 were included. An accelerated failure time regression model was used to examine factors associated with racial differences in median time to receipt of ADT.

Results: After adjusting for covariates, African-American men had a longer median time to receipt of ADT both before the MMA (TR: 1.15; 95% Confidence Interval (CI) [1.05, 1.27]) and after the MMA (TR: 1.29; 95% CI [1.10, 1.53]) as compared to Caucasian men. In addition to race, men residing in South had longer median time to receipt of ADT (TR: 1.26, 1.52; 95% CI [1.01, 1.52; 1.24, 1.87] before and after MMA, respectively) compared to the Northeast region.

Conclusion: After the passage of the MMA, African-American men with metastatic prostate cancer had longer median time to receipt of ADT compared to Caucasian men. Considering the palliative benefits of ADT, it is important to develop strategies to address the issue of racial differences in receipt of treatment for metastatic prostate cancer.

Translational Impact: In men with metastatic prostate cancer, the use of ADT is considered primary therapy. However, we found that African-American men had significantly longer median time to receipt of evidence based ADT. Further research is needed to assess additional factors associated with racial differences in ADT use.

Coronel, Maria PhD (Georgia Institute of Technology) POSTER: 44
Local Immunosuppression for Islet Grafts via Synthetic Immunomodulatory Protein Presentation

Coronel MM, Batra L, Yolcu ES, Weaver J, Hunckler M, Shrestha P, Zhao H, Bowen WS, Woodward KB, Shirwan H, Garcia AJ

Introduction: Clinical Islet Transplantation, a cell-based therapy for the cure of Type 1 Diabetes (T1D), has the potential to restore endogenous glycemic control for patients. Yet, the need for chronic immunosuppression due to autoimmunity and activation of allo responses have hindered its applicability. Herein, we seek to overcome these challenges by engineering a synthetic platform to induce localized host directed immunoregulation for long-term graft survival in the absence of chronic immunosuppression.

Methods: Microgels were fabricated as previously described [1], and functionalized with an engineered chimeric SA-PD-L1 protein. Effect of this protein on islet grafts was tested in vitro and in an in vivo syngeneic rodent model. Furthermore, the ability of SA-PD-L1 to convert T effector into T regulatory and suppress proliferation in response to allogeneic stimulation were tested.

Results: Islets co-cultured with SA-PD-L1-microgels maintained function and insulin expression in vitro. In vivo, co-transplantation did not hinder islet engraftment or glucose clearance rates. Immunomodulation assays in vitro demonstrated enhanced TGF-beta-induced conversion of Teff into Treg cells and effective suppression of Teff cell proliferation.

Conclusion: These results provide strong evidence for the potential of SA-PD-L1 to modulate T cell responses, and the feasibility of our platform to be easily integrated with current transplant methods without hindering functional outcomes. Translational Impact: This project investigates the effect of modulating the immune system via novel engineered polymers, a unique and highly relevant approach as it can potentially limit the need for systemic immunosuppression, and be easily translated as a therapeutic strategy for T1D.

Cuya, Selma M. PhD (Emory University) POSTER: 56
Investigating the Role of Musashi 2 in Neuroblastoma Tumorigenesis

Cuya SM, Rathik K, Chen D, Annam J, Schnepf RW

Background: Patients with high-risk neuroblastoma endure an extremely intense, multidrug treatment regimen and yet, approximately half of them die, thus mandating a better approach to this cancer. Our laboratory is investigating the overarching hypothesis that RNA binding proteins (RBPs), are deregulated in neuroblastoma, and drive oncogenic signaling networks. In this work, we focus on Musashi 2 (MSI2), an RBP that has been shown to play a critical role in the maintenance of stem cell populations and in the formation of aggressive tumors, notably in acute myeloid leukemia. The role of MSI2 in neuroblastoma, has not been assessed and is the focus of this investigation.

Methods: We used in silico analysis of neuroblastoma gene expression datasets annotated with clinical parameters. Additionally, we used shRNAs to manipulate transcripts of interest in neuroblastoma cells and measured effects on cell proliferation, cell cycle status, and apoptosis.

Results: Gene expression profiling revealed that MSI2 is robustly expressed in neuroblastoma cell lines, tumors, and patient derived xenografts, within the MYCN and non-MYCN amplified context. High MSI2 expression was associated with higher stages across multiple independent datasets and was correlated with worse survival. Depletion of MSI2 using four independent shRNAs led to 2 to 3-fold decreased proliferation across four cell lines that was due in part to increased apoptosis.

Conclusions: MSI2 is robustly expressed in multiple models of neuroblastoma and appears to drive increased proliferation and survival. Further understanding the role of MSI2 in neuroblastoma will provide a foundation for designing strategies to target this RBP for therapeutic effect.

Dahotre, Shreyas BSE (Georgia Institute of Technology) POSTER: 57
Multiplexed Cell Sorting Using Individually Addressable and Dynamic DNA Gates

Dahotre SN, Chang YM, Weiland A, Romanov AM, Tao K, Stammen SR, Ahmed R, Kwong GA

Introduction: Isolating cells based on the expression of specific surface markers has resulted in numerous applications for biomedicine. However, established cell sorting platforms rely on labels that are limited in number due to biophysical constraints (e.g. overlapping emission spectra of fluorophores). Here we establish DNA gated sorting (DGS) using a system of orthogonal and extensible DNA gates that label target cell populations for magnetic bead isolation en masse and then selectively unlock by strand displacement to sort cells.

Methods: DNA gates consisting of orthogonal DNA strand displacement reactions were uniquely conjugated to antibodies or streptavidin. To sort cells, Ab-DNA gates or pMHC tetramer-DNA gates were linked to magnetic beads to capture target cells; individual populations were then isolated by sequentially releasing magnetic beads by strand displacement.

Results: We first validated displacement kinetics and gate orthogonality on DNA-gated antibodies by initiating strand displacement on initially quenched Ab-DNA gates to release the quencher strand, observing complete displacement within 5 minutes. Next, we benchmarked DGS against commercial magnetic kits by sorting CD8+ cells from mouse splenocytes, finding no difference in sorting efficiency. We then performed a multiplex sort using DGS to isolate CD8+, CD4+, and CD19+ cells from mouse splenocytes, achieving purities >90%. Finally, we extended DGS to pMHC tetramer sorting by isolating antigen-specific T cells from a mouse model of LCMV infection.

Conclusion and Translational Impact: This DNA-based nanotechnology can potentially be expanded to exceed the capacity of current methods for sorting multiple types of cells, improve biomedical diagnostics, and provide new insights into cell biology.

Deal, Lee Anna MEd (University of Georgia) POSTER: 36
Georgia 4-H'ers Set Their Sights on Medical School

Bland LV, Deal LM, McGonagill B, Smith AW, Sumner, JR

Introduction: In 2016, 12% of the MUSM applicant pool was from rural, medically underserved Georgia. MUSM established a partnership with Georgia 4-H to reach its target population of youth in rural, medically underserved Georgia to increase the number of rural applicants. The goals of the partnership are to increase awareness of the physician shortage in rural Georgia and expose students to medicine and healthcare careers.

Methods: MUSM and Georgia 4-H designed the program, "Setting Your Sights on Medical School." Hosted on a MUSM campus, students rotate through seminars taught by MUSM Faculty and Students about physiology, patient interaction, rural medicine, telemedicine, medical research, and the application process. To date, 84 4-Hers participated in three events. Participants are allowed ongoing access to the MUSM Medical Library and engage in shadowing/mentoring opportunities.

Results: Survey data indicates 85% of participants' understanding of career opportunities in healthcare and awareness of resources to be successful in medical school increased. 92% better understood the academic requirements and process for applying to medical school. Participants reported their increased awareness of the physician shortage in rural Georgia.

Conclusion: Evaluation data suggests the program contributes to goals of increasing knowledge of healthcare careers and requirements for medical school. Evaluation of the impact on youth pursuing a career in medicine is on-going.

Translational Impact: Continued exposure of youth from rural Georgia to medicine through these initiatives is necessary to increase the number of students who aim to become rural physicians. Providing shadowing/mentoring opportunities is key to support the students on the pathway to medical school.

Farrell, Annie Nguyen BS (Emory University) POSTER: 37
Urinary Tract Infections in Children with Kidney Allografts: Risk Factors and Clinical Consequences

Farrell AB, Greenbaum L, Leong T

Background: Renal transplantation (tx) is the optimal treatment for end stage renal disease (ESRD) in children, but post-tx urinary tract infections (UTIs) may cause morbidity and reduce allograft survival.

Objectives: To quantify the number and risk factors for UTIs in pediatric kidney tx recipients in preparation for an analysis of the morbidity and impact of UTIs on allograft survival.

Methods: We identified all patients who underwent kidney tx between 2001 and 2016 (n= 390) at Children's Healthcare of Atlanta (CHOA). Patients were included if they had >1 yr of follow-up at CHOA. We conducted an IRB-approved, retrospective review of patient demographics, medical history, and tx outcomes in the 5 yrs following tx.

Results: Of the 205 records reviewed to date, we identified 176 eligible patients (61.9% male). Mean age at tx was 11.7 ± 5.5 yrs. 58.5% had a deceased and 41.5% had a living kidney donor. Obstructive uropathy was the etiology of ESRD in 21.0%. Mean UTIs in all patients was 1.1/patient \pm 2.7. On preliminary analysis, patients with a history of obstructive uropathy were more likely to develop a UTI than patients without (45.9% vs. 25.2%, $p = 0.014$). There is a trend to more UTIs in patients with a history of obstructive uropathy compared to patients without (2.1 ± 3.5 vs. 0.9 ± 2.4 , $p = 0.055$). In males, there were more UTIs in patients with a history of obstructive uropathy compared to patients without (1.7 ± 2.9 vs. 0.5 ± 1.5 , $p = 0.024$). 23.2% of all patients were on UTI prophylaxis post-tx; trimethoprim-sulfamethoxazole was the prophylactic antibiotic in 54.5%.

Conclusions: UTIs are common post kidney tx in children, especially in those with a history of obstructive uropathy. The associated morbidity and impact on graft survival are unknown.

Han, Woojin Ph.D. (Georgia Institute of Technology) POSTER: 25
Synthetic Bioadhesive Matrix Facilitates Muscle Stem Cell Transplantation and Engraftment in Dystrophic Diaphragm
Han WM, Anderson SE, Mohiuddin M, Jang YC, Garcia AJ

Introduction: Duchenne muscular dystrophy (DMD) is a devastating genetic disorder. A leading cause of death in DMD is diaphragm muscle deterioration, and current respiratory care, such as mechanically assisted ventilation, remains palliative. Muscle satellite cell transplantation restores dystrophin, but cell delivery strategies designed to target the diaphragm have not been developed. The objective is to engineer a synthetic matrix to deliver satellite cells to the dystrophic diaphragm.

Methods: We engineered a synthetic matrix that supports primary satellite cell function using hydrogels based on PEG-4MAL macromers. We further developed a delivery strategy to firmly integrate the engineered hydrogel to the inferior surface of the dystrophic murine diaphragm.

