EMORY COLLEGE OF ARTS AND SCIENCES | Undergraduate Research Programs

SPRING 2022 Symposium

ABSTRACT BOOK

April 21, 2022
8:00 AM to 5:00 PM

Oral Presentation Schedule:

First Name	Last Name	Session	Presentation Number	Time
Aaron	Thach	A	1 of 5	8:00 AM to 9:30 AM
Margaret	Greene	A	2 of 5	8:00 AM to 9:30 AM
Sonia	Karsan	A	3 of 5	8:00 AM to 9:30 AM
Mir Saif	Hossain	A	4 of 5	8:00 AM to 9:30 AM
Ramis	Banuri	A	5 of 5	8:00 AM to 9:30 AM
Maya	Basak	B	1 of 4	9:30 AM to 11:00 AM
Daphne	Ih	B	2 of 4	9:30 AM to 11:00 AM
Isabela	Galoustian	B	3 of 4	9:30 AM to 11:00 AM
Ben	Campion	B	4 of 4	9:30 AM to 11:00 AM
Duke	McDaniels	C	1 of 4	11:00 AM to 12:30 PM
Sanjana	Malipeddi	C	2 of 4	11:00 AM to 12:30 PM
Elizabeth	Nguyen	C	3 of 4	11:00 AM to 12:30 PM
Ryan	Gibbson	C	4 of 4	11:00 AM to 12:30 PM
Jiatong	Li	D	1 of 4	12:30 PM to 2:00 PM
Niara	Foster	D	2 of 4	12:30 PM to 2:00 PM
Ronald	Poole	D	3 of 4	12:30 PM to 2:00 PM
Twisha	Dimri	D	4 of 4	12:30 PM to 2:00 PM
Ellen	Cheng	E	1 of 4	2:00 PM to 3:30 PM
Kelly	Martinez	E	2 of 4	2:00 PM to 3:30 PM
Hye Min	Yoon	E	3 of 4	2:00 PM to 3:30 PM
Hye Min	Yoon	E	4 of 4	2:00 PM to 3:30 PM
Matthew	Chupack	F	1 of 4	3:30 PM to 5:00 PM
Xinyi	Zhang	F	2 of 4	3:30 PM to 5:00 PM
Danielle	Davis	F	3 of 4	3:30 PM to 5:00 PM
Summayah	El Azzioui	F	4 of 4	3:30 PM to 5:00 PM

Poster Presentation Schedule:

First Name	Last Name	Session	Poster Number	Presentation Time
Stevie	Ballas	A	1	8:00 AM to 8:50 AM
Roy	Chang	A	2	8:00 AM to 8:50 AM
Sona	Davis	A	3	8:00 AM to 8:50 AM
Jackson	Eckel	A	4	8:00 AM to 8:50 AM
Arpita	Govil	A	5	8:00 AM to 8:50 AM
Angel	Hailemariam	A	6	8:00 AM to 8:50 AM
James	Hess	A	7	8:00 AM to 8:50 AM
Grace	Kessler	A	9	8:00 AM to 8:50 AM
Aditya	Kolisetti	A	10	8:00 AM to 8:50 AM
Clara	LaFollette	A	11	8:00 AM to 8:50 AM
Ava	Lewandowski	A	12	8:00 AM to 8:50 AM
Grace	Li	A	13	8:00 AM to 8:50 AM
Audrey	Lu	A	14	8:00 AM to 8:50 AM
Andrea	Mancia	A	15	8:00 AM to 8:50 AM
Amaya	Martin	A	16	8:00 AM to 8:50 AM
Sharon	Miao	A	17	8:00 AM to 8:50 AM
Kathy	Ning	A	18	8:00 AM to 8:50 AM
Moyo	Odugbemi	A	19	8:00 AM to 8:50 AM
Gabriela	Olmedo	A	20	8:00 AM to 8:50 AM
Andrew	Pak	A	21	8:00 AM to 8:50 AM
Aadya	Parikh	A	22	8:00 AM to 8:50 AM
Niki	Patel	A	23	8:00 AM to 8:50 AM
Grace	Regnier	A	24	8:00 AM to 8:50 AM
Fahad	Salman	A	25	8:00 AM to 8:50 AM
Trozalla	Smith	A	26	8:00 AM to 8:50 AM
Marissa	Spies	A	27	8:00 AM to 8:50 AM
Yizhou	Wang	A	28	8:00 AM to 8:50 AM
Megan	Zhang	A	29	8:00 AM to 8:50 AM
Sophie	Anthony	B	1	9:00 AM to 9:50 AM
Jai	Arora	B	2	9:00 AM to 9:50 AM
Claire	Bai	B	3	9:00 AM to 9:50 AM
Jane	Chakraborty	B	4	9:00 AM to 9:50 AM
Liam	Horne	B	5	9:00 AM to 9:50 AM
Monse	Juarez	B	6	9:00 AM to 9:50 AM
Seyon	Kim	B	7	9:00 AM to 9:50 AM
Labdhi	Mehta	B	8	9:00 AM to 9:50 AM
Michelle	Pan	B	9	9:00 AM to 9:50 AM
Alekhya	Pidugu	B	10	9:00 AM to 9:50 AM

First Name	Last Name	Session	Poster Number	Presentation Time
Shreyas	Rajagopal	B	11	9:00 AM to 9:50 AM
Mario	Sánchez del Campo	B	12	9:00 AM to 9:50 AM
Virginia	Sanson	B	13	9:00 AM to 9:50 AM
Andrea	Snoddy	B	14	9:00 AM to 9:50 AM
Diana	Striyeshyn	B	15	9:00 AM to 9:50 AM
Javier	Trujillo	B	16	9:00 AM to 9:50 AM
Defne	Tuncaral	B	17	9:00 AM to 9:50 AM
Silu	Wang	B	18	9:00 AM to 9:50 AM
Daphne	Zhu	B	19	9:00 AM to 9:50 AM
Ellie	Abbott	C	1	10:00 AM to 10:50 AM
Lucy	Amirani	C	2	10:00 AM to 10:50 AM
Johnny	Bui	C	3	10:00 AM to 10:50 AM
Linda	Cho	C	4	10:00 AM to 10:50 AM
Stella	Dong	C	5	10:00 AM to 10:50 AM
Afsha	Hossain	C	6	10:00 AM to 10:50 AM
Irene	Hsu	C	7	10:00 AM to 10:50 AM
Heather	Jung	C	8	10:00 AM to 10:50 AM
Eric	Qian	C	9	10:00 AM to 10:50 AM
Alexander	Rojas	C	10	10:00 AM to 10:50 AM
Martha	Stern	C	11	10:00 AM to 10:50 AM
Rosemary	Tran	C	12	10:00 AM to 10:50 AM
Claire	Wei	C	13	10:00 AM to 10:50 AM
Shifa	Ali	D	1	11:00 AM to 11:50 AM
Jayden	Behling	D	2	11:00 AM to 11:50 AM
Mai Khuyen	Bui	D	3	11:00 AM to 11:50 AM
Justin	Byun	D	4	11:00 AM to 11:50 AM
Kristin	Edwards	D	5	11:00 AM to 11:50 AM
Ryan	Ho	D	6	11:00 AM to 11:50 AM
Ben	Kittleson	D	7	11:00 AM to 11:50 AM
May	Mei	D	8	11:00 AM to 11:50 AM
Hao	Wang	D	9	11:00 AM to 11:50 AM
Kathryn	Stachowicz	D	10	11:00 AM to 11:50 AM
Yasmeen	Ahmed	E	1	1:00 PM to 1:50 PM
Muskan	Ali	E	2	1:00 PM to 1:50 PM
Walter	Avila	E	3	1:00 PM to 1:50 PM
Allison	Cartee	E	4	1:00 PM to 1:50 PM
Jalyse	Garcia-Barreto	E	5	1:00 PM to 1:50 PM
Erica	Kahn	E	6	1:00 PM to 1:50 PM
Dana	Kim	E	7	1:00 PM to 1:50 PM

First Name	Last Name	Session	Poster Number	Presentation Time
Sarah	Marzouk	E	8	1:00 PM to 1:50 PM
Yuritzy	Ramos	E	9	1:00 PM to 1:50 PM
Vrushali	Thakkar	E	10	1:00 PM to 1:50 PM
Grace	Ward	E	11	1:00 PM to 1:50 PM
Sophia	West	E	12	1:00 PM to 1:50 PM
Priya	Yada	E	13	1:00 PM to 1:50 PM
Peter	Cooke	F	33	2:00 PM to 2:50 PM
Layla	Dhabaan	G	56	3:00 PM to 3:50 PM
Taryn	Salako	G	57	3:00 PM to 3:50 PM
Kieran	Aguirre	H	1	4:00 PM to 4:50 PM
Ali	Ashraf	H	2	4:00 PM to 4:50 PM
Pamela	Beniwal	H	3	4:00 PM to 4:50 PM
Danielle	Davis	H	4	4:00 PM to 4:50 PM
Mei	Deng	H	5	4:00 PM to 4:50 PM
Ziwei	He	H	7	4:00 PM to 4:50 PM
Nadine	Jarrar	H	8	4:00 PM to 4:50 PM
Minuk	Kim	H	9	4:00 PM to 4:50 PM
Linda	Li	H	10	4:00 PM to 4:50 PM
Layhana	Moponol	H	11	4:00 PM to 4:50 PM
Joseph	Owens	H	12	4:00 PM to 4:50 PM
Micah	Ross	H	13	4:00 PM to 4:50 PM
Arielle	Segal	H	14	4:00 PM to 4:50 PM
Phoebe	Taiwo	H	15	4:00 PM to 4:50 PM
Sherry	Tsui	H	16	4:00 PM to 4:50 PM
Jack	Warn	H	17	4:00 PM to 4:50 PM
Vanessa	Wildman	H	18	4:00 PM to 4:50 PM
Jenny	Zha	H	19	4:00 PM to 4:50 PM
Natalie	Mason	H	20	4:00 PM to 4:50 PM
Yixuan	Peng	H	21	4:00 PM to 4:50 PM
Beamlak	Kuma	H	22	4:00 PM to 4:50 PM

Table of Contents

Identifying Ideal Conditions for Methyl-α-cyclodextrin-Mediated Phospholipid Transfer in Viral Envelopes

Abbott, Ellie; Raghunath, Gokul

Presenter/s: Ellie Abbott

Emory Faculty Mentor: Gokul Raghunath

The ability of viruses to infect and cause severe disease is highly variable, and determining the mediators of that pathogenicity has been an active area of research for many decades. This work has produced many insights into the effects of the genetic code and protein structures of viruses, but understanding of the role of the viral phospholipid envelope in regulating infectivity is still limited. This research has been impeded by the lack of effective technologies that allow manipulation of the lipid bilayer like those available for the control of proteins and genetic material. Methyl-α-cyclodextrin (MαCD) is a reagent that has been found to facilitate controlled phospholipid exchange for manipulation of certain eukaryotic cell membranes but is yet to be applied in the context of the viral lipid envelope. This work seeks to identify ideal conditions for MαCD-mediated controlled lipid exchange for HIV-1 psuedoviruses. Liposomes that resemble viral envelopes in diameter (~100nm) and bilayer composition will be used as a model system for preliminary studies. Upon successful optimization in liposomes, we will attempt to incorporate specific lipids to the envelope of replication-incompetent HIV-1 pseudoviruses. Fluorescence microscopy will be used in conjunction with external probes specific to the exchanged lipids to evaluate the success of lipid exchange under conditions tested. If MαCD is found to facilitate lipid transfer in viral envelopes, it can be used to investigate effects of envelope composition on fusogenicty and infectivity, potentially providing valuable insight into a previously unknown regulator of viral pathogenicity.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - C
Poster Number (if applicable): 1
Presentation Time: 10:00 AM to 10:50 AM

Testing the accuracy of Photonic Sentry Monitoring Device in modeling flight behaviors of Aedes aegypti mosquitos in 3D space

Aguirre, Kieran; Vazquez-Prokopec, Gonzalo; Roy, Kristina

Presenter/s: Kieran Aguirre

Emory Faculty Mentor: Gonzalo Vazquez-Prokopec

Mosquitos remain the vector responsible for the most cases of vector-borne illness worldwide. Despite this, methods for quantifying mosquito flight behavior remain limited. An emerging technology, the Photonic Fence Monitoring Device (PFMD), allows for the tracking and mapping of mosquito flight patterns in 3D space in real time. Though limited in use, with only around 20 models in existence, the PFMD is pioneering the development of mosquito flight behavior analysis technology by using an infrared (IR) camera to track mosquitos in flight. By tracking detected objects' coordinates, speed, acceleration, and density can be calculated and displayed as heatmaps. The PFMD is calibrated to only register movement of objects approximately the size of a mosquito to reduce noise. The purpose of this study was to identify if the PFMD is registering flight tracks where none exist and thereby determine if the camera is accurately registering flight tracks. The hypothesis proposed was that more tracks than actually occur during recording are being recorded as a result of splitting one true track into many, increasing the noise in the data. A tethered mosquito was hung from an apparatus that allowed generation of tracks at a standard height, number, and distance from camera. Number of tracks registered by the camera was recorded. The difference between this number and the number of tracks actually present was calculated. It was found that more tracks were being recorded than actually existed. This suggests that the device is too sensitive. Current work is evaluating whether this variable sensitivity enables the use of PFMD for mosquito behavior research.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 1
Presentation Time: 4:00 PM to 4:50 PM

Good Trouble Across Development; Children's Judgment of Rules and Normativity Through Vignettes of Unfair and Fair Moral and Social Rules

Ahmed, Yasmeen; Agarwal, Nikita; Rochat, Philippe

Presenter/s: Yasmeen Ahmed

Emory Faculty Mentor: Nikita Agarwal

"Good Trouble" is a term coined by the famous Civil Rights Activist John Lewis, and it highlights the necessary trouble individuals make in hopes to achieve a more just system; when breaking the rule is necessary to work towards creating rules that are fair to the collective. With this in mind, our study seeks to identify how "Good Trouble" develops in childhood, and when kids begin to sacrifice strict obeying of rules when the rules are not fair to those who must follow them. Our study aims to identify if children value protests made against unfair rules and norms, and how they judge individuals who partake in "Good Trouble." Eight vignettes were shown to children ages 4-8. The vignettes showed a town with two groups of people that had rules for everything. Depending on the condition, the rules were either fair or unfair. Four of the eight vignettes involved moral rules, and the remaining four vignettes showed social rules. In the vignettes, characters were shown to argue their agreement or disagreement of the rule. The study aims to examine the child's preference for a person breaking an unfair rule and making "Good Trouble," and if this preference differs across the age range. Thus far, children prefer to be friends with the "good trouble" maker, and children also display a preference towards those breaking moral rules over social rules. With this research, we can begin to understand when children shift from a mindset of being strict rule followers to understanding that some rules must be broken to create a system of more just rules.

Research Discipline: Social Sciences
Presentation: Poster Presentation - E
Poster Number (if applicable): 1
Presentation Time: 1:00 PM to 1:50 PM

Primary Care Based Mindfulness Intervention for Chronically Traumatized Individuals

Ali, Shifa; Lott, Abigail; Dixon, Drew; McCullough, Madison

Presenter/s: Shifa Ali

Emory Faculty Mentor: Abigail Lott

This study explores the effectiveness of an 8-week Mindfulness-based Cognitive therapy (MBCT) treatment session for African American patients with comorbid Post Traumatic Stress Disorder and depression symptoms. The weekly sessions are focused on teaching mindfulness as a way to help increase awareness and control over thoughts, feelings, and bodily sensations related to experiences with trauma. Patients are randomized to either the waitlist group or the Mindfulness Intervention group. In order to examine retention rates and subject interest in the session, self-reports and exit interviews are used. The implications of this study could further our understanding of mind-body approaches in the treatment of PTSD and depression in communities with significant public health burdens.

Research Discipline: Social Sciences
Presentation: Poster Presentation - D
Poster Number (if applicable): 1
Presentation Time: 11:00 AM to 11:50 AM

The Impact of Development Across Puberty on Psychopathology

Ali, Muskan; Freeman, Sienna; Richardson, Rebecca; Raper, Jessica

Presenter/s: Muskan Ali

Emory Faculty Mentor: Jessica Raper

Psychopathology studies mental disorders and unusual or maladaptive behaviors. During adolescence, there are many serious changes in regards to hormones, the physical body, and emotions that impact the risk of psychopathology. In this project, the impact of male maturation during puberty in the development of stress and emotional brain circuits was studied through a non-human primate model of rhesus macaques (RM). Utilizing the human intruder test, behavioral responses to an acute stressor were collected and analyzed for 10 male RMs from pre- to peri- puberty. In the human intruder test, an unfamiliar human intruder positions themself in various positions relative to the cage and makes indirect and direct eye contact with the macaque which elicits an anxiety response in RMs. While behavioral responses to stressors were unchanged with age, there were expected age-related increases in growth observed in physical measures, which were collected at the same age markers as the behavioral data. This data showed that the cortisol stress response decreased at peri-puberty. Furthermore, functional connectivity (FC) between prefrontal cortex (PFC), amygdala (AMY), and hippocampus (HIPP) were determined using MRI scans. These regions are particularly important in the neural system in regards to emotional processing. It was found that HIPP volumes and FC between left orbital PFC and HIPP increase from pre- to peri-puberty. Specific alterations in neural circuits key in emotion and stress regulations, as well as cognitive control, were found to be dependent on maturation throughout puberty. This maturation allows for better regulation of stress and emotions in the later age groups. As the macaques get older, further changes in emotional development and maturation of the brain are expected. This study allows for the association of links between psychopathology and emotional development during puberty, which in turn allows for greater understanding of factors impacting the development of psychopathology.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - E
Poster Number (if applicable): 2
Presentation Time: 1:00 PM to 1:50 PM

Immoral Medicine

Amirani, Lucy; Crane, Jonathan K.

Presenter/s: Lucy Amirani

Emory Faculty Mentor: Jonathan Crane

N/A

Research Discipline: Humanities
Presentation: Poster Presentation - C
Poster Number (if applicable): 2
Presentation Time: 10:00 AM to 10:50 AM

Domain and Indicator Identification for the Development of a Household and Community Resilience Measurement Tool in the Context of Urban, Coastal, and Informal Settlements

Anthony, Sophie; Oza, Hemali

Presenter/s: Sophie Anthony

Emory Faculty Mentor: Hemali Oza

With the progression of climate change, natural disasters such as hurricanes, droughts, and floods are increasing in severity and frequency. Therefore, it is imperative that communities and households are resilient in response to these shocks and stressors. The literature defines resilience in many ways; however, most agree that it is the ability to recover from and adapt to a changing environment. To understand how resilience among these groups can be improved, we first need a metric to measure it, but the varying definitions and abstract qualities of resilience make it a difficult construct to measure. The aim of this study is to identify domains and indicators that can be used to measure the resilience of communities and households. To achieve this objective, we are conducting a scoping review; in particular, our study will be exploring resilience in the context of urban, coastal, and informal settlements. Databases (PudMED, Google Scholar, PsycINFO, etc.) were searched for eligible studies. Then, we determined which studies fit our specific criteria by conducting a double (two-reviewer) title and abstract screening followed by a double full text screening. We identified forty-four studies that fit our criteria. Now, the indicators from these studies are being sorted into the domains given in Serfilippi et al. We expect that the domains and indicators that are identified will provide us with a comprehensive list of factors that have been used to measure resilience. Following the conclusion of this study, these domains and indicators will be used to develop a resilience-measurement tool consisting of a set of survey questions that will be embedded into the existing data collection architecture of the Revitalizing Informal Settlements and their Environments study (RISE), a cluster-randomized control trial taking place in Fiji and Indonesia.

Research Discipline: Public Health
Presentation: Poster Presentation - B
Poster Number (if applicable): 1
Presentation Time: 9:00 AM to 9:50 AM

Pre-trauma Depression Symptoms Better Predicts the Risk of Developing Post-Traumatic Stress Disorder Symptoms 6 Months Post-Trauma Compared to Alcohol Consumption 6 Months Post-Trauma

Arora, Jai; Hinojosa, Ceci; Stevens, Jennifer

Presenter/s: Jai Arora

Emory Faculty Mentor: Jennifer Stevens

Alcohol consumption, depression, and post-traumatic stress disorder (PTSD) symptoms often co-occur in trauma-exposed individuals. Given inadequate sample sizes, it is unknown whether alcohol consumption is a better predictor than depression symptoms in predicting PTSD symptoms after trauma. Therefore, we sought to determine whether alcohol consumption predicts PTSD symptoms over and above depression symptoms in a large longitudinal dataset.

Using the AURORA dataset, a longitudinal, multimodal, observational study of trauma and its mental health impacts, alcohol consumption (alcohol frequency*quantity; PhenX Toolkit), depression (PROMIS Depression Short Form 8b Scale), and PTSD symptoms (PCL-5), were gathered across five timepoints (pre-trauma, 2 weeks, 8 weeks, 3 months, and 6 month post-trauma) from n=436 emergency department patients. Pearson correlation was used to reveal associations between demographic and clinical variables. Hierarchical linear regressions were conducted to determine whether clinical variables significantly predicted PTSD symptoms while controlling for demographic variables.

Age, pre-trauma depression symptoms, and 6-month alcohol consumption were significantly correlated with 6-month PTSD symptoms. Pre-trauma depression symptoms and age were used in the first model of the hierarchical regression. The model was significant with pre-trauma depression symptoms accounting for 13% of variance in 6-month PTSD symptoms, using age as a covariate ($F(2,264)=20.38$, p<.001; depression symptoms $\beta=0.32$, $t(264)=5.61$, p<0.001; age $\beta=0.16$, $t(264)=2.82$, p<0.01). 6-month alcohol consumption was added in a second model to determine its predictive value over and above depression symptoms. The model remained significant ($\Delta F(1,263)=5.63$, $p=0.02$, and $\Delta R2=0.02$), and alcohol was a significant predictor of PTSD symptoms ($\beta=0.14$, $t(263)=2.37$, $p=0.02$). Altogether, pre-trauma depressive symptoms were the strongest predictor of 6-month PTSD symptoms, with additive effects of age and alcohol consumption.

Overall, the data suggests individuals with pre-existing depression symptoms exposed to trauma might benefit from refraining from alcohol consumption and seeking treatment for depression to reduce their risk of developing PTSD symptoms 6 months post-trauma.

Research Discipline: Public Health
Presentation: Poster Presentation - B
Poster Number (if applicable): 2
Presentation Time: 9:00 AM to 9:50 AM

Understanding the Role of Inflammatory Disease Granulocytes from a Conditional LCMT-1 Knockout Mouse Model

Ashraf, Ali; Pallas, David; Tam, Duncan

Presenter/s: Ali Ashraf

Emory Faculty Mentor: David Pallas

N/A

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 2
Presentation Time: 4:00 PM to 4:50 PM

Uncovering the Mechanisms Underlying Diet-Induced Changes in Mouse Fecal IgA Concentrations

Avila, Walter; Cervantes-Barragan, Luisa; Royer, Charlotte

Presenter/s: Walter Avila

Emory Faculty Mentor: Luisa Cervantes-Barragan

The gut microbiome influences immunity and mucosal barrier maintenance and processes in the small intestine. Changes in diet alter the gut microbiota composition, impacting the gut immune system and its constituents. Immunoglobulin A (IgA), an antibody secreted by plasma cells in the intestine that helps defend against harmful pathogens, is also impacted by dietary change. Our preliminary research has shown that mice on a non-fermentable-fiber only (NFF) diet have significantly lower concentrations of fecal IgA than mice on a standard diet (SD). However, the mechanisms underlying this change remain largely unclear. One explanation could be that B cells in the guts of NFF mice produce less IgA in response to the NFF diet. It is also possible that the NFF diet significantly alters the gut microbiome composition, decreasing the repertoire of clonal plasma cells. To test these hypotheses, we will incubate NFF and SD mouse feces with IgA-targeting antibodies. These will bind to IgA attached to fecal bacteria, identifying them with a fluorescent signal and allowing them to be sorted. Sorted groups will undergo 16s rRNA sequencing to identify the attached bacteria. If no significant differences are found in the bacteria
bound by IgA in NFF or SD feces, this will indicate possible overall IgA reduction because of dietary change. If differences are found, this will imply that the B cell repertoire is primarily affected by changes in the microbiota induced by dietary modifications. Our experimental results will provide insight into how the absence of dietary fiber affects IgA expression and influences its role in defending against gut pathogens.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - E
Poster Number (if applicable): 3
Presentation Time: 1:00 PM to 1:50 PM

Evaluating the Impact of Peripartum Depression (PPD) on Epigenetic Age Acceleration using GrimAge

Author 1 Bai, Claire; Author 2 Smith, Alicia; Author 3: Knight, Anna

Presenter/s: Claire Bai

Emory Faculty Mentor: Alicia Smith

Pregnancy can be a vulnerable time for expecting mothers as oftentimes comes with immense biological, financial and social changes that affect daily well-being. Thus, peripartum depression (PPD) is a common medical illness, affecting 1 in 7 pregnant women and involves feelings of extreme sadness, anxiety, indifference, and changes in routine during and after pregnancy. Previous research has shown that depression is correlated with negatively implicated epigenetic modifications. This study investigates whether peripartum depression is associated with epigenetic changes that are correlated with cellular aging. This study utilizes GrimAge, an epigenetic predictor of mortality that identifies age related DNA methylation of 12 plasma proteins upon considering lifetime tobacco smoking. Further, AgeAccelGrim was calculated as the residual after adjusting GrimAge for chronological age. From the Emory University African American Maternal Stress and Infant Gut Microbiome Cohort, 421 participants who were all expecting mothers provided blood samples between 6-27 gestation weeks. A multiple linear regression was performed to measure the association between categorical Edinburgh Postnatal Depression Scale (EPDS) scores and AgeAccelGrim, controlling for relevant covariates: tobacco, marijuana, monocytes, and education. EPDS scores of 10 or higher indicated that the individual may have peripartum depression. The results of this study found no statistical significance between having PPD and AgeAccelGrim. Thus, we concluded that having PPD during and post pregnancy is not correlated with increased age acceleration. Ultimately, the goal of this project is to aid the growing field of precision medicine which aims to take into account a patient's lifestyle, environment and genetics to better health outcomes. Future studies should attempt to examine this question longitudinally and investigate whether age acceleration will be associated with ongoing depression after pregnancy.

