CELEBRATING 2O YEARS OF

2ource

SYMPOSIUM OF UNIVERSITY RESEARCH AND CREATIVE EXPRESSION

FRIDAY, APRIL 14, 2023: 9 A.M. — 4 P.M.

16 W. 61st St., 11th FLOOR

DESIGN & ILLUSTRATION BY ROZINA VAVETSI

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Dear New York Tech Faculty, Staff, Students, and Friends,

Welcome to the Symposium of University Research and Creative Expression (SOURCE) 2023, held on our New York City campus at W. 61st St., on April 14, 2023, beginning at 10 a.m. We are so happy you will be a part of the SOURCE's 20th-anniversary celebration!

Creative expression and participation in research in collaboration with faculty members and mentors are integral parts of a New York Tech student's educational experience. SOURCE provides a unique opportunity for students to present their research and creative scholarly work while offering common ground for interdepartmental, interschool, and interdisciplinary communication.

I am very pleased to inform you that this year, 123 abstracts were accepted—a new record—and more than 275 undergraduate and graduate students, representing nearly all our campuses, schools, and colleges, have authored or co-authored these abstracts. The depth and breadth of their projects are a strong testament to the quality of teaching and learning at New York Tech.

I would like to take this opportunity to congratulate all the students for their academic excellence. Many individuals in our New York Tech community have worked on this event to make it a success, and 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

Symposium on University Research and Creative Expression (SOURCE) 2023 Program	
9 a.m.	**DOORS OPEN**
9:15 – 10 a.m.	**REGISTRATION and BREAKFAST** **POSTER PREPARATION/INSTALLATION** **16 W. 61st St., 11th floor**
10 – 11:15 a.m.	**ORAL PRESENTATION I** **16 W. 61st St., 7th and 8th floor**
11:15 a.m. – 12:15 pm	**POSTER EXHIBITION I** **16 W. 61st St., 11th floor, Gallery 61**
12:15 – 1 p.m.	**PRESIDENT HANK FOLEY'S REMARKS** **Video Presentation** **Group Photo** **16 W. 61st St., 11th floor Auditorium**
1 – 2 p.m.	**POSTER EXHIBITION II** **Nada Anid Art Gallery and** **Student Lounge, 1855 Broadway**
2 – 3:45 p.m.	**ORAL PRESENTATION II** **16 W. 61st St., 7th, 8th, and 11th floor**

Oral Presentations 10:00- 11:15 am	16 W. 61st St. Room 721 Moderator: Lissi Athanasiou-Krikelis	16 W. 61st St. Room 722 Moderator: Michael Hadjiargyrou	16 W. 61st St. Room 822 Moderator: Melissa Huey
10 a.m.	"The effects of estrogen deficiency in aortic stiffness and high blood pressure"	"Runge-Kutta Solutions for Monopoles on Curved Spaces"	"How Religious and Cultural Identity Buffer the Effects of Internet Susceptibility"
	Harshita Pasupuleti and Yesha Patel	Devin Alvarez, Beza Nigatu, and Chin Ho Kua	Joshuah Joseph, Ariah Dull, and Brianna Borbon
10:15 a.m.	"Evaluation of sequencing technologies on bacteriophage genomes "	"Machine Learning in evaluating solar levels and greenhouse gas emissions in Puerto Rico"	"Physical Characteristics That Influence Willingness to Help the Homeless"
	Yamini Patel, Srinidhi Gadula, Michael Kaczmarski, and Nigel Oommen	Sarah Johnson	Aziza Swift, Jovelis Franchesca Toribio, and Brian Martinez
10:30 a.m.	"Isolation and Characterization of Staphylococcal Bacteriophages targeting MRSA"	"Single-Sided Focusing of Sound in Layered Materials"	"Does Body Positivity Promote Good Physical Health and Quality of Life?"
	Hamza Nagarwala	Andrew Wong	Deliesha Gilbert and Aurelie Monthe
10:45 a.m.	"Comparative Genomic Analysis of Arthrobacter Phages Isolated and Sequenced at NYIT"	"Malware - A to Z behind Ransomwares"	"Mental Health Glamorization in Social Media's Impact on Desensitivity"
	Ahnaf Zaman	Ankan Garg and Geovanny Lopez	Nicole Ziminski, Raul Castillo-Leon, and Alexandra Ortiz