Results: Satellite cells cultured in the RGD-presenting hydrogel exhibited superior survival, proliferation, and differentiation compared to the cells cultured in RDG, YIGSR, and C16-presenting hydrogels. The optimal stiffness ($G' 175$ Pa) and mesh size (30 nm) of the hydrogel was determined to further enhance the cell function. Fluorescently-labeled hydrogel delivered to the diaphragm remained localized to the site of delivery, whereas uncrosslinked control resulted in a non-specific distribution to other internal organs. Finally, GFP+ satellite cells delivered to the diaphragm using the engineered hydrogel survive, proliferate, and engraft in vivo.

Conclusion: A synthetic matrix that supports primary satellite cell function, and the delivery strategy to the dystrophic diaphragm has been engineered.

Translational Impact: This work is significant in advancing the respiratory treatment strategy in DMD. Salvaging the failing diaphragm muscle will positively impact healthspan and quality of life.

Hood, Jacob E. M.S. (University of Georgia) POSTER: 28
Glucose Concentration Affects Fibrin Clot Structure: Morphological Characteristics and Glycation Quantification
Hood JE, Averett RD

Introduction: The roles, functions, and regulations of hemostatic response components have been studied extensively, yet clotting in the diseased state of Diabetes Mellitus (DM) remains a serious epidemiological concern as cardiovascular events have shown to be higher for these individuals.

Methods: Fibrin gel z-stacks, polymerized at a consistent 3.4 g/L of fibrinogen to mimic an increased, yet physiologically relevant, fibrinogen concentration consistent with DM, were surveyed on a LSM 880 with 20X Plan-Apo/0.75 NA and DIC capability at 2x optical zoom.

Results: A novel image analysis technique, developed in MatLab (MATLAB; The MathWorks, Natick, MA), was able to successfully visualize fibrin gel conditions (0.0mM, 6.0mM, and 10.0mM), and evaluate three fibrin clot structure characteristics (fibrin fiber overlap, fibrin fiber length, and fibrin matrix porosity) in those conditions. [Conclusions] Overall, glucose

concentration significantly influenced fibrin clot structure measurements and were statistically significant ($p > 0.0001$) for all three concentrations of glucose.

Translational Impact: As significant differences in clot structure characteristics were distinguishable, this novel image detection technique could provide medical professionals with an alternative diagnostic tool if tailored to human plasma and coupled with the appropriate epidemiological data.

Jacob, Bobby PharmD (Mercer University) POSTER: 14
Clinical Outcomes Associated with Potential Misclassification of Clostridium Difficile Infection
Jacob BC, Peasah SK, Shogbon AO

Introduction: The objective of this study was to evaluate clinical outcome differences between patients with community onset (CO) CDI compared to those with potential misclassification as healthcare facility-onset (HO) CDI.

Methods: This was a retrospective, observational study of adults with a positive stool sample for Clostridium difficile from January 1, 2015 to March 31, 2016. Patients were classified as definite community-onset CDI (positive stool sample within 3 days of admission) or healthcare facility-onset (positive stool sample at least 3 days post-admission). The healthcare facility-onset group was further analyzed to identify patients who were symptomatic within 3 days of admission but had a ≥ 3 day delay in obtaining a stool sample for Clostridium difficile (possible community onset CDI group). The definite and possible community-onset groups were compared with respect to demographics and clinical endpoints.

Result: A total of 130 patients were evaluated including the definite community-onset CDI group ($n=105$) and possible community-onset CDI group ($n=25$). Potential inaccurate CDI classification was due to delay in physician laboratory order ($n=13$) or delay in stool sample collection ($n=12$). Baseline demographics between groups were similar. No significant outcome differences were found except that the possible community-onset group had a longer total length of stay (10.8 vs. 7.6 days, $P=0.0075$) and duration of inpatient CDI treatment (5.5 vs. 3.5 days, $P=0.0352$).

Conclusion: These findings suggest that misclassification of CDI may be associated with longer hospital stay and treatment duration.

Translational Impact: Further research is warranted in larger health systems to determine clinical and economic consequences.

Joshi, Devyani (Mercer University) POSTER: 21
Formulation and Testing of Novel Particulate Measles Vaccines via Transdermal Laser Ablation and in Oral Dissolving Films (ODF)
Joshi DJ, Bajaj L, Gala R, Popescu C, Knipp GT, McCain RR, Ubale RV, Addo R, Bhowmik T, D'Souza MJ

Introduction: We formulated oral and transdermal measles vaccine for needleless delivery for better patient-compliance. Goal was to explore potential of oral disintegrating films (ODF) loaded with measles vaccine microparticles and transdermal vaccination using laser ablation technology for long-lasting immune response.

Methods: The measles virus antigen was formulated using pre-crosslinked bovine serum albumin. The solution was spray dried to form microparticles containing the vaccine antigen using Buchi Spray Dryer B-290. The ODF Film formulation was cast into thin strips using the BYK-Gardner equipment and air dried. The ODF vaccine was tested in-vivo in pigs by buccal delivery. Blood serum samples were collected every 2 weeks and antigen specific ELISA was performed to quantify amount of specific antibody. For transdermal vaccination the vaccine microparticles were delivered into pores created in skin by laser ablation by suspending in Phosphate buffered saline.

Results: The size range of microparticles was 400-1200 nm. The desired film strength & disintegration properties were obtained by pre-gelatinized hydroxypropyl pea starch & Lycoat RS720. Significant increase in specific antibodies against measles was observed after 4 weeks of dosing and remained elevated until end of 6 week. There was significant increase in serum IgG levels when compared with serum IgG levels pre-dosing and post-dosing.

Conclusion: Buccal delivery of ODF loaded with vaccine microparticles is promising immunization delivery system.

Translational Relevance: ODFs are inexpensive and effective means to deliver vaccines orally without use of needles. Transdermal vaccination using laser ablation technology is a non-invasive route of vaccine delivery and will help to increased patient compliance.

Kaiser, Erin BS (University of Georgia) POSTER: 24

Human Neural Stem Cell Extracellular Vesicles Promote Acute and Chronic Recovery in a Porcine Model of Ischemic Stroke

Kaiser EK, Jurgielewicz BJ, Spellacy SE, Robin L. Webb RL, Platt SR, Stice SL, West FD

Introduction: Stroke annually accounts for 1 in 20 deaths in America. Rodent studies suggest neural stem cell-derived extracellular vesicles (NSC EV) may serve as a neuroprotective therapy for stroke. We evaluated NSC EV effects on intracranial swelling, infarct volume, diffusivity, and white matter in a porcine stroke model.

Methods: Stroke was induced by middle cerebral artery occlusion (MCAO), and NSC EV or PBS treatments were administered intravenously 2, 14, and 24 hours post-MCAO. Magnetic resonance imaging (MRI) T2 Weighted (T2W), Apparent Diffusion Coefficient (ADC), and Fractional Anisotropy (FA) sequences were collected 1 and 84 days post-MCAO.

Results: T2W sequences revealed NSC EV treated pigs exhibited a significantly lower percent increase in hemisphere volume resulting in a less pronounced midline shift relative to control pigs at 1 day post-MCAO. NSC EV treated pigs also demonstrated a significant decrease in infarct volume relative to control pigs at 1 day post-MCAO. ADC assessment revealed signal void indicative of cytotoxic edema; However, NSC EV treated pigs exhibited a significantly lower percent decrease in ADC values relative to control pigs 1 day post-MCAO suggesting improved diffusivity in ischemic lesions. NSC EV treated pigs exhibited a significantly lower percent decrease in corpus callosum FA values when compared to control pigs suggesting preserved white matter integrity at 84 days post-MCAO.

Conclusion: These results suggest NSC EV treatment led to decreased hemisphere and infarct volumes, promoted diffusivity, and preserved white matter integrity. **Translational Impact:** With these improvements in stroke, NSC EV treatment represents a translatable therapy that may change the current therapeutic paradigm of stroke.

Kim, Yujin PharmD (Mercer University) POSTER: 67

Fabrication and Characterization of Hyaluronic Acid Microneedles to Enhance Delivery of Magnesium Ascorbyl Phosphate into Skin

Kim Y, Hildebrandt C, Banga AK

Purpose: Microneedles (MNs) are widely investigated for enhancing drug delivery into the skin. Hyaluronic acid (HA) is preferred for MNs fabrication as it is biocompatible, viscoelastic, and moisturizing. In this study, HA MNs were fabricated, with and without magnesium ascorbyl phosphate (MAP-vitamin C derivative), to facilitate the delivery of MAP, into and across the dermatomed human cadaver skin.

Methods: A solution of HA (10% w/v), with or without 3% MAP (w/v) was added onto a Polydimethylsiloxane mold under vacuum and then desiccated. PLGA (poly-lactic and glycolic acid) was used to form the backing layer. To characterize microchannels and microneedles, scanning electron microscopy, confocal microscopy, methylene blue staining, and histology were performed. In vitro permeation studies were conducted using Franz diffusion cells.

Results: HA MNs (100 needles ~425 μ m long) were fabricated. Methylene blue studies depicted 95-100 microchannels. A significantly higher amount of MAP was delivered from poke and solution group ($82.24 \pm 25.08 \mu\text{g}/\text{cm}^2$) and drug in microneedle group ($15.96 \pm 3.87 \mu\text{g}/\text{cm}^2$) as compared to the passive group ($5.36 \pm 2.69 \mu\text{g}/\text{cm}^2$) ($p < 0.05$).

Conclusion: Passive permeation of MAP was low, which was enhanced using HA microneedles. Treatment of skin with blank HA microneedles followed by application of drug solution, showed higher drug delivery as compared to drug-loaded microneedles. This study demonstrated successful fabrication of HA microneedles facilitating MAP delivery.

Translational Impact: The present study provides an alternative to MAP administration, resulting in enhanced delivery of a hydrophilic molecule into skin. The approach can be translated to bedside providing non-invasive drug delivery for skin rejuvenation and discoloration.

LaPlaca, Michelle C. PhD (Georgia Institute of Technology) POSTER: 46
Multimodal Neurological Assessment Distinguishes Deficits Between Concussed and Control Subjects
LaPlaca MC, Medda A, Espinoza TE, Liu B, Kosoris NA, Wright DW, Gore RK

Concussion is a heterogeneous condition caused by a biomechanical force to the head that leads to neurological dysfunction, which persists in a small portion of patients. Concussion symptoms are highly variable from person to person, requiring assessment across neurological domains. To date there is no single tool that measures function across multiple domains. We developed a multimodal battery—Displayed Enhanced Testing for Cognitive Impairment and Traumatic Brain Injury (DETECT)—that assesses neurocognitive, oculomotor, and vestibular function in an immersive gaming environment. In this study we delivered tests for reaction time, target tracking, and nonpostural balance in clinically diagnosed concussion patients (n=25, 17.6 yo +/- 4.8, 52% male) and age-matched controls (n=88, 17.0 +/-3.8, 53% male) to determine the discriminating ability of DETECT. Concussed patients sought care for persistent symptoms from a specialty clinic within 6 months of diagnosis. Controls had no concussion in the prior 6 months. Reaction time was significantly different between the cohorts (average, p=0.025; maximum, p=0.016). Target tracking results showed a difference for both slow (< 0.96 rad/s) and fast (>1.6 rad/s) target speeds between concussed and control subjects (p<0.001 for both speeds). Several metrics for nonpostural balance, in which a subject uses head movement to balance a ball on a seesaw, showed significant differences (average ball acceleration, percentage of time inside gate, wavelet entropy, approximate entropy, sample entropy, p<0.05). These results indicate that deficits for persistent symptoms cross neurological domains and that DETECT may be a useful tool in concussion assessment. Funding: NFL/GE/UnderArmour Head Health II Challenge award.