Research Discipline: Social Sciences
Presentation: Poster Presentation - B
Poster Number (if applicable): 3
Presentation Time: 9:00 AM to 9:50 AM

The Intersection Between Social Epistemology and Ancient Philosophy

Ballas, Stevie; Jimenez, Marta

Presenter/s: Stevie Ballas

Emory Faculty Mentor: Marta Jimenez

This project explores the relevance of the views of Ancient thinkers in the field of social epistemology. While the field of epistemology (i.e. the study of human knowledge and truth) has focused since Early Modern times to the 20th Century on how knowledge operates in the context of independent individuals, and focuses on questions of certainty and justification, the newly developed branch of social epistemology (as the study of human knowledge and the pursuit of truth in a social context) focuses on the role of social institutions and relations in the production and dissemination of knowledge. Ancient Greek philosophers were very concerned with similar questions and thus ancient Greek epistemology has some key features in common with these new developments in social epistemology. My study aims at highlighting some of the key areas of potential overlap and influence between ancient Greek philosophers (specifically Plato, Aristotle, and the Stoics) and modern social epistemology. No current research has examined the relationship between these fields in detail, and my goal is to get a first impression of how, why, or if social epistemologists use the ancients and are aware of these connections.
I have developed this study through an examination of each article of the Journal of Social Epistemology (Steve Fuller, editor) using a search engine for key words relating to Ancient Greek Philosophy with the goal of identifying (1) the main topics in relation to which the Greek authors are quoted and (2) whether, and if so, how social epistemologists utilize ancient Greek thought. The results of this study offer interesting resources to the development of some contemporary discussions in social epistemology as well as offer contemporary tools to better understand the perspective of the ancient Greeks.

Research Discipline: Humanities
Presentation: Poster Presentation - A
Poster Number (if applicable): 1
Presentation Time: 8:00 AM to 8:50 AM

N/A

Banuri, Ramis

Presenter/s: Ramis Banuri

Emory Faculty Mentor: N/A N/A

N/A

Research Discipline: N/A
Presentation: Oral Presentation - A
Poster Number (if applicable):
Presentation Time: 8:00 AM to 9:30 AM

Race and Individualized Education Programs: A Look into Intake Questionnaires from the Marcus Autism Center

Basak, Maya; Mendez, Adriana (mentor)

Presenter/s: Maya Basak

Emory Faculty Mentor: Adriana Mendez

N/A

Research Discipline: Public Health
Presentation: Oral Presentation - B
Poster Number (if applicable):
Presentation Time: 9:30 AM to 11:00 AM

Tracing the Pathways and Cellular Impact of Oncohistone Mutations

Behling, Jayden; Corbett, Anita; Elayavalli, Satvik; Tong, SzeYu; Withers, Elise

Presenter/s: Jayden Behling

Emory Faculty Mentor: Anita Corbett

Histone proteins are essential to package chromatin within the cell nucleus and regulate gene expression. Despite these fundamental functions for histones in all cells, histone mutations, termed oncohistones, have been linked to specific forms of oncogenesis and cancer phenotypes. How specific oncohistone mutations affect cell function, as well as which specific pathways they impact, are still unknown. Exploring this knowledge gap could lead to a clearer understanding of how specific histone mutations drive oncogenesis. We have used budding yeast to model oncohistone mutations and explore how these mutations alter cell physiology. These studies reveal that yeast cells that express a histone H3 oncohistone, H3K36M, as the sole form of histone H3 show altered growth on media with caffeine. We th16e16n16 16e16x16p16l16o16i16t16e16d16 16t16h16i16s16 16g16r16o16w16t16h16 16p16h16e16n16o16t16y16p16e16 16t16o16 16i16d16e16n16t16i16f16y16 16h16i16g16h16 16c16o16p16y16 16s16u16p16p16r16e16s16s16o16r16s16 16t16o16 16d16e16f16i16n16e16 16t16h16e16 16c16e16l16l16u16l16a16r16 16p16a16t16h16w16a16y16s16 16i16m16p16a16c16t16e16d16.16 16T16h16i16s16 16a16n16a16l16y16s16i16s16 16i16d16e16n16t16i16f16i16e16d16 16E16s16a16116,16 16a16 16l16y16s16i16n16e16 16a16c16e16t16y16l16t16r16a16n16s16f16e16r16a16s16e16,16 16a16s16 16a16 16s16u16p16p16r16e16s16s16o16r16.16 16T16h16e16 16g16o16a16l16 16o16f16 16m16y16 16r16e16s16e16a16r16c16h16 16i16s16 16t16o16 16p16e16r16f16o16r16m16 16a16 16s16i16m16i16l16a16r16 16s16c16r16e16e16n16,16 16f16o16c16u16s16i16n16g16 16o16n16 16a16n16o

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - D
Poster Number (if applicable): 2
Presentation Time: 11:00 AM to 11:50 AM

Effects of HANP/GKT831 nanoparticle treatment on NOX1 and NOX4 expression levels to reduce resistance to radiation therapy and chemotherapy in breast cancer patients.

Beniwal, Pamela; Yang, Lily; Zhu, Lei

Presenter/s: Pamela Beniwal

Emory Faculty Mentor: Lily Yang

N/A

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 3
Presentation Time: 4:00 PM to 4:50 PM

Identifcation of Rvb1/2-mediated Molecular Interactions that Impact Cellular Function

Bui, Johnny; Najmi, Saman; Ghalei, Homa

Presenter/s: Johnny Bui

Emory Faculty Mentor: Homa Ghalei

Ribosomes, which perform the vital role of producing proteins in all cells, are composed of 4 ribosomal RNAs and 79 proteins. For the formation of ribosomes that are capable of accurate protein synthesis, ribosomal RNAs must be correctly processed, folded, chemically modified, and assembled with ribosomal proteins. Ribosome assembly is a complicated process that requires the action of several assembly factors, including the essential AAA+ ATPase Rvb1/2, which is the heterohexameric complex of Rvb1 and Rvb2. The Rvb1/2 complex also has essential roles in other cellular functions such as facilitating the access to DNA within chromatin-remodeling complexes, participating in DNA damage response pathways, and remodeling RNA-protein complexes. While we know that the ATPase activity of Rvb1/2 is required for proper assembly of complexes that chemically modify ribosomal RNAs, the precise role of Rvb1/2 in this pathway and the mechanism of function of Rvb1/2 are currently not understood. Because the Rvb1/2 complex is essential for viability, simple loss of function mutants are not useful to study the function of this enzyme. The Ghalei lab has leveraged the power of a budding yeast model system and engineered a mutant yeast strain of Rvb2 (rvb2-R350A) by CRISPR/Cas9 genome editing that has a cold-sensitive phenotype and is defective for Rvb1/2 ATPase activity. The goal of this project is to use this yeast strain to identify the critical Rvb2-mediated interactions that affect cellular function. Using a targeted high copy suppressor screen, we observe that overexpression of NOP58, which encodes an essential protein component of the complexes that modify ribosomal RNAs, can rescue the growth defect of cells expressing rvb2-R350A. To expand our findings, we plan to perform an unbiased high copy suppressor screen and identify other factors whose overexpression may affect the growth of cells expressing rvb2-R350A. Successful completion of the library screen will identify known and novel interactors of Rvb2 and aid in understanding the molecular interactions that regulate or are affected by the ATPase activity of Rvb1/2.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - C
Poster Number (if applicable): 3
Presentation Time: 10:00 AM to 10:50 AM

Characterizing social behavior in prairie voles

Bui, Mai Khuyen; Warren, Megan; Liu, Robert; Young, Larry

Presenter/s: Mai Khuyen Bui

Emory Faculty Mentor: Megan Warren

Vocal communication plays a pivotal role in the social interactions of animals. One way rodents communicate in social settings is through ultrasonic vocalizations (USVs), which are above the range of human hearing. However, the specific role of USVs is not yet certain, and prior work on the subject has focused largely on communication in rats and mice. Vocal communication may be further understood using other rodent models, such as the prairie vole which, like humans, forms life-long pair bonds and is biparental. Prairie voles also have larger auditory cortices than other rodents (Campi et al., 2007; Krubitzer et al., 2011), indicating that audition may play a larger role in prairie vole behavior. Communication via USVs in prairie voles is understudied and much remains unknown about its underlying processes. Therefore, we aimed to assess the interplay between USVs, neural activity, and behavior by simultaneously recording video, audio (USV), and electrophysiology data. A vole with an implanted electrophysiology recorder was placed into a plexiglass arena either alone, with an unrestrained social partner, or with one or more social partners contained under a metal cup. Audio and video data were captured with a single microphone and overhead camera, respectively, while the electrophysiology data was obtained via an electrode positioned within the vole's amygdala or striatum. I used the video data to characterize vole behavior using Boris behavioral analysis (Version 8.0.9; Friard, 2016). I found that the voles engaged in numerous behaviors, including sniffing, grooming, eating, and huddling. Using this behavioral information, we plan to assess the interplay between behavior, vocalizations

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - D
Poster Number (if applicable): 3
Presentation Time: 11:00 AM to 11:50 AM

The role of Wnk1 in cancer immune evasion

Byun, Justin; Sobierajska, Ewelina; Kissick, Haydn

Presenter/s: Justin Byun

Emory Faculty Mentor: Haydn Kissick

Cancer cells have shown the unique ability to avoid anti-tumor immune responses. One potential way tumors may inhibit anti-tumor immune responses is by resisting immunogenic cell death. Using flow cytometry, we determined whether tumors were “cold” (low CD8 T cell numbers) or “hot” (high CD8 T cell numbers). We found that the Wnk1 gene is highly upregulated in “cold” tumors. Wnk1 is a negative regulator of the NLRP3 inflammasome, which induces pyroptosis, a type of immunogenic cell death that recruits CD8 T cells. If cold tumors have an upregulation of Wnk1, this could decrease the process of immunogenic cell death. Through CRISPR-Cas9, we can delete the Wnk1 gene in mouse renal tumor cells to determine how the loss of Wnk1 affects immunogenic cell death, the immune response, and tumor control. We hypothesize that deletion of Wnk1 will lead to more immunogenic cell death, increased CD8 T cell infiltration, and therefore, better tumor control. Expected outcomes could lead to novel cancer treatments (i.e. Wnk1 inhibitors) for patients who exhibit “cold” tumors.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - D
Poster Number (if applicable): 4
Presentation Time: 11:00 AM to 11:50 AM

Vowel Production Variation in Urban and Rural Georgia

Campion, Ben; McLarty, Jason

Presenter/s: Ben Campion

Emory Faculty Mentor: Jason McLarty

This study examines the similarities and differences in the vowel spaces of African American Language (AAL) speakers between those with urban hometowns and those with rural ones. Differences in vowel sounds are often one of the most salient markers of an individual's dialect, and can be indicative of regional and sub-regional backgrounds. Vowel production differences between urban and rural speakers in Georgia have not been well-studied yet. Using data from Corpus of Regional African American Language (CORAAL), speakers were selected based on being from one of two locations: an urban center (Atlanta, GA) and a more rural location (Valdosta, GA). Half of the speakers came from the Atlanta dataset and half came from the Valdosta dataset, balanced for gender. From each speaker's interview, at least twelve instances of each vowel type were isolated and formant values were measured. Finally, those values were normalized (Lobanov 1972) and are presented in vowel plots where speaker and group level configurations will be compared. This study is currently in progress. It has been hypothesized that the Atlanta speakers will follow vocalic patterns associated with urban locations (Thomas 2007), while the speakers from Valdosta may exhibit a different vocalic configuration that is associated with more rural locations in the American South (Thomas 2003) The results of this study will provide further insight into the patterns of change in AAL, and add to the body of research into AAL and sub-regional variation in the South.

Research Discipline: Social Sciences
Presentation: Oral Presentation - B
Poster Number (if applicable):
Presentation Time: 9:30 AM to 11:00 AM

Pausing by E. coli RNA Polymerase at Protein Roadblocks

Cartee, Allison; Qian, Jin; Artsimovich*, Irina; Xu, Wenxuan; McCalla, Derrica; Dunlap, David; Finzi, Laura

Presenter/s: Allison Cartee

Emory Faculty Mentor: Laura Finzi

Deoxynucleic acid (DNA) is the medium of genetic information in all forms of life. Transcription, the synthesis of messenger ribonucleic acid (mRNA) from a DNA template, is the process in which that information is utilized. During transcription, a motor enzyme called RNA polymerase (RNAP) can translocate at up to 20-25 base pairs per second, but forces and transcription factors can also modulate activity and intrinsic pausing, which is thought to be important for regulation. Previous studies suggest RNAP may backtrack after intrinsic pausing which may prolong the inactive state. RNAP also pauses when it encounters a physical obstacle along the template DNA, but whether RNAP can actively disperse a roadblock or must passively wait for it to dissociate is uncertain. To investigate this, the DNA binding proteins LacI and EcoRI were used as site-specific roadblocks along a DNA template, and the pauses by E. coli RNAP were measured as a function of forces opposing or assisting RNAP translocation. Pauses were also measured in the presence of GreA, a protein that rescues backtracked RNAP complexes by cleaving nascent RNA backed up into the catalytic site. Opposing forces on RNAP encountering LacI obstacles increased average pause duration compared to assisting forces, with no dependence on force magnitude. However, including GreA eliminated the increase in pause time due to opposing force. Indeed, adding GreA to transcription elongation complexes stalled indefinitely at EcoRI roadblocks rescued translocation. In conclusion, backtracking by transcription elongation complexes extends pauses at EcoRI and LacI roadblocks unless GreA is present, but these two roadblocks must dissociate before RNAP can proceed.

Emory University, *Ohio State University

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - E
Poster Number (if applicable): 4
Presentation Time: 1:00 PM to 1:50 PM

CCR5 chemokine receptor involved in migration of Mesenchymal Stromal Cells (MSCs) to secondary lymphoid organs (SLOs)

Chakraborty, Jane; Foppiani, Elisabetta Manuela; Burnham, Andre; Horwitz, Edwin

Presenter/s: Jane Chakraborty

Emory Faculty Mentor: Edwin Horwitz

Graft-versus-host disease (GVHD) is a complication with blood and marrow transplantation in which donor T cells attack the patients' healthy tissues. GVHD is most effectively treated with glucocorticoids and various immunosuppressive drugs; however, patients with steroid resistant GVHD face poor prognosis. MSCs are proven to have immunosuppressive functions toward different mechanisms for this reason have emerged as a promising therapeutic option for several diseases including GVHD. MSCs can be therapeutically delivered via systemic infusion and appear capable of homing to sites of inflammation. MSCs are believed to play a role in SLOs function, which are sites that facilitate adaptive immune responses. However, the dynamics and molecular mechanisms of MSCs trafficking to sites of inflammation have not been fully elucidated. MSCs seem to express and respond to chemokines: understanding the role of specific chemokine receptors in relation to migration towards specific anatomical locations may improve the clinical efficacy of MSCs based therapy for immune diseases including GVHD. CCR5 is a chemokine receptor expressed on various cell types and plays a vital role in the inflammatory response by directing cells to sites of inflammation. CCL5 is its primary ligand, although other chemokines also bind. In this study, starting from a protein assay based on the T cells activated conditioned media, we found that CCL5-CCR5 axis is involved with migration of MSCs to an inflammatory environment. Through a migration study in vitro, we saw that migration of MSCs was dependent on CCL5 induced CCR5 signaling, which is strongly inhibited by a small molecule CCR5 antagonist and when CCR5 is knocked out in MSCs. Collectively these data suggest that increasing the expression of CCR5 could improve the MSCs homing to a site of inflammation. This strategy could be used to traffic MSCs to SLOs to attenuate GvHD while preserving Graft versus Leukemia.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - B
Poster Number (if applicable): 4
Presentation Time: 9:00 AM to 9:50 AM

Retention Rates of Migrant Farmworkers in Florida for the OhEARD Project

Chang, Roy; Albu, Ioana; Mutic, Nathan; Chicas, Roxana; Elon, Lisa

Presenter/s: Roy Chang

Emory Faculty Mentor: Nathan Mutic

N/A

Research Discipline: Nursing
Presentation: Poster Presentation - A
Poster Number (if applicable): 2
Presentation Time: 8:00 AM to 8:50 AM

Examining the relationship between the intentional loudness of a product and consumer perception

Author 1 Ward, Morgan; Author 2 Cheng, Ellen

Presenter/s: Ellen Cheng

Emory Faculty Mentor: Morgan Ward

People usually use products to signal their social status. Qualities about the product can project, such as product sounds (loud and quiet), sometimes express the user's status. There are two ways to attain status: by being dominant or by being prestigious. Louder products, such as a muscle car, are often considered a signal of dominance, while quiet product sounds are considered a signal of prestige. However, even though people hope to show a high status with a louder product, it is not certain that this effect will be produced. For example, many people have a negative perception of muscle cars and they may think they are annoying instead of prestigious. Thus, my research with Professor Ward seeks to identify what kind of response loud objects produce within observers. To obtain this research, a survey was conducted through the Goizueta Business School Behavioral Lab, where participants were asked to answer a series of questions. There were two conditions presented to participants: a condition where the object was quiet and did not emit sound, and a condition where the object was loud and emitted sound. Within these two conditions, there were also differences in whether the person with the product intentionally made the object produce sound or not. We then ran statistical analysis through R and examined the data through Anovas, beta coefficients, simple effects, mediation analysis, and regressions. Our findings statistically significantly revealed that a loud product felt "overbearing" to observers and loud objects may not make the owner have a higher status in the views of others.

Research Discipline: Social Sciences
Presentation: Oral Presentation - E
Poster Number (if applicable):
Presentation Time: 2:00 PM to 3:30 PM

Investigating Recollective Content of Emotional Memories

Cho, Linda; Dong, Stella; Nguyen, Dawn; Wong, Sara; Shepardson, Susie; Dr. Hamann, Stephan

Presenter/s: Linda Cho

Emory Faculty Mentor: Stephan Hamann

Emotional memories are often more vivid and have a greater sense of contextual recollection of the event (i.e., associated thoughts and perceptual characteristics from encoding) than neutral memories. This enhanced recollection is driven primarily by arousal. Although both emotionally negative and positive events have enhanced recollection, negative events generally have stronger recollection than positive events. Theories of emotional memories (i.e., The NEVER model) suggest that the enhanced recollection of negative events relative to positive is due to greater encoding and recapitulation of sensory details (Bowen., 2018). Additionally, emotional-binding accounts suggest negative events would be recollected with more emotional aspects (Yonelinas & Ritchey., 2015). Thus, it can be predicted that negative events would have more perceptual details and emotional responses in recollective content. However, only one study has analyzed the recollective content, and only the negative events were analyzed. Thus, it's unclear what contextual information underlies recollection for emotional events, particularly comparing those of positive events to negative events. To fill this gap, a justified remember/familiar recognition task was used to evaluate recollection during the recognition memory task of negative, positive, and neutral images, and recollective content reported by participants was analyzed. Consistent with previous literature, we found that recollection was greater for negative and positive valence pictures than neutral. Although our data analysis process is still in progress, the preliminary results are consistent with our prediction that recollection for pictures with negative valence is recalled with a significantly higher percentage of perceptual details than pictures with neutral valence. What's more, pictures with negative valence have significantly more emotional recollection responses than both positive and neutral pictures. These findings support predictions from valence-based accounts and emotional-binding accounts of recollection of emotional events that negative events enhance recollection with an increased encoding of perceptual and emotional details about the event.

Research Discipline: Social Sciences
Presentation: Poster Presentation - C
Poster Number (if applicable): 4
Presentation Time: 10:00 AM to 10:50 AM

A geographic comparison of social and economic inclusivity in metropolitan areas and how the conception of a neighborhood affects urban hyper-segregation and poverty concentration

Matthew Chupack; Jessica Lynn Stewart

Presenter/s: Matthew Chupack

Emory Faculty Mentor: Jessica Lynn Stewart

N/A

Research Discipline: Social Sciences
Presentation: Oral Presentation - F
Poster Number (if applicable):
Presentation Time: 3:30 PM to 5:00 PM

Southern Crescent Regional Commission Revival

Cooke, Peter; Bromell-Tinubu, Gloria; Doner, Richard; Hankla, Charles; Rich, Michael; Womack, Veronica

Presenter/s: Peter Cooke

Emory Faculty Mentor: Michael Rich

N/A

Research Discipline: Social Sciences
Presentation: Poster Presentation - F
Poster Number (if applicable): 33
Presentation Time: 2:00 PM to 2:50 PM

Identifying DNA sequence elements that rely on the BRG1/BRM-Associated Factor (BAF) Complex

Author 1 Davis, Sona; Author 2 Gorkin, David;

Presenter/s: Sona Davis

Emory Faculty Mentor: David Gorkin

BRG1/BRM-Associated Factor (BAF) complexes are critical for multiple developmental processes and its mutation can result in a variety of congenital disorders and cancer. Despite the importance of BAF to human development and disease, little is known about which DNA sequence elements are reliant on BAF complexes. This study will identify the DNA sequence elements active in human cancer cell line K562 that rely on BAF complexes for their accessibility and regulatory function. DNA sequence elements known as cis-regulatory elements (cREs) do not code for proteins but contain short sequence motifs bound by Transcription Factor (TFs) that regulate the transcription of genes. In order for most TFs to bind to cREs its DNA must first be cleared of any nucleosome particles. This clearing is performed by chromatin remodelers, an enzyme complex that utilizes ATP (an energy carrying molecule in the cell) to slide or eject nucleosomes and make the underlying DNA accessible to TFs. BAF complexes make up the largest family of chromatin remodeler, characterized by presence of the ATPase subunits SMARCA2 and SMARCA4 (also known as BRM and BRG1, respectively). This study will use a small molecular inhibitor of SMARCA2/4 ATPase activity, which has been shown to inhibit BAF complex function. Assay for Transposable Accessible Chromatin with Sequencing (ATAC-seq) will be used to identify cREs that change chromatin accessibility upon BAF inhibition, and mRNA sequencing (RNA-seq) to identify genes that become dysregulated upon BAF inhibition. Over 500 TFs binding locations of cell line K562 are known allowing for easy delineation of which cREs are dependent on BAF activity. By spotlighting regions of the genome that are reliant on BAF activity, this study will provide a new layer of knowledge about BAF's regulatory targets to enable future research into the mechanisms by which BAF mutations cause disease.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 3
Presentation Time: 8:00 AM to 8:50 AM

Analyzing the HIV susceptibility rate of birth control Depo-Provera has on the Female Genital Tract of Women

Smith Alicia; Davis, Danielle

Presenter/s: Danielle Davis

Emory Faculty Mentor: Alicia Smith

Danielle Davis
Department of Obstetrics and Gynecology, Emory University, Atlanta, GA

Birth control is necessary to ensure female reproductive rights globally. This gives every woman the choice of when to start their own family. The goal of this research study is to analyze the effects of certain birth control on the environment of the female genital tract, which may increase the risk of HIV. This research is highly important because HIV is one of the biggest epidemics. Women are the second largest population to be at risk for HIV; therefore, it is important for women with an increased risk of HIV to make an informed decision about which birth control would be safer for them. Without proper research on the effects of birth control, then women cannot make properly informed decisions about their reproductive health.

This project uses women being recruited from an ongoing study of HIV susceptibility following initiation of progestin-based hormonal contraceptives (HC). The goal of my project is to evaluate whether there are any demographic differences in women that choose different HC methods. We hypothesize that younger women will favor IUDs, which require fewer follow up visits relative to the Nexplanon implant or Depo-Provera injection. We also hypothesize that women with IUDs will miss more study visits and will be more likely to withdraw from the study or be lost to follow up.

