32nd ANNUAL BROOKLYN COLLEGE SCIENCE DAY

Brooklyn College Science Day is sponsored by the NIH MARC/U-RISE, NIH BP-ENDURE, NIH SURGE, NYS CSTEP, and the office of the Dean of the School of Natural and Behavioral Sciences.

PROGRAM

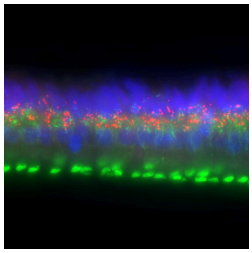
9:30 AM	POSTER SETUP (Student Center)
10:00 AM	STUDENT PRESENTATIONS AND JUDGING (2nd floor)
12:15 PM	LUNCH IN THE GOLD & MAROON ROOMS (6th floor)
12:30 PM	WELCOME AND REMARKS
	PRESENTATION OF AWARDS Undergraduate (UG) Division Graduate (GR) Division

ALL ARE INVITED TO LUNCH IN THE GOLD & MAROON ROOMS

Thanks to the staff of the Brooklyn College Student Center and the office of Government and External Affairs for their assistance

Cover Photo provided by Paul M. Forlano, Ph.D.

Oyster toadfish by PhD student Kelsey Hom



Cover Photo provided by Paul M. Forlano, Ph.D.

"Photomicrograph of sensory hair cells of inner ear of the plainfin midshipman fish (showing specialized ribbon synapses in red) by undergraduate Kobi Kobi"

BIOL - 100 THE POTENTIAL ROLE OF *L. MINOR* IN BIODEGRADATION OF MICROPLASTICS

Ayesh Ali (UG), Paula Khrom, Irene Lesyuk, Brooklyn College

Microplastics (< 5 mm in size) are considered freshwater pollutants of emerging concern. They come from the production and breakdown of multiple plastic sources which are used daily. These microplastics are not easily biodegradable and pose a threat to our environment. Microplastics can be found in soils, oceans, lakes etc. However, it was found that microplastics can be colonized by biofilm forming organisms, forming its own ecosystem called plastisphere. This opened the exciting possibility of microplastics entering the food chain and being consumed by the microorganisms living on it. The capacity of *L. minor*, commonly named duckweed, to adsorb nanoparticles has been extensively studied in recent years.

In our experiment we are studying the potential for biofilm formation on microplastics by bacteria, isolated from the duckweed microbiome. The bacteria grow in rich media for 24 hours, after which the concentration is measured using a spectrophotometer. A specific concentration is calculated for the preparation of ecoplates. The 96-well plates are loaded with LB/Hoagland's media + bacteria. The plates are left for 24 hours and are then stained with crystal violet and checked for the presence of bacteria using the microplate reader. We are testing which bacterial strains can thrive in plastic well plates and grow into biofilms. Bacteria, which grow together in a sticky, slimy biofilm can be implicated in biodegradation of the plastic.

The bacterial strains that show the highest biofilm adherence rate are tested using the small microplastic beads.

Since *L. minor* is prevalent in freshwater environments, its role in phytoremediation can have a significant impact on the environmental fate of microplastics.

BIOL - 101 THE EVOLUTIONARY ROLE OF PROLACTIN IN PREGNANCY OF THE MALE PIPEFISH

Mitchell Borshch (UG), Tony Wilson, Brooklyn College

Prolactin (PRL), fittingly dubbed "the hormone that does everything", is a hormone implicated in over 300 different functions. The mechanisms of PRL in mammals are well understood (most notably mammary gland milk production), though this is not the case in aquatic species. Directing research efforts to seahorses and pipefish, a group in which the male bears the young and where PRL has been shown to play an important role during pregnancy, helps to provide a foundation for a more complete evolutionary analysis of PRL function. We are validating antibodies for PRL and its receptor (PRLR) via western blotting and will quantify the levels of these proteins in the pituitary, gill, and brood pouch tissues during different stages of pregnancy using immunohistochemistry (IHC), in situ hybridization (ISH), and RNAScope, a recently developed RNA in-situ hybridization technology allowing for simultaneous signal amplification and background suppression.

BIOL - 102 BREAST CANCER BIOINFORMATICS: UNTANGLING THE ROLES OF NUCLEOLIN AND BRCA1 IN DYSREGULATED DNA REPAIR

Nitu Farhin (UG), Andy Lam, Anjana Saxena, Shaneen Singh, Brooklyn College

Nucleolin (NCL) and breast and ovarian cancer susceptibility genes (BRCA1) are known to play significant roles in the DNA repair pathway and are found to co-localize in breast cancer. However, how NCL and BRCA1 collaborate to mobilize the complex mechanism of DNA repair under stress conditions is not yet clear. To address this, we conducted an analysis of the protein-protein interactions between NCL and BRCA1 using various databases (NIH PPI Database, IntAct, STRING, BioGRID, GeneMania, PrePPI, and Mentha). Our analysis revealed an overlapping interactome of 47 proteins that interact with both NCL

and BRCA1. We conducted further analysis of the domain architecture to locate a set of proteins that have common domains that interact with NCL in breast cancer and commonalities within GO functional annotations. We found that the BRCT 1 and 2 domains exist in BRCA1, MDC1, NBN, TP53, leading to our hypothesis that these BRCT domains interact with NCL. These four proteins are known to code for DNA repair. In our previous research, we have successfully modeled the RNA-binding domains (RBD) of NCL and have delineated the binding interfaces between NCL-RBD and miRNA specifically dysregulated in breast cancer using computational approaches. In this study, we have modeled the full length of NCL to provide a complete structural representation of the protein. We also present predicted interaction scenarios and a detailed description of the interaction interfaces between NCL and proteins involved in DNA repair processes identified in the subset of overlapping interactome of NCL and BRCA1. This preliminary research provides a basis for creating in silico models to further understand the protein complexity of damaged DNA, and identify candidates that can be targeted in breast carcinoma.

BIOL - 103 IMMUNE MEMORY RESPONSE IN SEAHORSES AND PIPEFISH

Meriem Guettatfi (UG), Anthony Wilson, D'vorah Nelson, Brooklyn College

The genetic structure of the adaptive immune system in syngnathid fishes (seahorses and pipefish) differs dramatically from other vertebrates, with seahorses carrying a minimal MHC II system, while Syngnathus pipefish have lost these genes, thought to be essential for adaptive immune memory. As these species still appear to mount a robust response to immune challenge, this suggests that they may have evolved alternative mechanisms of immune protection. In order to explore immune function in this group, we are developing monoclonal antibodies for syngnathid immunoglobulins using a hybridoma system. Preliminary screening suggests that several of our candidate hybridomas bind immunoglobulins from both seahorses and pipefish. We are validating these candidates using western blotting and immunohistochemistry, and if successful, will be using these new antibodies to assess immune activation and memory in this unique model of immune memory.

BIOL - 104 DO SEX STEROID HORMONES REGULATE SYNAPTIC RIBBONS IN THE SENSORY HAIR CELLS OF PORICHTHYS NOTATUS (PLAINFIN MIDSHIPMAN)?

Kobi Kobi[1] (UG), Yassir Azzam[1], Jonathan T. Perelmuter[2], Joseph A. Sisneros[3], Paul Forlano[1]
[1]Brooklyn College
[2]Cornell University
[3]University of Washington

Developmental and hormonal changes in hearing are documented in several vertebrates including humans; however, the mechanisms and structures that mediate changes in hearing are less understood. The plainfin midshipman is a seasonally reproducing, vocalizing fish with robust hormone-driven changes in peripheral auditory sensitivity that enhance the detection of mating calls- a great model to study the mechanisms underlying auditory plasticity. Levels of testosterone and estrogen peak during the pre-nesting spring months and experimental treatment of testosterone and estrogen in winter, non-reproductive females mimic seasonal increases in high frequency encoding and overall sensitivity of the inner ear found in summer reproductive females. Using electron microscopy, we recently found a seasonal increase in hair cell synaptic ribbons in summer females. These specialized structures play a critical role by a fast transmission of auditory information to the brain, but synaptic ribbon regulation is poorly understood and no previous studies have shown the effects of sex steroid hormones on ribbon regulation. Here, we are testing whether this seasonal change in number of synaptic ribbons is mediated by sex steroid hormones. Testosterone, estradiol, or control silastic capsules were implanted into ovariectomized, non-reproductive winter females for 4 weeks. Saccules were collected and processed for

immunohistochemistry to label for synaptic ribbons. Images were taken on an epifluorescence microscope at a 60x magnification and changes in synaptic ribbon number, size, and intensity were quantified. We observed an inverted U-shape relationship between T levels and synaptic ribbon number with our data, but a larger sample size with variable T levels can further support this finding.

BIOL - 105 IN SILICO IDENTIFICATION AND CHARACTERIZATION OF PH DOMAINS IN CHLAMYDOMONAS REINHARDTII.

Marina Krupitskaya (UG), Brooklyn College

The Pleckstrin homology domain (PH domain) is a small protein domain commonly found in eukaryotic signaling proteins, generally involved in targeting proteins to the appropriate cellular location or in the interactions with a binding partner. Some of the diverse functions of the PH domain family include the ability to bind phosphoinositide phosphatase with high affinity and specificity. This binding function is achieved by recognition of vicinal phosphate groups: PtdIns(3,4)P2, PtdIns(4,5)P2 or PtdIns(3,4,5)P3, which results in targeting some PH domain containing proteins to the plasma membranes. Cellular signaling proteins that contain PH domains are serine/threonine kinases, tyrosine kinases, regulators of G-proteins, endocytotic GTPases, adaptors, cytoskeletal associated molecules and lipid associated enzymes. PH domains represent the 11th most common domain in the human proteome, but it is not well studied in other model organisms. Chlamydomonas reinhardtii is a model organism used for studying photosynthesis, cell cycle control, cilia structure and function, genome sequencing. The goal of this study is to identify all PH domains in C. reinhardtii proteins with the use of bioinformatic methods. We have identified 10 protein sequences containing PH domains so far from various databases. Domains, primary, secondary, tertiary structures were predicted. We have modeled and evaluated these PH domains. Our biophysical characterization provides a comparison of the structures and functions of PH domains in C.reinhardtii with those of human and other known PH domains to define putative functions for the identified domains. The long term goal of this study is to correlate the characterized PH domains with the physiology, and patterns of their expression in C. reinhardtii.

BIOL - 106 PARENTAL NUTRIENT INVESTMENT IN PIPEFISH

Laura Kuksa (UG), Anthony Wilson, Brooklyn College

Seahorses and pipefish are unique because the females deposit their eggs into the male brooding pouch during mating. The males then carry the eggs to term, allowing the fry to develop and grow before being released as free-living juveniles. This creates that opportunity for both male and female energetic investment in developing offspring, something that may be responsible for the high intensity of female mating competition in this system. In order to assess relative parental investment during the reproduction of Syngnathus fuscus, we will measure the concentrations of carbohydrate, lipid, and protein in both unfertilized eggs and newly released juveniles. We are currently optimizing the methods for measuring the concentration of macromolecules in S. fuscus, using standard solutions and freshly stripped eggs to develop standardized experimental protocols for assessing relative parental investment in this system.

