source

SYMPOSIUM OF UNIVERSITY RESEARCH AND CREATIVE EXPRESSION

FRIDAY, APRIL 29, 2022: 9 A.M.–3 P.M.

16 W. 61ST ST. 11th FLOOR

LOCATIONS

REGISTRATION AND SESSIONS
16 W. 61ST ST.

KEYNOTE SPEAKER
JACQUELINE MASON

"MY JOURNEY FROM NEW YORK TECH TO WALL STREET AND LESSONS ALONG THE WAY"

Please join us as Jacqueline Mason shares life lessons from her beginnings as a student at New York Tech to her successes as a leader in global IT project management.

16 W. 61ST ST.
11H FLOOR AUDITORIUM

NYIT.EDU/SOURCE

SPONSORED BY NEW YORK TECH
COLLEGE OF ARTS AND SCIENCES

NEW YORK INSTITUTE OF TECHNOLOGY

Dear NYIT Faculty, Staff, Students, and Friends,

Welcome to the Symposium of University Research and Creative Expression (SOURCE) 2022 on April 29 in the New York City campus Auditorium of New York Tech at 16 W. 61st Street starting at 10:00 AM.

Creative expression and participating in research with faculty members have become integral parts of a student's educational experience at New York Tech. 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 96 abstracts, a record breaker, were accepted and more than 183 undergraduate and graduate students of New York Tech—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.

In the last two years, the COVID didn't make a dent on our students' academic performance. Rather, our students have overcome difficulties and become much stronger than ever as the numbers demonstrated. Our students are back and so is the SOURCE event! I would like to take this opportunity to congratulate all the students for their academic excellence at New York Tech. Many individuals in the New York Tech 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

Jacqueline Mason:

My Journey from New York Tech to Wall Street and Lessons Along the Way

Please join us as Jacqueline Mason shares life lessons from her beginnings as a student at New York Tech to her successes as a leader in global IT project management.

About Amy Herman

Jacqueline Mason is a seasoned technology professional with over 25 years experience in the financial industry. Currently, Jacqueline is a Vice President at Morgan Stanley in Enterprise Technology Services, End User Technology division. • In her role, Jacqueline is responsible for driving the strategic agendas of End User Technology and Operations, with a focus on transitioning and adopting Agile methodologies to deliver products and services on a global scale • As such Jacqueline partners with all areas of the organization to support the division initiatives, and ultimately is a key contributor in delivering the end-state operating model for EUT • In addition, Jacqueline is committed to giving back and such serves as a mentor, supporting and advocating for the development and advancement of employees, as well as youths in her community and high school students in underserved communities. • Prior to joining Morgan Stanley, she worked at Citi as Senior Vice President in various global roles in Infrastructure Technology, Salomon Smith Barney and Salomon Brothers. • Jacqueline is a graduate of NYIT, holds a degree in Computer Science. She is a member of the Standing Committee of the Long Island Diocese of the Episcopal Church; she resides on Long Island with her husband and 2 daughters.

Symposium on University Research and Creative Expression (SOURCE) 2022 Program	
9:15 – 10 a.m.	**REGISTRATION and BREAKFAST** **16 W. 61st Street, 11th floor** **Doors open at 9 a.m.**
10 –11:45 a.m.	**ORAL PRESENTATIONS** **16 W. 61st Street**
noon – 1 p.m.	**KEYNOTE SPEAKER** **Jacqueline Mason** **"My Journey from New York Tech to Wall Street and Lessons Along the Way"** **16 W61st, 11th floor Auditorium** **Lunch will be served**
1 – 2 p.m.	**POSTER EXHIBIT** **16 W. 61st Street, 11th floor**
2 – 3:30 p.m.	**ORAL PRESENTATIONS** **16 W. 61st Street**

Oral Presentations **10 a.m. –11:45 a.m.**	**16 W. 61st St.** **Room 822:** **Moderator:** **Mena Youssef**	**16 W. 61st St.** **Room 11th fl** **Auditorium** **Moderator:** **Eve Armstrong**	**16 W. 61st St.** **Room 821** **Moderator:** **Melissa Huey**
10 a.m.	"The Morphology and Histology of Chicken Bone Characterized by Several Different Fixatives Using Microscopy and a MicroCT Scanner"	"Plan Collage"	"Positive Self-Talk and its Effect on Psychological Well Being and Performance"
	Fatima Khwaja, Tarifa Adam, Adith Anugu, Anamika Rao, Katie Sandhovel	Carolina Flores-Iglesias, Maxamillion Foley, Jose Molina, Dilara Yesiltepe, Edward Cahill	Ariah Dull, Bakhtawar Shahbaz
10:15 a.m.	"The Warburg Effect in Cancer and Alternative and Multistranded DNA and RNA Molecules"	"A practical study on social media platforms improves the teaching and learning practice in K 9 Physical Education before and after the Covid-19 pandemic in a developing country China"	"Contraception and Depression"
	Juliana D'Amico, Katie Sandhovel	Chu Wang, Rimandeep Kaur, Genliang Zhu	Taylor Narsingh, Danielle Tarpey, Sara Giammarella
10:30 a.m.	"Effects of MUSTN1 Knockout in Skeletal Muscle"	"ECG Changes in Patients with Hypermobile Conditions"	"Predictors of Triaging Injured Patients to General Ward or Stepdown Unit at a Level II Trauma Center"
	Arhum Ahmed	Denis Malkov, Anisa Raidah, Casey Sciandra, Lara Tong	Jae Moo Lee
10:45 a.m.	"The Mainstreaming Addiction Treatment Act of 2021 (S.445; H.R.1384) - A Step to Ending America's Opioid Epidemic"	"Stand up improv"	"Nonverbal Communication Impacts in Remote VS In-Person Settings"
	Yash Trivedi	Ishaan Singh	Carmine Velez, Anna Shumskaya

11 a.m.	“Genome Analysis of Two Phages from Sewage Infecting Citrobacter freundii“	“Comedy from the ivory tower”	“Race, Attention, & Threat Perception”
	Anna Makedonska	Benjamin Cheung	Kaylah Dewar, Sebastian Lopez, Michael Rosen, Fabrice Cyprien
11:15 a.m.	"Analysis of vascular calcification in internal carotid arteries and cerebral microvasculature by three-dimensional visualization and histologic examination"	“The Ivory Tower”	“To What Extent Is Exercise Self-Efficacy Related to Overall GPA in College Students?”
	Kelly Borges, Joseph Aabye, Ava Hanlon, Janet Back, Laurence Graziano	Alena Yukova	Raiyan Sami, Shuoen Liu, Sabrina Popal

Oral Presentations **2 p.m. – 3:30 p.m.**	**16 W. 61st St.** **ROOM 822** **Moderator:** **Spencer Turkel**	**16 W. 61st St.** **ROOM 821** **Moderator:** **Sophia Domokos**	**16 W. 61st St.** **ROOM 723** **Moderator:** **Colleen Kirk**
2 p.m.	"Turning Back The Wheel On Abortion Care In The US: Intended & Unintended Consequences"	"TLT GRANT: Learning in 3D: The VR Experience in the Classroom"	"Fournier's Gangrene Mimicking a Burn"
	Jessica Byron	Lavin Amarnani	Madina Khan
2:15 p.m.	"Health Policy Brief: COVID-19 Health Disparities Action Act of 2021 (HR 1400)"	"Broader Impacts for NSF Grant RUI: Solitonsin Holography"	"NYIT Undergraduate Research Journal"
	John Purcell	Avarna Manoj Agarwal, Pablo Planas	Srikrishna Prasad, Siem Satti, Danial Ahmed
2:30 p.m.	"Motivations and Impact of Restrictive Abortion Laws in the U.S."	"Modeling Periodic Seismic Waves in Spherically Symmetric Mediums"	"Secure Local CI/CD Pipeline"
	Christine Lee	Andrew Wong	Vinodkumar Kakarla
2:45 p.m.	"The Role of Alginate Hydrogels in Bone Tissue Engineering"	"The Physics of Lightning"	"fNIRS applied in Neuromarketing"
	Serin Ahn	Skylynn Kilfoil-Greaves, Ishaan Singh	Lisbeth Sandoe Pedersen

3 p.m.	"Effects of Zoledronic Acid and Magnesium alloys to Regulate Osteogenesis and Osteoclastogenesis"	"Holographic Duality"	"Instructional Technology Literacy Program for Teachers in Low-Income Communities"
	Sally Lee	Lillian Pratt, Beza Nigatu	Anthony Song Lara, Fatemeh Mohamadi Asli
3:15 p.m.	"The Role of Mesenchymal Stem Cells in in vivo Implants for Musculoskeletal Application"	"Lagrangian Mechanics"	"Colonialism, Capitalism, and the Filipina Aspiration for Whiteness"
	Chris Mathew	Chin Ho Kua	Azzam Afghani Alonto

Exhibition Hall 16 W. 61st St., 11th floor	
"Astrocyte-Regulated ATP Signaling on Motivational Behavior in Mice"	Aarya Nehe
" 3D Bioprinting of Functional Organs "	Abdulhadi Naser Badran
"Finding Bacteriophage of Staphylococcus aureus in NYIT Sewage Water"	Alana James, Subaita Almobin, Amna Zulfiqar, Muhammad Khan, Nishwa Nawaz, Menahil Kazmi
"Using Galaxy CPT and Apollo to Annotate Bacteriophages"	Alessandro Drudi
"The Isolation of Affect"	Alex D. Hernandez, David Ozga, Imari Faceson
"Tobacco consumption in France"	Alice Buquen
" Dogs: A potential source to treat Staphylococcus aureus infections? "	Amanda Vaysman, Priscilla de Mesa, Hibah Rizvi, Maheen Babar
" The American Perspective of Climate Change ″	Amelia Razak
“Choosing Ignorance and it's Consequences”	Amiel Calleja
" Know Your Limit - Lifestyle Poster "	Angelina Ojeda
" What A Waste "	Ashlynn Reynolds

" DDoS Prevention on Cloud Environment with Snort "	Aung Ko Ko
" Broader Impacts for NSF Grant RUI: Solitonsin Holography "	Avarna Agarwal
" Choroid Plexus Carcinoma "	Brightlyn Kwa, Siddhi Modi
" Gun Violence "	Cameron Tessitore
“Investigating tissue proliferation within elastic scaffolds”	Carlyn Annunziata
" Modeling Inversion of Sucrose "	Caroline Fernandez, Jaycee Rae Greer, Radu Ramses Mihnea Nestor, Tiffany Brooks Roberts, Christina Renee Varady, Komal Javed, Sameer S. Kazi Krushang Kamleshkumar, Selena Shiwprasad, Sarah Nicolle Souza, Christine Marie Lopresti, Ka Wai Wai Wen
" Lagrangian Mechanics "	Chin Ho Kua
" LGBT poster "	Connor Ammendola
" ECG Changes in Patients with Hypermobile Conditions "	Denis Malkov, Anisa Raidah, Casey Sciandra, Lara Tong
" Smoking Among Teens Infographic "	Devina Ramroop
“Relief of Post-COVD-19 Burning Mouth Syndrome with Osteopathic Manipulative Treatment: A Case Study”	Elisabeth L. Frankini

Exhibition Hall 16 W. 61st St., 11th floor	
"Development of Multiple-Target Molecules for the Treatment of Alzheimer's Disease"	Fawaz Syed
" Homelessness in New York City "	Fernanda Valle
" Isolation of bacteriophages on clinical strains of Staphylococcus aureus from commercial phage cocktails "	Hamza Nagarwala
" Return to Sport After Arthroscopic Rotator Cuff Repair in an Athlete: A Scoping Review "	Hannah Fischer, Matthew Alben, Neil Gambhir
"Immortal Coil of Land"	Hitakshi Agrawal, Rasika Deosthali
" Bacteriophages Close to Home "	Humza Bari, Tannya Singh
" EcoTourism in Small Island Developing States (SIDS) "	Isabel Tabet, Sahar Esfandyari
"Development of a Fluorescent Assay to Measure the effect of new compounds on Histone Acetyltransferase Activity"	Jennifer Gattus
" Tape Measure Protein (TMP) and its Functions in Different Phages "	Joana Thomson
" Our Existence is At Risk"	Justin B. Santiago
" Are You Okay? "	Kyle Acapana
"TLT GRANT: Learning in 3D: The VR Experience in the Classroom"	Lavin Amarnani

"Francisella tularensis interactions with mammalian RBCs"	Luke D'Cunha
“Riddled with grief”	Makeda Armstrong
"Genotyping Animal Models"	Mansi Patel
"Medical Students Learn Through Research on Prevalence of Sacroiliac and Pubic Symphysis Joint Shears in Chronic Low Back Pain and Impaired Single Leg Balance"	Marichelle Renee Pita
"Detection of dysplastic cervical cells from pap-smear images using texture features for the nucleus"	Mary Margarette Sanchez, Dono Shodieva, SimranSanju Kadam, Ramses Nestor, Angel Singh
"Seromucinous cyst presents as endometriosis complications in a 57 year-old post-menopausal female: a case report"	Matthew Sison, Yakubmiyer Musheyev, Benjamin Ilyaev
“Surveying Wastewater As A Source To Combat Antimicrobial Resistance”	May Thu Aung, Yash Trivedi, Rabia Rasheed, Ryan Ramasray
“Overcoming a “forbidden phenotype:: The parrot’s head supports, propels, and powers tripedal locomotion”	Melody Young
“Development and Validation of Solid Phase extraction and liquid Chromatopraphy/Mass Spectometry methods for the concurrent detection of select antibiotics in New York Tech’s Wastewater plant”	Michael Maino
“A survey of how much time people spend on their phones”	MingTong Wang
“ “The Association Between EMS Response Times and Hospital Outcomes at a Level II NYC Trauma Center “	Mohammad Aktar, Maria Aliberti, Benjamin Winchel, Sourish Rathi,
“An osteopathic woman was treated with a passive weight-bearing protocol”	Naiem Habib, Yisroel Grabie

“Effect of homoarginine on food consumption and cardiac function in mice“	Neil Kaungumpillil
“Effects of Osteopathic Manipulative Treatment (OMT) on Anosmia and Ageusia in Post- COVID-19 Patient: A Case Report“	Nicole Companion
“Development of Internal Prediction Models to Assess Mortality and Discharge Disposition in Patients with Traumatic Brain Injuries in a Level II Trauma Center”	Nikit Patel, Richard LaRocco, Scott Kivitz, Dana Schulz, Sonia Amanat
“Finding Bacteriophage of S. Aureus in Sewage”	Nishwa Nawaz, Menahil Kazmi
“Utility of a Retraction Robot in Simulated Pacemaker Implantation Surgery”	Nolberto Jaramillo, Ermin Tale
“Mechanisms of PAK1 regulation of Autophagy and Mitophagy in H9C2 Cardiomyoblasts”	Peter Girgis, Anoushka Guha, Pooja Jaiswal
“2D and 3D STORM Imaging of Cardiac Myocytes Deficient in Thyroid Hormones”	Riddhi Modi, Yash Trivedi, Amanda Charest
“Serine Integrase Within the Phage Genome”	Roslyn Paul
“Therapeutic Potential of S. aureus Bacteriophages found in Drug-resistant Fitness Centers”	Sahejdeep Chohan, Moshe Kabariti, Siem Satti, Srikrishna Prasad
“Using spatial omics and multiplexed imaging to discover new biomarkers of response or resistance to Immune Checkpoint Inhibitors (ICI) in advanced Non-Small Cell Lung Cancer (NSCLC) using Lasso logistic regression”	Sara Hussin
“Madness Through Time”	Sophia Denis, Makeda Armstrong
“Modern Enlightenment”	Sophia Denis

