

## Poster Session 1

### Architecture

#### 1. Kaitlyn Boniecki

##### **Designing for dystopia: The dynamics of living and working in a future industrial city**

Work has always been closely tied to the social and formal conditions that influence the built environment. Industrial sites greatly influenced not only the physical environment in which they stood, but also the political and cultural livelihood of workers. As these goliaths of American industrial prowess fell into decline, moving either outside city limits or overseas, so too did the areas surrounding them. Faced with new and dramatic circumstances, the spatial, economical, and cultural conditions shifted in retaliation. A new system that banked on technological rebirth soon took form, drastically changing the way people interact with one another and with the built environment. This report seeks to first understand the current and past societal conditions that inform the built environment in order to speculate on the potential living and working conditions in a future industrial city. A major influencing factor of this research project is science-fiction, which seeks to not only understand our immediate world and activities, but also inform us of the possibilities if things are left unchecked. Through this project, a speculative (and playful) look at the societal and physical structures of the future will take shape, revealing a rather wide range of scenarios that may be realized.

#### 2. TyJuan Swanson-Sawyer

##### **Deconstructing structural racism: Establishing an anti-racist urbanism**

The history of the United States is replete with atrocious human rights violations and denial of civil liberties. Focusing on how these faults affected the planning of cities and the people of color that inhabit them. The lack of opportunity, disinvestment, and property ownership will be the main focuses for the thesis. Much of the degradation in these communities were not caused by its residents, but the racist system that have denied them vital resources because of their race. Urban design can be utilized as a tool for reparations to create a framework that can be magnified in multiple scales and locations. Looking into the future of work, community stakeholders, and investment may be the key to healing, restructuring, and the empowerment of communities of color.

#### 3. Alyssa Skilton

##### **Communicating conservation agendas in vegetative roof implementation**

Conservation of native plant communities in urban environments presents challenges that require unique approaches. Vegetative roofs create green spaces that provide ecosystem services in cities, where they might otherwise not exist. Yet confusion exists regarding the methods of communication for living architecture conservation efforts, as well as native and rare plant use on vegetative roofs. With the multiple services to accommodate for, vegetative roof design greatly varies and could have conflicting conservation goals creating tradeoffs in ecosystem services. Recent findings show many native plants, and even rare species such as the *Oligoneuron album* germinate successfully in harsh conditions present on vegetative roofs. Utilizing native plants on vegetative roofs provides opportunities for native plant recovery and additional ecosystem services. To better enable conservation roof design goals, we seek to answer two questions: 1) Can we improve our way of communicating the conservation benefits of vegetative roofs? and 2) Can sedum roofs be overseeded with native and rare species to contribute to native biodiversity? To investigate these, two field sites are utilized in Cleveland, Ohio, CIIC site and

Cleveland Lakefront Biodiversity Roof examining germination rates. Proceeding with these studies will require the innovative application of ecosystem service tradeoff and conservation biology concepts.

#### **4. Haley DeRose**

##### **Coconut coir as a vertical textile in soilless growth systems**

Coconut coir is an inert fibrous material found between the hard, internal shell and the outer coat of a coconut and is considered a waste-product of the coconut oil industry. Because of the global demand for sustainable, renewable, and reusable products, coconut coir has risen as a natural alternative in many markets. With its high water absorption, lignin content, density, bending capacity, and neutral pH, coconut coir has become an ideal alternative for soilless growing media. Soilless growth systems have increased the accessibility and affordability of food with use of less space, energy, and water. This study investigates the use of coconut coir as a sustainable soilless media for vertical growth systems. Samples were created using two textile creation techniques, knit and weave. Experiments were conducted to create and test the viability of a coconut coir media textile to support the germination of curly cress microgreens on a lightweight deployable structure.

Keywords: coconut coir, media textile, deployable structure, microgreens

#### **5. Chad Boston**

##### **Developing a Localized Food Infrastructure for Defiance, OH**

The current food structure in the United States relies on monocultures and produces significant runoff which pollutes our water bodies. The existing american agricultural system is especially vulnerable to climate change due to its reliance on predictable weather conditions for irrigation. This means the existing system might not be plausible for the future. This proposal seeks to develop a localized food system to investigate if it is possible to grow food locally and still receive all daily nutritional requirements. Defiance, OH will act as a proof of concept to install a food infrastructure to address economic, ecological, equitable and educational issues concerning food supply, distribution, and waste by developing a designed kit of parts to produce a local and self reliant food system encouraging local food security.

#### **6. Nina Anani-Manyo**

##### **Computer Vision and Building Envelope**

Computer vision, a field which falls under artificial intelligence (AI) is increasingly establishing grounds in many disciplines as the demand for automated means to solve real world problems gradually grows. Discoveries about computer vision and the complexity of replicating and automating the human visual system encourages an even deeper research, and the programming of algorithms as a result has done a lot to improve and recognize the machine's ability. Architecture is a discipline that has been moving very closely towards the use of computers as investigation and problem-solving tools, and this begins to kindle ideas of how architecture and computer vision can work together to create newer approaches and techniques within the field. Hence, this study discusses the explorations of using computer vision as a tool to classify building materials, evaluate the details and potentially identify distresses of building envelopes using a collection of existing digital images and algorithms that help train the computer to produce efficient and reliable results.

## Poster Session 2

### Ecology and Evolutionary Biology

#### 7. Katherine Manning

##### Trapping method impact on insect catch

The assumptions and decisions you make in a study, including how you sample a community, impacts the results you find. In 2019 we conducted an insect sampling experiment in the Great Lakes Region to examine the insect community on natural thin-soil environments and green roofs, which are structurally analogous. These thin soils required us to alter our ground insect trapping method to use a trap that is on the ground's surface rather than in the ground, as is done traditionally. After identifying the insects caught, we are now questioning the effectiveness of the trap we chose (yellow ramp trap) for passive ground trapping in thin-soil environments. In the summer of 2020 on three grassy sites at Kent State University, without thin soils, we used three ground trapping methods: traditional pitfalls, yellow ramp traps, and a newly designed jar ramp trap. Over 13,600 specimens were caught over seven sampling periods. By comparing what we caught in each of these three ground traps, as well as to a flying insect trap (sticky card), we can determine if we can effectively sample ground insects in thin-soil environments with the new design.

#### 8. Harlee Rush

##### The pitfalls of pitfall trapping: a comparison of classical insect collection and novel camera trapping techniques in the Cuyahoga Valley National Park

Restoration of sites impacted by human activity is a key element of building a more sustainable world, but restoration also provides ideal testing grounds for gaining new understanding into ecological processes. Biodiversity responses to restoration efforts can be variable in time and magnitude, and they can be tricky/expensive to monitor. The Forest Soils and Trees Ecosystem Restoration project is a research initiative led by scientists at Kent State working alongside the Cuyahoga Valley National Park to collect data such as biodiversity. Restoration takes a long time, so it poses many questions on how one can sustainably monitor its processes. My project will focus on how we can measure biodiversity responses to restoration in a sustainable way. Pitfall and light traps are classic methods of measuring biodiversity, but there is a high lethality and invasivity of these methods. Alternatively, we propose a less lethal/easier approach with the use of technology such as cameras to collect information on insect biodiversity. The monitoring will focus on beetle communities as they often act as bioindicators in many habitats and are indicative of a site's ecosystem functioning. We will compare the efficacy of the technological methods to the classic methods such as pitfall traps.

#### 9. Christian Bullion

##### Using crowdsourced data to analyze patterns in odonate phenology

In a changing world, it is essential to understand how species ranges and phenologies are altered to plan for future conservation efforts. Odonates (dragonflies and damselflies) have become popular study organisms for such insect-based climate studies, partly because of an extensive link between their life history and their environment, and partly because their charismatic nature has resulted in a large hobbyist following. While formal scientific records of this taxa may be limited, hobbyist participation offers unprecedented coverage over time and space, making dynamic monitoring more feasible. While citizen

science databases, like iNaturalist, can be quite extensive, concerns regarding the accuracy and thoroughness of these public endeavors have arisen. Certain anomalies in the public data, most noticeably a large data gap centered around the central Appalachians, imply that public datasets may be misrepresentative of the “true” presence in that area. To test the accuracy and representativeness of these citizen endeavors, we did extensive ground-truthing across four states in the 2019 summer season. Our results found that citizen records were largely consistent with Odonate patterns recorded in citizen science databases, suggesting these databases were indeed capturing real biological questions, and raising further questions about the observed data gaps.

## **10. William Haas**

### **Differences in Phenotypic Characteristics: Comparing the growth rate among sub-populations of Eastern Red Cedar (*Juniperus virginiana*) to different growth treatments**

Plants that have an extensive geographical range can slowly create different sub-populations that are more isolated from other individuals within the same species. This can lead to extended periods of isolation and potentially develop local adaptations within these sub-populations from the constant exposure to different environmental parameters. Eastern Red Cedar is one of the most extensive conifers in the eastern portion of North America and its vast range has the potential to isolate individuals from one another. My goal was to see if different Eastern Red Cedar sub-population saplings would display differences in key phenotypic characteristics such as height, diameter, crown size. Also, I am interested to see if the exposure to brome grass would affect the characteristic as well. The results of the show significant differences in height, diameter, and crown size among the sub-populations of Eastern Red Cedar and the growth rate of saplings within brome grass. These results indicate that even within the same environmental parameters, the Eastern Red Cedar sub-population saplings have been isolated for enough time to slowly show significant difference in phenotypical traits.

## **11. Hannah Hartman**

### **Range expansion and population genetic structure of *Juniperus virginiana* (Cupressaceae) at Lakeside Daisy Nature Preserve**

The eastern red cedar (*Juniperus virginiana*) is a coniferous tree that is native to the eastern and central United States. It is an aggressive grower and is currently expanding its natural range into open areas like prairies, dunes, and grasslands affecting the native flora that inhabit them. One affected community is the prairie at the Lakeside Daisy Nature Preserve (LDNP) in Marblehead, Ohio. This preserve was designated to help preserve the federally threatened plant, lakeside daisy (*Tetraneuris herbacea*), but is now also home to an encroaching population of eastern red cedar (ERC). A few ERC were present in the preserve in the 1990s, and now, thirty years later, ERC have grown in number and are the most abundant woody plant in the preserve. In this study, I investigate whether ERC’s encroachment into LDNP is driven by seeds produced by the founder trees or by seeds from neighboring populations using microsatellite markers. Additionally, we will group trees according to their age to determine if the genetic diversity has changed over time and by their location to observe genetic diversity across different areas of the preserve.

