Borough of Queens CUNY Undergraduate Research Symposium 2024

Tuesday, April 2nd
Hosted at CUNY Queens College
65-30 Kissena Blvd, Queens, NY 11367
9:15am – 2:00pm

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PROGRAM OF EVENTS

Borough of Queens CUNY Undergraduate Symposium
Hosted at Queens College
65-30 Kissena Blvd, Queens, NY 11367

Tuesday April 2nd, 2024

Schedule of Events

TIME	EVENT	LOCATION
9:15 am to 10:00 am	Registration / Poster Setup	Student Union Ballroom
10:15 am to 10:20 am	Welcome addresses & Opening Remarks	Student Union Ballroom
10:20 am to 11:00 am	Keynote address #1 Dr. Joangela Nouel	Student Union Ballroom
11:05 am to 1:00 pm	Poster Presentation Session Tabling for Reseach Opportunities	Student Union Ballroom
1:05 pm to 1:45 pm	Keynote address #2 Dr. Alma Rodenas-Ruano	Student Union Ballroom
1:45 pm to 2:00 pm	Awards and Closing Remarks	Student Union Ballroom

SPEAKERS AND PRESENTERS

OPENING REMARKS

Dr. Alicia Meléndez, Queens College
Director of Undergraduate Research

Dr. Ron Nerio, CUNY Office of Research
Research Programs Director

WELCOME ADDRESS

President Kenneth Adams, LaGuardia
Community College

President Frank Wu, Queens College

KEYNOTE ADDRESS

Dr. Joanela Nouel, NYC DOHMH Public Health Laboratory

Introduced by Dr. Monica Trujillo, Biology Professor
at Queensborough Community College

Dr. Alma Rodenas-Ruano, Fordham University

Introduced by Dr. Nathalia Holtzman, Associate
Provost of Innovation and Student Success at Queens
College

KEYNOTE SPEAKERS

Dr. Joangela Nouel

Current affiliation: NYC DOHMH Public Health Laboratory

Dr. Nouel is a post-doctoral fellow at the NYC DOHMH Public Health Laboratory. Her area of focus is public health laboratory science and leadership. She has recently completed her PhD in Cell and Molecular Biology from the University of Pennsylvania. Her thesis work contributed to the understanding of how papillomaviruses can cause human cancer. Joangela also holds an associate degree in Mathematics and Sciences from Queensborough Community College (QCC) and a bachelor's degree in Biochemistry from The City College of New York (CCNY). She was part of the CUNY Research Scholars Program (CRSP) at QCC and a Maximizing Access to Research Careers (MARC) trainee at CCNY. Joangela has always been passionate about supporting the community and mentoring students.

Dr. Alma Rodenas-Ruano

Affiliation: Fordham University, NY

Dr. Alma Rodenas-Ruano is an Associate Professor in the department of Natural Sciences at Fordham University. Her scientific interests are placed within the field of Neurophysiology and Epigenetics. Specifically, she is interested in understanding how the environment impacts brain development. She received a Bachelor's in Science from the City College of New York (CCNY), a Master's in Molecular and Microbiology from the University of Central Florida, and a Ph.D. in Neuroscience from the University of Miami School of Medicine. She then trained as a postdoctoral fellow at Albert Einstein College of Medicine in Dr. Suzanne Zukin's neurodegeneration lab, and then in Dr. Pablo Castillo's neural plasticity lab. She has been the recipient of numerous awards that support her research, including a National Academy of Science Ford Foundation Fellowship, a Brain and Behavior Research Foundation Young Investigator Award, a Grass Foundation fellowship, an American Psychological Association (APA) Predoctoral award, and an NSF grant. She is dedicated to immersing her students in community collaborative work, and providing advocacy and accompaniment for immigrants. She loves to hike and spend time with her wife and 17-year-old twins.

BOROUGH OF QUEENS CONSORTIUM OF CUNY UNDERGRADUATE RESEARCH MEMBERS

LaGuardia Community College	Olga Calderon
LaGuardia Community College	Reem Jaafar
LaGuardia Community College	Niki Jones
LaGuardia Community College	Nathan Hosannah
LaGuardia Community College	Rejitha Nair
LaGuardia Community College	Roman Senkov
CUNY Office of Research	Joshua Barnes
CUNY Office of Research	Ron Nerio
Queens College	John Dennehy
Queens College	Nathalia Holtzman
Queens College	Dan Weinstein
Queens College	Ezekiel Willerson
Queens College	Daniel Yakubov
Queensborough Community College	Sarbani Ghoshal
Queensborough Community College	Urszula Golebiewska
Queensborough Community College	Regina Sullivan
Queensborough Community College	Monica Trujillo
York College	Ruel Desemero

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STUDENT POSTER ABSTRACTS

Effects Of Homoamino Acids On The Aggregation Of Amylin

Taskeen Afroze Karim

Mentor(s): Professor Ruel Desamero & Professor Adam Profit
York College

Homo amino acid means that there is an addition of a methylene (CH_2) group to the α-carbon of an amino acid. In homologous series the amino acid is extended by using an extra carbon chain in the side chain of the amino acid. Human islet amyloid polypeptide (hIAPP), also known as amylin, is a 37-residue peptide hormone that is produced and co-secreted alongside insulin by the pancreatic beta cells. Its misfolding and aggregation can lead to the development and progression of type 2 diabetes, primarily by affecting pancreatic function and insulin production. $hIAPP_{(22-29)}$ (NFGAILSS) is a fragment of amylin which is associated with type-2 diabetes. We hypothesize that the elongation of amino acids of the NFGAILSS sequence should slightly alter structure and affect interactions consequently reducing aggregation. The objective of this project is to synthesize six homopeptides of the NFGAILSS sequence and evaluate how the incorporation of homoamino acids affects aggregation. The homopeptides studied are- QFGAILSS, NhFGAILSS, NFGhAILSS, NFGAIhLSS, NFGAILShS and NFGAILhShS. They were synthesized using 2-chlorotrityl resin via Fmoc Solid phase peptide synthesis (SPPS). Synthesized peptides were identified using mass spectrometry. The aggregation propensities of the homologues were assayed using turbidity measurements and thioflavin T fluorescence assays. Circular dichroism (CD) would be done to monitor conformational changes.

The data obtained were analyzed in terms of how the homoamino acids affect structure and consequently aggregation propensity. Peptides substituted with homologues that do not aggregate will be tested on how they may affect the aggregation of the full-length amylin.

Tender Beginnings Can Prevent Compulsive Endings: Deficits in Childhood Affective Touch Contribute to Obsessive-Compulsive Symptoms

Sarah Akhtar

Mentor(s): Professor Usha Barahmand
Queens College

Empirical data supports the assertion that insecure attachment during childhood contributes to the development of emotional psychopathology. Notably, such insecure attachment is linked to deficiencies in affective touch experiences during formative years. Building upon existing literature, our research aimed to explore the potential connection between childhood affective touch experiences and the manifestation of obsessive-compulsive (OC) symptoms, examining the intervening factors of emotion regulation difficulties, behavioral activation/inhibition systems, and psychological need frustration. Recruitment for our study involved the online solicitation of participants through various social media platforms, yielding a sample of 270 individuals, predominantly female (64.4%) with a mean age of 27.2 years. The majority of participants were White (57.8%), single (66.7%), and a significant portion held at least a Bachelor's degree (44.8%). Employing a battery of instruments, including the Tactile Biography, BIS/BAS Scales, Interpersonal Emotion Regulation Questionnaire (IERQ), Psychological Need Satisfaction and Need Frustration Scale (BPNSNF), and the Obsessive-Compulsive Inventory- Revised, our analysis involved multiple regression and mediation techniques. Results underscored positive correlations between childhood affective touch experiences and emotion regulation, reward drive, and reward responsiveness. Conversely, a negative correlation emerged between childhood affective touch and psychological need satisfaction, though no significant link was found with behavioral inhibition. Mediation analyses revealed two noteworthy pathways connecting childhood affective touch to OC symptoms. The first demonstrated that reward responsiveness and psychological need frustration

independently and sequentially mediated this relationship. The second highlighted that psychological need satisfaction independently mediated the link between childhood affective touch and OC symptoms. Additionally, a direct effect of childhood affective touch on OC symptoms was observed. These findings suggest that interventions aimed at preventing OC symptom relapse should focus on bolstering psychological need satisfaction through the enhancement of emotion regulation strategies. Furthermore, preventative strategies should involve educating parents about the crucial role of physical affective touch in fostering the emotional well-being of children.

Molecular Dynamics Simulations of Modified NFGAILS

Tatiana Alexis-Mclaren

Mentor(s): Professor Ruel Desamero & Professor Adam Profit
York College

Human islet amyloid polypeptide (hIAPP), also known as amylin, is a 37-residue long peptide hormone that is stored and co-secreted with insulin in the pancreas. Amylin aggregations and amyloid deposits have been found to be a root cause of many neurodegenerative diseases and type 2 diabetes with a focus on the 22-28 region (NFGAILS) having been found to give rise to the rigid inflexible beta sheet structures that propagate the formation of amyloid deposits. Possible intervention in the formation of amylin fibrils have been found in the form of making alterations to this region of the polypeptide in order to disrupt and inhibit the formation of beta sheet structures. Utilizing molecular mechanics software, GROMACS, the structural behavior of unaltered NFGAILS was observed in 100 ns and 300 ns simulations, the objective this semester is to develop a general framework to computationally handle non-natural and natural amino acid sidechain alterations and run such simulations through GROMACS in order to observe whether these alterations will lead to an inhibition of the formation of beta sheet structures. Alterations include the addition of methylene groups into the side chain and completely substituting certain amino acids in NFGAILS for naturally occurring amino acids that contain an additional methylene in the chain already.