BIOL - 107 EFFECTS OF ANTHROPOGENIC NOISE ON OPSANUS TAU (OYSTER TOADFISH) CALLING BEHAVIOR IN NEW YORK CITY

Xylo I. Lazrinth[1] (UG), Rachel D. Rodriguez[1], Sydney G. Gdanski[1], Rebecca Jones[2], Kelsey N. Hom[1], Thomas Quigley[1], Paul M. Forlano[1]
[1]Brooklyn College
[2]Saint Mary's College

The oyster toadfish (Opsanus tau) is a species of fish dependent on acoustic communication for reproductive success, with males producing an advertisement call known as a "boat whistle" to attract females during breeding season. Anthropogenic noise, such as boat noise, has the potential to interfere with this communication. Data were collected from their natural habitat in two separate locations in New York City, Pier 40 at Hudson River Park and Sheepshead Bay, to explore the relationship between boat noise and calling behavior. Given differences in boat activity between the two locations, we predicted that the level of boat noise and quantity of calls would vary, with noisier conditions resulting in fewer calls. We expected Pier 40, experiencing heavier boat traffic and thus potentially more boat noise, to have a lower call rate. Using hydrophone recordings, number of toadfish calls and duration of boat noise events in seconds were counted over a period of 2 minutes for every hour of the day. Linear regression and t-tests were used to correlate hourly proportion of noise to hourly number of calls and compare mean calls per 2 minutes and mean seconds of noise per 2 minutes, respectively. We found that calling behavior at Sheepshead Bay was consistent with previous studies, peaking around sunset and sunrise. However, we also found variation in the noise level and relationship between nose and calling between the two locations. Sheepshead Bay experienced more noise, and there was an inverse relationship between calling and noise at Pier 40, while Sheepshead Bay exhibited the opposite effect. While more analysis is required to assess changes in calling behavior, this study provides valuable insights into potential effects of anthropogenic noise on the behavior of O. tau.

BIOL - 108 A COMPUTATIONAL STUDY OF THE ROLE AND STRUCTURE OF BAR DOMAIN PROTEINS IN ARABIDOPSIS THALIANA

Irene Lesyuk (UG), Brooklyn College

The BAR domain superfamily is a specialized protein domain family found in several intracellular signaling proteins, with a structural fold that is involved in selectively binding to and curving the plasma membrane from within a cell. The BAR domain shapes and reconstructs the membrane, as well as aids in the recruitment and attachment of proteins to the membrane. BAR domains have positive residues on their surface that interact with negative charges on the phospholipid head groups of the inner plasma membrane. The functional unit is a crescent shaped dimer that is composed of two identical monomers, each of which takes on a tri-helical structure. The BAR monomers self-assemble on the plasma membrane into a stable dimer form. No structure of a BAR domain has been solved for any plant, and their functions therein are largely unknown. Given the vitality of BAR domains to eukaryotes, the aim of our study was to model all the BAR domains within Arabidopsis thaliana - a well-studied model organism for dicot plants - and derive their possible functions. Canonical BAR domain structure and function is expected, as well as motifs unique to plants. We have located several protein sequences of Arabidopsis in the online databases that fit the motif of the BAR domain superfamily. The work in progress presented here focuses on analyzing motifs in these sequences and modeling each of the probable BAR sequences into their monomer forms. Then, we can model the functional dimers, and characterize them with respect to their biophysical features. The comparison of these results to solved BAR domains found in humans will offer putative functions for each Arabidopsis BAR domain.

BIOL - 109 DOPAMINE SYNTHESIS IN THE INNER EAR OF A VOCAL FISH UNDER SALIENT AND NOISY ACOUSTIC CONDITIONS

Fiona Lin (UG), Kelsey N. Hom, Paul M. Forlano, Brooklyn College

While many rodent studies have demonstrated that dopamine in the inner ear plays a neuroprotective function under noise-induced trauma conditions, a function for inner ear dopamine in the context of naturalistic acoustic conditions is largely unexplored. Previous studies on the plainfin midshipman, a vocal fish, have shown that dopamine in the inner ear's saccule decreases in the reproductive season and an increase in hearing sensitivity. Like midshipman, oyster toadfish (Opsanus tau) is a great model to study the effects of dopamine in inner ear function because they depend on acoustic signals, such as reproductive calls, called "boat whistles", to find mates. Also, oyster toadfish inhabit loud NYC waters, thus allowing us to examine a fish that must identify social acoustic signals in a noisy environment. In the present study, oyster toadfish were exposed for 30 minutes to one of four conditions: 1) ambient noise control, 2) brown noise (noise within the hearing range of the toadfish), 3) boat whistles, or 4) a combination of boat whistle and brown noise. Tyrosine hydroxylase (TH), is the rate limiting enzyme in dopamine synthesis. We also performed immunohistochemistry for phosphorylated TH (pTH-ir) because phosphorylationa activates TH. After sound exposure, saccular epithelial tissue was collected, sectioned, stained for pTH-ir and TH-ir, and imaged on a confocal microscope at 120X. Using ImageJ, we quantified the number, area, and intensity of dopamine release sites (pTH-ir/TH-ir puncta). We predict that dopamine synthesis and release would increase under noise conditions but decrease when exposed to the boat whistle without noise. This study may provide insight into the functional role of dopamine in the inner ear in the context of social communication.

BIOL - 110 DUCKWEED MICROBIOME COLONIZATION SOURCE

Ruth Y. Medrano (UG), Irene Lesyuk, Theodore Muth, Brooklyn College

The interaction of the microbial community with plants is an essential part as they benefit from each other such as in the case of duckweed (aquatic plant). Duckweed is a plant that facilitates the understanding and the study of microbial community interaction because it contains special characteristics, such as the small size that makes it easier to keep it in the lab and rapid development as it grows. Duckweed serves as a model system to study the microbial community. We hypothesized that the duckweed will be colonized by bacteria found in the donor sources exposed. Soil, dust, and leaves are the microbiome sources in this experiment. These sources contain a variety of bacteria. We have considered the importance of the microbiome community attached to the duckweed as it looks to be a potential tool for bioremediation of contaminated waters. Duckweed is not expected to be a selective plant for microbiomes to colonize and interact with.

BIOL - 111 A COMBINATION OF ACTIVE PHARMACEUTICAL INGREDIENTS (API) TO PREVENT HSV-2 AND CHLAMYDIA TRACHOMATIS INFECTIONS

Abigail Meyer[1] (UG), Osaretin Asowata[2], Natalia Teleshova[2], Jose Fernandez Romero[3]
[1]Brooklyn College
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[3]Borough of Manhattan Community College

Herpes simplex virus type 2 (HSV-2) is a viral infection that affects millions of people across the globe, and while treatments for herpes infections are available, there is, as of yet, no cure for the illness nor a vaccine. Though many infections are symptomatic, and symptoms can be mild even when they appear, they bring risks of neuroinflammation and increase in susceptibility to HIV. Chlamydia trachomatis, an

obligate intracellular bacterial pathogen, similarly infects large swaths of the population, increases susceptibility to HIV, and is one of the leading causes of infertility. Previous research has shown that metal compounds and an organic acid can inhibit viruses and bacteria, though a preventative treatment for herpes or chlamydia incorporating these APIs has not yet been developed. This study found that a combination cocktail of three compounds—whose identities have been concealed due to the unpublished nature of this research—exhibited virucidal activity against HSV-2 in Vero cells using a plaque-assay method. In conditions most resembling sexual HSV-2 transmission with the addition of human biological fluids (seminal and vaginal), the APIs on their own did not inhibit the virus; however, when added in combination, the compounds significantly inhibited the formation of viral plaques ($p<0.0001$). A similar pattern was found in an immunofluorescence assay challenging C. trachomatis with the same API cocktail: the compounds in combination effectively prevented the formation of bacterial inclusions within HeLa cells ($p=0.0001$) in the presence of biological fluids. These results indicate that an intravaginal antimicrobial device incorporating all three APIs may reduce the chances of HSV-2 and C. trachomatis infection.

BIOL - 112 ENVIRONMENTAL MICROBES AND ADAPTIVE GENETIC DIVERSITY IN HIPPOCAMPUS ABDOMINALIS

Nikita Ocean (UG), Jimiane Ashe, Anthony B. Wilson, Brooklyn College

Spatial variation in the distribution of environmental microbes is an underappreciated driver of vertebrate adaptive immunity, as hosts evolve to respond to the microbes dominant in their local environment. Previous research from our group has documented significant spatial variation in the distribution of marine microbes in nearshore environments impacted by human activities, and evidence that genetic variation of MHC Class IIα and β genes in the pot-bellied seahorse (H. abdominalis) is spatially structured over the species range. Using the functional supertyping of MHC genetic variation in wild-caught seahorses, we will test for statistical associations between MHC supertype and individual host microbiomes in natural populations. Statistical associations identified through this bioinformatic work will be experimentally tested in exposure trials on animals of known genetic background.

BIOL - 113 TRACKING LEMNA MINOR WITH ILASTIK AND TRACKMATE

Jacob Schlamowitz (UG), Christian Hoyer, Theodore R. Muth, Brooklyn College

TrackMate and Ilastik, are two tracking algorithms that have been used extensively as a tool to track eukaryotic cells, bacteria, and small organisms such as C. elegans as they grow, move, and divide. However, its use in tracking larger organisms has scarcely been investigated, and, as such, this research project aims to test the utility of using TrackMate and Ilastik to track larger organisms. Specifically, we wanted to track Lemna minor, a common duckweed species that has been shown to have the potential for bioremediation in polluted waters due to its microbiome. A time-lapse camera was used to record L. minor and the videos were analyzed via the two tracking algorithms to track movement, divisions, and growth of the duckweeds. Duckweeds were grown in differently colored boxes and wells and placed against differently colored backgrounds in order to find which combination yielded maximal contrast between the duckweed and its environment. Furthermore, using its machine learning algorithm, we trained Ilastik on a variety of different time lapses in order to produce a better segmentation and object classification algorithm than TrackMate. The utility of using TrackMate and Ilastik to track large populations of duckweed is still being investigated; however by using the detection algorithm along with filtering of the image on imageJ and Ilastik we have successfully tracked smaller populations of duckweeds. This technique, when perfected, has a variety of applications that can be used in future

experiments which includes investigations on how microbiomes of an inoculated duckweed spread throughout a population of sterile duckweeds.

BIOL - 114 FEMALE FEEDING DYNAMICS OF SYNGNATHIDAE

Odaine A. White (UG), Anthony B. Wilson, Brooklyn College

Female pipefish (Syngnathus spp.) are known to be more competitive than males during mating, and continue to actively feed after reproduction when the feeding behavior of pregnant males is reduced. As efficient resource acquisition after mating allows females to quickly replenish their energy stores, individuals that are able to successfully compete for resources are expected to have a significant fitness advantage. Our study aims to quantify behavioral variation during feeding in order to identify whether feeding hierarchies exist in the pipefish system. Individually-tagged pipefish are tracked during feeding using an automated video recording system, providing information on feeding behaviors including aggression, order, and tank placement. Experimental manipulation of experimental tanks will be used to assess the stability of dominance hierarchies over time, and how individual feeding behavior changes under different conditions of competition.

BIOL - 200 IN SILICO STUDY OF NEK10 AND ITS PROTEIN-TO-PROTEIN INTERACTIONS

Andriele Dos Santos Silva[1] (GR), Igor Semchenkov Pastukhov[1], Shaneen M. Singh[1,2]
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Cancer is the 2nd leading cause of death globally and the number of new cancer cases is expected to reach 27.5 million by 2040. Proteins that regulate the progression of the cell cycle are targets in cancer therapy because aberrant regulation of the cell cycle, mainly at the checkpoints, allows cells to accumulate DNA errors and continue to grow. The eleven members of the human NIMA-related kinases are a group of protein kinases that regulate the cell cycle and its checkpoints. NEK10 is the most divergent member of the NEK family and has been linked with melanoma, breast cancer, and ciliopathies. It is unique in having a centrally located catalytic domain flanked by two coiled-coil domains, as opposed to the N-terminal location of the catalytic domains in other NEKs. Despite its unique domain architecture and biological significance, it remains largely unexplored, particularly in terms of structural information and structure-function relationships. To bridge this knowledge gap, we have modeled and characterized the full-length NEK10 protein, revealing two unreported putative ubiquitin interaction sites (UBA domains). We also show interactions between NEK10 and the known cancer-causing protein MAP3K1 and HSPB1. Our docking analysis shows that I693 of NEK10's kinase domain interacts with the well-known phosphosite S275 of MAP3K1. HSPB1 is linked to poor clinical outcomes in several cancers. Our docking analysis suggests that the armadillo repeats of NEK10 may be needed for its interaction with HSPB1, where H301 of NEK10 forms a salt bridge with I179 of HSPB1, within a known protein-protein hotspot of HSPB1. Our findings lay the basis for elucidating the detailed molecular mechanisms of NEK10 interactions with other proteins to further study its therapeutic potential.