11 a.m.	**"Locating Noncanonical DNA Structures (i.e., Z-DNA, Triplex DNA, G4-quadruplex DNA, and i-Motif DNA) in Metabolic Genes (i.e., FH, SDHD, PKM2, and IDH1): The Warburg Effect, Cancer and Genomic Instability"**	**"MicroCT scanning of a Normal Adult Bovine Eye Globe"**	**"Susceptibility to Media-Imposed Eurocentric Standards of Beauty and How it Impacts Women of Color's Self-Esteem"**
	Juliana D'Amico, Anamika Rao, Prutha Patel, and Lina Elkoulily	Elizabeth Alayev, Kyle Mcpherson, John Mari, Isha Gujare, and Anjali Siluveru	Ariana Hernandez, Yana Kostova, and Briana Alcindor
11:15 am	**"Histological Characterization, MicroCT Scanning and DNA Structural Preservation of Chicken Bone"**	**Alice Multimodal Project**	**"From the Classroom to the Capitol: Youth Activism Against Dangerous Supplements"**
	Juliana D'Amico and Lina Elkoulily	Esther Bilenkin	Pari Patel and Ryan Ahmed

Oral Presentations 2 – 3:30 p.m.	16 W. 61st St. ROOM 721 Moderator: Spencer Turkel	16 W. 61st St. ROOM 722 Moderator: Leonidas Salichos	16 W. 61st St. ROOM 723 Moderator: Nicole Calma-Rodin	16 W 61st St Auditorium Moderator: Eve Armstrong
2:00 p.m.	"Phylodynamic analysis of Hepatitis D Virus in Italy"	"Borderlands"	"Memory and Melody"	"Stand-up Comedy and Storytelling Techniques for Building Communication Skills in Young Scientists"
	Nayan Pallothu	Leah Smit	Irham Saeed, Kaitlyn Broderick, Deborah Benitez, Serena Onbasi, and Serra Issi	Ali Gedawi, Lily Newkirk, Alena Yukova, and Ishaan Singh
2:15 p.m.	"Preventative Healthcare During the Covid-19 Pandemic"	"Multimodal Presentation on Art Spiegelman's 'Maus'"	"Magic Mirror on the Wall, am I Emotionally Intelligent after All?"	NA
	Joshua Gray	Jonathan Santos-Febus	Jawaad Nasim, David Harvey, Fatima Khalfan, and Maxine	NA
2:30 p.m.	"A Health Policy Perspective on Maternal Mortality in the U.S."	"The Impact of Supply Chain Disruptions Resulting due to Russia-Ukraine War "	"Anxiety in Group Work"	NA
	Elizabeth Rose	Abhishek Rajendra Agrawal and Sarvesh Rajendra Agrawal	Angad Jassal, Mike Gillespie, Alyssa Murtha, and Eric Zhao	NA
2:45 p.m.	"The Polish crested chicken's herniated brain: what's on its mind?"	"Towards a New Model of Experiential Learning for the Quantum Programmer"	"Alcohol And Aggression"	NA
	Mohit Shah	Shwetha Jayaraj	Brendan Watt, Benjamin Pennino, Prisha Patel, Shana Abraham, and Nicky Jagga	NA

3 p.m.	"NAACP Challenges Birth of a Nation"	NA	"The Relationship Between Students' Experience with Online Learning During the COVID-19 Pandemic and Their Feelings on Using Technology in Their Current Classes"	NA
	Sophia Yocelyn Rodriguez	NA	Seneca Pradhan, Melinda Feiner, Isabella Bennett	NA

Exhibition Hall 16 W. 61st St., 11th floor	
A Case Paraneoplastic Granuloma Annulare Associated with Metastatic Lung Cancer	Iya Agha
Design of Lightweight Web Based SQLI Detection Using ML Algorithm	Akshay Vallinayagam, Veera Venkata Sai Krishna Sunkara, and Jasneet Singh Parmar
Lycan's Venture	Ilan Cohen-Vasquez
Microwave Imaging of Non-Metallic Media	Sammy Ahmed
Overexpression of OCA6 found in drug F resistant clones of Leu-Saccharomyces cerevisiae	Jay Doshi
Remote Control P-47 Fighter Airplane	Vincent Carbone, Winson Wang, Umair Tahir, and Briana Hobert
Hexapod Robot Kit	Briant Rogers, Alessandro Naccarato, and Anmol Takhar
Noise Pollution Solution: A Study on Sound Dampeners	Inaya Syed
Lack of Healthcare Resources and Professional Training for Domestic Violence victims in Emergency and Urgent Care settings	Bairavi Maheswaran and Jaspreet Kaur