The D3 Receptor Antagonist, SR 21502, Reduces Cue-Induced Reinstatement of Methamphetamine-Seeking in Rats

Tasmia Ali, Patrick Timken, Daleya Parasram, & Kirk Persaud

Mentor(s): Professor Robert Ranaldi
Queens College

Methamphetamine is an addictive psychostimulant for which there is no FDA-approved treatment. Previous studies have shown that environmental cues trigger relapse in drug-seeking after a period of abstinence. This study intended to observe the effects of the D3 receptor antagonist, SR21502, on cue-induced reinstatement of methamphetamine-seeking in rats. Our paradigm consisted of training rats to self administer methamphetamine (paired with light and sound cues), followed by extinction sessions in which the cues were removed. The rats were then randomly assigned to varying dosage groups of SR21502 (vehicle, 3.75, 7.5, 15 and 30 mg/kg) and underwent a reinstatement session, in which the light and sound cues were reintroduced. We found that there was a significant reinstatement effect in the vehicle, 3.75, and 7.5 mg groups, but not in the 15 and 30 mg groups. In a separate experiment, animals were trained to lever press for food under a progressive ratio schedule and treated with the lowest dose of SR21502 that caused a significant reduction in Experiment 1. These animals responded on average 8 times more than the vehicle-treated rats in the reinstatement experiment. Our findings indicate that, at certain dosages, SR21502 reduces cue-induced reinstatement of methamphetamine-seeking without causing any locomotor deficits.

Poster 5

Considering Masculinity: The Effects of COVID-19 on Romantic Attraction

Kristina Andrade, Dailah Martinez, & Justin Moyer

Mentor(s): Professor Claudia Brumbaugh
Queens College

A body of literature demonstrates that mate preferences are shaped by communal health and pathogen prevalence (DeBruine et al., 2010; Beall, 2021). We examined how a major recent health event (the COVID-19 pandemic) affected romantic preferences, and whether lingering effects of the pandemic (e.g., mask-wearing) continue to affect romantic attraction. Mainstream evolutionary psychology theories posit that women generally prefer more masculine men due to the association of masculine traits with higher testosterone levels, which are indicative of greater genetic fitness. This evolutionary perspective suggests that women's preferences for masculine features stem from an underlying desire to have offspring with superior genetic qualities (Trivers, 1972). In times of low public health, such as during the pandemic when multitudes were ill and dying, it may be adaptive to mate and reproduce with men who are more genetically fit (DeBruine et al., 2010; Beall, 2021).

We predicted that women's attraction to masculine faces would be greater in a Covid prime condition compared to a control condition. Research also finds that anxiously attached individuals (i.e., people who have concerns about rejection) serve as sentinels and are highlysensitive to threat (Ein-Dor & Tal, 2012). In terms of the Covid pandemic specifically, anxious people reported lower levels of initial Covid infections (Kafetsios, 2022) and were more likely to adopt pandemic-related safety precautions (Lozano & Fraley, 2021). However, anxiously attached people are also less likely to compromise genetic fitness traits in a partner, such as masculinity (Alexopoulos et al., 2021). Thus, we predicted that anxious attachment would have a notable effect on preference for masculine faces when primed with Covid. We also explored moderating effects of pandemic proximity, personal loss, attachment avoidance, and fear of contamination on preferences.

Poster 6

Wanting to Be Involved: How Urban College Students Across New York Define Engagement on Campus

Jacquelyn R Apostolo, Kevin Gregov, & Jennifer Hernandez

Mentor(s): Professor Kristine Rosales
Queens College

This study examines the involvement of urban college students in conventional college experiences and on-campus activities. Due to the disruptive effects of COVID-19, students'relationships to their respective colleges have become progressively detached. This declining involvement has expressed itself in the form of disengagement in campus activities. A survey was created to understand students' perspectives, identify factors that may be impacting levels of engagement, distributions on one of the CUNY college campuses located in Queens, New York, and potential strategies that would help improve on-campus involvement. Specifically, it examines the following challenges: how urban students define the strength of their social ties to college, whether they believe that their engagement could be improved, and if this is the case, what could be done to increase their involvement on campus. This research hypothesizes that unemployed students in comparison to those employed are more likely to be involved in campus activities. Additionally, it considers that students who live at a greater distance from campus are less likely to be involved in campus activities than those living within closer proximity to campus. The findings reveal that most urban college students agree that their involvement is important and could be improved. However, the results show that students have moderate to weak levels of social ties to the college community. Furthermore, time constraints may be the greatest prohibitor in students' abilities to become more involved. For this reason, this research suggests that

increasing accessibility to events, information, and food options may lead to overall increases in urban college student involvement.

Metformin: An Old Drug Is Still The First-Choice For Treating Type 2 Diabetes

Angeliisa Arjune

Mentor(s): Professor Deb N. Chakravarti
York College

Diabetes is a disease that develops when the blood glucose level remains too high. Human body can generate glucose, but it comes mainly from carbohydrates in foods and drinks consumed. Glucose is the body's main source of energy. Insulin, a hormone made in the pancreas, helps glucose obtained from food to enter into cells to be used for energy. When glucose accumulates in blood, it causes health issues, such as diabetes, of which the most common is type 2 diabetes. In type 2 diabetes the body does not make enough insulin and/or the body's cells do not respond normally to the insulin. This causes glucose to remain in the blood without entering the cells and the cells in the body are unable to utilize insulin properly. Insulin may be produced in the pancreas but not in enough quantity to keep the blood glucose level in the normal range. One medication approved by the US Food and Drug Administration for type 2 diabetes is Metformin, a biguanide antihyperglycemic, which when used in conjunction with diet and exercise is prescribed for glycemic control in type 2 diabetes. Metformin is a very old generic drug with brands like Glucophage. This class project will review available information on pharmacodynamics, pharmacokinetics, mechanism of action, dosage forms and administration of Metformin. The comparison of Metformin with other type 2 diabetes drugs, such as Amaryl, Bydureon and Januvia will also be provided.

Understanding ADHD: Impacts, Challenges, and Interventions

Fatimah Asad
Queens College

Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by persistent patterns of inattention, hyperactivity, and impulsivity, affecting individuals across the lifespan. This research project aims to investigate the multifaceted impacts of ADHD, including its academic, social, and psychological implications. By examining existing literature, conducting surveys, and analyzing qualitative data, this study seeks to elucidate the challenges faced by individuals with ADHD in various domains of life, such as academic achievement, interpersonal relationships, and self-esteem.

Furthermore, this research project aims to explore the effectiveness of current interventions and support strategies for individuals with ADHD, including pharmacological treatments, behavioral therapy, and educational accommodations. By identifying gaps in existing interventions and barriers to access, this study strives to contribute to the development of more inclusive and effective support systems for individuals with ADHD.

This research project seeks to deepen our understanding of ADHD and its impacts on individuals' lives, as well as to inform the development of more targeted and evidence-based interventions to support individuals with ADHD in achieving their full potential.

Fentanyl: Key Pharmacological Characteristics

Sylvia Ayala

Mentor(s): Professor Deb N. Chakravarti
York College

The increasing prevalence of opioid-related overdoses has prompted an urgent need for a deeper understanding of potent opioids such as fentanyl. This pharmaceutical class project aims to provide a comprehensive analysis of fentanyl, focusing on its chemical properties, pharmacological mechanisms, therapeutic uses, and potential risks. The project explores the synthesis of fentanyl and its derivatives, shedding light on the pharmaceutical processes involved. Through an extensive literature review, this study examines the historical context of fentanyl use, its evolution in the pharmaceutical industry, and its role in pain management. Emphasis is placed on elucidating the unique pharmacokinetic and pharmacodynamic characteristics of fentanyl, contributing to a nuanced understanding of its efficacy and potential adverse effects. The project also addresses the current regulatory landscape surrounding fentanyl, exploring recent developments in pharmaceutical formulations and delivery methods to enhance safety and efficacy. Special attention is given to innovations aimed at minimizing the risk of addiction and overdose associated with fentanyl use. This project seeks to provide pharmaceutical professionals with a well-rounded understanding of fentanyl, offering insights that can inform responsible prescribing practices and contribute to the ongoing efforts to mitigate the opioid crisis. By bridging the gap between theoretical knowledge and practical applications, this analysis aims to foster a more informed and conscientious approach to the utilization of fentanyl in pharmaceutical contexts.

Tracking the Presence of SARS-CoV-2 in Hospital Wastewater

Iñigo Caballero Quiroga & Rebecca Posner

Mentor(s): Professor John Dennehy & Professor Monica Trujillo
Queens College

Climate change, urbanization, increased travel, and human-animal contact contribute to the possibility of novel pandemics. Clinical monitoring systems rely on testing, access to medical care, and hospitalization data to track the spread of pathogens through populations. This approach predominantly detects the most ill and is labor intensive to operate, resulting in a lag between data collection and reporting.

