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SYMPOSIUM OF UNIVERSITY RESEARCH AND CREATIVE EXPRESSION

FRIDAY, APRIL 26, 2019: 10 A.M. - 4 P.M.

## LOCATIONS

REGISTRATION AND SESSIONS

16 W. 61ST ST.

KEYNOTE SPEAKER

AMY HERMAN

"THE ART OF PERCEPTION"

NYIT AUDITORIUM ON BROADWAY

1871 BROADWAY

BETWEEN 61ST AND 62ND STREETS



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NYIT

Dear NYIT Faculty, Staff, Students, and Friends,

Welcome to the 16th Annual SOURCE at New York Institute of Technology!

Creative expression and participating in research with faculty members have become integral parts of a student's educational experience at NYIT. SOURCE is intended to provide a unique opportunity for students to present their research and creative scholarly work in collaboration with faculty members and their mentors. SOURCE also provides a common ground for interdepartmental, interschool, and interdisciplinary communication. I am very pleased to inform you that this year 82 abstracts were accepted and more than 165 undergraduate and graduate students of NYIT—representing nearly all our campuses, schools, and colleges—have authored or co-authored these abstracts. The depth and breadth of the projects are strong indicators of the quality of our teaching and learning at NYIT. I would like to take this opportunity to congratulate all the students for their academic excellence at NYIT.

Many individuals in the NYIT community have worked on the event to make it a success. I would like to extend a very special thank you to all the students, faculty, administrators, and volunteers who assisted with the preparation, management, and operation of SOURCE.

Sincerely,

Roger Yu, Ph.D.  
Chair, SOURCE Committee

**KEYNOTE SPEAKER**



Amy Herman: The Art of Perception

### **The Art of Perception Leadership Training: Seeing What Matters**

In this highly participatory session, lawyer and art historian Amy Herman utilizes works of art to address breakdowns in precise communications in both complex strategic planning and exchanges of critical information, which can be detrimental to a company's unified mission. The Art of Perception addresses these deficiencies by engaging leaders in dialogue and exercises that connect skills in perception and communication directly to strategic thinking as well as stakeholder relationships. Visual literacy provides an innovative vehicle to refresh participants' sense of critical inquiry, understand biases that impede optimal decision making, and renew the skills necessary for effective leadership.

### **About Amy Herman**

Amy Herman is a lawyer and art historian who uses works of art to sharpen observation, analysis, and communication skills. By showing people how to look closely at painting, sculpture, and photography, she helps them hone their visual intelligence to recognize the most pertinent and useful information as well as recognize biases that impede decision making. She developed her Art of Perception seminar in 2000 when she was the head of Education at The Frick Collection in New York City to improve medical students' observation and communication skills with their patients. She subsequently adapted the program to meet the needs of a wide range of professionals, and she leads sessions internationally for the New York City Police Department, the FBI, the French National Police, the Department of Defense, Interpol, the State Department, Fortune 500 companies, first responders, the military, and the intelligence community.

In her highly participatory presentation, she demonstrates the relevance of visual literacy across the professional spectrum and how the analysis of works of art affords participants an innovative way to refresh their sense of critical inquiry and reconsider the skills necessary for improved performance and effective leadership.

The program has been featured in the *New York Times*, *Wall Street Journal*, *CBS Evening News*, and *Smithsonian Magazine*, among others. Her TED talk, *A Lesson in Looking*, went live in December 2018. Herman holds an A.B., a J.D., and an M.A. in art history. Her book, *Visual Intelligence*, was published in May 2016 and was on both the *New York Times* and *Washington Post* best sellers' lists.

*Symposium on University Research and Creative Expression (SOURCE) 2019*  
*Program*

9:15 – 10 a.m.	<b>REGISTRATION and BREAKFAST</b> 16 W. 61st Street, 11th floor Doors open at 9 a.m.
10 –11:45 a.m.	<b>ORAL PRESENTATIONS</b> 16 W. 61st Street
noon – 1 p.m.	<b>KEYNOTE SPEAKER</b> Amy Herman “The Art of Perception” NYIT Auditorium on Broadway
1 – 2 p.m.	<b>POSTER EXHIBIT</b> 16 W. 61st Street, 11th floor Lunch will be served
2 – 3:30 p.m.	<b>ORAL PRESENTATIONS</b> 16 W. 61st Street
3:45 – 4:30 p.m.	<b>CERTIFICATE PRESENTATION</b> NYIT Auditorium on Broadway

<b>Oral Presentations</b> <b>10 a.m. –11:45 a.m.</b>	<b>16 W. 61st St.  Room 820  Moderator:  Lissi Athanasiou-Krikelis</b>	<b>16 W. 61st St.  Room 723  Moderator:  Sophia Domokos</b>	<b>16 W. 61st St.  Room 722  Moderator:  Melissa Huey</b>
<b>10 a.m.</b>	“Opinions in Abstraction”	“Structure-activity Relationship Study of Naphthyridine-based Phosphodiesterase 5 Inhibitors for the Treatment of Alzheimer's Disease”	“Perception of Emergency Services”
	Adam Marano	Chuxuan Wang	Matthew DiCairano, Jillian Rockford, Nicholas Lombardi, Estefania Solorzano
<b>10:15 a.m.</b>	“Effect of Cultural Dimensions on the Glass Ceiling”	“Head impacts and their effects on student athletes on and off the field”	“An Examination of Pluralistic Ignorance and Alcohol Consumption; College Athletes vs. Non-Athletes”
	Supraja Raghavan	Caroline Varlotta, Brandon Burg, Joseph Miceli, Joshua Giordano	Andrew Zito, Courtney Missbach, Tiffany Verni, Leandra Lopez
<b>10:30 a.m.</b>	"Latinx Culture Represented In Mainstream Film"	“Targeting ALT Cancers: The Role of the Fork Protection Complex in the DNA Replication Stress Response at ALT Telomeres”	“Social Media and Anxiety”
	Gabriella Pinder	Lauren Granat	Andrehyu Allen, Randy Haddad, Emmanie Ayala, Teyla Simon
<b>10:45 a.m.</b>	“Digital Stone Project: 3D Printing in Marbe”	“Patterns and Risk Factors of Pediatric Malignancies in a Bangladeshi Tertiary Care Hospital”	“Relationship between Self-Esteem and Academic Program in College Students”
	Sheraine Peart	Sharnam Ahmed, Feeza Hasan, Saadia Javed	Thomas Bozzo, Jess Hawley, Kylee Kanealey, Curtis Rosebery, Aleksei Urusov

<b>11 a.m.</b>	"Women Taking Charge: Film Adaptations from Frankenstein to The Munsters"	"Lamination of the Cerebral and Cerebellar Cortex"	"How Do Levels of Discrimination Vary Between Suburban and Metropolitan College Campuses"
	Brittany Vonksky	Christopher Rochon	Michelle Shinder, Farhin Sultana, Vivek Sindhu, Yue Chang-Smith
<b>11:15 a.m.</b>	"The Sounds of Sixth Street"	"Comparison of Beta Blocker vs Beta Blocker + T3 Treatment in rats with Myocardial Infarction"	"Examining the Perceptions of Body Image in College Students"
	Elizabeth Belnap	Abigail Samuels	Nicole Bermudez, Amin Yosofi, Kaylee Higgins, Matthew Arnone, Brendan Dowd
<b>11:30 a.m.</b>		"Construction of Fluorescent Sensors for Thyroid Hormone"	"Parenting Styles and the Effect on Adolescent Delinquency and Self-Esteem"
		Bassel Hassan, George Istafanos	Leonardo Innamorato, Gurjit Singh, Shannon Donovan, Amima Ahmad, Lakshmi Davuluri

<b>Oral Presentations</b>  <b>2 p.m. – 3:30 p.m.</b>	<b>16 W. 61st St.</b> <b>ROOM 820</b> <b>Moderator:</b> <b>Spencer Turkel</b>	<b>16 W. 61st St.</b> <b>ROOM 723</b> <b>Moderator:</b> <b>Youjeong Kim</b>	<b>16 W. 61st St.</b> <b>ROOM 721</b> <b>Moderator:</b> <b>Navin Pokala</b>
<b>2 p.m.</b>	“What’s lurking in your Kitchen Sponge?”	“The Effects of Parenting Styles on Young Adults Psychological Need Satisfaction”	“Probing the neural circuits of decision making in C. elegans”
	Olivia Albert	Dua Ahmed, Kaylin Viruet, Nigel Casanova, Zenab Shafiq	Miguel Echanove, Gonzalez de Anleo
<b>2:15 p.m.</b>	“The Significance of Mustn1 in Embryonic Development”	“The associations of Successful Aging amongst Chinese elderlies”	“Construction of C. elegans strains deficient in multiple neurotransmitters”
	Janelle Zapiti, Amma Haider	Yunqi Xu	Kinza Ahmed, Jenson John, Gaetana Iannelli
<b>2:30 p.m.</b>	“Identification of biofilm formation on the lid margin using fluorescein succinylated wheat germ agglutinin (WGA) staining”	“Attention Based Region of Interest Detection for Speech Emotion Recognition”	“Construction of a C. elegans strain lacking biogenic amine neurotransmitters”
	Salahuddin Qureshi	Jay Desai, Ravi Shah	Dianna Esther Levin, Kevin Lee
<b>2:45 p.m.</b>	““Isolation and Characterization of Bacteriophages Targeting Enterobacter Bacteria”		“Engineering histamine-gated cation channels”
	Samantha Frisina, Karl Pillion		Gauri Vilas Patel

<b>3 p.m.</b>	“Photomicroscopy: Light Microscopy and Molecular Biological Histotechnology”	“Project Sam: Artificially Intelligent Traffic Junction Systems”	“Reducing histamine expression in C.elegans”
	Megha Gupta	John-Paul Cantalino	Devine Obasa, Caroline Garas
<b>3:15 p.m.</b>	“The Neural Basis for Solving Olfactory CAPTCHAs”		“Thyroid hormones regulate the cardiomyocyte transverse-tubule structure”
	Asim Ahmed		Jerrin Peter



**Exhibition Hall**  
**16 W. 61st St., 11th floor**

"HLM Stability of PDE5 Inhibitors"	Ajay Benjamin
"Chiral Sensing of Natural Products via Chiroptical Spectroscopy"	Aliah Tull-Rampersaud, Rajvi Agravat Basanta Pant, Yazeed Alshammari, Mariam Gabriel, Banan Oraif
"The Sound of Healing"	Alishah Khan
"There are Bacteriophages in Your Kitchen Sponge"	Brianna Weiss, Lovejit Kaur
"Novel Compounds that Inhibit the Growth of Pancreatic Cancer Cells"	Chandrika Kumari
"Statistical Analysis for Aqueous Cupric Sulfate Photometric Measurements"	Christopher Chavez
"Lamination of the Cerebral and Cerebellar Cortex"	Christopher Ray Rochon
"The Cultivation and Display of Bioluminescent Dinoflagellates"	Daniel Singh
"Biomimetic Design in Architecture"	Eddy Voltaire
"United States of Obesity"	Eric Palillero
"Left-Handed Double-Stranded Z-DNA Microarray Prototypes"	Francis DeOcampo
"Impact of the External Environment on the Two-Qubit Quantum System"	Gurpreet Singh, Thomas Cherry

"Methods of Hyperspherical Functions with Application of Neutron Rich Isotopes in Heavy Ion Reactions"	Hasanuzzaman Rahman, Eric Carbona, Jessica Peters
"Microbial Genome Sequencing and Analysis Workflow"	Helly S. Amin
"Connexin 43 Mutations Effect Brain Myelination"	Himani Jani*, Yamini Nori*, Jeet Vaishnav
"A Study on the Integration of Phase Change Materials in Building Construction"	Jacqueline Ras
"The role of the forest on our planet"	Jie Gao
"Colombia, Home of the Amazon"	John Echeveria
"Conscious GPS"	Josiah-David Sykes, Randy St. Fleur
"Traffic Conditions"	Kailun Zhang
"Cat owner in the US"	Kaisheng Miao
"The Degas Project"	Karla Andrea Perez
"The Pencil Gripper"	Kehinde Williams, Jens Daci, Mariam Gabriel, Jonathan Coskuner, Elis Cucka
"The Presence of B-DNA in Dermatophytes [Tinea (Pityriasis) Obscurans] Within Human Tissue: Histological Stain- Part II"	Kristen Thomas, Steven Thomas, Harsimar Jassar, Syed Huda, Najd Aljonuv