Of the 79 women that received HC as part of the study, there were 36, 32, and 11 women, that self-selected in the IUD, Nexplanon implant, and Depo-Provera injection groups, respectively. Women that chose the injection (33.8+ 8.2 years; p=0.018), but not the implant (28.7+ 6.4 years; p=NS), were older than those that chose the IUD (28.0+ 6.7 years). Also, White women were less likely to choose the injection relative to the IUD compared to Black women (p=0.013). There were not differences by race in rates of women that chose the implant (p=0.096). Surprisingly, the rates of study completions are lowest for those that chose the injection relative to the other methods.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 4
Presentation Time: 4:00 PM to 4:50 PM

do different types of HC associate with different levels of anti HIV activity in the FGT

Davis, Danielle; Smith, Alicia

Presenter/s: Danielle Davis

Emory Faculty Mentor: Alicia Smith

Birth control is necessary to ensure female reproductive rights globally. This gives every woman the choice of when to start their own family. The goal of this research study is to analyze the effects of certain birth control on the environment of the female genital tract, which may increase the risk of HIV. This research is highly important, because HIV is one of the biggest epidemics. Women are the second largest population to be at risk for HIV; therefore, it is important for women with an increased risk of HIV to make an informed decision about which birth control would be safer for them. Without proper research on the effects of birth control, then women cannot make properly informed decisions about their reproductive health.

My hypothesis is that cervical samples from women using depo Provera will have an increased rate of HIV rate versus other cervical samples collected from women using other birth controls such as Nexplanon, birth control pills, or the birth control patch.

To begin with this research, we recruited 300 women with 75 women currently taking depo Provera, Nexplanon, the birth control patch and the birth control pills. We will collect and analyze cervical samples of each woman and tested each sample to find their HIV susceptibility.

We are currently still recruiting for the study currently; therefore, we cannot give a formal conclusion for the study yet; however, we are expecting women who use Depo-Provera will produce thinner cervical samples, which will increase HIV susceptibility. We will expose the cervical samples to a virus to see its susceptibility.

Research Discipline: Biomedical Sciences
Presentation: Oral Presentation - F
Poster Number (if applicable):
Presentation Time: 3:30 PM to 5:00 PM

The Primary Splicing Factor in Producing Circular Utrophin RNA

Deng, Mei; Hyojung, Choo; Wu, Fang

Presenter/s: Mei Deng

Emory Faculty Mentor: Hyojung Choo

In people with Duchenne's Muscular Dystrophy (DMD), the protein dystrophin is no longer functional, causing muscle cells to weaken. Dystrophin aids in strengthening muscle fibers and prevents injury from contraction and relaxation. A structurally and functionally similar protein, utrophin, may supplement a lack of dystrophin in muscles, making it a possible treatment to reduce the impact of DMD. Unlike most muscles that are impacted by a loss of dystrophin, the extraocular muscles (EOM) are spared from DMD, which could be due to the high expression of circular utrophin RNA (circ-Utrn RNA). Because of splicing factors, the utrophin transcript can form two variations of circ-RNA, which are more stable than the usual linear form. It's not known how circ-Utrn RNA is generated, but based on a selection of candidate binding proteins, it is hypothesized that SRSF7 is the main splicing factor. When SRSF7 is present in the full utrophin transcript, the level of circ-Utrn during C2C12 differentiation is typically high. To test whether SRSF7 is indeed the primary cause, siRNA, which targets and degenerates SRSF7 coding regions, was transfected into C2C12 myoblast stem cells. Through the synthesis of cDNA from the samples, RT-qPCRs were then conducted, and both circ-Utrn RNAs and SRSF7 RNA fold levels, all expected to decline, were measured to confirm the siRNA worked. It was also tested to see whether a lack of SRSF7 affected the myogenesis of C2C12 myoblasts. Since trials of the experiment are still being conducted, it is unclear whether SRSF7 is the main splicing factor and if its transcript levels decreased after transfection. However, if the results confirm the hypothesis, then circ-Utrn RNA may be synthesized more easily, and the use of utrophin to supplement a lack of dystrophin may be a more plausible solution to reducing the pathology of DMD.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 5
Presentation Time: 4:00 PM to 4:50 PM

Comparison and Visualization of Exosome Uptake in Irradiated and Non-irradiated Lung Cancer Cells

Dhabaan, Layla; Dynan, William

Presenter/s: Layla Dhabaan

Emory Faculty Mentor: William Dynan

Exosomes, which are extracellular vesicles secreted by cells, deliver specific biological molecules, such as DNA, lipids, and proteins to other cells or molecules. The innate immune system is engaged when tumor cells are exposed to therapeutic radiation, as an “anti-tumor effect” is observed . Radiation is when beams are targeted to cancer cells, which ends up damaging the cancer cell growth and the DNA in the cancer cells. Therapy treatments require new alternatives nowadays, as not all the current cancer treatments are effective. Thus, the “anti-tumor effect” can be applied to patients with non-small cell lung cancer, as the immune system is enhanced for these patients. The goal of this study is to observe and visualize quantitative differences in exosome uptake in irradiated and non-irradiated A549 cells, which stem from a lung cancer cell line. We tested the hypothesis that exosomes are taken up more efficiently in irradiated cells compared with non-irradiated cells. We used click chemistry, which involves using molecular probes to locate and attach to targets on live cells. The dye “DBCO-Cy5” was applied to label exosomes, and thus track their uptake so we could visualize the cells. We irradiated one chamber well of cells (at 10 Gy) and left another chamber well of cells non-irradiated for comparison. We fixed and observed exosome uptake at 0, 2, 6, and 24 hours after radiation by fixing and inserting the cells onto microscope slides for visualization. We quantified our data through “ImageJ,” a Java-based image processing program, and we analyzed a significant differences in exosome production between irradiated and non-irradiated cells. By conducting experiments in an independent manner, I was geared to become self-reliant and potentially discover an alternative therapy treatment for patients with non-small cell lung cancer.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - G
Poster Number (if applicable): 56
Presentation Time: 3:00 PM to 3:50 PM

Queer Online Spaces: An Exploration of Queer Cultures and Identities in Online Youth Communities.

Dimri, Twisha; Gilders, William K.

Presenter/s: Twisha Dimri

Emory Faculty Mentor: William Gilders

I am examining queer spaces and communities on social media apps like Tumblr, Twitter and Tiktok, which are mainly populated by youth between 12 and 20 years of age. I am examining how queer youth navigate their own sexuality and identities through these spaces and interact with one another online. I will be looking at popular trends, posts, and large content creators on these platforms, and interviewing young adults who interacted with these spaces as youth. These online queer communities are spaces for friendship, affirmation, support, education, and humor, and are essential for youth who may not have access to queer communities otherwise. However, it is important to recognize that unrestricted and unmediated access to the entire internet can be harmful for youth as it can lead to harassment, a lack of nuance on important topics, spread misinformation, and create echo chambers that cause a disconnect from reality. An interesting finding was the overlap of queer identities and mental illness that exist in these spaces, and how the two are often linked and dealt with through humor. I am focusing here on the youth and their unique internet cultures and how that relates to their understandings of identity, sexuality, and how they move through the world. The information I am gathering here can be used to make these spaces safer for the participants, by highlighting the benefits and mitigating harm. As younger generations grow more and more aware of their sexualities at younger ages, looking at the communities they form online can help us understand identity and all of its nuances.

Research Discipline: Humanities
Presentation: Oral Presentation - D
Poster Number (if applicable):
Presentation Time: 12:30 PM to 2:00 PM

Investigating Recollective Content of Emotional Memories

Dong, Stella; Cho, Linda; Nguyen, Dawn; Wong, Sarah; Shepardson, Susie; Hamann, Stephan

Presenter/s: Stella Dong

Emory Faculty Mentor: Stephan Hamann

Emotional memories are often more vivid and have a greater sense of contextual recollection of the event (i.e., associated thoughts and perceptual characteristics from encoding) than neutral memories. This enhanced recollection is driven primarily by arousal. Although both emotionally negative and positive events have enhanced recollection, negative events generally have stronger recollection than positive events. Theories of emotional memories (i.e., The NEVER model) suggest that the enhanced recollection of negative events relative to positive is due to greater encoding and recapitulation of sensory details (Bowen., 2018). Additionally, emotional-binding accounts suggest negative events would be recollected with more emotional aspects (Yonelinas & Ritchey., 2015). Thus, it can be predicted that negative events would have more perceptual details and emotional responses in recollective content. However, only one study has analyzed the recollective content, and only the negative events were analyzed. Thus, it's unclear what contextual information underlies recollection for emotional events, particularly comparing those of positive events to negative events. To fill this gap, a justified remember/familiar recognition task was used to evaluate recollection during the recognition memory task of negative, positive, and neutral images, and recollective content reported by participants was analyzed. Consistent with previous literature, we found that recollection was greater for negative and positive valence pictures than neutral. Although our data analysis process is still in progress, the preliminary results are consistent with our prediction that recollection for pictures with negative valence is recalled with a significantly higher percentage of perceptual details than pictures with neutral valence. What's more, pictures with negative valence have significantly more emotional recollection responses than both positive and neutral pictures. These findings support predictions from valence-based accounts and emotional-binding accounts of recollection of emotional events that negative events enhance recollection with an increased encoding of perceptual and emotional details about the event.

Research Discipline: Social Sciences
Presentation: Poster Presentation - C
Poster Number (if applicable): 5
Presentation Time: 10:00 AM to 10:50 AM

Social Explanations for Attitudes Towards Dual Citizenship

Eckel, Jackson; Lancaster, Thomas

Presenter/s: Jackson Eckel

Emory Faculty Mentor: Thomas Lancaster

Why do attitudes towards dual citizenship vary? Vink et al. in their study of dual citizenship in the Netherlands are the first researchers (to our knowledge) to use survey data to explain differences in attitudes towards dual citizenship. Following the example of Vink et al., this paper tests three potential explanations for tolerance of immigrant dual citizenship in Germany over the course of three decades: national pride, attitude towards ethnic exclusion, and perception of cultural threat. Analyzing GESIS survey data from the Leibniz Institute for the Social Sciences, we expected moderate correlations between our three independent variables and opinion on dual citizenship. Using multiple linear regression models, we found little to no support for the national pride hypothesis. We found that support for ethnic exclusion and perception of a cultural threat from immigrants had moderate correlations, but overall did not explain much of the variation in attitudes. This suggests a weak but real relationship between attitudes towards social issues and attitudes towards dual citizenship. However, we suspect that other potential explanations—economic, political, or otherwise—are more influential in determining attitudes towards immigrant dual citizenship.

Research Discipline: Social Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 4
Presentation Time: 8:00 AM to 8:50 AM

The Role of Puberty on Emotional Attention in Adolescent Male Rhesus Macaques

Edwards, Kristin; Richardson, Rebecca; Freeman, Sienna; Raper, Jessica

Presenter/s: Kristin Edwards

Emory Faculty Mentor: Jessica Raper

Studies investigating the drastic cognitive, emotional, and hormonal changes during adolescence are crucial to understanding how individuals perceive emotionally stimulating media during this developmental phase. The goal of this study was to investigate the role of pubertal maturation on developmental changes in emotional and cognitive control neurocircuits using a translational nonhuman primate model. Pubertal markers (testicular volume and testosterone levels), as well as basal (unstressed) cortisol levels were collected during a longitudinal study which conducted eye tracking of 10 male rhesus macaques (RM) from peri-puberty (33 months of age) to post-pubertal adolescence (58 months). To assess socioemotional attention, we used an infared eyetracker (Tobii T300) to present videos of differing emotional valence (neutral, positive, or aversive). Fixation duration to predefined regions of interest (ROIs) were analyzed-specifically the eyes, mouth, or elsewhere on the body. As expected, testicular volume and testosterone levels were positively correlated and increased with age from peri-puberty to adolescence. There was a significant effect of age on the basal-cortisol levels, such that male RMs had a decrease in cortisol from peri-puberty to adolescence. Regarding the ROIs, the percentage of time spent fixating on each ROI was independent of the type of emotional stimuli viewed. However, there was a significant effect of age with an apparent decrease in percentage of time fixated on the body after a peak at 40 months of age (late peri-puberty), while the inverse appeared in fixation duration on the mouth. Interestingly, fixation duration on the eyes had a fluctuating trend that resembled the fluctuation of testosterone levels. Future analysis will focus on how these specific changes in looking patterns are impacted by the pubertal markers. Understanding how changes during puberty influence the way that we process social and emotional cues will provide insight into understanding the causes of increased mental health issues that emerge during pubertal development.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - D
Poster Number (if applicable): 5
Presentation Time: 11:00 AM to 11:50 AM

Personal Experiences Impact Abortion Attitudes Among Christian Protestant Communities Within Georgia

El Azzioui, Summayah; Pringle, Johanna; Rice, Whitney S.

Presenter/s: Summayah El Azzioui

Emory Faculty Mentor: Johanna Pringle

Religious beliefs play an influential role in a person's worldview, including their attitudes towards abortion and other reproductive health services. Although Protestant communities hold similar religious beliefs, Dozier et al., 2020 found diverse abortion attitudes among Protestant religious leaders, with attitudes ranging on a spectrum through pro-life, gray area, and pro-choice. The purpose of this study is to further examine the role personal sexual and reproductive health (SRH) experiences play on abortion attitudes among Protestant communities within Georgia. Distinctions between direct and indirect personal experiences were also of particular interest. Using qualitative data from the Center for Reproductive Health Research in the Southeast's EnFaith Study, the personal experience code was analyzed from a sample of 14 participants (7 religious leaders and 7 congregants). Qualitative data were analyzed by categorizing them by participant, direct and indirect experiences, abortion attitude (pro-choice, pro-life, gray area), and overarching themes. As a result, personal experiences were found to have an impact on abortion attitudes. Religious leaders and congregants who have had a direct SRH experience more frequently hold gray area attitudes towards abortion. Also, stigmatized SRH experiences were associated with gray area abortion attitudes. Conversely, participants that shared negative SRH experiences (i.e., rape, unintended pregnancy, etc.) expressed primarily pro-life and gray area attitudes. These results have demonstrated that personal experiences influence abortion attitudes. It also provides insight into why members of the Protestant community hold diverse and contradictory views on abortion. Both findings have increased our understanding in order to better implement reproductive health initiatives in religious communities.

Research Discipline: Public Health
Presentation: Oral Presentation - F
Poster Number (if applicable):
Presentation Time: 3:30 PM to 5:00 PM

Foster, Niara

Presenter/s: Niara Foster

Emory Faculty Mentor: N/A N/A

N/A

Research Discipline: N/A
Presentation: Oral Presentation - D
Poster Number (if applicable):
Presentation Time: 12:30 PM to 2:00 PM

Spectroscopic Characterization of Small Metallic Compounds

Galoustian, Isabela; Nielson, Chris; Heaven, Michael

Presenter/s: Isabela Galoustian

Emory Faculty Mentor: Michael Heaven

Characterizing the electronic structure of small metallic compounds is motivated by the need to test and refine theoretical predictions of their properties. This has applications to the reprocessing of spent nuclear fuel and satellite communication amongst other fields. The Heaven lab employs various spectroscopic and expansion-cooling techniques on beryllium clusters, lanthanide and actinide compounds, and other metallic species to determine their rotational and vibrational transition frequencies and subsequent structural characteristics. In this project, Dispersed Laser Induced Fluorescence (DLIF) will be used to characterize the rovibrational structure of the prototypical hydride species ThH and UH. In this process, vapor-phase UH or ThH is generated using laser ablation of pure metal targets in the presence of H2. Tunable pulsed lasers are used to excite the hydrides. They subsequently emit fluorescence, and the emission spectrum reveals electronic, vibrational and rotational energy levels. A monochromator equipped with a high-gain array detector is used to determine the wavelengths corresponding to the fluorescent transitions. The data obtained from these measurements will be used to test the predictions of relativistic quantum chemistry calculations.

Research Discipline: Natural and Physical Sciences
Presentation: Oral Presentation - B
Poster Number (if applicable):
Presentation Time: 9:30 AM to 11:00 AM

A Quantitative Review of Methods for Modelling the Structure of Psychopathology

Garcia-Barreto, Jalyse; King, Christopher; Waldman, Irwin

Presenter/s: Jalyse Garcia-Barreto

Emory Faculty Mentor: Irwin Waldman

N/A

Research Discipline: Social Sciences
Presentation: Poster Presentation - E
Poster Number (if applicable): 5
Presentation Time: 1:00 PM to 1:50 PM

A Mosaic of Murals: Evaluating Spatial and Content Trends and Patterns in the Distribution of Street Art Throughout Greater Atlanta

Gibbons, Ryan; Dowd, Timothy

Presenter/s: Ryan Gibbons

Emory Faculty Mentor: Timothy Dowd

N/A

Research Discipline: Social Sciences
Presentation: Oral Presentation - C
Poster Number (if applicable):
Presentation Time: 11:00 AM to 12:30 PM

The influence of ALDH2 reactive aldehyde detoxification on vaginal pain in a rat model of endometriosis

Govil, Arpita; McAllister, Stacy

Presenter/s: Arpita Govil

Emory Faculty Mentor: Stacy McAllister

Endometriosis is defined by the growth of endometrial tissue outside the uterus. The disease affects 10% of women of reproductive age or ~190 million women within the United States alone. The most common symptom of endometriosis is pain and ~50% of women with endometriosis suffer from debilitating pelvic pain. Currently, treatments for the pain associated with this condition are ineffective or cannot be used long-term. Therefore, there is an unmet need for new and effective treatments for women suffering from endometriosis-associated pain. An enzyme called aldehyde dehydrogenase-2 (ALDH2) metabolizes reactive aldehydes to less reactive forms. Previous studies from our lab, in mice, suggest that ALDH2 regulates reactive aldehyde accumulation to modulate pain-associated behaviors. In the current study, we used a rat model of endometriosis, behavioral assessments of vaginal sensitivity, and pharmacology to determine if increasing ALDH2 activity can alleviate endometriosis-associated vaginal pain. We hypothesize that increasing ALDH2 activity with Alda-1, an ALDH2 enzyme activator, will alleviate endometriosis-induced vaginal pain. Our preliminary findings support this hypothesis and the ALDH2 enzyme as a novel treatment targeted to alleviate pain and improve the overall quality of life for the millions of women suffering from endometriosis.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 5
Presentation Time: 8:00 AM to 8:50 AM

The Motivations Behind the Use of Herodotus' Histories Across the 19th Century to Construct Ancient Egypt in the Edinburgh Review

Greene, Margaret; Nyord, Rune

Presenter/s: Margaret Greene

Emory Faculty Mentor: Rune Nyord

In recent Egyptological scholarship, scholars have investigated how and why we have come to hold certain ideas about ancient Egypt, both in academic research and in popular culture. A key part of this self-examination i44n44v44o44l44v44e44s44 44r44e44t44u44r44n44i44n44g44 44t44o44 44t44h44e44 44b44e44g44i44n44n44i44n44g44s44 44o44f44 44E44u44r44o44p44e44a44n44 44E44g44y44p44t44o44l44o44g44y44 44i44n44 44t44h44e44 44144944t44h44 44c44e44n44t44u44r44y44.44 44P44e44r44h44a44p44s44 44u44n44s44u44r44p44r44i44s44i44n44g44l44y44,44 44m44u44c44h44 44e44a44r44l44y44 44s44c44h44o44l44a44r44s44h44i44p44 44w44a44s44 44s44i44t44u44a44t44e44d44 44i44n44 44t44h44e44 44b44i44a44s44e44s44 44a44n44d44 44b44e44l44i44e44f44s44 44t44h44a44t44 44s44c44h44o44l44a44r44s44 44h44e44l44d44 44d44u44r44i44n44g44 44t44h44i44s44 44p44e44r44i44o44d44,44 44w44h44i44c44h44 44h44a44v44e44 44b44e44e44n44 44a44r44g44u44e44d44 44i44n44 44s44e44v44e44r44a44l44 44c44a44s44e44s44 44t44o44 44r44e44m44a44i44n44 44i44m44p44l44i44c44i44t44l44y44 44i44n44 44t44o44d44a44y44s44 44s44c44h44o44l44a44r44s44h44i44p44.44 44A44 44m44a44j44o44r44 44r44e44c44o44n44s44i44d44e44r44a44t44i44o44n44 44o44f44 44E44g44y44p44t44o44l44o44g44i44c44a44l44 44i44d44e44a44s44 44i44s44 44i44m44p44e44r44a44t44i44v44e44,44 44a44n44d44 44a44n44 44i44m44p44o44r44t44a44n44t44 44e44l44e44m44e44n44t44 44o44f44 44t44h44i44s44 44i44s44 44r44e44f44a44m44i44l44i44a44r44i44z44i44n44g44 44o44u44r44s44e44l44v44e44s44 44w44i44t44h44 44t44h44e44 44d44r44i44v44i44n44g44 44m44o44t44i44v44a44t44i44o44n44s44 44a44n44d44 44m44e44t44h44o44d44s44 44o44f44 44e44a44r44l44y44 44E44g44y44p44t44o44l44o44g44i44s44t44s44,44 44o44n44e44 44e44x44a44m44p44l44e44 44b44e44i44n44g44 44t44h44e44i44r44 44r44e44l44i44a44n44c44e44 44o44n44 44C44l44a44s44s44i44c44a44l44 44a44u44t44h44o44r44s44 44t44o44 44i44n44t44e44r44p44r44e44t44 44a44r44c44h44a44e44o44l44o44g44i44c44a44l44 44e44v44i44d44e44n44c44e44.44 44l44n44 44t44h44i44s44 44p44a44p44e44r44,44 44l44 44s44e44e44k44 44t44o44 44i44d44e44n44t44i44f44y44 44h44o44w44 44a44n44d44 44w44h44y44 44e44a44r44l44y44 44a44n44t44i44q44u44a44r44i44a44n44s44 44u44s44e44d44 44t44h44e44 44a44n44c44i44e44n44t44 44G44r44e44e44k44 44h44i44s44t44o44r44i44a44n44 44H44e44r44o44d44o44t44u44s44 44H44i44s44t44o44r44i44e44s44,44 44s44p44e44c44i44f44i44c44a44l44l44y44 44B44o44o44k44 44l44l44,44 44t44o44 44i44n44t44e44r44p44r44e44t44 44a44n44c44i44e44n44t44 44E44g44y44p44t44i44a44n44

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Research Discipline: Humanities
Presentation: Oral Presentation - A
Poster Number (if applicable):
Presentation Time: 8:00 AM to 9:30 AM

Healthcare Disparities within the Pregnancy Complications of Pre-eclampsia, Hypertension, High Blood Pressure, and Gestational Diabetes

Hailemariam, Angel; Irby, Les'Shon; Smith, Alicia

Presenter/s: Angel Hailemariam

Emory Faculty Mentor: Alicia Smith

N/A

Research Discipline: Public Health
Presentation: Poster Presentation - A
Poster Number (if applicable): 6
Presentation Time: 8:00 AM to 8:50 AM

Black Elites and Latino Immigrants: How Do Their Relationships Contribute to Policy-Making?

He, Ziwei; Browne, Irene

Presenter/s: Ziwei He

Emory Faculty Mentor: Irene Browne

In the last decade, the population of Latinos in the U.S. has increased significantly (Treisman 2021). Because of this increase in the Latino population, immigration policies are an urgent topic in our daily lives. As seen in previous years, the former president, Donald Trump, exemplified a harsher and more oppressing immigration policy trend through proposing to build borders that prevent the influx of immigrants (Ciciora 2019). Within this hostile climate, black leaders confront a dilemma. Some black leaders support anti-immigrant legislation and rhetoric because they perceive immigrants as competitors for jobs and resources (Briggs 2003). However, this competition stance allies blacks with the conservative whites (Galloway 2018). Other black leaders advocate political coalition-building with Latinos because they perceive that immigrants suffer under a racist system reminiscent of Jim Crow (Browne and Odem 2012). Understanding how Black elites negotiate this dilemma and engage in immigration politics can reveal how pressing issues of race relations play-out in policy-making. Our project aims to understand the impact of racial politics on immigration bills and how the relationships between Blacks and Latinos impact policy-making. To address this question, we explore both quantitative and qualitative data. For quantitative data, we examine numeric data on legislative behavior by race such as votes on immigration bills. We also use quantitative and qualitative data to compare immigration discourse in the mainstream black and Spanish language media. For the media content analyses, we use programming language like R to build Structural Topic Modeling. Understanding the relationship and attitude between Black elites and Latinos and attitudes allows us to have a more interdisciplinary view of the world and highlight how race, politics, and legislation are closely interconnected.