Wastewater-based epidemiology (WBE) has emerged as an effective and low-cost pathogen surveillance tool. Using this technology, pathogens present in wastewater are concentrated, identified, and quantified. WBE is now key in infectious disease monitoring, providing a variant-specific, community-representative picture of public health trends. Wastewater has been effectively used to detect HIV, SARS, MERS, Ebola, Polio, H1N1, H5N1, MPVX and SARS- CoV-2. The ability of WBE to provide early warning is valuable for detecting pathogens characterized by asymptomatic infections. The study monitored the presence of SARS-CoV-2, MPXV, and Influenza A virus (IAV) in hospital sewage using an in-situ passive sampler and concentrator device (SCD) we developed. The SCD is deployed for 24 hours in the hospital's manholes, continuously capturing, and concentrating microbes from patients, staff, and visitors. Using proprietary buffers and the Promega Wizard Enviro TNA Kit, total nucleic acids were extracted. RT-qPCR assays were used to estimate the prevalence of SARS-CoV-2, MPXV, and IAV in hospital wastewater. Samples were sequenced to identify circulating SARS-COV-2 variants. The trends in viral loads detected with WBE mirrored clinical data for the prevalence of these pathogens in NYC. We conclude that the SCD enables the capturing of pathogens from the hospital wastewater allowing for

the monitoring of pathogen levels in communities served by hospitals. The WBE data can be used for situational preparedness during an outbreaks where resource allocation is vital. Sequencing samples from wastewater offers a unique insight into the evolution dynamics of human viruses.

To Camouflage or Not to Camouflage: Mediators between Autistic Traits and Self-Efficacy

Elisheva Conway & Ayala Feder

Mentor(s): Professor Usha Barahmand
Queens College

Many individuals with autistic traits have been found to camouflage so they can better navigate the neurotypical world. It would be expected that successful camouflaging would be adaptive and lead to improved mental health, but previous literature has associated camouflaging with negative mental health outcomes, including low self-efficacy. We speculated that self-critical rumination may contribute to this negative outcome, and that self-compassion may help mitigate it. The purpose of the present study was to investigate and determine the impacts of self-critical rumination and self-compassion on self-efficacy following camouflaging in individuals with autistic traits. This non-experimental study included 283 participants consisting of 169 females, 96 males, and 18 non-binary individuals. The participants' ages ranged from 18 to 69 (M = 27, SD = 9.44). We recruited the participants through social media platforms and invited them to complete a Microsoft Form made up of self-report measures. After that, we collected the data in Excel and ran correlation and mediation analyses using JAMOVI and SPSS. We found that the relationship between camouflaging and self-efficacy in those with autistic traits is mediated by self-compassion and self-critical rumination. After camouflaging, self-critical rumination in individuals with autistic traits will predict a decrease in self-efficacy. On the other hand, self-compassion after camouflaging will predict an increase in self-efficacy. These results demonstrate the role that self-critical rumination plays in the adverse effect camouflaging

has on self-efficacy and suggest that a strengthening of self-compassion may mitigate these effects.

What is Behind the Mask? Exploring the Role of Cognitive Insight and Shame on Camouflaging

Ayala Feder & Elisheva Conway

Mentor(s): Professor Usha Barahmand
Queens College

Many individuals with autistic traits have been found to camouflage so they can better navigate the neurotypical world. It would be expected that successful camouflaging would be adaptive and lead to improved mental health, but previous literature has associated camouflaging with negative mental health outcomes, including low self-efficacy. We speculated that self-critical rumination may contribute to this negative outcome, and that self-compassion may help mitigate it. The purpose of the present study was to investigate and determine the impacts of self-critical rumination and self-compassion on self-efficacy following camouflaging in individuals with autistic traits. This non-experimental study included 283 participants consisting of 169 females, 96 males, and 18 non-binary individuals. The participants' ages ranged from 18 to 69 (M = 27, SD = 9.44). We recruited the participants through social media platforms and invited them to complete a Microsoft Form made up of self-report measures. After that, we collected the data in Excel and ran correlation and mediation analyses using JAMOVI and SPSS. We found that the relationship between camouflaging and self-efficacy in those with autistic traits is mediated by self-compassion and self-critical rumination. After camouflaging, self-critical rumination in individuals with autistic traits will predict a decrease in self-efficacy. On the other hand, self-compassion after camouflaging will predict an increase in self-efficacy. These results demonstrate the role that self-critical rumination plays in the adverse effect camouflaging has on self-efficacy and suggest that a strengthening of self-compassion may mitigate these effects.

Poster 13

RNS/ROS Combined Effect on Yeast Cells Survival

Rose Felix, Jalal Haidery, & Anna Li

Mentor(s): Professor Uri Samuni
Queens College

The overuse of antibiotics resulted in the development of resistant microbial pathogens. Nitric Oxide (NO) is essential for blood vessel health as a vasodilator to increase blood flow and lower blood pressure. Multiple studies investigated the effect of NO on bacteria under oxidative stress, but few studies have been conducted on yeast. In our research, we studied the effect of NO on *Saccharomyces cerevisiae* strain BY4741 cells under oxidative stress induced by Hydrogen Peroxide (H_2O_2). NO was formed as a byproduct of the redox reaction between sodium nitroprusside (SNP) and glutathione (GSH). A clonogenic assay was performed to observe the cell viability. Our results showed that the combination of H_2O_2 and NO greatly reduces the number of cells demonstrating a significant synergistic killing effect.

Poster 14

Characterizing Crowdedness in TESS Images

Swan Yi Htet

Mentor(s): Professor Keaton Bell
Queens College

Given that NASA's Transiting Exoplanet Survey Satellite's (TESS) large plate scale of 21 arcseconds per pixel introduces contamination to the light curves, assessing crowding issues in TESS becomes a necessity for one analyzing studies of potential orbiting exoplanets & stellar variability from a series of TESS photometric images of local stars. For exoplanets, if excess flux from crowdedness is not fully removed, it can cause a decrease in the apparent planet transit depth, leading to a systematic underestimation of planet radii. Therefore,

determining the precision of crowdedness corrections applied by the TESS pipeline will enable the propagation of this uncertainty surrounding crowdedness to measured system parameters. As for the procedure, one requires to gather the Target Pixel File (TPF) and sky positions of nearby stars using available observatory data queries such as GAIA, develop a best-fit simulation model image of the star, evaluate the crowdedness value in the photometric aperture for every image in the TPF, and compare the distribution of crowdedness values to the value used by the TESS reduction pipeline to determine its precision. Nonetheless, one needs to consider more potential variable uncertainty factors that further systematic differentiabilities when developing the best-fit model compatible with the TESS data, such as the uncertainty in the background flux of the TPF and the intrinsic variability of stars. Consequently, the application of this technique will be expanded to many TESS targets to quantify further the precision of the contamination corrections applied by the TESS pipeline.

Poster 15

Isolation of Extracellular Vesicles Containing Rotavirus

Christa Huang

Mentor(s): Professor Zubaida Marufee Islam
Queens College

Rotavirus, a double stranded RNA virus, is a leading cause of diarrhea in young children worldwide. The virus was considered to be a lytic virus but recent reports suggest that the virus can infect healthy cells without lysing the infected host. . The viruses package themselves inside of extracellular vesicles (EVs) and bypass the immune system to infect other healthy cells. EVs are lipid bound membranes produced naturally from different eukaryotic and prokaryotic cells. Depending on their size distribution they can be called exosomes (40-150nm), microvesicles (100-1000nm), apoptotic bodies (>1000nm) etc. This study aims to exemplify the impact of EV- mediated transmission on the rotavirus life cycle. To proceed with, we will isolate EV from 3 different cell lines, namely, MA104, HT-29 and Caco2 and infect them

with Rhesus Rotavirus strain. To isolate EV, we will be using PEG precipitation/Ultracentrifugation and Tangential Flow Filtration (TFF) technique. EV isolation will then be validated by Western blot analysis. Next, the efficiency of the two approaches will be analyzed for EV isolation to see which one excludes free floating viruses. We expect to see less free-floating viruses with the TFF approach as the virus particle is roughly 80 nm in diameter and the filter can filtrate vesicles ranging from 100-1000 nm in diameter. Next by conducting one-step growth curve experiment, we will compare the rotavirus life cycle and burst size between EV-mediated and free particle-mediated infections. We aim to understand how EV-based transmission influences viral replication dynamics and progeny production. We hypothesize that EV-mediated infections will exhibit an accelerated rotavirus life cycle and increased burst size compared to free particle infections. This is expected to be due to the potential for simultaneous introduction of multiple virus particles into cells via EVs, facilitating enhanced utilization of cellular resources for viral replication.

Poster 16

Filters of the Creek: Oyster Bioremediation and the Metagenomic Profile of the Gut Microbiome of *Crassostrea Virginica* (Eastern Oyster) in the Urban, Superfund Estuary, Newtown Creek

Rebecca Kane

Mentor(s): Professor Preethi Radhakrishnan
LaGuardia Community College

Estuaries are among the most productive and valuable ecosystems on the planet, offering a wide array of ecosystem services to human beings and wildlife. They are also the among the most impacted by human activities. Increased urbanization and environmental pollution have resulted in the alteration and destruction of estuarine environments. The primary objective of the current study was to determine the effect of site and location on the resident gut microbial communities of *Crassostrea Virginica* (Eastern Oyster) within a polluted superfund, Newtown Creek. We also aimed to determine the expression of nutrient

cycling ability based on the gut microbiome of *Crassostrea Virginica*. Oysters were collected from three different sites along the bulkhead of Newtown Creek. The 16S rRNA gene amplicon sequencing method was used to identify bacterial diversity in the microbiome of oyster gut samples. The results from our study indicate that in addition to oysters acting as excellent filter feeders, filtering contaminants from the raw sewage dumped during CSO events, their microbiomes are capable of even more. Our study shows that even in extremely polluted aquatic environments, *Crassostrea Virginica* can support a microbial community with sulfur-reducing, denitrifying and nutrient cycling potential.We hope that our study can help organizations such as the Department of Environmental Control and the Environmental Protection Agency to recognize the importance of non-profits such as Billion Oyster Project in creating new oyster habitats within Newtown Creek to promote oyster remediation as another method of restoring the creek's biodiverse ecosystem.