## **12. Kaitlin Shvach**

### **Plant phenology, seed dispersal, and eastern red cedar range expansion: it's all about timing!**

Eastern red cedar (*Juniperus virginiana*; ERC) is native to eastern North America, but is expanding into grassland and prairie ecosystems of the midwestern United States. ERC produces small light-green cones during spring that mature over the next 6-8 months. As cones mature, they increase in size and become deep-purple, indicating changes in seed viability and nutrient content. Ultimately, these changes act as a visual signal to attract foraging birds and mammals, driving ERC range expansion through seed dispersal (in feces) in late-fall and winter when other food sources are scarce. After fecal deposition, these seeds likely germinate, allowing colonization of new sites. Thus, successful seed dispersal depends upon temporal overlap between foraging and the presence of viable seeds. Foragers differ in when they are present and feeding in an area, with resident birds and mammals present year-round, nomadic foragers occasionally present as they track food availability, and migratory species present only during spring/fall migrations. To understand these interactions, I characterized ERC cone phenology and seed availability/viability monthly while also documenting foraging pressure by birds and mammals using wildlife cameras/microphones. Ultimately, I seek to define the relationship between plant phenology and animal-mediated seed dispersal to understand ERC range expansion.

## **Poster Session 3**

### **Environmental Sciences : Geology, Geography and evolutionary biology**

#### **13. Lama Tawk**

#### **Landscape Architecture: Mapping landscape architecture ordinances to measure the impact of environmental policies**

This project will collect and review landscape ordinances across American cities. Ecological theory will be integrated into the analysis of the landscape ordinances to highlight their benefits towards biodiversity conservation and ecosystem services provisioning. Using a meta-analysis approach, we will statistically compare research indicators extracted from the local landscape ordinances of a representative sample of cities from at least 5 cities from all 50 states. The database will consist of an online open-source map-based compilation of landscape ordinances while being a source of best practices for professionals.

#### **14. Marie Stofan**

#### **Monitoring freshwater salinization in an urban watershed**

Salt pollution from road deicers and building material weathering change the major ion composition and increase salinity of fresh waters. These alterations are pronounced in urban watersheds due to drainage of impervious surfaces. Wetlands in urban areas receive pulses of high salt concentrations and may retain dissolved salts, reaching toxic levels for aquatic biota and possibly altering biogeochemical processes. To characterize freshwater salinization in an urban wetland, we monitored water quality in a mitigation wetland complex and an adjacent first order stream at the Cleveland Metroparks Watershed Stewardship Center in Parma, Ohio. We collected high temporal resolution (5 min) specific conductance data from July

2018 to November 2019. Specific conductance remained elevated above typical freshwater levels throughout most of the monitoring period, and mean specific conductance was higher in the wetland complex as compared to the stream. Water depth and precipitation data reveal specific conductance was affected by hydrologic events. Observations of high specific conductance ( $>2,000 \text{ }\mu\text{S/cm}$ ) corresponded with periods of low water depth in the summer and early fall seasons, suggesting evaporative concentration of salt ions.

## **15. Rebekah Jones**

### **Boosting tree survivorship: Reclaiming mined land in Northeast Ohio**

The Forest Soil Tree Ecological Restoration (FoSTER) Project at Cuyahoga Valley National Park in Northeast Ohio seeks to reclaim degraded mine land and restore it to a more natural and ecologically sound habitat. Removal of vegetation and soil, compaction of the soil, herbivory, and invasive species are the main factors preventing a new forest from growing decades after human activity has ceased. Planted trees from previous restoration efforts largely did not survive in the compact soil. In 2017 and 2018, two sites were deep ripped to loosen the soil. Native tree saplings were planted in 2018 and 2019 and height measurements and survivorship data were collected after planting and in the summer of 2020. While growth and survivorship varied between the 16 different tree species, overall there was a vast improvement in survivorship over previous attempts at tree establishment.

## **16. Andrew Blinn**

### **Long-term monitoring of urban streams identifies stormflow disturbance thresholds and recovery intervals of ecosystem function.**

Stormwater control measures (SCMs) placed within urban drainage networks are designed to decrease peak flow in streams following storm events. Flooding of streams is hazardous to humans as well as aquatic biota that carry out important ecosystem functions like photosynthesis. While the effectiveness of SCMs are understood at a local scale, it is uncertain how their cumulative effect alters hydrologic conditions at the watershed scale. It is at this scale that important stream ecosystem functions are observed to decline when exposed to peak flows amplified by urbanization. High-frequency sensors were deployed in three urban streams within the Cleveland area to model ecosystem function in response to hydrologic disturbance. One year of monitoring within the Cuyahoga River network identified peak flow values which ecosystem function Gross Primary Production (GPP) is resistant to. These values represent a biologically relevant threshold of discharge values which can be used by stormwater management to gauge mitigation efforts. In addition, the interval of time from the disturbance event to when GPP recovered was recorded for each event. Recovery intervals were more variable at high peak flow values, reflecting the complex environmental and biotic factors that influence the resilience of urban stream ecosystems.

## **17. Zia Ul Hassan**

### **Impact of climate change on the flow regime of a Cleveland, Ohio, urban stream**

Continuous changes in precipitation patterns and rising air temperatures due to climate change are expected to have a significant impact on both high and low streamflows. In urban streams, these climate-induced changes potentially further exacerbate the challenges of stormwater management and urban flooding. We evaluate the impact of projected 21st century climate change on the flow regime of a 20.6 km<sup>2</sup>, 30.3% impervious urban watershed near Cleveland, Ohio, using a calibrated hydrological model (PCSWMM). 1-hour historical (1976-2000) and future climatic (2021-2095, RCP 8.5) precipitation and temperature outputs of four regional climate models (RCMs) were obtained from NA-CORDEX, bias-corrected to historical observed data using quantile mapping, and disaggregated to 5-minute temporal resolution for precipitation. RCMs show an increase in both temperature and precipitation over the 21st century for Cleveland. Intensity-duration-frequency analysis also indicates increasingly heavy precipitation amounts, without any increase in prolonged dry periods. As a result, discharge increases along the whole flow duration curve for West Creek, though flow variability does not increase. Despite changing precipitation patterns, streamflow variability indices (coefficient of variation, flashiness index, and time above mean flow) are fairly stable across historical and future climates. The increase of future rainfall intensity for the 1-hr and 24-hr rainfall duration and different return periods will decrease the performance of existing green infrastructure, exacerbating flooding in the West Creek catchment. Maintaining the historical flow regime through the 21st century will require substantially more green infrastructure designed for the larger storms of the future.

## **Poster Session 4**

### **Neurosciences**

#### **18. Sarah Sternbach**

#### **The BHMT “betaine methylation pathway epigenetically regulates oligodendrocyte differentiation**

Multiple sclerosis (MS) is characterized by neurological dysfunction and demyelination of the central nervous system. Further, oligodendrocytes are killed off and myelin production is halted, with progenitor cells (OPCs) unable to differentiate. We have previously shown that there is a depletion of methyl donors in MS, and that activation of the betaine homocysteine methyltransferase (BHMT) “betaine pathway restores methylation and neurological deficits in the cuprizone and EAE models of MS. We have also found that betaine regulates histone and DNA methyltransferase activity and in neurons and oligodendrocytes. In the present study, we are investigating the role of BHMT in oligodendrocytes, hypothesizing that through betaine supplementation, the BHMT “betaine pathway locally contributes to SAM synthesis for methylation of DNA and histones in OPCs. We found that betaine enhances DNMT activity, and that BHMT is required for betaine to have an effect, suggesting a role for the BHMT “betaine methylation pathway in epigenetic regulation. We observed morphological changes in primary OPCs under oxidative conditions and betaine treatment. QRT-PCR was performed to determine the effects of oxidative stress and betaine on various OPC differentiation regulators and we found that betaine enhances OPC differentiation marks. These data suggest that changes in methionine metabolism in MS may be linked to defects in

oligodendroglial gene expression. Thus, activation of the BHMT-betaine pathway may provide epigenetic control required for oligodendrocyte differentiation.

## **19. Kate Hardy**

### **Early-life stress alters vocalization preference in gerbils**

The mechanisms triggered by early-life stress (ELS) are broad and include alterations in critical period regulatory elements. Despite increased plasticity of the auditory system during critical periods, it is unknown whether ELS affects simple sensory perception. Further, children from low socio-economic status environments (a proxy for ELS) have increased risk for impaired speech perception and altered neural responses to speech envelopes. Recent studies from our laboratory indicate that ELS impairs auditory perception of temporal features, such as those expressed in gerbil vocalizations. Here we tested whether ELS affects gerbil approach and avoidance responses to conspecific vocalizations. To induce ELS, Mongolian gerbil pups were maternally separated and restrained during the critical period for auditory cortex maturation. These animals and an age-matched Control group were tested as juveniles (P30-P36) in a Y-shaped maze, which provides an opportunity to approach or withdraw from a sound source at the end of each arm. The sound stimuli were exemplars from either greeting or alarm calls. Our results indicate that ELS influences behavioral responses to ethologically relevant sounds. These data are among the first to demonstrate auditory dysfunction emerging from early-life stress, and will contribute to understanding how ELS in children impacts scholastic performance.