BIOL - 201 INVESTIGATING THE ROLE OF PP1β IN REGULATING NUCLEOLIN (NCL) SUB-CELLULAR LOCALIZATION AND FUNCTIONS DURING THE CELLULAR RESPONSE TO UV STRESS

Hanjun, Jeon[1] (GR), Kiroulos Sidra[1], Jessica Bergman[1], Jason Rivera[1], Max Kogan[2], Rebecca Yakobovich[2], Anjana Saxena[1,3]

[1]Brooklyn College

[2]Brooklyn Technical High School

[3]CUNY Graduate Center

Nucleolin (NCL) is a multifunctional nucleolar phosphoprotein involved in various cellular processes, including ribosome biogenesis, chromatin remodeling, DNA damage response (DDR), and the regulation of gene expression at transcriptional and translational levels. Post-translational modification (PTM) critically modulates NCL localization and its interactions with mRNA targets as well as other proteins. In this study, we explore different genotoxic stress and metabolic conditions when NCL translocates from nucleoli to nucleoplasm and even to the cell surface. We focus on NCL phosphorylation, which changes during the normal cell cycle and is implicated in sub-cellular localization upon DNA-damaging stimuli (e.g., UV stress) as well as in its binding to mRNA targets involved in the DNA damage response (DDR). Protein phosphatase 1 beta (PP1β), on the other hand, is a promising candidate that regulates NCL dephosphorylation, as it has been known to co-localize with NCL and proteins involved in DDR. Our preliminary results suggest that NCL at T76 is dephosphorylated upon UV stress. Treatment with phosphatase inhibitors, such as calyculin A (which targets both PP1 and PP2A) and okadaic acid (which targets PP2A but not PP1), further reveals the potential role of PP1 in NCL-mediated DDR. We aim to investigate the interplay between NCL and PP1β under normal cellular conditions and in response to UV damage. The goal is to understand the role of PP1β in the regulation of NCL phosphorylation, subcellular localization, RNA-binding functions, and control of gene expression during stress responses. A comprehensive understanding of phosphatases, particularly PP1β, in the regulation of NCL will contribute to insights into cellular responses to UV damage and other DNA-damaging agents.

CHEM - 115 DEVELOPMENT OF PLATINUM(IV)-GOLD(I) MODIFICATIONS AS POTENTIAL CHEMOTHERAPEUTICS AGAINST CISPLATIN-RESISTANT OVARIAN CANCER

David Aini (UG), Javier E. Lopez-Hernandez, Maria Contel, Brooklyn College

In 2021 over 1.8 M cancer cases were estimated in the U.S., from which 32% resulted in death.[1] Genitourinary cancers such as renal, bladder and ovarian, are very difficult to treat and constitute about 10% of new patient cases in the US and for these cancers, the patient mortality rate is estimated to be 25% (with considerable health disparities depending on ethnicity and socioeconomic status).[1] Cisplatin is currently used to treat of 40-80% of cancers (alone or in combination therapy) despite its narrow spectrum of activity limited to specific cancers.[2] In general, FDA approved platinum(II) agents (including cisplatin) are part of the primary current treatments in bladder and ovarian cancers. However, there are still issues with loss of activity, resistance, high toxicity, and efficacy in patients. Therefore, FDA-approved checkpoint PD-1/PDL-1 inhibitors are currently used in bladder and renal cancers but they are not efficacious for all patients, are commonly used in combination therapy and are very expensive for low-income and underrepresented communities.[3] The lack of drugs targeting these cancers calls for a real need of more affordable and effective chemotherapeutic treatments yielding significantly lower to zero-toxicity. Our group has developed heterometallic gold-based compounds with different metal centers (titanium and ruthenium) with very high efficacy in renal cancer with almost no systemic toxicity.[4] The overall goal of this project is the development of platinum (IV)-gold(I) modifications for the treatment of cisplatin-resistant ovarian cancer using as model platinum (IV)-gold(I) heterometallic compounds recently developed against triple negative breast cancer (TNBC) in our laboratory.[5]

CHEM - 116 CONTEXTUALIZING THE ROLE OF THE HISTONE METHYLTRANSFERASE ΔSET2 IN C9ORF72-BASED ALS PATHOLOGY

Kaitlyn Chan (UG), Samantha Cobos, Mariana Torrente, Brooklyn College

Amyotrophic lateral sclerosis (ALS) is a neurodegenerative disorder associated with motor neuron deterioration. A hexanucleotide (GGGGCC) repeat expansion (HRE) in chromosome 9 open reading frame 72 (c9orf72) is a common genetic cause of ALS. Transcription and translation of the HRE can result in the formation of PRn (proline and arginine) dipeptide repeat proteins, which are neurotoxic and linked to protein aggregate formation in the cytoplasm of motor neurons. While genetics provide a baseline understanding of ALS pathology, epigenetics have vast potential in studying the onset and treatment of ALS. A key epigenetic mechanism involves the post-translational modification of histone proteins. Previous studies have found increased trimethylation of lysine residues on Histones H3 and H4 in the frontal cortices and cerebella of c9orf72-ALS patients. As such, we question the role of histone-modifying enzymes in the context of c9orf72-based ALS. Set2 is one such enzyme, a histone methyltransferase that controls two epigenetic marks—the dimethylation and trimethylation of lysine 36 on Histone H3 (H3K36me2, H3K36me3). Here, we exploit a Saccharomyces cerevisiae model of (PR)50 proteinopathy. Set2 deletion (ΔSet2) strains were transformed with either ccdb (control) or (PR)50 plasmids. Deletion of Set2 ameliorated the growth defect unique to (PR)50 overexpression in yeast compared to controls in a growth assay, hinting that Set2 may be involved in (PR)50 toxicity. Western blots probing for H3K36me2 and H3K36me3 levels in the ΔSet2 strains showed that H3K36me2 levels were decreased whereas H3K36me3 levels were increased in (PR)50 yeast relative to control strains. Such findings cast new light on the role of Set2 in c9orf72-based ALS and its potential as a therapeutic target.

CHEM - 117 A MILLION TIMES MORE ACIDIC? DFT PREDICTION OF PKA FOR MET+-TYR-TRP (M+YW) CROSSLINK COVALENT TRIAD FOUND IN THE ENZYME KATG OF MYCOBACTERIUM TUBERCULOSIS (MTB).

Ryan Chen (UG), Andrzej Jarzecki, Brooklyn College

The catalase-peroxidase enzyme KatG is a heme-dependent protein critical for the virulence of Mycobacterium tuberculosis (Mtb). Its catalase function is essential for its survival against oxidative stress from hydrogen peroxide in infected host cells, including human cells. The catalase activity of KatG is distinct from other catalases due to the presence of a unique protein-derived cofactor, the Met255+-Tyr229-Trp107 (M+YW) covalent triad, which is autocatalytically and post-translationally generated. Because of the M+YW cofactor, the catalase activity is four orders of magnitude more efficient than its peroxidase activity. Covalently bonded amino acid adducts are not commonly found in nature, and the M+YW triad remains among the most complex of those reported to date. However, the mechanism by which M+YW is formed and enables the catalase activity of KatG remains poorly understood. Additionally, the discovery of a new transitional form with a hydroperoxyl group bonded to the indole nitrogen (M+YW-OOH), deepens the mystery. Chemical characterization of both states should provide the first line of molecular understanding for its stability and reactivity.
To conquer this challenge, theoretical DFT studies of conformational flexibility were launched to examine the impact of the Tyr229 covalency on its protonation state (pKa). The mobile Arg418 residue was also explicitly modeled for study. This study will present the details of the employed computational strategy for the accurate prediction of phenol pKa values and its direct application to the KatG M+YW adduct and its significant structural variants. In addition, we will report on the stabilization caused by the mobile Arg418 in its 'on' versus 'off' positions.

CHEM - 118 EXPLORING THE EFFECT OF THE AURORA KINASE INHIBITOR BARASERTIB ON GROWTH SUPPRESSION IN A YEAST ALS MODEL

Gabriel Cruz[1] (UG), Michael Kozlov[1], Rianna Segal[1], Samantha Cobos[1], Mariana Torrente[1,2]
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Amyotrophic Lateral Sclerosis (ALS) is a fatal neurodegenerative disease characterized by motor neuron degeneration. Currently, ALS has no cure, and FDA-approved treatments fail to control symptoms. ALS is associated with various genes, most notably chromosome 9 open reading frame 72, or C9orf72. Hexanucleotide repeat expansions in the C9orf72 gene are the most common cause of ALS. These hexanucleotide expansions result in dipeptide repeat proteins, which aggregate into inclusions in the motor neurons of ALS patients. Exploiting a yeast ALS model overexpressing the dipeptide repeat protein PR50, comprising 50 repeats of the dipeptide Proline-Arginine under a galactose-inducible promoter, we found that overexpression of PR50 is associated with increased phosphorylation levels of Histone H3 on Serine 10 (H3S10ph). Furthermore, we found that knockdown of Ipl1, the yeast homolog of Aurora B Kinase responsible for H3S10ph in yeast, leads to decreased H3S10ph levels and growth rescue in yeast overexpressing PR50. Histone modifications are highly accessible targets for pharmaceutical intervention. Therefore, aiming to prevent H3S10 phosphorylation increases and ameliorate PR50 toxicity without the need for genetic manipulation, we investigated chemical inhibition of the yeast aurora kinase Ipl1 in cell survival in the context of PR50 overexpression. We performed serial dilution growth assays on PR50 yeast in the presence of the Aurora B Kinase inhibitor drug Barasertib at varying concentrations. After the chemical inhibition of Ipl1, we performed western blot analysis to observe changes in H3S10ph. Through inhibition of Ipl1 and growth rescue of PR50 yeast, we aim to establish the significance of epigenetic drugs in neurodegenerative disease treatment.