Research Discipline: Social Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 7
Presentation Time: 4:00 PM to 4:50 PM

Development of an amphiphilic polymer hydrogel for use in Cardiovascular Implants

Hess, Alex; Morris, Viola; Pencea, Laura

Presenter/s: James Hess

Emory Faculty Mentor: Young-sup Yoon

N/A

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 7
Presentation Time: 8:00 AM to 8:50 AM

Elevated Vulnerability in Female and Aging Populations to Long-term Brain Deficits and Degeneration after Mild Head Trauma

Ho, Ryan; Ye, Sherry; Zheng, James

Presenter/s: Ryan Ho

Emory Faculty Mentor: James Zheng

Traumatic brain injury (TBI) is defined as an injury to the brain resulting from an external mechanical force most common in contact sports and vehicle accidents. Specifically, mild head trauma such as concussions is associated with long-term neurodegenerative diseases such as Alzheimer's disease. However, the underlying cellular and molecular mechanisms of chronic neurodegenerative impact from these injuries are still largely unknown. A better understanding of these long-term mTBI disease mechanisms is critical in developing therapeutic opportunities. To study these mechanisms, our lab developed the Head Impact Fly Injury (HIFLI) model, in which mild repetitive headfirst impacts to multiple awake and unrestrained adult Drosophila melanogaster can be delivered. In this study, we aimed to examine age as a risk factor in behavioral decline following injury and any sex differences. Flies were exposed to our mild head injury model at different ages (3d, 2wk, 4wk). Negative geotaxis behavior was recorded 90 min, 1d, 1wk, and weekly after injury until 6wk. 10s videos were analyzed using ImageJ to calculate climbing indices for each cohort of flies. Results suggest that flies subjected to our repetitive head injury model develop long-term climbing deficits, but these climbing deficits are substantially intensified in flies injured at older ages. Additionally, climbing deficits caused by injury are more profound in females than in males. Our findings suggest an increased vulnerability to brain injury in females and older adults.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - D
Poster Number (if applicable): 6
Presentation Time: 11:00 AM to 11:50 AM

Effect of Phosphate on Promigratory Genes and Cell Migration in Lung Cancer Cells

Beck Jr., George; Arnst, Jamie; Horne IV, Liam

Presenter/s: Liam Horne

Emory Faculty Mentor: Jamie Arnst

Lung cancer is one of leading causes of death worldwide. Over 130,180 die every year from it. It is the deadliest type of cancer in the United States and is more common than even breast and prostate cancer. Poor survival is often due to diagnosis of advanced disease when treatments are less effective. Identification of new targets that alter cancer progression will have a significant impact on patient survival. The American diet is particularly high in phosphates, found in colas, commercially prepared and processed foods, fast food, and more. Phosphate has been shown to promote tumorigenesis and growth in a Kras model of lung cancer. Additionally, phosphate has been shown to be upregulated in lung cancer compared to normal tissue in patients. Elevated phosphate has been shown to alter gene expression in numerous cell types, including cancer cells, thus, we believe phosphate may also have a role in affecting pro-migratory genes in tumor cells. To study this hypothesis, A549 lung cancer cells were treated with increasing concentrations of phosphate and migration was assessed using a transwell migration assay. . Additionally, we examined how inhibition of phosphate transport by Foscarnet (Fos) affected phosphate-driven cell migration. To understand how phosphate affected cell migration behavior, changes in gene expression of pro-migration genes were also examined. Preliminary results show that phosphate increases promigratory gene expression and increases A549 cell migration and treatment with Fos can inhibit these effects.. Suggesting that elevated phosphate could promote local tumor invasion. Future directions will confirm changes in gene expression and migration and will examine changes in intracellular phosphate levels during invasion using a FRET phosphate sensor.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - B
Poster Number (if applicable): 5
Presentation Time: 9:00 AM to 9:50 AM

The Role of Community-Level Incarceration Exposure on Racial Health Disparities in Birth Outcomes in Georgia

Hossain, Afsha; Stanhope, Kait; Boulet, Sheree

Presenter/s: Afsha Hossain

Emory Faculty Mentor: Sheree Boulet

Despite decreases in preterm births (PTB) and low birth weight (LBW) infants in the United States, racial health disparities persist between women and infants. The literature indicates that Black women and their partners experience higher levels of incarceration and other indicators of stress effects from structural racism which are associated with adverse birth and maternal health outcomes and increased barriers to healthcare resources. This research aims to assess county-level jail incarceration as a contextual stressor for individual-level preterm birth and low birth weight among Black and White women in Georgia. Births data (2008-2018) from Georgia OASIS and jail data (1990-2018) from the Incarceration Trends Dataset by the Vera Institute of Justice were assessed for descriptive analysis. We calculated race-specific incarceration rates and Black-White differences as well as Black-White differences in preterm birth and LBW rates according to tertile of incarceration rates (low, medium, high). Total incarceration rates increased from 1990 (0.18%) to 2018 (0.42%) and rates of incarceration were 4.5 times higher among Black individuals compared to White. Rates of preterm births and low birth weight births were greatest in counties with the highest incarceration tertile (14.8%; 10.7%) compared to counties in the medium (14.2%; 9.6%) or low (13.2%; 9.1%) tertiles. PTB and LBW rates were consistently greater among black populations than white populations regardless of incarceration level. In the highest incarceration tertile, black infants faced higher PTB (18.1%) and LBW (14.7%) rates compared to PTB (12.2%) and LBW (12.2%) rates in White infants in the highest incarceration tertile. This research suggests a relationship between community policing and incarceration practices and infant health outcomes. However, further research is needed to understand potential mechanisms.

Research Discipline: Public Health
Presentation: Poster Presentation - C
Poster Number (if applicable): 6
Presentation Time: 10:00 AM to 10:50 AM

Comparison of Nox1, Nox4 Enzymatic Activity in Various Cancers to Determine Nanoparticle-Based Therapy Compatibility

Hossain, Mir Saif; Yang, Lily

Presenter/s: Mir Saif Hossain

Emory Faculty Mentor: Lily Yang

N/A

Research Discipline: Biomedical Sciences
Presentation: Oral Presentation - A
Poster Number (if applicable):
Presentation Time: 8:00 AM to 9:30 AM

Investigating Drosophila melanogaster Glial Cell Morphology and Development using Gal4/UAS System

Hsu, Irene; Young, Elizabeth; Read, Renee

Presenter/s: Irene Hsu

Emory Faculty Mentor: Renee Read

Glioblastoma is the most aggressive and common form of primary brain cancer. Unfortunately, current treatments of surgical resection, radiation therapy and chemotherapy still yield a poor prognosis of 15 months median survival. By gaining a better understanding of normal glial cell subtypes underlying glioblastoma development, we may be able to target subtypes of glia in specific phases of development to optimize new treatments. Drosophila melanogaster has a highly conserved nervous system, with easily identified glial cell types that can be used to model glial biology in mammalian systems. In this project, we identified subtypes of glial cells in the larval Drosophila brain with the Gal4/UAS-GFP system. By using Gal4 enhancer traps, we expressed UAS-GFP in a glial cell type specific manner and visualized morphology of glial cell subtypes using confocal microscopy. To perform quantitative analysis on tumor development from different subtypes of glial cells, we will use Gal4/UAS to express glioblastoma-causing oncogene. We expect to see that GFP expressed in different subtypes of glia may vary based on location of the Gal4 gene. We can then compare normal glia morphology and development to those of glioblastoma. The results can further guide us in exploring specific aspects of mammalian tumor development and possible treatments for glioblastoma.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - C
Poster Number (if applicable): 7
Presentation Time: 10:00 AM to 10:50 AM

Food allergy pathophysiology, diagnosis, and treatment

Ih, Daphne; Horton, Codi; Leef, Chelsea; Tory, Rita; Vickery, Brian

Presenter/s: Daphne Ih

Emory Faculty Mentor: Brian Vickery

Chronic food allergies and anaphylaxis affect approximately 32 million Americans, most of whom are children. Immune-mediated (“true”) allergic reactions can be fatal, and the psychological stress of navigating dietary restrictions is a lifelong burden to patients and their families. Despite this, there is a limited understanding of the pathophysiology of food allergies and related disorders. We are currently designing an electronic data capturing system using REDCap to organize and optimize the collection of oral food challenge data from patient medical records at the Children’s Healthcare of Atlanta. Eventually, we will conduct an observational study of 1500-2000 oral food challenges from January 2020 onward to analyze patterns in the occurrence of side effects and true allergic reactions. Identifying biomarkers and related medical conditions that influence the development and presentation of food allergies will not only inform current food allergy therapies, but also facilitate earlier interventions to improve patient quality of life.

Research Discipline: Biomedical Sciences
Presentation: Oral Presentation - B
Poster Number (if applicable):
Presentation Time: 9:30 AM to 11:00 AM

Identifying Bioactive Compounds in Plants Using Flash Column Chromatography, Sephadex LH-20, and Preparative High-Performance Liquid Chromatography

Quave, Cassandra; Woo, Sunmin; Jarrar, Nadine

Presenter/s: Nadine Jarrar

Emory Faculty Mentor: Cassandra Quave

Empirical evidence in the past three decades has demonstrated an increase in alternative medical therapies as supplementary methods to counteract symptoms in several bacterial diseases. Botanical medicines are used as a primary means of treating bacterial infections in many systems of traditional medical practice, but there is little knowledge about which compounds are responsible for biological activity against infection. To identify the compounds of botanical structures, intricate extraction and isolation methodology must be established. Procedural extraction methodology include water decoctions, sonications, or 80% ethanol macerations, where the extracts are examined for bioactivity and cytotoxicity. Potential candidates are further partitioned and fractionated using reverse flash column chromatography, sephadex LH-20, and preparative high-performance liquid chromatography (HPLC), which serve to isolate the biologically active compound(s). Active compounds are analyzed using mass spectrometry and nuclear magnetic resonance (NMR), from which they can be identified. *Method efficacy and yields once that information is obtained*. Exploration of which plants contain the identified compounds may yield promising results in combating antibacterial resistance using botanical medical therapies.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 8
Presentation Time: 4:00 PM to 4:50 PM

The Latinx Experience among Mexican and Dominican Middle-Class Immigrants in Atlanta

Juarez, Monse; Browne, Irene

Presenter/s: Monse Juarez

Emory Faculty Mentor: Irene Browne

Immigration is a major component of the social and political situation present in the United States today with the passing of Donald Trump's presidency and as immigration reform garners nationwide attention. Understanding the immigrant experience in facing the difficulties of adjusting to a new country is crucial for raising awareness about immigrants' treatment within a turbulent political climate. While previous sociological studies have focused on highlighting the experiences of working-class Latinx immigrants, particularly their struggles with assimilation and discrimination, the middle-class experience of Latinx immigrants facing similar issues has not been well-studied. Consequently, this study examines the experiences of business-owning, middle-class Mexican and Dominican immigrants, which aid in highlighting the ever-present issue of discrimination and racism among assimilated individuals. Our research group is currently recording qualitative interviews of Mexican and Dominican restaurant owners in Atlanta, GA, along with planning follow-up interviews with respondents from ten years ago to analyze how their circumstances changed during the Trump presidency and COVID-19 pandemic. Interviews will be analyzed according to the mention of racism and discrimination done to these communities and present between these two communities. We anticipate that several respondents will have experienced some form of discrimination during their time living in the U.S. Additionally, findings may suggest how Mexican and Dominican immigrants factor race into their identity and use it as a social marker between their communities. Findings from this study could provide additional information into how discrimination remains after assimilation, as well as how middle-class, Latinx immigrant communities associate or dissociate from their working-class counterparts and from each other.

Research Discipline: Social Sciences
Presentation: Poster Presentation - B
Poster Number (if applicable): 6
Presentation Time: 9:00 AM to 9:50 AM

Nutrition, Body Habitus, And Food Insecurity In Pediatric Kidney Transplant Recipients

Jung, Heather; Wilkerson, Alexandria

Presenter/s: Heather Jung

Emory Faculty Mentor: Alexandria Wilkerson

It is critical for kidney transplant patients to have access to healthy and nutritious foods. The lack of nutritious food is a chronic issue throughout the United States but is particularly problematic in Georgia. It was hypothesized that patients in lower income brackets would have a harder time obtaining nutritious foods than patients in higher income brackets. In order to assess food access in kidney transplant patients, data was collected from patients (42 males, 20 females) who were ≥1-year post transplant with functioning allograft. Participants were asked to self report sex, race, age, annual family income, and zip code, and their risks and behavioral factors were assessed using the Family Nutrition and Physical Activity Screening tool (FNPA), a 20 question screening tool used to examine the influence of physical activity, sport participation, television viewing and video games on child adiposity. The FNPA screening was paired with Percent Body Fat (PBF) data determined using the Inbody 230 BIA analysis. We concluded that patients in lower income brackets generally have higher PBF and typically have less access to healthy or fresh foods – determined using self-reported zip codes and food access from the USDA Food Access Research Atlas – and are therefore at a greater risk of higher BMI, which is traditionally associated with suboptimal post-transplant outcomes. Our study is hoping to discover whether lower income groups have less access to quality foods, and whether that negatively impacts health compared to participants in higher income brackets. Acknowledging the limitations of access is important when providing nutritional recommendations, and education should be tailored for resources available to pediatric kidney transplant patients and their families. Supporting patients in accessing nutritious foods will ultimately aid in better post-transplant outcomes.

Research Discipline: Public Health
Presentation: Poster Presentation - C
Poster Number (if applicable): 8
Presentation Time: 10:00 AM to 10:50 AM

Quantifying the Impact of Wolbachia Infection in Aedes aegypti Mosquito Flight Activity and Locomotion

Kahn, Erica; Duran, Sebastian; Vazquez-Prokopec, Gonzalo

Presenter/s: Erica Kahn

Emory Faculty Mentor: Gonzalo Vazquez-Prokopec

Aedes aegypti mosquitoes are the primary vector of Zika, chikungunya, yellow fever, and dengue and are a major public health threat for over half of the world's population. A lack of vaccines and growing resistance to insecticides demonstrates the urgency for population control. Wolbachia, an intracellular bacterium, has been adopted as a biocontrol agent in Ae. aegypti using two strategies: 1) reducing the mosquito's ability to transmit diseases and 2) reducing population numbers by a reproductive manipulation termed cytoplasmic incompatibility. While many studies have characterized the reproductive fitness of Wolbachia-carrying mosquitoes compared to uninfected ones, little has been done to assess its energetic cost and impact [illegible]

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instances of high nutrient availability in an ecosystem, can have profound impacts on the
nstances of high nutrient availability in an ecosystem, can have profound impacts on the dynamics of a population and the entire ecosystem. In freshwater bodies, such resource pulses increase snail hosts' production of parasites called schistosomes, which infect humans and cause schistosomiasis, a Neglected Tropical Disease. It is already known that a general increase in resources can produce more parasites, but the

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - E
Poster Number (if applicable): 6
Presentation Time: 1:00 PM to 1:50 PM

Examining Associations Between Historical Redlining and Environmental Hazards in Metro Atlanta

Karsan, Sonia; Ekenga, Christine; Nanavati, Anuj

Presenter/s: Sonia Karsan

Emory Faculty Mentor: Christine Ekenga

N/A

Research Discipline: Public Health
Presentation: Oral Presentation - A
Poster Number (if applicable):
Presentation Time: 8:00 AM to 9:30 AM

Finding Echoes: Judicial Empathy Among Second and Third Generation Immigration Judges

Kessler, Grace; Heridia, Sara; Staton, Jeffrey

Presenter/s: Grace Kessler

Emory Faculty Mentor: Jeffrey Staton

How do judges' recent family immigration histories affect their behavior? Personal relationships and experiences build empathy, which can influence how decisions are made. Scholars of judicial politics have found that empathy derived from experiences and personal relationships impacts the behavior of judges in areas relevant to such experiences and relationships. Based on previous work, we should expect that the judges in the immigration court system who obtain empathy from family immigration experiences make more permissive decisions towards immigrants. However, immigration judges lack the quality of independence typically associated with federal and state court judges. Given this, immigration judges with a recent family immigration history may have empathy but may not rely on their experiences to make decisions. In the final removal hearings, the results demonstrate that they act more restrictively towards immigrants; they are more likely to deport immigrants. My role in this project is to collect the family history of these immigration judges. This information is typically difficult to obtain, which makes studies like this uneasy to complete. I engage in a multi-step, immersive process to uncover the background information of judges' parents and grandparents. Through this process I create a composite profile of the judges' immigrant identity. This process entails searching sources such as Google and Ancestry.com for direct accounts and allows for the searching of individual people with unique lives in a structured manner. My contribution allows for analytical assessments of the immigration experiences to occur. Overall, the paper highlights the competing interests that judges must navigate when making decisions and necessitates that if society wants empathetic judges, the structure of the immigration courts must be reformed.

Research Discipline: Social Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 9
Presentation Time: 8:00 AM to 8:50 AM

Exploring the overlap between the anterior insula and the ventral attention network using fMRI scans in children with autism of ages 8-12

Kim, Seyon; Blair, Henry; Ousley, Opal

Presenter/s: Seyon Kim

Emory Faculty Mentor: Opal Ousley

The anterior insula of the brain is most commonly involved in sensing pain and expressing emotions. Previously, it has been suggested that the anterior insula may be involved in controlling the ventral attention network (VAN), which is responsible for selective attention and salience. People with autism often show deficits in social skills, including selective attention. To explore this deeply, we designed a study to explore the connectivity between the anterior insula and VAN in children with autism. The resting fMRI scans of autistic children within the age range of 8 through 12 are being analyzed using an open-source dataset, Autism Brain Imaging Data Exchange II (ABIDE II). Currently, we are still preprocessing our data with Matlab, a programming platform, and Statistical Parametric Mapping 12 (SPM12), a programming software package ran on Matlab, we plan to obtain resting fMRI scans from the ABIDE II dataset and preprocess with various parameters in mind - head motion, smoothing, warping, etc. These variables need to be preprocessed as things like head motion can impact the integrity of a scan. If a particular subject has excessive head motion, they will be excluded from the sample. Additionally, we found that smoothing and warping were two of the most useful functions in the software package, harmonizing the size of each subject's brain to a standard template, which allows for localized region of interest analyses across subjects, while simultaneously reducing background noise and amplifying resting activity. As we progress through this study, we hope to see results that indicate differential overlap of functional and structural connectivity in individuals with autism. If the overlap is present, we hope to extract within ASD group differences that correlate the extent of said atypicality with the severity or strength of diagnostic social scores for autism.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - B
Poster Number (if applicable): 7
Presentation Time: 9:00 AM to 9:50 AM

Comparative analysis of centromeric sequences in Mus species

Kim, Dana; Thakur, Dr. Jitendra

Presenter/s: Dana Kim

Emory Faculty Mentor: Jitendra Thakur

Mus species exhibit extensive variations throughout the genome due to rapid evolution. These genomes exhibit vast differences within closely related species. Centromeres are one of such rapidly evolving genomic regions. Centromeres are defined as chromosome regions where spindle fibers attach via spindle microtubules to facilitate chromosome structure during cell division. This study examines centromeric sequences of one of the Mus species called M. caroli, categorized as being closely related to M. musculus. To understand centromere evolution, this study examines the relative similarities and differences in centromere sequences between M. caroli and M. musculus. Centromeric regions consist of large arrays of DNA repeats called satellites. Analysis is done by organizing raw whole genomic data of M. caroli into sequence clusters using a clustering software called CD-HIT and comparing the clusters to pre-defined M. musculus satellites using DNADynamo software. These software programs allow for streamlined visualization of DNA base pair matches within sequences. Although data is still being analyzed, current data shows that M. caroli centromeric sequences lack any similarities with M musculus. These results indicate that centromeric satellites constitute the unusually large genomic variation seen among closely related species within the Mus genus. These findings are important to addressing the implications of Mus evolution and provide the first steps to insight on what motivates evolution within the genus.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - E
Poster Number (if applicable): 7
Presentation Time: 1:00 PM to 1:50 PM

Video-Based Pose Estimation for Gait Analysis in Clinical Settings - A Preliminary Study

Kim, Minuk; Barren, Zachary; Rodrigo, Corey; Brinson, Paige; Alam, Zahin; Makanjuola, Joseph; Kesar, Trisha

Presenter/s: Minuk Kim

Emory Faculty Mentor: Trisha Kesar

In rehabilitative medicine, gait is one of the most common movement patterns assessed among individuals with neuropathologies such as stroke. Outside of the clinical realm that involves expertise of clinicians and costly 3-D motion capture analysis, there is a need for clinically accessible, user-friendly, standardizable methods to objectively quantify gait impairments. Pose estimation is an innovative method that can bridge the translational gap, providing more accessible, low-cost quantitative gait analysis in clinical and community settings.64 64H64o64w64e64v64e64r64,64 64p64o64s64e64 64e64s64t64i64m64a64t64i64o64n64 64t64e64c64h64n64o64l64o64g64y64 64i64s64 64p64r64o64n64e64 64t64o64 64e64r64r64o64r64s64 64i64n64c64l64u64d64i64n64g64 64m64i64s64-64l64a64b64e64l64i64n64g64 64o64f64 64i64n64a64n64i64m64a64t64e64 64o64b64j64e64c64t64s64 64a64s64 64h64u64m64a64n64.64 64T64h64e64 64o64b64j64e64c64t64i64v64e64s64 64o64f64 64t64h64i64s64 64p64r64e64l64i64m64i64n64a64r64y64 64s64t64u64d64y64 64a64r64e64 64t64o64:64 64(64164)64 64d64e64t64e64r64m64i64n64e64 64t64h64e64 64f64e64a64s64i64b64i64l64i64t64y64 64a64n64d64 64m64e64t64h64o64d64o64l64o64g64i64c64a64l64 64p64a64r64a64m64e64t64e64r64s64 64f64o64r64 64t64h64e64 64u64s64e64 64o64f64 64v64i64d64e64o64-64b64a64s64e64d64 64p64o64s64e64-64e64s64t64i64m64a64t64i64o64n64 64d64u64r64i64n64g64 64d64i64f64f64e64r64e64n64t64 64w64a64l64k64i64n64g64 64t64a64s64k64s64,64 64(64264)64 64c64r64e64a64t64e64 64a64 64r64e64p64o64s64i64t64o64r64y64 64o64f64 64l64a64b64e64l64e64d64 64v64i64d64e64o64s64 64t64h64a64t64 64w64i64l64l64 64b64e64 64u64t64i64l64i64z64e64d64 64i64n64 64t64h64e64 64f64u64t64u64r64e64 64t64o64 64t64r64a64i64n64 64a64 64m64o64d64e64l64 64t64o64 64s64e64g64r64e64g64a64t64e64 64t64h64e64 64u64n64i64m64p64a64i64r64e64d64 64a64n64d64 64d64i64f64f64e64r64e64n64t64 64t64y64p64e64s64 64o64f64 64i64m64p64a64i64r64e64d64 64g64a64i64t64,64 64a64n64d64 64(64364)64 64d64e64v64e64l64o64p64 64a64 64p64r64e64l64i64m64i64n64a64r64y64 64v64i64d64e64o64 64d64a64t64a64s64e64t64 64o64f64 64i64m64p64a64i64r64e64d64 64g64a64i64t64 64i64n64 64s64t64r64o64k64e64 64s64u64r64v64i64v64o64r64s64.64 64V64i64d64e64o64s64 64o64f64 64n64o64n64-64i64m64p64a64i64r64e64d64 64i64n64d64i64v64i64d64u64a64l64s64 64n64o64r64m64a64l64 64g64a64i64t64,64 64t64h64e64i64r64 64i64m64i64t64a64t64i64o64n64 64o64f64 64d64i64f64f64e64r64e64n64t64 64t64y64p64e64s64 64o64f64 64i64m64p64a64i64r64e64d64 64g64a64i64t64,64 64a64n64d64 64a64

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Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 9
Presentation Time: 4:00 PM to 4:50 PM

Effective Methods of Extraction, Isolation, and Identification of Bioactive Compounds from Plants

Kittleson, Ben; Woo, Sunmin; Quave, Cassandra

Presenter/s: Ben Kittleson

Emory Faculty Mentor: Cassandra Quave

The world is currently experiencing a crisis concerning the treatment of bacterial infections, with no new classes of antibiotic beings discovered since the 1980s and increasing rates of antimicrobial resistance globally. Botanicals have played a significant role in traditional medicines, and many current allopathic medicines employ drugs that are derivatives of structures originally discovered in plants. Natural products chemistry and the utilization of traditional ethnobotanical knowledge is a potential way to address the need for innovation in approaches to antimicrobial therapeutic development. When investigating anti-infective drug discovery through an ethnobotanical lens, the isolation and identification of compounds and their chemical structures is pivotal to understanding mechanisms of action and identifying potential drug candidates. This project aims to illuminate the extraction process used in the Quave lab for the isolation of bioactive molecules. The process begins with an initial extraction process of either a water decoction or an 80% ethanol maceration. Initial extractions are then screened for bioactivity and cytotoxicity, and promising candidates undergo further partitioning and fractionation via a combination of solid-phase extraction (SPE), normal-phase flash column chromatography, and high-performance liquid chromatography (HPLC), all in an effort to isolate the bioactive compound that can then be identified via a combination of mass spectrometry and NMR. Effective identification of chemical structures from this process could play a pivotal role in addressing the innovation gap in the antibiotic resistance crisis.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - D
Poster Number (if applicable): 7
Presentation Time: 11:00 AM to 11:50 AM

Evaluating microbial necromass as a proxy for soil carbon sequestration.