Lee, Jung Sun PhD, RDN (University of Georgia) POSTER: 31
University of Georgia Supplemental Nutrition Assistance Program Education (UGA SNAP-Ed): Evidence-based Research and Outreach to Promote Nutritional Health of Vulnerable Georgians
Cotto-Rivera E, Bailey LB, Murray D

Introduction: Georgia's poverty rate is among the highest in the nation and shows a high prevalence of diet-related chronic conditions. There is an urgent need for evidence-based interventions to improve nutritional health of low-income Georgians.

Methods: UGA SNAP-Ed, a USDA funded program was established in 2013 to help low-income Georgians establish a healthy eating and physically active lifestyle through evidence-based nutrition education and obesity prevention interventions based on the collective capacity of UGA and existing infrastructure of UGA Cooperative Extension. UGA SNAP-Ed has been developing innovative, culturally appropriate multilevel interventions using a unique model combining robust interdisciplinary research and outreach and collaboration with diverse stakeholders across the state.

Results: UGA SNAP-Ed has established four complementary face-to-face, eLearning, social marketing, and policy, systems, and environmental change nutrition interventions, and strives to reach low-income Georgians statewide. During FY2017, UGA SNAP-Ed reached 2,609 vulnerable Georgians for face-to-face and eLearning interventions and about 2.8 million Georgians for social marketing interventions. Comprehensive evaluation data suggest UGA SNAP-Ed support participants' willingness to engage and actual engagement in recommended eating and physical activity behaviors.

Conclusion: UGA SNAP-Ed has successfully established a statewide dissemination and implementation model to reach and impact the nutritional health outcomes of vulnerable Georgians.

Translational Impact: UGA SNAP-Ed's research and outreach infrastructure have the potential to inform the development, implementation, and evaluation of translational research to promote nutritional health of vulnerable Georgians.

Lee, Sujin BA (Emory University) POSTER: 60
Proof of Concept Study for the Evaluation of Peripheral Calcium Score as a Measure of Peripheral Arterial Disease Severity
Lee S, Arya S, Kalra K

Peripheral arterial disease (PAD) is a global atherosclerotic pandemic affecting 200 million people. The gold standard for diagnosing PAD is ankle-brachial pressure index (ABI), which is blood pressure at the ankle divided by pressure at the arm. PAD diagnosis is complicated by vascular calcification, which falsely elevates ABI. Few studies have used imaging to quantify calcification in lower extremity arteries. No studies have compared the diagnostic value of peripheral calcium volume score (PCVS) with ABI in a general PAD cohort. In this study, we describe the association of PCVS with continuous ABI values and ABIs categorized by severity of PAD: severe (<0.5), moderate (0.5-0.9), normal (0.9-1.4), noncompressible (>1.4). We hypothesized that smaller ABI would be associated with larger PCVS and that PCVS would differ among ABI categories. We

calculated PCVS on CTAs of infrarenal aorta and runoffs in a novel application of coronary calcium scoring module on peripheral arteries. In a multiple linear regression analysis, ABI was inversely associated with PCVS while holding age, race, smoking status, medication use, and comorbidities constant ($p < 0.01$). In an analysis of covariance, differences in mean PCV were significant across ABI categories ($F(3,27) = 4.74$, $p = 0.01$). Mean PCV was significantly different for ABIs < 0.5 and $0.5-0.9$ ($p = 0.08$), < 0.5 and > 1.4 ($p = 0.01$), and $0.5-0.9$ and > 1.4 ($p = 0.09$). Accounting for type II error in an accrued sample size of 40, we assumed that p values close to 0.05 represented very large effects. We conclude that mean PCV is a valid measure of PAD burden in patients with severe disease. Our study serves as proof of concept for development of a comprehensive peripheral calcium scoring system to evaluate PAD severity in the general population.

Li, Changwei MD, PhD (University of Georgia) POSTER: 16
Associations of Ages at Menarche and Menopause with Hypertension among Middle-aged and Older Chinese Women: The China Health and Retirement Longitudinal Study
Changwei Li, Tingting Liu, Luqi Shen, Ye Shen, Toni Miles

Introduction: Previous studies reported inconsistent associations ages at menarche and menopause with risk of hypertension.

Methods: We evaluated associations of ages at menarche and menopause with blood pressure (BP) and risk for hypertension among participants of the China Health and Retirement Longitudinal Study, a nationwide representative sample of Chinese women aged 45 years and older.

Results: After controlling for age, education, marital status, living areas, smoking, and drinking, 1 year early of menarche was associated with 0.81 ($P < 0.001$) and 0.42 ($P < 0.001$) mmHg higher medication adjusted systolic and diastolic BP, respectively, and 7% (95% CI: 4%-10%) higher odds of hypertension. When further controlling for body mass index (BMI), blood glucose, and lipids, the associations were still significant. Spline analyses did not support a U-shaped relationship between menarche age and hypertension risk ($P = 0.35$). When breaking down by living areas, menarche age was only associated with BP and hypertension among women living in rural areas. Menopause age was positively associated with hypertension prevalence (Odds ratio [OR]=1.02 per year delay of menopause, 95% CI: 1.01-1.03). However, when further controlling for BMI, menopause age was no longer associated with hypertension (OR=1.01, $P = 0.30$).

Conclusion: Our study suggested that the effect of menarche age on BP and hypertension may be modified by factors that were related to living areas in China. In addition, the effect of menopause age on hypertension was mediated by BMI.

Translational Impact: The impact of early menarche on risk of hypertension in late adulthood can be alleviated by factors related to living areas. In addition, managing body weight in women around menopause helps to prevent hypertension.

Li, Jessica BS (Emory University) POSTER: 63
Long-Acting Reversible Contraceptive Uptake in Female Sex Workers and Single Mothers in Rwanda and Zambia
Li JL, Parker RH, Wall KM, Haddad LB, Allen S

Introduction: Long-acting reversible contraception (LARC) has been well established as the most cost-effective form of contraception, but LARC usage in developing countries remains low. We implemented an integrated family planning program to increase LARC uptake in Rwanda and Zambia.

Methods: We enrolled three cohorts of single sexually active HIV-negative women: single mothers (SM) in Zambia, female sex workers (FSW) in Zambia and FSW in Rwanda. Participants were followed every three months for up to 5 years. At each visit, participants were counseled on contraceptive options and offered a LARC method. Data was collected on demographic factors, sexual and reproductive history, and gynecological exams and laboratory tests were performed.

Results: 458 Rwandan FSW, 555 Zambian FSW and 521 Zambian SM, were enrolled. Preliminary results show an increase in LARC usage from 21% at screening to 51% at the end of follow-up among Rwandan FSW, an increase from 12% to 42% in Zambian FSW and an increase from 18% to 44% in Zambian SM. We hypothesize that demographic factors and sexual history will be associated with increased LARC uptake. We also hypothesize that LARC users will have lower proportions of contraceptive method discontinuation and incident pregnancy compared to non-LARC users.

Conclusion: FSW and SM are disproportionately affected by high rates of unintended pregnancy. It is imperative that family planning interventions in developing countries target these populations to overcome obstacles in reproductive health and promote gender equality.

Translational Impact: Our study will provide necessary insights to an integrated family planning program, which will guide future efforts to design, implement and evaluate family planning initiatives for high-risk populations.

Liao, T. Vivian PharmD, BCPS (Mercer University) POSTER: 62
Implementation of an Analgesation Protocol in Critically Ill Trauma Patients

Zayas M, Liao TV, Pounds T, Peasah SK, Snawerdt J, Keddo A, Walker M

Introduction: Current literature supports accurate and frequent pain assessment with an analgesic-first approach as part of the management of analgesia and sedation for mechanically ventilated patients in the Intensive Care Unit (ICU). However, literature evaluating the impact of protocol use in elderly and trauma patients is limited. The objective of this study is to evaluate the duration of mechanical ventilation before and after implementation of a Pain, Agitation and Delirium (PAD) protocol in critically ill trauma patients with a focus on patients older than 65 years.

Methods: This study was an observational cohort study during two study phases. Phase I (October 2013 - September 2014) was the historical control and pre-protocol implementation period. Phase II (October 2014 - September 2016) served as the post-protocol implementation period. The primary objective was to assess the impact of an analgesia-first approach and light level sedation protocol on the clinical outcomes of mechanically ventilated patients. The primary outcome was to compare the difference in time on mechanical ventilation pre- and post-protocol implementation among participants.

Results: There were 85 patients in pre-implementation period and 72 patients in post-implementation period. The mean duration of mechanical ventilation was 7.89 days in the pre-implementation group compared to 6.72 days in the post-implementation group (p-value = 0.36).

Conclusion: The preliminary results indicate a shorter duration of mechanical ventilation in the post-protocol study phase, but the results were not statistically significant.

Translational Impact: This research can help to improve clinical outcomes in critically ill trauma patients and also elderly patients.

Livingston, Arletha PhD, MPH, MBA (Morehouse School of Medicine) POSTER: 10
Bridge Builders to Health Equity: High School Community Health Workers Training Program

Ervin CE, McCray G

During the summers of 2016 & 2017, MSM piloted an innovative High School Community Health Worker (HSCHW) Training Program. The goal of the program is to engage high school students from underserved communities to find innovative ways to impact health outcomes for those communities. The Objectives of the program are to:

- Increase the number of trained student community health workers to assist with community health programs in underserved communities
- Provide a health careers pipeline program and mentorship for underserved students
- Support & Promote the Community Health Worker field
- Promote health education and health literacy in schools and community
- Assist trained HS CHWs with the design and implementation of school-based and community-based health initiatives
- Provide health monitoring and health literacy activities to students' family members and community members

During the pilot, MSM trained 32 High school students from 6 metro-Atlanta High Schools (Banneker, Tri-Cities, Mays, McClarin, Washington, KIPP Collegiate). Students are ages 15-18, rising sophomores-recent graduates. This is the 1st HSCHW training program in the country to be implemented. The pilot program has achieved great preliminary outcomes and the program model is highly sought after by Universities and Community-based Organizations. This presentation addresses how utilizing an innovative multidisciplinary approach to training high school community health workers (translational research) impacts health and social disparities in underserved populations in urban metro Atlanta as well as demonstrates a way in which we can begin to create a pipeline of potential CHWs and other health careers.

Matthew, Rebecca MPH, MSW, PhD (University of Georgia) POSTER: 49
“Promotores” as Cultural Brokers: Fostering Bridges Toward Prosperous and Healthy Communities
Matthew R, Orpinas P, Calva A, Bermudez M, Darbisi C

Introduction: The community health worker/Promotoras de Salud model has been used successfully in the US since the 1950s to enhance access to and quality of health and social services. This presentation describes the process of moving from a community assessment to the development of a promotoras program—Lazos Hispanos/Hispanic Links—in the Athens Latino community. We discuss preliminary results regarding the process of engaging and training the promotoras, obtaining IRB approval, establishing a mixed-method evaluation process, and fostering community wide-support from local health and service providers.