CHEM - 119 RRP5 AND NOP1 KNOCKDOWNS ALLEVIATE GROWTH SUPPRESSION IN A S. CEREVISIAE ALS/FTD FUS MODEL

Rania Frederic (UG), Samantha N. Cobos, Seth A. Bennett, Mariana Torrente, Brooklyn College

Amyotrophic lateral sclerosis (ALS) is a neurodegenerative disease that affects voluntary muscle movement. Due to an overlap in disease mechanisms, ALS is now thought to form a disease continuum with frontotemporal dementia (FTD), which destroys neurons in the frontal and temporal lobes of the brain. ALS/FTD is linked to many genetic mutations, making it challenging to elucidate disease etiology. Mutations in the fused in sarcoma (FUS) gene lead to misfolding and aggregation of the FUS protein in the cytoplasm, a frequent indicator of ALS/FTD pathology. As genetics are not enough to illustrate the role that FUS aggregates play in ALS/FTD pathology, we seek to explore the epigenetic channels related to protein aggregation. A main epigenetic mechanism involves the post-translational modification of histone proteins. A Saccharomyces cerevisiae FUS overexpression model revealed decreased levels of H3K9ac, H3K14ac, and H3S10ph. Here, we elucidate how the epigenetic landscape links to FUS proteinopathy. Co-immunoprecipitation paired with tandem mass spectrometry identified 39 putative FUS binding partners, including Rrp5 and Nop1. Rrp5 is a conserved rRNA biogenesis protein found in both humans and yeast that is crucial for the generation of mature 18S rRNA. Nop1 is a histone methyltransferase responsible for methylating H2AQ105. Here, we show that Rrp5 and Nop1 knockdown strains are resistant to growth suppression elicited by FUS overexpression. Decreased levels of Rrp5 and Nop1 do not prevent the decreases in levels of H3S10ph, H3K14ac, and H3K56ac connected to FUS overexpression. These findings reveal mechanistic insight tying FUS aggregation to the epigenome, expanding our knowledge of how FUS aggregates lead to toxicity in ALS/FTD.

CHEM - 120 UNCOVERING THE ROLE OF THE HISTONE ACETYLTRANSFERASE GCN5 IN A YEAST ALS MODEL.

Daniel Gorelik (UG), Chaim Janani, Samantha N. Cobos, Mariana P. Torrente, Brooklyn College

Amyotrophic Lateral Sclerosis (ALS) is a neurodegenerative disease affecting motor neurons. Symptoms include muscle atrophy and paralysis. Currently there is no cure for ALS. ALS is associated with chromosome 9 open reading frame 72 (C9orf72). Hexanucleotide repeat expansion G4C2 in the C9orf72 gene is the most common genetic mutation in ALS. These expansions create dipeptide repeat proteins, which aggregate in the motor neurons of ALS patients. Most ALS cases are sporadic, meaning they arise with no family history of ALS. As genetics alone do not explain ALS, the disease might have an epigenetic component. Post translational modification (PTM) of histones is an epigenetic mechanism where chemical moieties are added and removed from histones. PTMs are involved in control of gene expression and research has linked them to many diseases, including ALS.

With a yeast ALS model overexpressing the dipeptide repeat protein PR50 (50 repeats of Proline-Arginine) under galactose-inducible expression, we found that overexpression of PR50 is associated with increases in acetylation levels of Histone H3 on Lysine 9 (H3K9ac) and Histone H3 on Lysine 18 (H3K18ac). Both modifications are written by the histone acetyltransferase general control non-depressible 5 (Gcn5) which is a writer for both. Since Gcn5 is highly conserved in humans and yeast, it is a promising therapeutic target. We created yeast cells overexpressing PR50 in which the Gcn5 gene is deleted, resulting in knockout of the enzyme. By assessing the levels of H3K9ac, H3K18ac and the toxicity of PR50 in context of Gcn5 deletion, we hope to establish how, if at all, Gcn5 is involved in the epigenetics of ALS. From this, we can identify histone PTMs which can be modulated with epigenetic drugs to combat ALS.

CHEM - 121 C9ORF72 DIPEPTIDE REPEAT PROTEINOPATHY IN YEAST IS ACCOMPANIED BY ALTERATIONS IN HISTONES H3 AND H4 POST-TRANSLATIONAL MODIFICATIONS

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Amyotrophic Lateral Sclerosis (ALS) is an incurable neurodegenerative disorder characterized by progressive paralysis. While most cases have no known genetic component, the most common genetic cause for the disease is an accumulation of hexanucleotide repeat expansions in the C9orf72 gene which lead to the production of dipeptide repeat proteins. Among these, a proline and arginine (PR) repeat protein leads to cytotoxicity. To better understand how these dipeptide repeat proteins interact with the epigenome, specifically histone post-translational modifications (PTMs), we characterized histone PTM levels on various lysine residues on Histone H3 and H4 in the context of a yeast PR50 overexpression model. We find significant increases in the levels of H3K9ac and H3K27ac, as well as an increase in the levels of H4K16ac. Acetylation levels on other sites remain unaffected. In addition, we found significant increases in the levels of H3K4me1, H3K36me2, H3K36me3 and H3K79me3. We hypothesize that increased activity of the histone acetyltransferase GCN5 is responsible for enhanced acetylation of H3K9ac and H3K27ac. Along with the acetylation marks, all of the methylation changes are indicative of enhanced gene transcription. Overall, the results show that PR50 proteinopathy in yeast is connected to the epigenome. A better understanding of the epigenetic mechanisms at play in ALS may illuminate potential therapeutic targets for ALS and other neurodegenerative diseases.

CHEM - 122 HISTONE PTM CROSSTALK IN A YEAST ALS/FTD MODEL

Camille P. Reynoso-Fernandez (UG), Samantha N. Cobos, Rania Frederic, Mariana P. Torrente, Brooklyn College

Amyotrophic lateral sclerosis (ALS) and Frontotemporal Dementia (FTD) form a fatal, incurable neurodegenerative disease continuum involving the death of neurons. Previous work in our lab has discovered that epigenetic mechanisms -namely histone post-translational modifications (PTMs)- are connected to ALS/FTD. In particular, we have discovered that the levels of phosphorylation on Histone H3 on Serine 10 (H3S10ph) are increased in yeast models of the disease. The goal of this project is to examine histone PTM levels when Ipl1 (the kinase responsible for installing H3S10ph) is knocked down in yeast. We hypothesize that removing Ipl1 might affect the levels of H3S10ph and as well as other PTMs via crosstalk. Crosstalk between histone modifications occurs when a histone PTM modulates the status of another modification on the same or a different histone. H3S10ph is known to be involved in a few histone crosstalk examples, specifically with H3K9ac, H3K14ac, and H4K16ac. We hypothesize that we should also detect the levels of these PTMs decrease when Ipl1 is knocked down. We will test this hypothesis by way of immunoblotting. We hope that this research will expand our knowledge of epigenetic mechanisms in ALS/FTD and open new avenues for new treatments for this disease.

CHEM - 123 IMPORTANCE OF PEPTIDE IN THE FORMATION AND STABILITY OF POLY(LACTIC-CO-GLYCOLIC) ACID NANOPARTICLES IN CANCER THERAPY

Mohinur Shodieva (UG), Sylwia Dragulska, Maxier Acosta Santiago, Aneta J. Mieszawska, Brooklyn College

Peptides are interesting molecules that can be used for nanoparticle (NP) synthesis because they are long-term stable, can target specific areas, and have the ability to rapidly clear from the bloodstream. Peptide synthesis is a process of linking multiple amino acids through an amide bond. There are two

different approaches to chemical peptide synthesis: liquid-phase peptide synthesis (LPPS) and solid-phase peptide synthesis (SPPS). It is claimed that SPPS is superior to LPPS due to their ability to avoid side reactions that are protected by the resin, and they can easily be purified. Conversely, using LPPS are expansive, and they require the use of hazardous reagents and solvents. SPPS undergoes multiple steps of anchoring, deprotecting, cleavage, and purification to achieve the final product. This method is easy and fast in achieving a high yield of pure peptide. Herein, we describe the synthesis of triphenylphosphonate (TPP) attached to the amino sequence Lysine-Phenylalanine-Phenylalanine (TPP-KFF) peptide using the SPPS method, which is used as a coating for poly(lactic-co-glycolic) acid (PLGA) NPs (TPP-PLGA NPs). The peptides self-assemble on the NP's surface providing a coating, and TPP moiety targets the mitochondria. Additionally, NPs can encapsulate the anticancer drug for biological applications. Overall, we describe the process and importance of the short peptides in the synthesis of NPs and its role in stability and targeting of NPs.

CHEM - 124 NANOPRECIPITATION METHOD OF SYNTHESIZING POLYMERIC NANOPARTICLES FOR PHYSICOCHEMICAL CHARACTERIZATION AND BIOLOGICAL APPLICATIONS

Iman H. Siddiqui (UG), Sylwia Dragulska, Maxier A. Santiago, Aneta Mieszawska, Brooklyn College

Nanoparticles (NPs) are nanomaterials between 1 to 1000 nanometers in size that have recently become prevalent in the field of medicine. They can carry fluorescent dyes for diagnostic purposes or small molecule drugs for therapy. The NPs have various features that increase their efficacy; for example, they can target cancer cells, protect the drug from enzymatic degradation, and release the drug in a controlled manner at the diseased site.

Herein, we report a NP with a poly(lactic-co-glycolic) acid (PLGA) core stabilized by short peptides self-assembled on the NP's surface. The peptides also allow active targeting of the NPs to cancer cells and provide their long in vivo circulation. In this study, three NPs were synthesized using the nanoprecipitation method. A NP with a plain PLGA core (PLGA NP) was synthesized for physicochemical characterization: such as hydrodynamic diameter by dynamic light scattering and transition electron microscopy (TEM), solubility, stability, and zeta potential. A fluorescent nanoparticle, PLGA-Cy7 NP, which emits in biologically relevant wavelengths (above 700 nm) was synthesized for purposes of biological imaging. Finally, a Pt/PLGA hybrid NP encapsulating platinum agent was synthesized for purposes of biological therapy, which is beneficial when targeting cancer cells and inducing apoptosis. In summary, we describe the nanoprecipitation method of synthesizing polymeric NPs for physicochemical characterization and biological applications.

CHEM - 125 EXTRACTION OF ACIDS FROM AQUEOUS PHASE TO NONSTOICHIOMETRIC PSEUDOPROTIC IONIC LIQUIDS

Rebecca T. Turay (UG), Mark N. Korbrak, Brooklyn College

Nonstoichiometric pseudo-protic ionic liquids (NPILs) are a recently-emerged class of compounds with novel physical properties. Their classification stems from nonvolatile liquids made of ions called ionic liquids. Furthermore, protic ionic liquids (PIL) contain ions obtained from a proton transfer between an acid and base. We report a study of acid extractions from an aqueous phase to a NPIL consisting of different mole ratios of organic bases to carboxylic acids. Our results show that the NPILs form a separate phase with water and extract acid to neutralize an acidic aqueous phase. This is consistent with a previous paper where NPILs created a floating two-phase system with characteristic mechanisms of the Hofmeister effect. We saw that the effect of salting influences the extraction capacity of the organic phase and its ability to alter pH. We observed that three-phase systems are created when using NPILs

containing non-tertiary amines. The results are consistent with recent research into molecular interactions between carboxylic acid and amine systems.

CIS - 126 A STRATIFIED ANALYSIS OF TREE-BASED JUST-IN-TIME SOFTWARE DEFECT PREDICTION MODELS

Jordan E. Angus (UG), Hui Chen, Brooklyn College

Software defect prediction (SDP) is a technique that aims to predict which parts of a software system are most likely to contain defects or errors and prioritize testing and debugging efforts accordingly. A variant of SDP commonly referred to as Just-In-Time SDP (JIT-SDP) aims to identify and prioritize potential defects in software code as they are being written rather than waiting until the end of a development cycle to identify and fix them. JIT-SDP is typically based on data mining and machine learning techniques, which analyze historical data on defects and other relevant factors to build predictive models. Despite the benefits of JIT-SDP, it is rarely used in practice due to poor predictive performance, which leads to many false positives and can cause developers to reject the tool. Researchers have attempted to improve the predictive performance of JIT-SDP by designing deep-learning models, but the improvement has been marginal at best. We want to divide software changeset data based on software change metric values, create strata based on a prediction percentage range, and evaluate how well our model predicts particular defects. Thus, while overall JIT-SDP model performance is not significantly improving, we can identify the software defects our model predicts well and generalize it to a type of software defect.