## **20. Timothy D Niepokny**

### **Components of the endocannabinoid system within the mouse suprachiasmatic nucleus**

The endocannabinoid and circadian systems regulate a variety of physiological and behavioral processes in mammals; however, there is relatively little known about the interplay between the two. Some components of the endocannabinoid system are under rhythmic control in parts of the brain and body. Receptors and enzymes for endocannabinoid synthesis and degradation have recently been elucidated in the rat suprachiasmatic nucleus (SCN), and a preliminary study of our own confirms the presence of many of the same components in the mouse SCN. Some of these components are rhythmic in the rat SCN, and we hypothesize that they are also rhythmic in the mouse SCN. Furthermore, both systemic and intracerebroventricular injections of Cannabinoid Receptor 1 (CB1) agonists inhibit light induced phase shifts in circadian wheel-running behavior. Genetic ablation of the CB1 receptor reveals altered circadian phenotypes with enhanced responses to light and an altered free-running period. A recent study suggests that Cannabidiol (CBD), a major non-psychoactive component of marijuana, affects circadian clock genes. We therefore hypothesize that systemic injections of CBD in mice will alter the circadian clocks response to light. Experiments in progress include using laser capture microscopy and quantitative real-time PCR to assess endocannabinoid gene expression around the 24-hour cycle in mouse SCN, and to investigate acute systemic injections of CBD on circadian behavioral activity. These data will help establish the role of the endocannabinoid system in the SCN and if CBD affects circadian behavioral rhythmicity.

## **21. Zackery Knauss**

### **Tempol Co-Treatment Selectively Reverses Fentanyl-Induced Changes in Intrinsic Cellular Activity and Signaling in the Prefrontal Cortex**

Introduction: Accounting for 46,802 deaths in 2018, the opioid epidemic has reached exponential proportions with the primary cause being opioid-induced respiratory depression (OIRD). Opioids alter

neuronal excitability states through changes in Ca<sup>2+</sup> signaling dynamics altering cellular function. Tempol is a potent antioxidant that prevents OIRD and cocaine-associated oxidative damage in the prefrontal cortex (PFC).

Objective: To examine the effect of tempol on fentanyl-induced cell-type-specific alterations in intrinsic Ca<sup>2+</sup> activity.

Methods: PFC neurons isolated from rat pups, were cultured over 12-days. The cellular activity was assessed through live-cell fluorescent imaging under continuous perfusion during 1) control, 2) fentanyl pre-treatment, 3) fentanyl and tempol co-treatment, 4) tempol washout, and 5) fentanyl and tempol washout.

Results: Tempol co-administration selectively reversed fentanyl-induced inhibition of intrinsic Ca<sup>2+</sup> activity within a subpopulation of fentanyl-affected cells. Importantly, this effect was not reversed by tempol washout and tempol alone induced no change from control.

Conclusions: These data provide evidence that Tempol selectively targets a subset of fentanyl-affected cells in the PFC which may contribute to many of the non-analgesic side effects associated with opioid use. Thus, the metabolism of reactive species may represent a key molecular target(s) for the development of novel therapies in the treatment of OIRD and drug-addiction.

## 22. Isha Mhatre-Winters

### **The Effects of Sex, Age and Genotype on Neuroinflammation in Humanized Targeted Replacement APOE Mice: Relevance to Alzheimer's Disease**

Neuroinflammation is implicated in the progression and pathology of Alzheimer's disease (AD). Advancing age, female sex, and presence of the APOE4 genotype have been shown to contribute to the increased risk of AD. We first sought to investigate the effects of an inflammatory stimulus invitro. Our findings indicate that E4 primary microglia (PMG) produced a 65% increase in media nitrite levels than the E3 genotype. Additionally, a 25% increase was observed in E4 females compared to males. Primary astrocytes from E4 females produced 50% more media nitrite compared to E3 females. Furthermore, humanized targeted replacement E3 and E4 mice (3 and 16 months) were injected with LPS and sacrificed 4h later. LPS induced a higher expression of proinflammatory cytokines in the hippocampus of young and aged E4 mice compared to E3. IL1b gene expression increased by ~30-fold and ~40-fold in aged E4 males and females, respectively. In contrast, IL1b increased ~15-fold in aged E3 mice. In the young cohort, gene expression in E4 mice increased by 2-fold compared to E3. These data indicate an increase in proinflammatory cytokine expression in older E4 female mice and provide insight into the role of age, sex, and genotype in the susceptibility to neuroinflammation.

## Poster Session 5

### **Biomedical Sciences**

#### 23. Nicole Schapker

### **Effects of compliant substrates on gait kinematics in squirrel monkeys (*Saimiri boliviensis*)**

Wild arboreal primates must maintain stability on substrates that vary in size and compliance. Here, we mimic wild conditions in the laboratory to evaluate kinematic changes in the gait of squirrel monkeys (*Saimiri boliviensis*) due to substrate compliance. Using high speed cameras, we filmed the strides of two

juvenile monkeys as they walked across poles of varying diameter (5cm, 2.5cm, 1.25cm). Poles were mounted on either a wooden base (‘‘stable’’ condition) or foam blocks (‘‘compliant’’ condition). We scored footfall timings and digitized approximate center of mass displacement to calculate kinematic variables (N = 154 strides). We predicted that on compliant supports monkeys would walk more slowly and ‘‘controlling for speed’’ increase stride lengths and duty factors while decreasing stride frequencies. As expected, monkeys increased stride length on all compliant pole diameters ( $p \approx 0.003$ ), and stride frequency was significantly decreased on most compliant poles ( $p < 0.001$ ). Unexpectedly, monkeys were fastest on the two widest compliant poles ( $p \approx 0.035$ ) but otherwise did not significantly adjust speed. Also, monkeys decreased hindlimb duty factors on compliant substrates ( $p \approx 0.008$ ). These results underscore the variability in kinematic adjustments to compliant substrates that have been observed in studies of wild primates.

#### 24. Tej Nakashe

##### **Fentanyl Differentially Modulates Intrinsic Ca<sup>2+</sup> Spiking Behavior in Individual Cultured Superior Cervical Ganglion Sensory Neurons**

**Introduction:** Opioid overdose with synthetic opiates such as fentanyl are known to result in opioid-induced respiratory depression (OIRD). Sensory neurons within the superior cervical ganglion (SCG) are important for regulating respiratory drive. SCG neurons use changes in intracellular Ca<sup>2+</sup> concentration ([Ca<sup>2+</sup>]<sub>i</sub>) to regulate neuronal communication important for regulating and modulating ventilatory dynamics. **Objective:** To examine the extent to which fentanyl modulates intrinsic Ca<sup>2+</sup> spiking amplitude and frequency in individual cultured rat SCG sensory neurons. **Methods:** SCG neurons were isolated from rat pups. ‘‘Real-time’’ Ca<sup>2+</sup> imaging was used to assess intrinsic Ca<sup>2+</sup> spiking behavior in the presence or absence of fentanyl (1, 10, 100 nM). **Results:** Intrinsic Ca<sup>2+</sup> spiking frequency and amplitude varied amongst the population of SCG neurons. Some SCG neurons were quiescent. Exposure to fentanyl dose-dependently decreased intrinsic firing frequency and amplitude of SCG neurons that were firing intrinsically. In contrast, exposure to fentanyl stimulated intrinsic firing of neurons that were initially quiescent. Removal of Ca<sup>2+</sup> from the perfusate completely eliminated intrinsic Ca<sup>2+</sup> spiking behavior in the presence or absence of fentanyl. **Conclusion:** These data provide evidence that fentanyl differentially modulates intrinsic excitability of SCG sensory neurons and may be important in OIRD at the cellular level.

#### 25. Praneetha Sundar Prakash

##### **Barcoded immunostaining**

Immunostaining of biological samples has been one of the histological gold standards for studying cellular processes such as expression of cell surface markers including proteins, lipids and carbohydrates and also uptake of extracellular substances such as proteins and drug molecules. While several advances in the field such as gold immunolabelling and immuno-assisted Correlative Light and Electron Microscopy (CLEM) have been reported, one of the major limiting factors is the multiplexing capabilities of these techniques.

DNA nanotechnology enables us to overcome the multiplexing issue in a fully modular way. Herein, we report a method of designing DNA origami structures complexed with gold nanoparticles called ‘‘DNA barcodes’’ which can be used for single step multiplexed immunostaining of tissue resin sections, as they bind to highly specific oligonucleotides bound to antibodies.

## 26. Fathima Nafrisha Cassim Bawa

### **Macrophage specific Retinoic acid receptor alpha (Rar $\alpha$ ) protects from diet induced Atherosclerosis**

Atherosclerosis is a chronic vascular disease caused by inflammation and accumulation of lipids in the blood vessels. Macrophages in atherosclerotic lesions participate in lipid accumulation giving rise to foam cells and mediating inflammatory cytokines. This makes them an attractive target for therapy. Previous studies have shown that retinoid signaling plays a broader role in modulating macrophage lipid metabolism and its inflammatory phenotype. We hypothesized that Retinoic acid receptor alpha (Rar $\alpha$ ) may play a role in macrophages to protect against diet induced atherosclerosis. To test this hypothesis, we conducted in-vivo studies using macrophage specific Rar $\alpha$  knockout mice. Rar $\alpha$  floxed mice were crossed with lysozyme cre transgenic mice to generate macrophage specific knockout mice (m-Rar $\alpha$  -/-). Rar $\alpha$ fl/fl (control) and m-Rar $\alpha$  -/- were given High fat/High Cholesterol (HFHC) diet for 16 weeks. Cholesterol levels were increased in peritoneal macrophages of m-Rar $\alpha$  -/- compared to control. We also used macrophage specific Rar $\alpha$  knockout in low-density lipoprotein receptor knockout (Ldlr -/-) atherosclerotic models. Rar $\alpha$ fl/fl Ldlr -/- and m-Rar $\alpha$  -/- Ldlr -/- were given HFHC diet for 16 weeks. The Oil Red O staining of aorta shows m-Rar $\alpha$  -/- Ldlr -/- has significantly increased atherosclerotic plaques compared to control. Our data demonstrate that modulating Rar $\alpha$  in macrophages can protect from atherosclerosis.