“Ovarian Serous Cystadenoma Presents As Bladder Issues in 23-Year-Old Female: A Case Report”	Yakubmiyer Musheyev
“Determinants of Plaquing Behavior in cluster AZ phages on Arthrobacter globiformis”	Yamini Bhaveshbhai Patel, Hannah Saji, Alexandru Medina, Vrushali Patel, Amna Syeda
“Combating SARS-CoV-2 With Wastewater Based Epidemiology”	Yash Trivedi, May Thu Aung, Rabia Rasheed, Ryan Ramasray
“Reviving the Historic Sabils of Cairo”	Yousef Ismail

Astrocyte-Regulated ATP Signaling on Motivational Behavior in Mice

Student Presenter: Aarya Nehe

Faculty Mentor: Weikang Cai

Department: Biomedical Sciences

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

Dopamine neurons are located in the substantia nigra, ventral tegmental area, and hypothalamus of the brain. They release dopamine at specific brain regions to regulate motivational pathways. It has been demonstrated that elevated dopamine levels further increase motivation in mice to obtain a food reward. Conversely, decreasing the amount of dopamine signaling results in depressive-like behavior. Astrocytes release ATP through exocytosis to modulate neuronal activity. This mechanism occurs via the vesicular nucleotide transporter gene VNUT to provide a mechanism for the storage and release of ATP. In the present study, in order to further investigate the role of dopaminergic activity, we generated a novel transgenic mouse model in which VNUT is silenced in astrocytes. The motivation of both sexes of mice with knockout of the VNUT gene (VNUTKO) was compared against wild-type (WT) mice using sucrose pellets. The mice were habituated to a feeding experiment device (FED) that dispensed the pellets after burrowing their nose into a cavity to trigger a sensor in the FED. The progressively more effort settings would challenge the mice to trigger the sensor multiple times to dispense a sugar tablet, thus testing their motivation for obtaining a food reward. The results suggested that in male mice, VNUTKO alone produced a significant decrease in motivation versus WT. Future studies can explore if a decrease in the exocytosis mechanism of ATP alone can decrease dopamine signaling.

3D Bioprinting of Functional Organs

Student Presenter: Abdulhadi Badran

Faculty Mentor: Azhar Ilyas

Department: Electrical and Computer Engineering

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

3D bioprinting is a promising technology in the field of regenerative medicine, and it is another successful strategy to overcome the shortage of organ donors and transplantations. 3D bioprinting enables accurate control over the distribution of cells to create biological tissues and organs. This promising technology relies on the layer-by-layer fabrication. Different biomaterials and bioprinters are used for 3D bioprinting for tissues and organs, and each biomaterial and bioprinter have unique roles. For instance, there are three leading 3D bioprinting technologies for organs and tissues that have been used widely: inkjet-based bioprinting, extrusion-based bioprinting, and laser-based bioprinting. Additionally, 3D bioprinting of functional tissues and organs may be accomplished by using natural and synthetic biomaterials such as alginate and polylactide. Successful creation of functional tissues and organs by using 3D bioprinting requires a number of considerations such as combining specific types of biomaterials and cells to create functions for the 3D bioprinted tissues and organs. Furthermore, there are a number of human organs that have been scientifically 3D bioprinted such as heart, liver, and kidney, in order to test the possibility of 3D bioprinting those organs and mimicking their functionality within the human body.

Finding Bacteriophage of Staphylococcus Aureus in NYIT Sewage Water

Student Presenter: Alana James, Subaita Almobin, Amna Zulfiqar, Muhammad Khan, Nishwa Nawaz

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

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

Infections caused by resistant strains of Staphylococcus aureus, including MRSA (Methicillin resistant S. aureus) are becoming increasingly difficult to treat with antibiotics. S. aureus is found on human skin and in the environment, including wastewater. Bacteriophages are viruses that infect bacteria. Due to increasing antibiotic resistance among community and hospital isolates of S. aureus, researchers are experimenting with alternative treatment options like phage therapy. Wastewater is home to many microbes, including S. aureus, so we hypothesized that it may be a good source of bacteriophages that can infect S.aureus and resistant strains such as MRSA. We have isolated several Staphylococcal phages from wastewater samples collected from the NYIT wastewater treatment facility over the past three years. These phages are currently being characterized for the ability to infect and kill several strains of S. aureus, imaged by transmission electron microscopy, having the genomes sequenced. Given the abundance of phages in the environment, each bacteriophage we have isolated may be a novel phage and with the potential to be good therapeutic candidates for phage therapy in treating S. aureus infection.

The Ivory Tower

Student Presenter: Alena Yukova

Faculty Mentor: Eve Armstrong

Department: Physics

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

Stand-Up Comedy from the Ivory Tower.

Comedic storytelling themed on preparing for medical school. I have joined the Ivory Tower Stand-Up Comedy group in hopes of developing my communication skills, as well as attempting to come to terms with my upbringing and my nationality in the current geopolitical climate. I will be doing my piece on the struggles of being a pre med student, as well as being a student in general. I am also dedicating a part of my performance to my birth country - Russia, for me it is exciting that Russians who do not agree with Putin's tyrannical actions now have representation at SOURCE.

Using Galaxy CPT and Apollo to Annotate Bacteriophages

Student Presenter: Alessandro Drudi

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

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

Bacteriophages are increasingly relevant in research and medical fields. It is important to discover and analyze bacteriophages that appear in many places in order to understand better how they infect their host bacteria. There are many new bacteriophages that are discovered every day and are a large reservoir of new genetic information. Genetic engineering technologies such as CRISPR have arisen from research into phage genomes. Therefore, genetic annotation of bacteriophages can be very advantageous. Annotation is the process of finding genes within a genome and then using various tools to determine the function of the genes. Some of these tools are automatic; however, they are imperfect and require some human annotation to form a complete understanding of a genome–especially to avoid perpetuating mistakes that automatic tools may make. In my experience, I have done manual annotation through the SEA-Phage program, and now I am applying this experience to Galaxy CPT and Apollo, which have more automated tools. Galaxy CPT (Center for Phage Technology) and Apollo are platforms that allow collaborative and reproducible annotation. Combining the computerized annotation possible with Galaxy CPT and Apollo with human annotation is a very effective method of annotating phage genomes.

The Isolation of Affect

Student Presenter: Alex Hernandez, David Ozga, Imari Faceson

Faculty Mentor: Colleen Kirk

Department: Management & Marketing Studies

School/College: College of Osteopathic Medicine, Long Island

Physicians are faced with emotional dilemmas. Empathy helps physicians relate to and communicate with patients and is often seen as a positive trait. On the other hand, medical students are trained to avoid overt emotional displays during their interactions with patients due to issues of bias and effective decision-making. Indeed, research illustrates that as medical students progress through their training, they become less empathetic and more cynical. The Isolation of Affect research study seeks to understand the evolution of affect in medical trainees as they progress through medical school. Applying themes in psychology and consumer behavior marketing to medical student education yields the central question: is there a change in the emotional reactivity of trainees and is this associated with a change in the attitudes, actions, or thoughts of student doctors toward patients? This study surveyed medical students to analyze their emotional reactions to identical scenarios during pre-clinical education and post-clinical education. Through a mixed-methods analysis, this research investigates changes in the student doctor's emotional state, and key personality traits including communal narcissism, crying proneness, and empathy, which may be associated with an impact on patient care. The implications of this study may warrant recommendations for the preservation or alteration of the medical student trainee's emotional state. The preliminary results will be presented at SOURCE.

Tobacco Consumption in France

Student Presenter: Alice Buquen

Faculty Mentor: Patty K. Wongpakdee

Department: Digital Art and Design

School/College: School of Architecture and Design, New York City

My project is an infographic about tobacco consumption in France. I chose this topic because it is a real problem in my country that affects a large part of the population, starting with young people. It is important to inform people about the hazards of tobacco, in order to decrease this consumption which is very dangerous for health. Indeed, in France each year more than 75% of cancers are due to tobacco. My goal is to show figures and data, to show the reality of this consumption.

Dogs: A Potential Source to Treat Staphylococcus Aureus Infections?

Student Presenter: Amanda Vaysman, Priscilla de Mesa, Hibah Rizvi, Maheen Babar

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

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

Staphylococcus aureus causes more than 119,000 bloodstream infections each year in the United States. These serious infections often need extensive treatment and can lead to long-lasting debilitating conditions or death. While antibiotics are commonly used to treat S. aureus infections, the overutilization of antibiotics resulted in increasing prevalence of antibiotic resistant strains such as methicillin-resistant S. aureus (MRSA) and vancomycin-resistant S. aureus (VRSA). Phage therapy is a promising alternative that consists of using viruses that infect bacteria called bacteriophages. There are an estimated 1031 bacteriophages, more than any other organism and found in environments inhabited by their host. Household dogs have repeatedly been recognized to be carriers of MRSA. Dogs come into contact with a wide variety of environments that are filled with bacteria. We have isolated phages that infect S. aureus from the anus, paws, and noses of dogs. We are in the process of characterizing these phages to evaluate the host-range, lytic potential, image by transmission electron microscopy, and genome sequencing. These novel bacteriophages from dogs that may hold therapeutic potential to be used in phage therapy for infections caused by S. aureus.

The American Perspective of Climate Change

Student Presenter: Amelia Razak

Faculty Mentor: Patty Wongpakdee

Department: Digital Arts and Design

School/College: School of Architecture and Design, New York City

An infographic design project detailing the American view of climate change. While to most of the world climate change is a real and occurring problem, many Americans are still oblivious to its short- and long-term effects on the planet. Americans either seem to be mostly unsure of the reality of climate change or seem to be losing interest in it altogether. For these reasons, the United States is amongst the countries with the worst climate change policies worldwide.

Choosing Ignorance and Its Consequences

Student Presenter: Amiel Calleja

Faculty Mentor: Carrie Rubinstein

Department: Digital Art and Design

School/College: School of Architecture and Design, New York City

After reflecting upon a difficult semester, I took the liberty to create this collage to express the emotions of its time. It’s easy to acknowledge the faults we have, then ignore them, joke about them with friends, and even plan to amend them at a later date. The allure of current pleasures and impulses distracts from the real concerns that need to be addressed. This piece features that in the midst of escapism, there is the sudden realization that in actuality, you're sinking. In this 18 x 48 multimedia work, I used the imagery of alcohol to represent the pleasures of the present. A deliberate choice of alcohol is largely associated with indulgence and temporarily forgetting problems. In the middle of the artwork, there is a large ink drawing of a jug spilling down the piece and it is being held by an unclear humanoid form at the top. This represents the impulsive side of every person, encouraging indulgence. At the opposite end of the jug, there is a realistic portrait of being overcome by the waterfall. It is a self-portrait holding a wine glass up to the waterfall with a fed-up look. To express how deep down I knew I was not making good choices, however, I chose to ignore the circumstances. Creating this artwork was a cathartic experience for me. While it was a deeply sore introspection, I respect that it led me to a clearer mind. I hope to express to others that escapism can only distract you for so long before the consequences of it start to bruise you.

Modeling Periodic Seismic Waves in Spherically Symmetric Mediums

Student Presenter: Andrew Wong

Faculty Mentor: Vitaly Katsnelson

Department: Mathematics

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

The long-term goal of this project is to determine whether it is possible to derive meaningful results from seismic wave measurements taken from a single seismometer on a planet's surface. Due to the prohibitive cost of transporting the required equipment astronomical distances, there is considerable interest in the feasibility of using just one seismometer for tomographic imaging of other planets to determine the composition of their interiors. With only a single seismometer available, our focus is on periodic waves that return to their starting position after one or more revolutions around a planet since having a single seismometer allows one to determine travel times of such waves. If there are sufficiently many periodic travel times, then one can potentially image the innards of a planet using a well-known technique called travel-time tomography. We show that under certain geometric conditions, there is a rich family of periodic waves, and our program simulates these periodic wave paths. Our program models the behavior of seismic waves in a spherically symmetric, multilayered medium, and considers possible wave scattering and mode conversions at the boundaries and interfaces. The program's results show that it is possible to calculate the takeoff angle to derive periodic waves that return to the point where they originated within a specified number of reflections and/or transmissions. It is possible to generate many of these periodic waves for different sets of layers.

Know Your Limit - Lifestyle Poster

Student Presenter: Angelina Ojeda

Faculty Mentor: Patty Wongpakdee

Department: Digital Arts and Design

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

Knowing the right calorie intake for your body can greatly increase your health. If your calorie consumption is too low or too high you are at risk for diabetes, cancer and heart disease. As of September 2021, there are 16 states battling a 35% or higher obesity rate. I created a graphic, “Know Your Limit,” to break down the significant factors. Your weight, sex, age and physical activity determine the amount of energy your body needs each day. By encouraging others to further understand what they are eating and how their bodies are burning, this work can promote a healthier lifestyle.

Genome Analysis of Two Phages from Sewage Infecting Citrobacter freundii

Student Presenter: Anna Makedonska

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

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

Antimicrobial resistance (AMR) is a growing global health threat that reduces the effectiveness of current treatments for microbial infections. Finding alternatives to antibiotics, therefore, remains an important public health challenge. Phage therapy uses viruses (bacteriophages) that infect bacteria to treat bacterial infections. Despite its promising application, much is yet unknown regarding the interactions between a phage, bacterium, and human host. To this end, we have isolated, purified, and studied two separate phages that infect the same bacteria, Citrobacter freundii. C. freundii is a commonly encountered microbe that typically causes treatable opportunistic infections. Recently, strains with AMR have proven more challenging to treat, making it a more dangerous pathogen, and hence a good target for phage therapy. The two phages were isolated from wastewater and are extremely lytic to bacteria. TEM shows that they are tailed phages from the myoviridae family. One phage is refractive to restriction enzyme digestion and with a greater capacity to infect other Citrobacter hosts. Genome sequences show both phages have large genomes of roughly 180 kb. We explore the reason for the inhibition of restriction enzyme digestion and conduct a comparative genomic investigation with other closely related bacteriophages to determine their suitability for phage therapy.