Method: Grounded in community-based participatory research and Latina feminist theory, the current research employs a mixed-method, non-experimental, pre-post time series design, involving three participant groups: promotoras, clients, and service providers. Quantitative data are entered into REDcap and analyzed via SPSS software; qualitative data are thematically analyzed via Atlas.ti.

Results: The community faces several barriers to access healthcare: lack of health insurance options, limited access to specialist providers, challenges navigating health/social service applications, and limited Spanish-language resources. We also find a cadre of committed service providers ready to respond to noted barriers, and a dynamic and deeply engaged group of promotoras eager to continue to enhance access to and quality of services within their community.

Conclusion & Translational Impact: Calling upon scholars from 7 disciplines, 9 community partners/service providers, and 9 promotoras/investigators, the current translational research highlights the promise of interdisciplinary and collaborative promotoras programs in developing a health-supportive infrastructure.

McKinley, DeAngelo B.S. (Mercer University) POSTER: 20
Impact of a Pharmacist-Led Intervention Program on the Readmission Rates of African-American Men with Heart Failure
McKinley D, Akil A, Moye PMM

Introduction: The primary aim of this research was to evaluate whether a multidisciplinary team approach to treating heart failure, with an emphasis on incorporation of a pharmacist component to the standard of care, reduces readmission rates in African American males.

Methods: The control group were AAM with heart failure (AAM-HF) who received care before the implementation of the pharmacist to standard of care. The intervention group consisted of AAM-HF who received care with the addition of a pharmacist during the 18-month evaluation period. Machine learning approaches classification, available for Python 3.6 were used to analyze the data and assess whether the intervention was predictive of reduced readmission rates. All-cause readmission within 30-days was the outcome variable. Several classifiers were tested during model building including random forest, lasso, k-nearest neighbor (KNN), support vector machine and artificial neural networks.

Results: The KNN classifier performed best, and was able to correctly classify readmission status in 82.5% of patients with a C-statistic of 0.82. Attributes found to be predictive include: the intervention, ejection fraction < 40%, obesity, dyslipidemia, pacemaker, nitrate and other cardiovascular medication use, and smoking. Further analysis showed the intervention to be predictive of reduced 30-day readmission.

Conclusions: Analysis by machine learning showed the pharmacist-led intervention to be predictive of reduced 30-day readmission in AAM-HF. Future studies are warranted to validate these findings further and to explore whether such an intervention can potentially reduce readmission rate of patients with other disease states.

Menon, Ipshita M.Pharm (Mercer University) POSTER: 27
Innovative RSV virus like particulate vaccines for RSV infection
Menon IJ, D'Sa S, D'Souza MJ

Introduction: The respiratory syncytial virus (RSV) is highly prevalent in children and manifests itself in the form of bronchiolitis and pneumonia. One of the major proteins present in the virus, is the fusion protein F, which can be integrated into a virus-like particle (VLP), yielding a highly immunogenic F-VLP antigen.

Methods: In this study, the F-VLP antigen was incorporated into a biodegradable polymer matrix and its in vitro immunogenicity was evaluated in a mechanistic study to evaluate surface co-stimulatory expression, wherein antigen presenting cells were stimulated with the vaccine-adjuvant combinations. Further, vaccine-adjuvant combination was administered to C57BL/6 mice via the transdermal route using microneedles (AdminPatch®) to evaluate the immunogenicity of the vaccine in vivo.

Results: Particulate vaccines with or without adjuvants significantly increase expression of immune markers such as nitric oxide and resulted in enhanced cell-surface expression of CD80/86, CD40, MHC II and CD54/ICAM-I on dendritic cells. In vivo studies using the non-invasive transdermal route demonstrated elevated humoral and cell-mediated immune responses in a mouse model.

Conclusion: These preliminary studies prove the efficacy of the RSV F-VLP microparticulate vaccine as a novel immunotherapeutic strategy in the future development of a vaccine against RSV.

Translational Impact: RSV leads to the hospitalization of approximately 3.4 million children annually and nearly 160,000 people die due to RSV infection worldwide. There are no licensed vaccines available today for RSV. The successful development of this vaccine would open a new paradigm in the treatment of RSV and would in turn save many human lives.

Metzger, Nicole L. PharmD (Mercer University) POSTER: 48
Development of Acute Kidney Injury in Patients with Cystic Fibrosis Treated with Tobramycin Versus Colistin
Metzger NL, Wallace MD, Peasah SK, Walker SD

Introduction: Acute kidney injury (AKI) is an adverse event associated with use of intravenous (IV) tobramycin or colistin when treating exacerbations of cystic fibrosis (CF).

Methods: A single-center, retrospective medical record review of adult patients admitted for a CF exacerbation who received IV tobramycin or colistin was conducted. The primary endpoint compared the incidence of Acute Kidney Injury Network Stage 1 AKI between patients who received tobramycin or colistin. Secondary endpoints included incidence of any stage AKI and identification of variables associated with AKI. Chi-square and Student's t-test compared nominal data and interval data, respectively. Logistic regression was used to find associations between development of AKI and body mass index, serum creatinine, and dose.

Results: Of 134 patients, 64 received tobramycin and 70 received colistin with a mean daily dose of 10.6 mg/kg and 3.3 mg/kg, respectively. The only significant difference between the groups was that more patients received vancomycin with tobramycin than with colistin (50% vs. 31.4%, $p=0.035$). Increasing doses of colistin was associated with increased odds of AKI ($p=0.045$). The incidence of Stage 1 AKI did not differ between the drugs (tobramycin 17.2% vs. colistin 12.9%; $p=0.628$), nor with any stage of AKI.

Conclusion: The incidence of AKI in patients admitted for CF exacerbation was similar between those treated with IV tobramycin or colistin but higher doses of colistin increased the odds of AKI.

Translational Impact: Since the incidence of AKI is similar, providers should assess additional factors when choosing tobramycin versus colistin for treatment of CF exacerbation and be cautious with high doses of colistin.

Naskou, Maria C. DVM (University of Georgia) POSTER: 42
Equine Platelet Lysate Gel: a Novel Matrix for Mesenchymal Stem Cell Delivery
Naskou MC, Copland IB, Galipeau J, Peroni JF

Introduction: To orchestrate healing, Mesenchymal Stem Cells (MSCs) need to remain in the site of injury for days to weeks depending on the application. The lack of evidence of MSC localization in injured tissues and of the correlation between MSC retention and repair outcomes precludes the optimization of cell therapies. The hypothesis was that equine platelet lysate gel (ePL gel) supports the viability, proliferation and immuno-modulatory function of MSCs.

Methods: A tunable gel matrix was obtained from ePL. Equine bone-marrow derived MSCs were encapsulated in ePL gel and viability was assessed over a 5-day period. To assess the ability of MSCs to modulate the inflammatory response, equine monocytes were stimulated with LPS and co-incubated with either ePL gel or MSCs encapsulated in ePL gel. Cell culture supernatants were assayed for the production of the pro-inflammatory cytokine TNF- α .

Results: MSCs incubated in lysate gel demonstrate high viability over a 5-day period. Moreover, MSCs encapsulated in the gel exhibit escalating proliferative rate over a 7-day period. We determined that monocyte production of TNF- α declined by 50% in the presence of the gel. Furthermore, it appeared that the inclusion of MSCs in the gel resulted in a more efficient suppression of TNF- α .

Conclusions: These results open the opportunity to further investigate the biological characteristics of ePL gel in the context of optimizing MSC retention into injured tissues. Future studies include in vivo experiments evaluating the potency of ePL gel as a matrix for the delivery of MSCs to injured musculoskeletal tissues.

Translational Impact: A lysate gel matrix could be similarly manufactured from all species to promote the localization and persistence of cell therapies at the site of injury.

Naskou, Maria C. DVM (University of Georgia) POSTER: 43
Equine Platelet Lysate Affects the Immunomodulatory Capacity of Mesenchymal Stem Cells

Naskou MC, Sumner S, Copland IB, Galipeau J, Peroni JF

Introduction: The mesenchymal stem cell (MSCs) secretome plays an important role to regulate influx of endogenous progenitor cells, mediate apoptosis, fibrosis and tissue revascularization and, most notably, to decrease of inflammation and promote immune-regulation. MSCs have been proposed as a therapeutic for use in systemic and local inflammatory injuries. MSCs produced for clinical use rely on the use of the xenogeneic culture media fetal bovine serum (FBS) which has the potential to cause immune reactions. Platelet lysate (PL) is a homologous alternative to FBS which is showing promise as a cell culture supplement. We therefore sought to determine the effect of equine PL and conditioned media (CM) on the ability of MSCs to regulate the activation of LPS-stimulated monocytes.

Methods: Equine MSCs were cultured in FBS or equine PL and PL or FBS CM were generated. LPS-stimulated equine monocytes were exposed to the following conditions: (a) MSCs cultured with FBS or PL, (b) FBS and PL CM (c) PL alone. Cell culture supernatants were collected at certain time points and assayed for the production of the pro-inflammatory cytokine tumor necrosis factors-alpha (TNF- α) through ELISA.

Results: LPS-stimulated monocytes exposed to MSCs cultured in PL or FBS and PL CM produced significantly less TNF- α than LPS-stimulated monocytes alone. Exposure to PL achieved greater suppression of TNF- α release.

Conclusions: We show that media alone without MSCs may suppress monocyte activation better than MSCs, therefore, biological products such as PL may be considered for the regulation of cell-mediated immune responses.

Translational Impact: developing FBS free culture media may have significant impact on the efficacy of cell therapeutics across species.

Oppong-Damoah, Aboagyewaah (Mercer University) POSTER: 4
Nanoparticle Encapsulation of Oxytocin Increases its Brain Penetration and Duration of Action In Vivo

Oppong-Damoah A, Zaman RU, D'Souza MJ, Murnane KS

Introduction: The blood-brain barrier (BBB) serves as a major limitation to the delivery of therapeutics for central nervous system (CNS) disorders. Current methods to deliver large-molecule therapeutics to the CNS include intrathecal administration, direct surgical cannulation, and intranasal delivery.

Methods: In this study, we utilized both in vitro and in vivo models to evaluate the brain uptake of oxytocin encapsulated nanoparticles (OT-NP) conjugated with two different brain targeting ligands. As OT is a highly prosocial molecule, and intranasal delivery of OT is being developed for Autism Spectrum Disorder (ASD) and other social deficit disorders, intranasal administration was employed for in vivo bioimaging and efficacy evaluations using dyadic social interactions.

Results: In vitro studies showed successful NP transport across a murine brain endothelial cell (Bend.3 cells) model of the BBB. Brain imaging studies with a LI-COR Odyssey bioimager showed significantly higher brain penetration of indocyanine green (ICG) dye NP, with a peak intensity of brain ICG uptake at 2 hours. Dyadic social interaction experiments revealed significantly higher social interactions 2 hours after administration of both types of NPs, which was sustained for at least 3 days. Interestingly, the type of brain targeting ligand influenced the nature of the acute social interactions, suggesting differences in the kinetics of brain uptake or the organ selectivity for the brain.

Translational Impact: These multimodal data strongly support the use of our approach to developing a brain targeting and sustained-release formulation of oxytocin. This formulation can now be used to support intranasal delivery of oxytocin and potentially other neuropeptides.