## 27. Shreya Gupta

### **Sex-specific cognitive deficit and Alzheimer's-related pathology associate with reduced O-GlcNAc signaling in an aging mouse model of metabolic syndrome**

Metabolic syndrome (MetS), characterized by hyperglycemia, obesity and hyperlipidemia, is a major risk factor for late-onset Alzheimer's Disease (AD). Recent studies suggest a putative link between hyperphosphorylated tau neurofibrillary tangles, a classical AD hallmark, and cerebral glucose hypometabolism. Impaired glucose metabolism leads to attenuated O-linked N-acetylglucosamine (O-GlcNAc) protein modification. To interrogate the link between O-GlcNAc signaling with AD pathology in MetS-induced cognitive decline, aging mouse model of agouti KKAY+/-, non-agouti KKAY-/- and C57BL6 wild-type (WT) mice were subjected to periodic body weight and blood-glucose monitoring followed by behavioral tests conducted at 12+ months age. Plasma and brain tissues were collected for further studies. Body weight, blood-glucose, total cholesterol and triglyceride levels were significantly elevated in agouti KKAY+/- mice vs. controls, confirming their MetS phenotype. In behavioral analysis, such as object-recognition and spontaneous-activity test, KKAY+/- mice showed severe cognition impairment and memory loss vs. WT; primarily observed in females. Immunoblotting of hippocampal-associated tissue lysates revealed increased pTau and pERK coupled with reduced pGSK expression in female KKAY+/- vs. WT. It was accompanied with attenuated O-GlcNAc transferase and O-GlcNAc protein expression. Together, these data demonstrate a sex-specific impairment in cognitive function and AD-related pathology that associate with reduced O-GlcNAc signaling in aging MetS KKAY+/- mice.

## 28. Desmond Owusu Kwarteng

### **Ionization properties of Monophosphoinositides in PC and PC/PE model membranes.**

Phosphoinositides are phosphorylated derivatives of phosphatidylinositol (PI) found in low amounts in cellular membranes. They perform several key cellular events such as signaling, membrane trafficking, protein recruitment and modulation despite their low numbers. Their functional diversity is due to spatial

and temporal regulation of PIs by enzymes which phosphorylate and dephosphorylate the inositol ring resulting in the production of different derivatives. These can be mono, bi and tri phosphorylated forms depending on whether they have a single, double or triple phosphate group(s) attached to the hydroxyls of the inositol ring respectively. We focus on the monophosphorylated forms (PI3P, PI4P and PI5P). These are unevenly distributed across various organelles where they perform diverse and specific roles ranging from autophagy initiation by PI3P on autophagosomes; coordination of lipid homeostasis by PI4P at the Golgi apparatus and transcriptional regulation by PI5P in the nucleus. Ionization properties of the phosphorylated headgroups of anionic lipids have been shown to impact how they interact with proteins and lipids in the membranes. Here, we used <sup>31</sup>P MAS NMR to measure the charge of 5% of the monophosphorylated derivatives in pure DOPC and DOPC/DOPE bilayers as a function of pH and membrane composition.

## **Poster Session 6 Chemistry and Biochemistry I**

### **29. mary brintha croos anburaj**

#### **“Micro-RNA mediated N-acetyl transferase 8 like (NAT8L) regulation in neurodegenerative diseases and cancers”**

N-Acetyl transferase 8 like (NAT8L) protein is a mitochondrial membrane bound enzyme that catalyzes the synthesis of N-Acetyl aspartate (NAA) from Acetyl CoA and L-Aspartate. N-Acetyl aspartate is one of the most abundant metabolites in the central nervous system. The lack of NAA plays a critical role in several neurodegenerative diseases. In addition to many other proposed functions, NAA is essential in the production of the myelin sheath, the covering on neurons that protects the axon and helps transmit signals throughout the central nervous system. On the other hand, the overexpression of NAT8L and NAA have been identified as early biomarkers of various cancers. Bioinformatic analysis was used to identify that NAT8L mRNA could potentially be regulated by its cognate micro-RNA in neurons and in several cancers. Specific Micro-RNA can bind to the 3' UTR of NAT8L mRNA thereby reducing its expression. Altered level of micro-RNA in neurodegenerative diseases and cancer cells will potentially delineate how micro-RNA can be utilized or targeted to restore NAT8L levels as a novel therapeutic approach.

### **30. Mohamed Rushdhi Mohamed Rauff**

#### **Discovery of a novel peptide which can decrease the viability of breast cancer cells by inhibiting FTO binding to its m6A targets**

N6-methyladenosine (m6A) is the most abundant nucleotide modification observed in eukaryotic mRNA and it is coded on to mRNA transcripts by writers and erasers. These signals can be decoded by methyl readers to regulate gene expression. Hence abnormal expression levels of writers and erasers can lead to various diseases and conditions such as cancer, male infertility and obesity. FTO (Fat mass and obesity-associated protein) and ALKBH5 are the well characterized erasers in humans. Among those increased levels of FTO has been observed in several cancers including breast cancer. From phage display

experiment, a peptide (MTR-pep1) that bind specifically to m6A-modified RNA compared to its unmethylated counterpart was discovered. Our fluorescence measurements illustrated the binding of MTR-pep1 with the methylated target RNA (MTR) with lower micromolar affinity. A FRET assay confirmed that MTR-pep1 can inhibit binding of FTO to its target RNA. A 40% decrease in cell viability was observed upon treatment of breast cancer cell line, MDA-MB-231 with MTR-pep1. Hence our results illustrate the potential of MTR-pep1 to be developed as a drug for breast cancer.

### **31. Amarasooriya M.D.S. Jayawardhana**

#### **Dual-Action Organoplatinum Polymeric Nanoparticles Overcome Drug Resistance in Ovarian Cancer**

A novel approach of organometallic compounds towards the construction of nanoparticles for cancer therapy to enhance cellular uptake by targeting nucleus and mitochondria was achieved. By mixing the organometallic compound with a biocompatible polymer, PEG50 in a proper ratio coordination driven self- assembly occurs, to yield micelles. Bond formation between Pt and carboxylate ligands confirmed with <sup>1</sup>HNMR and <sup>31</sup>PNMR studies. Drug loading capacity within micelles found to be 80%. Cytotoxicity studies were carried out with MTT experiments, cellular uptake and cell imaging experiments. Mechanism of action of the micelles was studied with apoptosis,  $\gamma$ H<sub>2</sub>AX, Mitostatus and MitoSOX assays. Results reveal that synthesized nanoparticles show better therapeutic effects on several cancer types including ovarian cancer.

### **32. THULASI MAHENDRAN**

#### **Mitochondrial mRNA oxidation in human neuronal cells dysregulates energy production in neurological disorders.**

Mitochondria is the major hub for energy production in our body and its dysfunction is linked to several neurodegenerative disorders including Alzheimer's, Parkinson's and Multiple Sclerosis (MS). They play crucial roles in cell signaling, cell cycle regulation, apoptosis, and reactive oxygen species (ROS) production. Mitochondria is the primary source of ROS generation in many cells. The overproduced ROS eventually causes oxidative damage, particularly cell membrane damage due to lipid peroxidation, changes in protein structure and function due to protein oxidation, and structural damage to DNA and RNA. The mitochondrial genome encode 13 mRNAs, 22 tRNAs and 2 rRNAs. Since mRNA is the intermediate in the central dogma, oxidative damage to the mRNA will have potential impacts on protein synthesis. Therefore, the selective RNA oxidation in these mitochondrial mRNAs could disrupt the formation of the protein complexes involved in the respiratory chain, leading to enhanced mitochondrial dysfunction, reduction in energy production and progression of neurodegeneration. Identifying the link between mitochondrial mRNA oxidation and protein synthesis that eventually leads to reduced energy production in human neuronal cells under oxidative stress condition will help to relate mitochondrial mRNA oxidation to neurodegenerative diseases with the aim of developing therapies.

### **33. Mohammed Enamul Hoque**

#### **Encounters Between Cas9/dCas9 and G-quadruplexes: Implications for Transcription Regulation and Cas9-Mediated DNA Cleavage**

The prevalence of potential G-quadruplex forming sequences (PQS) in the human genome and their impact on transcription, replication, and DNA repair provides challenges and potential new applications

for CRISPR technology. Using the nuclease-dead Cas9 (dCas9), we targeted in cellulo a G-rich sequence, which contains multiple PQS, within the human tyrosine hydroxylase promoter. We demonstrate that transcription can be up or down-regulated by targeting different parts of this G-rich sequence. Our results suggest that TH transcription levels correlate with the stability of different G-quadruplexes (GQs) formed by this sequence and targeting them with dCas9 can modulate their stability. Unlike alternative approaches, regulating TH expression by targeting the promoter GQs with dCas9 enables a specific and temporary control and does not require mutations in the sequence. We also investigated whether the presence of GQs in target sequences impacts other activities of the CRISPR complex, in particular the DNA cleavage activity of Cas9. We discovered a significant reduction in cleavage activity when the vicinity of a high-stability GQ was targeted. Furthermore, this reduction is significantly more prominent for the G-rich strand compared to the complementary C-rich strand. With these, we demonstrate new potential applications for dCas9 where it regulates transcription by targeting secondary structures but also highlight potential issues Cas9 might encounter while targeting such sequences.

## **Poster Session 07**

### **Chemistry and Biochemistry II**

#### **34. Bishnu Pant**

##### **Synthesis of highly stable and effective Bi<sub>2</sub>O<sub>3</sub> Nanoparticles for antibacterial properties**

Due to their low toxicity and high effectiveness, some bismuth compounds have been used for centuries in the treatment of a variety of microbial infections including syphilis, diarrhea, gastritis, and colitis. As reported in the literature, all Bi-based NPs lead to relatively large-sized NPs. In most of the antimicrobial activity studies, Bi-based NPs have been prepared by the traditional bottom-up method that requires the use of a soluble bismuth salt to react with a base in the controlled nucleation of Bi-based NPs. Here we have successfully synthesized fine-sized and well-established Bi-based NPs e.g. Bi<sub>2</sub>O<sub>3</sub> NPs by using a top-down synthetic route with the aid of ultrasound energy. Herein, we have found that the top-down Bi<sub>2</sub>O<sub>3</sub> NPs preparation method can lead to the formation of ultrafine Bi<sub>2</sub>O<sub>3</sub> NPs that exhibit the lowest MIC value of 0.75 µg/mL for PA bacteria and can easily rupture the cellular wall of the bacteria.