Program for Teachers in Low-Income Communities

Student Presenter: Anthony Song Lara, Fatemeh Mohamadi Asli

Faculty Mentor: Gregory Gerber

Department: Instructional Technology-Management in Information Systems

School/College: College of Engineering and Computing Sciences, Vancouver

The “Instructional Technology Literacy Program for Teachers in Low-Income Communities in Lima, Peru” focuses on facilitating teachers to effectively bring technology-based learning into their learning/teaching programs. Most communities in Peru do not have enough resources to invest in educational technologies, including green screen equipment. We made this possible through the Edward Guiliano Fellowship Program and provided the Simon Bolivar School with everything they needed to continue and maximize their learning. We delivered interactive instructional technology training to teachers in Lima, Peru, to become masters at choosing, using, and applying digital learning tools in a k-12 education system with an outstanding 21-century teaching methodology. We seek to empower teachers to grow as critical thinkers who are competent and digitally literate. This is a unique digital literacy plan that seeks to address and rectify the education and information access inequities caused by socio-economic status – exacerbated by the COVID-19 pandemic.

Effects of MUSTN1 Knockout in Skeletal Muscle

Student Presenter: Arhum Ahmed

Faculty Mentor: Michael Hadjiargyrou

Department: Biological and Chemical Sciences

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

MUSTN1 or Mustang (Musculoskeletal Temporally Activated Novel Gene) is a pan-musculoskeletal gene exclusively expressed in bone, cartilage, skeletal muscle, and tendon cells. Previous in vitro experiments showed that MUSTN1 downregulation leads to a decrease in myofusion and mRNA expression of myogenesis related marker genes. In this study, we examined the in vivo effects of MUSTN1 ablation in skeletal muscle development and function. The knockout (KO) mice were generated using the Cre-Lox system and were examined in weight, grip strength tests, and glucose tolerance tests at ages 1 to 6 months. The KO male mice had lower weight ($p < 0.01$), grip strength ($p < 0.01$), and blood glucose ($p < 0.0001$) at 2 months compared to the control, but these differences disappeared at 4 months. Female mice did not show any significant difference between genotypes at all ages. Our data presents an opportunity to add to the understanding of additional regulatory mechanisms of skeletal muscle development and how MUSTN1 can be related to skeletal muscle pathologies.

Positive Self-Talk and Its Effect on Psychological Well Being and Performance

Student Presenter: Ariah Dull, Bakhtawar Shahbaz

Faculty Mentor: Melissa Huey

Department: Behavioral Sciences

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

Mental health is often looked at as something we are able to control and compartmentalize when it comes to work. However, research shows that mood and psychological well-being play a significant role in overall performance (Hong-Yui, 2022). Our research works to understand the impact of positive self-talk on psychological well-being and academic performance. We hypothesize that with increased positive self-talk, confidence in test-taking and classroom psychological well-being will be improved.

Classes in the Behavioral Sciences Department will be asked to participate, and each class will be split into two groups: the experimental group and the control group. The experimental group will be exposed to positive self-talk at the beginning of each class for 1-2 weeks of classes, while the control group will not receive any positive self-talk training. Each group will then be tasked with an academic achievement task and given a survey about their psychological well-being during class. We expect to find a positive impact of positive self-talk on psychological well-being and an increase in performance. These results can be applied to research on psychological well-being within class environments to help further identify how student performance can be enhanced through understanding personal factors that either inhibit or enhance a student's education.

What A Waste

Student Presenter: Ashlynn Reynolds

Faculty Mentor: Patty Wongpakdee

Department: Digital Art and Design

School/College: School of Architecture and Design, New York City

I chose to create an infographic reflecting the waste issue in America in hopes to inspire sustainability. I wanted to motivate viewers to take a look at how much garbage they produce and the lasting effects that waste can have on the planet. I believe we can make a difference by making just a few small changes to our everyday lives, such as reusable water bottles or straws.

DDoS Prevention on Cloud Environment with Snort

Student Presenter: Aung Ko Ko

Faculty Mentor: Maryam Raiyat Aliabadi

Department: Computer Science

School/College: College of Engineering and Computing Sciences, Vancouver

Between the rise of cyberattacks and the rapid data migration to the Cloud, cloud security becomes a higher priority for organizations and cloud service providers. This paper demonstrates the deployment of Snort IDPS in the cloud environment that provides better alerts and logs management to mitigate DDoS attacks quickly. The DDoS attack, in which the performance of a system, website, web-based application, or web-based service is purposefully and maliciously degraded, or the system becomes inaccessible, is the most well-known attack that threatens availability. In this paper, we present the deployment of Snort IDPS in AWS Cloud. This paper also details the integration of the Snort Logging and Alerting component with AWS CloudWatch and Simple Notification Service (SNS). Finally, we demonstrate the comparison of system performance before and after deployment of Snort IDPS on AWS Cloud.

Broader Impacts for NSF Grant RUI: Solitons in Holography

Student Presenter: Avarna Manoj Agarwal, Pablo Planas

Faculty Mentor: Sung Park

Department: Digital Art and Design

School/College: School of Architecture and Design, New York City

The NSF Grant wants to work towards getting younger students who are about to make decisions about their professions get interested in the different topics of Physics by creating fun and informative TikTok Videos.

Specifically on topics such as Holographic Duality, Strong Coupling, Extra Dimensions, how extra dimensions in string theory help us understand particles, what E=mc^2 means and solitons. The purpose is to take these difficult and intimidating topics, and break them down in a way that helps younger students get interested in it and want to look further into it. Like a glimpse of what to expect.

TikTok and Instagram are chosen to communicate and engage the students since that is currently the best platform to reach our target audience. These TikTok videos will have a fun element to it, while being straightforward and easy to understand. The intent is to find metaphors and comparisons in real life that lead back to the topics and help them comprehend the subject better.

The teams working on this are the Design Team and the Physics Department. We are working with Undergraduate Physics Students who are coming up with concepts and story boards that lead to easier explanations. Then the design team is producing, directing, and editing all the videos and content to make sure it is expressing the message we want to communicate.

Creating such videos will help them figure out what field excites them, which topic they would like to look more into, and what sparks their curiosity.

Colonialism, Capitalism, and the Filipina Aspiration for Whiteness

Student Presenter: Azzam Afghani Alonto

Faculty Mentor: Jeaniffere Vila

Department: Humanities

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

The skin-whitening industry is booming in the Asia-Pacific region, and colonialism is regarded as one of the factors that made it successful (Future Market Insights, 2021; Singson, 2017; Renault, 2015). After being colonized by the Spaniards, Americans, and Japanese for almost 400 years – all of whom uphold fair skin as a beauty standard for women – the Philippines retained explicit colorism in its culture, especially since fair skin signifies high socioeconomic status (Renault, 2015; Rondilla, 2012). In the most recent study done by Mendoza for the Journal of Public Health Policy (2013), half of Filipinas, mostly represented by middle-class and working-class women, make up 90% of skin-whitening product consumers and often disregard potential health issues that come from these. This study aims to examine the role of colonialism in the current beauty standards for Filipinas, how corporations and the media perpetuate these beauty standards, and how and why Filipinas choose to use these products.

Comedy From the Ivory Tower

Student Presenter: Benjamin Cheung

Faculty Mentor: Eve Armstrong

Department: Physics

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

Comedic story telling themed on interacting with professors. I decided to do this project because I wanted to get out of my comfort zone. I have extreme stage fright, and this project will help me overcome that anxiety. Above all else I want to improve my communication skills, and develop those skills through comedy.

Choroid Plexus Carcinoma

Student Presenter: Brightlyn Kwa, Siddhi Modi

Faculty Mentor: Haotian Zhao

Department: Biomedical Sciences

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

Choroid plexus carcinoma (CPC) is a rare and aggressive brain cancer that primarily affects children. The benign forms of CPC are choroid plexus papilloma (CPP) and atypical CPP. While little is known about CPC, the cancer phenotype includes CPC cells with solitary cilia instead of multiciliated cells (MCCs), persistent TP53 mutations, and disruptions to the multiciliogenesis program that is led by GMNC-MCIDAS transcription factors. MCCs can be found in the ependyma and choroid plexus (CP) epithelia, where the CP secretes cerebrospinal fluid and the ependymal cilia circulate it throughout the ventricular system. In mice models, MCCs had cilia defects due to the deletion of Trp53 and Rb1, paralleling the defects in the human GMNC-MCIDAS pathway. Geminin Coiled-Coil Domain Containing (GMNC) and multi-ciliate differentiation and DNA synthesis associated with cell cycle protein (MCIDAS) aid in early MCC differentiation, triggered by NOTCH inhibition. It is found that abnormal NOTCH signaling led to the development of CPPs. In this study, we show that faulty NOTCH and Sonic Hedgehog signaling in mice leads to tumors similar to human CPC tumors. NOTCH drives tumor development as it inhibits GMNC and MCIDAS expression, yielding monociliated cells. However, the overexpression of Gmnc-Mcidas yields viable results as multiplication reoccurs and tumor proliferation decreases. Mastering the GMNC-MCIDAS program and its role in inhibiting tumorigenesis leaves room for treatment options for CPC.

Gun Violence

Student Presenter: Cameron Tessitore

Faculty Mentor: Patty Wongpakdee

Department: Digital Art and Design

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

Gun Violence is such a large problem in the world today, hence why I decided to design my infographic poster surrounding the issue, as gun violence is something I feel very passionate about changing. After understanding the statistics of gun violence, and noticing the way these statistics are rising annually, it isn't difficult to realize that this is a serious problem, one that needs to be addressed more often by the media. All in all, gun violence needs to be stopped, but we can only make a change if we all come together.

Investigating tissue proliferation within elastic scaffolds

Student Presenter: Carlyn Annunziata

Faculty Mentor: Pejman Sanaei

Department: Mathematics

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

Scaffolds engineered for use in tissue regeneration consist of multiple pores which are lined with cells, through which nutrient-rich culture medium flows. Nutrient solution circulates throughout the scaffold pores, promoting cellular proliferation. The proliferation process depends on several factors such as scaffold geometry, the nutrient solution flow rate, the shear stress, and the elastic properties of the scaffold material. These factors greatly affect the tissue growth rate. Recent studies focus on the first three factors, while in this work, we focus on the cellular growth rate in elastic scaffolds under the constant flux of nutrients. As cells grow, the pore radius decreases, therefore, in order to sustain the nutrient flux, the inlet applied pressure at the top of the scaffold pore should be increased. This results in expansion of the elastic scaffold pore, which in turn influences the cell growth rate. Considering the elasticity of the scaffold, the pore deformation allows further tissue growth beyond that of inelastic conditions. In this paper, our objectives are as follows: (i) develop a mathematical model for cell proliferation describing fluid dynamics, scaffold elasticity, and tissue growth; (ii) solve the models and then simulate the tissue proliferation process. The simulation can emulate real-life cell growth in a tissue engineering pore and offer a solution that reduces the numerical burdens. Our algorithm is demonstrated to be in agreement with the experiment.

Nonverbal Communication Impacts in Remote VS In-Person Settings

Student Presenter: Carmine Velez, Anna Shumskaya

Faculty Mentor: Melissa Huey

Department: Behavioral Sciences

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

The current college environment includes the use of both in-person and online classes. Though a remote setting is convenient, there are implications of an increased difficulty in the use of nonverbal communication. We hypothesize a reduction in students psychological well-being resulting from the inability to effectively engage in nonverbal communication remotely.

Once Dr. Melissa Huey and research assistants, Carmine Velez and Anna Shumskaya, received IRB approval, a preliminary study was completed to ensure the reliability of self-reports. After seeing no significant difference between observational and self-report data, the researchers have begun to anonymously survey members of The New York Institute of Technology. The study will determine the relationship between psychological well-being such as anxiety, mindfulness, and engagement, and the use of nonverbal communication such as eye contact, posture, and hand raising, throughout the various settings. The research may provide insight into the effectiveness of remote learning and methods for creating an optimal learning environment.

Plan Collage

Student Presenter: Carolina Flores-Iglesias, Maxamillion Foley, Jose Molina, Dilara Yesiltepe, Edward Cahill

Faculty Mentor: Elijah Williams

Department: Architecture and Design

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

Second-year students in the Architecture program at NYIT conducted an exercise where the end result was a collage of many architectural plans. A plan shows a view from above that can be cut from different places of a structure to show the levels. Students walked into the library and were given the names of some books to find that had plans of different buildings by different architects around the world. Once they found their books, they looked through them to find the plans they were most interested in and photocopied them. They were split into 3 groups and each group made one collage with pieces of each other's plans and it came out very interesting. Curves were combined with straight elements, interior spaces were combined with the exterior, and different scales were also combined. After their first collage was done they went back to find more books for more plans and continued the process of photocopying the books, and then combining different plans with each other. It became more interesting with the experimentation of different scales of the plans and seeing how they look mixed with each other. Students in the class said the emphasis was placed on connecting circulation and spaces. They liked the ability to create a more interesting design and potentially create a more obscure design. One student said that they felt that the assignment was very successful in opening their mind to better and more abstract things.

Modeling Inversion of Sucrose

Student Presenter: Caroline Fernandez, Jaycee Rae Greer, Radu Ramses Mihnea Nestor, Tiffany Brooks Roberts, Christina Renee Varady, Komal Javed, Sameer S. Kazi Krushang Kamleshkumar, Selena Shiwprasad, Sarah Nicolle Souza, Christine Marie Lopresti, Ka Wai Wai Wen

Pandya,

Faculty Mentor: Ana Petrovic

Department: Biological and Chemical Sciences

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

Sucrose, commonly referred to as table or cane sugar, is one of the common nutritional sources of energy that is released upon its digestion of glucose and fructose, followed by their subsequent catabolism. The rate of digestion of sucrose in aqueous media can be followed by measuring the angle of rotation of polarized light passing through the solution. While sucrose is dextrorotatory, the resulting mixture of glucose and fructose is slightly levorotatory, because the levorotatory fructose has a greater molar rotation than the dextrorotatory glucose.

Herein, we present efforts to reproduce the experimentally obtained kinetics data via molecular modeling of glucose, fructose, and sucrose. In this molecular modeling effort, we highlight the importance of a) properly setting bonding within the model structures as well as b) conducting a comprehensive survey of the conformational space of models in a suitable solvent environment.

Lagrangian Mechanics

Student Presenter: Chin Ho Kua

Faculty Mentor: Sophia Domokos

Department: Physics

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

Ever wondered if all motion can be governed from a simple, unifying rule? Or where does the wave equation come from? Or how we could connect all of these into a game? Cue: Lagrangian Mechanics - An alternative perspective on the rules that govern our world's objects and their motion. Learn from this presentation about what it intuitively means, how it's being used in many fields of physics and engineering, and see physics in a different lens. Watch how we're going to connect physics, computer science, game development, and a tennis ball all in one go.