CIS - 127 CORRELATING NETWORK REACHABILITY MEASUREMENTS FOR IMPROVING INTERNET CENSORSHIP DETECTION

Bram Wolfe (UG), Hui Chen, Brooklyn College

Internet Censorship is a problem worldwide, with countries and private organizations using their control of Internet distribution to manage what the average person can and cannot learn online. Internet censorship is done in several ways, such as redirecting computers attempting to access specific IPs or injecting data into packets coming back from certain sites with information that prevents access. Several databases check the Internet availability from various locations worldwide to look for Internet censorship. However, one difficulty with detecting Internet censorship is that, in many cases, it appears to be an Internet outage. The only way to determine that an outage event is a case of Internet censorship is by observing the data through various dimensions. If one looks at the trend of Internet outages over time, one might find that they all occur over a short period and are related. One could also analyze the vantage points affected, what Internet protocols and applications were blocked at that vantage point, or if the events occurring at vantage points in the same Autonomous System show a trend of outages. Both observation forms are improved with the increased data available to analyze, making the observed trends more statistically significant. This research aims to determine if cross-referencing the data collected by multiple databases can more accurately discern if these outage events are a case of censorship. To do so, it is necessary to create a program that can handle two main challenges: the algorithmic challenge of processing Internet scale observation data and querying that data efficiently and making practical inferences that are statistically significant. This study focuses explicitly on cross-referencing these two databases, Censored Planet and ICLab.

EES - 128 THE WILSON'S LAB - EVOLUTIONARY BIOLOGY, HISTORY, AND THE DEVELOPMENT OF THE SYSTEM

Michael Magno (UG), Anthony B. Wilson, Brooklyn College

Seahorses (Hippocampus spp.) are nearshore marine species with a unique form of reproduction, male pregnancy. Given their unique morphology and fascinating reproductive system, seahorses are often displayed in commercial aquaria, but maintaining these animals under laboratory conditions can be challenging. Our project is aimed at developing a marine recirculating system for raising and rearing seahorses at Brooklyn College, and establishing a culture of symbiotic bacteria for controlling ammonium and nitrogen levels in this new system, known as aquarium cycling. We will first establish these cultures in a large central filtration system (TMC-5000), which includes mechanical and biological filters, a protein skimmer and an ultraviolet sterilization system. Once these cultures are established, this central reservoir will be connected to a larger aquarium system of tanks which will house our seahorses. Insights gained in the course of this work will be used to develop standard protocols to efficiently establish new aquarium systems for the other species of marine animals used in the Wilson laboratory.

EES - 202 BIOGEOCHEMICAL ACTIVITY OF CRITICAL ZONE CLAYS ON LONG ISLAND'S NORTH SHORE

Vanessa Alfonso (GR), Peter M. Groffman, Zhongqi Cheng, David E. Seidemann, Stephen U. Aja, Brooklyn College

Late Cretaceous clays exposed at sites located on the north shore of Long Island, New York, were sampled to explore questions about how contemporary factors and processes interact with ancient geological materials. Chemically and biologically catalyzed weathering processes have produced multi-colored clays belonging to the kaolin group with inclusions of hematite, limonite, and pyrite nodules. We sampled exposed clays at three sites to address three questions: 1) Do these exposed clays support significant amounts of microbial biomass and activity, i.e, are they alive? 2) Do these clays support significant amounts of nitrogen (N) cycle activity? 3) Are these clays a potential source of N pollution in the contemporary landscape? Samples were analyzed for total carbon (C) and N content, microbial biomass C and N content, microbial respiration, potential net N mineralization and nitrification, soil nitrate (NO_3^-) and ammonium (NH_4^+) content, and denitrification potential. Results strongly support the idea that ancient geologic materials play a role in contemporary C and N cycling in the Critical Zone. Respiration was detectable in all samples and strongly correlated to organic matter, indicating a living microbial community on the clays. There was evidence of an active N cycle. Higher levels of denitrification potential compared to both potential net nitrification and potential net N mineralization indicate that these clays act more as a sink rather than as a source of N pollution in the landscape.

HNS - 129 PROGRAM LOGIC MODEL FOR CULTURAL ADAPTATION AND OPTIMIZATION OF A 16-WEEK DIABETES PREVENTION PROGRAM WITH CARIBBEAN COMMUNITIES IN NYC

Cassandra Felix[1] (UG), Margrethe Hørlyck-Romanovsky[1], Abena Dinizulu[1], Aliyah Cyrus[1], Christine Cotiere[1], Alana Alexandra Raphaela Schoch[2]
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In New York, 1.7 million people, or 10% of the population, have diabetes, and 33% have pre-diabetes. Research has shown that lifestyle change programs—such as the National Diabetes Prevention Program (DPP)—can reverse the effects of pre-diabetes and reduce the risk of developing diabetes. Caribbean-born Black immigrants make up 48% of the Black immigrant population in the northeast region. Diabetes prevalence among Caribbean-born Black immigrants living with diabetes is 32% in New York City. Little is known about how DPP lifestyle changes could be adapted to the Black Caribbean communities. Cultural adaptation programs incorporate the target populations' culture, meanings, health beliefs, and values. The aims of this study are to: (1) adapt the CDC's DPP curriculum materials to be culturally representative of Black Caribbean communities; and (2) evaluate the use of online and smart devices and their feasibility and efficacy in delivering culturally relevant interventions. Participants will be supplied with a wireless scale, a Fitbit, and smartphone applications. Participants will attend 16 web-based modules and self-monitor their food intake and physical activity. Surveys will assess participants' readiness for change, experience using supplies, experience attending virtual workshops, and other suggestions for improving program delivery. Using a program logic model will allow for planning, fidelity, and process evaluation of the adaptation. A systems science approach is relevant to bridge our current knowledge of the effectiveness of lifestyle change programs and create a model for successful and effective cultural adaptations of the DDP within any cultural community.

HNS - 130 IMPACT OF COVID-19 PANDEMIC ON SUBSTANCE USE TREATMENT TRENDS BY AGE IN NEW YORK STATE, 2016-2020

Caroline Gerber (UG), Enrique Pouget, Brooklyn College

The COVID-19 pandemic occurred while generational changes in substance use patterns were becoming more apparent. It is important to know if the pandemic changed trends in drug treatment admissions in order to understand how vulnerability to substance dependence and overdose may have changed. While COVID-19 is the third leading cause of death overall in the U.S., drug overdose has become the leading cause of accidental death. New York State was the initial epicenter of the pandemic in the U.S. Thus, COVID-19 may have had the greatest initial impact on people who use drugs in New York. Data show that overdose deaths increased since 2020 in New York to historic highs. Data for the Treatment Entry Data Series (TEDS) for the year 2020 recently became available, enabling the examination of any changes in trends in treatment entry resulting from the first year of the pandemic. We examined TEDS data from 2016 to 2020 comparing the proportions of patients entering treatment in New York by age and other sociodemographic characteristics. The proportion of patients under 25 years old declined from 29% in 2016 to 21% in 2020. Post-pandemic data from 2020 appear to continue or exacerbate this trend. This trend was remarkably consistent by racial/ethnic group, gender, primary drug used and treatment history. Overall substance use trends may obscure trends for subgroups, including age groups. Further research is needed to determine whether this trend represents a decreasing need for treatment or a declining utilization of treatment for patients under 25. The COVID-19 pandemic may have intensified this trend. Research is needed to determine whether this trend is consistent across treatment modalities and across geographic regions. The increasing proportion of older cohorts represented in TEDS data in New York parallels trends in fatal drug overdose. Generational differences in attitudes and behavioral

norms, as well as differences in the availability of substances and the availability of drug treatment, may impact the rates as well as the consequences of substance use in some groups.

HNS - 131 EXPRESSION OF ADIPOSE TRIACYLGLYCEROL LIPASE TO STUDY THE REGULATION OF LIPOLYSIS

Mark Hachicho (UG), Zanib Ishfaq, Margie Lenis, Jasmine Williams, Jorge M. Caviglia, Brooklyn College

Triacylglycerols are the main form of energy storage in humans. The hydrolysis (or breakdown) of triacylglycerols is regulated by hormones and the nervous system to provide fatty acid and glycerol during periods of fasting. The primary lipase in humans and other mammals is Adipose Triglyceride Lipase (ATGL), also called patatin-like phospholipase domain 2 (PNPLA2). ATGL is regulated by ABHD5 (alpha beta hydrolase domain 5), which activates ATGL.
However, how ATGL is regulated by ABHD5 is not known. The aim of this project is to produce and purify ATGL to study its regulation by ABHD5.
We constructed plasmids for ectopic expression of human ATGL in bacteria and in mammalian cells. We produced ATGL in E. coli and in AML12 mouse hepatocytes. We assessed the expression of ATGL by Western blot and we measured lipase activity using a fluorescence based enzymatic assay.
ATGL is expressed both in AML12 hepatocyte cells and in E. coli and we can detect it by Western blotting. ATGL produced hydrolyzes triacylglycerols, showing that it has lipase enzymatic activity.
In conclusion: We are able to express active ATGL, which we will use to study its regulation by ABHD5, and how it regulates triacylglycerol lipolysis and the storage of lipids.

HNS - 203 THE EFFICACY OF FOOD SAFETY EDUCATION AMONG JEWISH ORTHODOX STUDENTS IN AN ALL-MALE PRIVATE HIGH SCHOOL

Naftali Miles (GR), Xinyin Jiang, Brooklyn College

Food Safety (FS) education, which includes information regarding the knowledge and practice of safe food handling, is important due to its potential to decrease food borne illnesses and increase healthy choices. Despite the importance of educating high school students about FS, few courses are offered at this level, especially in private Jewish Orthodox institutions which usually have limited offerings of secular education beyond basic General Education classes. Furthermore, there is limited research assessing the efficacy of such courses on the improvement of FS knowledge and practice at the high school level. The current study compared the pre-test and post-test scores of an exam given before and after FS modules were introduced in the course of a typical curriculum in the form of lectures, videos, and a practical demonstration in order to determine the effectiveness of the FS module on FS knowledge and practice of students. Participants were male high school freshmen attending a private Jewish Orthodox institution in Brooklyn and enrolled in a Health & Nutrition class as part of their regular curriculum. A sample of 11 students was included in the analysis. Using a paired sample t-test, a statistically significant improvement in scores was found between the pre-tests and post-tests, $t(9)=6.85$, $p<0.001$, indicating that the FS module significantly improved the knowledge and practice of students. These findings contribute to our understanding of how effective FS education can be to high school students, even in a population (i.e., Jewish Orthodox high school freshmen) receiving limited secular education beyond basic General Education classes.

PHYS - 132 COMPARATIVE CHARACTERIZATION OF ELECTROSPUN NANOFIBERS FROM MOF-BASED POLYMER BLENDS

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Filtration of pollutants remains an important area of research due to the health concerns they pose. Of particular detriment are particles smaller than 2.5 μm, referred to as PM2.5, that are harmful to breath but increasingly present due to air pollution. Electrospinning is a simple and effective technique for producing nanofibers with the capability of filtering such particulates. Electrospun nanofibers developed from polymers exhibit good porosity, extremely small pores, uniformity, and high throughput. They have seen significant modifications and combinations with other materials to improve their filtration capabilities, including metal organic frameworks (MOFs). In addition, mixtures of polymers offer improved mechanical features and porosity that can further the applicability of the nanofibers. In this work, polymer blends were synthesized from the following polymers: polyacrylonitrile (PAN), polyvinylidene fluoride (PVDF), and polystyrene (PS). Two MOFs were added to the blends, namely ZIF-8 and ZIF-67. Viscosity and density measurements of the mixtures were taken to better understand the kinds of solutions able to be electrospun. Stretching tests were used to characterize the strength of the fibers. Filtration tests were performed on the resulting electrospun fibers to test their permeability or lack thereof. It is proposed that the fibers will have tensile and filtration features comparable to those of traditional filter media.