#### **35. Sudeshi Madushani Abedeera Liyana Patabendige**

##### **“RsuA plays an important role in bacterial survival under environmental stress conditions”**

Ribosome is an essential cellular component that carries out protein biosynthesis in all forms of life. Although the composition of ribosome is known, various subpopulations of ribosomes also known as stress ribosomes has been discovered under various environmental stress conditions. The 16S rRNA pseudouridylation enzyme, RsuA is a survival protein that is essential for cell survival under several stress conditions. Here, we investigated the stress-induced cell growth defects in the RsuA deletion strains. Comparison of growth curves of wild-type and RsuA knock-out E. coli strain illustrated RsuA is important for cell growth under antibiotic stress. However, the presence of RsuA is disadvantageous for cell survival under oxidative stress. Exogenous expression of RsuA reduced the RsuA-dependent growth defects. These observations suggest that bacterial rRNA modification enzymes play important roles in cell survival under various environmental stress conditions.

#### **36. NALIN KRISHANTHA ABEYDEERA KEKIRIWARA GODAGE**

### **Iron transport-facilitating nanocomplex as an antimicrobial agent against multi-drug resistant staphylococcus aureus**

The increased incidence of *S. aureus* resistant to multiple antibiotics necessitates the development of novel antimicrobials alternative to or combined with conventional antibiotics. Iron is essential for all forms of life because it functions as a catalytic and electron-transfer cofactor for many proteins and enzymes. However, iron, particularly, that found as free ion forms in the cell is highly toxic due to its redox activity to catalyze the Fenton reaction to produce reactive oxygen species (ROS). Hence, there is a remarkable balancing act of maintaining iron homeostasis on display by both mammalian and bacterial cells for their survival. It was recently found that a lipophilic small molecule natural product, hinokitol, can exhibit a remarkable capacity to bind to ferrous and ferric iron to form a hinokitol:iron complex (Fe-Hi3) with high affinity and transport them across lipid membranes<sup>1</sup>. This motivated us to explore the capacity of Fe-Hi3 complex as a stealth iron-carrier that can bypass the regulation of iron trafficking in the bacterial cell, which should constitute a novel strategy for killing pathogenic bacteria by means of disturbing iron redox activity in bacterial cells. Here, we have validated the antimicrobial potential of Fe-Hi3 complex as an antimicrobial agent, using an in vitro model of multi-drug resistant *S. aureus* (MDRSA) culture and in vivo model of mouse wound infection by MDRSA

### **37. Thiloka Dassanayake**

#### **Synergistic effects of copper-vitamin C incorporated alumina nanocomposite hydrogels for burn wound healing**

The number of antibiotic-resistant bacterial strains has been dramatically increased over the past few decades. With bacteria constantly evolving, humans are unable to discover new antibiotics fast enough to keep an upper hand in this race. It is therefore vital to explore novel non-antibiotic-based antimicrobial drugs with high efficacy and different mechanisms of action to inhibit bacterial growth. This study was focused on designing a biocompatible and efficient nanocomposite drug delivery system containing Vitamin C-Copper nanoparticles (CuNPs) incorporated into alumina hydrogels. It has been demonstrated that  $\gamma$ -alumina hydrogels with CuNPs embedded in the hydrogel network can be readily formed by hydrolysis reactions of aluminum isopropoxide in water, followed by incorporation of CuNPs. The products obtained in both nanoparticles and composite forms were fully characterized by dynamic light scattering (DLS), X-ray powder diffraction (XRD), scanning electron microscopy (SEM) and Transmission electron microscopy (TEM). The CuNPs released from the hydrogels are expected to exhibit improved cellular penetration via endocytosis and could trigger apoptosis by generating Reactive oxygen species (ROS) in bacterial cells. The antibacterial efficacy of CuNPs was examined and found to be highly active against *Staphylococcus aureus* (SA), *Pseudomonas aeruginosa* (PA) as well as methicillin-resistant *Staphylococcus aureus* (MRSA) and Multi drug-resistant *Pseudomonas aeruginosa*(MDRPA).

### **38. Dinesh Marasinghe Marasinghe Mudiyansele**

#### **Microwave Spectroscopy of the 2-methylaminoethanol-water Complex**

Microwave spectroscopy is extremely sensitive to the precise structural information of the molecules. The ubiquity of water and its hydrogen bonding interactions increase the research interests in the weakly bound complexes of water. The rotational spectrum of the 2-methylaminoethanol-water (2MAE-water) complex has been observed using a cavity-based Fourier-transform microwave spectrometer (CB-FTMW) in the range of 10-19 GHz. 2MAE exists in trans and gauche conformations. We modeled 10 possible

conformers of the 2MAE-water complex, five trans, and five gauche conformers, using ab initio calculations (MP2/6-311++G(d,p)). 14 rotational transitions were fit to Watson's A reduced Hamiltonian:  $A=3368.02$  MHz,  $B=2282.60$  MHz, and  $C=1538.00$  MHz.  $^{14}\text{N}$  nuclear quadrupole hyperfine splittings were resolved, and the 38 hyperfine components were fit to  $\nu_{aa}=1.5439(7)$  MHz and  $\nu_{bb}=-1.083(25)$  MHz. The measured spectrum is assigned to the lowest energy model structure of the complex, which has two intermolecular hydrogen bonds: from the hydroxyl group to water and to the methylamino group. The structure of 2MAE-water is compared with 2-aminoethanol-water (2AE-water) and 2-methoxyethylamine-water (2MEA-water) complexes.

## Poster Session 8 Health Sciences

### 39. Peter Gates

#### **Optimization of high-cadence cycling parameters to improve motor function in people with Parkinson's disease**

Previous research has shown that dynamic high-cadence cycling can improve motor symptoms of Parkinson's disease such as tremor and bradykinesia, these results were not homogenous. Data from a previous study where individuals with PD rode the dynamic cycle with different resistance settings was used to build two preliminary predictive models. We hypothesized that participants who had higher BMI, increased age, more severe symptoms, and higher PD medication dosages were less likely to contribute effort during the study. **METHODS:** Thirteen participants completed three sessions of dynamic biking under three different resistance settings. UPDRS-III was assessed before and after each session and bike settings (cadence, power) were recorded every second. Entropy of cadence was calculated using Matlab and data were analyzed using repeated measures ANOVA and multiple linear regression. **RESULTS:** There were no significant differences in power, entropy of cadence, and UPDRS-III score between the three bike settings. There was a high correlation ( $r^2=-0.62$ ,  $p=0.01$ ) between effort and BMI, which remained significant ( $r^2=-0.85$ ,  $p<0.005$ ) for participants who completed all three sessions within 10 days but not for those who took longer to complete the sessions ( $r^2=-0.59$ ,  $p=0.1$ ). These findings were used to create a preliminary model explaining variance in effort ( $R^2$  adjusted=0.62,  $p=0.04$ ). **CONCLUSION:** Participants characteristics such as pre-UPDRS, age, BMI, and daily medication intake play a role in the amount of exerted effort during bouts of dynamic cycling. Future studies will test and improve on the preliminary model, and look into ways of increasing effort during a cycling session.

### 40. Younguk Kim

#### **The Effects of Deep Brain Stimulation on the Strength Training Participation and Mobility in individuals with Parkinson's Disease**

**Background:** Deep Brain Stimulation (DBS) is surgical implantation of electrodes into deep brain areas to alter abnormal brain activity. In Parkinson's disease (PD), DBS decreases the symptoms of PD. Even though this technique improves PD patients' agility and motor performance, there has been a limited number of studies regarding DBS patients' exercise participation frequencies and their mobility performance. **Purpose:** To assess strength training participation hours, days per week, and mobility performance in individuals with DBS and without DBS. **Methods:** The Fox-Insight-Database was used for this analysis.

Demographic, mobility and physical activity variables were analyzed with SPSS using a Mann-Whitney-test and independent-sample t-test. Results: There was no significant difference in strength training participation days and hours ( $p > .05$ ) between the two groups. In addition, the individuals without DBS group showed greater mobility than the DBS group ( $p < .05$ ). However, this is likely partially explained by the finding that the DBS group had an average age of diagnosis of 51 years while the individuals were diagnosed at an average of 61 years old ( $p < .05$ ). Conclusion: These results suggest that although DBS patients have lower mobility and an earlier age of PD diagnosis that they participate in strength training with similar frequency as those without DBS.

#### **41. Elliott Arroyo**

##### **The effects of three different types of exercise on inflammation**

**PURPOSE:** To compare the inflammatory response to an acute bout of moderate-intensity continuous exercise (MICE), high-intensity interval exercise (HIIE), and sprint interval exercise (SIE). **METHODS:** Recreationally active men ( $n=11$ ;  $22 \pm 3$  yrs;  $180.2 \pm 4.6$  cm;  $78.4 \pm 7.8$  kg;  $12.1 \pm 3.5$  %BF;  $46.3 \pm 4.0$  ml $\cdot$ kg $^{-1}$  $\cdot$ min $^{-1}$ ) completed a maximal graded exercise test (VO<sub>2</sub>max) and three exercise trials (HIIE, SIE, and MICE) in a randomized, counterbalanced fashion on a cycle ergometer. HIIE consisted of fifteen 90-second bouts at 85% VO<sub>2</sub>max interspersed with 90-second active recovery periods. SIE consisted of fifteen 20-second bouts at 130% maximum wattage interspersed with 160-second active recovery periods. MICE was a continuous bout at 65% VO<sub>2</sub>max. Each trial lasted 53 minutes, including a 5-minute warm-up and a 3-minute cool-down. Blood was collected before (PRE), immediately post (IP), 30 minutes (30P), 2 hours (2H), 6 hours (6H) and 24 hours (24H) post-exercise. Plasma concentrations of tumor-necrosis factor (TNF)- $\alpha$  were assayed. Changes in surface expression of TNF Receptors (TNFR) 1 and 2 on monocyte subsets were measured via flow cytometry. **RESULTS:** As of the date of this submission, data is being analyzed and will be made available by the time of the symposium.