Kolisetti, Aditya; Sihi, Debjani; Sinsuan, Ann; Bausemer, Paul

Presenter/s: Aditya Kolisetti

Emory Faculty Mentor: Debjani Sihi

Modern biogeochemical models suggest that CO2 enters soil through the microbiome metabolizing dead organic matter (e.g., microbial necromass) that previously used atmospheric carbon as photosynthetic substrate. Such metabolism converts this carbon into highly inert amino sugars that eventually further complex with soil mineral particles within aggregates that can slow down reconverting it back to CO2. If we can tap into and optimize this bioprocess, climate change and agricultural efforts would have access to one of the largest carbon sinks for improving both soil and air quality. However, this field suffers from its newness, and severely lacks empirical evidence on different soil climatic conditions, microbiome populations, and relationships between soil organic carbon and soil amino sugar content. This project aims to curb that lack of information, serving as a primary study into the soil in and around Atlanta, Georgia using amino sugars as a proxy for the persistence of soil organic carbon (SOC). We began with on-site soil sampling across natural and managed systems, and then analyzed soil sample hydrolysate for amino sugar markers (glucosamine and mannosamine) from mineralized soil aggregates. Samples were then examined under a mass spectrometer (Orbitrap Velos, resolution of 50 000) to isolate each sugar and calculate their abundance per unit gram of dry soil mass. Using conversion factors from Joergensen et al. (2018) and Liang et al. (2019), we will evaluate the permanence of SOC storage by quantifying microbial necromass across different soil types in Georgia.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 10
Presentation Time: 8:00 AM to 8:50 AM

Looking for Familiarity in Orangutans

Kuma, Beamlak; Engelberg, Jonathan

Presenter/s: Beamlak Kuma

Emory Faculty Mentor: Robert Hampton

N/A

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 22
Presentation Time: 4:00 PM to 4:50 PM

Quantifying the impact of mild cognitive impairment on balance and mobility through the four-square step test.

LaFollette, Clara Beth; Rosenberg, Michael; Hackney, Madeleine

Presenter/s: Clara LaFollette

Emory Faculty Mentor: Madeleine Hackney

Mild cognitive impairment (MCI) is a precursor to dementia and Alzheimer's Disease that affects 15-20% of adults over 65, reducing autonomy and quality of life. Individuals with MCI have impaired thinking and judgement, which, when combined with age-related physical decline, may impact individuals' ability to make and carry out decisions. This project sought to characterize differences in four-square step test (FSST) performance in adults with and without MCI, as the extent of cognitive decline, due to MCI, affects balance and mobility is unclear. We hypothesized participants with MCI would perform the FSST more slowly than healthy older and younger adults, and physical and cognitive function would be associated with performance. The FSST is a clinical test that assesses dynamic stability and ability to step over obstacles in multiple directions, thereby quantifying balance, with faster FSST completion times reflecting better balance and mobility. In the FSST, participants stepped over four rods in a cross formation on the ground and moved around the coordinate system as quickly as possible. We recorded FFST completion times and estimated joint kinematics during each trial using an inertial measurement unit system. Participants also conducted the 30 second chair stand, a test that quantifies leg strength, and the TUG simple and cognitive tests, which measured mobility and cognition dual tasking abilities. Individuals with MCI performed significantly slower than healthy young adults (ΔFSST=2.43 seconds, 27.4% difference, $p = 0.018$). Additionally, faster FSST times were associated with improved 30-second chair stand scores ($p=0.011$, $R2=0.3$). Improved FSST performance was associated with smaller differences in TUG cognitive and TUG simple times ($p=0.079$, $R2=0.17$). These results suggest the combination of physical and cognitive deficits reduce balance/mobility performance more than either individually. These results offer better guidance for MCI caretakers, to include assistance on physical, in addition to cognitive obstacles, the current focus.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 11
Presentation Time: 8:00 AM to 8:50 AM

Thiamine transporter in Drosophila blood-brain barrier shown to have minimal effect on sleep regulation.

Lewandowski, Ava; Avila, Ashley; Zhang, Shirley

Presenter/s: Ava Lewandowski

Emory Faculty Mentor: Shirley Zhang

Past work suggests that the circadian clock in the blood-brain barrier (BBB) acts as a timing mechanism for the entry of behavior-altering substances, such as amino acids and vitamins, coming from the blood. Our current focus is to determine the peripheral influences on behavior by manipulating entry mechanisms at the blood-brain barrier and determining effects on sleep. We have used tissue-specific promoters to express RNAi to knockdown various BBB transporters in drosophila to study effects on sleep quantity and quality. Inhibiting the expression of CG6574 (a SLC19A3 gene ortholog), which encodes a thiamine transporter, resulted in decreased sleep. However, further experiments using pyrithiamine, which inhibits thiamine binding to the receptor, presented little difference in sleep between drosophila consuming it or not. We then found that the sleep decrease did not map to CG6574, suggesting off target effects of the RNAi line. Consequently, the thiamine transporter has not been proven to be significantly important for the regulation of sleep. For the future, we are already screening and testing more BBB surface receptors and transporters for their influence on sleep. These results will further contribute to our understanding of peripheral effects on neurobehavior, and we may eventually utilize this information for medical implications, such as drug delivery.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 12
Presentation Time: 8:00 AM to 8:50 AM

Factors Influencing Breastmilk Provision for Infants Admitted to an Urban Tertiary Neonatal Intensive Care Unit

Li, Grace; Lakhani, Anisa; Patel, Ravi M; Keesari Rohali; Leon-Hernandez, Angela; Barbian, Maria E

Presenter/s: Grace Li

Emory Faculty Mentor: Maria Barbian

Introduction: From 2018-2020, the rate of preterm birth in the US was 53% higher for Black women compared to White women. Mother's own milk (MOM) provides optimal nutrition for premature infants, decreasing their risk of sepsis, necrotizing enterocolitis, and neurodevelopmental impairment. Unfortunately, there are significant breastfeeding disparities in Black communities.

Objective: This study aims to identify factors that impact maternal expression of MOM for infants admitted to an urban tertiary care Neonatal Intensive Care Unit (NICU).

Methods: We performed a secondary analysis from a survey completed by 92 mothers one week after their infants' NICU admission. To evaluate the association between MOM expression and infant characteristics, maternal mental illness, and participation in family-centered care practices, we conducted univariable analyses and expanded to multivariable models using binary logistic regression.

Results: Among our cohort of 92 mothers, 72.8% of mothers were providing MOM at the time of the survey, 78.3% of mothers were Black and 25.0% of mothers reported a history of mental illness or psychological stressors. Lower gestational age was found to be positively associated with expression of MOM (OR= 0.84. 95% CI= 0.72-0.97, P= 0.020). After adjusting for all other predictors, this association was not statistically significant (P = 0.05). We found no association between maternal mental illness and the provision of MOM.

Conclusion: We were encouraged to find that among our cohort, factors that have historically been negatively associated with MOM production did not impact the provision of MOM. Further studies are needed to identify the factors that sustain provision of MOM among this population

Significance: Increasing provision of MOM in Black infants is an important step to decreasing health disparities in this community. In our cohort, provision of MOM was not inhibited by factors that traditionally have been shown to hinder production of MOM.

Research Discipline: Public Health
Presentation: Poster Presentation - A
Poster Number (if applicable): 13
Presentation Time: 8:00 AM to 8:50 AM

Nietzsche: God is Dead

Lysaker, John; Li, Linda

Presenter/s: Linda Li

Emory Faculty Mentor: John Lysaker

Nietzsche is a famous German philosopher. His work can be divided into four stages. The first stage, which includes work such as The Birth of Tragedy, deals with language art. Works such as All Too Human belong to the second stage, whose theme is the philosophy of culture. The next stage's works include Gay Science, Thus Spoke Zarathustra, Beyond Good and Evil, and On the Genealogy of Morals. This is the most meaningful stage to study, where concepts such as the death of God and will to power start to appear. Finally, the last stage is when Ecco Homo came out. It is also the stage of craziness. God is dead is one of Nietzsche's most famous concepts. But why is God dead? How do people nowadays view God? What is the role of God in our life specifically? Atheists deny the existence of God but still talk about topics that revolve around God. Normal people view God as a being, while Nietzsche argues that God should be a horizon. He is visible but also invisible. In my research. I dedicate myself to what Nietzsche means by "God is dead" and the role of philosophers in this question. Based on the document study and summary, this research will examine how people "kill" God: God is no longer what we appeal to when explaining things. This study aims at exploring both religion and philosophy from Nietzsche's perspective.

Research Discipline: Humanities
Presentation: Poster Presentation - H
Poster Number (if applicable): 10
Presentation Time: 4:00 PM to 4:50 PM

Stable Cross-beta Nanotube Assembly Using Block Co-Polypeptides

Li, Harry; Gnewou, Ordy; Conticello, Vincent.

Presenter/s: Jiatong Li

Emory Faculty Mentor: Vincent Conticello

Biopolymer-based nanomaterials present unique opportunities for industrial applications in many fields like pharmaceutical and green chemistry. These materials can be produced from peptides that self-assemble into polymeric quaternary structures. Self-assembly of peptides is highly sensitive to their environment and the macromolecular architecture has a strong influence on supramolecular structure. Here, we assemble a previously identified heat and pH resistant block co-polypeptides. After dissolving the pre-made peptide powder in solution, we annealed the polymer and analyzed it using circular dichroism and transmission electron microscopy to elucidate the supramolecular structure. We observed a strong, pure signal from circular dichroism, indicating the presence of beta-sheet secondary structures as predicted. The expected results are nanotubes of a width approximately 25 nm. The buffer pH had a significant influence on the morphology of the self-assembled nanotubes, with pH 2 and 12 yielding individual, short nanotubes, and pH 6 yielding extended nanotube assemblies. Future studies will focus on investigating the relationship between monomer structural elements and the resulting dynamic nanotube conformation, to allow for higher flexibility when manipulating the material.

Research Discipline: Natural and Physical Sciences
Presentation: Oral Presentation - D
Poster Number (if applicable):
Presentation Time: 12:30 PM to 2:00 PM

Investigating the Effect of Chemogenetic Inactivation of Auditory Cortices on Learning in an Innate Behavior Context

Lu, Audrey; Wong, Kelvin; Lu, Kai; Liu, Robert

Presenter/s: Audrey Lu

Emory Faculty Mentor: Robert Liu

N/A

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 14
Presentation Time: 8:00 AM to 8:50 AM

Exploring the Antibacterial Properties of Essential Oils

Malipeddi, Sanjana; Gnewou, Ordy

Presenter/s: Sanjana Malipeddi

Emory Faculty Mentor: Ordy Gnewou

N/A

Research Discipline: Natural and Physical Sciences
Presentation: Oral Presentation - C
Poster Number (if applicable):
Presentation Time: 11:00 AM to 12:30 PM

Visualizing Indoleamine 2,3-Dioxygenase with L-Tryptophan Through X-ray Crystallography.

Mancia, Andrea; Ireland, Kendra; Davis, Katherine

Presenter/s: Andrea Mancia

Emory Faculty Mentor: Katherine Davis

Indoleamine 2,3-dioxygenase (IDO) is a heme-containing enzyme that partakes in L-tryptophan (L-Trp) metabolism and produces N-formylkynurenine (NFK). It suppresses the immune response of the human body, and is therefore a health-relevant enzyme whose inhibition could be beneficial in the treatment of a variety of diseases such as cancer. Research has focused on formulating IDO inhibitors as a method to increase immune response, yet many have failed, perhaps due to IDO's reaction mechanism not being fully understood. A lack of structural insights regarding IDO's catalytically relevant states additionally contribute. However, using novel approaches, x-ray crystallography can be used to determine these structures. The main focus of this project is to visualize IDO bound to its substrate L-Trp in its Fe(IV)-oxo form.
From previous work, crystallization occurs most reproducibly with a truncated and mutated IDO construct dubbed as "T. IDO K116A/K117A," in which residues 1 through 14 are removed and lysines at residues 116 and 117 are changed to alanines. Expression of the variant IDO used E.coli Rosetta cells transformed with a pET28a plasmid and purified with Co-NTA, cation exchange, and size-exclusion columns. Many ferryl heme intermediates, including IDO's ferryl species, are extremely short-lived and reactive, perhaps explaining why no structures have currently been solved due to the difficulty of capturing the intermediate. Thus, discovering new IDO constructs that can extend the longevity of the ferryl intermediate will be crucial to crystallizing and determining the structure of the ferryl state. IDO constructs have been made to lengthen the ferryl state for crystallization and some crystallization conditions have been determined. Work will be continued to obtain crystals of IDO that have captured the lengthened ferryl state for future x-ray spectroscopy and crystallography to determine the structure.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 15
Presentation Time: 8:00 AM to 8:50 AM

Transgenerational Epigenetics in Caenorhabditis elegans

Martin, Amaya; Kelly, William; Kent, Tori

Presenter/s: Amaya Martin

Emory Faculty Mentor: Tori Kent

Epigenetic mechanisms causing modifications affecting phenotypic expression of genes based on external stimuli can produce variably stable changes in gene expression via the establishment of different heritable states of chromatin architecture. The germline is the cell lineage responsible for generational heritability of epigenetic and genetic information. In C. elegans, the germ lineage epigenome has demonstrated high levels of modifications within each generation. These alterations exhibit high levels of stability and transgenerational conservation of phenotypes that are unrelated to genetic changes (Kelly, 2014).

Thorough investigation of the various gene interactions between the HRDE-1, MET-1, and ZNFX-1 effector genes was conducted utilizing methods of cross breeding and measuring the brood sizes and relative embryonic mortality rates. In addition to crossing the genes in, the use of RNA induction was also used to examine the impacts of the double mutant gene.

Thus far, the HRDE-1 RNA effector suggested that HRDE-1 and ZNFX-1 are a part of a fail-safe mechanism for the germline because the double mutant worms are significantly more sterile. It can be concluded that the fail-safe when HRDE-1 and ZNFX-1 get involved is an over correction in the presence of MET-1 and likely represses transcription and possibly translation processes involved in synthesizing proper germ cells. The current research focuses on how TIR-1 (Transport Inhibitor Response 1) x ZNFX-1 CRISPR x MET-1 mutant worm germlines will respond when induced and raised on auxin.

Defects and abnormal transcription in germ cells caused by these gene modifications can result in sterility. This research seeks to study and track germlines and observe when and how the expression of an epiallele has persisted via observing indicators such as sterility (which can be observed via a microscope and GFP reporter genes that will show inappropriate expression in certain tissues). This research is applicable to understanding how external stimuli such as diet, environment, and lifestyle can affect developmental, behavioral, and medical experiences.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 16
Presentation Time: 8:00 AM to 8:50 AM

The Influence of Legislator Race on Immigration Policy

Reingold, Beth; Brown, Irene; Martinez, Kelly

Presenter/s: Kelly Martinez

Emory Faculty Mentor: Beth Reingold

N/A

Research Discipline: Social Sciences
Presentation: Oral Presentation - E
Poster Number (if applicable):
Presentation Time: 2:00 PM to 3:30 PM

The Price of Fright: Counting the Jumpscares in the Top 10 US Box Office Horror Movies

Marzouk, Sarah; Barracano, Rob

Presenter/s: Sarah Marzouk

Emory Faculty Mentor: Rob Barracano

Horror movies all have one goal: to scare viewers. One common technique of accomplishing that goal is the usage of jumpscares, a method of scaring the audience with a sudden, unexpected, and frightening image, sound, or action. In this study I counted the jumpscares in each of the top 10 US box office horror films. These films are very financially successful, with each of them making at least $150 million. While watching the films, I marked big and medium jumpscares with the letter 'A' and small jumpscares with 'B'. In addition, any questionable jumpscares were marked 'C'. I judged the rating of jumpscares based off a few factors, including the intensity of suspense preceding the jumpscare, the volume of sound used alongside the jumpscare, and the narrative use of the jumpscare. I then ranked the horror films on jumpscare count. I hypothesized that the movies that were ranked higher on the box office will have more jumpscares than the movies that were ranked lower. However, I found this not necessarily true; there was no clear correlation between box office ranking and jumpscare amount. Instead, I noticed something else: the older horror movies on the list tended to have fewer jumpscares than the newer ones. Thus, with this project, one can see that today's financially successful horror movies rely more on short-lived thrills and frights than prolonged tension or suspense. Such a realization can help people, from film theorists to horror directors to everyday movie-watchers, understand the cinematic makeup of today's famous horror films, ultimately deciding for themselves what it truly means to be scared.

Research Discipline: Arts and Creative Expression
Presentation: Poster Presentation - E
Poster Number (if applicable): 8
Presentation Time: 1:00 PM to 1:50 PM

A Fate Worse than Death: Sentence Lengths for Gulity but Mentally Ill Defendants

Mason, Natalie

Presenter/s: Natalie Mason

Emory Faculty Mentor:

Previous studies have suggested that in criminal cases defendants who are disposed Guilty but Mentally Ill will receive longer sentences and spend more time confined than mentally healthy defendants who are guilty of the same crimes. However, research has been limited in both scope and scale, and has not examined the relationship between other moderating variables such as sex and race. This study utilizes criminal court records in the state of Indiana from 2012-2021 and examines sentence lengths for Guilty but Mentally Ill (GBMI) defendants compared with sentence lengths for Guilty verdicts. In line with previous research, for most categories of crime GBMI defendants received a longer average sentence than Guilty defendants. This pattern was especially obvious amongst more violent crimes (homicide, assault, etc.). Moderating variables such as being non-white vs white and being male vs female, were found to be significant predictors of sentence length, however, being disposed Guilty but Mentally Ill was found to be the largest predictor of sentence length by a significant margin. These findings imply a societal bias against individuals with mental health issues, which inadvertently creates further inequality. Based on the results of this study further research should be done showing the expanse of these impacts, and steps should be taken to reshape how the court handles cases involving mental health.

Research Discipline: Social Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 20
Presentation Time: 4:00 PM to 4:50 PM

Exploring the Structure-Activity Relationship of Drug Series NMDAR-PAM1: A Positive Allosteric Modulator for NMDA Receptor Subunits

McDaniels, Duke; Banke, Tue

Presenter/s: Duke McDaniels

Emory Faculty Mentor: Tue Banke

The activity of neural glutamate-binding NMDA Receptor ion channels is a pivotal player in the initiation and regulation of several highly complex processes within the brain (e.g. memory formation, motor function, learning, etc). This variety is owed to the receptor's own highly-variable, multi-subunit structure, the different components of which are capable of interacting with extraneous allosteric modulators, chemical compounds which serve to either increase or decrease the receptor's functionality upon binding. As malfunctions in these receptors have been linked to several brain diseases and disorders (e.g. epilepsy, depression, schizophrenia, etc), neuropharmacological drug development targeting NMDARs through allosteric modulation has accelerated in recent years, with a number of compounds being shown to act on these receptors in a measurable and potentially clinically-applicable fashion. However, the potential for more effective options has not even come close to dwindling, and this ongoing project seeks to explore the potential effectiveness of one such unique drug series (referred to here as NMDAR-PAM1) as a potential allosteric modulator for NMDARs. Voltage-clamp data collected from Xenopus oocytes injected with rat RNA to express different NMDAR subunit combinations and treated with members of this drug series suggest that many of the compounds may function most effectively as positive allosteric modulators for three of the four subunits, though some break this trend. Though this study is still incomplete, the results seen so far are promising and could present opportunities for further exploration into whether the effects of the drug series on the oocyte rat neuron stand-ins might be replicable on slices of mouse neural tissue, an endeavor beginning the next necessary step of several along the road to potential clinical applications.

Research Discipline: Biomedical Sciences
Presentation: Oral Presentation - C
Poster Number (if applicable):
Presentation Time: 11:00 AM to 12:30 PM

Characterization of the role of EGFR in activating a TAZ-driven oncogenic program promoting NSCLC metastasis.

Mehta, Labdhi; Sharma, Richa; Shanmugam, Mala

Presenter/s: Labdhi Mehta

Emory Faculty Mentor: Mala Shanmugam

Lung cancer is the 2nd most common cancer and the leading cause of cancer death in the world. Non-small cell lung cancer (NSCLC) accounts for 80-85% of all lung cancer cases, and the primary cause of death of NSCLC patients is metastasis. The major mode of metastasis in NSCLC is collective invasion wherein phenotypically heterogeneous packs show coordinated movements. Our collaborator Dr. Adam Marcus isolated leaders and followers cells from NSCLC collectively invading packs using an image guided selection technique (Spatiotemporal Cellular & Genomic Analysis). Leaders are invasive cells while followers are highly proliferative cells. Hippo signaling pathway effectors yes-associated protein YAP and transcriptional coactivator with PDZ-binding motif TAZ are elevated and associated with poor prognosis and survival in NSCLC patients. Hence YAP and TAZ could be promising therapeutic targets in NSCLC. Recent studies show that both YAP and TAZ regulate distinct transcriptional programs. We found that knocking out TAZ in leaders reduced leader cell invasion. High TAZ expression in leaders correlated with high EGFR expression, a protein involved in several signaling pathways promoting NSCLC survival and targeted for NSCLC therapies. TAZ knockout leaders showed reduced EGFR expression. EGFR knockdown leaders showed reduced TAZ expression. To investigate the influence of pharmacological inhibition of EGFR on TAZ, leaders and followers are treated with increasing doses of Erlotinib (1, 5, 10 uM) in a time dependent manner (24 and 48 hours) and checked for YAP, TAZ, and EGFR protein levels using western blot. We found that after 24 and 48 hours, Erlotinib treatment inhibited EGFR levels but did not affect YAP and TAZ in leaders and followers. These findings indicate that upregulated TAZ could be the probable mechanism for the acquired resistance to EGFR inhibitors in NSCLC, and combined targeting of TAZ and EGFR would enhance the efficacy of EGFR inhibitors towards NSCLC.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - B
Poster Number (if applicable): 8
Presentation Time: 9:00 AM to 9:50 AM

Changing Women Power in Marvel movies

Mei, May; Reynolds, Daniel

Presenter/s: May Mei

Emory Faculty Mentor: Daniel Reynolds

Throughout the history of superhero films, women are presented in the narrative as masculine appendages and as the male "other" in a patriarchal world. Women's actions, behaviors, and language in the film narrative are presented in order to show women's sexuality, vulnerability, and incompetence, as well as to contrast with men's greatness. In the Marvel films, most of the male heroes are white, and these white heroes have unusual identities, for example, Iron Man is the founder of the Stark Group with hundreds of millions of dollars after taking off his gauntlet. This narrative structure and the setting of the characters' backgrounds emphasize the secondary status of women, who need the help of white male heroes in order to succeed.

Through comparative analysis, the trend of Marvel movies in the past decade shows that the status of female superheroes and female characters is getting higher and higher. The project will firstly introduce the history of feminism in films, then synthesize scholarships that exist about representations of women, and discuss female images, including Pepper Potts, whose role has advanced from an assistant to a warrior. However, they still only play a temporary role in saving the scene, the role of promoting the plot is limited. Captain Marvel, Marvel's first female superhero solo film, is one of the films that is dominated by a female perspective and a female story line in terms of narrative structure, portraying a female character who defies patriarchal authority, continues to improve, and awakens to herself.

Marvel is trying to change the narrative structure of women's appearance, behavior, language, and background to give them a higher status and power in the narrative structure of the film, thus alleviating the contradictions arising from the female consciousness against the patriarchal culture and breaking the dichotomous image construction.

Research Discipline: Arts and Creative Expression
Presentation: Poster Presentation - D
Poster Number (if applicable): 8
Presentation Time: 11:00 AM to 11:50 AM

Snail Populations and Their Parasites

Miao, Sharon; Bradley, Lynda; Civitello, David

Presenter/s: Sharon Miao

Emory Faculty Mentor: David Civitello

Resource pulses, or temporary instances of high nutrient availability in an ecosystem, can have profound impacts on the dynamics of a population and the entire ecosystem. In freshwater bodies, such resource pulses increase snail hosts' production of parasites called schistosomes, which infect humans and cause schistosomiasis, a Neglected Tropical Disease. It is already known that a general increase in resources can produce more parasites, but the effect of the timing of pulses throughout the season is unknown. To test this, a greenhouse artificial small pond experiment was performed. 6 different treatments were conducted: control (no pulse), pulse at 14 days, pulse at 28 days, pulse at 42 days, pulse at 56 days, and pulse at 70 days. For all treatments, each tank was founded with 12 snails of a realistic size range (4-16 mm) and kept in 50 L of synthetic lake water with algae and zooplankton. Pulses were administered by adding mushroom compost, dried azolla, and water lettuce into the tanks, and each week, the snail population of each tank was analyzed by measuring their sizes and counting how many parasites they produce. From conducting computer simulations of these experiments, we expected that during the mid-season (31-50 days), the amount of parasites produced will be the highest, due to the snails reaching maturity around that time. The results of the experiment (presented at SIRE symposium) will hopefully shed light on the ecological dynamics that influence the dependence on time frame and consequences of resource pulses.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 17
Presentation Time: 8:00 AM to 8:50 AM

A qualitative validation of the SAMANTA Questionnaire scale to assess heavy menstrual bleeding (HMB) in Senegal.