Poster 17

Characterization of Brain Vascular Perfusion Following Peripheral Painful Inflammation in Mouse Model

Afolashade Kazeem

Mentr(s): Professor Maral Tajerian
Queens College

Pain is a complex condition affecting millions of people. It affects the physical, psychological, and cognitive aspects of individuals. Pain causes plasticity in the nervous system, which could lead to changes in cerebral blood perfusion. Alternatively, plasticity could result from reduced cerebral perfusion due to pain. While extensive research has focused on understanding the mechanism and implications of Painful inflammation, this study aims to assess the effect of peripheral Painful inflammation on cerebral blood perfusion (CBP) using laser speckle contrast imaging. Laser speckle imaging (LSCI) offers a non-invasive and real-time method to visualize and quantify blood flow changes. The blood flow

dynamics to the cerebrum of the mouse model were observed three days after administration of the complete Freund adjuvant (CFA). The study used Adult C57BL/6 mice (n=24) injected with CFA to initiate peripheral painful inflammation or normal saline on the right hinge paw, stereotaxic surgery to access the brain tissue three days after CFA injection, and laser speckle contrast imagery to observe blood perfusion. The result showed a significant reduction in cerebral blood perfusion with an increasing pain level (p<0.05). Mice who received normal saline showed higher levels of cerebral perfusion, whereas mice who received CFA showed some level of cerebral hypoperfusion, depending on the dosage of CFA received. Experimental mice who received the high dose of CFA show the highest level of cerebral hypoperfusion compared to animals who received low and medium doses.

Poster 18

Synergy in Dual Inhibition of NEK2 and EGFR Kinases in Glioblastoma Cells

Sana Khan

Mentor(s): Professor Karl Fath, Professor Sanjai Pathak, & Professor Sarbani Ghoshal
Queens College

Glioblastoma (GBM), also known as Grade IV astrocytoma, is an aggressive brain tumor which is known for its strong resistance to chemotherapy. The median survival time of a patient with GBM is 12-18 months. Thus, there remains an unparalleled demand to identify novel drugs associated with cell migration and cell viability of this rapidly proliferative brain tumor. It has been found that NEK2 kinase (Never-In-Mitosis-A-related kinase), which facilitates centrosome separation and bipolar spindle formation, is overexpressed in many cancers including GBM. In addition, many malignant tumors also overexpress EGFR (epidermal growth factor receptor). Our research is aimed at identifying any synergistic effects of the dual inhibition of both NEK2 and EGFR kinases by commercial inhibitors, namely (Rac)-CCT 250863 (a NEK2 kinase inhibitor) and Lapatinib (an EGF receptor tyrosine kinase inhibitor). We are using the human glioblastoma cell line A-172 and the rat

glioblastoma cell line C-6. Wound healing assays (scratch assays) are a standard protocol to measure the migration of cells across a cell-free gap. With this data, we will be able to quantify if there is a synergistic decrease in metastatic potential when both NEK2 and EGFR kinases are inhibited in GBM cells. These data will support our working hypothesis that the development of novel dual-action single molecule inhibitors of both kinases would promote enhanced anti-cancer therapy in GBM cells. Current efforts of the lab are focused on further investigating pathway inhibition using antibodies to identify certain downstream proteins (MAP pathway phosphorylation) that are altered by both of these inhibitors.

Poster 19

Unraveling the Link Between Touch Hunger in Childhood and Borderline Personality Traits

Sarah Khokhar

Mentor(s): Professor Usha Barahmand
Queens College

Unstable interpersonal relationships, intense fear of abandonment, inappropriate anger, and abnormal pain perception are well-established features of borderline personality disorder (BPD). Individuals with BPD often engage in seeking physical pain as a coping mechanism to alleviate undesirable internal states, especially negative emotions and inner tension. Recent research suggests that those with BPD exhibit a heightened pain threshold. Given that empirical evidence demonstrates the modulating effect of affective touch on perceived pain, we postulated that individuals with BPD would report deficiencies in childhood experiences of affective touch. Moreover, we theorized that these deficiencies would be connected across the lifespan, linking childhood experiences to deficits in adult affective touch and the frustration of psychological needs, ultimately contributing to borderline personality traits. To investigate these hypotheses, we recruited a substantial sample of 243 adults, comprising 63.8% females, 24.3% males, and 11.9% nonbinary individuals, spanning ages from 18 to 67 years

(average age= 26.8 years). Participants completed an online survey featuring self-report assessments of childhood and adult affective touch experiences, psychological needs frustration, and borderline traits. Data analysis utilized the PROCESS macro model 81, with childhood affective touch experiences as the input variable, adult affective touch as the first mediator, psychological needs frustration as the second set of mediators, and borderline traits as the outcome variable. Results aligned with our predictions, revealing a direct impact of deficient childhood affective touch on borderline traits. Childhood affective touch experiences were also predictive of deficits in adult affective touch, sequentially contributing to frustration in psychological needs and the manifestation of borderline traits. Specifically, childhood affective touch accounted for 34.8% of the variance in adult affective touch experiences. Deficits in adult affective touch were linked to borderline features through the frustration of relatedness and competence needs. These findings provide empirical support for impaired nociception and tactile sensitivity in individuals with BPD, shedding light on the potential underpinnings of self-injurious behaviors observed in BPD and other forms of psychopathology.

Poster 20

Persistence of Correlations in Neurotransmitter Transport Through the Synaptic Cleft

Masroor Khonkhodzhaev, Shota Maglakelidze, & Yonathan Dubi

Mentor(s): Professor Lev Murokh
Queens College

The "quantum brain" proposal can revolutionize our understanding of cognition if proven valid. In this work, we examine the preservation of the correlations created in the pre-synaptic neurons through the transfer of neurotransmitters across the synaptic cleft. We simulate transport of two neurotransmitters at two different clefts, with the only assumption that they start simultaneously, and determine the difference of their first passage times. We show that in physiological conditions, the correlations are persistent even if the parameters of the two neurons are different.

Poster 21

Squid Pro Quo: A Behavioral Study of *Euprymna Berryi* in Light v. Dark

Da Eun Kim & Annaliese Chang

Mentor(s): Professor Sebastian Alvarado
Queens College

An animal's ability to adapt to its changing environment is critically important for their survival and can manifest across a range of traits such as behavior and/or morphology. *Euprymna berryi,* also known as the hummingbird bobtail squid, are found in coastal parts of the Indo-Pacific Ocean and occupy a range of habitats tied to seasonal variation and substratum. *E. berryi* are benthic; they reside almost entirely on the seafloor during their lifetime and, thus, often employ behaviors, like burying, to camouflage. The purpose of this study was to observe the effects of the visual environment on these behaviors and pigmentation using a light/dark rearing paradigm. In this study, *E. berryi* were raised in either a completely light or dark environment and then, introduced to a novel (the opposite color) and control (the same color) environment. Animals were recorded in both light/dark environments and behaviorally scored. We hypothesized that squid would bury more when placed in their home color than in the novel color. Our findings show dark-reared squid blew sand after burying more frequently in the control and used their siphon to propel themselves more frequently in the novel environment and we noted no differences in their pigment cells between conditions.There were no significant differences in frequency or duration of behaviors between control or novel environments for light-raised squid. Our results suggest that dark-raised *E. berryi* were more prone to performing stress-related behaviors more frequently than light-raised. A possible explanation of this could be an associated increase in stress with the lack of visibility in a dark-raised environment. This can be further investigated with an additional study on stress physiology of *E. berryi.*

Proposing a Paradigm for Attention Deficit Hyperactivity Disorder-Associated Delayed Sleep Phase Syndrome in the Mouse Model

Neli Kotlyar

Mentor(s): Professor Jeff Beeler & Cayla Murphy
Queens College

Dopamine (DA) is a fundamental regulator for sleep and the circadian rhythm, affecting clock-protein expression and consequently melatonin inhibition. Hypodopaminergic brain activity in neurological disorders such as attention deficit hyperactivity disorder (ADHD) are highly associated with sleep disorders: in various studies, over 70% of both children and adults diagnosed with ADHD have been found to have symptoms of delayed sleep phase syndrome (DSPS), characterized by delays in the sleep-wake cycle (Fargason et al., 2017). While ADHD is known to be often comorbid with sleep/circadian disorders, notably ADHD in tandem with DSPS, little research has been done into whether hypodopaminergic brain activity causes or shares a common etiology with sleep dysregulation. In the proposed experiment, three two-week phases will take place with wild-type C57BL/6 control mice and the transgenic DATIREScre strain. In the first phase, both wild-type and transgenic mice will be observed with the colony's regular 12-hour light cycle. In the second phase, both populations will have their light cycle altered one hour forward every 24-hours. In the final phase after a two-week period of readjustment to the regular cycle, both populations will be kept in a completely dark environment. Variables being measured are proportion and average amount of time spent awake versus asleep, rhythmicity of sleep cycles, and number of arousals. We predict that the DATIREScre mice will have an increased frequency of night-time arousals and time spent awake, as well as a more irregular sleep pattern and delayed sleep onset. This upcoming experiment will attempt to reverse-translate the 70% co-incidence rate of ADHD and DSPS seen clinically in humans within the DATIREScre mouse model, which will help elucidate whether this comorbidity is a pleiotropic effect of Slc6a3 gene polymorphism.

Does Visual Ecology Sway the Mating Decisions of an African Cichlid Fish?