The Role of Mesenchymal Stem Cells in in vivo Implants for Musculoskeletal Application

Student Presenter: Chris Mathew

Faculty Mentor: Azhar Ilyas

Department: Electrical and Computer Engineering

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

Mesenchymal stem cells represent a promising source of cells for in vivo bone engineering due to their capability for multipotent differentiation. Advancements in bioprinting have enabled printing of scaffolds that are able to impact differentiation and proliferation of stem cells. As a result, many studies have investigated the use of various mesenchymal stem cells in combination with scaffolds for the effectiveness in bone regeneration. There are various factors that impact the efficacy of bone regeneration including scaffold composition, cell-surface interactions, and the animal model used. For the studies analyzed, the commonly used scaffold materials include collagen, alginate and hydroxyapatite with tricalcium phosphate. The physiological properties of these scaffolds as well as interactions between the scaffold and the stem cells and the impact these interactions may have on bone regeneration were observed. While many studies have already investigated the in vitro potential of mesenchymal stem cells for osteogenic differentiation, in vivo studies may prove as a means for more efficient bone repair notably with critical size defects. This review aims to categorize the advancements in in vivo models using dental pulp stem cells, bone marrow stem cells, and adipose-derived stem cells and compare scaffold composition with effectiveness in repairing bone fractures.

Motivations and Impact of Restrictive Abortion Laws in the U.S.

Student Presenter: Christine Lee

Faculty Mentor: Joerg Leheste, Arthur Klein

Department: Biological and Chemical Sciences

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

The undermining actions of both the state and federal governments to restrict abortion access after the decisions made by Roe vs. Wade have continued to pose a threat to the health and well-being of all birthing people. The United States House of Representatives bill H.R. 558 is designed to restrict the performance of the Dilation and Evacuation (D&E) abortion procedure most used in second-trimester abortions. If enacted, H.R.558 will work to restrict abortion access to birthing individuals who seek procedures during their second trimester which predominately includes individuals of color, socioeconomically disadvantaged, and marginalized communities. Further, an increase in maternal mortality, surging numbers of displaced children, and the overflow of orphanages and foster care systems are expected. In addition, the alignment of religious beliefs and political viewpoints as well as the importance of female representation in reproductive policy decisions are examined.

A practical study on social media platforms improves the teaching and learning practice in K 9 Physical Education before and after the Covid-19 pandemic in a developing country China.

Student Presenter: Chu Wang, Rimandeep Kaur, Genliang Zhu

Faculty Mentor: Darren Francis

Department: Education

School/College: College of Arts and Sciences, Vancouver

Social Media Tools: WeChat

Methodology: Qualitative and quantitative

Basic Theory: School, Family, and Community Partnerships

According to the investigation of typical Chinese rural-urban communities and their school districts, ample studies about social media can improve the teaching and learning practice. Our project established a ‘public page’ on the most popular social media platform in China aims to enhance the engagement and participation of the K9 student in physical education activities in and out of the classroom. Help the students transfer from the teacher-centric study model to the student-centric study model under the supervision of teachers, parents, and community volunteers, especially during the pandemic period. This project integrated the source from school districts and communities, and rebuilt a strong connection between schools, families, and communities before and after the Covid-19 spread. Also, it is an example of School, Family, and Community Partnerships interactions to contribute to more involvement in Physical education activities.

Amount of LGBT people in the USA.

Student Presenter: Connor Ammendola

Faculty Mentor: Patty Wongpakdee

Department: Digital Art and Design

School/College: School of Architecture and Design, New York City

I picked this topic because I wanted to show the world that we exist as a community, and how important it is for the community to have rights, considering how many of us there are. I hope to spread awareness on how many of us there are and to show other LGBT people they are not alone. By spreading awareness and showing other people how many other LGBT people are in the world, people can see that they are not alone. Showing which states also have the most people, can show people in the community where they may feel safest to live.

ECG Changes in Patients with Hypermobile Conditions

Student Presenter: Denis Malkov, Anisa Raidah, Casey Sciandra, Lara Tong

Faculty Mentor: Todd J. Cohen

Department: Clinical Sciences

School/College: College of Osteopathic Medicine, Long Island

Patients at the New York Institute of Technology College of Osteopathic Medicine Ehlers-Danlos Syndrome/Hypermobility Treatment Center that were referred for cardiac evaluation were the subjects of this study. Patients were classified as either EDS or HSD by the center's hypermobility specialist and became part of the patient registry with these conditions. PR, QRS, QT, QTc intervals, and heart rates were collected from 12-lead ECGs and analyzed for significant differences using an unpaired Student's t-test. P-value 0.05 was statistically significant. Medications taken at the time of the ECG reading were also noted.

There were 35 hypermobile patients and 35 controls, that were age- and sex-matched. The data analysis of the ECG measurements for significant differences between the groups produced the following p-values: PR interval-0.11, QRS interval-0.21, QT interval-0.56, QTc interval-0.10, heart rate-0.17. There were no statistically significant differences in the ECG intervals and heart rates between the two groups.

This study compared 12-lead ECG QT/QTc intervals between hypermobile (EDS and HSD) and non-hypermobile patients that presented with cardiac manifestations. Concurrent medications were considered as the cause for ECG variations as well. This study failed to demonstrate any significant difference in ECG intervals between the two groups. Additional research is necessary to fully understand the mechanisms of palpitations, presyncope, and syncope in these two groups.

Smoking Among Teens Infographic

Student Presenter: Devina Ramroop

Faculty Mentor: Patty K. Wongpakdee

Department: Digital Art and Design

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

I chose this topic because I wanted to highlight the dangers of smoking that occur among teens. It's an ongoing issue in today's society, where many teens are addicted to smoking, and it's very impactful and hard-hitting. By showcasing statistics on tobacco use and its harmful effects, the message of avoiding smoking should be known and seen by all.

Relief of Post-COVD-19 Burning Mouth Syndrome with Osteopathic Manipulative Treatment: A Case Study

Student Presenter: Elisabeth Frankini

Faculty Mentor: Adena Leder, Sheldon C. Yao

Department: Osteopathic Manipulative Medicine

School/College: College of Osteopathic Medicine, Long Island

Burning Mouth Syndrome (BMS) is a rare condition consisting of a burning sensation of the oral mucosa of unknown etiology without physical examination findings. Patients may have other symptoms including difficulty speaking, headache (HA), temporomandibular disorder (TMD), and muscular weakness of the jaw. Treatment methods include benzodiazepines and antidepressants. Although there is no documentation of Osteopathic Manipulative Treatment (OMT) being utilized to treat BMS, OMT has been shown to be effective in treating TMD and HA. 71-year-old male presented with a burning sensation of the left side of his tongue for the past two weeks. Previously, the patient experienced the sensation for over one year after being diagnosed with COVID-19 in March 2020. Patient reported 2/10 pain at time of visit, and 8/10 pain at its worst. He used Mylanta 4 times/day to alleviate pain. Physical examination and vital signs were within normal limits. Osteopathic structural examination revealed somatic dysfunctions of the cranium, jaw, spine, ribcage, and pelvis. OMT including cranial osteopathic manipulative medicine, myofascial technique, ganglion release, muscle energy and counter strain were utilized. At 1 week follow up, the patient self-reported no burning for 4 days following treatment. He reported an 80% overall decrease in discomfort and ceased use of Mylanta for 4 days. He recently resumed Mylanta and has been using it 1-2 times/day and rates the pain 2/10 at its worst.

The Morphology and Histology of Chicken Bone Characterized by Several Different Fixatives Using Microscopy and a MicroCT Scanner

Student Presenter: Fatima Khwaja, Tarifa Adam, Adith Anugu, Anamika Rao, Katie Sandhovel

Faculty Mentor: Claude E. Gagna

Department: Biological and Chemical Sciences

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

The use of fixatives is very important in order to properly process tissues for microscopic investigations. Our group is the first to comparatively characterize bone tissue based on a variety of different chemical fixatives. Preliminary research was performed using cat femur bones, in order to properly learn how to use the microCT scanner (i.e., Burker SkyScan 1173), and its software (i.e., Dragonfly).

Our main research project involves the bones of birds, i.e., chickens. Their bones are significantly lighter in weight than those of mammals, and some of their bones are hollow and also act as part of their respiratory apparatus, namely, pneumatic bones. The chicken bones we used are either, pneumatic bones, i.e., skull, humerus, clavicle, keel, pelvic, girdle, and lumbar and sacral vertebrae, or medullary bones, i.e., leg bones, ribs, and shoulder blades.

A variety of different chemical fixatives were employed to preserve the overall morphology and histology of adult (i.e., 9 weeks) male chicken (i.e., Cornish X) medullary bone tissue (i.e., femur; average length: 4.5 inches). This was done in order to determine the specific effects of fixation on the overall bone's morphology (e.g., bone cortex, epiphyseal growth plate, proximal metaphysis, and diaphysis). We have used eleven fixatives, i.e., 10% Neutral Buffered Formalin, Formalin-Alcohol-Acetic Acid (FAA), Zenker's solution, Davidsons, Carnoy's, Buffered Zinc Formalin, Bouin's, Davidson's, 70% ethanol, 91% ethanol.

Development of Multiple-Target Molecules for the Treatment of Alzheimer's Disease

Student Presenter: Fawaz Syed

Faculty Mentor: Jole Fiorito

Department: Biological and Chemical Sciences

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

Alzheimer's disease (AD) is the 7th leading cause of death in the United States according to the NIH and is characterized by the progressive deterioration of cognitive performance. It does not currently have a cure, and treatments aim only to mitigate the symptoms of mild AD. The disease proceeds through the accumulation of improperly processed amyloid ß peptides into plaques and intracellular neurofibrillary tangles of tau proteins. AD is a multifactorial neurodegenerative disorder with several target proteins contributing to its etiology. Potential therapeutic strategies to combat AD include the inhibition of phosphodiesterase type 5 (PDE5) and the modulation of histone acetyltransferase, among others. Current drug therapies rely on the administration of a single drug that acts on one specific molecular target or the combination of drugs acting on different targets. In this research study, we propose the development of a multi-target-directed-ligand (MTDL), wherein one drug molecule interacts with multiple targets involved in the disease. To investigate this therapeutic approach, we designed a small library of quinoline derivatives as potential MTDL candidate molecules with biological activity on both PDE5 and HAT enzymes. Thus far, one molecule has been successfully synthesized. Upon finalization of the molecule library, each candidate will be tested via PDE5 and HAT assays to determine their effect on enzymatic function.

Homelessness in New York City

Student Presenter: Fernanda Valle

Faculty Mentor: Patty Wongpakdee

Department: Digital Arts and Design

School/College: School of Architecture and Design, New York City

Homelessness is an issue that New York continues to tackle. Over the past decade, there has been an alarming rise in homelessness. The infographic sheds light on who is the most affected by homelessness and where it's the most prominent. Even if not directly affected by the issue, it's important to understand the current situation to know how to provide help and/or advocate for the issue.

Isolation of bacteriophages on clinical strains of Staphylococcus aureus from commercial phage cocktails

Student Presenter: Hamza Nagarwala

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

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

Antibiotic resistance has become a major threat to public health in recent years. One of the most prevalent strains is methicillin-resistant Staphylococcus. Staphylococcus infections are common after orthopedic surgeries. In order to investigate the infection of Staphylococcus post-fracture in mice, a collaborator at the University of Washington has engineered two clinical strains of Staphylococcus aureus to exhibit fluorescence. This makes it much easier to visualize infections in mice models. This project focuses on finding bacteriophages that infect these clinical strains of S. aureus. Bacteriophages are viruses that infect bacteria, and they are becoming increasingly relevant in the age of antibiotic resistance because they are specific to the bacteria they infect. The ultimate goal of bacteriophage research is to find phages viable for clinical use. We have procured commercial phage cocktails manufactured for phage therapy and are in the process of isolating single phages on each strain. Upon the completion of this phase of the project, we hope to use these results to study phage infection models in mice. Further data to be presented at SOURCE.

Return to Sport After Arthroscopic Rotator Cuff Repair in an Athlete: A Scoping Review

Student Presenter: Hannah Fischer, Matthew Alben, Neil Gambhir

Faculty Mentor: Mandeep Virk, Division of Shoulder and Elbow Surgery, Department of Orthopedic Surgery, NYU Grossman School of Medicine, NYU Langone Orthopedic Hospital

Department: Orthopedic Surgery

School/College: College of Osteopathic Medicine, Long Island

Background: To provide a scoping review on the current literature specific to return to sport (RTS) outcomes after arthroscopic rotator cuff repair (aRCR) in athletes with full-thickness rotator cuff tears (RCTs).

Methods: A review of all English language articles in PubMed, Medline, and Embase was conducted in December of 2021. All articles reporting on the ability to RTS after aRCR for full-thickness RCTs had their respective patient cohort included. Studies that were non-English, published before 2000, failed to distinguish between partial and full-thickness tear outcomes, and RCT's treated by open or mini-open RCR, debridement, or nonsurgical management were all excluded from our review.

Main Results: Eleven studies were reviewed with 463 patients (385 athletes) and a mean age of 47.9. High variability was seen in regard to factors related directly and indirectly to one's ability to RTS after aRCR. RTS varied in rate and timing, with reports ranging from 50.0% to 100% of patients returning on average between 4.8 to 14 months. RTS combined rate using a random effect model was 90.6% (95% CI, 82.4%-95.2%). Additionally, 31 patients returned to a higher level of sport, 107 returned to or near preinjury level, and 35 returned to a lower level of competition.

Conclusions: There is a high percentage of athletes returning to sport after arthroscopic repair of a full-thickness RCTs, but the timing of return is often variable and varies with the type of sport.

Immortal Coil of Land

Student Presenter: Hitakshi Agrawal, Rasika Deosthali

Faculty Mentor: Jeannette Sordi

Department: Architecture and Design

School/College: School of Architecture & Design, New York City

Terrestrial biosphere has been irreversibly altered by humans due to rapid urbanization. Every psychological and bodily human practice leads to global transformation such as increases in agriculture, industries, migration, mining, wars, etc. which has a footprint. These transformations have led to the evolution of human life in controlled environments, rather than engaging with the natural system which now is the major cause of climate change. Can we design something which is not there forever i.e., temporary or cyclical?

Human negotiations to deal with these situations result in reclamation of land from sea. This further has consequences such as frequent floods, land sliding etc. which are a part of climate change. To tackle these, we have to be of the approach REUSE NOT RECLAIM.

Mining is one of the most widespread and invasive land uses that causes land degradation. Mining being one of the major issues where nonrenewable resources are being extracted which are diminishing quickly. It leaves land infertile and the environment uninhabitable for years which exceed the number of years it was mined for. Centuries of mining and extracting resources from earth has led to the formation of numerous abandoned towns.

These towns could be revitalized into a living, thriving habitat. The question here that arises is when we can develop a technology to extract the ground can we not invent something to bring it back when the extraction is done. If humanity was capable of affecting the land it can also fix it.