Peasah, Samuel PhD MBA (Mercer University) POSTER: 54
The Role of Pharmacists in the Prevention and Treatment of Hospital-Acquired Infections
Peasah SK, Marshall LL

Introduction: Required public reporting and reimbursement penalties have contributed to the increased focus by hospitals to reduce hospital-acquired infections (HAI). Although management of HAI requires a multidisciplinary approach, we explore the different roles and contributions of hospital pharmacists to summarize approaches pharmacists and pharmacy directors can explore.

Methods: Face-to-face guided interviews of pharmacists from eight hospitals conducted on their role in addressing HAI. Interviews were transcribed and summarized using NVIVO thematic analysis.

Results: The most common HAI mentioned by the pharmacists was *Clostridium difficile*. Among interventions to prevent these infections the common themes included antibiotic stewardship, hygiene, and effective catheter management policies. All respondents saw the role of the pharmacists as stewards of appropriate use of antibiotics to prevent and treat these conditions. Although some mentioned interdisciplinary approach, working with physicians and nurses, majority defer to nurses on the question of prevention and the pharmacists on the question of treatment. *Clostridium difficile* management still remains a challenge but most of the respondents think policies in place to reduce infections are generally effective. Not all had an antibiotic stewardship program.

Conclusion: Pharmacists are actively involved in designing and implementing strategies to reduce HAI. Antibiotic stewardship is an important area where pharmacists can make the most impact.

Translational Impact: This summarizes strategies used by pharmacies in different hospital systems to reduce HAI. Pharmacists and pharmacy administrators can adopt these strategies to improve systems that will help reduce the risks of patients' exposure to HAI.

Powell, Ariathni B.A. (University of Georgia) POSTER: 9
Nutritional and Health Status of Women of Childbearing Age in Accra, Ghana
Powell A, Johnson E, Ansong R, Steiner-Asiedu M, Anderson AK

Introduction: Dietary and lifestyle changes across low and middle-income countries (LMIC) parallel increases in non-communicable diseases and poor pregnancy outcomes. This pilot study examines the nutritional and health indicators of women of childbearing age in Accra, Ghana.

Methods: This was a cross-sectional study of 75 childbearing-aged women in Accra, Ghana. Information on socio-demographics, diet and lifestyle was collected using questionnaires. Blood pressure, fasting blood glucose (FBG) and blood lipids levels were measured to assess health.

Results: Of the 75 participants, 76% had birthed at least 1 child. Median age was 37 years, 56% were college graduates, and almost half were middle-income. Mean BMI was 29.13 kgm² with about 43% of participants being obese. Average percent body fat was 42%. Although participant blood pressure, blood triglycerides and total LDL cholesterol levels didn't differ by weight status, normal weight women tended to have slightly higher total HDL cholesterol. FBG level was not associated with weight status as mean value was within normal range, irrespective of weight.

Conclusion: The majority of participants were overweight or obese with excess percent body fat. However- these anthropometric risk factors did not appear to affect cardiovascular health biomarkers with the exception of total HDL cholesterol which was slightly lower among the overweight and obese. There is therefore a need for larger and potentially prospective studies to examine these associations.

Translational Impact: Findings of this pilot study have potential to be used for identification of early risk factors among women of childbearing age and for health education to ensure healthy pregnancy outcomes in LMIC countries undergoing urbanization and nutrition transition.

Przybyla, Andrzej PhD (University of North Georgia) POSTER: 70

Arm Choices Behavior Depends on Interlimb Differences in Motor Performance: Effect of Sensorimotor Conditions and Long-Term Practice

Akpınar S, Sainburg R, Przybyla A

Previous studies have indicated that handedness, similarly to language and cognition, is associated with brain lateralization, thus hemispheric specializations for different aspects of sensorimotor performance. In particular, Sainburg (2002) developed the Dynamic-Dominance Hypothesis providing evidence that right handers, 80-90% of population, have the left hemisphere specialized in controlling movement dynamics resulting in the right dominant arm proficiencies in dynamic tasks such as reaching or throwing. In turn, the right hemisphere is specialized in controlling movement impedance resulting in the left non-dominant arm proficiencies in postural stability, i.e. holding bread during slicing. In terms of human arm kinematics during reaching movements, the right arm-left hemisphere is able to produce straighter movement trajectories, and the left arm-right hemisphere is able to produce relatively good accuracy. Although these interlimb differences in sensorimotor performance have been evident, handedness has been most often measured by questionnaires that assess an individual's preference for using a particular hand to perform a variety of tasks. While such assessments have proved reliable, they do not address the underlying neurobehavioral processes that give rise to the choice of which hand to use.

In the first study, we hypothesized that an individual's choice of which hand to use for a given task should result from an interaction between underlying neurobehavioral asymmetries and imposed task conditions. We tested this hypothesis by manipulating two factors in targeted reaching movements: (1) region of workspace and (2) visual feedback conditions. The first manipulation modified the geometric and dynamic requirements of the task for each arm, whereas the second modified the sensorimotor performance asymmetries, an effect predicted by previous literature. We expected that arm choice would be reflected by an interaction between these factors. Our results indicated that removing visual feedback improved the relative performance of the non-dominant arm in terms of movement accuracy and increased significantly the choice to use this arm for targets near midline of the body, which were originally reached using the right arm when visual feedback was provided. This effect was enhanced for targets requiring larger movement amplitudes, thus further away from our body. We concluded that the asymmetrical patterns of hand preference are updated and modified with respect to present sensorimotor conditions.

In the follow up study, we examined whether intense high-level long-term training of the right dominant arm might modify arm choice for reaching and performance asymmetries. Eight Olympic level fencers and eight non-fencers performed reaching movements under 3 experimental conditions: (a) nonchoice right, (b) nonchoice left, and (c) choice, either right or left arm as selected by subject. The nonchoice conditions allowed assessment of potential interlimb differences in movement performance, while the choice condition allowed assessment of the frequency and pattern of arm selection across subject groups. Our findings showed that elite fencers, although focusing for years on the right dominant arm training, had substantially greater symmetry between the two arms in both the sensorimotor performance and arm choice measures. We found that greater symmetry in sensorimotor performance resulted from relatively greater improvement of the left non-dominant arm. These findings provide evidence that arm choice behavior and performance asymmetries can be modified by intense long-term training.

Radmard, Vahideh (University of Georgia) POSTER: 65

Investigation of Pressure Effect on the Surface Instability of Soft Biological Tissues

Radmard V, Averett R

Introduction: Creasing in soft biological tissues, in contrast to wrinkling, has not been thoroughly explored and addressed before. Hence, it is essential to study crease formation in soft tissues and set up a systematic approach to quantify phenomenon. Among different parameters that may have an effect on crease formation, our current focus is the effect of pressure. Pressure from intraluminal fluids exist to a greater or lesser extent in organs like airways, esophagi, and brain.

Methods: In this paper we discuss analytically how to bring the effects of normal pressure into the analysis of surface instability in a growing soft tissue. We present a criterion to onset of surface instability on the surface of compressed soft material while the surface is under pressure. The derived criterion is utilized to predict the effect of normal pressure on the growth, instability, and crease formation of a growing soft tissue. Nonlinear finite element simulation is carried out to capture morphological pattern of the growing soft tissue.

Results: Results show that normal pressure on the free surface of compressed soft matter increases the critical compressive strain required for the formation of creases. The critical compressive strain to begin creasing is a function of the dimensionless ratio of the normal pressure and shear modulus of material.

Translational Impact: Our formulation can be extended to study crease formation in several soft biological tissues such as the brain or solid tumors. Mechanical forces influence tumor shape and may be related to tumor proliferation and invasive growth. By our method and with a multilayer model we can predict the critical growth ratio for crease formation of a growing solid tumor in the presence of external and internal pressures.

Rambacher, Kalyn M. B.S. (Mercer University) POSTER: 32
Cysteine-S-Sulfenation Mediates Canonical β 2-Adrenergic Receptor Function in Human Airway

Rambacher KM, Moniri NH

Introduction: Inhaled β 2-adrenergic receptor (β 2AR) agonists are utilized for treatment of asthma attacks by eliciting rapid bronchial dilation. Asthmatic tissue is characterized by increased NADPH Oxidase expression and reactive oxygen species (ROS) levels compared to healthy tissue. We and others have shown that agonism of β 2AR with isoproterenol leads to activation of NADPH Oxidase and generation of intracellular ROS. These ROS oxidize cysteine residues on the β 2AR itself, a functionally significant post translational modification known as cysteine-S-sulfenation, which thus far has not been evaluated for its effects on β 2AR ligand binding or receptor function.

Methods: Utilizing plasma membrane and whole cell radioligand binding, the current study evaluates oxidation state-dependent alterations to ligand binding to the β 2AR in immortalized human lung epithelial cells (CALU3). CALU3 cells were also assessed for oxidation state-dependent alterations to receptor signaling by evaluation of G-protein dependent and independent signaling cascades.

Results: Cysteine-S-sulfenation significantly increases ligand binding to the β 2AR in whole cell and membrane preparations. Labeling of the β 2AR with the sulfenic acid selective small molecule dimedone abolished ligand binding and significantly decreased all receptor signaling.

Conclusions: β 2AR's ability to undergo transient redox modifications to cysteine residues is essential for canonical receptor function.

Translational Impact: Given the oxidative environment native to asthmatic tissue, the findings presented here have implications for asthma treatment with β 2AR agonists, and present a need to better understand how β 2AR may interact and respond differently to ligands in asthmatic tissue compared to healthy models.

Ray, Azizi Pharm.D. (Mercer University) POSTER: 12
Effects of the Second Generation "Bath Salt" Cathinone Alpha-Pyrrolidinopropiophenone (α -PPP) on Behavior and Neurochemistry in Mice

Ray A, Chitre NM, Daphney CM, Blough BE, Canal CE, Murnane KS

Introduction: Cathinones ("bath salts") are an emerging class of abused amphetamines and few studies have examined their persistent effects on neurochemistry and behavior. Thus, we investigated the effects of the synthetic cathinone α -pyrrolidinopropiophenone (α -PPP) on anxiety, learning and memory, and brain monoamine neurochemistry.

Methods: All studies were conducted in Swiss-Webster mice using a dosing regimen of α -PPP (80mg/kg) that has been used to study the neurotoxicity of amphetamines (QID, q2h). Anxiety was studied using the elevated plus maze test. Working and recognition memory were assessed using the Y-maze and novel object recognition test (NORT), respectively. Regional levels of dopamine, serotonin, norepinephrine, and 3,4-dihydroxyphenylacetic acid were determined in the pre-frontal cortex, striatum and hippocampus using high-pressure liquid chromatography. Behavior was assessed 4 days after the dosing regimen and neurochemistry was assessed the following day.

Results: α -PPP had no significant effect on anxiety in mice, yet it induced significant impairments in both working memory and recognition memory. There were few apparent changes in tissue monoamine levels, suggesting that these memory deficits are related to changes in other neurotransmitter systems. Brain cholinergic systems are a likely candidate system as both Y-maze and NORT performance is associated with this system.

Conclusions: The current study establishes that exposure to α -PPP impairs learning and memory and suggests that it may have an influence on brain cholinergic systems.