Exhibition Hall 16 W. 61st St., 11th floor	
New Paradigm on Neurodegeneration and Possibly Autoimmunity from ALS/FTD and Its Genetic Hallmarks	Mike Chung
The Duality of Marjane Satrapi / 100 Demons: Traumatic layering of Self	Lasharrifia Shelton
Cost Analysis of Routine Histopathological Evaluation of Specimens Following Total Ankle Arthroplasty	Nicholas Andriani and Aidan Papalia
A Mitochondrial Myopathy-Related Missense Mutation in ADP/ATP Carrier Destabilizes the Carrier Structure	Yllka Valdez
Promoting Resources to Prevent HPV Cancers	Riya Sood and Beatrice Carpo
Cannabidiol (CBD) as a Promising Anti-Cancer Drug Through Activation of Endoplasmic Reticulum (ER) Stress Mechanisms	Ariel Shaddaie and Samantha Cornwell
Comparison of Penetration Test Tools From the Perspective of Risk Assessment based on AHP method	Lie Zhou and Xuanyang Luo
Method for Developing In-Ear Dry Contact Electrode Systems to Measure Electroencephalography	Ryan Ahmed, Pari Patel, and Yllka Valdez
Santhari's Magical Bindi (Children's Book)	Ambika Siddabathula
The Effect of Brain Dehydration on the Efficacy of Cerebrospinal Fluid's Cushioning Effect: A Computational Study	Puneet Dhaliwal, Emaan Naeem Mughal, Elizabeth Avshalomov, and Milan Toma

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

How An Increase In Muscle Stiffness Correlates with Viscerosomatic Reflex Changes	Taylor Castro, Anoushka Guha, Abeer Naeem, and Nicole Companion
Assessing Differences in Palpation Pressure Between First Year and Second Year Osteopathic Medical Students	Kole Nikprelaj, Abraham Adriel, Syed Faiz, Khalid Aziz-ur-rahman, and Jacob Thomas
Comparison of Prevalence of Chapman's points in Subjects with Dysmenorrhea	Abeer Naeem, Taylor Castro, and Anoushka Guha
Accuracy of Lumbar Somatic Dysfunction Diagnosis in Comparison to Muscle Stiffness Measured by Myotonometry	Anoushka Guha, Taylor Castro, and Abeer Naeem
A Comparison of the Clinical Wound Healing Outcomes of Autologous Skin Grafts and Tissue-Engineered Skin Constructs	Sourish Rathi and Sonika Rathi
A Review of Management Options for Chronic Pectoralis Major Tears	Benjamin Hershfeld
Target Preference Depends on the Relative Effort and (Possibly) Time of Decision	Ibraheem Qureshi, Elan Adhemi, Rehel Ahmed, and Daniel Tanis
The Effect of Rhomboid Counterstain on Muscle Tone, Stiffness, and Subjective Pain: A Pilot Study	Kaitlin Unser, Nicholas Lewis, Rejath Jose, Anvin Thomas, and Alec Toufexis
Synthesis of Multi-Target Directed Ligands for Alzheimer's Disease	Annette Pietraru

Exhibition Hall 16 W. 61st St., 11th floor	
Reversal of Atherosclerosis Leads to Calcification and Aortic Root Dilation in Mice	Xin (Cindy) Lin and Daniel Kalta
Why Hearts Fail: Single Molecule Microscopy of Cardiac Myocytes	Sanketh Kumar
Effects of Na-Caprate on Leak Pathway Permeability in Renal Epithelium	Shivani Rana and Leyla Nasr
Comparison of Tone and Stiffness Changes to Lumbar Paraspinal Muscle with Varying Osteopathic Treatment Modalities	Nicole Companion
Left-Sided Presentation of Acute Appendicitis in a Patient With Situs Inversus Totalis: A Case Report	Anisa Raidah, Faiz Syed, and Nolberto Jaramillo
Learning From the COVID-19 Pandemic: Future Directions of Special Education Infrastructure	Phoenix Reisner
Exploring the Prevalence of KaiC Among Various Microbial Environments	Melody Lin
Blood Diagnostic Bot	Manmeet Multani, Justin Catagua, Luis Carrasco, Navjeet Singh, Ercibel Rubio, Eugene Atiase, and Evan Katradis
RenewAll	Dani Gulino, Tron Strapp, Kevin Small, Nick Paterno, Henry Meyer, and Jake Latsko
SmartCuts	Krishaan Gomes, Hamza Hosein, Dean Maloupi, and Ryan Pirbaks