Bacteriophages Close to Home

Student Presenter: Humza Bari, Tannya Singh

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

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

Staphylococcus aureus is a bacterium that can lead to a number of severe medical conditions such as sepsis or pneumonia. According to the CDC, S. aureus infections are responsible for at least 20,000 deaths each year in the United States. Bacteriophages, also known as phages, are viruses that infect bacteria. Growing antimicrobial resistance among bacteria, including S. aureus threatens our ability to treat bacterial infections. Phages are one possible alternative treatment, which has been used successfully for decades but is a relatively new idea in Western societies. Bacteriophages infect and reduce bacterial populations while posing no negative threats to humans and animals. S.aureus is commonly transmitted via skin-to-skin contact, so we reasoned that such environments may also contain phages that can infect S. aureus. We sampled high-touch areas around the house in order to determine to what extent phages were transferred from skin to high-touch areas. We successfully isolated phages from a bathroom window as well as a bathroom doorknob which both represent high touch or common areas within a home. We are currently characterizing these isolated bacteriophages, to understand how similar they are to other S. aureus phages and to evaluate their potential for use in phage therapy.

EcoTourism in Small Island Developing States (SIDS)

Student Presenter: Isabel Tabet, Sahar Esfandyari

Faculty Mentor: Jeannette Sordi

Department: Architecture and Design

School/College: School of Architecture and Design, New York City

Small Island developing states are categorized as such due to the fact that they are vulnerable regions which host distinctive terrestrial and marine ecosystems such as coral reefs, etc. These Island states are identified through three key characteristics:

Small size - limited resources and economic diversity

Remoteness and Isolation - creating a reliance on imported goods and services but an environment of unique culture and biodiversity

Maritime Environment - strong tourism assets, but vulnerable to climate change

They suffer from underdeveloped economies with high transportation, communication, public administration, and infrastructure costs as well, they contend with limited availability of human, institutional and financial resources to manage and use natural resources in a sustainable way (Ashe 2005).

Many SIDs rely on tourism, environmentally, socio-culturally and economically sometimes it being the only industry present. Tourism creates links with and stimulates demand in other economic sectors such as manufacturing, services, transportation, fisheries, and agriculture. Tourists are attracted to SIDs due to their unique, exotic maritime and terrestrial ecosystems; however, this creates an influx of tourists during certain seasons of the year that leads to inverted situations where there are more tourists than residents of these islands. This can overwhelm local natural resources and infrastructure causing it to degrade and become aesthetically unappealing.

Stand Up Improv

Student Presenter: Ishaan Singh

Faculty Mentor: Eve Armstrong

Department: Physics

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

THE FUNNY BRAINIACS

present

THE LOCKDOWN COMEDY

By

Ishaan Singh

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A hilarious recount of events that happened during the lockdown. How life as a student during lockdown was difficult and how it was not made any better by notorious neighbors. A presentation of teaching skills and experience in exorcism. I am doing this to improve my social skills and have a go at improv comedy.

Predictors of Triaging Injured Patients to General Ward or Stepdown Unit at a Level II Trauma Center

Student Presenter: Jae Moo Lee

Faculty Mentor: Stephen DiRusso

Department: Clinical Sciences

School/College: College of Osteopathic Medicine, Long Island

Current literature has not extensively studied the decision-making process of triaging lower-risk trauma patients in either the General Ward (GW) or Stepdown unit (SDU).

Admitted trauma patients with an age of 18-years or older at Level II Trauma Center in Bronx, NY, between 2010 and 2019 were identified. Burn patients, intensive care unit admission, and patients needing invasive ventilation were excluded. Multiple logistic regression models were used to identify predictors for triaging patients to either GW or SDU. Area Under the Curve (AUC) was identified to assess the performance of the model. Also, predicted probabilities of triaging patients to SDU were compared between GW and SDU patients.

Out of the total of 8442 trauma patients, 3523 were included: 2770 were triaged to GW, and 753 were triaged to SDU. Adjusting for patient characteristics, the AUC of the multivariable logistic model was 0.724. Patients who were inebriated (OR=1.70; 95%Cl 1.04- 2.78; p<0.001), NISS greater 15 (OR=2.46; 95%Cl 1.98-3.07; p<0.001), and higher comorbidity (OR=1.06; 95%Cl 1.03-1.09; p<0.001) had higher odds of being admitted to SDU. Gender and insurance status were insignificant. The median predicted probability to be admitted to SDU among GW and SDU patients was 0.15(0.10-0.25) and 0.28(0.16-0.41), respectively.

Lower-risk trauma patients are triaged based on patient and injury characteristics. However, there is wide variability. There is a need for evidence-based algorithms to triage.

Development of a Fluorescent Assay to Measure the effect of new compounds on Histone Acetyltransferase Activity

Student Presenter: Jennifer Gattus

Faculty Mentor: Jole Fiorito

Department: Biological and Chemical Sciences

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

Alzheimer's disease is a neurodegenerative disease that results in memory loss and reduction in cognitive function due to the accumulation of amyloid plaques and fibrillary tangles. According to the CDC, 5.8 million Americans lived with Alzheimer's disease in 2020. Previous research has explored the relationship between modulating histone acetyltransferase (HAT) activity and improvement from defects in synaptic function and memory after amyloid plaque development. HAT enzymes add an acetyl group to lysine residues of histone proteins, regulating the expression of several memory-related genes during memory formation and/or consolidation. The HAT enzyme uses an acetyl group from acetyl-coA resulting in the production of the acetylated histone and free coenzyme A (CoA). The purpose of this study is to develop a fluorescence assay to detect any change of HAT enzyme p300 activity on histone 3.3 in the presence of HAT modulators. We use a fluorescent molecule, which binds to the sulfhydryl groups of CoA and generates a fluorescent signal. Our results so far have shown that the assay is working properly with significant differences between the substrate control (in the absence of p300) and positive control (in the presence of p300). Our experimental conditions have confirmed anacardic acid as an inhibitor (20% inhibition at 15μM) and YF2 as an activator (17% activation at 100nM). This enzymatic assay will be used for measuring the p300 activity of newly synthesized compounds.

Turning Back The Wheel On Abortion Care In The US: Intended & Unintended Consequences

Student Presenter: Jessica Byron, Melba Avalos, Amy Xiao

Faculty Mentor: Joerg Leheste

Department: Biomedical Sciences

School/College: College of Osteopathic Medicine, Jonesboro

For nearly five decades, the right to abortion care has been protected by the Supreme Court in through its decision in Roe v. Wade. This could all change as the court considers Dobbs v. Jackson Womens Health Organization. How could a decision that overturns the precedent for nationwide access to abortion affect women, children, and physicians? How will geography and state laws impact healthcare equality in regard to reproductive rights? How will geography affect who can access care financially, and how will this influence the conditions that children are born into? We have analyzed the impact of these decisions informed by scientific and medical evidence and also considered the conflicting moral viewpoints surrounding the polarizing topic of abortion. We are concluding with policy recommendations at the federal level that would award women and their physician's protection from state laws criminalizing reproductive choices.

Tape Measure Protein (TMP) and its Functions in Different Phages

Student Presenter: Joana Thomson

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

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

Bacteriophages are viruses that specifically target and infect bacteria. There are hundreds of billions of bacteriophages in the world, which is more than every other organism on earth. Students isolated and studied two phages, Janeemi (AZ cluster) and Uzumaki (AU6 cluster) that infect Arthobacter globiformis over the fall of 2021. Phages bind to surface receptors of specific host cells and the DNA genome passes through the cell wall and membrane to enter the cytoplasm and begin replication. Most phages are tailed phages, where the DNA passes through a tunnel in the tail and into the host cell. One gene that is mostly conserved in tailed phages including those from cluster AZ and AU6 is the tape measure protein (TMP), which helps determine the length of the tail for each phage. By further researching the TMP, I aim to not only discover more information about and compare the TMP gene in phages similar to Janeemi but also compare its functions to that of other phages such as Uzumaki and see how their specific TMP gene affects tail length among other factors.

Health Policy Brief: COVID-19 Health Disparities Action Act of 2021 (HR 1400)

Student Presenter: John Purcell

Faculty Mentor: Joerg Leheste

Department: Basic Sciences

School/College: College of Osteopathic Medicine, Jonesboro

Soon after the onset of the COVID-19 pandemic, it became clear that racial and ethnic minority groups, as well as other vulnerable populations, were disproportionately impacted by the virus. While health disparities have existed long before 2019, scarce resources and expeditious response efforts shed light on and amplified the need for effective countermeasures. Limited studies indicate that interventions such as public awareness campaigns and vaccine outreach efforts have helped narrow the gap of health inequities, resulting in increased vaccine uptake, testing, and improved health outcomes among these populations. However, as of March of 2022, the COVID-19 vaccine and booster uptake among the pediatric and adult populations remain suboptimal, especially for underserved populations. If enacted, the COVID-19 Health Disparities Action Act of 2021 (HR 1400) will provide federal funds and resources to establish and execute COVID-19 public awareness campaigns that target communities that have been disproportionately affected by the pandemic. Federal offices and agencies, acting in collaboration with local jurisdictions, will implement educational campaigns to promote vaccination, as well as other public health measures, tailored to address the range of barriers to healthcare experienced by racial and ethnic minorities, rural, and other vulnerable populations. This health policy brief provides an evidence-based analysis of the possible impact of this bill if written into law.

The Warburg Effect in Cancer and Alternative and Multistranded DNA and RNA Molecules

Student Presenter: Juliana D'Amico, Katie Sandhovel

Faculty Mentor: Claude E. Gagna

Department: Biological and Chemical Sciences

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

Cancer cells are mutated cells that continually divide to promote excessive growth, survival, and expansion. Cancer cell metabolism is altered to increase glucose uptake and fermentation of glucose to lactate. This process, known as the Warburg effect, continues to occur even in the presence of healthy functioning mitochondria. The Warburg effect is a hallmark of cancer that has been reported for over 100 years and extensively studied in the last 20 years. As biologists continue to explore the implications of the Warburg effect, further research is needed to clearly identify the function of the Warburg effect. Here, we discuss the role of exotic nucleic acids, i.e., alternative (e.g., Z-DNA and cruciform DNA) and multistranded DNA and RNA (e.g., G4-DNA and i-motif quadruplex DNA) molecules' relationship to the Warburg effect in cancer.

Our Existence is At Risk

Student Presenter: Justin Santiago

Faculty Mentor: Patty Wongpakdee

Department: Digital Art and Design

School/College: School of Architecture and Design, New York City

I wanted to demonstrate in an infographic poster the state of gay rights in the United States. The rights of LGBTQ+ individuals across the country are in jeopardy at the hands of legislation that could severely limit freedoms and enable persecution endangering many youths and families. I wanted to bring not only awareness to how much progress we as a nation have to make in the fight for equality, but how much prejudice and limitations gay and trans individuals already face as it is.

Race, Attention, & Threat Perception

Student Presenter: Kaylah Dewar, Sebastian Lopez, Michael Rosen, Fabrice Cyprien

Faculty Mentor: Nicole Calma-Roddin

Department: Behavioral Sciences

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

Previous studies have revealed that, in our society, people tend to have implicit bias, which affects the way individuals perceive and interact with others. The purpose of this study is to explore how race impacts attention. Previous findings indicated that White participants have a biased attention towards Black faces compared to White faces (Trawalter et al., 2008). Prior research has interpreted this as being related to threat perception, in line with previous studies of biologically threatening stimuli. We will ask participants to engage in the dot-probe paradigm, where two faces are shown to participants, followed by a dot where one of the faces has been. Afterwards, the participant must identify where the dot is located. We will measure the speed of their reaction time of finding the dot. A faster reaction time means that participants' attention was already focused on the face that had been in this position. With an overwhelming amount of prior research where participants were White and the target faces in the experiment were only Black or White, our study will take a more inclusive approach and look at not only Black vs. White faces, but will both add Asian faces to the study and have a more diverse group of participants. We believe Asian individuals will garner the least amount of attention amongst the three groups, while Black individuals will garner more attention than the other groups.

Analysis of vascular calcification in internal carotid arteries and cerebral microvasculature by three-dimensional visualization and histologic examination

Student Presenter: Kelly Borges, Joseph Aabye, Ava Hanlon, Janet Back, Laurence Graziano

Faculty Mentor: Olga V. Savinova

Department: Biomedical Sciences

School/College: College of Osteopathic Medicine, Long Island

Vascular calcification (VC) is a nontraditional cardiovascular disease risk factor associated with increased morbidity and mortality in the general population. While it is known that coronary VC causes reduced myocardial perfusion, abnormal vasomotor response, and impaired compliance, less is known about the effects of VC on cerebral microcirculation. Atherosclerotic calcification in vessels that feed the brain has been associated with cerebrovascular disease in human imaging studies. Specifically, internal carotid artery (ICA) calcification load is significantly associated with white matter lesion volumes and the presence of lacunar infarcts, and aortic arch calcification is associated with the presence of cortical infarcts; both noted independently of ultrasound carotid plaque score (a common clinical assessment). Supporting these findings, studies investigating the distribution pattern of intracranial VC and its association with MRI markers of small vessel disease have found that intracranial VC is common in patients with ischemic cerebrovascular disease, and the ICA is most frequently affected. These findings suggest VC may play a pathophysiologic role in cerebrovascular disease. This study aims to examine the relationship between calcification in the ICA and the cerebral microvasculature via 3D visualization of vessel wall structures in human cadaveric ICAs, intracranial arteries, and microvasculature using high-resolution micro-computed tomography and histologic evaluation.

Are You Okay?

Student Presenter: Kyle Acapana

Faculty Mentor: Professor Wongpakdee

Department: Digital Arts and Design

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

The poster brings awareness to the most common anxiety disorders in 2019. I felt like anxiety was normalized to where it was a common thing to be anxious, but specifically who is affected by anxiety? So, I took a broad subject and specified it to 2019 to give a better understanding. This infographic visually communicates and brings across the different forms of anxiety and who is affected by it.

TLT GRANT: Learning in 3D: The VR Experience in the Classroom

Student Presenter: Lavin Amarnani

Faculty Mentor: Sung Park

Department: Digital Art and Design

School/College: School of Architecture and Design, New York City

Learning in 3D is a WebXR experience in Virtual Reality that is cross-platform to reach a diverse set of students for a better learning experience. This project demonstrates molecules on display for learning Chemistry with pertinent information using videos and images. It allows students to immerse themselves in the learning experience. Besides Chemistry, the experience is scalable to different subjects. This process is twofold, curation and learning. Students willing to volunteer can curate content for the immersive experience to help their classmates learn along.

Holographic Duality

Student Presenter: Lillian Pratt, Beza Nigatu

Faculty Mentor: Sophia Domokos

Department: Physics

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

In this presentation, we discuss the existence of measurable physical quantities in the context of String Theory's Holographic Duality conjecture. Holographic Duality is a way to understand complex physical phenomena in our universe by translating them to simpler processes in a different universe that features extra dimensions and curved space. We can use Holographic Duality to relate the coupling of quarks and gluons. In this talk, we will use metaphors and concrete examples to make the abstract concepts covered more intuitive for non-experts.

fNIRS applied in Neuromarketing

Student Presenter: Lisbeth Sandoe Pedersen

Faculty Mentor: Colleen Kirk, N. Sertac Artan

Department: Management and Marketing Studies

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

Functional near-infrared spectroscopy (fNIRS) is a non-invasive method to study the human brain's psychological responses in a natural environment. In marketing, consumers' emotional reactions to advertising have primarily been studied through their self-assessment of emotions. Little research has been done on consumers' psychological responses to advertising and how neurologically expressed negative emotions such as territoriality. This study examines consumers' physiological reactions to advertisements that elicit negative emotions and situations that provoke a feeling of territoriality. Across two experiments, we used the fNIRS device to record the prefrontal emotional response of 25 participants while evoking negative emotions and a sense of territoriality. The first experiment exposed the participants to three different advertisements in a randomized order, two of which elicited negative emotions and one serving as a baseline. The second experiment randomly presented the same participants with one of two scenarios provoking (or not provoking) a sense of territoriality. The results of the study will be presented at the conference.