Mopono, Layhana;

Presenter/s: Layhana Moponol

Emory Faculty Mentor: Bethany Caruso

Heavy menstrual bleeding (HMB) is estimated to affect one in five women, but there are no tools that have been validated in multiple contexts for its diagnosis, which would enable a better understanding of its prevalence. Heavy menstrual bleeding also has a potential association with anemia and other health outcomes, but the absence of literature and adequate tools to assess HMB limit the ability to study this relationship. This study assesses the face validity of the SAMANTA Questionnaire, a tool to diagnose HMB previously developed and used in Portugal, in Senegal, to see if it is a valid tool in other geographic contexts. The 6-item SAMANTA questionnaire on heavy menstrual bleeding, which includes questions to detect excessive blood loss, was tested for validity via cognitive interviews in French or Wolof with 15 women in Senegal as part of a larger study on sanitation. A question on shortness of breath and fatigue was also asked to identify a possible symptom of anemia. The quantitative questions were asked, and participants were asked to think out loud as they considered their responses and explain how they interpreted the question. Debriefings were performed with data collectors who reported participant responses to these items and provided feedback on the wording of questions when applicable. French interviews were simultaneously translated and transcribed. Data were then coded and thematically analyzed in order to validate the heavy menstrual bleeding scale (HMB01-HMB06). Of the 15 participants selected for our cognitive interviews, approximately 86% of women experienced heavy menstrual bleeding during their menstrual cycle and about 30% of participants would agree that it greatly impacts their quality of life as it relates to day-to-day activities and travel. Approximately 53% of the women reported feeling excessively tired or short of breath during their menstrual cycle. A scale to measure HMB that has been validated in multiple contexts could be used for better understanding the prevalence of HMB on a larger scale. The validation of the scale in Senegal contributes to this effort. Once HMB is better diagnosed, we will be able to identify approaches that might be suitable as best practices in evaluating HMB with other health and social outcomes.

Keywords: heavy menstrual bleeding; menstruation; validation; cognitive interviews

Research Discipline: Public Health
Presentation: Poster Presentation - H
Poster Number (if applicable): 11
Presentation Time: 4:00 PM to 4:50 PM

Younger and older adults' relationships with dance and music: Developing dance therapies for Alzheimer's and Parkinson's disease

Hackney, Madeleine; Bay, Allison; Nguyen, Elizabeth; Slusaranko, Alexandra

Presenter/s: Elizabeth Nguyen

Emory Faculty Mentor: Madeleine Hackney

People, young and old, can hold deeply personal attitudes towards music and dance, as shaped by their culture and particular experiences. In the development of therapy interventions, it is important to consider the participant's relationship to the foundation of the intervention. Consider the case of Argentine tango interventions for persons with mild cognitive impairment and persons with Parkinson's disease. Thus, in the case of dance interventions, participants' perceptions and past histories of dance experiences, events and classes will vary and may affect the efficacy of or their satisfaction with dance used as treatment. This study will interview older and younger adults to compare how their personal history with music and dance may affect current attitudes towards music and dance used therapeutically. Two questionnaires (the Dance Relationship and the Music Relationship) were developed to evaluate the participants' daily relationships and past experiences with music and dance. The results will be analyzed and graphed in a box and whisker plot to observe differences in perception between age groups. The results could give us a better idea of how a person's psychosocial history with music and dance affects how they perceive the tango interventions. This information could then aid researchers in developing better informed, more impactful dance and music therapies.

Research Discipline: Biomedical Sciences
Presentation: Oral Presentation - C
Poster Number (if applicable):
Presentation Time: 11:00 AM to 12:30 PM

Generating Mechanisms of Tumor Radiation Therapy and αPD-1 Treatments to Enhance Anti-Tumor T-cell Stimulation and Differentiation

Ning, Kathy; Buchwald, Zachary

Presenter/s: Kathy Ning

Emory Faculty Mentor: Zachary Buchwald

CD8+ T-cells are a type of cell in the immune system that have been found to be important in cancerous tumor control, especially during radiotherapy that can stimulate the antitumor T-cell immune response. However, T-cell stimulation can be hindered by various factors. For example, programmed death-1 (PD-1) is a receptor expressed by T-cells that suppresses the T-cell immune response when bound to programmed death-ligand-1 (PD-L1) expressed on cancer cells. Blocking these PD-1 receptors can thus overcome immune suppression and increase antitumor activity. Although the tumor site itself is critical in CD8+ T-cell activation, the tumor-draining lymph nodes (TDLN) near the tumor are the main sites for T-cell stimulation. Preliminary data has found that both tumor radiotherapy and anti-PD-1 (αPD-1) treatments may stimulate stem-like CD8+ T-cells – which are crucial for long-term maintenance of T-cell responses – in TDLNs, resulting in differentiated T-cell terminal effectors in the tumor that are capable of tumor cell killing. From this data, this project aims to look at the specific mechanisms of how these two treatments stimulate the differentiation of stem-like T-cells into terminal effectors. The hypothesis is that a combination of tumor radiotherapy and αPD-1 treatment will stimulate a unique differentiation and transcriptional profile of stem-like T-cells into terminal effectors. This will be tested by using single-cell RNA sequencing to compare the transcriptional changes in TDLN T-cell populations for four treatment groups of murine models with injected melanoma cells: untreated, tumor radiotherapy only, αPD-1 treatment only, and a combination of radiotherapy and αPD-1. These data will be critical in generating an initial mechanistic understanding of the tumor radiotherapy and αPD-1 treatments, which can provide a resource in future developments of targeted therapies and pharmacologic approaches to enhance anti-tumor T-cell stimulation and differentiation.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 18
Presentation Time: 8:00 AM to 8:50 AM

Race in Physician Labor Markets

Odugbemi, Moyo; McCarthy, Ian;

Presenter/s: Moyo Odugbemi

Emory Faculty Mentor: Ian McCarthy

Racial equity in the labor market affects social welfare and economic productivity. In healthcare, the labor market affects the economy, but also the quality of life of consumers of healthcare. Race plays a role as one of the primary indicators of how satisfied a patient is during or after receiving care from a physician. Therefore, racial inequalities in the physician pool can indicate a source of disproportionate patient outcomes. Whether or not a patient has equal access to a physician they consider racially similar can be evaluated based on different factors in the physician labor market. On one hand, racial inequality among physicians could exist in wage and compensation, an indicator of labor market outcome. And on the other hand, disproportionate access to certain medical specialties based on race would also indicate physician labor market inequality. This research's goal was to study specifically how race affects outcomes in the physician labor market to potentially explain strategies that'll improve patient outcomes. We found from a review of literatures in this field that there is limited access to data on physician wages and race. Regulatory organizations with access to such repositories have restricted access to it. Next steps necessitate creating a database that allows us to analyze how race affects physician wages and chances of practicing in different specialties.

Research Discipline: Social Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 19
Presentation Time: 8:00 AM to 8:50 AM

Understanding Homeostatic Plasticity in E13 Chicken Embryos

Olmedo, Gabriela; Ratliff, April; Wenner, Peter
Department of Cell Biology, School of Medicine, Emory University

Presenter/s: Gabriela Olmedo

Emory Faculty Mentor: Peter Wenner

Homeostatic plasticity (HP)– a negative feedback system that prevents permanent states of hyperexcitability in neurons - is essential to the development, survival, and fitness of an organism. Diseases such as hypertension, which can lead to more serious and often fatal conditions such as a heart attack or stroke, are marked by unregulated levels of hyperexcitability, which could be caused by a failure of HP. The goal of this project is to better understand the role of HP in the sympathetic nervous system during development. HP can be induced by blocking synaptic activity with certain drugs, a process that may help us understand how a baseline level of excitability is established. To answer this, we first need to know the effect of synaptic blockade on the embryo at our age of interest (E13). Our model organism was the chicken embryo because its development has been heavily studied and the spinal cord (which h [illegible]

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Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 20
Presentation Time: 8:00 AM to 8:50 AM

Crop Protection Inputs and Meteorological Conditions: Limiting Greenhouse Gas Emissions

Owens, Joe1; Saikawa, Eri1; Armanov, Alexander1; Thibodeaux, Matthew2; Gaur, Nandita2; Thompson, Aaron2; Basinger, Nicholas2

1. Department of Environmental Science, College of Arts and Sciences, Emory University

2. Department of Crop and Soil Sciences, College of Agricultural and Environmental Sciences, University of Georgia

Presenter/s: Joseph Owens

Emory Faculty Mentor: Eri Saikawa

Soils act as sources and sinks for greenhouse gases (GHG), such as carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). These fluxes can be altered by common elements found in crop protection products. However, the evidence of the impact that crop protection products have on soil carbon and GHG emissions is inconclusive. We analyzed the link between inputs of crop protection products, soil carbon, and GHG emissions in an attempt to fill this gap. Additionally, we examined whether meteorological conditions such as soil moisture, air temperature, rain, and solar radiation influence the treatments differently. Corn was used as a model crop as it is a staple grain crop grown in many countries and requires a large amount of nitrogen input, in addition to crop protection. Plot treatments were combinations of three cropping systems (conventional, cereal rye cover crop, and a soybean intercrop) and three levels of crop protection input (no crop protection inputs, minimal number of crop protection applications, and maximum number of crop protection applications). Each treatment had four replications, leading to a total of 36 plots. The results indicate that crop protection input levels may not significantly affect GHG fluxes from the soil. Instead, GHG fluxes were primarily influenced by soil temperature, soil moisture, and fertilizer inputs. These results shed light on ways farmers can utilize crop production products to mitigate climate change.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 12
Presentation Time: 4:00 PM to 4:50 PM

Epidemiology in the News: How Public Health Experts Identify Well-Researched Claims in the Media

Pak, Andrew J.; Janssens, A. Cecile J.W.

Presenter/s: Andrew Pak

Emory Faculty Mentor: Cecile Janssens

N/A

Research Discipline: Public Health
Presentation: Poster Presentation - A
Poster Number (if applicable): 21
Presentation Time: 8:00 AM to 8:50 AM

Exploring the relationship between blood lead levels of children in Georgia and educational outcomes by district

Pan, Michelle;

Presenter/s: Michelle Pan

Emory Faculty Mentor: Eri Saikawa

N/A

Research Discipline: Public Health
Presentation: Poster Presentation - B
Poster Number (if applicable): 9
Presentation Time: 9:00 AM to 9:50 AM

Analysis of time-dependent probabilities and light-matter interactions between high-quality planar mirrors

Ribeiro, Raphael; Parikh, Aadya

Presenter/s: Aadya Parikh

Emory Faculty Mentor: Raphael Ribeiro

N/A

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 22
Presentation Time: 8:00 AM to 8:50 AM

Funicular Distribution & Density of 5-HT Fibers in the Thoracolumbar Spinal Cord

Patel, Niki; Giorgi, Andrea; Perreault, Marie-Claude

Presenter/s: Niki Patel

Emory Faculty Mentor: Marie-Claude Perreault

Serotonergic (5-HT) neurons in the raphe nuclei of the brainstem profusely innervate every part of the central nervous system to exert a breadth of modulatory functions, including regulation of spinal motor circuits. The existing literature has reported complex and sometimes conflicting action of 5-HT on spinal motor circuits. This has been attributed to differences in methodology (species, age, etc.) and lack of approaches that would enable the specific activation of the 5-HT raphe neurons projecting to the spinal cord (5-HT raphe-spinal neurons) without activation of the non-5-HT raphe-spinal neurons. Now that such a specific approach is now possible in the mouse (Giorgi and Perreault 2021), it is critical that we gather information about the anatomy of the 5-HT raphe-spinal system in this species. Therefore, the goal of this study is to assess the funicular distribution and density of 5-HT raphespinal fibers projecting to the upper lumbar segments of the spinal cord, where core circuits of the locomotor central pattern generator are found, both in newborn mice and in young adult mice.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 23
Presentation Time: 8:00 AM to 8:50 AM

Advancement of Mathematical Modeling in International Trade Theory – A Review on Ricardian and Heckscher-Ohlin Models

Peng, Yixuan; Lind, Nelson

Presenter/s: Yixuan Peng

Emory Faculty Mentor: Nelson Lind

International trade theories and modeling have been established and improved in the past century. Based on different elements mimicking real-world scenarios, basic international trade theories have been proposed by economists to explain the real-world data, project future trends, and guide economic policies. Though specific theories, such as the Ricardian Model and Heckscher-Ohlin Trade Theory, have been examined in detail, the development of these trade theories has not been well connected and organized. Therefore, this study examined and summarized the major improvement on these trade theories both mathematically and logically utilizing the Ricardian Model and Heckscher-Ohlin Trade Theory (H-O model).

With expressions of functions and statistical regressions, this study would conclude with the
summary of the advancement of the H-O model with a continuum of goods and the effects of
changes in endowments on the goods produced including the prices of goods and factors with the the elasticity of substitution in production. A similar mechanism in the Ricardian Model would be presented with how the equilibrium influences the relative wage, specialization pattern, and price structure across countries. Furthermore, we examine the modified Ricardian model proposed by Eaton Jonathan and Samuel Kortum which incorporates geography barriers into the calculation of equilibrium with the modified gains from trade and the benefits from new technology utilized in trade.

Lastly, through these theoretical perspectives specifically on the Ricardian model, we summarize applications of these models, including non-tradable goods, tariffs, transportation costs, and unemployment under sticky money wages. Together with the showing sectoral
heterogeneity, intermediate products, and sectoral linkages for quantifying welfare gains from
tariff cuts described in the publications using real data. This study aims to provide a systematic review of the evolution of international trade theories, recognize the
landmark in economic theories, and offer a concise logical flow of the development and application of models. With reviews of the significant publications in the realm of international trade, we conclude the significant steps of the improvement of these theories and how it is adapted to better fit the real situation, including the change from simple two goods and two-countries theories to a continuum of goods and other changes.

Research Discipline: Social Sciences

Presentation: Poster Presentation - H
Poster Number (if applicable): 21
Presentation Time: 4:00 PM to 4:50 PM

Analyzing the Activation of Specific Neuronal Bodies Using the 6-Hertz Seizure Model

Pidugu, Alekhya; Fernandez, Dr. Alejandra; Gross, Dr. Robert

Presenter/s: Alekhya Pidugu

Emory Faculty Mentor: Alejandra Fernandez

In this project, c-Fos gene expression was used in order to study the pattern of neuronal activity of seizures in a mouse model. C-Fos is a proto-oncogene which is a gene involved in normal cell growth and is expressed within neurons. Using immunohistochemical laboratory techniques, the c-Fos proteins expressed from the gene can be identified in these neuronal bodies within the mouse brains. One of the purposes of the study is to determine what structures in the mouse brains are active at different time points after the seizures happen. Previous studies have shown seizures can be recognized in the frontal cortex. Many common forms of seizures are said to be caused by structures in the frontal or temporal lobe of the forebrain. Thus, there is evidence that indicates the anterior orbital gyrus, medial orbital gyrus, and posterior orbital gyrus in the front lobe could be identified by the c-Fos neural marker. Temporal lobe epilepsy is one of the most common forms of adult epilepsy and tends to be drug-resistant. Thus, we are using the 6 Hz model as it is also drug-resistant. After the mice have a seizure, they will be sacrificed after 5 minutes, 30 minutes, 1 hour, 2 hours, or 4 hours. The mice brain sections will be cut using a cryostat set to 40 microns. Then an immunohistochemistry protocol will be used to stain the sections with a c-Fos antibody. The results of the IHC showed significant fluorescence in the hippocampal regions of the brain. By understanding how these seizures occur in mice, we can apply this information to human brains and determine how we can treat the affected structures. This data can be used to develop future clinical or translation studies regarding human brains.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - B
Poster Number (if applicable): 10
Presentation Time: 9:00 AM to 9:50 AM

Stateless Being, Beingless State: A Study in the Pessimism of Afropessimism

Poole, Ronald; Marder, Elissa

Presenter/s: Ronald Poole

Emory Faculty Mentor: Elissa Marder

The modern theoretical intervention of Afropessimism has importantly deconstructed the foundations of Western knowledge and knowledge production. Framed as meta-theory, that is a theoretical commentary on theoretical commentary, Afropessimism weaves together several strands of thought in phenomenological and existential philosophy, post-colonial and decolonial cultural studies, and psychoanalysis in propounding the absolute condition of anti-blackness in the world, anti-black racism as the foundation of the world as such. Whereas the material implications of Afropessimism as a descriptive system of culture and history are tremendous in the way of clarifying the “human subject’s” relation to law, media, politics, science, education, family, etc., there remains some resistance in/to the broader reception of Afropessimism as a distinct and legitimate philosophical system. This project endeavors less to ‘legitimate’ Afropessimism but rather to explicate some important strands of thought in Critical Race Theory, Black Feminism, and psychoanalysis as they inform the Afropessimist critique. Through a sustained [illegible]

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Research Discipline: Humanities
Presentation: Oral Presentation - D
Poster Number (if applicable):
Presentation Time: 12:30 PM to 2:00 PM

Age and Sex Related Long-Term Brain Deficits Caused by Mild Head Trauma in the Drosophila Model

Qian, Eric; Ye, Sherry

Presenter/s: Eric Qian

Emory Faculty Mentor: James Zheng

Mild traumatic head injury (mTBI), including concussion, can lead to chronic brain dysfunction and degeneration but the underlying mechanisms remain poorly understood. Available data suggest that sex- and age-dependent factors have effects on mTBI outcomes, but our ability to link these population-level observations to molecular and cellular effects in the brain is limited. A better understanding of these mTBI disease mechanisms and their variation between sexes and with age are critical steps in defining disease mechanisms and therapeutic opportunities. To study these potential mechanisms, we developed the Head Impact FLy Injury (HIFLI) model, which can deliver mild repetitive headfirst impacts to multiple awake and unrestrained adult Drosophila melanogaster. Flies were exposed to our head injury paradigm at different ages (3d, 2wk, 4wk), and brains were collected at 6 weeks old. Following collection, the brains are stained with DAPI and phalloidin, imaged, and analyzed using ImageJ to determine the degree of gross degeneration, which is plotted and statistically analyzed using R. We found that Drosophila subjected to our repetitive head injury paradigm develop long-term deficits such as progressive brain degeneration, but brain degeneration is substantially exacerbated in flies injured at older ages. Additionally, brain degeneration caused by injury is more profound in females than in males, and injured aged females exhibit the largest degree of degeneration in the brain. Our findings suggest an increased vulnerability to brain injury in females and older adults.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - C
Poster Number (if applicable): 9
Presentation Time: 10:00 AM to 10:50 AM

Imaging of the endocrine pancreas and β-cells in patients with type 1 and type 2 diabetes mellitus: a review of specificity and accuracy.

Rajagopal, Shreyas; Narayan, K. M. Venkat; Beyh, Yara

Presenter/s: Shreyas Rajagopal

Emory Faculty Mentor: K.M. Venkat Narayan

The scope of people affected by type 2 diabetes mellitus (T2DM) continues to expand, posing the need for effective imaging techniques to better understand its pathogenesis. T1DM and T2DM entail a deficiency in producing or responding to insulin, oftentimes accompanied by a degradation of cells in the pancreas. The endocrine pancreas, specifically β-cells, are of particular research interest due to their role in insulin production. This study attempted to synthesize the current trajectory of noninvasive in vivo imaging of the pancreas under two categories: magnetic resonance imaging (MRI) and computed tomography (CT). Drawing on the findings of individual studies involving MRI and CT, it compared the accuracy, versatility, and safety of both imaging methodologies to identify imaging techniques that are the most useful in the future of diabetes research. Results suggest that MRI outpaces CT in specificity of β-cell specific contrast agents. The variety of emerging parameters of quantifying β-cell function combined with avoiding radiation-related risks makes MRI a favorable imaging technique for assessing pancreatic function in diabetic patients. However, recent advances in CT contrast agents and convergence with positron emission tomography (PET) are also a marker of its increasing accuracy, providing detailed imaging in a cost-effective manner. Examining the subsections of CT and MRI, benefits and drawbacks, and the extent of endocrine specificity is imperative to connect β-cell tracer innovation to other advances in imaging technology. Accurate and effective imaging is necessary to better understand the prognosis of T1DM and T2DM, a precursor to developing new methods of diagnosis and treatment.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - B
Poster Number (if applicable): 11
Presentation Time: 9:00 AM to 9:50 AM

The Effects of Parental Immigration Status on First-Generation College Students

Ramos, Yuritzy; Lopez de mesa Moyano, Paloma

Presenter/s: Yuritzy Ramos

Emory Faculty Mentor: Paloma Lopez de mesa Moyano

First-generation immigrants and the children of immigrants have been responsible for a large fraction of the growth in the student population over the past few years. Yet, the impact of parents' immigrant background on first-generation students has been poorly studied in the past. This study aims to explore characteristics such as gender ratio and racial makeup of college populations for 2015 and 2019 using data from the American Community Survey. The study focuses on individuals between the ages of 15 and 23 who were attending college at the time of the survey. This population was further divided into three subgroups: college students, first-generation college students, and first-generation college students with immigrant parents. The data showed that while factors such as nominal househ汯+湩潤敷栠据敲獥搠映湩ぐ悡瑞ぐ恒桴□潰異慬楴湯漠瑨来□瑨整

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Research Discipline: Social Sciences
Presentation: Poster Presentation - E
Poster Number (if applicable): 9

Presentation Time: 1:00 PM to 1:50 PM

Impacts of Temperature and Relative Humidity on Low-Cost Air Sensor Performance

Regnier, Grace; Pu, Siyan; Chen, Flora; Saikawa, Eri

Presenter/s: Grace Regnier

Emory Faculty Mentor: Eri Saikawa

The affordability and accessibility of low-cost air sensors makes them essential for mapping pollutants in urban areas. However, the reliability of outdoor sensors may be affected by local weather conditions, such as temperature or relative humidity. There is currently no consensus within the scientific community as to how these meteorological effects should be identified and corrected for. Our research aim is to understand the impacts of a North American southeastern climate on low-cost sensors and evaluate how well statistical methods can adjust for these effects. Eight Airly sensors (including three gas-type models) and three Dylos sensors were installed next to a federal regulatory monitor at the EPA's South DeKalb site for up to three months. A linear regression was then performed to evaluate whether poor correlation between the federal and low-cost sensors coincided with a change in temperature and/or relative humidity. Though investigation is still ongoing, preliminary results suggest that high temperature and humidity may cause the sensors to report higher concentrations of pollutants than they might have otherwise recorded. However, the trends may be nonlinear and subject to other factors (e.g., heavy rainfall) which are not considered in this study, making it difficult to provide a reliable, "one-size-fits-all" correction factor. Future studies would benefit from evaluating sensor performance both in outdoor locations and in a controlled environment, which would help to separate meteorological effects from other noise. A thorough understanding would improve public confidence in low-cost air sensors and encourage the expansion of sensor networks within cities.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 24
Presentation Time: 8:00 AM to 8:50 AM

Development of an Extracellular Vesicle-based mRNA delivery system

Rojas, Alexander; Dobosh, Brian; Tirouvanziam, Rabindra

Presenter/s: Alexander Rojas

Emory Faculty Mentor: Rabindra Tirouvanziam

The progression of cystic fibrosis (CF) is characterized by the chronic recruitment of polymorphonuclear neutrophils (PMNs) into the lung resulting in inflammation. However, PMNs fail to kill bacteria resulting in respiratory infections. PMNs are also highly pinocytic, making them good targets for extracellular vesicle (EV)-based therapies. EVs are lipid particles which form a ubiquitous mechanism of cell-to-cell communication. An in-depth profile of the RNA composition of EVs from healthy endothelial cells was determined and genetic motifs that may promote the packaging of RNA into EVs was found [1]. As a proof-of-concept, we included these motifs in the 3'UTR of EGFP mRNA and determined that some promoted the packaging of mRNA into EVs of epithelial cells. We hypothesized that we could select for more effective EV localization motifs by using a directed evolution approach. H441 epithelial cells were grown in culture and the EVs, which contain mRNA with supposed EV localization motifs, were purified by differential centrifugation. RNA was extracted from the EVs using Trizol. The RNA will then be fragmented using Mg+2 and TGIRT-III template switching will be used to attach our unknown cDNA library sequences with known sequences and cloned downstream of EGFP-STOP and upstream of a betaglobin 3'UTR. The cloned cDNA libraries will be transfected into H441 epithelial cells, which will then secrete EVs containing EGFP mRNA as a result of the selected motifs. This procedure will be repeated to enrich for sequences that preferentially go into EVs. After multiple generations, we expect to find an enrichment of particular RNA sequences, which may be EV localization signals. In the future, we hope to use this EV localization signal to load therapeutic mRNA such as CFTR or EHF and target diseased cells and potentially see improvements in cellular function and patient pathophysiology.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - C
Poster Number (if applicable): 10
Presentation Time: 10:00 AM to 10:50 AM

Best Practices for Combatting Antisemitism Online

Ross, Micah; Lipstadt, Deborah; Schainker, Ellie

Presenter/s: Micah Ross

Emory Faculty Mentor: Ellie Schainker

This study sought to identify the most effective practices for fighting antisemitism online. Antisemitism as a form of discrimination has existed for millennia; however, the advent of the internet and social media has opened up an entirely new medium through which antisemitism and other forms of hatred can develop and proliferate. Given that online antisemitism is a relatively recent development, there is still much research needed in order to identify the manifestations and best methods for fighting antisemitism. To address our research question, I compiled and took notes on all relevant scholarly journals which discuss this topic. I then categorized the overarching answers thematically and created a write-up outlining my findings. Based on my preliminary findings, I identified 8 distinct categories of different methods for fighting antisemitism online: education, government policy reform, collaborative solutions, imploring users to act, perceptional shifts, advertising, social media reform, and third-party organizations. These findings outline specific ways to address the growing and evolving problem of online antisemitism.