PHYS - 204 CLIMATE-CHANGE, POLITICAL INSTABILITY AND SOCIAL IMPACT ON PAKISTAN QUANTIFYING THE GLACIAL MELT INTO THE 2022 FLOODING

Muhammad A. Siddiqui (GR), Brooklyn College

According to German Watch, Pakistan has been ranked in top ten of the countries most affected by climate change in the past 20 years.
Disequilibrium brought about by climatic variability, manifests in the form of social and political unrest. Proper mitigation can prevent the country from severe consequences, being caused by human activities such as burning of fossil fuels, deforestation, and farming.
Pakistan is home to more than 7,000 glaciers and melting glaciers were considered one of the major contributors to flooding. Meteorological and river flow datasets were analyzed to quantify the glacial melt contribution to the flood, during the 2022 historic flood and monsoon cycles.
Although, the link between political structure and climate changes is ill-defined, climate change creates social and economic stress and is mitigable if policy frameworks are flexible enough to change the national narrative of climate change adaptation and asset conservation.
Pakistan has signed various agreements and committed to UN and regional climate goals. The country is trying to comply with commitments while working on coal projects in parallel. Social and political stresses brought about by climate change are deeply tied to the existing social structure, political configuration, and historical context of the country.
This work quantifies and demystifies the water contribution from melting glaciers.

PSYC - 133 DEMOGRAPHIC DIFFERENCES IN ACADEMIC WORRY AND STRESS

Yara Alhusari (UG), Hannah Bodek, Laura A. Rabin, Jaia Jones, Anjali Krishnan, Lyba Aftab, Rona Miles, Brooklyn College

Academic stress, which is conceptualized as the psychological and physiological reactions that students have when confronted with educational obligations and pressures, can be caused by a variety of factors, including tests, assignments, competition, expectations from self and others, and fear of failure. Academic stress is a regular occurrence among students of all backgrounds, and may have been exacerbated during the COVID-19 pandemic. The present study investigated the association between academic stress and demographic characteristics to identify groups of students at-risk for high academic stress along with common stress reduction methods being employed. Questionnaires were completed by 326 demographically-diverse undergraduate students from a variety of academic majors. Overall scores on a 10-item questionnaire that captured experiences in the year prior to taking the survey, were suggestive of a moderate to a high level of academic worry/stress. There were no statistically significant associations between academic stress/worry scores and gender, race/ethnicity, or year in school (all $p<.05$). Notably, the greatest source of worry was how students would score on academic assessments while of least concern was their perceived ability to adapt to an online course format. The average number of stress reduction methods reported by participants was mean=2.21 (SD=1.62) out of a possible 12, and female participants endorsed a greater number ($p<.05$) of methods, with no differences by race and ethnicity or year in school. These results will be used to enhance knowledge about the most pressing academic stressors for diverse undergraduate students and inform interventions that researchers and educators can undertake to promote student mental health and well-being.

PSYC - 134 THE ROLE OF PETS IN SOCIALIZATION OF YOUNG CHILDREN

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Across the globe, children are widely regarded as being young, naive, and innocent, thus considered incapable of handling conversations about “adult" topics. Prior studies show that parents often regulate children’s access to information they deem is emotionally difficult, and shield children from talking about topics surrounding death, violence, sexuality, etc. However, past research largely neglects to examine how pets may shape the kinds of conversations parents may be forced to have with children at an earlier stage, given the death or sickness of a pet, a pet’s public expression of sexual tension or actions, and more. To fill the gap in prior work, a two-part qualitative study was conducted with parents and their children, in which we examined the role that pets played in shaping when and how parents engaged in conversations with children about emotionally difficult topics, as well as a drawing task interview with children to find the ways in which children perceive the role of the pet in the home. Six parents living in the US who had children between the ages of 3-7 and lived with pets were interviewed, with data collection ongoing. Interviews were analyzed using a grounded theory method, where we identified common themes that cut across family narratives. We will present preliminary findings on a) the types of “adult” topics that pets elicit from families, and b) how parents navigate having emotionally difficult conversations about these topics with children.These findings shed insights into the complex role that pets play in families, and have implications for researchers seeking to understand the contextual factors that shape socialization of young children.

PSYC - 135 DOES EMOTIONAL INTELLIGENCE MEDIATE THE RELATIONSHIP BETWEEN LOW STRESS REACTIVITY AND PSYCHOPATHIC TRAITS?

Edoardo Bianchi (UG), Liat Kofler, Yu Gao, Brooklyn College

Blunted autonomic stress reactivities have been associated with psychopathic traits, but less is known about the mechanism underlying this relationship. One study has suggested that autonomic dysfunction may contribute to low emotional intelligence, that is, deficiency in monitoring, labeling, and using emotions to guide subsequent behaviors, which in turn leads to psychopathic and antisocial behaviors (Ling et al., 2018). However, only male participants were included in that study, and the role of different dimensions of emotional intelligence, including emotional comprehension and emotional management, was unknown. In this study, we aim to replicate findings of Ling et al. (2018) in both females and males from a diverse undergraduate student sample, and to examine the role of specific dimensions of emotional intelligence to better understand the mechanism. Emotional intelligence and psychopathic traits are being assessed along with basic demographic information. Participants autonomic stress reactivity during a stressful social test are recorded. Separate mediation analyses will be conducted to determine if emotional intelligence mediates the relationship between psychophysiological reactivity and psychopathic traits in males and females. Findings will be discussed in the framework of the somatic marker's hypothesis.

PSYC - 136 ASSOCIATION BETWEEN SOCIAL VULNERABILITY AND SUSCEPTIBILITY IN NON-DEMENTED OLDER ADULTS

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Objective: Social vulnerability, conceptualized as an impaired ability to detect or avoid potentially harmful interpersonal interactions, has been associated with the cognitive decline characteristic of neurodegenerative diseases. Social vulnerability is not routinely assessed in clinical evaluations of older adults, despite its potential clinical utility in identifying individuals at risk of poor outcomes.
Method: Participants (age 60 and over) were cognitively unimpaired, or presented with subjective cognitive decline or mild cognitive impairment. Each participant had a knowledgeable informant (i.e., family member or friend) who completed the Social Vulnerability Scale (SVS; Pinsker et al., 2006), a 15-item measure including items such as, "Been deceived by someone who has deceived them before." Respondents were asked to rate the likely outcome if the participant was, "placed in that situation now," using a Likert-type scale ranging from never to always (total score range from 0-60). Point biserial correlation was applied to investigate the association between SVS scores and the response to a single item from a COVID-19 questionnaire: "Since the beginning of the Covid-19 pandemic, has your loved one fallen prey or come close to falling prey to scam?"
Results: For the 69 participants M age =75.6; M education = 15.7; 70% female), SVS scores were significantly associated with the report of increased susceptibility to a scam (r pb =.47, p<.001) during the COVID-19 pandemic.
Conclusions: These results highlight the need for attention to social interaction patterns during clinical evaluations, to help identify and mitigate potential harmful outcomes in those most vulnerable. Additional research should clarify the relationship between social vulnerability and falling prey to scams.

PSYC - 137 THE IMPACT OF EARLY ENVIRONMENTAL ADVERSITY ON AUTONOMIC NERVOUS SYSTEM: A LONGITUDINAL STUDY

Liz Cortes (UG), Kelly Cotton, Elizabeth Chua, Brooklyn College

Stress is a state that everyone handles differently. How well a person feels and copes with acute stress might be influenced by symptoms of anxiety, depression, or chronic stress. Our goal was to understand how subjective responses to acute stress relate to different subscales of the Depression Anxiety and Stress Scales (DASS), as part of our larger project exploring stress effects on working memory. Using the State-Trait Anxiety Inventory (STAI-6), we measured the change in subjective stress levels before and after participants completed the Trier Social Stress Test (TSST). During the TSST, participants perform a public speaking task, followed by a difficult mental arithmetic task. Participants then completed a working memory task. At the end of the experiment, participants completed the DASS, which asks about experiences over the past week. Overall, participants reported higher stress scores, as measured by a change in STAI-6, after completing the TSST, indicating that the TSST did induce subjective stress. Anxiety scores were positively correlated with change in STAI-6 scores (r = 0.25), as were depression (r =0.23) and stress (r = 0.11) scores. In conclusion, the results are consistent with the idea that those who experience anxiety, depression, or stress in the past week have a more severe stress response after an acute stressor than those not experiencing these symptoms. By knowing the relationship between acute stress and anxiety, life stress, and depression, we will better understand individual variation in stress responses and begin to identify how this complex relationship affects cognition.

PSYC - 138 COLOR APPEARANCE OF IRIS, BUT NOT DERMIS, CORRELATES WITH SEX-LINKED WAVELENGTH DISCRIMINATION OF OBSERVER

Emily Didia (UG), Yisroel Fishman, Taylan S. Ergun, Alla Chavarga, Israel Abramov, Brooklyn College

Human color vision is based on 3 different cones types. The genetic contributions to cone polymorphism (and thus color vision ability) may similarly underlie the determinants of iris and skin pigmentation. Thus, performance on tests of color vision and wavelength discrimination may be impacted by the spectral characteristics of an observer's iris and dermis--both indirect indicators of ethnicity, suggesting contributions from a shared genetic pool. Previous research has reported conflicting accounts of the relationship between iris reflectance and a common test of hue discrimination (FM100) (Garakani & Ng, 2019). We compared color vision ability using a shortened colored cap arrangement test (Farnsworth-Munsell Hue Test - D15) as well as a comprehensive measure of wavelength discrimination (Delta Lambda) based on a technique using direct hue-scaling of monochromatic lights (Abramov, Gordon, Chan 2009), with iris and dermis albedo (summed reflectance). Due to the well-documented sex-linked recessive inheritance of color blindness, as well as our previous work reporting sex differences in color vision (Abramov, Gordon, Feldman, and Chavarga 2012b), we assess these relationships further in the context of sex. Our investigation revealed a relationship between iris spectral reflectance and wavelength discrimination ability, with no impact of dermis reflectance on any of these color vision related measures.

PSYC - 139 THE IMPACT OF EARLY ENVIRONMENTAL ADVERSITY ON AUTONOMIC NERVOUS SYSTEM: A LONGITUDINAL STUDY

Joyce Escatel-Flores (UG), Yu Gao, Liat Kofler, Brooklyn College

Respiratory sinus arrhythmia (RSA) is a heart rate variability measure of the parasympathetic nervous system and has been linked to emotion regulation and multiple psychopathology. Environmental adversity (EA) is defined as risk factors such as neighborhood crime, parental marital conflict, low social

economic status, stress, and abuse that occurs in a person's lifetime. Researchers have found that EA has a significant impact on RSA changes in children and adolescents. Evidence has suggested that in children, girls who experience more EA had a lower resting RSA and are more likely to show poor emotional regulation (Feurer et al., 2019). Another study found evidence linking potential traumatic events to low baseline RSA (Gray et al., 2017). In contrast, one study found that positive parenting style was associated with lower RSA (Lisitsa 2021). In this study, we aim to examine the effects of different EA factors on RSA. Specifically, it was hypothesized that overall higher EA would be associated with lower RSA, and that parental marital conflict would be the strongest EA factor that impacts resting RSA. Data from a longitudinal study will be used to test these hypotheses. Participants consisted of 8-11-year-olds and their caregivers who visited our laboratory for a battery of tests. Resting RSA was measured while children were relaxing for 2 minutes, and their social adversity index, prenatal maternal stress, neighborhood collectiveness, child abuse, domestic violence, and parenting styles were assessed based on caregiver's reports. Results will add to the growing literature on the impact of early EA on human health.