Francisella tularensis interactions with mammalian RBCs.

Student Presenter: Luke D'Cunha

Faculty Mentor: Joseph Horzempa, PhD

Department: Biological Sciences

School/College: College of Osteopathic Medicine, Jonesboro

Francisella tularensis, the causative agent of tularemia, is a pathogenic gram-negative bacterium that enters human red blood cells (RBCs). Previous investigations suggest that invasion of RBCs helps F. tularensis survive in the gut of arthropods – a transmission vector of this bacterium leading to colonization. Since tularemia is a zoonotic infection, humans are not the primary host of F. tularensis. Therefore, we sought to investigate whether F. tularensis was capable of invading RBCs of other animals. Using gentamicin protection assay, we discovered that while F. tularensis could enter sheep and chicken erythrocytes, bovine RBCs did not support invasion. Because of previous studies published by our lab, and due to intrinsic differences between human and bovine erythrocyte surface protein Band 3, we hypothesized that RBC membrane protein Band 3 is required for invasion. We used anti-band 3 Fab fragments to physically block the Band 3 RBC surface protein, and investigated how this impacted F. tularensis invasion, as qualified by gentamicin protection assay. Here, we provide preliminary evidence suggesting that F. tularensis uses Band 3 to enter human RBCs. Using fluorescent microscopy, we observed that F. tularensis bacteria congregate in peculiar clusters during interaction with erythrocytes, and that this interaction appears to be dependent upon erythrocyte surface proteins and the Type VI secretion system.

Fournier's Gangrene Mimicking a Burn

Student Presenter: Madiha Khan

Faculty Mentor: Martine Louis

Department: Clinical Sciences

School/College: College of Osteopathic Medicine, Long Island

Introduction:

Fournier’s gangrene is a rapidly progressive necrotizing fasciitis invading the planes of the perineal region. It can be mistaken for other pathologies like hematoma, phlebitis, cellulitis, or septic arthritis. Herein we describe the case of a patient in whom Fournier’s gangrene was mistaken for a burn.

Case:

A 77-year-old male with a history of coronary artery disease presented with a right gluteal fold wound with extension to the perineal region for one day. Vital signs were unremarkable. On physical examination, bilateral perineum and gluteal folds appeared erythematous with desquamation and one fluid-filled blister as well as one ruptured blister, consistent with a second degree-burn. Labs were significant for a white blood cell count of 29.1 K/uL. A transfer to a burn facility was implemented and a CT scan of the abdomen/pelvis revealed the presence of numerous abnormal foci of air involving the tissues of the perineum extending into the proximal right thigh consistent with Fournier’s gas gangrene. The patient was urgently taken to the operating room for surgical debridement and placed on broad-spectrum antibiotics (Vancomycin, Zosyn, and Clindamycin). Wound cultures revealed the presence of Escherichia coli and Enterococcus avium. He was discharged home on postoperative day 12 and seen in the clinic with an almost healed wound (5mm) at 5 weeks post-discharge.

Conclusion:

It's vital to recognize the innocuous presentation of necrotizing fasciitis and treat it promptly.

Riddled with grief

Student Presenter: Makeda Armstrong

Faculty Mentor: Ryan Seslow

Department: Digital Art and Design

School/College: School of Architecture and Design, New York City

A Digital art piece that metaphorically discusses the effects of long-standing grief.

Genotyping Animal Models

Student Presenter: Mansi Patel

Faculty Mentor: Yingtao Zhao

Department: Biomedical Sciences

School/College: College of Osteopathic Medicine, Long Island

Animal models are an important approach to study human diseases and develop therapies. When using animal models, it is essential to distinguish the diseased animals and the wild-type animals. Genotyping is a widely used technique to identify the genetic background of different animals. This is an important process during experiments because it allows scientists to determine what types of genetic traits are coded for by the genome. In this project, we are using two mouse models to study two human brain disorders: intellectual disability and Alzheimer's disease. Mutations in Heparan Sulfate 6-O-Sulfotransferase 2 (HS6ST2) cause intellectual disability in human patients. We have generated mouse models to disrupt HS6ST2 in mice to study HS6ST2-associated intellectual disability. We also have the 5xFAD mice, which are a widely used mouse model of Alzheimer's disease. By performing genotyping for the two animal models, we can determine if the organisms are wild-type, heterozygous, or homozygous for the mutation. Overall, this process allows us to categorize mice into different groups. By doing so, we can perform experiments that can increase our understanding of these neural disabilities. Increased knowledge of these disorders will potentially lead to the development of new therapeutics that can help millions of people in the future.

Medical Students Learn Through Research on Prevalence of Sacroiliac and Pubic Symphysis Joint Shears in Chronic Low Back Pain and Impaired Single Leg Balance

Student Presenter: Marichelle Renee Pita

Faculty Mentor: Jayme Mancini

Department: Clinical Sciences

School/College: College of Osteopathic Medicine, Long Island

Background: The prevalence of chronic low back pain (LBP) and impaired single leg balance (SLB) in osteopathic medical students (OMS) is unclear. In this study, we investigated the impact of research participation on OMS' understanding of chronic LBP.
Objective: To investigate the impact of participating in a prevalence study on OMS' understanding of chronic LBP exam and management.

Methods: During a laboratory session, OMS completed worksheets while examining their partners. Innominate diagnoses named by OMS were classified as correct or incorrect. In OMS with correct diagnoses, we calculated the prevalence of sacroiliac and pubic shears, chronic LBP, and failed SLB.

Results: When asked if the study improved their understanding of chronic LBP management, self-completed responses from 99 OMS were 50.5% "Yes, definitely," 40.4% "Somewhat," and 3% "Not at all." Innominates were correctly diagnosed in 80.8%. In this group, 23.8% had chronic LBP and 15% failed SLB. In OMS who failed SLB, there were 75% rotations and 25% shears.

Discussion: The results suggest that OMS believed their understanding of chronic LBP improved through this study. In failed SLB, innominate rotations were more prevalent than shears. Though no identifiers were collected, social desirability bias may limit this study. Inaccurate anatomical landmark identification may be another limiting factor. Future studies could determine which other joint dysfunctions affect SLB and include OMS from several schools.

Detection of dysplastic cervical cells from pap-smear images using texture features for the nucleus

Student Presenter: Mary Margarette Sanchez, Dono Shodieva, SimranSanju Kadam, Ramses Nestor, Angel Singh

Faculty Mentor: Niharika Nath

Department: Biological and Chemical Sciences

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

Cervical cancer screening involves pap smear staining and microscopy of the cervix cells to detect pre-cancerous abnormal nuclear morphologies. The analysis process is time-consuming and subject to human error. Quantitative analysis of cellular nuclear features may be used to increase detection efficiency and classification of normal and abnormal cells. The aim of this study is to investigate nuclear textural features and examine if these features can be used to discriminate between normal cells, moderate and severe dysplastic cells. A hospital benchmark dataset was used. We segmented the nucleus region using Cell Profiler. Angular Second Moment, Contrast, Correlation, Inverse Difference Moment, and Entropy were compared for normal versus moderate and severe dysplastic cells and K-means clustering was performed. The Contrast feature which measures the variations such as relative smoothness showed that the moderate and severe dysplastic cells had a significantly lower range ($p<0.05$) compared to the normal cells. Correlation, which is the measure of similarity in relative intensity values, was higher in moderate and severe dysplastic cells ($p<0.001$). Entropy which measures complexity was also higher in dysplastic cells. Using these features, prediction accuracies of 72-80% were obtained. Texture characteristics have the potential to discriminate between normal and dysplastic cells demonstrating potential in cervical cancer detection.

Seromucinous cyst presents as endometriosis complications in a 57-year-old post-menopausal female: a case report

Student Presenter: Matthew Sison, Yakubmiyer Musheyev, Benjamin Ilyaev

Faculty Mentor: Maria Levada

Department: Clinical Sciences

School/College: College of Osteopathic Medicine, Long Island

Endometriosis should be considered when a female patient reports symptoms of pain/ tenderness in the pelvic area, a frequent need for urination, bloating, vomiting, or nausea. Clinical suspicion is increased if the patient has a history of endometriosis. However, many patients with endometriosis can be asymptomatic which is why physicians need to keep an open mind and have a broad differential when examining female patients. Exams that aid in the diagnosis of endometriosis include, but are not limited to a pelvic exam, an ultrasound, magnetic resonance imaging (MRI), and an exploratory laparoscopy. In this case study, we present a 57-year-old post-menopausal female patient that presented to her OBGYN with hot flashes and abnormal ultrasound revealing an ovarian cyst. Seventeen years prior to the complaints, the patient was found to have endometriosis and endometrial polyps. This warranted a left oophorectomy at the time. Due to the patient's history, symptoms, and current scans, it was assumed that the present cyst was a complication of endometriosis. Ultimately, the cyst, the right ovarian cyst wall, right fallopian tube, and uterine fibroids were surgically removed and sent to pathology. Upon further review of the patient's pathology reports, it was found that the cyst removed was a borderline malignant seromucinous cyst.

Overcoming a “forbidden phenotype:” The parrot’s head supports, propels, and powers tripedal locomotion

Student Presenter: Melody Young

Faculty Mentor: Michael Granatosky

Department: Digital Anatomy

School/College: College of Osteopathic Medicine, Long Island

The parrot’s head supports, propels, and powers tripedal locomotion. No vertebrate, living or extinct, is known to have possessed an odd number of limbs. Despite this “forbidden phenotype”, gaits that utilize odd numbers of limbs (e.g., tripedalism or pentapedalism) have evolved in both avian and mammalian lineages. Tripedal locomotion is commonly employed by parrots during climbing, who utilize their beaks as an additional support. However, it is unclear whether the beak functions simply as a stabilizing hook, or as a propulsive limb. Here, we present data on kinetics of tripedal climbing in six rosy-faced lovebirds (Agapornis rosiecollis). Our findings demonstrate that parrots utilize cyclical tripedal gaits when climbing and the beak and hindlimbs generate comparable propulsive and tangential substrate reaction forces and power. Propulsive and tangential forces generated by the beak are of equal or greater magnitudes to those forces generated by the forelimbs of humans and non-human primates during vertical climbing. We conclude that the feeding apparatus and neck musculature of parrots has been co-opted to function biomechanically as a third limb during vertical climbing. We hypothesize that this exaptation required substantive alterations to the neuromuscular system including enhanced force-generating capabilities of the neck musculature and modifications to limb central pattern generators.

Development and Validation of Solid Phase Extraction and Liquid Chromatography/Mass Spectrometry Methods for the Concurrent Detection of Select Antibiotics in New York Tech's Wastewater Plant

Student Presenter: Michael Maino

Faculty Mentor: Jole Fiorito

Department: Biological and Chemical Sciences

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

Proceeding their consumption or improper disposal, antibiotics tend to accumulate in wastewater, an environment characterized by the presence of microbes, such as bacteria. Bacterial exposure to these antibiotics poses significant consequences, such as the potential development of antibiotic resistance. In the medical realm, as the prominence of antibiotic resistance grows, antibiotic efficacy is reduced, contributing to bacterial infections that are more difficult to treat. The objective of this research is to determine, test, and validate efficient methods for detecting four antibiotics [Ampicillin (AMP), Amoxicillin (AMX), Cephalexin (CPX), Doxycycline (DXC)] in wastewater samples collected from the New York Tech wastewater treatment plant in the Long Island campus. Solid phase extraction (SPE) was used for filtering and concentrating wastewater samples, followed by liquid chromatography/mass spectrometry (LC/MS) analysis to detect the antibiotics according to their m/z values and retention times. Antibiotic standards for each antibiotic were prepared and analyzed using the same LC/MS methods as a reference for the wastewater samples. It is believed that AMP and DXC are detectable in our wastewater samples, while AMX and CPX are believed to be undetected. These results demonstrate that the SPE and LC/MS methods of analysis are sufficient for antibiotic detection and may be useful for further research of antibiotic resistance in bacteria.

A survey of how much time people spend on their phones

Student Presenter: MingTong Wang

Faculty Mentor: Patty Wongpakdee

Department: Digital Art and Design

School/College: School of Architecture and Design, New York City

People are too addicted to their phones. Misinformation on the Internet guides your subjective consciousness. Nowadays, there are many bloggers or articles on the Internet, who spread wrong information or distorted truth in order to attract attention. These contents often correspond to their own misfortune or negative aspects, but often do not have correct guidance. Teenagers, in particular, are more likely to be guided by articles or videos on the Internet. I think we should have corrected subjective values and not be influenced by Internet bloggers. The most important thing is to control how much time you spend on your phone

The Association Between EMS Response Times and Hospital Outcomes at a Level II NYC Trauma Center

Student Presenter: Mohammad Aktar, Maria Aliberti, Benjamin Winchel, Sourish Rathi

Faculty Mentor: Stephen M. DiRusso

Department: Clinical Sciences

School/College: College of Osteopathic Medicine, Long Island

Introduction: Quality of pre-hospital care, time to onset of definitive care and on-scene care can impact patient outcomes.

Objective: Evaluate the relationship between hospital dispositions at a Level II Trauma center (discharged, increased care and treatment, or death) and EMS response times (time to scene, total time at scene, total time of call).

Methods: Trauma Registry data from 3068 patients admitted to St. Barnabas Hospital were analyzed. Patients were grouped based on discharge disposition: Against Medical Advice (AMA) or Discharged Home, Discharged to Alternate level of care, Died. Time variables were: time in transit to the hospital, time at the scene, and the total time of the call. Groups were compared using the Kruskal Wallis test in SPSS.

Results: Regarding Hospital Disposition, 1923 (62.7%) patients were discharged as AMA/went home, 1057 (34.5%) patients needed further medical treatment, and 88 (2.9%) patients died in the hospital. Patients who were disposed to further medical treatment had longer time spent at the scene (21 mins) compared to patients who went home (16 mins) or died in hospital (15.5 mins) ($p<0.001$).

Conclusion: Patients who died in the hospital had shorter transit times, perhaps because EMS anticipated additional on-scene treatment was unnecessary or foresaw better patient outcomes in the hospital. EMS spent more time in the field with patients that had indications for in-field treatment, which could have contributed to better patient outcomes.

AN OSTEOPOROTIC WOMAN WAS TREATED WITH A PASSIVE WEIGHT-BEARING PROTOCOL.