Research Discipline: Humanities
Presentation: Poster Presentation - H
Poster Number (if applicable): 13
Presentation Time: 4:00 PM to 4:50 PM

Evaluating the Transition Plans of Students with Autism Spectrum Disorder

Salako, Taryn; Snider, Laurel; Segall, Matt

Presenter/s: Taryn Salako

Emory Faculty Mentor: Matt Segall

For students who receive special education services, postsecondary transition planning is required by law and documented in the Individualized Education Program (IEP). Transition planning is especially important for students with autism spectrum disorder (ASD), who have a much higher probability of experiencing poor outcomes after high school. Annually, transition assessments provide educators with the goals and activities for students to use to work towards a successful transition. Despite this, it can be hard to monitor and improve transition while it is happening. The purpose of this research was to develop a tool to better monitor the outcomes of transition planning for students with ASD. This tool was developed to evaluate how teachers adapt IEPs after receiving recommendations from transition assessments conducted by the Emory Autism Center. Coding targets were developed by a team of experts in transition and operationalized in a codebook. Next, the coding team completed iterative coding to refine the codebook and reach consistency for all data targets. Inter-rater reliability of 95% was reached, indicating that the coding procedure was robust and consistent. This tool uses retrospective document review to compare the IEP and the transition assessment, noting similarities and differences between the two documents. During the IEP coding process, information about the student's preferences and strengths, activities that they will practice to achieve their goals, and their involvement in the transition planning process is extracted. These procedures will be used to annually evaluate, the IEPs of participants from two Georgia school systems. This data will be used to improve the transition for students with ASD and tailor professional development for educators involved in the transition process.

Research Discipline: Social Sciences
Presentation: Poster Presentation - G
Poster Number (if applicable): 57
Presentation Time: 3:00 PM to 3:50 PM

POM-based materials with anti-SARS-CoV-2 activity

Salman, Fahad; Snider, Victoria; Hill, Craig

Presenter/s: Fahad Salman

Emory Faculty Mentor: Craig Hill

COVID-19 is a disease caused by the SARS-CoV-2 virus; research has proven that the virus remains viable on solids for up to one week. Because of this, infection can be caused when a person comes into contact with a solid that has been contaminated with the virus. One way to reduce the viral transmission and prevent the global rise in COVID-19 cases is to reduce the period of viability of SARS-CoV-2 on solids. This could be done by coating antiviral anionic polyoxometalate (POM) compounds, on solid surfaces (cationic polymers) to inactivate and/or kill the virus. Since COVID-19 started to spread in late 2019, reports of POMs that display anti-SARS-CoV-2 is a fairly new topic of research. Therefore, to bridge the gap, this study focuses on synthesizing and characterizing POMs and POM-polymer composites that have shown promise in their antiviral activity. 18-tungstotetranickel (II) diphosphate, [Ni4(H2O)2(PW9O34)2]10- (Ni-POM) was synthesized under mild hydrothermal conditions. Green rod-shaped crystals of the POM were obtained, which were then characterized by Fourier Transform Infrared (FTIR) spectroscopy, UV-Visible spectroscopy, and Phosphorus-31 Magnetic Resonance (31P NMR) Spectroscopy. The POM structure and spectra matched those that were published in previous studies fairly well, confirming successful synthesis of the Ni-POM. Subsequently, an organic cationic polymer, methylated-polyethylenimine (m-PEI) was synthesized via N-alkylation of PEI with methyl iodide. The orange gel-like m-PEI was then characterized by Proton Nuclear Magnetic Resonance (1H NMR) Spectroscopy and FTIR. The next step is to bind anionic Ni-POM to the cationic polymer, m-PEI, electrostatically, via ion-exchange to form a thin coating of Ni-POM-m-PEI that can be applied to surfaces. Work will then be performed by collaborators to confirm the hypothesis that the Ni-POM deactivates SARS-CoV-2. In addition, Ni-POM-m-PEI will be tested against viral particles and the viral infected cell lines.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 25
Presentation Time: 8:00 AM to 8:50 AM

Improving School Shooting Datasets for Causal Identification of Voter Turnout Following and Related to Violent Activity

PI: McAlister, Kevin

Lab Members: Ali, Inaara; Ding, Christina; Nelson, Ruth; Taylor, Jeffrey; Zhang, Matt

Presenter/s: Mario Sánchez del Campo

Emory Faculty Mentor: Kevin McAlister

One tragic violent event that is sadly evermore commonplace in the US is school shootings.
In response to such a trend, a lot of important questions regarding policy naturally emerge, and experts gauge public interest in policy reform by observing the attributable amount of voter turnout. But, despite an abundance of data and the importance of the issue, this domain of research remains underserved. Furthermore, existing datasets and studies based on these use, we argue, too broad of a definition of what consists of a school shooting, for example often including unrelated violent events which just so happen to occur on the premises of a school, which makes consequent efforts of causal identification challenging. We consolidate these databases by matching incidents across them, and use a combination of a Support Vector Machine classification methods and Active Learning processes in an attempt to encode what we argue is a more fitting definition to our general intuition of what consists of a school shooting, whilst still maintaining the objectivity of a computer and reproducibility of approach. We hope the resulting database can become a useful resource for future research in this area, including our own, and illuminate tangential areas of research and policy by reverse engineering the machine process of defining a school shooting and what that could look like for other hard classification problems.

Research Discipline: Social Sciences
Presentation: Poster Presentation - B
Poster Number (if applicable): 12
Presentation Time: 9:00 AM to 9:50 AM

Bringing the Clinic to the Community: A Pilot Study of Two Community-based HIV Care Models Designed to Engage and Retain Out-of-care People with HIV

Sanson, Virginia; Kalokhe, Ameeta

Presenter/s: Virginia Sanson

Emory Faculty Mentor: Ameeta Kalokhe

N/A

Research Discipline: Public Health
Presentation: Poster Presentation - B
Poster Number (if applicable): 13
Presentation Time: 9:00 AM to 9:50 AM

The Impact of Neurotoxin DSP-4 on the Locus Coeruleus-Norepinephrine System

Segal, Arielle; Iannitelli, Alexa; McCann, Katherine; Weinshenker, David

Presenter/s: Arielle Segal

Emory Faculty Mentor: David Weinshenker

Degeneration of noradrenergic neurons in the locus coeruleus (LC) is a pathological indicator of Parkinson's disease. This neurodegeneration is linked to non-motor symptoms of Parkinson's disease including sleep disturbances, cognitive decline, and anxiety. The ability to model this LC dysfunction is essential for improving our understanding of the development of these non-motor symptoms as well as the overall progression of Parkinson's disease. DSP-4 (N-(2-chloroethyl)-N-ethyl-2-bromobenzylamine hydrochloride) is a neurotoxin selective for LC neurons and has been used to model LC dysfunction associated with Parkinson's disease. In this experiment, mice were treated with either saline or DSP-4 and immunofluorescent histochemistry for the norepinephrine biosynthetic enzyme tyrosine hydroxylase (TH) was performed in the LC to measure noradrenergic neuron integrity. HALO, an image analysis software, was then used to quantify neuron loss in the LC following DSP-4 or saline treatment. Although this quantification is still in progress and final results have not yet been obtained, previous studies suggest that while DSP-4 induces severe LC axon loss, LC cell bodies remain relatively intact. Thus, we hypothesize that treatment with DSP-4 results in neuronal dysfunction rather than complete cell death, which is indicative of early Parkinson's disease and may drive prodromal symptoms.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 14
Presentation Time: 4:00 PM to 4:50 PM

Randomized Controlled Trial of CES for Fibromyalgia

Smith, Trozalla; Woodbury, Anna, MD

Presenter/s: Trozalla Smith

Emory Faculty Mentor: Anna Woodbury

Cranial Electrical Stimulation is a non-invasive therapy that delivers small electrical currents throughout the brain via a small battery operated device with through electrodes clipped on a patient's ears. CES has been approved by the U.S Food and Drug Administration for treating anxiety, insomnia, and depression and new studies have focused on its effect on chronic pain. The physiological and neurochemical CES effects are currently unknown. Patients with Fibromyalgia experience poorly controlled pain and symptoms such as sleep disturbances, depression and anxiety. There are limited treatments that target the symptoms of Fibromyalgia. Our study is a rigorous, randomized, double-blind, placebo-control trial of Cranial Electrical Stimulation aiming to address the need of identifying and understanding mechanisms of non-opioid pain management.

Aim 1. Examine the clinical utility of Cranial Electrical Stimulation in male and female veterans with fibromyalgia. Hypothesis: True Cranial Electrical Stimulation improves clinical pain (primary outcome), function (sit-to-stand, bicep curl, handgrip strength), and PROMIS (Patient-Reported Outcomes Measurement Information System) measures (sleep, mood, global health, etc.) to a greater degree than sham Cranial Electrical Stimulation.

Aim 2. Determine the short and long-term effects of CES on fibromyalgia-related altered network connectivity using rs-fcMRI as a biomarker in Aim 1 subjects. Hypothesis: True CES results in increased DMN-SMN connectivity (secondary outcome) relative to sham at 1 & 12 weeks post-treatment.

Aim 3. Establish the utility of baseline rs-fcMRI as a clinical biomarker for predicting CES treatment response in Aim 1 subjects. Hypothesis: Intra-group variations in baseline rs-fcMRI (exploratory outcome) can predict treatment response for CES responders and non-responders.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 26
Presentation Time: 8:00 AM to 8:50 AM

Taxonomic Findings in the Herbarium: Investigating the "Ferns of Jamaica" Specimen Collection Book

Snoddy, Andrea; Samarakoon, Tharangamala; Quave, Cassandra

Presenter/s: Andrea Snoddy

Emory Faculty Mentor: Cassandra Quave

The "Ferns of Jamaica" book, embossed with a gold title and wrapped in a dark red covering, has sat on the bookshelf in the Herbarium, untouched for years. It is likely over 100 years old, and numerous aesthetically placed ferns stand proudly against its yellowed pages. The author of this enigmatic book is unidentified but speculated to be Perry Wilbur Fattig, known entomologist and curator of the Emory Museum from 1926 to 1953. The purpose of this research is to identify and annotate all specimens in the book, trace its history, and explore the identity and life history of the potential author. General observations were conducted to examine the physical aspects of the book for clues alongside the author's handwriting for comparison. The author's life history was traced using public education, birth, marriage, and death records and by contacting Joseph McHugh, a professor and curator at the University of Georgia. However, the identity of the author is tentative and other options are open for exploration and will be detailed. The fern book was imaged using a Canon Eos 5D Mark II digital camera body placed in an ORTECH Photo e-Box plus. The updated nomenclature of ferns was confirmed through the International Plant Name Index (IPNI). The primary findings of this research include the identification and annotating of ferns and the recognition of their properties. The book contains twenty-three genera, one hundred and one species, and one hundred and six specimens of Jamaican ferns including species with renowned medicinal uses. The grander implication behind this research lies in the appreciation and value of historic taxonomic findings, the expansion of the Herbarium's catalog, and the increase in data available for others to use in their studies.

Research Discipline: Humanities
Presentation: Poster Presentation - B
Poster Number (if applicable): 14
Presentation Time: 9:00 AM to 9:50 AM

Analysis of Recruitment and Attrition of Participants for the Ongoing Partnered Rhythmic Rehabilitation for Enhanced Motor-Cognition in Prodromal Alzheimer's Disease Study

Spies, Marissa; Hackney, Dr. Madeleine; Bay, Allison; Carroll-Sauer, Cathleen

Presenter/s: Marissa Spies

Emory Faculty Mentor: Madeleine Hackney

Every year millions of Americans experience a decline in their quality of life because of Alzheimer's Disease (AD). Studies examining how AD-related motor and cognitive decline can be slowed are being conducted to improve the lives of these individuals. One such study is the Partnered Rhythmic Rehabilitation for Enhanced Motor-Cognition in Prodromal Alzheimer's Disease (PARTNER), which examines how integrating motor and cognitive skills through dancing can improve the cognitive functioning of individuals with Prodromal Alzheimer's Disease (pAD). This project will utilize data taken from recruitment phone calls for the PARTNER study to analyze the reasons why people accept or decline further screening for eligibility, as well as why those who are screened and determined to be eligible still may decline to enroll in the study or withdraw prior to completing all study visits. Furthermore, the diversity of the representation in the sample will be analyzed to determine whether the data from the PARTNER study is representative of the pAD population in metro Atlanta, as generalizing the results from the PARTNER study to the pAD population at large requires that the sample population be representative of the target population. If there are systematic reasons why eligible individuals decline to enroll, withdraw after the screening, or decline to be screened, then this could introduce selection bias. Understanding why eligible individuals do not enroll or complete study visits allows the study team to take measures to ensure that any barriers to enrollment can be addressed so that the study population is representative, and bias is minimized.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 27
Presentation Time: 8:00 AM to 8:50 AM

N/A

Stachowicz, Kathryn

Presenter/s: Kathryn Stachowicz

Emory Faculty Mentor:

N/A

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - D
Poster Number (if applicable): 10
Presentation Time: 11:00 AM to 11:50 AM

Systematic review and meta-analysis on Autism Spectrum Disorders screening and diagnostic procedures for children aged 18 to 42 months

Stern, Martha; Leong, Traci; McCracken, Courtney; Peterson, Shenita; Sivathasan, Shalini; Yuan, Abbey; Peck, Adina; Kerolos, Diana

Presenter/s: Martha Stern

Emory Faculty Mentor: Traci Leong

Autism spectrum disorder (ASD) is a developmental disability that affects about 1 in 44 children in the US and is associated with social, communication, and behavioral challenges. Characteristics of ASD can present in the first six months of life; however, the average age of diagnosis in the US is about four years. Early diagnosis is critical as children who receive early intervention can have better outcomes. The current gold standard for ASD diagnosis involves a battery of assessments and/or clinicians specializing in ASD. While diagnostic tools are available for young children (YC), they may be less accurate because children at this age are still developing critical social and communication skills. Accurate ASD diagnostic tools are needed for YC to improve early intervention efforts. This study aims to evaluate the diagnostic accuracy of different types of ASD diagnostic tools for YC and evaluate how these tools perform in different populations and clinical settings.

This study is a systematic review and meta-analysis evaluating the accuracy of ASD diagnostic tools in YC. Our search consisted of keyword searches based on four concepts: YC, tools for ASD diagnosis, description of diagnostic accuracy, and comparison with a clinician-judged best estimate of ASD. Papers had to be published on or after 1/1/2020, in English, and have full text available.

Our search of three databases identified 6949 papers after removing 107 duplicates. Trained reviewers have reviewed 230 abstracts, of which 209 did not meet the criteria. Common reasons for exclusion were incorrect age range, sample ascertainment, and lack of a gold standard diagnosis. Reviewers will complete title and abstract screening and full-text review by Summer 2022. We hypothesize that the tools' accuracy will be influenced by the sample composition, the child's age when the tool was used, and whether it was a subjective assessment.

Research Discipline: Social Sciences
Presentation: Poster Presentation - C
Poster Number (if applicable): 11
Presentation Time: 10:00 AM to 10:50 AM

The regulation and function of nuclear B7-H4 in breast cancer

Striyeshyn, Diana; Wan, Yong; Zeng, Lidan

Presenter/s: Diana Striyeshyn

Emory Faculty Mentor: Yong Wan

B7-H4, as a well-known immune checkpoint inhibitor, presents in various cancers. In breast cancer, it has been detected in about 95% of patient tissues and correlated with poor prognosis, making B7-H4 a promising target for breast cancer treatment. In addition to its plasma membrane localization, B7-H4 was also found in the nucleus of breast cancer cells. However, the function of nuclear B7-H4 and the mechanism regulating its nuclear translocation is still unknown.

To explore the function of nuclear B7-H4, we regulated the expression levels of B7-H4 with a Tet-On negative feedback circuit in breast cancer cells, and we predict that the expression of B7-H4 promotes cell proliferation and drug resistance. Furthermore, we manipulated the amount of nuclear B7-H4 by mutating the predicted nuclear localization signal (NLS) or introducing an additional NLS. We hypothesize that NLS facilitates the nuclear translocation of B7-H4 and enhances the cell proliferation and drug resistance phenotypes. Finally, we tagged B7-H4 with a photoconvertible fluorescence protein mMapple3, enabling us to trace its intracellular trafficking. In the future, the regulation of B7-H4 nuclear translocation will be explored by identifying its binding partners with immunoaffinity purification mass spectrometry (IP-MS).

Overall, this study could provide insight into the significance and regulation of nuclear B7-H4 in breast cancer and potentially present nuclear B7-H4 as a novel therapeutic target.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - B
Poster Number (if applicable): 15
Presentation Time: 9:00 AM to 9:50 AM

The most effective retention strategies for the MWCCS and the impact on participant retention in a longitudinal study

Taiwo, Phoebe; Sallenger, Sutton; Foster, Antonina; Ofotukun, Ighovwhera; Sheth, Anandi; Wingood, Gina

Presenter/s: Phoebe Taiwo

Emory Faculty Mentor: Antonina Foster

In 2019, the Multicenter AIDS Cohort Study (MACS) combined with the Women's Interagency HIV Study (WIHS) to create the MACS/WIHS Co[illegible]Horror movies all have one goal: to scare viewers. One common technique of accomplishing that goal is the usage of jumpscares, a method of scaring the audience with a sudden, unexpected, and frightening image, sound, or

action. In this study I counted the jumpscares in each of the top 10 US box office horror films. These films are very financially successful, with each of them making at least $150 million. While watching the films, I marked big and medium jumpscares with the letter ‘A’ and small jumpscares with ‘B’. In addition, any questionable jumpscares were marked ‘C’. I judged the rating of j

Research Discipline: Public Health
Presentation: Poster Presentation - H
Poster Number (if applicable): 15
Presentation Time: 4:00 PM to 4:50 PM

COVID-19 Vaccination Site Access Dashboard

Thach, Aaron; Vigfusson, Ymir

Presenter/s: Aaron Thach

Emory Faculty Mentor: Ymir Vigfusson

N/A

Research Discipline: Public Health
Presentation: Oral Presentation - A
Poster Number (if applicable):
Presentation Time: 8:00 AM to 9:30 AM

The Effect of Video Game Biofeedback on Arousal State and Engagement Level

Thakkar, Vrushali; Alam, Zahin; Makanjuola, Joseph; Kesar, Trisha

Presenter/s: Vrushali Thakkar

Emory Faculty Mentor: Trisha Kesar

Hemiparesis, a common symptom of strokes, is the weakness or inability to move on one side of the body. Substantial research has been conducted to develop gait training programs to optimize recovery and focus alleviating hemiparesis in stroke patients. Biofeedback training has been identified as a promising intervention for targeting specific biomechanical impairments by providing the user with real-time information on a specific targeted variable. Incorporating game-based interfaces for gait biofeedback has the potential to increase patient motivation, distract patients from fatigue, and encourage and reward a greater number of repetitions during gait training. The primary objective of this study was to collect user data regarding a newly developed biofeedback gait training game and assess its effectiveness for engagement and difficulty. The clinical trial included 3 able-bodied participants. Each participant was exposed to different modes of biofeedback such as no biofeedback, basic interface, and gamified interface during a single gait analysis session. The average heart rate, electrodermal activity, average rate of perceived exertion, and engagement score were measured following each mode of biofeedback. Previous studies have shown that increases in electrodermal activity, through a measure called skin conductance response, and heart rate strongly correlate to heightened psychological and emotional activity, giving potential insight into the arousal response to video game biofeedback. Data was analyzed using Python and Excel. Preliminary results demonstrated that the game biofeedback interface increased heart rate, perceived exertion, and was found to be more creative and fast-paced. We expect to see skin conductance response increase in response to video game biofeedback through continued analysis. In future clinical studies, the incorporation of gaming systems as a rehabilitative tool provide opportunities to increase long-term therapeutic benefits for stroke recovery.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - E
Poster Number (if applicable): 10
Presentation Time: 1:00 PM to 1:50 PM

3D Bioprinting Cardiac Patch Constructs

Tran, Rosemary; Boeun Hwang

Presenter/s: Rosemary Tran

Emory Faculty Mentor: Boeun Hwang

Cardiovascular disease has become one of the leading health concerns in our world today with myocardial infarction being one of the most common types. The complications of cardiac treatment derive from the heart's minimal self-renewal ability and limited cardiomyocyte proliferation. Challenges also include the lack of patient-specificity in treatment and minimal regenerative properties. To approach this issue, much research has been done in the development of cardiac patch devices that aim to repair damages in the heart. Specifically, technological advancement in the field of 3D bioprinting presents promising innovations that incorporate hydrogel bioinks, vascular channel designs, and infusion of live cardiomyocytes and endothelial cells in a collagen patch construct. This project expands on previous research efforts in order to develop a functioning cardiac patch that promotes cardiomyocyte proliferation and decreases mortality rates due to myocardial infarction. Previous research suggests that follistatin-like-1 (FSTL-1) protein can enhance cardiomyocyte growth and health. Incorporating this protein into a novel cardiac patch device will further reinforce its success and regenerative function. Using hydrogel bioinks infused with cardiomyocytes and FSTL-1 protein, the construct will be printed using a 3D bioprinter and the hollow vascular channels of the construct will be seeded with endothelial cells. In order to evaluate the efficacy of this device, animal studies will be performed in the future using disease-induced rat models that simulate adult hearts affected with myocardial infarction. If successful, this animal study will enable promising applications for human clinical trials and eventually real patients.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - C
Poster Number (if applicable): 12
Presentation Time: 10:00 AM to 10:50 AM

Interviewing Middle-Class Hispanics in Atlanta

Trujillo, Javier; Browne, Irene

Presenter/s: Javier Trujillo

Emory Faculty Mentor: Irene Browne

In my research, I interview middle-class, Latinx individuals in Atlanta, Georgia. In specific, I interview restaurant owners from either Mexico or the Dominican Republic, as they are the most prevalent Hispanic groups located in the Atlanta area. The interviews go into specific detail about their upbringing and lives in the United States as a middle-class, minority group. The questions asked reflect all aspects of their everyday life, ranging from discrimination and prejudice they may experience, to their economic standpoints, and how it is like to live a life in the United States. The purpose of the study is to understand how these marginalized groups of individuals feel and relate to all the social-economic situations they face in our country. There is a wide range of research conducted on the lower class, and higher class Hispanic, but little to no research on how the laws, economy, and overall structure of the United States implicitly and explicitly impact middle class Hispanic. Thus, this data will allow us to gather and illustrate that gap in research. The hypothesis is that many of the interviewees believe that due to their race, they tend to be undermined and classified as unable to overcome economic challenges by starting their own companies, like restaurants. Thus, being placed in a position that does not align with their own group of other Hispanics due to their different economic status, but also not relating to other Americans based they are deemed different based on their ethnic and cultural backgrounds.