**Exhibition Hall**  
**16 W. 61st St., 11th floor**

"The Use of Photomicroscopy in Order to Characterize Histological Morphology and Molecular Histotechnology"	Mahdi Azad, Faria Ahmad, Anthony Yodice, Uzma Patel, Adarsh Pillay
"All You Need to Know if You're Veg-Curious"	Malwina Zaslonka
"Anterior Pelvic Tilt. What, Why and How to Correct it"	Marko N. Rombolakis
"Concert Venues of NYC"	Michael Serrecchia
"Review of Energy Storage Technologies"	Michael Vangi
"Purification of High Molecular Weight Double-Stranded DNA for Use in DNA Microarrays"	Nabeel Tanveir, Sadia Ahmed, Alex Raju, Ashley Reji
"Identifying characteristics of bacteriophages isolated from sewage found to infect bacteria <i>Citrobacter freundii</i> "	Natalia Reynisdottir
"Towards Homo-Chiral Crystal Growth: The Case-Study of NaClO <sub>3</sub> "	Nugzar Noniashvili, Chelsea Duncan, Manpreet Virk, Theerathep Layanun, Angela Huan, Pritu Saha
"Senses"	Runmei Cui
"Counting Oil"	Ryan Nissan Isaac Rahमान

"Characterization of Molecular Fixatives for the Optimal Preservation of Eye Globe Tissue Morphology, and Tissue-Based Canonical DNA Molecules"	Shaheryar Gill, Safyah Siddiqui, Silva Lleshi, Mina Ahsan, Alisha Malhotra
"The Presence of B-DNA in Dermatophytes [Tinea (Pityriasis) Obscurans] Within Human Tissue: Immunohistochemistry - Part 1"	Sharon Thomas, Seelia Jacob, Melina Hamaoui, Prachi Shah, Gina Koros
"A Comprehensive Study on Kinetic Facades and its Benefits in Thermal Comfort"	Stephan C. Martinez
"Factors That Influence First Time PANCE Pass Rates"	Tahia Syeda, Zeev Rubinson, Faraiba Faqeerzada, Fareeha Sial
"Addicted to the Gram"	Terresa Yen
"Klebsiella Pneumonia"	Usman Niaz
"Game of Thrones Infographic"	Yichi Zhang
"Plastic Oceans"	Yijun Liang
"Video-On-Demand Market in the United States"	Yujia Yan

## **Comparison of Beta Blocker Vs Beta Blocker + T3 Treatment in rats with Myocardial Infarction**

Student Presenter: Abigail Samuels

Faculty Mentor: Kaie Ojamaa and A. Martin Gerdes

Department: Biomedical Sciences

School/College: College of Osteopathic Medicine, Long Island

Beta-blockers are a mainstay of treatment in heart failure due to their ability to improve cardiac contractility and remodeling. Previous studies in our lab have shown that T3 is comparable to a beta-blocker, metoprolol (Met), in improving left ventricular function and modification in expression of genes involved in thyroid hormone and beta-adrenergic signaling in rats with myocardial infarction. This study aimed to determine if an additive effect was conferred from a combination T3 + Met treatment as compared to treatment with Met alone. Adult female Sprague-Dawley rats aged 12 weeks were subjected to left anterior descending (LAD) coronary artery ligation or sham surgery (n=6). Surviving rats were randomly assigned to one of three treatment groups for 8 weeks: MI+Vehicle (n=9), MI+Met (n=10) or MI+Met+T3 (n=13). Results showed that the MI+Met+T3 group was treated adequately with T3 as seen by a significant decrease in serum T4 but without significant change in serum total T3. Infarcts were large enough to cause a significant deficit in the majority of cardiac contractile measurements but treatment with Met or Met+T3 did not provide any significant improvement in echocardiographic or hemodynamic measures. Treatment with Met alone restored MI-induced endothelial dysfunction. Initial analysis of these data leads us to conclude that combined Met + T3 treatment did not confer an advantage to treatment with either drug alone.

## **Opinions in Abstraction**

Student Presenter: Adam Marano

Faculty Mentor: Vera Manzi-Schacht

Department: Digital Arts and Design

School/College: College of Arts and Sciences, New York City

The phenomenon of differing opinions and insights despite experiencing the same subject matter has always fascinated me. To that end, I wish to present a series of abstract expressionist paintings created by myself to explore the opinions and insights of peoples as they view my work. Located near each painting will be a ledger for guests to write down (anonymously) what feelings and/or thoughts are brought about whilst examining each painting. Throughout the exhibition, I will, either manually or remotely, rotate the images, completely changing the orientation and upsetting previous perceptions.

## **HLM Stability of PDE5 Inhibitors**

Student Presenter: Ajay Benjamin

Faculty Mentor: Jole Fiorito

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

Phosphodiesterase type 5 inhibitors (PDE5-Is) have been proposed as a beneficial approach for neurodegenerative memory loss diseases. PDE5Is bind to the PDE5 enzyme and prevent second messenger cyclic GMP from converting to GMP. The inhibition of PDE5 and increased levels of cGMP play a role in the treatment of diseases, including Parkinson's and Alzheimer's disease, and lead to an increase of synaptic plasticity. Human Liver Microsomes (HLM) are drug-metabolizing enzymes involved in the process that describes the disposition of pharmaceuticals within an organism. Our goal is to find a stable PDE5-I. A stable PDE5-I is determined by a half-life greater than 60 minutes which is the time required for the concentration of the drug to decrease by half. HLM enzymes are used to test how metabolically stable PDE5-Is are. PDE5-I compounds were tested for HLM stability in an in vitro assay. The assay components and test compound, were mixed together in a vial and placed in an incubator. Aliquots were withdrawn at 0, 5, 15, 30 and 60 minutes. The samples were then assayed by liquid chromatography-mass spectrometry. Peak area response ratio (PARR) to internal standard was compared to the PARR at time 0 to determine the percentage of test compound remaining at each point. From the compounds tested, JF18 a 1H-pyrrolo[3,4-b] quinoline scaffold and JF43 a naphthyridine scaffold showed microsomal stability by having a half-life greater than 60 minutes.

## **Chiral Sensing of Natural Products via Chiroptical Spectroscopy**

Student Presenter: Aliah Tull-Rampersaud, Rajvi Agravat Basanta Pant, Yazeed Alshammari,  
Mariam Gabriel, Banan Oraif

Faculty Mentor: Ana Petrovic

Department: Life Sciences

School/College: College of Arts and Sciences, New York City

A definitive stereochemical elucidation of the chiral natural products is merited by their environmental impact and biological significance, as they are commonly used as drug leads. Each enantiomer of conformationally flexible natural product could interact stereospecifically with biological systems, thus leading to a different physiological response and even harmful environmental repercussion. The two enantiomers may degrade or accumulate in the environment differently, or may be toxic in different ways toward other species. Even though the need for synergic application of multiple chiroptical methods is not general, the tandem application of ORD, ECD and VCD yielded more complete structural characterization for these compounds by providing improved insight into the stable conformers and reliable Absolute Configuration (AC) assignments. To arrive to the definitive AC, both experimental and TD-DFT predicted chiroptical responses need to be considered and correlated. Where applicable, assessment of quantitative reliability of the correlated chiroptical signals needs to be taken into account. With this presentation, we will present our efforts to advance chiroptical sensing and structural elucidation as related to a selected natural product.



## **The Sound of Healing**

Student Presenter: Alishah Khan

Faculty Mentor: Charles Matz

Department: Interior Design

School/College: School of Architecture and Design, Long Island

Mental health is seen as a taboo in a country like India. Many families believe that depression or erratic behavior is a sign of “possession” where a ritual of cleansing or prayer can “fix” an individual. This, however, is not the correct way to approach such an important issue. Research shows that the body vibrates at different frequencies, and when out of tune can cause health issues. I am proposing a space that redefines the traditional school setting in India and allows children to be educated not only in academics but in self-care and mental health. This space will not only promote mental health but educate others that mental illnesses do exist and they are as severe as a physical injury which requires medical attention. The space will use a combination of sound and visuals, where students and faculty can realign their body’s natural frequency to promote balance.

## **Social Media and Anxiety**

Student Presenter: Andrehyu Allen, Randy Haddad, Emmanie Ayala, Teyla Simon

Faculty Mentor: Melissa Huey

Department: Behavioral Science

School/College: College of Arts and Sciences, New York City

Research on social media and technology usage has found there are ample negative effects. For instance, the excessive use of technology has been linked in multiple research studies to anxiety and depression amongst young adults (O’Keeffe, & Clarke-Pearson, 2011). The purpose of this research is to determine if the usage of social media is associated with depression, anxiety, and self-esteem. In addition, we seek to investigate and determine if basic social skills of young adults are being mitigated by an overuse of online social networking. We are going to recruit college students throughout New York City and Long Island Campuses at New York Institute of Technology to participate in our survey. The survey entails an anxiety inventory, depression inventory, and multiple questions regarding cell phone usage and the socialization of the participants online versus in-person. We hypothesize that the participants will show drastic differences between how active they are socially online versus in-person, and that high social media usage will be directly correlated with high anxiety and depression levels as well as lower self-esteem.

## **An Examination of Pluralistic Ignorance and Alcohol Consumption; College Athletes vs. Non-Athletes**

Student Presenter: Andrew Zito, Courtney Missbach, Tiffany Verni, Leandra Lopez

Faculty Mentor: Dina Karafantis

Department: Behavioral sciences

School/College: College of Arts and Sciences, Long Island

Excessive alcohol consumption among college students is considered an important public concern across college campuses in the United States. In particular, college athletes are considered a “risk group” for consuming too much alcohol. Although research has shown this to be true, this may not be the case at New York Institute of Technology. Factors such as the large number of commuter students (including student athletes), as well as the lack of on campus housing may make the student athletes at New York Institute of Technology an exception to the previous findings. Our study will examine non-athlete students’ perception of New York Institute of Technology athletes’ alcohol consumption. The athletes completed the AUDIT questionnaire, which examines individual alcohol consumption, while the non-athletes completed a questionnaire assessing pluralistic ignorance regarding the alcohol consumption among student athletes. We hypothesized that 1) there will be a high level of pluralistic ignorance regarding excessive alcohol consumption among college athletes at NYIT, and 2) NYIT athletes’ alcohol consumption will be not support previous research findings. Data is still being collected.

## **The Neural Basis for Solving Olfactory CAPTCHAs**

Student Presenter: Asim Ahmed

Faculty Mentor: Gonzalo Otazu Aldana

Department: Life Sciences

School/College: College of Arts and Science, Long Island

Rodents can identify target odors of interest in the presence of a strong background of odors in their natural environment. Experiments in the lab have shown that this identification ability can come after long training periods. However, it is not known whether an animal can generalize this identification ability to situations where the background is novel and there has not been a long training period. In order to test the generalization ability of mice, we presented awake – head fixed mice with target odors in the presence of a small set of background odors. We used intrinsic optical imaging to record dorsal glomerular activation patterns to these odor combinations (training set) and used those data to create a linear classifier for detecting the target odors. We then tested the learned linear classifier with odor mixtures that included a larger set of novel background odor. We found that the linear classifier performance varied between 65% and 90% accuracy for a set of 9 novel background odors. We then trained mice to perform a go/no-go task using the training set. Mice reached 90% performance after 8-10 days of training. We then tested the detection capability using a test set composed of novel odors. Mice correctly identified the target odors with the novel background odors at a rate that was consistent with the imaging data. Mice required an extra sniff to respond to the target odor and mice response times were slower in the novel odor environment compared to the response.

## **There are Bacteriophages in Your Kitchen Sponge**

Student Presenter: Brianna Weiss, Lovejit Kaur

Faculty Mentor: Bryan Gibb

Department: Biology

School/College: College of Arts and Sciences, Long Island

Bacteriophages are viruses that infect bacteria. There are  $10^{31}$  bacteriophages, which means that phages are the largest source of genetic diversity on the planet. Phages are a subject of renewed interest as alternative treatments for bacterial infections, so isolating them could unveil new insights into biology and prove useful as a therapeutic. Kitchen sponges are often seen as one of the most contaminated items in the home. Since phages are found wherever bacteria reside, we hypothesized that the diverse microbial ecosystem of the kitchen sponge may harbor novel bacteriophages. Seven students isolated bacteria from dirty kitchen sponges brought in from their home, which were used to search for bacteriophages within the sponge. Two students succeeded in isolating bacteriophages that targeted the host bacteria from their sponges. 16S sequencing identified both host strains as members of Enterobacteriaceae, but biochemical test results demonstrated that the isolates were different. The phages, LKsleep and Shaolin, produce hazy plaques and are suspected to form lysogens. We show the two phages are capable of cross-infecting the other isolated host, suggesting that the hosts are closely related. This is interesting given that LKsleep and Shaolin and their respective hosts were isolated from separate sponges taken from different homes. Based on TEM, both phages are members of the Myoviridae family. Ongoing efforts are further characterizing the bacteriophages with their hosts.