Student Presenter: Naiem Habib, Yisroel Grabie

Faculty Mentor: Joseph Simone

Department: Osteopathic Medicine

School/College: College of Osteopathic Medicine, Long Island

Women lose a sizable amount of bone mineral density (BMD) each year for the first five years after menopause, establishing a vast community of patients requiring continuing management. Common pharmacotherapies used presently impose a financial burden and are also laden with side effects that limit the treatment duration. It has been well established that weight-bearing activity (WBA) programs provide substantial efficacy in increasing and maintaining BMD in this population. Furthermore, WBE has been shown to affect biological markers associated with bone health.

We present a case of a woman who visited an Osteopathic Medical Treatment (OMT) clinic with low bone mineral density and a complaint of back pain. She subsequently was diagnosed with several somatic dysfunctions and underwent treatment with an OMT protocol that was intended to replicate the stress of WBA. After seven treatments, the patient underwent laboratory studies that suggested that bone turnover had occurred. To date, we believe that this finding is novel to the osteopathic community and we hope to further elucidate our findings by pursuing a future study.

Effect of homoarginine on food consumption and cardiac function in mice

Student Presenter: Neil Kaungumpillil

Faculty Mentor: Olga Savinova

Department: Biomedical Sciences

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

Background: Plasma homoarginine (hArg) is a non-proteinaceous endogenous amino acid that correlates with better cardiovascular and renal disease prognosis. We have previously found that supplementation with hArg reduces food consumption and improves heart function in mice with chronic kidney disease (CKD). In this study, we analyzed whether hArg has similar effects in healthy mice.

Methods: The mice of both sexes were randomly assigned into three groups receiving 14 μg/ml of hArg; 14 μg/ml arginine (Arg) – a structurally similar amino acid, or placebo treatment in drinking water. Data from a previous CKD ± hArg experiment were used for comparison. 24-hour food and water consumption, fecal and urine output, and cardiac function were measured. The results were compared by a one-way ANOVA. In a sub-analysis, the effects of health status (healthy or CKD) and treatment (placebo or hArg) were analyzed by a two-way ANOVA.

Results: Neither hArg nor Arg supplementation affected metabolic or cardiac parameters in healthy mice. CKD status had no effects on food consumption and fecal output but was associated with increased water consumption and urine output ($p<0.0001$). CKD mice were smaller compared with healthy controls ($p<0.0001$). Cardiac function and left ventricular dimensions adjusted to body size were increased in CKD mice independent of treatment ($p<0.05$).

Conclusion: In this experiment demonstrated that hArg supplementation has a differential

effect in healthy and CKD mice."

Effects of Osteopathic Manipulative Treatment (OMT) on Anosmia and Ageusia in Post- COVID-19 Patient: A Case Report

Student Presenter: Nicole Companion

Faculty Mentor: Sheldon Yao

Department: Clinical Sciences

School/College: College of Osteopathic Medicine, Long Island

During our clinic sessions, we met a patient suffering from post-COVID-19 loss of smell (anosmia) and taste (ageusia) lasting for 7 days. We did a literature search to find what previous studies have found in understanding and treating post-COVID anosmia and ageusia. There were not any effective treatment methods documented, including systemic and intranasal corticosteroids. At the time, the pathophysiology was suspected to be related to inflammation of the olfactory support epithelium targeting ACE-2 receptors, and not the olfactory neurons themselves. Applying the principles of osteopathic medicine, we treated our subject with Osteopathic Manipulative Treatments (OMT) that addressed different body systems and regions regarding inflammation, as well as the 5 models of Osteopathy. We tracked the subject's recovery of taste and smell over the next 4 days after treatment. Immediately after treatment on day 7, the subject noted a slight improvement in smell and taste of a tangerine. On day 9, he noted an increased taste of bitter. By day 10, the subject reported a return to baseline and being able to fully smell and taste ginger and cinnamon separately. This case study shows promise in improving the recovery time of post-COVID-19 anosmia and ageusia using OMT.

Development of Internal Prediction Models to Assess Mortality and Discharge Disposition in Patients with Traumatic Brain Injuries in a Level II Trauma Center

Student Presenter: Nikit Patel, Richard LaRocco, Scott Kivitz, Dana Schulz, Sonia Amanat

Faculty Mentor: Stephen Dirusso

Department: Clinical Sciences

School/College: College of Osteopathic Medicine, Long Island

Aim: Generate a prediction model from in-hospital data to assess mortality and discharge disposition for survivors in patients with traumatic brain injuries (TBIs).

Methods: Level II NYC Hospital Trauma Registry data (2016–2019) was used. Patients dead on arrival were excluded. For rehab discharge disposition prediction model, patients who died prior to discharge were also excluded. Model variables included: demographics, co-morbidities, and physiologic data. Prediction models were generated using logistic regression (LR). Odds ratios (ORs) were calculated for significant variables ($p<0.05$). Discrimination (Area under the Receiver Operator Curve (AuROC)) and calibration (Hosmer-Lemeshow C-statistic (HL-C)) measured predictive capability.

Results: There were 934 patients with TBIs in the trauma registry. Final mortality prediction model included 843 TBI patients. Final rehab discharge disposition prediction model included 780 TBI patients. Significant predictors for mortality included ED GCS Score, supplemental oxygen, NISS, and insurance. Significant predictors for discharge disposition for survivors included ED GCS Score and NISS. AuROC is 0.955 and HL-C is 0.147 ($p>0.05$) for the mortality regression model. AuROC is 0.857 and HL-C is 0.541 ($p>0.05$) for rehab discharge disposition regression model.

Conclusions: We created good prediction models for mortality and rehab discharge disposition for TBI patients. These models can be utilized for trauma service process improvement.

Finding Bacteriophage of S. Aureus in Sewage

Student Presenter: Nishwa Nawaz, Menahil Kazmi

Faculty Mentor: Bryan Gibb

Department: Biological & Chemical Sciences

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

Our project focuses on finding phages from the bacteria, S. Aureus. In our research, we aimed to successfully locate different samples to test and look for S. Aureus, so that we can then find phages from those samples. We hypothesize that if we try to look for phage samples of S. Aureus in places where there is a high chance of finding lots of bacteria, then we will most likely encounter a phage sample from here, and will hopefully be able to locate it, isolate it, purify it, and hopefully even image it. In this project, we first began to look for samples of S. Aureus by initially collecting samples from our nose, as well as another sample from a random part of our body. The results indicated no sign of phage on any of the samples. Next, we decided to sample filtered sewage water samples that Dr. Gibb had obtained over the past three years. We then did a spot titer for three strains. Our results showed that we had found phage on some of our samples; in particular, the lab strain yielded the most phage results. Our goal for the future: going forward, we plan to continue working with the various samples of sewage filtered water that we have. We will continue to work with these samples in hopes of successfully finding phage, by doing various different spot and full plate titers, and other methods to hopefully obtain phage samples. Once we hopefully find these samples, we plan to isolate them, purify them, and then hopefully be able to image them via TEM.

Utility of a Retraction Robot in Simulated Pacemaker Implantation Surgery

Student Presenter: Nolberto Jaramillo, Ermin Tale, Denis Malkov

Faculty Mentor: Todd Cohen

Department: Clinical Specialties

School/College: College of Osteopathic Medicine, Long Island

Anatomical retraction of tissue is an important aspect of many surgical procedures including pacemaker implantation. These procedures are often performed by members of the healthcare team, however, due to current healthcare staff shortages, innovative solutions are in high demand. E.R.R.S.E.L.A. (ETIC Research Robot for Student Engagement & Learning Activities) is part of a research and student engagement program created by the NYIT College of Engineering & Computing Sciences and Entrepreneurship & Technology Innovation Center (ETIC). E.R.R.S.E.L.A. was developed to enrich student creativity by allowing students to use custom-designed tools and create custom routines for the robot. The purpose of this project is to alleviate healthcare workers of the tedious task of tissue retraction during pacemaker implantation surgery through using a semi-autonomous robotic retraction system using E.R.R.S.E.L.A. This study aims to assess the ability of E.R.R.S.E.L.A. to move autonomously about a simulated surgical environment and perform simulated surgical retraction for pacemaker implantation surgery through the use of attached linear actuators and retractors. This project is a collaboration between the NYIT College of Osteopathic Medicine and the College of Engineering & Computing Sciences.

Mechanisms of PAK1 regulation of Autophagy and Mitophagy in H9C2 Cardio myoblasts

Student Presenter: Peter Girgis, Anoushka Guha, Pooja Jaiswal

Faculty Mentor: Satoru Kobayashi

Department: Biomedical Science

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

P21-activated serine/threonine Kinase 1 (PAK1) plays an integral role in the homeostasis of cardiac muscle cells (cardiomyocytes). Autophagy is a process that helps maintain cellular homeostasis by removing and recycling injured and obsolete intracellular components. Mitophagy is a form of selective autophagy that eliminates injured mitochondria. In previous studies, we have demonstrated that PAK1 is essential and sufficient to maintain both autophagy and mitophagy. However, the downstream pathways of PAK1-dependent autophagy and mitophagy remain unclear. In this study, we seek to identify the effectors that mediate the ability of PAK1 to regulate autophagy and mitophagy. The H9c2 cardiac myoblast cells were treated with siRNA to knockdown PAK1, and the protein expression levels of important regulators were determined with Western blot analyses. The ATG5-12 complex is an essential promoter of autophagosome formation. TFEB is a master transcription factor that regulates the expressions of autophagy and lysosome genes. p62 is an adaptor and receptor for cellular components that are marked for degradation by autophagy. Our results showed that PAK1 knockdown reduced the protein expression levels of all the above factors, which are expected to attenuate autophagy activities. In addition, PAK1 knockdown also diminished the expression of FUNDC1, a mitophagy receptor essential for mitophagy. These results may explain why PAK1 is able to positively regulate autophagy and mitophagy.

To What Extent Is Exercise Self-Efficacy Related to Overall GPA in College Students?

Student Presenter: Raiyan Sami, Shuoen Liu, Sabrina Popal

Faculty Mentor: Nicole Calma-Roddin

Department: Behavioral Sciences

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

Individuals hold beliefs about their capabilities to perform certain types of tasks across different areas. This is referred to as self-efficacy. Prior research has shown that exercise and academic self-efficacy are two distinct concepts that develop through different ways. However, prior work has shown that individuals who are more physically active typically achieve higher academic scores (Van Dusen et al., 2011). In this study, we will be examining the role of exercise self-efficacy and the effects it may have on the academic performance of college students. Participants enrolled at the New York Institute of Technology will take an online survey through Qualtrics (consisting of both original items and those inspired by prior questionnaires) asking about their exercise habits, their academic performance across different subject areas, and their overall GPA. We expect levels of exercise self-efficacy to positively correlate with academic performance. These findings may lead to future work determining whether developing exercise self-efficacy could be effective in improving academic performance in college students and connect these two otherwise distinct fields of self-efficacy.

2D and 3D STORM Imaging of Cardiac Myocytes Deficient in Thyroid Hormones

Student Presenter: Riddhi Modi, Yash Trivedi, Amanda Charest

Faculty Mentor: Kaie Ojamaa

Department: Biomedical Sciences

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

A significant percentage (30-50%) of patients with advanced heart failure have low thyroid hormone levels. Thyroid hormones (TH) regulate the expression of dyadic proteins Ryanodine and Calcium channels, and an associated bridging protein Junctophilin-2 (Jph). These proteins are necessary for Excitation-Contraction (EC)-coupling, i.e., calcium release and cardiomyocyte contraction. Adverse remodeling in heart failure is in part due to dilation and disorganization of the transverse tubules (TT) that directly affect EC-coupling in cardiomyocytes and thus contractile function. To test our hypothesis that TH maintains TT and EC-coupling, rats were made TH deficient by treatment with oral PTU that inhibits hormone production. Cardiomyocytes were isolated from hearts of normal euthyroid (EU) rats and thyroid-deficient (PTU-treated) rats and labeled with antibodies that recognize RyR and Jph proteins. Images of the cardiomyocytes were captured using a Nanoimager-S super-resolution microscope (Oxford Nanoimaging Ltd, U.K.) with a 100x oil immersion objective. STORM (stoichastic optical reconstruction microscopy) images were captured to identify clusters of RyR and Jph. A clustering algorithm (CODI) was used to measure the size and number of RyR clusters and the number of Jph proteins associated with the RyR clusters. In addition, 3D images were captured to determine the spatial organization of the RyR and Jph clusters to ascertain whether differences could be observed in response to th

Serine Integrase Within the Phage Genome

Student Presenter: Roslyn Paul

Faculty Mentor: Bryan Gibb

Department: Biological and Medical Sciences

School/College: College of Arts and Sciences Long Island

Studying bacteriophages can be used for a myriad of reasons, such as phage therapy, phage display, and gene therapy. Bacteriophages throughout many clusters have the gene coding for serine integrase in common. The protein structure for this gene is highly conserved throughout the cluster to ensure that the efficient genetic recombination reaction occurs when a bacteriophage infects its host. Serine integrase essentially facilitates the insertion of viral DNA into the host genome through Site-Specific Recombination (SSR). It recognizes and attaches itself to the attP attachment site, which is located on the viral genome, and the attB attachment site, which is found on the host genome, to initiate this reaction. These attachment sites are only 40-50bps long, and the recombination carried out by serine integrase is largely irreversible unlike its counterpart, tyrosine recombinases. Serine integrase is a very important protein within the genome of a phage, where its presence can determine a lot about a phage's virulence. Serine integrase allows phage DNA to be inserted into the bacterial genome to start the less virulent stage called the lysogenic stage which can then become lytic, or the more virulent stage, after a mechanical or chemical stressor. Overall, serine integrase is a very important protein in the genome.

Therapeutic Potential of S. aureus Bacteriophages found in Drug-resistant Fitness Centers

Student Presenter: Sahejdeep Chohan, Moshe Kabariti, Siem Satti, Srikrishna Prasad

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

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

Staphylococcus aureus is a gram-positive bacterium commonly found in normal human flora, often on the skin and on the anterior nares in the nasal cavity. When infecting humans, it can cause a wide array of clinical manifestations, and it is an extremely common cause of skin infections. Antibiotic-resistant forms of S. aureus, such as MRSA, VISA, and VRSA pose a growing public health threat as they are more difficult to treat. Bacteriophages are viruses that infect bacteria, and they have been used to treat bacterial infections. Each phage targets specific bacteria, and there are estimated to be more than 10^31 phages on the planet. Furthermore, phages can adapt to overcome bacterial resistance, so they maintain a constant arms race with the bacteria. A common area where S. aureus resides are fitness centers which have physical activity, contact, and transfer of microbiota. Gyms present an ideal environment for drug-resistant strains to spread throughout the community. One study found that 36.3% of S. aureus samples isolated from a fitness center were multidrug-resistant. The purpose of our work is to find and isolate S. aureus phages found in the environment of a community fitness center. After isolation, these phage samples will be characterized and evaluated for their therapeutic potential in treating S. aureus infections.