Avraham Zion (Avi) Kuighadush & A. Martashvili

Mentor(s): Professor Sebastian Alvarado
Queens College

Many variables can shape reproductive behaviors in the wild. Photoperiod, social interactions, and ambient temperature can be triggers that precipitate various reproductive outcomes. We chose to study the behavioral and morphological adaptability of female *Astatotilapia burtoni* to changes in their ambient visual environment. Males of this species are predominantly blue or yellow and can also change their social rank to become either territorial or non-territorial. Territorial males display behaviors related to territoriality and mating, while non-territorial males don't. There's limited understanding of female-specific preferences for body coloration. By investigating female interpretation of male cues, we learn how female sexual selection can be modulated by male phenotypic plasticity. Females can also develop yellowish or bluish coloration based on their rearing environment and our study asks whether visual factors influence social dynamics in females and their choice of mate. We predicted that yellow-reared females would prefer yellow males and blue-reared females would favor blue males. If females prefer males of the opposite color, it suggests that male behavior holds more weight than visual cues in female mate selection. In the first phase (n=24), half of size- and age-matched females were placed in a blue environment, and the other half in a yellow environment. Following a month, their color preferences were assessed without the male presence, and then they interacted with blue and yellow males. Female gonads were examined to calculate the Gonadosomatic Index (GSI) and overall reproductive readiness. Yellow and blue-induced females showed a preference for the yellow male over the blue. Notably, blue-induced females favoring the blue substrate, later spent more time with the yellow male. Females with higher GSIs, indicating readiness to mate, favored the yellow male. This trend suggests that the reproductive

behaviors of yellow males might override the influence of visual ecology entirely.

Negative Mode Electrospray of the 2-Hydroxyethylhydrazinium Nitrate (HEHN) Ionic Liquid: Cluster ion Formation and Fragmentation

Pui Yung Varonica Lee

Mentor(s): Professor Wenjing Zhou & Professor Jianbo Liu
Queens College

Ionic liquids (ILs) have versatile applications and now are envisioned as propellants for spacecraft electrospray thrusters due to their inherent ionic nature, negligible vapor pressure, high electric conductivities, and low viscosity. 2 Hydroxyethylhydrazinium nitrate (HEHN) is a task-specific IL developed by the Air Force Research Laboratory.The literature reported work only focused on mechanistic studies of HEHN decomposition. Our group have previously explored cluster ion formation, constituents, and cluster fragmentations of the HEHN IL in the positive electrospray plume. In the present work, we have extended the investigation to the negative electrospray of HEHN, focusing on the similarities and differences vs. the positive electrospray of HEHN. The formation and fragmentation of negative HEHN cluster ions in the electrospray were measured by home-built guided-ion beam mass spectrometry coupled to electrospray ionization. The experiment was augmented by density functional theory (DFT) calculations and molecular dynamics simulations to reveal reaction dynamics for negative HEHN clustering and fragmentation in electrospray plumes and to determine how they affect propulsion thrust and specific impulse. These results will help digital propellant engineering including determining propellant utilization-metrics and improving thruster performance.

Investigating Chemotherapy Efficacy within Human Vascular Endothelial Cells Constituted Tumor Microenvironment

Nang Kham Hsi Liang

Mentor(s): Professor Na Xu, Professor Ying Liu, and Malcolm Reid
LaGuardia Community College

Blood vessels directly connecting with cancer tissues have been identified as crucial factors influencing the effectiveness of chemotherapy, as they play a significant role in cancer cell proliferation and metastasis from the primary site to other organs. This research focused on testing the efficacy of chemotherapy drugs as well as assessing the side effects of those drugs on blood vessels. The esophageal adenocarcinoma (EAC) organoids labeled with fluorescence reporter were cultured together with Human Vascular Endothelial Cells reprogrammed with ETS variant 2-transcription factor (ETV2) (R-VEC) in a 2D-vitro microenvironment and tested with different anti-tumor drugs. Cell viability was recorded by confocal fluorescence microscopy and analyzed over time using ImageJ (Fiji). The study's findings revealed that the combination of three drugs, namely FOLFIRI, SAHA, and GSK343, was effective in killing tumor cells without harming R-VEC cells. In contrast, using either FOLFIRI or GSK343 alone led to the death of both tumor cells and R-VEC cells, indicating that these drugs can cause toxicity in the normal tissue of the tumor microenvironment. However, when SAHA was administered in conjunction with these drugs, the resulting effect on patient blood vessels was less harmful.

Investigation of Anticancer Properties of PolyRhodanine Copper NanoComposites

Fnu Manisha

Mentor(s): Professor Sarbani Ghoshal & Professor Moni Chauhan
Queensborough Community College

Rhodanine (derived from thiazolidine), a heterocyclic compound, plays an essential role in the biological system of humans. Its derivatives are present in drugs used in antibiotics, antiviruses, antidiabetics, and antifungals. We hypothesize that the shape-controlled synthesis of PolyRhodanine will provide an exciting perspective for diagnosing and treating diseases, including cancer. In our research, we used PolyRhodanine Copper nanocomposite which was synthesized in a single-step oxidation-reduction reaction in the presence of transition metals in the microwave. Subsequently, we tested our compound in a human lung cancer cell line, namely A549, to measure cancer cell viability by the colorimetric MTT (3- [4,5-dimethylthiazol-2-yl]-2,5 diphenyl tetrazolium bromide) assay. The MTT assay is used to measure cellular metabolic activity as an indicator of cell viability and cytotoxicity. In our experiment, 20,000 A549 cells were plated in each well of a 96-well plate and treated with varying doses of the compound for 48 hours to investigate the viability of lung cancer cells. Our data shows viability of A549 cells decreases in a dose dependent manner with treatment concentrations from $0.01\mu M$ to $1\mu M$ in comparison to cells in the DMSO control treatment group. Current studies are focused on understanding the antimicrobial effect of the compound. We would like to acknowledge Qiaxian Johnson and Dr Bhanu P. Chauhan from the Department of Chemistry, William Patterson University, Wayne, NJ, for the TEM images.

Probing the Role of Phenylalanine Residues on the Amyloid Formation of the N-Terminal Fragment of Serum Amyloid A

Samantha Mariano

Mentor(s): Professor Ruel Desamero & Professor Marvin Bilog
York College

AA amyloidosis is a severe complication of chronic inflammatory disorders and is potentially fatal. The amyloid fibrils involved in AA amyloidosis are derived from serum amyloid A (SAA) which is an acute phase reactant protein. In AA amyloidosis, circulating amyloid fibrils are deposited in organs and tissues ultimately leading to their failure. While SAA has been identified as the major component of amyloid fibrils, little is known about the mechanism by which it misfolds to form aggregates.

Presented herein is a comprehensive study probing the role of the 4 phenylalanine residues on the amyloidogenic fragment of SAA, SAA_{1-13}. After systematically replacing Phe-3, Phe-4, Phe-6, and Phe-11 with Leu, we characterized the amyloidogenic propensities of the mutated fragments relative to the wild-type sequence. The peptide sequences were synthesized using Fmoc-solid phase chemistry and purified using high-performance liquid chromatography. To ensure and verify the sequence, mass spectrometry was done. Results of turbidity and thioflavin fluorescence assays to reveal amyloidogenic propensity were analyzed in terms of its implication on the mechanism of misfolding. Initial data reveal that Phe-3 and Phe-6, and to some extent Phe-11, play a crucial role in the aggregation of SAA_{1-13}.

Poster 28

Effects of Caffeine on Phagocytosis of Zymosan by BV2 Microglial Cells

Yadanar Min

Mentor(s): Professor Ana Lucia Fuentes
LaGuardia Community College

Caffeine is the most widely consumed pharmacological compound and is found in coffee beans, tea leaves, and manufactured products, such as chocolate and soft drinks. Caffeine can have either adverse effects on human health (toxicity, excitement, nervousness, and headaches) or positive effects on cognition, learning, and memory, depending on the amounts consumed. In-vitro studies have shown that caffeine downregulates the production of pro-inflammatory molecules both in macrophages and microglia (phagocytes in the blood and brain, respectively). In light of these reports, we decided to investigate the effect of caffeine on an essential function of these cells, phagocytosis. We hypothesized that as with pro-inflammatories production, caffeine would downregulate phagocytosis. We used BV2 microglial cells, which we pre-treated with different concentrations of caffeine, followed by incubation with zymosan, a yeast-derived particle readily engulfed by macrophages. We used Wright's stain to microscopically visualize and quantify the number of cells phagocytizing as well as the number of particles in each cell. To our surprise, we found that phagocytosis was upregulated in cells treated with caffeine concentrations of 0.5, 0.75, and 1 μM. At higher doses, caffeine gave rise to high mortality in the cultured cells. Inflammation can contribute to many neurodegenerative diseases because of the accumulation of insoluble proteins in the brain. If caffeine can serve as an anti-inflammatory agent and stimulate phagocytosis, it could represent a molecule with therapeutic properties for treating those kinds of diseases.

Poster 29

Moving Towards More Efficient Types of Photovoltaics with Intermediate-Band Solar Cells Formed by Type-II Quantum Dots

Samantha Mirocznik & Anand Persaud

Mentor(s): Professor Igor Kuskovsky
Queens College

Conventional single-junction solar cells in use today are limited by the Shockley-Queisser Limit to a maximum theoretical efficiency of around 30%. Intermediate-band solar cells (IBSC) feature intermediate energy bands that allow for the absorption of additional photons below the semiconductor bandgap while not decreasing the open-circuit voltage. This has the power to significantly increase cell efficiency. We present here an IBSC with intermediate band formed by Type-II CdTe/ZnCdSe quantum dots. Quantum dots were fabricated by migration-enhanced epitaxy. Bulk layers of ZnCdSe:Cl and ZnSeTe:N were used as n- and p-layers respectively. The cell was grown on indium phosphate. We characterized the cell using current-voltage, optical absorption, and spectral response measurements. These measurements show that CdTe/ZnCdSe IBSCs are good candidates to replace conventional single-junction devices.