## **Women Taking Charge: Film Adaptations from Frankenstein to The Munsters**

Student Presenter: Brittany Vonknsky

Faculty Mentor: Amanda Golden

Department: English

School/College: College of Arts and Sciences, Long Island

“Women Taking Charge: Film Adaptations from Frankenstein to “The Munsters” is an oral and video essay about the treatment of women in Mary Shelley’s original novel, Frankenstein and the two James Whale’s 1930’s film adaptations of the novel as compared to the treatment of women in the 1960’s television series “The Munsters.” In the original novel and the film adaptations, women are treated like accessories shown solely to move the male character’s plot along. Once they have fulfilled the man’s desires, in some cases, they are murdered. While in “The Munsters”, women are shown as independent and the foundation of the household. Lily Munster does what she wants, even if her husband disapproves of her actions. This is important to society today because it is a visual depiction of how women have become more independent in society. Throughout the essay, the audience sees how inequality between sexes is based on the times they were created, and with more adaptations, hopefully the more women will be seen as equal to men. This essay will be accompanied by video clips from the films Frankenstein and The Bride of Frankenstein, as well as video clips from the television series “The Munsters.”

## **Head impacts and their effects on student athletes on and off the field**

Student Presenter: Caroline Varlotta, Joshua Giordano, Matthew Geiselman, Katherine Kleevers, Taesung Kim, Simon Katz, Joe Miceli, Brandon Burg

Faculty Mentor: Matthew Heller & Haille Zwibel

Department: Osteopathic Medicine

School/College: College of Osteopathic Medicine, Long Island

Sports are the second most common cause of mild traumatic brain injury (mTBI) in young adults. Even when an athlete does not sustain mTBI, he may sustain subconcussive impacts, which are of unknown significance. A past study has demonstrated changes on functional magnetic resonance imaging (fMRI) throughout the football season, despite the student athletes not displaying clinical signs of concussion. At NYIT-COM, we have a project that assesses the effects of subconcussive impacts on symptom scales, neurocognitive function, and balance throughout the lacrosse and soccer seasons. We use an accelerometer to quantify impacts, and multiple types of cognitive tests, including King-Devick, ImPACT, C3logix, and ClearEdge. In our first study, we found a decline in verbal and visual memory for ten players throughout the lacrosse season, despite only one athlete sustaining a concussion. Exploring the effects of these impacts is important because the effects, such as memory decline or deficits in visual motor speed, will affect the athlete's ability to execute plays on the field and learn in the classroom. Through this presentation, we hope to provide information on our study, the tools we are using in our research project, as well as the current literature on the effects of head impacts in athletics.

## **Novel Compounds that Inhibit the Growth of Pancreatic Cancer Cells**

Student Presenter: Chandrika Kumari

Faculty Mentor: Niharika Nath

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

Cell cycle regulators and tumor suppressor p53 play an important role in cancer biology and is responsible for cell cycle regulation. Active p53 binds to DNA to stimulate production of p21 to inhibit the cell cycle. When p53 is mutated in cancer, proteins divide unabated. Nitric oxide (NO) and hydrogen sulfide (H<sub>2</sub>S) molecules in cells have cancer-promoting and cancer-inhibiting properties. Compounds that release (NO) and (H<sub>2</sub>S) exhibit potential inhibitory effects against various cancer cell types. H<sub>2</sub>S disrupts the metabolic process and pH regulation in cancer cells; preventing them from proliferating. Non-steroidal anti-inflammatory compounds, namely aspirin, releasing NO and H<sub>2</sub>S (aspirin NOSH-1 and NOSH-3 isomers) were examined for pancreatic cell growth inhibition. The cell lines BXPC3, MIA-PaCa-2 CRM (KRAS-mutated), and MIA PaCa-2 were grown in culture and treated with various concentrations. Cell viability was measured by MTT assay. Cell cytotoxicity was measured by Sulforhodamine B followed by measurement of absorbance values by spectrophotometry. NOSH-1 strongly inhibited pancreatic cell proliferation. Gene expression of p53 and p21 by qPCR was examined to determine the effect of NOSH-1 on the cells. These results demonstrated that there is an increase in p53 and p21 mRNA level. It's possible that NOSH-1 aspirin inhibits cell viability by inducing p53 and p21. The role of NO and H<sub>2</sub>S in NOSH has potential in reducing viability of pancreatic cells with KRAS mutation.



## Statistical Analysis for Aqueous Cupric Sulfate Photometric Measurements

Student Presenter: Christopher Chavez

Faculty Mentor: Grady Carney

Department: Life Sciences

School/College: College of Arts and Sciences, New York City

With respect to photometers, cuvettes and molarity, absorbance variability was determined for aqueous cupric sulfate. Molar absorptivity for 3x3 photometer/cuvette statistical design had confidence interval,  $12.02 \leq \langle \alpha \rangle \leq 12.06 \text{ cm}^{-1} \text{ M}^{-1}$  at 95% level. With respect to variability in molar absorptivity, Two-way ANOVA revealed marginal photometer dependency, insignificant cuvette dependency, and insignificant photometer/cuvette interaction. Three-way ANOVA for absorbance variability revealed significant direct Beer's Law effect, insignificant direct effects for both photometer and cuvette, insignificant cuvette/molarity interaction, marginal molarity/photometer interaction, and significant cuvette/photometer interaction. Molarity measured for 0.0200 M unknown solution had percent error of 0.389, coefficient of variation(CV) of 0.468, and instrumental limit CV of 0.1.

## **Lamination of the Cerebral and Cerebellar Cortex**

Student Presenter: Christopher Rochon

Faculty Mentor: Raddy Ramos

Department: Biomedical Sciences

School/College: College of Arts and Sciences, Long Island

The cerebellum and neocortex are highly organized brain structures, consisting of several specific and laminated cell layers. Poor cell migration and lamination are a product of neurodevelopmental disorders that are associated with cognitive disabilities. This project's goal is to study brain malformations across development in mice that carry a mutation in G protein-coupled receptor 56 (GPR56). The brains of these knockout mice have malformations in both the neocortex and the cerebellum. We are constructing and characterizing GPR56 mutant mice that carry transgenes that allow for imaging of neural activity (GCamp6), and tracing of microglia cell anatomy (GFP-Cx3cr1). Examining changes in neural activity and anatomy that result from the GPR56 mutation will allow us to better understand how malformed structures arise, and why they result in neurodevelopmental disorders.

## **Structure-activity Relationship Study of Naphthyridine-based Phosphodiesterase 5 Inhibitors for the Treatment of Alzheimer's Disease**

Student Presenter: Chuxuan Wang

Faculty Mentor: Jole Fiorito

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

Phosphodiesterase 5 (PDE5) is an enzyme that hydrolyzes the second messenger cyclic guanosine monophosphate (cGMP), causing a decrease of the transcription factor cAMP response element binding protein (CREB) and impairment of learning and memory in Alzheimer's disease (AD). Thus, inhibition of PDE5 has been studied as a therapeutic strategy for the treatment of AD. Our goal is to synthesize novel PDE5 inhibitors as drug candidates for the treatment of AD. We previously discovered a PDE5 inhibitor, namely JF14, which showed high potency for the target enzyme. Compound JF14 is a naphthyridine-based molecule bearing a 3-chloro-4-methoxybenzylamino group. In order to explore further the inhibitory activity of compound JF14, we designed two analogs, compound JF31 and JFCW1, with modifications of the functional groups in the benzylamino moiety. Compounds JF31 and JFCW1 were obtained in low to moderate percentage yields (16% and 48%, respectively) and with purity higher than 97% for both compounds (measured by liquid chromatography-mass spectroscopy). The structures of the new compounds were characterized by <sup>1</sup>H-NMR spectroscopy. In an enzymatic assay, we found that both compounds showed a lower potency than JF14, indicating that the chloro and methoxy substitutes in the benzylamino moiety are fundamental for the PDE5 inhibitory activity. In future studies we will evaluate the effects of structural modifications of the tricyclic ring on the PDE5 activity of this class of compounds.

## **The Cultivation and Display of Bioluminescent Dinoflagellates**

Student Presenter: Daniel Singh

Faculty Mentor: Bryan Gibb

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

Dinoflagellates are a subgroup of algae. While most are saltwater plankton, different species may be found in freshwater environments. The research done in this project focused mainly on the ability of certain dinoflagellates to undergo bioluminescence. Special attention was given to how bright and for how long each culture of dinoflagellates was able to luminesce. Multiple forms of media were prepared and tested which included commercial sources of water and salt, as well as locally harvested seawater. In order to better study the dinoflagellates the construction of a custom luminometer was started. a team of engineers was brought onto the project to aid in the construction of a growth chamber with a number of controllable variables such as temperature and time exposed to light. A number of art piece like displays were designed in order to makes the dinoflagellates bioluminesce in visually pleasing ways. One of the main goals of this project was the culmination of all these projects in order to design a kit that could be used to cultivate and display dinoflagellates in a classroom setting.

## **Artificially degrading histamine in *C. elegans***

Student Presenter: Devine Obasa, Caroline Garas

Faculty Mentor: Navin Pokala

Department: Life Sciences

School/College: College of Arts & Sciences, Long Island

The worm *Caenorhabditis elegans* is a powerful and widely used model organism for studying neuroscience, since it only has 300 neurons compared to the 86 billion neurons in humans. Our lab has developed histamine as a chemical-genetic reagent for controlling the activity of individual *C. elegans* neurons, via expression of histamine receptors from other organisms. However, since worms do not have mechanisms for removing histamine from synapses, its effects last too long. Therefore, we want to be able to reduce its levels. Organisms that use histamine have enzymes that are capable of degrading it. We want to put those enzymes into worms at specific locations (synapses between neurons) in order to degrade the histamine. Using PCR, we can clone the DNA that code for these enzymes and fuse them to proteins localized at the synapse.

## **Construction of a *C. elegans* strain lacking biogenic amine neurotransmitters**

Student Presenter: Dianna Levin, Kevin Lee

Faculty Mentor: Navin Pokala

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

*Caenorhabditis elegans* is a useful model organism for neuroscience because of its fully mapped brain wiring, and well characterized genome. One gene of interest is the *cat-1* gene, which is responsible for the transport of serotonin, dopamine, octopamine and tyramine into synaptic vesicles. These neurotransmitters are crucial for the function of laying eggs, pharyngeal pumping, locomotion and learning. A mutant strain that contains a deletion in *cat-1* has been generated. Unfortunately, due to the way this deletion was generated (UV radiation), this mutant strains contain additional unwanted mutations. To get rid of these unwanted mutations, only leaving the mutation in the *cat-1* gene, the process of backcrossing was implemented. Mutant *cat-1* hermaphrodites were crossed with wild-type (normal) males and their male offsprings were picked. The male offspring were crossed with wild-type hermaphrodites. Each of these crosses replaces mutant DNA with wild-type DNA. Offspring that retain for the *cat-1* mutation were identified using PCR. By doing rounds of this process, unwanted mutations can be diluted out.

## **The Effects of Parenting Styles on Young Adults Psychological Need Satisfaction**

Student Presenter: Dua Ahmed, Kaylin Viruet, Nigel Casanova, Zenab Shafiq

Faculty Mentor: Melissa Huey

Department: Behavioral Science

School/College: College of Arts and Sciences, New York City

As human beings, satisfying our psychological needs is essential to healthy mental development. This study will determine how parenting styles affects the need satisfaction of young adults. Based off of the self-determination theory, humans yearn to satisfy three psychological needs; autonomy, relatedness and competence. The way we are raised starting from infancy has an effect on how satisfied we are as young adults. The four parenting styles the research focuses on are authoritarian, permissive, uninvolved, and authoritative.

Surveys will be administered to about sixty NYIT students selected randomly during the spring 2019 semester. There will be four instruments used: perceived parenting style survey, CES- D depression inventory, Rosenberg's self-esteem inventory and basic life satisfaction inventory. Participants will answer a total of 81 questions and results will be analyzed statistically. It is hypothesized that authoritarian parenting would be associated with less life satisfaction, depressive symptoms and low self-esteem whereas authoritative would lead to more positive outcomes. Permissive parenting is predicted to be related to high life satisfaction, depression and low self-esteem. Neglectful parenting will also have all negative outcomes.

## **Biomimetic Design in Architecture**

Student Presenter: Eddy Voltaire

Faculty Mentor: Ehsan Kamel

Department: Energy Management

School/College: School of Architecture and Design

Energy consumption has dramatically increased over the course of the past 50 years, as people spend more time indoors, the demand for energy is constantly increasing. Building energy use according to the EIA (U.S. Energy Information Administration) accounts for over 40% of primary energy consumption in the U.S. and the E.U. not considering developing nations such as China and Africa. The need to build better buildings that can naturally provide heating and cooling and further reducing the energy use by mechanical systems will be key in reducing energy consumption and CO<sub>2</sub> emissions. Proper design of building's facade can reduce or increase solar heat gain, passively provide heating and cooling, and provide shading to reduce the energy demand on a building, which can be accomplished through biomimetic design. Biomimetic design is an approach to innovation where nature and its processes are emulated into the design of building and its façade; naturally allowing the skin (façade) of a building to deliver the means to provide thermal comfort.

This research study is an investigation into the design of dynamic architecture, as it relates to nature and biomimetic innovation within the design of buildings. Architects and engineers alike seek solutions for sustainability from the greatest teacher of all, nature. It is part of a larger undertaking known as biomimicry, an examination of nature, understanding its workings, then modeling its systems and processes to solve man-made problems ranging from materiality, energy efficiency and reduction, to necessities such as natural light and ventilation. The outcomes of this research is to provide a fundamental understanding of biomimicry, its innovations and how it can aid in the overall fight to reduce energy consumption in buildings.