#### **42. Abigail Cordell**

##### **Prevalence and contributing factors of obesity and obesity-related secondary conditions in adults with intellectual and developmental disabilities**

**Background:** Obesity and its secondary conditions in the intellectual and developmentally disabled (IDD) population are serious health problems requiring further research, especially in the context of nutritional care. The transition to group homes from institutions further indicates a need for updated research. **Objective:** To identify and describe the prevalence and contributing factors of obesity and its secondary conditions in the IDD population living in group homes. **Methods:** Descriptive variables including demographics, body mass index (BMI), weight status, dietary intake, dietary-related behaviors, obesity-related secondary conditions, and mobility level were collected through de-identified medical charts. **Results:** Average participant age ( $n=40$ ) was 41yr  $\pm$  14. Mean BMI was 26.0kg/m<sup>2</sup>  $\pm$  6.1 with 1 (3%) participant underweight, 21 (53%) normal weight, 10 (25%) overweight, and 8 (20%) obese. Cardiovascular disease appeared in 8 (20%) participants, and type 2 diabetes mellitus in 2 (5%). More participants were non-ambulatory (65%) than ambulatory (35%). The most prominent dietary-related behavior was rapid intake (17.5%). **Conclusion:** Obesity is of grave concern in the American IDD population. As a preventable condition among those with IDD, obesity-targeted interventions based on updated findings should be of paramount interest. Registered dietitian nutritionists are essential in these interventions due to nutrition's pivotal role.

#### **43. Jasmine Bondar**

### **Graduate Nursing Students Report Greater Risk, but Similar Anxiety and Resilience, compared to Non Health Related Degree Students early in the COVID-19 Pandemic**

Higher education has been impacted by the novel coronavirus. Nursing students of all academic levels have been vulnerable from the effects of the pandemic. This health care crisis has led all academic levels of nursing students to be challenged within their personal education and their perceived understanding of the effects of the virus. However, nursing students are educated about infection prevention and disease processes. The aim of the study was evaluate perceived risk of contracting COVID-19, anxiety, and resilience in GNS versus non health related degrees.

#### **44. Erin Orlins**

##### **A case study of LifeAct: A school-based suicide prevention program**

School-based prevention programs are being implemented across the United States to reduce the high prevalence of suicide among adolescents. More insight about how these programs impact the school environment would be useful to programmers and school personnel. Student reactions to LifeAct, a school-based suicide prevention program, were observed at one high school. Interviews were conducted with the school guidance counselor and the LifeAct instructor regarding their perceptions of program impact on the school environment. An interview transcript and field notes were coded to categorize the data. The following three overarching themes were developed: engagement, emotions, and help-seeking actions. These findings suggest that the LifeAct program influences the school environment during and after program delivery. Further exploration of the long-term impacts of school-based suicide prevention programs on the school environment would be beneficial.

#### **45. Shelly Evans**

##### **Perceptions of health-related quality of life (HRQoL) experienced by older ethnic Somalis aging transculturally in the U.S.: An Interpretative Phenomenological Analysis**

In recent years, Somalis have been one of the largest refugee groups admitted to the U.S. Although a small sector, older Somalis have contributed to the unprecedented growth of the aging U.S. population. As a result of extreme circumstances associated with forced migration, the plight of older and aging refugees is unique, and the challenges that increase the likelihood of poor health outcomes and threaten health-related quality of life (HRQoL) may be more complex than those of other older adult populations. Interpretative Phenomenological Analysis (IPA) is a qualitative methodology that examines how individuals make sense of significant life experiences. This IPA study explores how older ethnic Somalis resettled in the Midwest U.S. perceive their HRQoL as they age in an unfamiliar context. Participants include 16 purposively selected Somali immigrants, aged 60 years and older, who engaged in one-to-one, in-depth, semi-structured interviews conducted with the assistance of an interpreter. Findings revealed three super-ordinate themes--Resettled, Unsettled, and Incomplete, accompanied by supporting sub-themes. As the priorities that define HRQoL vary across cultures, this study will fill a critical need to guide programmers' understanding of how older Somali refugees perceive and prioritize aspects of HRQoL.

#### **46. Fatemeh Dehghan Manshadi**

## **Substance Abuse: Definition, Patterns, Negative Impacts, Factors Contributing to Alcohol/ Drugs Abuse, and Therapy**

Substance abuse is one of the most complex problems of public health. African Americans have lower rates of substance abuse at a younger age and the same or higher rates in middle adulthood compared to White Americans. Some of the factors that contribute to abusing drugs/ alcohol are parents' divorce, parental alcoholism, and genetic risks. Drugs/ alcohol abuse impact both men and women, affect all cultures, and is experienced by people from all age groups. Substance abuse has negative effects on people's lives. Substance abuse may cause different health problems such as: "Cardiovascular conditions, pregnancy complications, and sexually transmitted diseases". Alcohol may increase aggressive behaviors by disrupting normal brain functions. In addition, the rate of child abuse or neglect is higher among alcoholic women in comparison with women with no alcohol problems. A child who is raised by an alcoholic or drug-addicted parent may spend a lot of time and energy to get basic survival needs. Also, they may deal with a lot of stress. The above-mentioned information shows the importance of taking actions to increase the prevention and treatment of substance abuse problems in the United States. People with substance abuse disorders can benefit from participating in group therapies.

## **Poster Session 9**

### **Applied Mathematical Sciences**

#### **47. Naira Chovelidze**

##### **Modern Astrostatistics Problems**

"Astronomy and astrophysics today requires a vast range of statistical capabilities. It helps astronomers to know something about: sampling theory, survival analysis with censoring and truncation, measurement error models, multivariate classification and analysis, harmonic and autoregressive time series analysis, wavelet analysis,... Astronomers need combinations of methodologies that have not yet been fully developed". E. D. Feigelson, G. J. Babu

#### **48. Pavan Poudel**

##### **Fast uniform scattering on a grid for asynchronous oblivious robots**

We consider  $K = (k+1) \times (k+1)$  autonomous mobile robots operating on an anonymous  $N = (n+1) \times (n+1)$ -node grid,  $n = k \cdot d$ ,  $d \geq 2$ ,  $k \geq 2$ , following Look-Compute-Move cycles under the classic oblivious robots model. Starting from any initial configuration of robots positioned on distinct grid nodes, we consider the uniform scattering problem of repositioning them on the grid nodes so that each robot reaches to a static configuration in which they cover uniformly the grid. In this paper, we provide the first  $O(n)$  time, collision-free algorithm for this problem in the asynchronous setting, given that the robots have common orientation, knowledge of  $n$  and  $k$ ,  $O(1)$ -bits of memory, and visibility range of  $2 \cdot \max\{n/k, k\}$ . The best previously known algorithm for this problem on a grid has runtime  $O(n^2/d)$  (or  $O(nk)$ ) with the same robot capabilities in the asynchronous setting except the visibility range  $2 \cdot n/k$ . The proposed algorithm is asymptotically time-optimal since there is a time lower bound of  $\Omega(n)$ .

#### **49. Golam Mustafa**

##### **Single molecule investigation of tandem g-quadruplex structures formed by human telomeric sequence**

Human telomeric overhangs consist of 100-300 nucleotide long GGGTTA repeats, which can fold into multiple tandem G-quadruplex (GQ) structures. These structures protect and stabilize the telomeres and have been shown to inhibit telomerase activity, which made them an attractive target for anti-cancer drugs. Using single molecule Forster resonance energy transfer (FRET) spectroscopy, we interrogated the accessibility of 24-144 nucleotide long human telomeric DNA molecules (surface-immobilized and donor labeled) with short PNA molecules (acceptor labeled) that are complementary to a single repetition. These telomeric overhangs contain 4-24 GGGTTA repeats and can form 1-6 GQ structures when fully folded. However, when not fully folded, certain repeats can be accessed by PNA. PNA strands bind to these open sites on the telomeric DNA for a short period of time prior to dissociation, resulting in discrete FRET bursts as observed in the implementations of FRET-PAINT method. These bursts were analyzed in terms of their dwell times, binding frequencies, and topographic distributions. Both dwell times and binding frequencies were greater for binding to intermediate regions of telomeric DNA compared to 3' or 5'-ends. Finally, the binding frequency per telomeric repeat decreased monotonically with increasing telomere length, indicating a length-dependent compaction of the structure. These observations provide a potential framework to understand triggering of senescence or apoptosis when telomeric overhangs become shorter than a critical length (~50 nt) where the necessary compaction may not be possible. The higher stability of the ends is consistent with GQ structures protecting telomeres against exonuclease activity.

## 50. Safa Shubbar

### PhGC: A Machine Learning-Based Workflow for Phenotype-Genotype Co-analysis on Autism Data

Collaborated with a research team in Case Western Reserve University to design and implement an efficient system to leverage machine learning approach to identify behavioral phenotypes of ASD based on their corresponding genomics data. Utilize unsupervised clustering algorithms to extract the core members of each cluster and profile the core member subsets to explore the characteristics using genotype data from the same dataset.

## Poster Session 10

### Psychological sciences

#### 51. Jessica LaBuda

##### A meta-analysis of accuracy and bias in romantic partner perceptions

The current meta-analysis examined tracking accuracy ( $k = 53$ ), projection ( $k = 53$ ), similarity ( $k = 22$ ), mean-level bias ( $k = 44$ ), and positive and negative conceptual bias ( $k = 44$ ) in people's perceptions of romantic partners across a comprehensive set of samples that simultaneously estimated accuracy and bias. The results revealed significant overall effect sizes for tracking accuracy ( $\hat{I}^2 = .21$ ), projection ( $\hat{I}^2 = .49$ ), similarity ( $\hat{I}^2 = .30$ ), and positive and negative bias ( $r = -.03$ ); whereas, mean-level bias was not significant ( $r = .001$ ). Our findings are the first to provide information regarding the effect sizes of tracking accuracy and projection when accounting for the variance of each. Further, the results show that people tend to view their partner with a negative bias (e.g., overestimate negative behaviors or underestimate positive behaviors). Overall, these findings extend and build upon prior research, which suggests that accuracy and bias are complex and connected perceptual processes that serve adaptive functions to help partners understand each other, build security, and monitor potential threats.