Poster 30

Microbial Diversity of Selected New York Waterways

Maha Almaflehi, Jiamiao Chen, Julianne Cossin, Diya D'Costa, Emily Dragoi, Tiffany Huang, Shamonique Jackson, Christopher Mungavin, Jalen Nicholas, Adrian Orellana, Maria Rodriguez, Alexander Tilas, & Katherine Vegas

Mentor(s): Professor Monica Trujillo
Queensborough Community College

Water is a natural reservoir for microbes. NYC waterways are a combination of naturally occurring microbes, and microbes introduced by human activity.

Thus, due to human activity, some of these microbes exist in the waterways that would otherwise not be found in the natural environment. Urbanization implies among other things, the existence of wastewater that must be treated before being released; runoff from the concrete used in city streets, waste from pets and non-native animals and chemicals such as fertilizers. Due to NYC's combined sewer system, untreated wastewater under certain climate conditions is released into the waterways. This poses additional threats to human and environmental health. Additionally, flooding events are predicted to be more frequent in NYC in the near future due to erratic weather caused by climate change. We collected samples from thirteen different waterways in NYC. The samples are being analyzed for microbial diversity using cultured and uncultured methods. Cultured methods- Samples were plated in different media as the first step to obtain pure cultures. Pure isolates will be identified and characterized using a combination of microscopic, metabolic, and molecular methods. Uncultured methods- Total DNA was extracted from the water samples. Identification of microbes will be done using 16S rRNA analysis. The primary goal of this project is to have a preliminary assessment of the microbial diversity of the thirteen waterways. Additionally, we are interested in whether climate change induced wastewater release may have a significant effect on the health of our waterways.

Poster 31

Extending Beneficial Effects of Environmental Enrichment to Extended Access Heroin Self-Administration Model

Ziv Nachshon

Mentor(s): Professor Robert Ranaldi & Professor Apoorva Vashisht
Queens College

Substance use disorder is a pathological condition involving neural plasticity in the brain's reward and cognition systems. It is caused by abnormal activation of gene expression programs in response to extended drug use. To develop effective interventions, addiction and relapse mechanisms are studied. Rat models may be used to observe the behavioral and neurological aspects of substance use disorder. The rats are placed in an operant chamber in which they can voluntarily self-administer heroin for long access periods, six hours. Cue-induced reinstatement in rat models has provided valuable insights into the resumption of drug-seeking actions following a period where heroin self-administration is extinguished. Rats placed in environmentally enriched cages during the extinction period are less likely to resume drug seeking behavior (i.e., pressing the drug active lever) throughout the reinstatement period compared to rats placed in normal cages. The results illustrate that on average, female and male rats treated with environmental enrichment display diminished motivation for the drug compared to non-environmentally enriched rats. These results suggest there is a connection between environmental enrichment and the neurological mechanisms associated with substance use disorder, and suggest that environmental enrichment may constitute a potential treatment for addiction.

Poster 32

Studying Biofilms Grown in Chemostats

Aliza Nagel

Mentor(s): Professor John Dennehy, Professor Fabrizio Spagnolo, & Professor Monica Trujillo
Queens College

Developing models to study biofilms is key to advancing our understanding of their dynamics. Here, we report on observed persistent shedding of bacteria from biofilms when grown under continuous culture conditions in a Kubitschek-style chemostat. Method: Planktonic and biofilm cells of Pseudomonas aeruginosa PAO1 strain (SCK194 PAO1-Parsek Tn7::PcdrA-GFPc GmR) were studied using a newly developed experimental platform for growing biofilms in chemostats under continuous culture. This strain has Green Fluorescent Protein (GFP) cloned under a promoter that is activated when cells adopt the biofilm lifestyle. Here, a sterile coverslip is introduced into the chemostat allowing planktonically growing cells to migrate out of the media, settle and seed the coverslip or wall biofilms, or be washed out as waste. The size

of the planktonic population was calculated by plating and counting CFU/ml. The coverslip was observed under the microscope and the wall biofilm populations were analyzed using Fluorescence Activated Cell Sorting (FACS). Results: The chemostat provides an appropriate model to study biofilms, where the biofilm can mimic real world conditions- having a sticky surface to which they can attach with a moist, nutrient rich environment. The coverslip serves as a sticky surface to which the biofilms can adhere while preserving its structural integrity, thereby allowing us to observe the biofilm structure under a microscope without altering its morphology. Using image processing, details of the biofilm architecture can be elucidated. The FACS analysis of the wall biofilm provides additional details of the composition and structure of a biofilm growing in equilibrium with a planktonic population. The described model and techniques provide a unique opportunity to analyze and dissect the events happening during the establishment and development of biofilms.

Poster 33

Employees Burnout and Food Safety Behaviors in the Restaurant Industry

Kalynn Ng

Mentor(s): Professor Jihee Choi
Queens College

Employee burnout is known as mental and physical exhaustion prompted by ongoing stress that can lead to a lack of motivation to work. While employee burnout can lead to job dissatisfaction and demotivation in general, the question whether burnout amongst restaurant employees is associated with food safety behaviors in the context of a restaurant remains unanswered. The objective of this study is to measure the level of burnout of restaurant employees and affective job commitment and determine the relationship between these factors and employees' food safety behaviors. A total of 143 respondents who are currently working in the restaurants in the U.S as non-managerial employees participated in the survey through M-Turk (58% male and 42% female). Descriptive statistics and multiple linear regression were used for data analysis to test the

relationships between employees' burnout, affective job commitment as independent variables and food safety behavioral intention (dependent variable). The assumptions for the regression analysis were tested including normality, constant variance, linearity, and outliers and the results met the requirements, and no assumptions were violated. The resulting model was statistically significant ($F=55.302$, $p<.001$), with adjusted explanatory power of $r2 = 0.538$. The variables related to employee's food safety behaviors were employee's burnout ($\beta=-.420$ for personal burnout, $\beta= -.315$ for work related burnout, $p<.001$) and affective job commitment ($\beta =0.584$, $p<.001$). The results will be valuable to develop strategies to mitigate employees' burnout and increase affective job commitments to improve food safety behaviors in the restaurant industry.

Poster 34

Assessing the Role of Disaggregase Hsp104 in the Addition of New Material to Htt-GFP Inclusions

Rachel Pakan

Mentor(s): Professor Lesley Emtage
Queens College

The mechanisms underlying the formation and growth of unfolded protein inclusions in living cells are poorly understood phenomena that hold relevance for neurodegenerative disease pathogenesis. In S. cerevisiae, mutant huntingtin fused to GFP (mHtt-GFP) is brought into mobile, ovoid inclusion bodies. The disaggregase Hsp104 is necessary for the formation of mHtt-GFP inclusions, but it is unknown whether it is required for the initiation of an inclusion or for aggregated particles of mHtt-GFP to fuse with an inclusion. Using the acute knock-down of Hsp104 in cells with existing inclusions, we hope to gain insight into the protein's role in the addition of new material to inclusions. We have created cells strains containing Hsp104 tagged with a degron sequence and mCherry (Hsp104-degron-mCherry) that are co-expressing the Tir1E3 ligase. Using auxin-inducible degradation, we are in the process of knocking down

Hsp104; the addition of auxin to the cells will target Hsp104-degron-mCherry to the proteasome for degradation.

Raising Bilingual Children: The Best Course of Action A *linguistic* and Developmental Study

Gianna Palumbo

Mentor(s): Andrea Ariza
Queens College

Multilingualism is a gift that can change the prospect of one's life. As one gets older, this language acquisition skill gets harder; suggesting the best way to become bilingual is to be raised learning two languages. However, the process comes with challenges. If done poorly, this can inhibit a child's learning and academic success for the rest of their lives; further inhibiting their quality of life, providing a drastically opposite result than hoped for. By looking at early childhood developmental psychology and trends combined with linguistic research, we can hypothesize what the general best route is to navigating two languages at once for children. An important factor in this study includes not only looking at the child's proficiency in both languages, but their in-school successes and hardships; presence of ENL/ESL classes, and IEPs. This meta-analysis research aims to answer the question: What is the best way to raise a bilingual child without inhibiting academic success? The main findings of this study revealed that (in the case of two parents or guardians present) that a one-person one-language approach along with exposure to mixed media and representation along with active practice of both languages works best; in addition to support from the schools. Although this is not a case-by-case definitive solution, it is important to note how every child learns differently, and more research is needed in this field of study.

CETIRIZINE: Anti-Histamine Drug for Allergic Rhinitis and Chronic Urticaria

Sujoya Paul

Mentor(s): Professor Deb N. Chakravarti
York College

Cetirizine is a second-generation antihistamine drug used for allergic conditions like rhinitis and urticaria. It blocks histamine release providing short-term relief from symptoms such as sneezing and hives. Notable for its non-sedating nature, it selectively inhibits histamine H1 receptor making it suitable for daytime use. Derived from Hydroxyzine, Cetirizine effectively treats chronic idiopathic urticaria and allergic respiratory diseases displaying its anti-inflammatory properties. In terms of pharmacokinetics, Cetirizine is rapidly absorbed orally with consistent bioavailability in tablet or syrup form. It is primarily eliminated through urine and feces. The drug's plasma elimination half-life is 8.3 hours. Its unique features, such as rapid action, prolonged duration and minimal metabolism contributes to its effectiveness. The drug acts by inhibiting peripheral histamine H1 receptors demonstrating antihistamine activity with minimal anticholinergic effects. However, clinical studies indicate a higher incidence of dry mouth with manageable side effects. Like other H1 antihistamines, Cetirizine impedes histamine activity at the histamine H1 level. It also enhances mast cell stability by decreasing calcium ion concentration to prevent histamine release. Cetirizine appears non-carcinogenic and non-mutagenic at various therapeutic doses in a two-year carcinogenesis study in rats. Breastfeeding mothers are recommended to avoid Cetirizine since it is excreted in breast milk. This drug is available over the counter in various dosage forms including tablet, chewable tablet, oral-capsule; and an oral solution form with prescription.