## **The Sounds of Sixth Street**

Student Presenter: Elizabeth Belnap

Faculty Mentor: Jonathan Goldman

Department: English

School/College: College of Arts and Sciences, New York City

In her article “Modernism and Boricua Literature: A Reconsideration of Arturo Schomburg and William Carlos Williams”, Lisa Sanchez Gonzalez talks about the way that our binary perceptions of race don’t quite apply when talking about Puerto Ricans in New York. Gonzalez writes that “the Boricua community fractures the North American color line and has been consequently appropriated or erased in US literary history”. In American discourse, we tend to lump all Latinx people into one racial demographic, ignoring the fact that most Latinx populations are made up of people with some combination of Native American, African, and European descent. When we treat Latinx people as a racial monolith, we erase the ordeals black and native Latinx people have suffered at the hands of white Latinx people.

Martita Morales’s poem, “The Sounds of Sixth Street” examines the racial diversity within a community of Puerto Rican’s in New York, and looks at a few of the many ways intra-cultural racism can hurt people, on both a small and large scale. I propose to do a close reading of this poem, using Gonzalez’s article as a theoretical framework.

## **United States of Obesity**

Student Presenter: Eric Palillero

Faculty Mentor: Patty K. Wongpakee

Department: Digital Art and Design

School/College: College of Arts and Sciences, New York City

Obesity makes up one of the leading preventable causes of death in the U.S. It is a chronic disease that can seriously affect your health. With this spread; it has increased the amount of cardiovascular disease, type 2 diabetes, hypertension, certain cancers, and other obesity-related illnesses in the country. In my infographic, I will show just how much damage this disease has caused and why it should be considered a worldwide epidemic.

## **Left-Handed Double-Stranded Z-DNA Microarray Prototypes**

Student Presenter: Francis DeOcampo

Faculty Mentor: Claude Gagna

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

As part of Dr. Claude Gagna's research developing left-handed double-stranded Z-DNA microarrays, I helped in the preparation of two-dimensional drawings using ChemBioDraw 14.0. Employing this powerful software allowed us to draw the Z-DNA molecules as they are attached to the glass microarray surface of actual slides. Additionally, the drawings allow for attachment of fluorophores (i.e., fluorescent dyes) to the double-stranded Z-DNA molecule, namely, Cy5 fluorophore to the 3'-end, and Cy3 to the 5'-end of DNA. Additionally, it allowed us to demonstrate the position of the primary amino linker (NH<sub>2</sub>) to the opposite 3'-end of the terminally immobilized DNA. The DNA microarray slides that were used to develop prototypes were purchased from Arrayit Corp. (surface of glass slide functionalized by SuperAldehyde coupling chemistry). The SuperAldehyde glass substrate contains primary aldehyde groups that are attached covalently to the glass slide. The primary amino linkers of the DNA attach to the aldehyde groups on the slides by covalent bonds. Immobilization of the DNA is stabilized by dehydration which leads to the Schiff base formation. This covalent end attachment forms a strong bond to the microarray surface. Additionally, I drew different types of drugs (i.e., chemicals) and biologicals (e.g., antibodies) that bind to Z-DNA. These drawings help others better understand the chemical and biological reactions that take place with the novel Z-DNA microarrays.

## **Latinx Culture Represented In Mainstream Film**

Student Presenter: Gabriela Pinder

Faculty Mentor: Jonathan Goldman

Department: English

School/College: College of Arts and Sciences, New York City

In the 1890s, the mainstream film industry began and almost simultaneously, while some of the first US-based films about Latinx culture were made by Latinx creators, the Latinx film industry began as well. With two different audiences to tend to and two differing objectives, there are often representations (and misrepresentations) of Latinx culture in mainstream film, whereas many US-based films about Latinx culture from Latinx creators seem to better capture Latinx culture for audiences other than Latinx people who may not directly relate to the content as Latinx people may be able to. This presentation is used to analyze what is (and has been) the evolution of mainstream film and how it has affected the representation of Latinx people in mainstream film. To do so, examples of both Latinx culture in mainstream film and US-based films about Latinx culture from Latinx creators, like "West Side Story" and "I Like It Like That" and many more, will be taken from several different periods and will be compared and contrasted to better assess the evolution of mainstream film and its impact on the representation of Latinx people in mainstream film and modern society. The end results and conclusions are used to further educate audiences on the story of Latinx people in mainstream film in the hopes of further debunking myths and misrepresentations of Latinx culture, which may have formerly been appropriated in the film industry, and successfully expanding on Latinx culture and what it actually means for Latinx people.

## **Engineering histamine-gated cation channels**

Student Presenter: Gauri Vilas Patel

Faculty Mentor: Navin Pokala

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

The worm *C. elegans* has its entire neural network mapped, making it a powerful model organism for neuroscience. Since *C. elegans* does not use histamine as a neurotransmitter, we can express histamine-gated receptors from other organisms in specific worm neurons to regulate their activity, add histamine to the animals, and observe the resulting behaviors. Past research has shown that *C. elegans* neurons expressing histamine-gated chloride channels from fruit flies can be silenced by histamine neurons. We would also like to activate neurons using histamine, via histamine-gated cation channels. Unfortunately, there are no known natural histamine-gated cation channels. Previous work has shown that expressing activated cation channels is lethal to yeast cells. We are working to use this yeast system to identify mutations that convert a natural histamine-gated chloride channel into one that conducts cations instead.

## **Construction of fluorescent sensors for thyroid hormone**

Student Presenter: George Istafanos, Bassel Hassan

Faculty Mentor: Navin Pokala

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

Thyroid hormone (TH) is a powerful regulator of metabolism. Problems with TH levels have been linked to many medical conditions, including recovery from heart attacks. Our goal is to construct a genetically engineered TH sensor for measuring hormone levels at the cellular level in real time. We created a first generation version by taking the gene for the thyroid hormone receptor and fusing it to the gene encoding green fluorescent protein (GFP). This DNA sequence was put into a plasmid and used to transform bacteria that can produce this artificial protein, which can be purified using affinity chromatography. When thyroid hormone binds to the receptor, it causes a conformational change in the protein, causing the fluorescence to change. The amino acids that link the hormone receptor to the GFP are not optimal. Our focus is to find the best sequence of amino acids that will cause the largest change in fluorescence when TH is added to the sensor. This will be done by creating a library of random mutants and screening them using a fluorometer.

## **Impact of the External Environment on the Two-Qubit Quantum System**

Student Presenter: Gurpreet Singh, Thomas Cherry

Faculty Mentor: Yusui Chen

Department: Computer Science

School/College: School of Engineering and Computing Sciences, Long Island

As a unique quantum coherence, quantum entanglement between qubits can be used to transfer information and realize the potential of quantum computing. However, a qubit system cannot be ideally isolated from its surrounding environment, which refers to external factors such as radiation, photons, sound waves, mechanical vibrations, heat, and electromagnetic fields. The interactions between the qubit system and its environment reduce the entanglement inside the qubit system and turn it into the shared entanglement between the system and environment. Such a process is called quantum decoherence, which is viewed as a process of losing the information stored between two qubits. Our project focuses on the effects of the environment on the two-qubit system. Through the graphical analysis of the non-Markovian stochastic Schrodinger equations, we study the dynamics of the entanglement between two qubits and visualize the state of either qubit on the Bloch sphere. The study on the dynamics of entanglement can help better understand the quantum decoherence process and how to reduce and control the impact of decoherence in a real quantum device.

# **Methods of Hyperspherical Functions with Application of Neutron Rich Isotopes in Heavy Ion Reactions**

Student Presenter: Hasanuzzaman Rahman, Eric Carbona, Jessica Peters

Faculty Mentor: Klara LaGrance

Department: Mathematics

School/College: School of Engineering and Computing Sciences, New York City

The effect of projectile shape on cross sections and momentum distributions of fragments from heavy ion reactions is studied. We propose a new approach that implements the underlying symmetries of each isotope with a few parameters directly in the density. Various densities and their nuclear structure are then analyzed in the reactions of  $^{12}\text{C}$  and  $^{11}\text{Li}$ ,  $^{11}\text{Be}$ , and  $^{11}\text{C}$  on a carbon target.



## **Microbial Genome Sequencing and Analysis Workflow**

Student Presenter: Helly S. Amin

Faculty Mentor: Bryan Gibb

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

The study focuses on the workflow of sequencing and analysis of the microbial genome. The Whole Genome Sequence (WGS) provides the most comprehensive map of an organism's genetic make-up. Intrinsic properties of the genome are not the only consideration before sequencing. The extraction of high-quality DNA is one such aspect that is of utmost importance. Recent advances in sequencing technologies and analysis tools have rapidly increased the output and analysis speed as well as reduced the costs of WGS. Emerging sequencing technology like Illumina sequencing allows rapid, cheap and accurate whole genome bacterial analyses, but short reads (<300 bp) do not usually enable complete genome assembly. Despite its many advantages in cost, run time, and output, the Nanopore technology system is still a technology under development due to its high error rate (~10%) compared to Illumina (0.1%). The sequencing data is obtained in FASTQ form which needs to be converted into FASTA form for further analysis. The most common platform for genomic data analysis is a Linux Operating System, which consists of plenty of command line and graphical tools for assembling raw reads. From this assembled DNA sequence, tools can be applied for genome characterization. This characterization is achieved by determining the bacterial identity of the sample, annotating genes, and identifying genes of clinical importance, such as Antimicrobial Resistance (AMR) and virulence genes.

## **Connexin 43 Mutations Effect Brain Myelination**

Student Presenter: Himani Jani\*, Yamini Nori\*, Jeet Vaishnav

Faculty Mentor: Randy F. Stout, Jr.

Department: Biomedical Sciences

School/College: College of Arts and Sciences, Long Island

Myelin is a specialized cell membrane wrapping that speeds communications between neurons in the nervous system, supports the axons of neurons, and modulates information processing. Gap junctions are protein channels that connect cells of the brain such as the oligodendrocytes which produce myelin. Myelin is lost in diseases such as multiple sclerosis and also in humans carrying certain mutations to gap junction encoding genes. Studies in humans and mice indicate that gap junction connections between astrocytes and oligodendrocytes are required for normal myelin. We hypothesized that the structure of myelin in the cortex (layers 1 and 2) of mice that express a mutant form of Connexin 43 with most of the posttranslationally modified regulatory region deleted would have decreased myelin density and average fiber length due to decreased gap junction communication between astrocytes and oligodendrocytes. We tested this hypothesis by humanely sacrificing mice with mutant and wild-type Connexin 43 (Cx43, aka GJA1) and used immunostaining to label myelin. We used structured illumination microscopy to acquire 3D multi-color channel images of the myelin structure and gap junction expression-localization the mouse brain tissue. We quantified the density and average fiber length of myelin in the two experimental groups (WT and truncation-mutant Cx43 mice). We will present the comparisons of the two groups. Preliminary results indicate the opposite of the expected results- more myelin in.

# **A Study on the Integration of Phase Change Materials in Building Construction**

Student Presenter: Jacqueline Ras

Faculty Mentor: Ehsan Kamel

Department: Energy Management

School/College: School of Architecture and Design, Long Island

The increasing rates of energy consumption are becoming a major concern for civilizations around the world. Energy consumption in the United States can be broken down into four major sectors that include Residential, Commercial, Industrial, and Transportation. Each sector is seeking new, innovative ways to transform the way we consume energy in order to minimize the growing concerns regarding climate change. Of these sectors, buildings are responsible for 40 percent of the total energy consumption in the U.S. Phase Change Material (PCM) is one of these solutions that is helping to transform the way we think about materials. PCMs are types of substances, i.e. paraffin salts, waxes and non-paraffin organics, that absorbs heat during the day and releases the heat during the night to keep the temperature within the comfort level without the use of heating and cooling systems to reduce the energy consumption. This study reviews the various forms of PCM applications in different building envelope systems and how they perform with regards to thermal energy storage and their potential energy saving in buildings. To have a better understanding PCM's applications and its impact on energy use, three case studies are reviewed to study their operating temperature range, latent heat of fusion, melting congruency, thermal properties and energy saving potentials. The outcomes of this study can contribute to the selection of proper PCM materials for applications in sustainable building design.

## **The Significance of Mustn1 in Embryonic Development**

Student Presenter: Janelle Zapiti, Amna Haider

Faculty Mentor: Michael Hadjiargyrou

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

Mustn1 is a vertebrate specific protein that is predominantly expressed in the musculoskeletal system: skeletal muscle, tendon, bone and cartilage. This gene has been associated with embryonic development, postnatal growth, exercise and regeneration of bone and skeletal muscle. Mustn1 expression has been shown as an essential aspect for prechondrocyte function therefore, may have significant potential for regulating chondrogenesis during embryonic development. In order to test the significance of Mustn1 for chondrogenesis in embryonic development, we use mice as the model through interbreeding to create a knockout mouse that no longer contains Mustn1. Mustn1 is constructed from three exons and two introns therefore, to create these knockout mice this set-up must be removed. These knockout mice will be able to exhibit how cartilage and bone isn't developing or developing improperly during embryonic development.