Effects of Zoledronic Acid and Magnesium alloys to Regulate Osteogenesis and Osteoclastogenesis

Student Presenter: Sally Lee

Faculty Mentor: Azhar Ilyas

Department: Electrical and Computer Engineering

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

Bone related disorders such as osteoporosis and giant cell tumors of the bone affect nearly 200 million people. Both disorders are unpredictable and difficult to diagnose, leading to late treatment plans. Treatment options available also come with risks and complications, suggesting the need for an improvement that promotes and supports the natural healing process of bone tissue. Zoledronic acid appears to be a good candidate to mediate the symptoms of these disorders due to their effects on calcium levels by causing apoptotic death of osteoclasts. Ongoing research has also revealed promising results for the use of metal alloys such as magnesium and strontium due to the effects of these cations within the body. Mg^{2+} helps to promote the release of calcitonin and with the addition of zoledronic acid, osteoclastogenesis is inhibited through the Nk-B pathway. This review highlights and summarizes the use of zoledronic acid alone as well as its usage with magnesium-strontium based alloys to regulate osteoclastogenesis.

Using spatial omics and multiplexed imaging to discover new biomarkers of response or resistance to Immune Checkpoint Inhibitors (ICI) in Advanced Non-Small Cell Lung Cancer (NSCLC) using Lasso logistic regression.

Student Presenter: Sara Hussin

Faculty Mentor: Leonidas Salichos

Department: Biological and Chemical Sciences

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

Using spatial transcriptomics we collected 224 pre-treated lung cancer tissue samples from 56 patients and run a panel of 18000 mRNAs, assessed by oligonucleotide-tagged in situ hybridization. The human whole transcriptome was sequenced on the NovaSeq platform to quantify the mRNAs present in each region of interest. Three tissue compartments, defined by fluorescence co-localization (tumor [panCK+], leukocytes [CD45+/CD68-], macrophages [CD68+] were generated to assess mRNA and were sampled 4 times (4 blocks, per compartment, per patient). Then, we used R to perform a LASSO logistic regression to generate a set of mRNA biomarkers associated with response or resistance to immunotherapy. Our models were trained using blocks 1,2 and 4 for each compartment and were validated using cross-validation (CV) and block 3 (b3, which showed the highest heterogeneity). Our first model, using information from panCK+ (tumor cells) had a CV AUC of 0.905 and a block 3 AUC of 0.825, sensitivity of 0.885, and specificity of 0.615. This model included 64 mRNAs with CDK18, GOLGA2, ERV3-1, and BLVRA having the highest coefficients. Our second -mixed- model, derived from all 3 compartments (panCK, CD45 and CD68), had a CV AUC of 0.952, a b3 AUC of 0.767, a sensitivity of 0.667, and specificity of 1. This model had 17 mRNAs from CK, 7 mRNAs from CD45, and 11 mRNAs from CD68 with PDHB (CK), BLVRA (CK), ANPEP (CK), PPP1R10 (CD45), WDR13 (CD68), and COPS9 (CD68) having the highest coefficients.

The Role of Alginate Hydrogels in Bone Tissue Engineering

Student Presenter: Serin Ahn

Faculty Mentor: Azhar Ilyas

Department: Electrical and Computer Engineering

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

Tissue Engineering and Regenerative Medicine (TERM) is a combination of biomaterials, nanotechnology, and biomedical engineering to construct artificial tissues or organs using scaffolds, cells, and bioactive molecules. The orthopedic approach of TERM is to develop orthopedic implants for fracture repair, bone growth, and drug delivery. Alginate is a naturally derived polysaccharide extracted from brown algae. Due to its biocompatibility and low immunogenicity, alginate has been utilized in countless biomedical and industrial settings. For bone tissue engineering pure alginate hydrogels lack osteogenic properties and are inadequate to be placed in load-bearing sites. Physical and chemical modifications have been made to alginate to address these issues and increase structural integrity. In this paper, various modifications to create alginate composites such as alginate-bio glass, alginate-bio ceramic, alginate bio silica, and alginate-bio signaling molecules will be introduced along with their effects on osteogenesis.

The Physics of Lightning

Student Presenter: Skylynn Kilfoil-Greaves, Ishaan Singh

Faculty Mentor: Sophia Domokos

Department: Physics

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

In this presentation, we will discuss the physics of lightning, why lightning occurs, the types of lightning, the colors of lightning, and some unexplained thunderstrike phenomena. We will explain the physics of thunderbolts being created and various situations that can completely change physical features of the lightning. We will also explain the different forms of discharges, such as clouds to the ground lightning, within clouds lightning, etc. Later, we discuss the lightning color spectrum and why colors can occur in lightning strikes. Towards the end of our presentation, we will expound on several baffling lightning occurrences.

Madness Through Time

Student Presenter: Sophia Denis, Makeda Armstrong

Faculty Mentor: Carrie Rubinstein

Department: Digital Arts and Design

School/College: School of Architecture and Design, New York City

This project is an 8-15-page comic book retelling of Alice in Wonderland. It will be printed in standard comic book size (6.875” by 10.438”). The goal of this project is to bring awareness to the advancements in psychology throughout time. It deals with the stigmatization of mental illness and the alienation of those who live with mental health problems.

Modern Enlightenment

Student Presenter: Sophia Denis

Faculty Mentor: Carrie Rubinstein

Department: Digital Arts and Design

School/College: School of Architecture and Design, New York City

Inspired by Monet's Rouen Cathedral series, :Modern Enlightenment" is a 18 x 24 light study. This piece aims to showcases the importance of observation. Throughout my first year of art classes, my professor Carrie Rubinstein emphasized how drawing is 90% observing your subject and while your arms are drawing, only 10% of the time should you look down at the paper. Observation is a powerful tool, transferable to other aspects of life.

NYIT Undergraduate Research Journal

Student Presenter: Srikrishna Prasad, Siem Satti, Danial Ahmed

Faculty Mentor: Elizabeth Donaldson

Department: Biological and Chemical Sciences

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

This project/presentation is about a new NYIT Undergraduate Research Journal we are creating. The New York Tech Undergraduate Research Journal (NYTURJ) is an online, Open Access, and peer-reviewed journal that will annually publish compelling and rigorous multidisciplinary undergraduate research to promote scholarly activities at the undergraduate level. The New York Tech Journal aims to nurture research at the undergraduate level within all disciplines. It is a place for students, researchers, and members of the community to present their achievements while appreciating others. We encourage students to go beyond the boundaries of the classroom while providing a forum for the exchange of new ideas and research. Our journal will be run entirely by a staff team of New York Tech undergraduate students along with established faculty reviewers. All submitted papers will go through an extensive review by the New York Tech Undergraduate Research Journal's team of editors and reviewers, who will subsequently deliberate and select the best-submitted papers for publication. Our editors work closely with chosen authors to polish their papers to ensure that the author's ideas and discoveries are of the highest quality possible. After review, they will be published under one of NYTURJ's two sections: Natural Sciences & Engineering and Humanities & Social Sciences. We are planning to present our progress at SOURCE, and present it to faculty and other researchers.

Contraception and Depression

Student Presenter: Taylor Narsingh, Danielle Tarpey, Sara Giammarella

Faculty Mentor: Nicole Calma-Roddin

Department: Behavioral Sciences

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

"Many women use oral contraception. In addition, many women experience depression. But is oral birth control related to depression levels in women? Prior research showed both support for and against the relationship between oral contraception use and depression in women. We found that, in prior research, the Beck Depression Inventory showed that there is little difference in depression levels between women who use oral contraceptives and those who do not use oral contraceptives. Some other measurements show that there is a correlation between depression and oral contraceptives, but we believe this is because of the different methods that were used. Our goal was to see if there was a difference between depression levels for those who use oral birth control and those who do not using two different surveys: the Beck Depression Inventory and the Patient Health Questionnaire (PHQ-9). Our participants are college aged women, split into two groups based on whether they use oral contraceptives. All women will take the Beck Depression Inventory and the Patient Health Questionnaire. We expect to see a difference in depression levels between the women who use oral contraceptives and the women who do not use oral contraceptives using the Patient Health Questionnaire, but not the Beck Depression Inventory.

Secure Local CI/CD Pipeline

Student Presenter: Vinodkumar Kakarla

Faculty Mentor: Sara Khanchi

Department: Computer Science

School/College: College of Engineering & Computing Sciences, Vancouver

The developers in startups are not able to deploy their unstable code to the dev environment without pushing it to the git. The local CI/CD pipeline bypasses the process of pushing the code to the git. The pipeline will execute unit test cases and deploy the code to the dev environment. The pipeline is implemented in node.js. For node servers we can integrate this pipeline.

Ovarian Serous Cystadenoma Presents As Bladder Issues in 23-Year-Old Female: A Case Report

Student Presenter: Yakubmiyer Musheyev

Faculty Mentor: Maria Levada

Department: Clinical Sciences

School/College: College of Osteopathic Medicine, Long Island

Pelvic organ problem(s) should be suspected when a female patient experiences difficulty emptying her bladder (urinary retention), abdominal distention, and bloating. Clinical suspicion is increased if she also reports any sexual activity while not using barrier contraception or is inconsistent with the use of barrier contraception as this can increase the likelihood of a sexually transmitted disease which can ultimately mimic the same symptoms. Exams that aid in the diagnosis of bladder issues include bladder ultrasound, urine analysis, and cystoscopy. Ovarian serous cystadenomas are common benign epithelial neoplasms that can range in size from 1-30cm and can also mimic symptoms/signs associated with bladder issues. In this case study, we present a 23-year-old female patient that presented to the clinic with signs and symptoms of bladder issues including difficulty voiding and abdominal distention. Upon further workup of the patient, it was evident that the patient had a large cyst of the right ovary that was surgically removed. A pathologic exam revealed that it was a benign serous cystadenoma that measured an impressive 28cms in diameter.

Determinants of Plaquing Behavior in cluster AZ phages on Arthrobacter globiformis

Student Presenter: Yamini Bhaveshbhai Patel, Hannah Saji, Alexandru Medina, Vrushali Patel, Amna Syeda

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

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

Bacteriophage is a virus that infects and reproduces inside a bacteria to parasitize it. They outnumber bacteria by 10:1 and are the most abundant biological particles on the planet. Students at the New York Tech used Arthrobacter globiformis, a soil-dwelling bacterium, as a host to isolate novel actinobacteriophages in the fall of 2019 and 2021. Five of the phages have been characterized, sequenced, and annotated. Cluster AZ includes Janeemi, Phives, Eraser, and Kaylissa, who are all temperate due to the discovery of a putative serine integrase gene that is conserved among the cluster. These AZ phages create plaques that start off clear but eventually change into hazy bullseye. Eraser's plaques, on the other hand, are consistently larger and clearer. We were able to make stable lysogens of these phages, but Eraser was more difficult to make. Phage Eraser was able to create clearings on lysogens of others in an immunity assay. What genetic factors influence the plaquing behavior of Arthrobacter globiformis cluster AZ phages? We're working on a plaquing assay to distinguish between different AZ phages, which we'll utilize to find genomic regions of interest that could influence plaque features. The endolysin gene is one candidate gene that may play a role in this behavior. There are 3 distinct phams for endolysin in cluster AZ, which helps break down the peptidoglycan cell wall. The repressor gene could also play a role in plaque morphology, but no repressor has been found.

The Mainstreaming Addiction Treatment Act of 2021 (S.445; H.R.1384) - A Step to Ending America's Opioid Epidemic

Student Presenter: Yash Trivedi

Faculty Mentor: Joerg Leheste

Department: Biological and Medical Sciences

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

Over 2 million Americans suffer from opioid use disorders (OUDs), which are defined as the misuse of drugs that target opioid receptors to induce euphorically and analgesic effects leading to clinical impairment or distress. Opioid abuse deaths constitute approximately 75% of drug overdose deaths in America each year, exacerbating the opioid epidemic we are currently experiencing. Given these facts, it is critical for the American healthcare system to offer alternative treatment options for patients. As a Schedule III partial mu-opioid agonist with proven clinical efficacy, buprenorphine is a Medicare-covered alternative. Until recently, healthcare practitioners were required to apply for an “X waiver” according to the Drug Addiction Treatment Act of 2000 in order to prescribe buprenorphine, thus limiting accessibility. H.R.1384 is a bill that removes this requirement and allows for the practice of medication-assisted treatment (MAT) and other detoxification treatments, reducing the hurdles around buprenorphine prescription. This bill has the potential of saving many lives that would otherwise be lost to the opioid epidemic.

Combating SARS-CoV-2 With Wastewater Based Epidemiology

Student Presenter: Yash Trivedi

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

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

Causing over 460 million cases and 6 million deaths worldwide, severe acute respiratory coronavirus 2 (SARS-CoV-2) is the virus responsible for the ongoing COVID-19 pandemic. Within the past two years, various methods, with predictive measures, for understanding infection trends, have been developed and adopted, but the relatively new field of wastewater based epidemiology (WBE) provides a unique solution to combating the spread by serving as an accessible indicator of COVID cases at the population level. It has been demonstrated that SARS-CoV-2 RNA levels in wastewater often increase in advance of detectable cases, so monitoring wastewater is an effective leading indicator for community-level surveillance. NYIT has its own wastewater treatment facility, so having the capability to conduct surveillance for pathogens such as SARS-CoV-2 that can be detected in wastewater will enable early warning of pending outbreaks among the campus community, allowing the implementation of preventative measures that can limit the spread of a pathogen such as SARS-CoV-2. We have identified SARS-CoV-2 RNA from wastewater samples collected at NYIT in February that correlate with the Omicron spike early in 2022. Expanding upon these methods provides a realm of possibilities for public health monitoring, and can be extended to other disease-causing pathogens found in wastewater. This epidemiological investigation is part of a movement for methods to combat infectious disease as a whole.

Reviving the Historic Sabils of Cairo

Student Presenter: Yousef Ismail

Faculty Mentor: Pablo Lorenzo-Eiroa

Department: Architecture and Design

School/College: School of Architecture and Design, New York City

Sabil wa kuttab (n): a charitable public water dispenser and school/library. Water is an essential element of life and an integral part of Islamic beliefs. Sabils are one of the emerging Islamic architectures under the rule of the mamluks in Egypt where they are usually accompanied by a Kuttab on the upper floor. Through research of the humanist and religious aspects of Islam, in which access to water in deserts is currently paralleled to access to knowledge in the form of public libraries. Following Borges' "library of babel" as a reading reference, this cultural heritage project has been integrating human necessity to nourish the body in the arid areas with water, with the nourishing of the intellect and access to knowledge. Contemplating alternative expansive real time emergent virtual spaces by retrieving physical books 3d scanned from existing physical libraries activating 3d Photogrammetry Big Data Survey at the level of the built environment, the historical building heritage and the physical books. Through API data gathering and unsupervised Machine Learning, a user would be able to enter a virtual world where all books are written by a GTP-2 Artificial Intelligence semantic model informed by previous users, and contribute with their own text creating an endless ever-growing library."