#### 52. Emma Bernardi

### **Can taking a test hinder the learning of new information? Evaluation of the negative interpolated testing effect (NITE)**

Taking a test can affect one's ability to effectively learn new information. One outcome is that the test will make learning new information easier -- a phenomenon called test-potentiated new learning (TPNL); another possibility is that taking a test will make learning new information harder -- a phenomenon we label the negative interpolated testing effect (NITE). One hypothesis for when TPNL vs NITE will occur is the borrowed time hypothesis (described by Davis & Chan, 2015), which suggests that TPNL will occur if the originally tested information is well known, and NITE will occur if the originally tested information is unknown or not well known. We test this hypothesis by manipulating the recall of the originally tested information before participants learn the new information.

### **53. Christina Korth**

#### **Social Support and Coping Self-Efficacy amidst the Novel Coronavirus (COVID-19) Pandemic**

The ongoing coronavirus (COVID-19) pandemic has given rise to significant psychological distress that may have lasting impacts. College students experienced lost resources, including social isolation. With traumatic stressors, social support enables individuals to engage in beneficial behaviors and can enhance self-efficacy (CSE). CSE has also been found to be a protective factor across traumas and may mediate the relationship between social support and PTSD symptoms. The current study evaluated whether CSE mediates the relationship between social support and PTSD symptoms in college students during COVID-19. College students from a large midwestern university and community completed online questionnaires assessing social support, CSE, and PTSD symptoms. Greater social support was associated with higher CSE and decreased PTSD symptoms. In regression analyses controlling for sex, race, and sample, both social support ( $F[5,179]=8.69, p=.02$ ) and CSE ( $F[5,179]=8.69, p<.01$ ) uniquely explained variance in PTSD symptoms. A mediation analysis revealed an indirect effect of social support on PTSD symptoms ( $\beta^2=.13, 95\% \text{ BCa CI } [-.21, -.05]$ ) that was partially mediated by CSE. Individuals with greater perceived social support may experience less trauma symptoms, which is partially explained by higher levels of CSE. Interventions to promote CSE necessitate consideration to mitigate the adverse mental health consequences of COVID-19.

### **54. Jasmin Beaver**

#### **A High Salt Diet Influences Stress Responding**

Consuming excess salt (NaCl), the primary source of dietary sodium (Na), has become prevalent in modern society. Research has seldom examined how salt consumption affects brain health and function, and consequently, behavior. Adult male and female C57BL/6J mice had access to one or two diets differing in salt content. For 4 or 8 weeks, experimental groups received either: control diet; high salt diet; both control and high salt diets (mixed); this last enabled analysis of diet preference over time. During the final day of the diet manipulation, environmental threat response was assessed using a swim stressor. Results indicate a significant increase in latency to first immobility for male mice in the 4 week high salt condition compared to controls, suggesting continued consumption of salt sex-selectively enhances responses to environmental stressors. Male mice in both diet periods that were in the mixed group initially preferred the control diet, but over time consumed equivalent amounts of both diets. In contrast, females initially preferred both diets, but then gradually preferred the high salt diet. Overall, our early findings indicate that elevated consumption of salt has sexually dimorphic influences on basic mammalian behaviors.

## **55. Keaton Somerville**

### **Hair cortisol concentration and perceived chronic stress in low-income urban pregnant and postpartum Black women**

Black women are more likely to experience short- or long-term health consequences from their labor and delivery and die from pregnancy-related causes than White women. Similarly, infants born to Black women also have heightened health risks. Developing research suggests that a contributing factor to Black health disparities may be maternal chronic stress. A widely used biomarker for chronic stress is hair cortisol concentration (HCC). Few prior studies have explored the HCC of pregnant Black women or comprehensively examined perceived chronic stress in this population. Using a mixed-methods focus group framework, we assessed HCC and perceived chronic stress among low-income pregnant and postpartum Black women. Four focus groups were conducted (N = 24). The mean HCC for our pregnant Black participants was greater than pregnant White women in reviewed published studies. The high levels of stress evidenced at all pregnancy stages indicate that many of these women are experiencing chronic stress, which can contribute to higher Black maternal morbidity and mortality rates, and possibly infant mortality rates. From the open coding of the focus group transcripts, 4 themes emerged: chronic stress, experiences of racism, experiences of trauma, and negative thinking. Selective coding based on these themes revealed cumulative experiences of chronic stress, various traumatic experiences, and frequent encounters with racism. Negative thinking styles were observed across the 4 focus groups. More studies of HCC and perceived stress among pregnant Black women are encouraged. Findings suggest the need for tailored multi-level interventions given the layers of stressors present in this population.

## **Poster Session 11**

### **Fashion and Arts**

#### **56. Alexandra Reich**

##### **Purpose Driven Strategies for Fashion Product Small Businesses: Case Studies and Business Plan**

Fashion businesses today are progressively challenged by consumers to provide something other than just the latest trends. With a multitude of choices and an overwhelming amount of opportunity, consumers seek a message, a story, or a narrative, around a product which makes them feel good about their purchase. Small-businesses are often the best able to pivot, or align themselves, with a purpose-driven mission that helps define their product, services, employees and business practices. Of particular interest are American made companies which address environmental concerns with practices such as up-cycling or recycling and social concerns such as veteran health and well-being. To determine common attributes of these purpose-driven businesses, a website content analysis and literature review will be framed within the quadruple bottom line theory identifying successful patterns. The SME businesses analyzed, which have incorporated purpose-driven strategies, are Anne Cate, Sword and Plough, Alabama Chanin, Zero Waste Daniel, and United by Blue. From this information, a theoretical business plan and feasibility study was created that followed several attributes from the companies analyzed. The outcome will be a list of best practices of purpose driven strategies for small businesses as well as a theoretical business plan that incorporates these best practices.

## 57. Yee Lin Elaine Yuen

### **Ancient Greece to the Fashion Runway: An Example of Sustainability through Time**

Ancient Greece civilization has a notable impact on the Western dress as part of the Clothing and Textiles focus of home economics. The purpose of this study was to investigate the influence of Ancient Greece and connections with contemporary global fashion to reveal the sustainability of Hellenistic influences.

This study centered on a site visit to different museums in Athens, Greece to look for the archaeological evidence in Ancient Greece, following a specified illustration on the change of arts from Bronze Cycladic period to Classical Period 3000-323 BCE chronologically. The findings were defined systematically in silhouettes, colors, motifs, and materials from the literature, painting, and sculpture in Ancient Greece.

The latest fashion presented on the runways is another platform for understanding the long-lasting and sustainable influence of Ancient Greek costumes. Various well-known fashion designers chosen for analysis, comparing the relationship and background inspiration between the Ancient Greek costume and contemporary fashion. These designers are included but not limited to Mary Katrantzou, Sophia Kokosalaki, and Eleni Kyriacou, originally born in modern Greece.

The analysis found many intersections and connections between contemporary fashion and Ancient Greek costume in silhouette, materials, function, motifs, and colors/pigments. Different alterations through technology and fashion trends reveal changes in modern lifestyle.

## 58. Heeju Noe

### **Fashion renting: An exploratory study of user and non-user behaviors**

Fashion renting, a form of collaborative consumption, is an emerging sustainable business model that extends the product life cycle and minimizes waste garments. Fashion renting has been the topic of interest for multiple studies, and as a result, the current fashion discipline possesses a substantial understanding of the factors that encourage consumers to engage in fashion renting. However, a limitation is that relatively little attention has been placed on consumers who do not engage in fashion renting. This is an important gap in research, especially considering that understanding non-users of products or services often leads to valuable and distinct implications. Accordingly, the purpose of this study is to investigate both the user and non-user groups of fashion renting services to obtain a better understanding of the phenomenon. In this qualitative study, two focus group interviews were conducted for users and non-users of fashion renting services.

Keywords: fashion renting, consumption value theory, collaborative consumption, sharing economy, circular economy

## 59. Katie Stoller

### **Workmanship: Cross-functional collaboration between fashion design and fashion merchandising**

The Fashion industry is significantly polluting environments with overproduction and overconsumption: one garbage truck of textiles is landfilled or incinerated every second. As a result, clothing and textiles make up 7% of landfills globally.

We propose Workmanship, a sustainable apparel brand that offers innovative and transformative designs with detachable collars, cuffs, and sleeves to promote circular fashion. Our multifunctional products allow

our customers to purchase fewer, higher-quality garments to increase our sustainability efforts while mix-and-matching sleeves, collars, and cuffs, fully expressing creativity and individuality. Our products will be using sustainable materials and produced fairly and ethically by responsible partners.

As part of a collaboration between a fashion design and fashion merchandising student, a collection of three to five garments will be created and launched on our website in order to gauge consumers feelings regarding multi-functional clothing.

## **60. Meagan Smith**

### **Swimming Through Abstraction: The Woven Intersection of Craft, Design, and Technology**

This series of weavings creates a sensory experience that heightens awareness of tactility created by phenomenological movements of wave like patterns. These works are influenced by my interest in swimming. Dynamic actions such as floating, diving, splashing, bending and submerging provide inspiration for the development of the undulating transformation of the weave patterns. The designs for these woven compositions are created in the virtual realm of the computer. Starting from a structural system of undulating marks, I respond intuitively, collaging and building animated textural patterns. These patterns vibrate with motion, color, and are meant to provide an immersive experience through their optical physicality. Similar to the action of swimming, directional forces are at play, intersect, and break up with moments of activity and rest.