# **Attention Based Region of Interest Detection for Speech Emotion Recognition**

Student Presenter: Jay Desai, Ravi Shah

Faculty Mentor: Houwei Cao

Department: Computer Science

School/College: School of Engineering and Computing Sciences, New York City

Automatic emotion recognition for real-life applications is a challenging task. Human emotion expressions are subtle, and can be conveyed by a combination of several emotions. In most existing emotion recognition studies, each audio utterance/video clip is labelled/classified in its entirety. However, utterance/clip-level labelling and classification can be too coarse to capture the subtle intra-utterance/clip temporal dynamics. For example, an utterance/video clip usually contains only a few emotion-salient regions and many emotionless regions. In this study, we propose to use attention mechanism in deep recurrent neural networks to detect the Regions-of-Interest (ROI) that are more emotionally salient in human emotional speech, and further estimate the temporal emotion dynamics by aggregating those emotionally salient regions-of-interest. We compare the performance of the proposed attention networks with the state-of-the-art LSTM models on multi-class classification task of recognizing six basic human emotions, and the proposed attention models exhibit significantly better performance. Furthermore, the attention weight distribution can be used to interpret how an utterance can be expressed as a mixture of possible emotions.

## **Thyroid hormones regulate the cardiomyocyte transverse-tubule structure**

Student Presenter: Jerrin Peter

Faculty Mentor: Kaie Ojamaa

Department: Biomedical Sciences

School/College: College of Arts and Sciences, Long Island

Thyroid hormones (TH) are known to regulate transcription of genes necessary to maintain normal cardiac structure and function. We hypothesized that bioactive triiodothyronine, T<sub>3</sub>, improves cardiac contractile efficiency by regulating genes necessary for maintaining the transverse tubule (TT) network of the cardiomyocyte, which is important for excitation-contraction (EC) coupling. Our previous studies showed that T<sub>3</sub> treatment of rats in heart failure improved the adverse remodeling of the TT system. In the present study, TH deficiency was produced in female Sprague Dawley rats by treatment with PTU (propylthiouracil) for 8 weeks followed by 6 or 14 days of T<sub>3</sub> (10ug/kg/d) treatment. RNA from ventricular tissue was extracted from normal, PTU, and PTU+T<sub>3</sub> treated rats and qRT-PCR was used to measure gene expression. TH-deficient PTU treated animals showed decreased expression of sarcoplasmic reticulum calcium ATPase (SERCA2) and increased expression of the slow contractile myofibrillar protein, beta-myosin heavy chain ( $\beta$ MHC); T<sub>3</sub>-treatment reversed expression of these genes. Structural TT genes, junctophilin 2 (Jph2) and bridging integrator protein (BIN1) were also regulated by T<sub>3</sub> treatment of the TH-deficient animals. In conclusion, T<sub>3</sub> treatment of TH-deficient animals normalized gene expression of contractile myofibrillar and calcium regulatory genes as well as key TT genes thereby improving cardiomyocyte contractile function and potentially maintaining TT organization.

## **The role of the forest on our planet**

Student Presenter: Jie Gao

Faculty Mentor: Patty K. Wongpakdee

Department: Digital Arts and Design

School/College: College of Arts and Sciences, New York City

Forests and trees make vital contributions to both people and the planet. This infographic will demonstrate how forests and trees bolster livelihoods, provide clean air and water and conserve biodiversity. This infographic will help people be more aware of what would happen if the forest gets destroyed.

## **Colombia, Home of the Amazon**

Student Presenter: John Echeverria

Faculty Mentor: Rozina Vavetsi

Department: Digital Art and Design

School/College: College of Arts and Sciences, Long Island

For the past few decades, Colombia as a nation unfortunately has been known to have a negative outlook due to problems involving political corruption, narcotic trafficking & paramilitary-civilian violence. However, now in a more stable democratic system, Colombia is home to some of the world's most natural beauties & thrives in areas like economy, architecture, & overall cultural uniqueness. Colombia's success as a nation ought not to be overshadowed by the pains of a difficult past but should be praised for the cultural, natural, & socioeconomic successes that are only summarized, but limited to, within this informational graphic poster.



## **Project Sam: Artificially Intelligent Traffic Junction Systems**

Student Presenter: John-Paul Cantalino

Faculty Mentor: Michael Colef

Department: Electrical and Computer Engineering

School/College: School of Engineering and Computing Sciences, Long Island

This project was borne out of a terrible 45-minute commute from Bay Shore to Glen Cove at a job I used to have. During three years of sitting in traffic, I started to realize that certain intersections I was stopping at had traffic signals which were not intelligently programmed. Queues of vehicles were sitting at a red light, while no one was passing in the opposing direction. Some junctions had signals that were not synchronized, allowing long queues of vehicles to move from one junction to the next only to have to stop again barely 200 yards later.

This led me to investigate several routes to fix these problems. The first of which is using data science and machine learning to optimize current junction timings. This is the cheapest but least adaptable option. The second was performing the same optimization but on a continuous basis using computer vision and cameras. Finally, the most expensive but likely most reliable option is using LIDAR technology to monitor queues as well as track vehicle approach speeds and use this data to intelligently change traffic light phases. These ideas create long term benefits with the most obvious being time savings for drivers. Indirectly, the economy is boosted by less man-hours being wasted behind the wheel, as well as a reduction in common accident types.

This project is in its infancy still, but I do have some slightly working computer vision examples to display.

## **Conscious GPS**

Student Presenter: Josiah-David Sykes, Randy St. Fleur

Faculty Mentor: Ziqian (Cecilia) Dong

Department: Electrical and Computer Engineering

School/College: School of Engineering and Computing Sciences, New York City

At this presentation our team will be showcasing an invention we developed for our Senior Design Project. This invention, including both a mobile application as well as hardware, is being presented in Albany at the 2019 CREATE Symposium held by NYSID on April 10th. We are showcasing a product intended to assist the visually impaired in accurately navigating to their bus stop and waiting in the correct position. While other applications aid the visually impaired, they do not promote the level of independence that our product users and client, AHRC, require. This product is meant to ensure that, without having to ask another individual for help, they can use this wearable device to pinpoint the location of their bus stop, thus bringing greater convenience to their travel. Many different tools and technologies were used to develop this prototype and we hope to bring to life, interest in the field of technological assistance for disabled individuals, to future engineers. Additionally, we hope that future NYIT senior design groups will carry the torch and advance the level of this product as time goes on.

## **Traffic Conditions**

Student Presenter: Kailun Zhang

Faculty Mentor: Patty K. Wongpakdee

Department: Digital Art and Design

School/College: College of Arts and Sciences, New York City

Transportation is a big topic in China. Nowadays, more and more people own their own cars. People's favorite brands, travel purposes and many things are different from each other. As the number of people who own cars increases, traffic jams and accidents are more common than ever before, and many people die as a result. My infographic will show the differences in people's preferences for cars and trends in traffic conditions.

## **Cat owner in the US**

Student Presenter: Kaisheng Miao

Faculty Mentor: Patty K. Wongpakdee

Department: Digital Art and Design

School/College: College of Arts and Sciences, New York City

Cat owner in the US: Now there are more and more cat owners in the United States. My idea is to show the current situation of cat owners in the United States, the classification of the cat population, and the cost, like how much does it cost to keep a cat, so that people can know the current situation of cat owners in the United States, and to show the cats have become an important part of human life.

## **The Degas Project**

Student Presenter: Karla Andrea Perez

Faculty Mentor: Charles Matz

Department: Interior Design

School/College: School of Architecture and Design, Long Island

My goal was to explore cultural heritage through Mexican folkloric dance.

It became a form of self expression and identity. My understanding of dance stemmed from ballet like most 8 years old girls in the U.S. My mother gifted me Ballet Art from the Renaissance to the Present to silence the Barbie Ballet movies on repeat. The images and stories inspired me until I realized that a Mexican American girl wasn't welcome, I didn't fit the aesthetic. I found there was just as much validity and beauty in Mexican Folklore as there was in European ballet, the only difference was that it just wasn't being advertised.

Sharing my cultural dances became a way to promote the Mexican community and contend with the current narratives that are against it. A section in the Ballet Art book titled The World of Degas was the inspiration for the Degas Project: Bringing artists and performers together to create modern day renditions of what it means to be a dancer. With the help of Manhatitlan Mexican Dance Group and an outreach to college students in Arts related fields, an interdisciplinary workshop was created. The dancers posed and performed in traditional garments giving the artists a fresh perspective of what it means to be a ballerina.

Through fine and visual art, both parties were able to create a new experience. This connection could potentially be replicated with other cultural dance groups expanding community dialogues and their understanding of the diverse groups living in them.

## **The Pencil Gripper**

Student Presenter: Kehinde Williams, Jens Daci, Mariam Gabriel, Jonathan Coskuner, Elis Cucka

Faculty Mentor: Nabi Sertac Artan

Department: Electrical and Computer Engineering

School/College: School of Engineering and Computing Sciences, New York City

Writing can be a daunting task especially for children with learning disabilities. Without the necessary fine motor skills, writing can take longer, and can impact other aspects of a child's development. As there are a variety of writing styles, and subtleties in each style, it can be hard to pinpoint the specific issue causing the under-development of the fine motor skills necessary for writing. A device, which can collect data to measure the fine motor skills while the child is writing can help identify these issues and monitor the progress of the development of these skills. The goal of this project is to develop a wearable device to aid children with learning disabilities to improve their writing skills. The first step of this project, which is the subject of this abstract is to develop the device for collecting pressure measurements from the contact points between the fingers and the pencil, while the subject is engaged in writing exercises. In later stages of this project, the information collected will be used to assess the child's fine motor skills and help develop personalized exercises to improve the writing skills of the subjects. Currently, we are instrumenting a pencil gripper with pressure sensors, and electronics for wireless data acquisition.

## **Construction of *C. elegans* strains deficient in multiple neurotransmitters**

Student Presenter: Kinza Ahmed, Jenson John, Gaetana Iannelli

Faculty Mentor: Navin Pokala

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

The human brain has over 80 billion neurons, with staggeringly complex connectivity. In contrast, the nervous system of the worm *Caenorhabditis elegans* has 300 neurons, and has been completely mapped anatomically. However, there is still much more work that needs to be done in order to understand how the nervous system generates behavior. Glutamate, GABA, and acetylcholine are the three primary neurotransmitters used by all animals. We have obtained mutant *C. elegans* strains that lack each of these individually. We are crossing these mutant strains to each other to construct strains deficient for various combinations of these neurotransmitters. Strains that lack multiple neurotransmitters will help us better understand the interaction between these important molecules, and how they interact to contribute to locomotion and behavior.

## **The Presence of B-DNA in Dermatophytes [Tinea (Pityriasis) Obscurans] Within Human Tissue: Histological Stain- Part II**

Student Presenters: Kristen Thomas, Steven Thomas, Harsimar Jassar, Syed Huda, Najd Aljonuv

Faculty Mentor: Claude Gagna

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

Dermatophytes are considered to be a common type of fungus that can result in human skin disease. Dermatophytes are asexual or imperfect fungi of which there are about 40 species in 3 genera. These organisms survive by obtaining nutrients from the stratum corneum, mainly, keratinized materials. These organisms which invade the stratum corneum of the epidermis can cause massive inflammation within the host tissue, as the host directly responds to the production of the metabolic by-products. However, they are restricted to the outer most layer, the stratum corneum. They do not have the ability to penetrate into the deeper layers of the epidermis, mainly, the stratum granulosum, the stratum spinosum and the stratum basale. The end products of the proteases actually result in nutrients for the invading fungi. Some of the pathologies associated with this type of infection are known as Tinea.

The H&E stain is useful in characterizing the presence of dermatophytes in human skin, however, it is the PAS stain, a specialized histological procedure, that is used by most pathologists for routine diagnostic procedures. All tissue sections were obtained from the laboratory of W. Clark Lambert, M.D., Ph.D. (Rutgers NJ Medical School), and all tissues were stained by Dr. Claude Gagna (NYIT). The students in this research project used the Zeiss microscope in Theobald Hall, Rm 430, in order to take high-quality photographs for eventual publication.



# **Targeting ALT Cancers: The Role of the Fork Protection Complex in the DNA Replication Stress Response at ALT Telomeres**

Student Presenter: Lauren Granat

Faculty Mentor: Dong Zhang

Department: Biomedical Sciences

School/College: College of Osteopathic Medicine, Long Island

## **Introduction:**

Cancer cells gain replicative immortality through two major telomere maintenance mechanisms: 1) reactivating telomerase (85-90% of cancers) or 2) adopting the Alternative Lengthening of Telomere (ALT) pathway (10-15% of cancers).