PSYC - 140 THE PHYSIOLOGICAL EFFECTS OF OSTRACISM: THE MODERATING ROLE OF GENDER, ETHNICITY, AND REJECTION SENSITIVITY.

Leanna Elder (UG), Liat Kofler, Yu Gao, Brooklyn College

Ostracism is a common form of bullying that has become more salient with the rise of technology. With increased accessibility into the lives of others comes increased opportunities to target individuals, bypassing the need for face-to-face interactions. This increase in bullying behavior is problematic as the threatening nature of social exclusion precipitates an activation of the sympathetic nervous system, also known as the fight-or-flight response, which heightens arousal and disrupts homeostasis. In addition, social exclusion elicits negative emotions, specifically reductions in mood states and fundamental needs (self-esteem, control, belonging, and meaningful existence). These changes in arousal and emotional states caused by social exclusion are associated with poor social outcomes that jeopardize the well-being of the self and society. To better understand this phenomenon, previous work has examined the effects of ostracism on the autonomic nervous system (i.e., skin conductance). The current study aims to further understand the mechanism by evaluating the potential moderating effects of gender, ethnicity, and rejection sensitivity in a larger, more diverse sample. Using the Cyberball paradigm, participants partook in a virtual ball-tossing game in which participants were either included or excluded during a game of catch. Skin conductance levels (SCLs) were recorded at baseline and for the duration of the task. It is hypothesized that participants will demonstrate less habituation, or a maintenance of high skin conductance levels, during exclusion versus inclusion conditions. Further investigation into the ostracism-autonomic response relationship is essential in order to mitigate the negative social outcomes and experiences associated with social exclusion.

PSYC - 141 COLORS OF EYES FORM CLUSTERS WHEN PLOTTED ON A CHROMATICITY DIAGRAM

Yisroel Fishman (UG), Emily Didia, Alla Chavarga, Taylan S Ergun, Israel Abramov, Brooklyn College

Eye color is highly inherited, but can change due to factors such as age and disease (Frudakis et al., 2007; Uy et al., 2020; Sun et al., 2014). Iris color classification scales usually utilize a variety of color categories to compare an individual's eye to painted glass eyes or photographs of irises as exemplars. These early methods lacked objectivity and were not standardized/statistically tested for reproducibility (Mariana; Alina, 2015). In the present study we investigated the utility of measuring iris spectral reflectance using a

scanning spectroradiometer, comparing spectral scan results to traditional eye color categories. From these measurements, we calculated: A) albedo- the sum of an individual's iris reflectance across the spectrum, B) dominant wavelength, and C) color coordinate values for each iris in a standard chromaticity space (CIE 1976). We found at least two eye color clusters: one cluster composed equally of males and females whose dominant wavelengths span from approximately 576 to 585 nm, and a large cluster (nearly all female) whose dominant wavelengths span from 570 to 582nm, but which displays a puzzling pattern - its chromaticities tightly follow the chromaticity distribution of black-body radiators that absorb all incident electromagnetic radiation. Any object whose temperature is above absolute zero continuously radiates photons; each photon vibrates at a fixed frequency and travels at light speed, creating a wave. All reach earth's orbit but only some penetrate earth's atmosphere and reach ground level – these constitute the visible spectrum. Photon streams from different black-bodies will have different spectra. These can be plotted on a standard chromaticity diagram that can be used to describe the appearance of each radiator's spectrum.

PSYC - 142 NEURAL BASIS OF REWARD TIMING PREDICTION ERRORS IN PAVLOVIAN LEARNING

Noah Hussein[1] (UG), Dan Siegel[1, 2], Andrew Delamater[1]
Brooklyn College[1]
CUNY Graduate Center[2]

Through Pavlovian learning, it is documented that animals will form new associations between environmental stimuli and food rewards to the extent that the rewards are surprising, i.e., when there is a "reward prediction error." These prediction errors are often described in terms of a mismatch between actual and anticipated reward values, but the reward's size, type, and time of occurrence are other features that may be important. Our current study investigates the role of time prediction errors in rats with a focus on its underlying neurobiological substrates. We trained 24 rats for 29 days to expect food rewards at different times from stimulus onset in the presence of different predictive cues (e.g., a tone stimulus predicts food occurring after 60s but a flashing light predicts food after 15s). During a test session, half the rats had the specific stimulus-food time relations maintained, but for the other half, they were switched to induce time prediction errors. Shortly after the test session, we extracted the rats' brains and then stained them for phosphorylated ribosomal protein s6, expressed in recently activated neurons. Preliminary results suggested that the switch group had a significant increase in the number of activated cells in the basolateral amygdala and an increase in intensity (proxy for firing rate) in the Dorsal lateral Striatum and Ventral Tegmental area. This novel approach to examining the locus of time-based prediction error coding in the brain will inform future studies designed to assess the causal status of specific pathways in prediction error-driven neuroplasticity.

PSYC - 143 THE ROLE OF OUTCOME SURPRISE IN HUMAN PREDICTIVE LEARNING

Diyora Khaknazarova (UG), Andrew R. Delamater, Brooklyn College

We explored the hypothesis that new associative learning depends upon outcome surprise in a predictive learning task with humans. Participants learned to associate different visual cues (shapes) with different target stimuli (colored squares) to which they were instructed to respond. We measured reaction time and % correct responses on trials in which expected or unexpected targets occurred. Consistent with standard associative theory, new learning was greater when cues were paired with unexpected targets.

PSYC - 144 ATTITUDES AND MEMORY CONFORMITY IN A COLLABORATIVE MEMORY TASK

Jennifer John-Ogam[1](UG) Jennifer A. Mangels[1], Karen Rodriguez[2]
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Collaborative memory refers to the recall output of individuals working together in a group to remember past information or events (American Psychological Association, n.d.). Over the years, past research has led to the identification of a number of cognitive mechanisms, at the individual level, that work to shape collective memory, and are, in part, activated by aspects of social interactions (Rajaram, 2022). The aim of this study is to analyze how an individual's pre-judgments and attitudes about others influences the extent to which they conform to the memory of others in a collaborative memory task. Participants were instructed to study a list of 120 items extracted from the DRM lists, individually. During the group retrieval portion, participants worked in groups of three and took turns deciding whether an item presented to them on a screen was either "old" or "new" and to rate their confidence in their initial decision, pre-feedback, and in their final decision, post-feedback. Prior to the study and group retrieval phase, participants completed a mini icebreaker followed by a questionnaire that sought to examine their expectations and ideas about future group performance as well as their own performance in relation to the other members. Upon analysis of the data, we expect positive attitudes expressed by group members (as indicated by higher scores on the items) to correlate with a greater number of times in which switching occurs during the group retrieval phase (meaning, the number of times individuals change their initial decision in response to feedback from group members) and vice versa. Such results may suggest that our initial judgment of others is a crucial component in dictating the extent to which memory conformity occurs.

PSYC - 145 DECREASE OF PKMζ THROUGH ζ-TRAP INHIBITOR SUPPORTS PKMζ IS CRITICAL FOR NORMAL MEMORY

Odelia Johnson (UG), Changchi Hsieh, Carlos Velez, Todd Sacktor, SUNY Downstate

PKMzeta is an atypical protein isoform of PKC, crucial for long term potentiation maintenance. It can be inactivated by a synthetic peptide (ζ-trap) by decoupling PKMζ and a memory-associated protein, KIBRA. However, alternative isoforms, PKC-iota/lambda exist to compensate for the absence of PKMzeta. The question remains as to whether PKMzeta is responsible for the overall long-term memory or memory in a normal brain. To support that PKMzeta is indeed the molecule for the basis of long-term memory, quantitative immunohistochemistry was utilized to analyze the amount of PKMzeta present in wild type mice succeeding the administration of ζ-trap. Significantly lower amounts of PKMzeta were present in hippocampus slices, blocking spatial long term memory in mice, thus demonstrating PKMzeta is indeed the molecule underlining the basis of long term memory.

PSYC - 146 EXPLORING THE LINKS AMONG ANXIETY SENSITIVITY, ABERRANT SALIENCE, AND SCHIZOTYPY IN A UNIVERSITY SAMPLE

Jasmine Kaur[1] (UG), Christopher Liong[2], Victoria Martin[2] , Deborah J. Walder[3]
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Schizotypy is conceptualized as a complex personality construct associated with greater psychosis proneness. Aberrant salience (AbS) (the attribution of attentional resources to irrelevant stimuli resulting in inappropriate actions and behaviors) is well-documented as heightened in schizophrenia and, recently, linked with schizotypy (Martin et al., 2022, unpublished data). Anxiety sensitivity (AS) is a transdiagnostic construct characterized by heightened awareness of one's somatic sensations, and internalization of physical sensations has been associated with increased psychopathology risk. Elevated AS is

well-documented in mood and anxiety disorders, though not examined in psychosis risk. The current study examined a proposed theoretical link among AbS, AS, and schizotypy, including hypothesized mediation effect of AS on the relationship between AbS and schizotypy. Self-report measures were administered to diverse undergraduate students (n=2321, 1691F/627M). Preliminary data analyses using SPSS PROCESS macro (default of 5000 bootstrapping samples), adjusted for demographics, revealed significant direct effects of AbS on AS (b=0.60, p<.0001), AS on schizotypy (b=0.26, p<.0001), and AbS on schizotypy (b=0.93, p<.0001). The significant indirect effect (b=0.15, 95%CI 0.13-0.18) supported the theoretical link, whereby AS partially mediates the relationship between AbS and schizotypy. Results hold implications for potential utility of AS in early psychosis risk screening within the general population.

PSYC - 147 MENTAL HEALTH STIGMA AND PRIVACY CONCERNS IN ACTIVE-DUTY SOLDIERS

Leah Mandelbaum[1] (UG), Faigy Mandelbaum[2], Mitchell L. Schare[2], Chana Leah Reich[3], Jennifer Drake[4], Laura Rabin[4]
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Mental health stigma hinders military personnel from seeking mental health treatment during their deployment. An estimated 60% of military combatants who would benefit from psychotherapy don't pursue it.
Previous research has found five barriers to pursuing psychological treatments experienced by military populations. These barriers are: (1) experiencing fear of rejection from social circles; (2) concerns about negative career outcomes; (3) worries about potential privacy breaches; (4) anxiety about being perceived as weak by peers; and (5) practical barriers such as not having time to attend treatment. This study used the Military Stigma Scale 3 to better understand military stigma experiences among 304 active-duty soldiers in Israel. Soldiers were recruited in-person and identified by uniform. Data collection occurred at the city Central Bus Stations, high security areas (i.e., Western Wall) and army base entrances. Results on a 4-point Likert Scale found that over 70% of soldiers were concerned that their personal problems would be recorded onto their military record if they sought mental health care. Additionally, over 70% of respondents were concerned that they would lose the respect from their chain of command if the commander discovered they were seeking mental health care. Lastly, over 63% of soldiers were concerned that their chances of promotion would be harmed. These findings are consistent with prior literature, and demonstrate the difficulties that soldiers face when making decisions about receiving mental health care during their deployment. Future research should assess the efficacy of interventions aimed at decreasing stigma around mental health problems and help-seeking behaviors.