Translation impact: This research highlights the dangers of α -PPP and related cathinone derivatives, and suggests a target system for the development of compounds to treat their deleterious effects.

Reed-Knight, Bonney PhD (Emory University) POSTER: 15
Physiological Reactivity as a Biomarker of Anxiety and Depressive Symptoms in Youth Diagnosed with Chronic Gastrointestinal Disease

Reed-Knight B, Hinrichs R, Jovanovic T

Introduction: Physiological reactivity refers to bodily reactions in response to a stressor and varies with regards to intensity and threshold for activation between individuals. Differences in reactivity may affect patients' risk for developing anxiety and mood difficulties. We aim to investigate indices of physiological reactivity as biomarkers of anxiety and depressive symptoms in youth newly diagnosed with inflammatory bowel disease (IBD).

Methods: Youth ages 8 to 17 years diagnosed with IBD within the last 45 days are recruited to participate in an experimental task to assess physiological reactivity to an IBD-specific and a global stressor and to complete study questionnaires of perceived stress, internalizing symptoms, and IBD-specific quality of life. Physiological reactivity is measured using a mobile assessment of skin conductance, a non-invasive, commonly used measure of electrical impulses on the surface of the skin.

Results: The current sample includes 34 youth and their parents. Data collection is ongoing; 72% of patients approached in the clinic have consented to participate. Initial results demonstrate lowest levels of reactivity during a baseline condition, highest levels during a backwards star tracing exercise, and moderate levels discussing "the hardest part about being diagnosed with IBD."

Conclusion/Translational Impact: Assessment of physiological reactivity in patients newly diagnosed with IBD is low burden, objective, and deemed acceptable by most patients. Next steps include analyzing the relationship between physiological reactivity and anxiety and depressive symptoms to identify predictive validity of physiological reactivity for internalizing symptoms.

Ross, Ted M. (University of Georgia) POSTER: 64
Impact of Age and Pre-Existing Influenza Immunity in Humans on the Elicitation of Anti-Hemagglutinin Antibodies Receiving Split Inactivated Influenza Vaccines

Nuñez IA, Carlock MA, Allen JD, Owino SO, Moehling K, Nowalk MP, Diagle K, Sweeney K, Mundle S, Vogel TU, Delagrave S, Ramagopol M, Zimmerman RK, Kleanthous H, Ross TM

Most humans have pre-existing immunity to influenza viruses. In this study, volunteers (ages of 18-85 years) were vaccinated with split, inactivated Fluzone™ influenza vaccine in four consecutive influenza seasons from 2013 to 2016 seasons. The impact of repeated vaccination on breadth and durability of antibodies was assessed as a result of vaccine strain changes. Total IgG anti-hemagglutinin (HA) binding antibodies and hemagglutination-inhibition (HAI) activity increased in all age groups against both influenza A HA components in the vaccine post-vaccination (day 21). However, younger subjects maintained seroprotective titers to the vaccine strains, which resulted in higher seroconversion rates in the elderly, since the HAI titers in elderly subjects were more likely to decline prior to the next season. Young subjects had significant HAI activity against historical, as well as contemporary H1 and H3 vaccine strains from the mid-1980s to present. In contrast, elderly subjects had HAI activity to H1 strains from all years, but were more likely to have HAI activity to older strains from 1918-1950s. They also had a more restricted HAI profile against H3 viruses compared to young subjects recognizing H3N2 influenza viruses from the mid-2000s to present. Vaccine recipients were then categorized by whether subjects seroconverted from a seronegative or seropositive pre-vaccination state. Regardless of age, immunological recall or 'back-boosting' to antigenically related strains were associated with seroconversion to the vaccine strain. Overall, both younger and older people have the ability to mount a breadth of immune responses following influenza vaccination.

Ryan, Gina PharmD (Mercer University) POSTER: 38
Lipoprotein Subclasses and Apolipoproteins in African American Men with Type 2 Diabetes

Ryan GJ, Momary KM

Introduction: Typically, African Americans (AA) with type 2 diabetes (T2DM) have low triglycerides (TG) instead of elevated TG as seen in other races with T2DM. There may be differences in lipoprotein size distribution and apolipoprotein (Apo) levels in AA with and without diabetes. The objective of this project is to determine if there are differences in apolipoprotein levels and lipoprotein subclasses in AA men with T2DM and AA men without T2DM.

Methods: After a 12 hour fast, venous drawn blood samples were obtained from AA men, who were not receiving lipid-lowering therapy, and tested for advanced lipoprotein analysis. Lipoprotein distribution and peak particle diameter were determined by ion mobility methods.

Results: Subjects with T2DM had significantly higher cholesterol levels, LDL, TG, ApoB, and hsCRP (Table). T2DM subjects significantly smaller peak LDL diameter and fewer large LDL particles. There were no differences between groups in Lp(a) levels, HDL levels, HDL subclasses, or ApoA1 levels.

Conclusion: Prior to this study, little was known about the distribution of LDL subfractions, ApoB and ApoA1 levels in African-American males. There are significant differences in levels of LDL-C, TC, TG, ApoB, hsCRP, and LDL subclass distribution in African-American men with type 2 diabetes and African-American men without type 2 diabetes.

Clinical Translational Impact: Further studies are warranted to determine if these differences require different treatment recommendations.

Ryan, Gina PharmD (Mercer University) POSTER: 39
The Relationship between of HDL-C Levels and Lipoprotein Subclasses and Taq1B & I450V Polymorphisms in the CETP Gene in African-Americans with Type 2 Diabetes

Momary KM, Samedy LA, Ryan GJ

Introduction: Increased activity of cholesteryl ester transfer protein (CETP), mediates the exchange of triglycerides between HDL and very low-density lipoproteins. This study was initiated to investigate the relationship of CETP polymorphisms on the levels of lipoprotein subclasses and apo-lipoproteins in African American (AA) men with and without type 2 diabetes (T2DM).

Methods AA men (N=104), with or without T2DM and not being currently treated with lipid-lowering agents, provided fasting venous blood samples that were analyzed for: total cholesterol, LDL-C, HDL-C, apolipoprotein B, apolipoprotein A1, lipoprotein a, LDL particle size subclasses, and HDL particle size subclasses, and advanced genomic testing. Single nucleotide polymorphism (SNP) genotyping was performed using commercially validated allelic discrimination.

Results: The distribution of CETP Taq1B genotypes was B1B1 67.0%, B1B2 21.7% and B2B2 11.3%. Levels of LDL Q-IVb, LDL IVa, LDL IIIb, HDL 2b and HDL_L_i ($p = 0.009$) were significantly higher in subjects carrying a CETP Taq1B B2 allele, but levels of HDL3a and HDL3b were lower ($P < 0.05$). Only HDL2a ($P = 0.015$) was higher in T2DM subjects carrying a CETP Taq1B B2 allele. There were no statistically significant differences in the subfractions associated with the CETP I450V polymorphism. Conclusion: It appears that the presence of Ta11B B2 allele is associated with larger cardioprotective HDL subfractions (HDL 2b and HDL_Li) and T2DM diminishes the elevation patterns of HDL lipoprotein subfractions that were associated with the B2 allele.

Translational Impact: Additional studies should be conducted to determine if CETP Taq1B2 polymorphism can serve as biomarkers in the prediction and management of cardiovascular events.

Ryan, Gina PharmD (Mercer University) POSTER: 40
Closing Communication Gap about Medication Utilization: Evaluation of Patient-Specific Behaviors for not Bringing Medication Bottles to Clinic

Patel SM, Ryan G

Introduction: Inaccuracies in medication reconciliation lead to medication errors. Despite various reminder efforts made by healthcare providers, only 25% of patients end up Bringing their medication Bottles to Clinic (BBC). Currently, there is no information available in literature that has assessed the reasoning(s) behind these low rates. This study seeks to identify the reasons why patients do not BBC, evaluate specific patient characteristics associated with these rates and identify potential patient-directed intervention(s) that can be assessed in future studies.

Methods: The survey was divided into four domains: patient demographics, three survey instruments, reasons related to not BBC, and suggested interventions for improving the rates of BBC. Descriptive statistics and bivariate correlations were assessed, along with linear and logistic regression. A P value < 0.05 was considered to be statistically significant.

Results: Two hundred thirty patients were included. Of these, 73% did not BBC and the most common reasons included "doctor has all medication information in computer" followed by "did not think it was important." Number of providers seen in last 6 months (-0.130 ; $P = 0.04$) and annual income (-0.129 ; $P = 0.04$) were associated with not BBC. Per these patients, the most

common suggestions for improving these rates included “explaining why BBC is important” followed by “giving a special bag for BBC.”

Conclusion/Translational Impact: The findings from this study suggest that patients who do not BBC are not aware of its importance. Additionally, there are specific patient demographics that are associated with patients' behavior of not BBC. Future randomized trials should utilize these factors and test interventions directed towards improving patient awareness.

Sahu, Margaret BS (Emory University) POSTER: 41

Preeclamptic Placental Stromal Cells Exhibit Defective Re-Decidualization and Reduced Suppression of sFlt1 Transcription In Vitro

Sahu M, Venkataraman D, Smith AK, Badell M, Sidell N, Rajakumar A

Introduction: Preeclampsia (PE) is a major contributor to global obstetric morbidity and mortality. PE pregnancies are characterized by shallow implantation, inadequate spiral artery remodeling, and elevated circulating levels of the anti-angiogenic protein, sFlt1. While the etiology of PE is unknown, defective maternal decidualization has been proposed as a contributor to disease development. Recent findings show that decidualization of endometrial stromal cells is reversible and negatively correlated with sFlt1 expression. We hypothesize that PE placental stromal cells (DSCs) will demonstrate inadequate re-decidualization and elevated sFlt1 expression.

Method: DSCs were prepared from 7 healthy (NP-DSC) and 6 preeclamptic (PE-DSCs) placentas. Cell culture, cAMP treatment for decidualization, and reversal of decidualization were performed as published. Levels of sFlt1 and decidualization markers PRL, IGFBP1, and VEGF were analyzed using qPCR. Graphpad PRISM data is presented as mean+/-sd.

Results: Expression analyses (Table 1) show that induction of NP-DSCs, but not PE-DSCs, results in statistically significant elevations in decidualization markers and suppression of sFlt1.

Conclusion: When induced to decidualize, PE-DSCs do not fully decidualize or downregulate sFlt1. This pattern of incomplete decidualization and elevated sFlt1 expression suggests that dysfunction in these processes at the maternal fetal interface may be an early driver of PE development.

Translational Impact: Insight into early derangements of decidualization marker levels could lead to development of a clinical biomarker for risk assessment or early diagnosis. Characterization of the hormonal response of PE-DSCs may reveal opportunities for pharmacologic intervention leading to abatement of disease.