The ALT pathway utilizes homologous recombination to elongate the telomeres. Telomeres lengthened via this mechanism are prone to replicative stress. The fork protection complex (FPC) is crucial for maintaining the integrity of difficult-to-replicate regions, such as telomeres, and consists of the following proteins: Timeless (TIM1), AND1, Claspin, PARP-1, and TIPIN, among others.

Our laboratory recently found that depleting FANCM (MU), an important DNA repair enzyme, leads to replicative stress.

## **Methods:**

U2OS, an ALT cellular model, was transfected with siRNA targeting Luciferase (Luc, the negative control), FANCM (MU), and one of the following sets of proteins: TIM, AND1, Claspin, PARP-1, or TIPIN. Following transfection, cells were stained with antibodies recognizing either BLM, or pRPA, markers for replication stress, and TRF2, a telomere marker, and then visualized using fluorescent microscopy.

## **Results:**

1. Co-depletion of FANCM and TIM induced more BLM and pRPA foci at ALT telomeres than the co-depletion of FANCM with AND1, Claspin, PARP-1 or TIPIN.
2. Co-depletion of FANCM and TIM leads to synthetic lethality in ALT cells.

## **Conclusion:**

Inhibition of FANCM and TIM1 may be a feasible strategy for targeting ALT cancers.

## **Parenting Styles and the Effect on Adolescent Delinquency and Self-Esteem**

Student Presenter: Leonardo Innamorato, Gurjit Singh, Shannon Donovan, Amima Ahmad, Lakshmi Davuluri

Faculty Mentor: Emily Restivo

Department: Behavioral Sciences

School/College: College of Arts and Sciences, Long Island

Parenting styles have an important effect on the way children are raised. The type of parenting a child experiences will impact their developmental and cognitive abilities (Landry, 2014). There are four traditional parenting styles that are typically explored: authoritative, authoritarian, permissive, and neglectful (Baumrind, 1967). Research has found that these parenting styles are associated with self-esteem and delinquency (Hoeve, 2011). Self-esteem, in particular, is an important aspect of health and wellness for adolescents and young adults. Low levels of self-esteem could potentially lead to destructive behavior to themselves and others. The purpose of this study is to examine the relationship between parenting styles, the risk of delinquency, and self-esteem among college students. We hope to investigate the impact of parenting styles on self-esteem and delinquency in order to have a better understanding of a child's behavior and life decisions.

## **The Use of Photomicroscopy in Order to Characterize Histological Morphology and Molecular Histotechnology**

Student Presenter: Mahdi Azad, Faria Ahmad, Anthony Yodice, Uzma Patel, Adarsh Pillay

Faculty Mentor: Claude Gagna

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

In order to obtain superior pictures with high magnification of histological morphology of the eye globe, specifically the crystalline lens, we upgraded our photomicroscopy system. The Department of Life Sciences upgraded its 100X objective with the new Zeiss Plan APOCHROMAT 100X/1.4 Oil DIC and obtained a new camera (Infinity 3 Lumenera). The Lumenera INFINITY ANALYZE software allows for the capture of high quality images that can be saved for further examination. Our Zeiss Scope A1 is an excellent light microscope with fluorescent capabilities that allows for easy upgrades such as the ones that we did as a department. We also obtained a Zeiss 2.5X/0.06 objective in order to be able to take low magnification pictures of the eye globe (the eye globe of the dog is relatively large and unlike that of a mouse cannot be seen in one single viewing). Finally, we obtained a new computer monitor (28 inches by ASUS) that allowed for Dr. Gagna to better communicate the live microscopic data to students. In conclusion, the use of a superior 100X oil immersion objective along with a much better camera resulted in our obtaining much more accurate data (e.g., higher resolution). Obtaining superior equipment for photomicroscopy also allows the Department of Life Sciences faculty to obtain peer-reviewed quality pictures for publication in journals. Additionally, this project allowed students to learn a new technique, namely photomicroscopy.

## **All You Need to Know if You're Veg-Curious**

Student Presenter: Malwina Zaslonka

Faculty Mentor: Patty K. Wongpakdee

Department: Digital Art & Design

School/College: College of Arts and Sciences, New York City

Year after year more people decide to become vegetarians due to various reasons. This infographic presents most common motives that are connected to health, religion, and impact on the environment. It also demonstrates various advantages of becoming a vegetarian, such as saving money spent on food or conserving water used in meat production. Anyone who considers changing to a vegetable-based diet will find this infographic helpful in the decision-making process.

## **Anterior Pelvic Tilt.. What, Why, and How to Correct it**

Student Presenter: Marko Rombolakis

Faculty Mentor: Eleni Nikitopoulos and Roger Yu

Department: Biology

School/College: School of Health Professions, New York City

Anterior pelvic tilt (APT) is poor posture due to the combination of hyperactivated and inactivated muscles. Hyperactive muscles shorten due to constant contraction and the opposing muscles lengthen due to inactivity. This combination then leads to the pelvis to rotate in an anterior (forward) direction.

Hyperactive muscles are overactive muscles, which aren't letting their reciprocal muscle innervate properly. In APT, the hyperactive muscles include the Hip Flexors - which consists of our Rectus Femoris, Tensor Fasciae Latae (TFL), Psoas Major. Another hyperactive area is the Quadriceps Femoris - which consists of the Rectus Femoris, VMO, VLO, and VI. The final area tends to be our spinal erectors such as the lumbar, thoracic, and cervical spine and the muscles that run along the spine. All of these muscles being hyperactive pull the pelvis forward.

These hyperactive muscles mean that somewhere there are weakened, inactive muscles. This is where reciprocal inhibition comes in. The weak, or deactivated, areas consist of the Gluteal Muscles. Also, there could be involvement of the Hamstrings, a group of muscles and their tendons at the rear of the upper leg and the abdominals: these muscles will rotate your pelvis posteriorly.

Correcting Anterior Pelvic Tilt is about correcting our muscular imbalances. I will cover how to correct Anterior Pelvic Tilt, specifying how to strengthen and activate the weak, inactive muscle groups while loosening the hyperactive muscle groups.

## **Perception of Emergency Services**

Student Presenter: Matthew DiCairano, Jillian Rockford, Nicholas Lombardi, Estefania Solorzano

Faculty Mentor: Andrew Costello

Department: Behavioral Sciences

School/College: School of Engineering and Computing Sciences, Long Island

The proposed research project aims to either confirm or deny an idea put forth by the media that the police are and should be widely feared. It will also include information about firefighters, and EMT's as control emergency services so and differences between the three would be easily discernible. The goal of the research is to offer more insight in the campus community on how its individuals feel; whether they feel safe or unsafe in the presence of law enforcement. This will likely have an impact on the students' views and hopefully sheds light on this issue by providing statistics that are relevant to the students by showing the perspective of their peers.

# **Photomicroscopy: Light Microscopy and Molecular Biological Histotechnology**

Student Presenter: Megha Gupta

Faculty Mentor: Claude Gagna

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

Recently the Department of Life Sciences at the Long Island campus of New York Institute of Technology has upgraded its photomicroscopy system. The Department has obtained a new camera, the Infinity 3 Lumenera and has upgraded its 100X objective from its 100X/1.3 objective to the new Zeiss Plan APOCHROMAT 100X/1.4 Oil DIC. A new software, the Lumenera INFINITY ANALYZE allows students and faculty to take high quality images that can be saved and eventually published in journals. The Zeiss Scope A1 is a light microscope that has the ability to take fluorescent images and can be easily upgraded as newer technologies are released. In addition, the department has purchased the Zeiss 2.5X/0.06 objective, an objective that allows students and faculty to take low magnification pictures of the eye globe as eye globe of animals like dogs are relatively large and cannot be seen in one single viewing like those of a mouse. Lastly, the department has obtained a new computer monitor, the 4K ASUS 28 inch screen which allows Dr. Gagna to display his data to his students and fellow collaborators. In conclusion, this new 100X oil immersion objective, the image analysis software, and Zeiss Scope allow the Department of Life Sciences students and faculty the chance to publish high resolution images and share their research with the scientific community. Additionally, this technology teaches students a wonderful new technique, photomicroscopy.

## **Concert Venues of NYC**

Student Presenter: Michael Serrecchia

Faculty Mentor: Rozina Vavetsi

Department: Digital Art and Design

School/College: School of Architecture and Design, Long Island

This project will be an info graphic that maps out and gives info on various music venues located in Manhattan and Brooklyn. Its purpose is to showcase the events that NYC has to offer while giving people an idea of where all the major and minor concert venues are. I hope to provide info on people's favorite concert venues and allow them to discover new ones. It will also be color coated based on the type of music that the venue is known for in order to give a better idea of the type of venue it is. I believe that it will serve as a helpful guide for tourists who want to know what the city has to offer and a way for locals to find new and interesting spots.



## **Review of Energy Storage Technologies**

Student Presenter: Michael Vangi

Faculty Mentor: Ehsan Kamel

Department: Energy Management

School/College: School of Engineering and Computing Sciences, Long Island

A literature review of Energy Storage technologies and their possible implementations. With the increasing usage of renewable energy technologies and the infrastructure of the current electrical grid aging, energy storage technologies are increasingly becoming more important to the future of power delivery. Moreover, the current state of renewable energy technology such as solar and wind are not perfect and have issues such as intermittent power generation or peak generation during times of minimum usage. Energy storage technologies can be the solution to these issues. The goal is to store the electricity that is being produced, but not used at that moment, so that during peak usage times, or times when the energy production sites are down, the storage units can provide power to the electrical grid. The energy storage technologies that are being developed can range in size from units meant for houses (e.g., Tesla Powerwall) to ones that can help power whole towns (e.g., Pumped Hydroelectric Stations (PHS)). Some of the current technologies being developed are chemical storage, PHS storage, potential energy storage, Superconducting magnetic energy storage (SMES), capacitor technology, thermal storage, and fuel cells. Each different technology fills a different use case, there is no one size fits all for energy storage technology.

This research study aims to categorize and analyze the different energy storage technologies being developed to show the range of available options. There are many different parameters to keep in mind when choosing which storage technology to use, which is why categorizing them is so important. These parameters include cost, durability, efficiency, capacity, scale, response time, and power output. Each possible use case has different priorities when it comes to these parameters. The output of this research can give details on the different specifications that should be taken into consideration when determining which technology is the best for different applications.

## **How Do Levels of Discrimination Vary Between Suburban and Metropolitan College Campuses**

Student Presenter: Michelle Shinder, Farhin Sultana, Vivek Sindhu, Yue Chang-Smith

Faculty Mentor: Melissa Huey

Department: Behavioral Science

School/College: College of Arts and Sciences, New York City

Throughout both urban and suburban college campuses alike, there has been a shift of a more diverse community of culture and ethnicity. The purpose of our research is to examine college students' racial bias and social stigma at New York Institute of Technology based on which campus they attend. It seeks to explore biases between different college campus demographics in an effort to showcase modern day racism and discuss ways to reduce such bias. Due to exposure of the surrounding environment, campuses located in the city are likely to attract a more culturally diverse student body. Therefore, the chances for students in metropolitan areas to have interactions with varied groups are significantly larger than students from the suburban areas. By the end of this research study, we expect to find a better understanding of levels of discrimination on the metropolitan campus versus the suburban campus. We are looking to recruit college students from the New York City and Long Island campuses and conduct a short survey to gather information on demographics, levels of discrimination, and levels of openness on both campuses.

## **Probing the neural circuits of decision making in *C. elegans***

Student Presenter: Miguel Echanove Gonzalez de Anleo

Faculty Mentor: Navin Pokala

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

The mechanisms of decision making or “free-will” are not well understood. It may be easier to study this phenomenon in simpler organisms, like the worm *C. elegans*. These animals can detect volatile molecules, and can follow concentration gradients to its source. The molecules and cells required for the detection of two odorants, diacetyl and isoamyl alcohol, are well understood. We are determining concentrations at which the animals are equally attracted to both odors. Using genetic methods to alter neural activity, we can manipulate cells in the neural network that integrate this sensory information. This will allow us to better understand how the animal decides between these two equally attractive choices.

## **Purification of High Molecular Weight Double-Stranded DNA for Use in DNA Microarrays**

Student Presenters: Nabeel Tanveir, Sadia Ahmed, Alex Raju, Ashley Reji

Faculty Mentor: Claude E. Gagna

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

In order to obtain low cost, high molecular weight DNA for experimentation with novel next-generation DNA microarrays, NYIT students acquired a Carolina DNA Extraction Kit. Students independently isolated the wheatgerm DNA following the included protocol within the DNA extraction kit. However, we modified the procedure by using molecular biology grade water, and reagents as well as autoclaved/sterile glassware to prevent substances like DNases RNases and proteinases from degrading the extracted double stranded DNA. The final product was characterized for purity using a DNA spectrophotometer. Additionally, we had the wheatgerm DNA purified to the point where we could obtain both SDS PAGE and 2D Gel.