PSYC - 148 CELL TYPE PROFILE OF OXYTOCIN RECEPTOR-EXPRESSING NEURONS IN THE PREFRONTAL CORTEX

Atheer Musad[1] (UG), Lin Lin[2], Alicia Che[2]
[1]Brooklyn College
[2]Yale University

Oxytocin is a peptide hormone that is involved in parturition and lactation, as well as social behaviors. The early social interactions between the infant and the parents contribute to the development of future social behavior. The neural mechanisms underlying the interaction between external sensory inputs and

social behavior are not well understood, but oxytocin signaling has been attributed to transmitting social information to neurons by modulating inhibition. The prefrontal cortex (PFC) is an important brain structure responsible for orchestrating social interactions. In this project, we investigate the neuronal types that express oxytocin receptors (OXTRs) in the PFC in mice at weaning age, at postnatal day (P) 21. We utilize a variety of techniques including cryostat slicing, immunohistochemistry, and confocal microscopy to label and quantify the OXTR-expressing neurons in the PFC. Specifically, we focused on the Somatostatin (SST)-expressing portions and compared it to the Parvalbumin (PV)- expressing neurons. We found that SST-expressing neurons make up a large portion of OXTR-Ai9 cells in the PFC compared to PV-expressing neurons. We also found that cortical layers 5 and 6 contain the most OXTR-expressing neurons compared to other layers.

PSYC - 149 CONNECTIONS BETWEEN CHILDHOOD TRAUMA EXPERIENCED BY LONE SOLDIERS AND THEIR DECISION TO SERVE.

Chana L. Reich[1] (UG), Faigy Mandelbaum[1], Rachel Dekel[2], Leah Mandelbaum[1], Jennifer E. Drake[2], Laura Rabin[2]
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[2]Bar Ilan University

Child abuse is correlated with post-traumatic stress disorder (PTSD) symptoms in Lone Soldiers. Lone Soldiers serve in the Israeli Defense Force (IDF) without family support in Israel. This study aims to understand the experiences of Lone Soldiers with childhood trauma histories, and the role that childhood trauma plays in the decision to serve in the IDF. An estimated N = 2,000 soldiers will be recruited online and in person. Survey assessments include demographics, the Childhood Trauma Questionnaire (CTQ), International Trauma Questionnaire (ITQ), and others. For the current study, we present open-ended items: “Why did you decide to join the army?”; “Did adverse childhood experiences play a role in your decision to join the army?”; and “If yes, please explain how”. Results will be coded using conventional content analysis. Outcome data will determine if childhood trauma is correlated with Lone Soldiers’ decision to enlist in the IDF and identify factors that explain why. We hypothesize significant correlations between experienced childhood trauma and Lone Soldiers’ decision to join the IDF. We hypothesize that content analysis categories will include; (1) starting over a new life with a new identity; (2) escaping a negative situation; and (3) fast integration into a new society and culture. Expected limitations include: (1) incomplete content analysis due to ongoing data collection; (2) Hebrew-English language discrepancies; and (3) limitations of convenience sampling. Results may lead to additional emotional and financial support for Lone Soldiers with histories of childhood trauma. Suggested supports include increased stipends and available counseling resources (i.e. current IDF weekly psychotherapy waitlists are over 1-year 5), and help in forming community.

PSYC - 150 BRAIN STIMULATION STUDY OF MEMORY AND MEMORY AWARENESS

Joel Rejouis (UG), Michael Garcia, Elizabeth Chua, Brooklyn College

As individuals acquire new knowledge, they also evaluate their own subjective learning. Our research aims to investigate the effects of brain stimulation over the prefrontal cortex on memory and memory awareness. Prior work using conventional 1x1 transcranial direct current stimulation (tDCS) over the frontal cortex in healthy young adults showed impairments in an associative encoding task. (Gaynor & amp; Chua 2017), but surprisingly did not show any effects on memory awareness. One potential explanation for the lack of effects on memory awareness and surprising direction of the effects on encoding is that the low spatial resolution of conventional tDCS obscured the specific roles of prefrontal sub-regions in memory and memory awareness. The current experiment used High Definition-tDCS to

test the roles of the anterior prefrontal cortex (aPFC) versus the dorsolateral prefrontal cortex (DLPFC) in memory and memory awareness, and to test whether they can be improved with brain stimulation. In this study, participants learned novel word pairs, while receiving active HD-tDCS over the aPFC or DLPFC, or sham HD-tDCS. After each word pair, participants made a judgment of learning (JOL) and indicated their belief about their ability to recognize those word pairs 24 hours later. In a subsequent memory test, participants viewed intact, rearranged, and new word pairs, and were asked to judge them as intact, rearranged, or new. Data collection is ongoing, but repeated measures ANOVAs on preliminary data (N=24) showed no significant differences between the stimulation conditions for memory performance ($p = .531$) or JOL ratings ($p = .412$). The null results could come from not having a full sample or perhaps tDCS is too weak to affect performance on this task.

PSYC - 151 WHISKING IN RATS AS A FUNCTION OF BODY TEMPERATURE MEASURED WITH A MACHINE-LEARNING APPROACH

Samir Samadov[1] (UG), Elana Cohen[2], Natalie Cipriano[2], Benjamin Tessler[2], Mark Stewart[2], Ofer Azoulay[2], Richard Kollmar[2]
[1]Brooklyn College
[2]SUNY Downstate

Whisker (vibrissae) movement in rodents is controlled by the facial nerve and is easy to observe. The rat thus provides an excellent animal model for developing treatments of unilateral facial paralysis in humans. To be scalable, however, rat studies of facial-nerve regeneration after injury and repair require methods to monitor whisking repeatedly and efficiently. We explored heat as a non-invasive stimulus to elicit whisking under anesthesia and used machine learning as a high-throughput approach to measure the resulting whisker movements.

Rats were anesthetized with urethane (1.5 g/kg ip). After anesthesia, microtubes (approximately 1 cm length) were threaded onto three whiskers on each side to enhance their visibility. The rat was then warmed gently over 10 min to normal body temperature with a desk lamp while internal body temperature was recorded with a rectal thermometer. Vibrissae movements were captured on video at 240 fps. The videos were analyzed by locating the six whiskers frame-by-frame with machine-learning software (DeepLabCut). Whisker trajectories were correlated with body temperature by using custom R scripts.

Machine learning accelerated whisker detection and localization by almost two orders of magnitude over manual processing and with comparable accuracy. The mean of the maximum whisking amplitude increased almost two-fold as the rat was warmed from ~32°C to ~38°C. After removing the heat source, the whisking amplitude rapidly returned to baseline levels even though the internal body temperature remained normal. Our results demonstrate first that whisking can be stimulated non-invasively in anesthetized rats with gentle warming. Second, detailed whisking trajectories can be extracted efficiently from large amounts of high-speed video with machine-learning software. The combination of these two approaches will allow us to track functional recovery after facial-nerve injury and repair and test novel treatments for unilateral facial paralysis.

PSYC - 152 EFFECT OF EXTINCTION ON CONTEXT-DEPENDENT FLAVOR PREFERENCES IN RODENTS

Zayedali Shaikh[1] (UG), Andrew Delamater[2]
[1]City College
[2]Brooklyn College

This study aims to examine the role of context in the extinction of conditioned flavor preferences in rodents. Rats were initially trained to associate different flavors, either almond or banana, with sucrose, each in a distinctive experimental context (different rooms, caging, etc).
Then each flavor was presented without sucrose (i.e., was extinguished) in the context in which the other flavor had been conditioned. The purpose of this is to build the association of one flavor with sucrose and a second flavor without sucrose in each specific context. Following periods of acquisition and extinction, a test phase between both flavors in each context will measure how much of each flavored water is consumed, being a measurement of flavor preference. We expect that the rats will prefer the flavor that had not undergone extinction in each context to the one that had. These results would show that extinction learning can be context-specific in this form of learning, a result that has not been demonstrated previously.

PSYC - 153 INTERMITTENT THETA-BURST STIMULATION IN THE PRE-LIMBIC CORTEX DRIVES BRAIN-WIDE CIRCUIT REORGANIZATION AND RESCUES STRESS-INDUCED SPINE ELIMINATION.

Hanan Yafai [1] (UG), David James Estrin[2], Shane Johnson[2], Conor Liston[2], Pooja Suganthan[3], Thiara Ahmed[3], Kenneth Johnson[2], Christine Kuang[3]
[1]Brooklyn College
[2]Weill Cornell University
[3]Hunter College

Loss of dendrites and spines in the prefrontal cortex (PFC) has been attributed to chronic stress. Prolonged stress exposures can significantly disrupt the signaling events and cause the neural circuit activity to be out of sync, leading to the loss of spines and a marked reduction in cognitive performance. We hypothesize that intermittent theta-burst stimulation (iTBS) of the prelimbic cortex (PL) will inhibit dendritic spine elimination in the PFC and thereafter result in changes to dendritic spine reconfiguration across the brain. Moreover, iTBS will increase mice's motivational behavior and decrease their defensiveness. To achieve this, we employed an optogenetics technique to stimulate the dorsal medial (PFC) neurons after 14 days of exposure to corticosterone or vehicle control, a common endocrine stress model. Following iTBS, a subset of mice were assessed in a behavioral assessment and were used for Golgi staining and imaging. Furthermore, the Golgi stain data suggests an increase in dendritic spine count after TMS treatment, in contrast to the mice that endured stress without TMS stimulation.

PSYC - 205 ASSOCIATIVE LEARNING STRATEGIES IN SPATIAL NAVIGATION

Janelle Mendoza[1] (GR), Stefano Ghirlanda[2]
[1]CUNY Graduate Center
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The Morris Water Maze (MWM) is a spatial learning task in which rodents start at different points around the perimeter of an open-field water maze to find a submerged platform. After a series of trials, rodents show navigation abilities such as finding the platform when starting from a new location and learning quickly to find platforms and a new location. These findings are often attributed to the ability to plan using cognitive maps; however, we argue that they may arise from associative learning based on a sufficiently accurate representation of space. In this study, we simulate associative learning with

allocentric navigation in a 10x10 grid. Simulated rats are able to quickly find the location of a trained platform from a new starting point, replicating qualitative findings from empirical research (Vorhees & Williams, 2006).

PSYC - 206 "MI CABELLO ES QUIEN SOY": THE ROLE OF HAIR IN GENDER SOCIALIZATION AMONG LATINAS

Marimar Perez[1](GR), Jessica Li[2], Emmanuel Pascual[2], Esther Gonzalez[2], Yana Kuchirko[2]
[1]CUNY Graduate Center
[2]Brooklyn College

Hair, along with its different colors, lengths, textures, and styles, is an important way women express themselves. Despite the societal importance of hair for women's identities and experiences, few studies have empirically examined women's perspectives on hair in relation to gender socialization. For Latinas specifically, hair may play an important role in socialization of marianismo. Marianismo refers to societal expectations of women being submissive, pure, inferior to men, selfless, and sacrificial for family. In this study, we examine Latina's perspectives about hair in relation to gender socialization processes: marianismo and self-silencing. Participants filled out questions on a survey on qualtrics, reporting demographic information along with measures pertaining to marianismo, self-silencing scale, questions about hair esteem, self-esteem, and hair texture. Preliminary results show correlations between hair esteem and marianismo subscale of virtuosity ($r=-.30$, $p<.000$). Hair esteem is related to self-silencing ($r=-.33$, $p<.000$), divided self ($r=-.27$, $p<.000$) and externalized self-perception ($r=-.38$, $p<.000$). Lastly, we observed a correlation between Silencing the Self ($r=.21$, $p=.040$), Divided Self ($r=.37$, $p<.001$) and Externalized Self Perception ($r=.24$, $p=.02$) on how important being a Latina is for the participants. We discuss the implications of understanding how women feel about their hair in relation to their adherence to gender norms. This study contributes an important lens onto the relation between gender ideologies and Latina's well-being through the lens of hair, an understudied yet prevailing feature of women's lived experiences.

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