Sattler, Elisabeth Lilian PhD, BS Pharm (University of Georgia) POSTER: 23

Effect of Dietary Approaches to Stop Hypertension Diet on Hemodynamic Markers in Advanced Heart Failure Patients

Sattler EL, Dunbar SB, Quyyumi AA, Murrow JR, Lewis RD, Young HN, McConnell, W

Heart failure is one of the leading causes of hospital admissions, functional limitations, and mortality in adults. Despite evidence strongly supporting dietary approaches to improve risk factors and comorbidities of heart failure, surprisingly little is known about diet therapy for advanced heart failure patients. The objective of this study is to examine the effect of a Dietary Approaches to Stop Hypertension (DASH) diet on hemodynamic, cardiometabolic, and inflammatory markers in advanced heart failure patients, using a one-group pre-post test design feeding trial. We will recruit NYHA functional stage III heart failure patients 18+ years who have undergone CardioMEMS™ hemodynamic monitoring device implantation. The study is divided into a calibration (self-selected diet) and a DASH feeding intervention phase (each 21 days in length). The following participant data will be collected on 3 occasions: anthropometric (height, weight, waist and hip circumference, percent body fatness), cardiometabolic (blood pressure, blood glucose, HbA1C, lipid panel, basic metabolic panel, BNP, NT-proBNP, troponin 1, MRproADM, sST2), inflammatory (IL-1a, IL-1b, IL-6, TNF-a), functional status, and self-reported measures (e.g., demographic/economic characteristics, quality of life, medication adherence). Hemodynamic marker (pulmonary artery pressure, heart rate) and pharmacotherapy information will be obtained from through retrospective assessment of EHR data. To measure changes in outcome markers pre-post intervention, we will use paired student t-tests or Wilcoxon rank sum tests. Findings from the study will provide knowledge of dietary influences on ventricular function needed to define evidence-based diet therapy to prevent HF complications in advanced heart failure patients.

Segar, Lakshman PhD (University of Georgia) POSTER: 34

Chronic alcohol consumption induces ketonemia and prevents hyperglycemia in the mouse model of type 2 diabetes

Srinivasan M, Shawky N, Thangaraju M, Segar L

Introduction: Alcoholic ketoacidosis (AKA) and diabetic ketoacidosis (DKA) are life-threatening complications that share the characteristic features of high anion gap metabolic acidosis and hyperketonemia (e.g., ↑ β -hydroxybutyrate; β OHB). To date, the impact of chronic alcohol consumption on systemic ketone concentration and glycemic control remains unclear, especially in type 2 diabetes.

Methods: Using type 2 diabetic db/db mice, the present study examined the effects of chronic ethanol feeding for 9 days, an NIAAA model with some modifications. Lieber-DeCarli ethanol liquid diet contained 36% EtOH- and 36% fat-derived calories.

Results: In db/db mice, chronic alcohol intake resulted in significant decreases in weight gain and caloric intake. Importantly, alcohol-induced elevation in systemic β OHB concentration (~8-fold ↑) was associated with significant lowering of blood glucose (from 298.4 ± 26.2 mg/dL to 79 ± 6.3 mg/dL). In addition, alcohol intake led to an increase in hepatic β OHB, downregulation of key gluconeogenic mRNAs, and depletion of glycogen. Furthermore, alcohol intake resulted in a significant decrease in the allosteric activation of glycogen synthase.

Conclusion: The present findings suggest that in type 2 diabetes, chronic alcohol-induced ketonemia may occur in concomitance with significant lowering of blood glucose concentration, which may be attributable to suppression of gluconeogenesis in the setting of glycogen depletion.

Translational Impact: It is widely accepted that AKA is characterized by hyperketonemia with normal to low blood glucose concentrations, whereas DKA is defined by hyperketonemia and hyperglycemia. The present findings would provide new insights into treatment strategies that target hepatic ketogenesis in AKA or DKA.

Senatorov, Ilya (Mercer University) POSTER: 26

Mechanisms of Homologous and Heterologous Phosphorylation of FFA4 Isoforms

Senatorov IS, Cheshmehkani A, Moniri NH

Introduction: The G protein-coupled receptor Free Fatty Acid Receptor 4 (FFA4), which in humans is expressed as distinct short (FFA4-S) and long (FFA4-L) isoforms, is an attractive drug target due to its profound influence on a variety of endocrine, inflammatory, and metabolic processes. Since these activities are regulated by phosphorylation of the receptor by kinases, the purpose of the current study was to examine mechanisms and differences between phosphorylation of both FFA4 isoforms.

Methods: Phosphorylation assays using 32 P-labeling in HEK293 cells expressing either FFA4 isoforms or truncated mutants. Kinase inhibition was performed by siRNA for GRKs, or the chemical inhibitors H-89 for PKA and BIM11 for PKC. Arrestin recruitment assays were conducted using yellow fluorescence protein (YFP) tagged arrestin-3 and visualized via confocal microscopy.

Results: Homologous phosphorylation of both isoforms is mediated by GRK6, whereas heterologous phosphorylation is mediated by PKC. FFA4-L has lower basal phosphorylation compared to FFA4-S and truncation of the C-terminus abrogates both isoforms ability to recruit arrestin.

Conclusion: The same kinases are responsible for homologous and heterologous phosphorylation of FFA4-S and FFA4-L. The arrestin sensor for both isoforms is located on the C-terminal tail of the receptor following S340 (FFA4-S) or S356 (FFA4-L).

Translational Impact: FFA4 is an attractive drug target due to its role in mediation of inflammatory and metabolic processes, effects that are regulated by phosphorylation of the receptor. Since we have discovered the mechanisms leading to FFA4 phosphorylation, drug development efforts targeting FFA4 should ensure proper phosphorylation responses to elicit the desired human health effects.

Serota, David P. MD (Emory University) POSTER: 19

Predictors of HIV pre-exposure prophylaxis uptake and persistence in a cohort of young black men who have sex with men in Atlanta, Georgia

Serota DP, Rolle CM, Sullivan PS, Rosenberg ES, Kelley CF

Introduction: Young black men who have sex with men (YBMSM) in the Southeast have the highest HIV incidence among all demographics in the United States. HIV pre-exposure prophylaxis (PrEP) with tenofovir-emtricitabine is >90% effective in preventing HIV transmission when taken daily, however awareness, access, uptake, and adherence to PrEP remains unacceptably low in this population.

Methods: The EleMENT study is an ongoing prospective cohort study of HIV-negative YBMSM in Atlanta, GA designed to evaluate interactions between substance use and HIV risk behavior. All participants are offered PrEP, including a physician initiation visit, assistance obtaining medication, and guideline-recommended monitoring. Detailed baseline and follow up information is collected about participant demographics, sexual practices, mental health, and substance use. Multivariable logistic regression models will be constructed to identify independent predictors of PrEP uptake and then PrEP persistence.

Results: Study enrollment was completed in June 2017 with 300 HIV-negative YBMSM. Thus far, 52.5% (158/300) of participants have either initiated PrEP through the study or are receiving PrEP outside of the study.

Conclusion: This study will evaluate predictors of PrEP uptake and PrEP persistence using demographic information, a set of validated mental health scales, and biomarker-adjudicated substance use.

Translational Impact: The objective of this T4 research project is to facilitate the implementation of an effective, but underutilized, HIV prevention strategy in a community at high risk of HIV infection. With a better understanding of how these variables impact PrEP uptake and adherence in this key population, interventions can be optimized for implementation of PrEP among YBMSM in the southeast.

Starr, Richard BS (Georgia Institute of Technology) POSTER: 51
Process to Expedite ETL to Import Datasets to the OMOP Common Data Model

Starr R, Choi M, Riley M, Duke J

Introduction: The OMOP Common Data Model provides a standardized vocabulary and data model to allow collaborative research to occur across different health data sources. There is a significant learning curve when undertaking the transformation of an existing data source to the OMOP CDM. While there are publicly available code snippets and example ETLs, these are difficult to implement without a detailed understanding of the vocabulary and data model.

Methods: We implemented an ETL system that uses staging tables to normalize disparate incoming data formats into a standardized generic format. The OMOP specific transformations occur on data in this standardized format. Any dataset to be ingested only has to be transformed to meet this simple generic format, allowing new dataset formats to be ingested into the OMOP CDM with a minimum of effort. This way the complex OMOP transformations are abstracted from the process of creating the ETL for each new dataset.

Results: This approach has been applied in several use cases including bulk claims imports, nightly batch EMR imports and as the backend for a FHIR server.

Conclusion: Separating the work of mapping an incoming dataset from the transformation into the OMOP CDM allows for faster integration of new dataset formats. The reuse of the OMOP transformation code helps to create consistent and reproducible implementations of the OMOP CDM.

Translational Impact: Having an easily deployed and implemented system to convert existing clinical datasets into a common format used for analytic research by many institutions will allow research questions to be explored without needing analytics code to be rewritten for each dataset format. For new OHDSI stack implementers, it can help kickstart the transformation of their existing dataset.

Verma, Arti PhD (University of Georgia) POSTER: 11
Akt-B-Catenin Signaling in the regulation of Endothelial to Mesenchymal Transition (Endmt) And Pathological Pulmonary Vascular Remodeling

Arti V, Harika S, Sandeep A, Somanath PR (Shenoy)

Introduction: Endothelial-to-mesenchymal transition (EndMT), a type of cellular differentiation in which endothelial cells adopt a mesenchymal phenotype acquiring contractile and motile properties, is an important source of myofibroblasts in the development of fibrotic disorders. Although there is compelling evidence for the contribution of EndMT to the pathogenesis of

fibrotic diseases, further understanding of the molecular mechanisms and regulatory pathways involved in EndMT is necessary to develop novel therapeutic approaches for Pulmonary arterial hypertension (PAH).

Methods: Normal and Akt1 null human microvascular endothelial cells were stimulated with TGF- β and subjected to Western blot, IHC, and gene array analysis. C57BL6, EC Akt1 KO mice were subjected to SUGEN-Hypoxia to induce PAH.

Results: TGF β 1 induced EndMT, only in a specific population of ECs and appeared to be a weak inducer of EndMT. TGF β 2 appears to be a potent contributor of EndMT, and loss of Akt1 promoted EndMT. TGF β 1 stimulation, although activated Akt1 briefly, led to its inactivation in long-term associated with activation of Src. Loss of Akt1 increased expression of mesenchymal markers and reduced expression of endothelial markers. Inhibition of β -catenin nuclear localization with ICG-001 reversed SU-Hypoxia-induced EndMT in vivo.

Conclusion & Translational Impact: TGF β 2 is a potent inducer of EndMT and Akt1 inhibition in endothelial cells induces expression of TGF β 2 and inhibits expression of BMP2, thus shifting the balance of genes in ECs promoting EndMT. β -catenin inhibitors could be used to inhibit EndMT in PAH and thus a potential therapy to treat PAH.

Xie, Zhong-Ru PhD (University of Georgia) POSTER: 68
Computational Study on the Drug Resistance of Paclitaxel

Woodling D, Stewart M, Phillips MA, Pham A, Xie ZR

Introduction: Microtubules, which are responsible for the cell division, serve as an important target in cancer treatment and research. The dynamics of how the microtubules grow and shrink will affect how cell division occurs. Studies have found a breakthrough anticancer drug, paclitaxel (TA1), which targets to the "Taxane site," on the β - tubulin heterodimer structure that aids in creating the overall microtubule structure. However, the drug resistance is a big challenge of the application of Paclitaxel.

Methods: In this research through computer drug discovery, we have applied ligand docking on tubulin proteins through a program, Schrodinger. Our predicted results provide new evidences for the mechanisms of observed drug resistances.