## **Identifying characteristics of bacteriophages isolated from sewage found to infect bacteria *Citrobacter freundii***

Student Presenter: Natalia Reynisdottir

Faculty Mentor: Bryan Gibb

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

Rapidly growing antimicrobial resistance (AMR) in bacteria is reducing the effectiveness of current treatments for microbial infections. At the current pace, by 2050, more people may die annually from AMR bacterial infections, than from cancer. Finding an alternative therapy to antibiotics, therefore, remains one of the largest public health challenges. Phage therapy uses bacteriophages (phages), viruses that infect bacteria, to treat bacterial infections. The practice has been around for almost a century but has only recently gained attention from western medicine. *Citrobacter freundii* is a commonly encountered microbe that typically causes treatable opportunistic infections, but recently, strains with AMR have proven more challenging to treat, and hence a good target for phage therapy. We have isolated, purified and studied two separate phages that essentially infect the same bacteria, *C. freundii*. So far, we have learned these *Citrobacter* phages are extremely lytic members of the myoviridae family and have some differences in their genome properties. Further characterization will explore the genomes of these two phages, test host specificity against other related bacteria, including other strains of *C. freundii*. We will continue exploring the phage-host relationship and aim to start testing the phages against clinical isolates of *C. freundii*, some of which may contain AMR, in an effort to evaluate their potential for future phage therapy applications.

## **Examining the Perceptions of Body Image in College Students**

Student Presenter: Nicole Bermudez, Amin Yosofi, Kaylee Higgins, Matthew Arnone, Brendan Dowd

Faculty Mentor: Dina Karafantis

Department: Behavioral Sciences

School/College: College of Arts and Sciences, Long Island

Social Comparison Theory states that individuals determine their own social and personal worth by comparing themselves with others whom they perceive as being better or worse off than they are. Comparison begins during early adolescence and can lead to body dissatisfaction and low levels of self-worth. In fact, body dissatisfaction among college age women in Western societies is especially prevalent. Over 80% of women in college settings reported that they were dissatisfied with their bodies. With perpetual exposure to social media and television, society's image of the ideal physique for both males and females has been established. Unrealistic standards have been engrained in most of society as the ideal male and female bodies. This belief is bound to cause stress and body image dissatisfaction because people will be aiming for a goal that cannot possibly be achieved in any natural way, or without an extremely rigorous training and nutritional regimen. Our research examined perceptions of body image between college males and females and its correlation to stress. We hypothesized that participants who exhibit more body dissatisfaction will have higher levels of stress, regardless of gender. We hope to better explain what may potentially lead to body dissatisfaction and stress. By presenting such findings, we hope to be able to help people become more aware of what may cause body dissatisfaction and the impracticality of comparing oneself with an unrealistic standard.

## **Towards Homo-Chiral Crystal Growth: The Case-Study of NaClO<sub>3</sub>**

Student Presenter: Nugzar Noniashvili, Chelsea Duncan, Manpreet Virk, Theerathep Layanun, Angela Huan, Pritu Saha

Faculty Mentor: Ana Petrovic

Department: Life Sciences

School/College: College of Arts and Sciences, New York City

Investigation of the factors that influence crystallization of achiral compounds into chiral geometries, exhibiting equilibrium mixtures of left- and right-handed chiral crystals, is of interest in chiral resolution technology and is a topic closely related to the spontaneous emergence of biological homo-chirality. Our efforts towards homo-chiral crystallization of NaClO<sub>3</sub> and prediction of its enantiomeric chiroptical spectroscopic responses advances this field of research.

In the crystallization under inert condition, it is statistically expected to observe that chiral nuclei of NaClO<sub>3</sub> are formed essentially equally in left- and right-handed forms. These nuclei grow to form macroscopic-size crystals. Once the chiral nucleus is formed, it overtakes and dominates the entire development of the handedness of the crystals. We will present our analytical evaluation of the confidence level to which results from chiral crystallization under inert condition is reproducible. We will also provide initial results from setting-up chiral crystallizations in the presence of the chiral seed crystals and by subjecting the crystalizing solution with the circularly polarized light. From molecular modeling perspective, we will present our effort to determine the size of the smallest chiral unit-cell that distinguishes the two enantiomeric (handed) forms and allows their identification and differentiation via chiroptical spectroscopic methods. With this fundamental research, we are investigating the degree of chirality within the crystal as well as how large does the crystal nucleus have to be in order to exhibit stereo-specificity that permits resolution of the two enantiomeric forms.

In addition to the fundamental interest regarding the chiral crystallization phenomenon, the ability to generate and distinguish enantio-pure crystals is of profound importance in the pharmaceutical and agrochemical industries, where the global market for chiral technology is forecasted to reach USD 125.41 billion by 2025.

## **What's Lurking in Your Kitchen Sponge?**

Student Presenter: Olivia Albert

Faculty Mentor: Bryan Gibb

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

Kitchen sponges are an essential tool of the kitchen, but they are also an ideal home for microbes. In fact, kitchen sponges are one of the most heavily contaminated surfaces in the home. Sponges regularly come into contact with a variety of microbes, including potential pathogens commonly found in unwashed produce, raw meat and feces. Despite this, many people leave the kitchen sponge sitting in a tray near the sink, allowing these microbes to persist and flourish on the sponge, contaminating everything the sponge touches. Numerous strategies exist for reducing microbial contamination of kitchen sponges, and recently a new product was developed to ensure kitchen sponges were maintained in a disinfected state. Sponge Bath provides a novel approach to this problem where the sponge following use is stored in container of disinfectant to prevent microbial growth. We are evaluating the effectiveness of different strategies for everyday use and maintenance of kitchen sponges to maximize longevity and reduce exposure to potentially dangerous pathogenic bacteria. Our current work has involved developing and optimizing methods for testing bacterial contamination of kitchen sponges. The basic procedure is an adaptation of the FDA use-dilution method for evaluating the effectiveness of disinfectants on hard non porous surfaces, but kitchen sponges are quite different, and we have made adjustments to the assay, which allow us to measure microbial burdens on and within the kitchen sponge.



## Senses

Student Presenter: Runmei Cui

Faculty Mentor: Charles Matz

Department: Interior Design

School/College: School of Architecture and Design, Long Island

In art exhibitions, everyone should have a right to experience arts but not only through looking at art works. One of the major arguments that people make is most art museums and exhibitions do not allow people to touch art, but only to view. What is it to be like to be blind, but still wants to engage with arts. Vision plays a major role in how we interact with the world. In 2012, it was estimated that there were 285 million visually-impaired people in the world, with 39 million of which, are legally “blind”. Blindness can not only cause difficulties to one’s normal daily activities, it can create major problems in spaces where many activities happen. One of the major arguments for blind people is that they do not have a chance to view arts.

I propose to design an art exhibition for people to experience blindness. I believe people should engage with arts through experience, touch and feelings; not only through looking at art works. I would like people to walk around the museum with blindfolds and experience the gallery spaces using other senses than vision. In the design, people are forced to move around the spaces through the special design of circulation. Tangible materials would be used in the space for people to “experience” and “touch” all around the museum.

The purpose for this design is to let people appreciate what they are gifted. Even though one might be lack of one or more senses, however people should still be acknowledged of who they are.

## **Counting Oil**

Student Presenter: Ryan Rahmanan  
Faculty Mentor: Patty Wongpakdee  
Department: Digital Art and Design  
School/College: College of Arts and Sciences, Long Island

This poster displays oil consumption and production in the United States. The process provides visual statistics of how much oil the United States produces, how it fairs up to its major competitor, Saudi Arabia, and how the country's major oil state, Texas, stands in its daily production.

## **Identification of biofilm formation on the lid margin using fluorescein succinylated wheat germ agglutinin (WGA) staining**

Student Presenter: Salahuddin Qureshi

Faculty Mentor: Michael Hadjiargyrou

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

Blepharitis, meibomian gland dysfunction (MGD) and dry eye disease (DED) have always been understood as separate diseases affecting the eye in different locations. Blepharitis and DED may also cause Meibomian and lacrimal gland damage. For years, we haven't clearly understood the true basis of these diseases and thus, treating patients is challenging. We have examined the possibility that bacterial biofilm accumulation causes all three diseases. We hypothesize that blepharitis begins as a bacterial biofilm initiated folliculitis, eventually destroying the integrity of the eye lash follicles, leading to chronic inflammation. Ultimately, the continuous biofilm formation begins to affect the Meibomian glands preventing the production of normal meibum during adulthood and eventually enters the lacrimal glands. Thereafter, the final stage is total lid structure damage leading to entropion, ectropion and floppy eyelid syndrome. As such, blepharitis, MGD and DED are different manifestations of the same disease coined as DEBS (dry eye blepharitis syndrome). To examine biofilm formation on the lid margin, we obtained samples from patients with DEBS and stained them with fluorescently succinylated WGA which binds to N-acetylglucosamine, a building block sugar in biofilm formation. Biofilm presence was analyzed by fluorescent microscopy. Further identification of the bacteria responsible for the production of the biofilm will help us better understand how to prevent and treat DEBS.

## **Isolation and Characterization of Bacteriophages Targeting Enterobacter Bacteria**

Student Presenter: Samantha Frisina, Karl Pillion

Faculty Mentor: Bryan Gibb

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

Antibiotic resistance is a rapidly growing problem that kills an estimated 1.5 million people a year worldwide and by 2030, could kill more people than cancer. Novel approaches are necessary to ensure we maintain the ability to readily treat bacterial infections. Bacteriophages are viruses that infect and kill bacteria. We isolated and conducted a characterization of phages isolated from sewage targeting two species of bacteria. *Enterobacter aerogenes* and *Enterobacter cloacae* are bacteria that inhabit the guts of people and are commonly found growing in kitchens and hospitals. These bacteria are opportunistic pathogens, and are typically treatable with a course of antibiotics. However, there are increased reports of antibiotic resistant strains, which cause more dangerous life threatening infections. We isolated and characterized two phages from primary sewage, one for each strain. Although the bacteria are related, the phages are so specific for the one species of bacteria they were isolated from, they do not infect the other. These two phages appear completely lytic, so they could be good candidates for phage therapy. We are currently analyzing the genomes of both phages to learn more about their mode of action, similarities to other isolated phages, and relationship with their host bacterium. Future studies will examine these phages for their ability to kill clinical isolates of bacteria in vitro and in vivo within infected mice.

## **Characterization of Molecular Fixatives for the Optimal Preservation of Eye Globe Tissue Morphology, and Tissue-Based Canonical DNA Molecules**

Student Presenter: Shaheryar Gill, Safyah Siddiqui, Silva Lleshi, Mina Ahsan, Alisha Malhotra  
Faculty Mentor: Claude Gagna  
Department: Life Sciences  
School/College: College of Arts and Sciences, Long Island

As the average lifespan increases, we need to focus on healthcare issues concerning vision, i.e., cataracts. Our group characterized the differences between fixation of dog eye globes using two different fixatives, i.e., Davidson's and Formalin-Acetic Acid-Alcohol (FAA). We determined that Davidson's resulted in superior tissue morphology and maintained normal eye globe size, while FAA resulted in poor tissue morphology and swelling. Concerning the extraction of tissue-bound DNA from paraffin-embedded tissues, Davidson's allowed for superior extraction of intact double-stranded (ds) DNA (0.341 OD; Enzyme-linked immunosorbent assay), while FAA processed tissue resulted in lower yields of extracted ds-DNA (0.286 OD; Enzyme-linked immunosorbent assay). Therefore, we believe that Davidson's fixative will allow for superior results in future laser microdissection procedures to obtain high molecular weight ds-DNA from specific regions of the crystalline lens (e.g., epithelium, fiber cells). NYIT undergraduate students performed precise measurements of eye globe tissue sections cut at 3 microns thick (H&E stained), i.e., vertical and horizontal measurements. We calculated the percent increase in FAA tissue swelling as compared to Davidson's. It should be noted that based on previous research, it has been determined that no swelling or reduction in size occurs with Davidson's. This research hopes to shed new light on the development of cataracts in mammals.

# **Patterns and Risk Factors of Pediatric Malignancies in a Bangladeshi Tertiary Care Hospital**

Student Presenters: Sharnam Ahmed, Feeza Hasan, Saadia Javed

Faculty Mentor: Maria Plummer

Department: Clinical Specialties

School/College: College of Osteopathic Medicine, Long Island

The objective of this survey is to gather information about the epidemiology of cancer in Bangladesh. Bangladesh is the eighth most populous country in the world with 156 million people. Of these, 1.3 -1.5 million people suffer from cancer. This puts cancer as the sixth most common cause of death, accounting for 10% of deaths in the country. Through this survey we want to classify the types of cancer that Bangladesh is suffering from. Then, identify the most common types of cancer, along with demographic, environmental and socioeconomic factors that affect morbidity and mortality in Bangladesh and much more. This survey will be conducted retrospectively through interviews with patients and their families. Patient safety and confidentiality will be maintained and all the interviews will be taken with the patient's informed consent. All the rules and regulations of ethical research set forth by the International Review Board will be strictly observed.