## **61. Kyle DeAnna**

### **Radicalization by Design: How social media design has created a new wave of extremism**

The psychology of hate and the causes of radicalization is a dense field of research, but a focus on design and images in this realm is lacking. Categorization of hateful images has been done by the ADL but deeper context around these images is also lacking. A synthesis between modern hate symbols, the means of distribution of these symbols, and an analysis of the mainstream acceptance of these images needs to be further studied in order to assess how design shapes these radical ideologies. I propose that my research will uncover the nefarious relationship between radical politics and design, specifically how design is being used to escalate far-right violence, radicalize moderates, and the creation of new and prevalent design symbols. My hope is that my research can be used to identify radicalizing tactics and perhaps learn counter tactics to subvert extremist intentions.

## **62. Joseph Young**

### **Allegiance by design: Visual identities in reference to political ideology and brand loyalty**

When Americans swear a civil oath upon that iconic symbol of red, white, and blue, we say the same words, but our perspectives are largely different. Our pledge of allegiance holds different meanings to different citizens of this nation. Social identity plays a key role in how we distinguish ourselves and others. The intersection of consumer choice and political ideology reflects aspects of a national identity. Leaning towards Conservative, Progressive, or Centrist ideologies can influence individual views towards visual appeal as well as their promotion of symbols and icons that represent them. At the end of this process individuals from different political organizations will be vetted based on a line of questioning and sought for further interviews. By investigating personal visual identities within a political sphere, we will begin to

understand how self-referential experiences form within group identities and how this relates to brand loyalty.

## **Poster Session 12**

### **Lifespan Development & Educational Sciences**

#### **63. Deborah Tyukodi**

##### **The Effects of Parent Implemented Language Strategies on Child Communication.**

Early Intervention is a broad scope of services provided to families and their children ages 0-3, who have developmental delays or a medical diagnosis. The role of the Early Intervention specialist is to coach families on evidence-based strategies that can be used throughout their daily routines to improve outcomes for their children and family unit. This study is a single subject, AB design that examined the effects of the family using language strategies in the natural environment on the child's functional communication. Data collection on parent intervention fidelity and child communication acts were observed through video-recorded sessions during home visits with the caregiver and primary service provider. Preliminary results indicate that parent implemented language strategies implemented in the home have a favorable outcome, showing an increase in expressive language skills with their child. The implications of this result are likely to show that parents interacting and modeling language strategies foster communication skills in children. Results from this study align with past research in that meaningful caregiver-child interactions are associated with increased functional communication in children. Interventionists should continue to provide evidence-based strategies through coaching to caregivers to support positive outcomes in language development.

#### **64. Bailey Zalar**

##### **The effectiveness of caregiver-implemented strategies to increase toddler functional communication**

Early Intervention is a service provided by the state to families with children under three years of age who exhibit delays and disabilities in various areas of development. Caregivers are, then, coached by professionals to use evidence-based strategies with their children. Because interventionists only see the child once every couple of weeks, caregivers learn how to implement these strategies to increase learning opportunities in the child's daily life. One large area of focus for many of these families is communication outcomes, especially in the realm of functional communication. The present study investigates caregiver use of evidence-based communication strategies and their effectiveness in increasing their toddlers' use of functional communication. The study is a single-subject, AB design that measures both the effectiveness of the caregiver's use of the strategies as well as child outcomes from baseline (A) to intervention (B). Data will be gathered through live and recorded tele-intervention sessions with the caregiver and child in which the caregiver will receive direct coaching on the selected strategy and will then use the strategy with the child. Based upon previous research, it is expected that caregiver implemented intervention, will increase the desired child outcome (i.e., functional communication).

## **65. Jamilia Bush**

### **The Effects of Parent Implemented Communication Strategies Across Routines on Child Communication.**

Early intervention serves children from birth to age three who have disabilities or delays. These delays may affect the child's communication and language development. Families frequently report challenges such as not being able to understand their child's wants and needs. Early Intervention capitalizes on learning opportunities that exist throughout the child's day by coaching parents and caregivers on communication strategies that they can use in their natural environments. This single-subject AB research design examined the effects of an evidence-based communication strategy used by caregivers on the child's communication attempts across daily routines. The parent received explicit instruction during teleintervention sessions to ensure the strategies were implemented accurately. Sessions video recordings were reviewed with parents to reflection on strategy fidelity. Through the recording of tele-intervention sessions, baseline and intervention data was collected and analyzed. It is expected, in alignment with past research, parent implemented communication strategies will support effective child communication.

## **66. Madeline Quinn**

### **Parent-Implemented strategies for children who are considered late talkers**

Early Intervention is a program for children with disabilities from birth to 3 years of age that enhances parents' knowledge of how children grow. EI professionals coach families on evidence-based strategies that parents can use with their children throughout daily interactions. One of the biggest disconnects in the field of Early Intervention is translating research into understandable, accessible and useable information for parents. Having parent-implemented strategies to address speech delays is critical in the field of Early Intervention, as these impairments effect parent-child communication each day. This single-subject, A-B design study looked at strategies that parents can use in natural environments to support children with speech delays to communicate effectively. Through a synthesis of research, this study replicated strategies that promote joint imitations (IV) to increase motor control for speech sounds (DV) in children with speech delays. Data was collected through video recordings of the parents and their children through weekly teleintervention sessions. Results indicated a positive effect of joint imitation on overall production of speech sounds and an increase in child communication. The implications of study suggest that strategies for improving child communication can be implemented by parents in naturalistic settings when given appropriate coaching by Early Intervention professionals.

## **67. Mary Le Rouge**

### **Embodied Cognition and Metaphor in Public Responses to a Proposed Wind Farm and its Relevance for Technical Communication**

This poster is theoretically based in the embodied cognition posited by Varela and colleagues and evidenced through the linguistic metaphor systems outlined by George Lakoff and Mark Johnson (1980).

It is supported by primary research conducted in 2019 on public responses in Northeast Ohio to a proposed offshore wind farm on Lake Erie, the pilot Icebreaker Wind project. Evidence that participants preferred to explore relationships with the wind farm through embodied experience is shown through their use of anthropomorphism and personification with metaphor when describing nonhuman aspects of the project such as the Earth, mechanical objects of the wind farm, Lake Erie, and birds through surveys, oral interviews, and drawings. Embodied cognitivism allows us to evaluate the types of memories and second-hand knowledge that participants shared in their surveys and interviews that lead to some common structural formulas that they used to understand and communicate about technical environmental documentation. These findings point to ways that technical documentation can be improved to better communicate with the public through embodied representations of environmental issues that are constructed with prototypical metaphors.

#### **68. Paige Graham**

##### **The Effects of Parent-Implemented Milieu Strategies Used Throughout Their Daily Activities on Child Engagement**

The field of Early Intervention provides services and support to families with infants and toddlers who have developmental delays or disabilities. In Early Intervention, the provider coaches the caregiver on evidence-based strategies that they can use in natural environments to help their child grow and develop. This single-subject AB research design examined the effects of caregivers' use of milieu teaching strategies that included joint attention, following the child's lead, mand, time delay, and feedback on child engagement during interactions across their day. The parent's strategy use was evaluated for fidelity using video self-reflection and feedback at each session. Data was collected and analyzed through session recordings and findings will be shared during the poster session. This study is anticipated to replicate current research findings that parents can implement evidence-based strategies within their daily routines and enhance their child's engagement.

#### **69. Kimberly Travers**

##### **The Development and Examination of an Assessment Tool to Increase Early Intervention Professionals' Quality in Writing Family Outcomes.**

The Individualized Family Service Plan (IFSP) is the cornerstone of family involvement and the plan for Early Intervention (EI) services. The child and family-directed outcomes are described and measured according to the IFSP. However, professionals are not always writing these outcomes in a manner that is measurable or meaningful. Having simple tools that will support professional competency is critical for the continued advancement of quality IFSPs. Therefore, a repeated measures group design examined the effectiveness of the Family Level Outcome Assessment Tool (FLOAT) online training (IV) on participants' FLOAT and EI competency rating scores (DV). Data analysis of descriptive statistics of mean, median, and mode of participants' rating scores and repeated measures ANOVA to examine for effects across time on gain scores of the FLOAT and competency matrix will be presented. It is predicted that there will be a significant difference between pretest and posttest ratings.

## **70. Shannon Lutz**

### **Exploring students' use of online platforms and tools used for their composing practices**

The purpose of this study is to gain information regarding how (and if) Kent State students are using The Student Guide to College Writing I & II website that is a requirement for College Writing I and College Writing II courses, as well as to inquire whether students use other online resources and/or posing questions to their College Writing instructors. The Student Guide to College Writing I & II is a website with helpful information about college writing practices, conducting research, grammar, resources available to them on campus, etc. The Student Guide to College Writing I & II is updated weekly, as we are continually looking for ways to develop the website further. We intend to use information from this study to help inform us on other ways that we may be able to improve the website. In addition, we are interested in learning how students in College Writing courses use other online platforms to find answers to their writing questions. And lastly, we would like to include questions that inquire about their level of comfort in approaching/contacting their instructor for writing questions that they may have. The overall goal of this study is to better understand students' use of The Student Guide to College Writing I & II and how we may enhance the website, but we would also like to understand how we might help enhance students' autonomy in their role as college writers who produce work at a level that is appropriate at an academic level. We believe that, particularly at this time when students have acclimated to remote learning, students' use of online practices could help us to better understand what we have done well in The Student Guide to College Writing I & II and what we can improve upon to best assist college writing students.

## **71. Shayleigh Holbrook**

### **The effects of parent implemented Milieu teaching strategies on child communication**

Early Intervention serves the families of infants and toddlers with developmental delays in a natural context. The goal of Early Intervention is to build parents' capacity to interact with their child in a way that promotes engagement and overall development. EI professionals coach families on strategies they can use in their natural environment so parents can implement the strategies across generalized learning opportunities and routines. This single subject, A-B research design examined the effects of milieu teaching strategies implemented by parents on the functional communication attempts by the child. Data was collected through recordings during tele-intervention sessions and coded for child acts. Intervention fidelity was monitored by coaching parents on the strategies and using video recordings for self-reflection on intervention accuracy. The results are expected to replicate current research in demonstrating that parent implemented strategies that are embedded across daily routines can have a positive effect on child communication.