The Relationship Between Autistic Traits and Shame: Exploring the Impact on Camouflaging Behaviors

Reyana Persaud, Ayala Feder, Faiza Mughal, Elisheva Conway, & Amanda Seepersaud

Mentor(s): Professor Usha Barahmand
Queens College

Camouflaging in autism refers to the process by which individuals on the autism spectrum consciously or unconsciously attempt to mask or hide their autistic traits and perceived deficits in social abilities to fit in, avoid negative social consequences, or meet societal expectations. This can involve mimicking neurotypical social behaviors, suppressing stimming behaviors, or employing strategies to appear engaged in social interactions. However, camouflaging can lead to cognitive and emotional exhaustion, feelings of inauthenticity and confusion about one's identity, as well as lower self-esteem. The purpose of the present study was to determine which specific autistic traits and what aspects of shame predict camouflaging in individuals with autistic traits. A sample of 283 (18–69 years; 59.7% female) completed an online survey including self-report measures of autistic traits (AQ), shame (EISS), and camouflaging (CAT-Q). Data were analyzed using correlation and multiple linear regression analyses. Results show that while all autistic traits are significantly and positively associated with both internal and external shame as well as camouflaging, only attention switching, attention to detail, and communication deficits accounted for 3.4% of the variance in camouflaging with internal shame accounting for a further 6.7% of the variance. Findings reflect that individuals with autistic traits experience difficulties with executive functions among which attention switching is a notable area of challenge. The role of attention to detail in camouflaging underscores the significant cognitive and emotional effort involved in masking. Furthermore, the significance of internal shame points to the self-criticism that these individuals engage in, a significant factor in various forms of psychopathology and suicide. Our findings imply that understanding these mechanisms can help develop 1) targeted interventions to enhance the ability of individuals with autism to navigate tasks and transitions more effectively, and 2) support strategies that diminish the reliance on camouflaging and promote more authentic social interactions, thereby prevention severe outcomes like psychopathology and suicide.

STEM-Care Winter Workshop 2023. Small World Initiative

Micaela V. Reyes

Mentor(s): Professor Derrick Brazill
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Antibiotics are chemicals made from bacteria. A series of steps are followed in this research study to identify the bacteria that produced a desired chemical. First, soil is collected from near environment of York College in Jamaica, Queens, NY. The soil is then diluted and distributed in Agar plates to allow bacterial growth. After some hours the bacteria are isolated and relocated in Master Plates containing different types of bacteria that are known to trans mutate into the MERSA (multi-resistant) bacteria. Later, the isolated colonies that inhibit the growth of other bacteria are relocated in the ESKAPE plate to dilute and further observation under the microscopy. This winter workshop is constituted in three weeks . The purpose of this work is to collect, isolate, identify and store pure bacteria colonies that could possibly lead the development of a new antibiotic. New antibiotics are needed to fight AMR (antimicrobial resistance) that are increasingly becoming more life-threatening and untreatable. Soil collected from different locations around the USA is studied to help new antibiotics discoveries. Because the time required to make new findings implies a large amount of dedication and many times are not rewarded, the pharmaceutical companies do not pursue nor invest in this purpose. Students from different universities pursuing a STEM career are encouraged to participate in this initiative and submit the data to the website where all information is stored for further studies. Small World Initiative is the program responsible for instructing the student and collecting all data.

Probing The Role Of Ser-5 On The N-Terminal Region Of Serum Amyloid A

Sophia Rodriguez, Julian Feliciano, & Jalena Baker

Mentor(s): Professor Ruel Desamero & Professor Adam Profit
York College

AA Amyloidosis is a systemic disorder that results from the aggregation of Serum Amyloid A (SAA) protein. Patients who experience AA Amyloidosis often see severe symptoms of organ or tissue failure which can result in a poor quality of life or death. This degenerative disease is thought to be due to a conformational change of Serum Amyloid A protein from alpha helix to beta sheets, the hallmark of from the. Changing the conformation not only changes its overall shape but interferes and/or hinders the interactions between amino acids which can affect the protein's ability to function. The fibrils formed are then deposited into the affected organ tissues leading to Amyloidosis. Finding a way to prevent the aggregation of SAA will in turn prevent the formation of beta sheets that leads to fibrils thus delaying or stopping the onset of Amyloidosis. AA Amyloidosis has been seen in patients dealing with cancer as well as deceases like , Alzheimer's, Huntington's, Parkinson's, Type II Diabetes, Rheumatoid Arthritis, and recently COVID-19.

SAA_{1-13} is a peptide consisting of the first 13 amino acids of Serum Amyloid A protein with the sequence of RSFFSFLGEAFDG. From previous studies revealed that this region of SAA is the least stable and most amyloidogenic and the least stable region of SAA. Recent mutational studies in our group indicated that Ser-5 in the sequence plays an important role, though mechanistically unclear, in modulating aggregation. It is therefore the goal of this work to understand at the molecular level the role of Ser-5 in the misfolding of SAA.

Our investigation will consist of mutating Ser-5 of SAA_{1-13} Ser-5 to homeserine, aspartic acid, and threonine. These mutated SAA peptides along with wild type were synthesized using Fmoc Solid Phase Peptide synthesis. Analytical methods like High Performance Liquid Chromatography (HPLC) and Mass Spectroscopy (MS) helped identify and confirm the purity of our peptide samples. Thioflavin T (ThT) Fluorescence Assay was used to determine the amyloidogenic propensity of our peptide samples We characterized associated conformational change using Circular Dichroism (CD) and identified the morphology of that fibrils formed using transmission electron microscopy (TEM). The data obtained were analyzed in terms of the mechanistic implications of replacing Ser-5 with other groups.

Automation in the Laboratory

Jonnathan Saavedra

Mentor(s): Professor John Dennehy
Queens College

In scientific laboratories, automation plays a crucial role in enhancing quality, efficiency, safety, and cost-effectiveness. However, highly specialized robots may not always represent the best investment due to cost and lack of versatility. That is where robots like Opentrons come into play because they are relatively affordable, open source, and adaptable to various tasks. This research utilizes an Opentron robot for automating serial dilution processes and simulating pathogen distribution across common hospital objects using probabilistic models. These processes are being done by a thorough understanding of the Opentrons API and fundamental Python programming language to interact with OT-2 (Opentrons robot) a liquid handling robot. OT-2's capability of automating serial dilutions addresses the need for precision and reproducibility in microbiological experiments, reducing human error and increasing productivity. On the other hand, the hospital simulation script represents an innovative approach to modeling pathogen spread within healthcare environments. It uses probabilistic models to simulate the distribution of pathogens across common hospital surfaces, providing a tool for assessing critical points for infection control and prevention. This script aims to

contribute to infection prevention by developing a better understanding of pathogen spread and identifying high-risk areas for targeted cleaning. The findings have the potential to inform better sterilization practices and public health policies, ultimately contributing to safer hospital environments and reduced transmission of infectious diseases. By utilizing versatile robots for automation, this research not only streamlines experimental protocols but also provides insights into the dynamics of microbial spread in healthcare settings. This interdisciplinary approach exemplifies the synergy between microbiology, robotics, and computer science, showcasing the potential of technology to address complex biological and health-related challenges.

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The Surrounding Shame Within You Before Masking Your Soul

Amanda Seepersaud, Ayala Feder, Elisheva Conway, Reyana Persaud, & Faiza Mughal

Mentor(s): Professor Usha Barahmand
Queens College

Autistic traits refer to subtle and subclinical manifestations of features linked to autism spectrum disorder, exhibiting a normal distribution within the general population. Research indicates that individuals displaying these traits engage in camouflaging to conceal their condition in social contexts. This encompasses the suppression of autistic inclinations and deliberate participation in socially conventional behaviors. Empirical evidence indicates that individuals with autistic traits are often rejected by peers, marginalized by social groups, and experience greater levels of loneliness compared to matched controls. The present study examines whether feelings of shame mediate the association of autistic traits and camouflaging. Data were collected from 283 individuals from ages 18 to 69 years with a mean of 27 years (SD =9.4). Most participants were female (59.7), White (54.4%), working part-time or full-time (61.8%), single (70.3%), and had college degrees (54.4%). Participants responded to self-report measures assessing autistic traits, experiences of internal and external shame, and camouflaging. Data

were analyzed using SPSS version 29 and the PROCESS macro was utilized to test the hypothesized mediation. Results revealed that autistic traits correlated positively and significantly with both external and internal shame as well as camouflaging. Both direct effects and indirect effects of autistic traits on camouflaging were observed. Only internal shame served as a significant mediator linking autistic traits to camouflaging. Findings imply that interventions targeting the experience of internal shame in individuals with autistic traits can help these individuals reduce their motivation to camouflage.