The goal of this survey is to gather information that can be used effectively to partner with health care facilities in Bangladesh to set up rotations for NYIT-COM students and provide free healthcare to the distressed cancer patients in Bangladesh.

## **The Presence of B-DNA in Dermatophytes [Tinea (Pityriasis) Obscurans] Within Human Tissue: Immunohistochemistry – Part 1**

Student Presenter: Sharon Thomas, Seelia Jacob, Melina Hamaoui, Prachi Shah, Gina Koros

Faculty Mentor: Claude Gagna

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

Dermatophytes, an asexual or imperfect fungi, are a common type of fungus that is capable of causing disease in human tissue, mainly the skin. The organism obtains nutrients from keratinized material, which is abundant in the stratum corneum. Dermatophytes invade the stratum corneum of the epidermis causing massive inflammation in the tissue which is a result of the host responding to metabolic byproducts of the organism. The organism colonizes the outer layer, the stratum corneum, but are unable to penetrate the deeper layers such as the stratum granulosum, stratum spinosum, and the stratum basale.

In order to develop a new procedure for the characterization of dermatophyte invading and colonizing the stratum corneum in human tissue, we, for the first time, stained tissue sections with an anti-ds-B-DNA monoclonal antibody. Using an anti-DNA antibody in order to diagnose the presence of dermatophytes in human tissue could result in a new and powerful diagnostic tool. Additionally, staining with this antibody tells us more about the molecular biology of this organism as it thrives within human skin and goes through various cycles. All tissue sections were obtained from the lab of W. Clark Lambert, M.D., Ph. D. and all of the histological and immunohistochemical staining procedures were carried out by Dr. Claude Gagna. All of the photographic images were taken by NYIT Students.

## **Digital Stone Project: 3D Printing in Marble**

Student Presenter: Sheraine Peart

Faculty Mentor: Robert Smith

Department: Digital Art and Design

School/College: College of Arts and Sciences, New York City

The Digital stone Project is an annual workshop that allows for 20 students and teachers to conduct research projects in the field of 3D printing in Marble in Tuscany Italy.

My project consisted of researching the process of taking a sculpture from the computer modelling stage to the actual production stage as well as exploring the limits of the processes weak points. 3D printing in marble has two notable weak points, achieving thinness of the sculptural form and creating undercuts, that is, creating empty spaces under a sculpture.

I create the sculpture "Roots" to test these two areas of weakness. My project discusses the process of 3D printing in Marble and how it differs from 3d printing in plastic. Additionally, it discusses how to address some of these weaknesses and how to design a sculpture to overcome these issues.



# **A COMPREHENSIVE STUDY ON KINETIC FAÇADES AND ITS BENEFITS IN THERMAL COMFORT**

Student Presenter: Stephan Martinez

Faculty Mentor: Ehsan Kamel

Department: Energy Management

School/College: School of Architecture and Design, Long Island

It is a common understanding that global warming is one of the biggest threat that humanity is facing today. According to the National Climate Assessment, human influences are the number one cause of global warming. The commercial and residential building sector accounts for about 40% of carbon dioxide (CO<sub>2</sub>) emissions in the United States per year, more than any other sector. Interactive architecture is increasingly playing a bigger role in today's architecture and how it can present us with a solution by transforming the built environment to be more energy efficient and climate-friendly. Kinetic architecture is an integration of form and technology that has inspired from nature and geometric complexity in buildings should not neglect the need for better energy efficiency performance. The level of complexity on these systems are typically high and many factors must be accounted for when designing.

This paper investigates the different aspects and parameters that must be taken into consideration when designing for a kinetic façade such as outdoor temperature, solar radiations, material's properties, and the possibility of energy generation. The same way they exist different forms of kinetic façades, some will respond to the wind, others will respond to the sun. We will be looking into major examples for the application of kinetic façade in buildings to understand how different conditions affect the application of this system. These case studies include but not limited to Masdar Institute for Science and Technology in the United Arab Emirates and Pearl River Tower in China. This research study helps to have a better understanding of kinetic façade, the design parameters in different environment, and their applications.

## **Effects of Cultural Dimensions on the Glass Ceiling**

Student Presenter: Supraja Raghavan

Faculty Mentor: Radoslaw Nowak

Department: Human Resource Management and Labor Relations

School/College: School of Management, New York City

### **PURPOSE:**

The Fortune 500 magazine revealed that there are less than 5% of women CEO as of 2018. This triggered the curiosity to research about whether national cultural dimension has effect on the glass ceiling of women. The research focuses on cultural dimension impacting women as Chief Executive Officers, women holding influential government positions and gender wage gap.

### **RESEARCH QUESTIONS:**

1. Effect of national cultural dimensions on advancement of women to senior roles in an organization
2. Determine the effects of national cultural dimensions on women's glass ceiling in government positions
3. Effect of national cultural dimensions on the gender wage gap
4. Identify obstacles that prevent women in all cultures to move up the organizational hierarchy to break the ceiling.

Archival data were obtained from various government publications, trade associations, international organizations like the World Bank, International Labor Organization, etc. The data were obtained for more than 50 countries.

Data collected were entered in SPSS (software used for statistical analysis) developed by IBM to find statistical relationships between the variables. The data were analyzed, and the relationships were established.

At the end of the research and data analysis, the relationships were established, and research questions were answered.

## **Factors That Influence First Time PANCE Pass Rates**

Student Presenters: Tahia Syeda, Zeev Rubinson, Faraiba Faqeerzada, Fareeha Sial

Faculty Mentor: Corri Wolf

Department: Physician Assistant Studies

School/College: School of Health Professions, Long Island

The Physician Assistant (PA) profession is one of the fastest growing careers in the United States. According to the Bureau of Labor Statistics, the need for PAs is expected to increase by 30% over the next decade. As a result, the number of interested applicants and programs have grown. Upon graduation from an accredited PA program, a PA graduate must first pass the Physician Assistant National Certification Exam (PANCE) before being able to acquire a state license. The PANCE is more than a certification exam; it affects the accreditation eligibility and reflects a school's educational success. Schools are constantly looking to maximize PANCE pass rates. This study evaluates potential factors affecting PANCE pass rates, including: (a) if and how programs conduct a board review, (b) who teaches pharmacology, and (c) how anatomy is taught.

## **Addicted to the Gram**

Student Presenter: Terresa Yen

Faculty Mentor: Patty K. Wongpakdee

Department: Digital Arts and Design

School/College: College of Arts and Sciences, New York City

One day my friend asked me to do a survey for her and I said yes. I had no idea the survey was on social media and boy was I in for a treat. I knew I was on my phone a lot but I had no idea just how addicted I was until I took this survey. I often found myself scrolling on Instagram when I was bored, with my boyfriend and sometimes I would just end up on Instagram without even realizing. It's become such a horrible habit of mine that I began to wonder, am I the only one?". My infographic is about social media and the effects it has on us as a culture. Social media is more than just a form of entertainment, it is the new way of marketing and making a living. But it is also the cause of stress, depression, anxiety and body issues.

## **Relationship between Self-Esteem and Academic Program in College Students**

Student Presenter: Thomas Bozzo, Jess Hawley, Kylee Kanealey, Curtis Rosebery, Aleksei Urusov

Faculty Mentor: Emily Restivo

Department: Behavioral Science

School/College: College of Arts and Sciences, Long Island

The purpose of this study is to examine the relationship between major and self-esteem amongst college students. Self-esteem is highly correlated with mental health issues such as depression and anxiety, as well as academic performance. Therefore, it is important to see which college majors are impacted by self-esteem. We hypothesize that there will be a statistical difference in levels of self-esteem between college majors. We predict that architecture and engineering students will have lower levels of self-esteem than other majors such as behavioral science and liberal arts.

Our data will be collected by utilizing a two-part survey. The first ten questions of the survey consist of the Rosenberg Self-Esteem Scale to measure each student's self-esteem. After the self-esteem inventory, there are nine demographic questions which allow us to compare self-esteem scores across different subpopulations. The surveys will be administered with the help of several professors during their classes. Participants will also be recruited in common areas located throughout the Long Island campus. Each participant will be asked to fully read and sign a consent form before beginning the survey.

## **Klebsiella Pneumonia**

Student Presenter: Usman Niaz

Faculty Mentor: Bryan Gibb

Department: Life Sciences

School/College: College of Arts and Sciences, Long Island

*Klebsiella pneumoniae* is an infectious bacteria in a genus with growing antibiotic resistance. *Klebsiella* bacteria can often be found as harmless enterobacteriaceae in the intestines. They can also be found in stool samples. *Klebsiella* infections often occur in patients that are already sick and receiving treatment for other conditions, such as in hospitals or nursing homes. Symptoms of the infection vary depending on where the infection is. If the lungs are infected, symptoms include fever, cough, chest pain, breathing issues, and bloody mucus. *Klebsiella* could also infect the blood, brain, heart, skin, or urinary tract. If an infection is suspected, the physician will diagnose from a blood test. If an infection is confirmed the doctor will start with treatment of antibiotics. However, *Klebsiella pneumoniae* has been showing an increased resistance to carbapenem antibiotics. Carbapenems are an effective class of antibacterials normally reserved for bacteria that are known to be resistant to other antibacterials. Some *Klebsiella* have been found to produce an enzyme known as carbapenemase, making carbapenem antibiotics ineffective. This places *Klebsiella pneumoniae* as a carbapenem-resistant Enterobacteriaceae, CRE, a family of difficult to treat germs due to their resistances to the body's natural defenses as well as most antibacterial medicines. Here, we are attempting to isolate and identify a potential bacteriophage in sewage samples that could infect non-CRE *Klebsiella pneumoniae* with the eventual goal of finding a bacteriophage that could safely treat CRE *Klebsiella pneumoniae* infections in humans. A potential phage has been found, and is undergoing isolation to be identified.

## **Game of Thrones Infographic**

Student Presenter: Yichi Zhang

Faculty Mentor: Patty K. Wongpakdee

Department: Digital Art and Design

School/College: College of Arts and Sciences, New York City

Game of Thrones - A Song of Ice and Fire -

I created this infographic because I think the Game of Thrones (HBO TV shows) are getting more and more popular right now. For helping viewers to have a better understanding of the show, I list a several things like badge, castle, sword etc. And I also created a speculative map so that people can find out different house location more easily.

## **Plastic Ocean**

Student Presenter: Yijun Liang

Faculty Mentor: Prof. Patty K. Wongpakdee

Department: Digital art and design

School/College: College of Arts & Sciences, New York City

The ocean is almost a plastic world! This is not scaremongering.

This is our problem: the Pacific garbage patch, the yellow stuff. You may not know, but marine plastic waste and microplastics have been everywhere, all over the world, from the coastal estuary areas to the oceans, from the equatorial waters to the Arctic and Antarctic, from the surface of the ocean to the ocean in the ultra-abyssal zone. On earth it is difficult to find no-plastic-pollution, "pure land".



## **Video-On-Demand Market in the United States**

Student Presenter: Yujia Yan

Faculty Mentor: Patty K. Wongpakdee

Department: Digital art and Design

School/College: College of Arts and Sciences, New York City

The topic of this infographic poster is about the video-on-demand market in the U.S.

The reason why I chose this topic is that in nowadays, people have tons of ways to get themselves entertained and one of the most common way is to watch drama, reality shows and movies etc. online using their computers. People don't need a cable or a TV screen anymore.

The infographic poster illustrates the current status of the Video on Demand consumption in the United States; how many people are using Video on Demand services in the U.S. and what's the trend of it throughout these years, how many people are paying for it, which content provider is the most popular among the others and how many hours people spend on it weekly etc.

## **The associations of Successful Aging amongst Chinese elderlies**

Student Presenter: Yunqi Xu

Faculty Mentor: Boncho Dragiyski

Department: Campus Commons (Nanjing)

School/College: Engineering and Computing Sciences

China is aging more rapidly than ever before. However, the Chinese government has a very weak safety net to cover for all of these new elderlies. Thus, Successful Aging (SA) is therefore an important research subject, and identifying its determinants is crucial. According to Rowe and Kahn, SA constitutes a later life with less disease related disability, high level of cognitive and physical functions, and an active lifestyle. However, there is an increasing emphasis on the psycho-social aspects of in more recent researches, whereby clinical aspects of aging are viewed to be less important while social engagement, well-being, and independence are prioritized. However, there is no consensus on the exact definitions of SA despite the abundance of research into this topic. Despite the lack of consensus, it has been acknowledged and accepted that SA is hugely influenced by culture and society. This research will aim to investigate how the multi-facets of SA correlates to the elderlies in China via the following approaches:

1. What are the determinants of SA?
2. What are the cultural similarities and differences between China and other parts of the world?
3. What are the behavioral similarities and differences between elderlies of different cities and provinces?
4. Which determinant of SA most strongly correlates to the elderlies in China? Based on a comprehensive review of previous research articles and fieldwork surveys, these paper assets that Chinese elderlies have low correlation to Successful Aging.