Research Discipline: Social Sciences
Presentation: Poster Presentation - B
Poster Number (if applicable): 16
Presentation Time: 9:00 AM to 9:50 AM

Can microbiome changes alone drive individual changes in bee learning, memory and foraging

Tsui, Sherry; Avila, Laura; Chen, Jason; Gerardo, Nicole

Presenter/s: Sherry Tsui

Emory Faculty Mentor: Laura Avila

The use of agricultural chemicals and antibiotics play an essential role in suppressing bacterial crop diseases. However, the adverse effects on beneficial organisms in cropping systems due to the overuse of these agrochemicals are essentially unknown. Thus, it is now vital to address this knowledge gap especially for antibiotic broadcast during bloom. A large body of work has shown that alterations in interactions between species in the bee gut can influence bee learning, memory, and foraging; however, the mechanism behind these results remain unknown. The negative impacts on bee learning and foraging observed in the lab might be due to the changes in the microbiome composition or alternatively due to direct antibiotic neurotoxicity. Given the growing literature on the existence of an insect brain-gut axis, I hypothesize that one of the main drivers of changes in bee learning, memory, and foraging is the indirect impact of antibiotics on the bee gut microbiome. To test the hypothesis, I will challenge susceptible and resistant bees with streptomycin and assess bee learning. I expect that after being challenged with an antibiotic diet, bees inoculated with resistant symbionts will not experience declines in bee learning and foraging, as opposed to bees inoculated with antibiotic-susceptible symbionts. The results from this project will help us better understand the role of microbiomes on insect foraging and uncover the role of antimicrobial resistance in protecting bees against field antibiotic exposure.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 16
Presentation Time: 4:00 PM to 4:50 PM

Selective Radical Cyclization Using Photoredox Catalysis

Tuncaral, Defne; Hendy, Cecilia; Maust, Mark; Blakey, Simon

Presenter/s: Defne Tuncaral

Emory Faculty Mentor: Simon Blakey

Optimizing the efficiency of organic synthesis is crucial for developments in pharmaceutical chemistry. One class of reactions studied extensively for their ability to produce complex molecules is free radical cyclizations. Starting with aryl iodides as the radical precursor, we utilized photoredox catalysis to form the two main cyclization products, 5-exo and 6-endo. Previously the Blakey Lab accessed both 6-endo and 5-exo products from N-heterocycles based on the hydrogen atom transfer reagent used. The core skeletal structures provided by the radical cyclizations of our molecules of interest, benzodihydropyran for 6-endo and 2,3-dihydrobenzofuran for 5-exo, were targeted due to their significance as the structural features of many drugs and biologically active compounds. Extending the scope from N-heterocycles to aryl iodides led to the discovery of an alcohol product, formed by reacting with oxygen. Several reactions were set up in small scale using aryl iodides with olefin substituents, iridium or organic dye photocatalysts, silane, and sodium carbonate in methanol to acquire the 5-exo alcohol product. Selectivity for the 5-exo alcohol was optimized through reaction conditions including the type of photocatalyst used and exposure to oxygen pressure. We found that selective, high-yielding 5-exo cyclizations occur in small scale using Ir[dF(CF3)ppy]2(dtbpy)PF6 as a photocatalyst and exposing the reaction to oxygen early in the assembly of the reagents. Future perspectives of this research include optimizing a method for cyclization and oxygenation to develop functionalized rings with alcohols, examining different reagent effects on selectivity, and maintaining the yield in larger scale applications. Utilizing photoredox chemistry, which is driven by light, can drastically alter the energy requirements for organic synthesis. In large-scale, industrial uses of the proposed mechanism, the utilization of light can provide an efficient way to synthesize pharmaceutically significant molecules as well as help mitigate the effects of climate change by using renewable energy.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - B
Poster Number (if applicable): 17
Presentation Time: 9:00 AM to 9:50 AM

Spectroscopic Characterization of Lanthanide Oxides and Their Cations

Wang, Yizhou; Heaven, Michael

Presenter/s: Yizhou Wang

Emory Faculty Mentor: Arianna Rodriguez

The role of the 4f electrons in lanthanide bond formation is a debated issue in lanthanide chemistry. Lanthanide compounds have substantial potential in industry and material science due to their use in the air force and nuclear energy. Yet, our understanding of lanthanides is exceedingly restricted due to the complexity of lanthanide spectra. The main objective of our project is to collect spectroscopic data for prototypic lanthanide diatomic molecules such as samarium oxide via high-resolution laser-induced fluorescence spectroscopy (LIF). First, low-resolution LIF over the range from roughly 15,000 cm-1 to 22,000 cm-1 was recorded, and bands with sufficient intensity for investigation via high-resolution LIF were measured and extensively studied. With the assistance of the modeling program PGOPHER, the position, intensity, and wavelength of the newly observed fluorescence emission bands in this region were investigated, rotational and vibrational constants were determined, and novel data about the electronic transitions and radiative decay of lanthanide molecules were obtained. Through scrutinizing the LIF data of samarium oxide, we found 4 previously unreported, highly complex molecular electronic state transitions from upper-lying states to low-lying states. These novel insights into lanthanide bonding may then be used by organic and computational chemists to develop and improve nuclear waste treatment methods.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - A
Poster Number (if applicable): 28
Presentation Time: 8:00 AM to 8:50 AM

An Investigation into Orbitofrontal Cortex's role in Driving Compulsive Behavior

Wang, Silu; Yount, Sophie; Gourley, Shannon

Presenter/s: Silu Wang

Emory Faculty Mentor: Shannon Gourley

Compulsions refer to the intractable preservation of behaviors in face of adverse consequences. Compulsivity can be a fundamental building block of drug and alcohol addiction, negatively impacting numerous lives in modern society. It has been found that in human patients with obsessive compulsive disorder (OCD) the orbitofrontal cortex (OFC) is hyperactive. Therefore, we hypothesized that the hyperactive OFC drives compulsive-like behavior. To test our hypothesis, we utilized an experimentally-bred mouse line generated in our lab that is prone to compulsive-like behavior. We performed intracranial injection of Inhibitory (Gi-coupled) designer receptors exclusively activated by designer drugs (DREADDs) in the OFC of experimentally-bred mice, which allowed us to normalize their compulsive-like behavior upon repeated injection of the DREADD specific ligand clozapine N-oxide (CNO). In a new cohort of experimentally-bred mice, we performed ketamine injections to explore the possibility of reversing compulsive-like behavior using this promising OCD treatment. We discovered that the compulsive-like grooming activity had decreased significantly after consistent CNO injection in the Gi-DREADDs treatment group. There was also a trend showing that the ketamine treatment similarly suppresses the compulsive-like grooming. This trend will require further validation as we repeat the ketamine experiment, and dendritic spines on excitatory OFC neurons will also be visualized and reconstructed to evaluate the treatment effect. For the next step, we will look at protein markers of neuronal activity/plasticity in downstream projections in the striatum, where pathological changes were also discovered.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - B
Poster Number (if applicable): 18
Presentation Time: 9:00 AM to 9:50 AM

Optimal Experimental Design Based on Heterogeneous Observational Studies

Xiong, Ruoxuan; Wang, Hao

Presenter/s: Hao Wang

Emory Faculty Mentor: Ruoxuan Xiong

Through analyzing experimental data from a randomized controlled trial (RCT), causal effects can be carefully studied and examined; however, there is a tradeoff between statistical efficiency gains of a RCT and its corresponding experimental scale. By contrast, passively observed data from observational data base (ODB) have become more widely available, but the estimates of causal effects merely based on ODB can be biased due to heterogeneous effects and potential confounding in the observational sample. Although recent studies propose various approaches that merge data from observational and experimental sources to study causal inference, we need to pay extreme attention to heterogeneous nature of observational and experimental datasets when merging them. Instead, we propose a novel and efficient experimental design methodology based on multiple heterogeneous observational datasets. For ODB settings, we assume there are not only unobservable confounders but also noise when receiving the treatment. We plan to resolve this problem through experimental design using statistical methods and causal inference machine learning models. Through simulation and empirical studies, we will demonstrate the validity and feasibility of our proposed method, which minimizes the variance of estimates of average treatment effect (ATE) as well as solves minmax problem when approximating the conditional treatment effect (CATE) compared to benchmarks. Later, data privacy and user security issues will be handled by introducing federated learning and distributed statistical inference.

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - D
Poster Number (if applicable): 9
Presentation Time: 11:00 AM to 11:50 AM

The Impacts of Race and Poverty on Infant Mortality in the United States

Ward, Grace; Martinez, Micaela

Presenter/s: Grace Ward

Emory Faculty Mentor: Micaela Martinez

In the past century, major strides have been made in reducing infant mortality rates through improved healthcare and living conditions. Despite this, these trends do not hold true for children of color and children living in poverty. Equitable healthcare starts at birth; addressing these disparities is essential to ensuring a healthy start to life for everyone. This study endeavors to understand how race and poverty perpetually serve as confounding factors for infant mortality and to explore how environmental and systemic factors impact infant mortality. Data for infant mortality, racial demographics, and poverty in US counties for 2017-2018 were compiled and processed from the US Census and CDC Wonder. These data were analyzed to discern the nature of correlations between infant mortality and race/poverty nationally and regionally. Racial composition of counties was measured as percent of the population non-white. When analyzing counties across the country in aggregate, poverty and infant mortality were found to have a statistically significant correlation ($R^2 = 0.2185$) while race and infant mortality were not significantly correlated. However, when counties were broken down by region, poverty had a significant correlation to infant mortality in all regions (R^2 ranging from 0.075 to 0.612), and racial composition was significantly related to infant mortality in the Midwest ($R^2 = 0.171$). In order to fully interpret these data, variation in regional racial demographics must be examined. Open questions include, does the Midwest's unique racial composition drive the relationship between race and infant mortality? And do the top causes of infant mortality differ across the United States? As a next step, top causes of infant mortality in regions in the US will be compared to better understand how race and poverty influence infant mortality.

Research Discipline: Public Health
Presentation: Poster Presentation - E
Poster Number (if applicable): 11
Presentation Time: 1:00 PM to 1:50 PM

Investigating OXTR Gene Expression Using Ancient DNA

Warn, Jack; Joseph, Sophie; Lindo, John

Presenter/s: Jack Warn

Emory Faculty Mentor: John Lindo

Oxytocin (OXT) is a pituitary hormone and neurotransmitter known to have an important role in social bonding and reproduction in humans (Gimpl & Fahrenholz 2001). Throughout vertebrate evolution, OXT neuropeptide signaling has been adapted by organisms for regulating responses to the changing environment. OXT molecules bind to the transmembrane Oxytocin Receptor (OXTR), and this OXT-OXTR system is critically involved in multiple social functions, particularly in mammals (Carter 2013; Feldman et al. 2016). Perhaps most importantly for human societies, OXT, along with the structurally and functionally similar arginine vasopressin (AVP), is implicated in parochial altruism, the inclination toward intra-group cooperation and inter-group aggression without expectation of personal reward (De Dreu et al. 2010). OXTR gene variants in humans, such as single nucleotide polymorphisms (SNPs), have shown association with emotional responsiveness and prosocial behavior, as well as significant incidence of methylation and subsequent influence on levels of OXTR gene expression (Maud et al. 2018). I am specifically interested in studying the evolutionary history of OXTR, and other OXT pathway genes, within ancient populations in the Andes of So131u131t131h131 131A131m131e131r131i131c131a131 w131h131a131t131 131i131s131 131m131o131d131e131r131n131-131d131a131y131 131E131c131u131a131d131o131r131 131a131n131d131 131P131e131r131u131 u131s131i131n131g131 131a131n131c131i131e131n131t131 131D131N131A131.131 131T131h131i131s131 131r131e131g131i131o131n131 131h131a131s131 131a131 131c131o131m131p131l131e131x131,131 131d131y131n131a131m131i131c131,131 131a131n131d131 131v131a131r131i131e131d131 131p131o131p131u131l131a131t131i131o131n131 131h131i131s131t131o131r131y131,131 131r131a131n131g131i131n131g131 131f131r131o131m131 131h131u131n131t131e131r131-131g131a131t131h131e131r131e131r131 131g131r131o131u131p131s131 131t131o131 131d131e131n131s131

Research Discipline: Natural and Physical Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 17
Presentation Time: 4:00 PM to 4:50 PM

Astrocyte Cilia in the Developing Mouse Brain

Wei, Claire; Bear, Rachel; Caspary, Tamara

Presenter/s: Claire Wei

Emory Faculty Mentor: Tamara Caspary

Astrocytes are the largest glial population in the brain, and their functions include regulating neuron homeostasis and synapses. Despite growing research about astrocytes over the past decade, the topic of astrocyte development remains relatively unexplored. Similar to neurons, astrocytes extend a primary cilium from near the soma. Primary cilia are singular projections critical to multiple signaling processes during development. Abnormal cilia development in cells have been linked to ciliopathies, or diseases caused by cilia, yet little is known about primary cilia in astrocyte development. This project aims to understand the heterogeneity of cilia in the astrocyte lineage in the developing brain. To investigate astrocyte cilia, I used a genetic mouse model and immunofluorescent staining to visualize the expression of specific ciliary proteins in astrocyte primary cilia in vivo. I will quantify the number of astrocytes expressing ARL13B and AC3, two cilia-specific markers, at different timepoints to determine changes in astrocyte cilia during development. I hypothesize that the heterogeneity of astrocyte primary cilia will be different at distinct stages of astrocyte development. My results will show whether the expression of ciliary proteins in astrocytes changes during development. Variations in the frequency of astrocyte primary cilia that express specific primary ciliary proteins would suggest diverse functionality of astrocyte cilia throughout development. Understanding the heterogeneity of cilia in developing astrocytes will lay the foundation for future research examining the function of primary cilia in astrocyte development.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - C
Poster Number (if applicable): 13
Presentation Time: 10:00 AM to 10:50 AM

Computational modelling of MKK3-MYC complex

West, Sophia; Du, Yuhong; Fu, Haian; Ivanov, Andrey

Presenter/s: Sophia West

Emory Faculty Mentor: Andrey Ivanov

Transcription factor MYC is a major oncogene that is frequently upregulated in more than 50% of human cancers. MYC inhibition is an important target for cancer treatment, however, targeting MYC for therapeutic discovery is a challenge. Mitogen-activated protein kinase kinase 3 (MKK3) has been discovered in our lab as a new binding partner and activator of MYC in cancer cells. Thus, inhibition of MKK3-MYC protein-protein interaction (PPI) may provide a new avenue to control MYC oncogenic program. In this study, we leverage the methods of computational chemistry to determine the structural basis of the MKK3-MYC complex and facilitate the discovery of potent MKK3-MYC PPI inhibitors. The crystal structures of the MKK3-MYC complex or MKK3 alone are not available. To build a model of the MKK3-MYC complex, I evaluated the different computational modeling methods. The AlphaFold is a new artificial intelligence technology that can accurately predict protein structures. By comparing AlphaFold with the traditional homology modeling method, I found that the AlphaFold provides a more accurate and complete MKK3 model. However, the quality of the MYC AlphaFold model was limited due to the large percentage of disordered regions. Previously we showed that the MYC Helix-Loop-Helix (HLH) domain is responsible for MKK3 binding. Therefore, I used the available crystal structure of MYC HLH domain to build the MKK3-MYC model. The resulting MKK3-MYC model obtained with the protein-protein docking was consistent with available experimental data. Recently, our lab reported the discovery of the first MKK3-MYC PPI inhibitor, SGI-1027. The analysis of the MKK3-MYC PPI interface surface combined with computational docking revealed that SGI-1027 can favorably bind to MKK3 and may directly interfere with MKK3-MYC interaction. These findings provided new critical insights into the structural organization of MKK3-MYC PPI and enabled large-scale virtual screening to computationally discover new MKK3-MYC PPI inhibitors

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - E
Poster Number (if applicable): 12
Presentation Time: 1:00 PM to 1:50 PM

Tracking and analyzing population dynamics of Gentamicin treated E. Coli at the single cell scale in order to visualize growth and death kinetics

Wildman, Vanessa; Akiyama, Tatsuya; Kim, Minsu

Presenter/s: Vanessa Wildman

Emory Faculty Mentor: Minsu Kim

N/A

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 18
Presentation Time: 4:00 PM to 4:50 PM

Examining the Effectiveness of Social Media on Recruitment Strategies for Psychological Research

Yadav, Priya; Ramos Nasser, Catalina; Miller, Katherine; Palmer, Rohan PhD

Presenter/s: Priya Yada

Emory Faculty Mentor: Rohan Palmer

N/A

Research Discipline: Social Sciences
Presentation: Poster Presentation - E
Poster Number (if applicable): 13
Presentation Time: 1:00 PM to 1:50 PM

The role of language dominance and the orthographic effect in loanword phonology: Korean American heritage bilinguals' adaptation of the unstressed English schwa

Yoon, Hye Min;

Presenter/s: Hye Min Yoon

Emory Faculty Mentor: Yun Kim

Orthography has been found to be a factor that plays a role in adapting loanwords from a source language into a native language. This notion is supported by the Perceptual Uniformity Hypothesis, which predicts that the orthography of the source language can affect the loan mappings onto the native language when there is phonetic ambiguity in perception (Oh & Daland, 2018). An example to support this hypothesis is the adaptation of English unstressed vowels from English into Korean, notably the English sch136w136a136 136i136n136 136t136h136e136 136u136n136s136t136r136e136s136s136e136d136 136s136y136l136l136a136b136l136e136 136p136o136s136i136t136i136o136n136 136(136O136h136 136&136 136D136a136l136a136n136d136,136 136213601361136813 6)136.136 136A136l136t136h136o136u136g136h136 136t136h136i136s136 136e136f136f136e136c136t136 136o136f136 136o136r136t136h136o136g136r136a136p136h136y136 136c136a136n136 136b136e136 136f136o136u136n136d136 136i136n136 136t136h136e136 136p136r136e136v136i136o136u136s136 136l136i136t136e136r136a136t136u136r136e136,136 136a136 136g136r136e136a136t136 136d136e136a136l136 136o136f136 136t136h136e136 136r136e136s136e136a136r136c136h136 136d136o136n136e136 136i136n136 136l136o136a136n136w136o136r136d136 136p136h136o136n136o136l136o136g136y136 136h136a136s136 136b136e136e136n136 136w136i136t136h136 136m136o136n136o136l136i136n136g136u136a136l136 136p136o136p136u136l136a136t136i136o136n136s136.136 136A136 136r136e136s136e136a136r136c136h136 136g136a136p136 136t136h136a136t136 136s136t136i136l136l136 136r136e136m136a136i136n136s136 136i136s136 136w136h136e136t136h136e136r136 136t136h136i136s136 136s136a136m136e136 136e136f136f136e136c136t136 136w136o136u136l136d136 136b136e136 136s136e136e136n136 136i136n136 136h136e136r136i136t136a136g136e136 136b136i136l136i136n136g136u136a136l136s136 136w136h136o136 136a136r136e136 136m136o136r136e136 136e136x136p136e136r136i136e136n136c136e136d136 136a136n136d136 136d136o136m136i136n136a136n136t136 136i136n136 136t136h136e136 136s136o136u136r136c136e136 136l136a136n136g136u136a136g136e136.136 136I136n136 136o136r136d136e136r136 136t136o136 136e136x136p136l136o136r136e136 136w136h136e136t136h136e136r136 136h136e136r136i136t136a136g136e136

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Research Discipline: Humanities
Presentation: Oral Presentation - E
Poster Number (if applicable):
Presentation Time: 2:00 PM to 3:30 PM

The Immediate Effects of Abdominal Breath-Control on Phonological Working Memory Performance and L2 Word Learning

Yoon, Hye Min;

Presenter/s: Hye Min Yoon

Emory Faculty Mentor: Yun Kim

Working memory (WM) refers to a short-term ability to store and manipulate information that can be utilized for various cognitive tasks and has been found to be a strong predictor of second language (L2) vocabulary learning (Baddeley, 2003; Juffs & Harrington, 2011; Rice & Tokowicz, 2020). A method that could aid learners' WM performance in learning foreign language vocabulary is deep breathing, which consists of slowing down one's breath while focusing on abdominal movement during respiration and has been been associated with improved cognitive functioning on WM tasks (Nirmalasari, 2020; Kim et al., 2013; Laborde et al., 2021). However, there have been no studies connecting deep breathing with word learning. Thus, this study aimed to analyze the impact of breath-control on L2 word learning in Lithuanian starting with 40 L1 English-speaking monolinguals. All participants completed a backwards digit span task, and then half were randomly placed into the control group in which they watched a video from NASA about findings in space, while the other half were assigned to the experimental group that engaged in 17 minutes of slow breathing exercises following familiarization (Laborde et al., 2021). Then, all participants proceeded onto the word learning task before completing a vocabulary quiz (Kemp & McDonald, 2021). The findings show that the breathing group had significantly higher scores on the working memory task compared to the control, while the groups had no difference in L2 word learning accuracy, potentially due to the cognitive effects of slow breathing wearing off b[illegible]

Research Discipline: Social Sciences
Presentation: Oral Presentation - E
Poster Number (if applicable):

Presentation Time: 2:00 PM to 3:30 PM

Dynamic social investigation motivation at different cohabitation phases of male monogamous prairie voles and its application to investigating neurotransmitter modulation of social behaviors

Zha, Jenny; Zhu, Hong

Presenter/s: Jenny Zha

Emory Faculty Mentor: Hong Zhu

The prairie vole (Microtus ochrogaster) forms life-long bonds with its partner in the wild and thus is an ideal animal model of social behaviors. After cohabitation as short as 6-48 hours, both male and female prairie voles show strong preference to and huddle with their partners in the partner preference test and also display aggressive mate-guarding behaviors to stranger animals. In this project, we carried out a series of partner preference tests on male prairie voles at a sequence of cohabitation periods in which the male voles can choose to interact with either the partners or the non-partner female voles through gates. With behavioral annotation software, we can investigate whether the length of cohabitation correlates with social investigation preference and whether removal from cohabitation induces a rebound preference for the same partner. In partner preference test recordings, we expect to see changes in social investigations with the partner animal with the progression of longer total cohabitation time, attributed to strengthening of the pair bond. During partner preference tests and cohabitation periods, we can also use fiber photometry to monitor brain activity. By recording neurotransmitter release in freely-moving male prairie voles, we can couple signal increases with annotations of prairie vole behaviors and examine whether the motivation to interact with the partner animal and salience of the partner are influenced by cohabitation. Attributing social investigation behaviors to changes in neurotransmitter levels can provide evidence for neurotransmitter modulation of social information processing and neural systems involved in long-term pair bond formation for monogamous species.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - H
Poster Number (if applicable): 19
Presentation Time: 4:00 PM to 4:50 PM

Effect of Resource Pulse on Freshwater Snail Population and Schistosome Parasites

Zhang, Megan; Bradley, Lynda; Civitello, David

Presenter/s: Megan Zhang

Emory Faculty Mentor: Lynda Bradley

Nutrient pollution caused by fertilizer run-off or sewage overflow can lead to resource pulses that alter algae growth or organic material accumulation. Understanding how these fluctuations in environment affect aquatic systems is critical for basic ecological understanding and effective disease and ecological management. Agricultural runoff and nutrient pollution have been suggested to increase the number of freshwater snail hosts and schistosome parasites within them, which is a species of parasitic flatworms. One form of schistosome disease is the Neglected Tropical Disease schistosomiasis, caused by cercariae (the human-infectious life stage) produced by freshwater snails. By controlling the timing of a simulated resource pulse and measuring the corresponding snail sizes and number of cercariae they contain, the goal of the experiment is to identify whether pulse seasonal timing has an influence on the effect of both snail population ecology and schistosome transmission. Based on computer model simulations, we believe that pulses in the middle of the season will increase snail abundance and parasites more than other times. Results will be presented at the SIRE symposium.

Research Discipline: Public Health
Presentation: Poster Presentation - A
Poster Number (if applicable): 29
Presentation Time: 8:00 AM to 8:50 AM

The Mapping of English [s] in Loanwords to Korean under the Influence of Source Word Stress Patterns

Zhang, Xinyi; Oh, Mira; Kim, Y.J

Presenter/s: Xinyi Zhang

Emory Faculty Mentor: Yun Kim

With the increase of intercultural contract, loanwords emerge to be borrowed from a donor language to another. English, as a major lingua-franca of the world, contributes to the formation of a variety of loanwords in other languages. There is only one voiceless alveolar fricative /s/ in English. However, Korean has a two-way distinction for this consonant: lenis /s/ (ㅅ) and fortis /s*/ (ㅆ). This non-correspondance creates challenges for the precise mapping of sounds from English loanwords into Korean. Kim and Curtis(2000) present a possible mapping process of English /s/ to Korean. The singleton [s] in English is commonly adapted as the fortis /s*/ while the [s] in s+consonant ([sC]) cluster are likely to be adapted as lenis /s/. The paper compares the appearance of [s] and [sC] at different syllabi[illegible]Exosomes, which are extracellular vesicles secreted by cells, deliver specific biological molecules, such as DNA, lipids, and proteins to other cells or molecules. The innate immune system is engaged when tumor cells are exposed to therapeutic rad

Research Discipline: Social Sciences
Presentation: Oral Presentation - F
Poster Number (if applicable):
Presentation Time: 3:30 PM to 5:00 PM

How Brain Activity Transforms to Shape Skilled Behavior During Learning

Zhu, Daphne; Pascual, Leila May; Sober, Samuel

Presenter/s: Daphne Zhu

Emory Faculty Mentor: Samuel Sober

We utilize complex motor patterns in our everyday lives without realizing it. Seemingly mundane activities, such as threading a needle or fastening clothing, are highly trained motor functions that our nervous systems learn to carry out impeccably. Previous studies have provided significant insight into the anatomical, genetic, and molecular-level changes that occur in the brain during motor learning. However, a poorly understood aspect of skilled motor learning is how the brain's activity changes during development to allow animals to execute highly skilled behaviors. Therefore, the goal of our research is to understand how precise patterns of neural activity are transformed when the brain learns skilled behavior. We use the Bengalese finch song system to study how neural activity enables the acquisition of skilled song behavior. Birdsong is analogous to human speech - both are highly skilled behaviors that are learned through practice. Birdsong is learned during development as male juvenile birds imitate an adult tutor's song. Neurons in RA, the arcopallium of the songbird brain, control the output of vocal muscles and thus likely play a role in song development. Our research seeks to understand whether and how RA neurons change their control of vocal behavior during song learning. While previous work on motor control has explored the impact of slow, hundred-millisecond scale variations in motor activity on motor actions, our lab has found that variations in neural patterns, as precise as 1-millisecond scale variations, matter for skilled motor output. Our central hypothesis is that millisecond-precise patterns in the brain are a crucial component of motor skill level that is acquired through practice. To test this, we record the activity of RA neurons over the course of song learning. Our preliminary results show gross differences in neural patterning statistics between juvenile, unlearned and adult, learned songs. This suggests that neural control of behavior changes over the course of skill acquisition.

Research Discipline: Biomedical Sciences
Presentation: Poster Presentation - B
Poster Number (if applicable): 19
Presentation Time: 9:00 AM to 9:50 AM