Results: After docking the TA1 to each of 13 structure download from PDB, the docking scores of each structure were compared. Six highest scoring proteins were selected. Each ligand was then removed from the taxane site in its bound conformation state. The six different TA1 ligand conformation states were then overlapped with each other and also the native TA1 ligand conformation. Overlap of the ligands allowed for visual analysis of how the ligand changes conformation when bound to the taxane site.

Translational Impact: There were six amino acid residues that were found to interact with the Taxol ligand of these tubulin proteins: Asp26, His229, Phe272, Thr276, Ala375, and Arg369. Of these residues, there are three specifically involved in resistance to the Taxol drug including, Asp26, Phe272, and Ala375. When these three residues are specifically mutated, they are found to play a role in the Taxol drug resistance when used in chemotherapy treatment. We will perform additional docking experiments to find new drug candidates for the mutations.

Yesudasan, Sumith PhD (University of Georgia) POSTER: 61
Fibrin Clot Simulation using a Reactive Coarse Grain Molecular Dynamics Method

Yesudasan S, Averett RD

Introduction: Polymerization of fibrinogen into fibrin fibers is one of the widely studied areas of research related to thrombosis. In past, researchers have performed extensive studies to unveil the mechanisms of fibrin polymerization. However, mechanisms of fiber branching and cross-linking of the long fiber strands is still elusive. Computational modeling of fibrin polymerization and the underlying mechanisms are not well developed and only a few studies exist to this subject. In this work, a new method for coarse grain MD (CGMD), is designed to simulate polymerization of fibrinogen into a fibrin network structure.

Methods: A CGMD model of the fibrinogen molecule was developed using Iterative Boltzmann Inversion method in conjunction with artificial neural networks (ANNs). The model is coupled with dissipative particle water models and characterized the force fields to match the experimentally observed diffusivity. Using distance based rules and hydrophobic mimicking through charges, we simulated fibrin clot formation with this model.

Results: The results correlate with experimental imaging results observed in fibrin clots, such as branching and continuous strand formation, and also correlate with mathematical observations related to mass fractal dimension of fibrin clots.

Conclusion: We developed a new coarse grain model and a new reactive method to simulate the polymerization of fibrinogen into a fibrin network structure. This methodology encompasses a new class of simulations which can be utilized in polymerization models and large biomolecular simulations.

Translational Impact: The impact of the present work is multidisciplinary and the final goal is to understand the mechanics behind venous thrombosis to develop better treatments and thrombolytic strategies.

Yeung, Howa MD (Emory University) POSTER: 50

Prevalence of Skin Cancer Risk Factors and Screening among Men and Women in Same-Sex and Opposite-Sex Relationships

Yeung H, Chen SC

Introduction: Sexual minority persons face higher rates of cancer-related risk behaviors and healthcare access issues; however, skin cancer risk factors in sexual minority persons are poorly understood.

Methods: Prevalence of sunburns, photoprotective behaviors, indoor tanning, and skin cancer screening were compared among men and women in same-sex relationships (SSR) and opposite-sex relationships (OSR) in the nationally representative National Health Interview Surveys 2000-2015.

Results: 448 men and 497 women in SSR and 48,312 men and 53,108 women in OSR were identified. Men in SSR were less likely to regularly wear long sleeved shirts (8.3% vs. 13.3%), long pants (24.3% vs. 37.7%), wide-brimmed hats (14.8% vs. 22.5%), caps/visors (33.1% vs. 50.4%) compared with men in OSR, but were more likely to tan indoors (15.9% vs. 6.4%), use sunscreen (32.3% vs. 24.0%), and have had a skin cancer screening examination (36.2% vs. 21.7%, each Rao-Scott chi-square test with adjusted $P < 0.05$ after multiple comparison adjustments). Women in SSR were more likely to have had at least one sunburn in the past year (48.0% vs 37.3%, adjusted $P = 0.003$) despite similar prevalence of photoprotective behaviors. Multivariable logistic regression models adjusting for sociodemographic differences also showed lower prevalence of caps/visors use and higher prevalence of sunscreen use, indoor tanning, and skin cancer screening among men in SSR.

Conclusion: Novel disparities in skin cancer-related behavioral risk factors were identified among men in same-sex relationships.

Translational Impact: Tailored interventions to address disparities in photoprotective behaviors and indoor tanning are critically needed to prevent skin cancers in sexual minority men.

Zalesky, Christopher (Emory University) POSTER: 1

Understanding Care Delivered to Patients with a Possible Concussion at an Urban Level 1 Trauma Center

Zalesky CC, Patzer RK, Patel S, Wright DW

Background: Annually, 2.5 million Traumatic Brain Injuries (TBI) occur with nearly 75% classified as mild TBI (mTBI), also known as a concussion. Mild TBI can be subtle and detection requires a high index of suspicion and a regimented evaluation process. This study was done to define the proportion of patients with a possible mTBI evaluated for concussion at a high volume urban trauma center.

Methods: A prospective cohort of patients was identified using a 3-question screen at the time of triage: did an injury occur; was the mechanism consistent with mTBI; was there a period of altered mental status. Patients who screened positive were thought to meet a minimum threshold for the evaluation of mTBI. Information about mTBI specific evaluation, management, and education was obtained from the patient's charts.

Results: 38,484 patients were screened over 16 weeks, of whom 453 (1.18%) screened positive for a possible mTBI and did not meet exclusion criteria. 198 patients had documented loss of consciousness (LOC), 101 were diagnosed with mTBI, and 49 received mTBI discharge instructions. Overall, 32.5% of included patients had mTBI listed in the differential or as a diagnosis and 32.3% with LOC received an mTBI diagnosis.

Conclusions: Many patients with a possible mTBI were not evaluated, managed, or educated for their potential injury. Changes in physicians' approach to mTBI must occur to increase the proportion of patients receiving appropriate evaluation, management, and education.

Zaman, Rokon Uz (Mercer University) POSTER: 52
Novel microparticulate Vaccine Formulation for Metastatic Breast Cancer
Zaman RU, Mulla NS, D'Souza MJ

Introduction: Breast cancer is the most fatal form of cancer in females. Immunotherapy is being explored to provide a better treatment option, as current therapies pose numerous adverse effects. With this in mind, our purpose has been to formulate and evaluate a micro particulate therapeutic vaccine to provide a new line of therapy for metastatic breast cancer.

Methods: Vaccine microparticles were prepared by encapsulating 4T1 tumor associated antigens (TAA) into cellulose polymers using spray dryer technology. In vitro characterization of microparticles was conducted. Expression of surface co-stimulatory molecules treated with vaccine microparticles were determined by flow cytometer. In order to determine the efficacy of the vaccine, vaccine microparticles were administered using microneedles in Balb/c murine breast cancer model.

Results: The yield was $80 \pm 5\%$ w/w. The particle size was 1-4 μm and the zeta potential was -7 ± 2 mV. The microparticulate vaccines demonstrated significantly stronger immunogenicity revealed by significantly higher amount of nitric oxide released and significantly higher expression of CD40, MHC II and CD80, MHC I in the vaccine microparticles group compared to blank microparticles and vaccine suspension group. The immunized animals showed significantly lower tumor growth spread of tumor cells to other organs compared to the naïve animals.

Conclusion: The TAA vaccine microparticles formulated by spray drying can potentially be an effective treatment for patients with metastatic tumor.

Translational Impact: This vaccine shows immense promise to be translatable for human use since most breast cancers are known to metastasize into other organs. Further the ease of formulation of the vaccine microparticles lends itself to scale up for human use.

Zaman, Rokon Uz (Mercer University) POSTER: 53
Formulation of Nanoparticulate Vehicle to Target Drugs and Therapeutic Peptides across the Blood Brain Barrier
Zaman RU, Oppong Damoah A, Mulla NS, Murnane KS, D'Souza MJ

Introduction: The blood brain barrier (BBB) restricts the movement of most drugs into the brain. Although there are a number of large compounds that have shown great potential in the treatment of neurodegenerative diseases, they cannot pass the BBB. In-order to cross this barrier, endogenous biological mechanisms can be utilized. If conjugated on the delivery vehicle, an iron binding protein transferrin (Tf) that binds to the Transferrin receptors (TfR) expressed on the BBB can improve drug transport across the BBB using receptor mediated transcytosis. In this study, we examine the development of a transferrin conjugated oxytocin loaded nanoparticulate formulation that can cross the BBB.

Methods: Transferrin conjugated PLGA based nanoparticles were made following multiple emulsion solvent evaporation method. Particles were characterized in vitro. The amount of the oxytocin released was determined by oxytocin specific ELISA. Transferrin conjugated indocyanine green loaded nanoparticles were injected to mice via intraperitoneal route to determine the brain penetrance.

Results: The formed nanoparticles were slightly negatively charged (-7.56mV) and the average size was 191.7 nm in diameter. Encapsulation efficiency was 81.4%. The release study demonstrated that about 26% of encapsulated oxytocin was released by day 33. Bio-imaging data showed that nanoparticles crossed the BBB within 30 minutes of the administration of the particles.

Conclusion: This study showed that the transferrin conjugated nanoparticulate formulation can cross the blood brain barrier (BBB).

Translational Impact: This nanoparticulate vehicle can potentially be used to target drugs and therapeutic peptides to the brain in order to treat patients with different neurodegenerative diseases.

Zhang, Chuan MA (University of Georgia) POSTER: 17

Mathematical Models to Assess Leg Muscle Mass in Ambulatory Children with Spastic Cerebral Palsy Using Dual-Energy X-Ray Absorptiometry

Zhang C, Miller F, Modlesky CM

Introduction: Cerebral palsy (CP) is a movement disorder associated with small and weak muscles. Unfortunately, methods that accurately assess muscle mass in children with cerebral palsy are scarce. Whether dual-energy X-ray absorptiometry (DXA) yields accurate estimates of midleg muscle mass in ambulatory children with CP is unknown.

Methods: Ambulatory children with spastic CP and typically developing (TD) children 5-11 y were studied (n = 15/group). Fat-free soft tissue mass (FFST) and fat mass (FM) in the midleg were estimated using DXA. Muscle mass (muscleMRI) and muscle mass corrected for intramuscular fat (muscleMRI_{fc}) in the midleg were estimated using magnetic resonance imaging (MRI). Mathematical models were created to predict muscleMRI and muscleMRI_{fc} in children with CP using DXA.

Results: Children with CP had lower FFST (38%), muscleMRI (41%) and muscleMRI_{fc} (47%) (all $p < 0.05$). Models developed using data from TD children explained 90% of the variance in muscleMRI and 82% of the variance in muscleMRI_{fc} in children with CP (both $p < 0.05$); however, the models overestimated muscleMRI (12%) and muscleMRI_{fc} (18%) (both $p < 0.05$). Models developed using data from children with CP explained 90% of the variance in muscleMRI and 89% of the variance in muscleMRI_{fc} in children with CP (both $p < 0.05$). Moreover, the estimates were not different from muscleMRI and muscleMRI_{fc} (both $p > 0.98$).

Conclusion: DXA-based mathematical models can accurately estimate midleg muscle mass in children with CP when the models are composed using data from children with CP rather than TD children.

Translational Impact: The developed mathematical models offer the potential to assess muscle status and the effect of different treatments on muscle in children with CP.

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