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Loratadine: A Blockbuster Antihistamine Drug

Saeen Seikh

Mentor(s): Professor Deb N. Chakravarti
York College

Loratadine belongs to a class of non-sedating antihistamine drugs used to treat allergies. It is a second-generation antihistamine used for seasonal allergic rhinitis that causes runny nose, nasal congestion, sneezing and itchy nose, throat, eyes and ears. It is also used to treat chronic idiopathic urticaria. Loratadine was developed at Schering-Plough Corporation (now Merck) and patented as a new chemical entity in 1980. It was approved by the US Food and Drug Administration (FDA) in 1993 as a prescription medication and launched under the brand name Claritin. In 2002 it was switched from a prescription to an over-the counter medication by the FDA. After expiration of Schering-Plough's patent in 2002 and subsequent loss in patent lawsuit, Loratadine became available as a cheaper generic drug and is sold worldwide. Histamine is the chemical produced by our immune system which binds to histamine H1 receptors to trigger an allergic reaction. Antihistamines, such as Loratadine, work by binding to the histamine H1 receptors to prevent or reduce the severity of histamine mediated symptoms. Loratadine belongs to the family of tricyclic anti-histamines and is a fast-acting drug. This class project will summarize the pharmacodynamics and pharmacokinetics of Loratadine, including information on absorption,

metabolism, elimination, half-life and clearance. Loratadine is available in various dosage forms, such as tablets, syrup or as an oral solution. Some common side effects of Loratadine are headache, feeling tired or worn out, nausea, vomiting and dry mouth.

Assessing Consumer Perceptions of Food Safety in Mobile Eateries: A Study on Food Trucks

Kate Shanley

Mentor(s): Professor Jihee Choi
Queens College

Food trucks have been a growing industry over the past couple years, this increase in mobile food attraction has also inherently been associated with an increase in reported foodborne illness cases. Mobile food operations such as food trucks work in cramped environments and operate under little oversight making them high-risk populations for food safety maintenance. Due to the limited studies on this topic and increasing consumer anxiety around how safe this food being prepared is, a perfect research opportunity was created. In this study we explored how consumers' food safety knowledge, perceived service quality, past experiences with food trucks, and perceived risk are related to their perceptions of safety towards the food being served from food trucks. 286 total respondents (45.1% males and 54.5% females, 80% aged between 18 - 39 years), who had ordered food within the past six months from food trucks in the United States participated in a survey via Prolific. Descriptive statistics and multiple linear regression were used for data analysis, with a determination coefficient $(R^2)= 0.398$. Our results showed significant positive correlations between food truck customers' knowledge about food safety ($\beta = 0.088$, $p < 0.05$), perceived service quality ($\beta = 0.215$, $p < 0.01$), and prior experience ($\beta = 0.291$, $p < 0.001$) with their perceived safety of the food. Conversely, customers' perceived risk ($\beta = -0.289$, $p < 0.001$) was negatively associated with perceived food safety from food trucks. These results give food truck owners insight from acustomer's point of view, to instruct them on what modifications could be made to

inevitably improve both the customer experience and business revenue.

Sourdough Microbiomes

Monisha Sherpa, Abid Ally, Aisatou Diallo Maham Naz, & Shantanu Zubayer

Mentor(s): Professor Louis Levinger & Louis Bradbury
York College

This study explores the microbial community within the rye and wheat berry microbiome of sourdough, focusing on key findings at different stages of fermentation. In day 0 there were presence of Pantoea agglomerans and day 7 absence of Pantoea and presence of Levi Lactobacillus brevis and Pediococcus pentosaceus. In metagenomics using the software QIIME 2 for ITS primer we identified the fungi Blumeria graminis but for 16S primer no Pantoea bacteria. The rise from sourdough could be presence of the yeast cells which serves as energy source for bacteria such as Pantoea and Leviloactobacillus. Fungi such as Blumeria appearing in abundance at a later date on flour, wheat, rye and grain samples are verified through Sanger Sequencing. These insights, crucial for the food industry, shed light on microbial dynamics influencing sourdough quality.

Salbutamol: Receptor Agonist for Treatment of Asthma and COPD

Priscillia Sikpa

Mentor(s): Professor Deb N. Chakravarti
York College

Salbutamol is a widely used drug to relieve symptoms of chronic obstructive pulmonary disease (COPD) and asthma. COPD is a collection of lung diseases that causes breathing problems or airflow restriction. Common disorders observed in COPD patients are

emphysema or chronic bronchitis. People with COPD have lungs that are damaged or clogged with phlegm resulting in wheezing, tiredness, and difficulty of breathing, cough or sometimes cough with phlegm. COPD patients are at a high risk for other health issues. Although there is no good cure available, the symptoms can be prevented to reduce damages by using rescue inhalers, such as Salbutamol or oral steroids. Asthma is a long-term chronic condition that affects the airways in the lungs. These airways are the tubes that carry air in and out of the lungs. People with asthma have their airways inflamed or narrowed at times and this makes it harder for air to flow out of airways when breathing out. Just like COPD, asthma has no cure but its symptoms can be controlled with rescue inhalers to treat them and controller inhalers to prevent them. David Jack discovered Salbutamol in Ware, England in 1966 and Ventolin was launched in 1969. The US Food and Drug Administration approved the first generic of an Albuterol Sulfate inhalation aerosol in 2020 for treatment or prevention of bronchospasm in people four years or older. This poster discusses the pharmacodynamics, pharmacokinetics, mechanism of action, as well as adverse effects and toxicity of Salbutamol.

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Fish Authentication by MALDI Mass Spectrometry

Ranjit Singh & Brindia Joseph
Mentor(s): Professor Emmanuel Chang & Professor Muhammad Ali
York College

Authentication of fish involves using a MALDI machine for mass spectrometry to analyze the chemical composition of fish samples. This method helps identify and verify the species of fish by measuring the mass-charge ratio (m/z) of ions produced from the fish's biological makeup. By comparing the obtained mass spectra with known reference data, we can confirm if a fish is authentically and accurately labeled or also conclude for certain if it isn't the case. In summary, this helps to prevent fraud and ensuring proper labeling of fish products in the food industry for consumers all around the world.

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Investigating the Effect of a Peptides Derived from Sars-COV-2 on the Aggregation of Serum Amyloid A

Iliana Vigil

Mentor(s): Professor Ruel Desamero & Professor Adam Profit
York College

The aggregation of serum amyloid A (SAA) leads to a long-term complication of inflammatory disorders such as rheumatoid arthritis, Crohn's disease, etc. The misfolding or aggregation of SAA is a hallmark of systemic AA amyloidosis. Preventing the aggregation of SAA should help prevent the health problems associated with amyloidosis. Recently, the overexpression of SAA has been found to be a marker for COVID-19 severity. A computational study found that a nine-residue segment in SARS-CoV-2 envelope protein (SK9) promotes the aggregation of SAA. Introducing species that can hijack the interaction could potentially suppress SAA aggregation aggravated by SARS-CoV-2. Interestingly, according to another computational work, human islet amyloid polypeptide (hIAPP) binds SK9 with no increase in amyloidogenicity. SK9 in fact stabilizes the helicity around residues 20-29, the aggregation prone region of hIAPP. Besides SK9, it was also reported that a ten-residue segment of SARS-CoV-2 spike protein (FI10) also stabilizes the helicity of the same hIAPP region. Here, we are extending the study about possible SARS-COV-2 and SAA interactions by determining if FI10 can promote the amyloidogenic propensity of SAA and that the presence of hIAPP suppresses these effects. To test our hypotheses, we synthesized using solid-state techniques and characterized spectroscopically the peptides SK9, FI10, and the amyloidogenic fragments of both SAA and hIAPP. We probed the interaction formed between the different peptides by measuring changes in the amyloidogenic propensities and analyzed the results in terms of the influence in the misfolding mechanism of SAA. We used molecular modeling techniques to correlate spectroscopic data to changes in the conformation of the peptides studied.

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Auxin Induced Degradation of Autophagy Genes in Meiotic Fidelity

Shannon Wright

Mentor(s): Professor Alicia Meléndez
Queens College

Previous research has demonstrated that autophagy plays a role in the germline development of C. elegans hermaphrodites. The protein BEC-1 mediates stem cell proliferation in a non-cell autonomous manner as it is required in muscle or hypodermis (epidermis) for cell cycle progression in the germline. Loss of function mutations in the bec-1 gene results in fewer cycling mitotic cells, as well as delays in cell cycle timing of cells within the mitotic region of the germline. Tissue specific expression of bec-1 in hypodermis and/or muscle tissues rescues the bec-1 mutant phenotype. Somatic expression of bec-1 restores the number of cycling mitotic cells and cell cycle progression to that seen in the wildtype animals. More recent studies have aimed to investigate the location at which autophagy is acting in meiosis regulation. In addition, the -1 oocyte of the bec-1 mutant is observed to have poorly condensed chromosomes, chromosomal fusions, and endomitotic nuclei disorganization. Similar to what we have observed in the mitotic progenitor zone in C. elegans, tissue specific expression of bec-1 in the hypodermis (epidermis) and muscle rescued the bec-1 mutant meiotic phenotypes. Furthermore, we have now established a BEC-1 auxin inducible degron system (AID), where we cause the degradation of BEC-1 in specific tissues by driving the expression of TIR1 and adding auxin. For the BEC-1:: AID, we find that degradation of BEC-1 in the germline, hypodermal, and pansomatic tissues produced a phenotype similar to the loss of function bec-1 mutant. Here we expand the use of the AID system for tissue specific knockouts of the autophagy proteins ATG-7 and ATG-18 in tissues of the hypodermis. The goal is to not only demonstrate the effects of somatic ATG-7 and ATG-18 loss on meiotic fidelity in the germline but also to discover, through various timed experiments, at which stage in meiosis autophagy is required.