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

Hyperglycemia and Hyperlipidemia Decelerate Mitophagy Flux in Cardiomyocytes	Srinidhi Gadula, Nidhi Banker, Pravin Vathappallil, Qiangrong Liang , and Tamayo Kobayashi
More Than A TV Show—How Scrubs Can Color Your Patient's Perspective	Kyle Gillani and Andrew Cecora
Regional Differences in Cerebral Microvascular Calcification Across Elderly Human Subjects With and Without Dementia at Time of Death	Isabella Romano, Joseph Aabye, Olivia Ballone, Nicholas Weeks, and Kelly Borges
The Need to Improve Transgender Patient Care	Daniella Abramov
Metabolic and Cardiovascular Effects of Homoarginine on Healthy Mice: a Preclinical Study	Anisa Raidah, Billy Ding, Xin Lin, Daniel Kalta, and Neil Kaungumpillil
Enhancing the Stability and Activity of Glucose Oxidase Through Interaction with Highly Curved Gold Nanoparticles	Abdur-Rehman Hussain and Jeleeta Jolly
Creating a Lateral Flow Assay to Detect E.coli	Anjani Bhavsar, Zainab Mubasher, and Emaan Mughal
Tea on the Global Scale	Jaqueline Sung
Online Sports Betting Infographic	Pat OToole
It's More Than Baby Blues	Rachel Goff

Exhibition Hall 16 W. 61st St., 11th floor	
All Things Tequila	Karina Palacios
Where is Your Accent From?	Styliani Rallis
Enhancing Neurotransmitter Detection with Electrochemically Etched Carbon Fiber Microelectrodes and Enzyme-Nanoparticle Functionalization	Aakash Soni, Stevin Thomas, Sana Naeem, and Abdur-Rehman Hussain
Men's Mental Health in College	Subarna Dutta
Exploring Quantum Algorithms to Solve a Rubik's Cube	Joanna Pedretti, Ali Gedawi, Shwetha Jayaraj, Bryan Garay, and Sabrina Wang
Echocardiographic Features of Mouse Model in Chronic Kidney Disease	Alexander Malayev, Puneet Dhaliwal, Danyang Ma, Saud A. Nasruddin, and Michael Gao
Does Tissue-Nonspecific Alkaline Phosphatase Deficiency in Hepatocytes Affect Cardiac Function and Arterial Stiffness in Mice with Atherosclerosis?	Harshul Singh, Saud A. Nasruddin, Neil Kaungumpillil, Danyang Ma, and Michael Gao
Saudi Traditional Art: Qatt Alasiri	Shantha Ali A

Exhibition Hall **16 W. 61st St., 11th floor**	
A Comparison of Echocardiogram Parameters in Ehlers-Danlos Syndrome (EDS) Patients With and Without Mast Cell Activation Syndrome (MCAS)	Anisa Raidah, Nolberto Jaramillo, Casey Sciandra, Bernadette Riley
Literature Review of OMM Lymphatic Drainage Techniques for Patients Suffering from Venous Insufficiency or Peripheral Arterial Diseases	Iya Agha
Cardio360	Parker Mixon, Yisrael Feman, Robert Hubley, Jerry Jose
Fluid-Structure Interaction Analyses of Vasculature and Aneurysms	Faiz Syed and Sahar Khan
Osteopathic Medical Students Preference on Osteopathic vs Allopathic Degree Based on Their Desired Specialty	Lucas Hildreth, Anisa Raidah, Pauline Huang, Naveed Tariq, and Helen Wong
The Impact of Music on Kama Muta: A Comparison of Advertisements With and Without Music.	Bhavi Doshi, Nehal Beniwal, Pradhyumna Alone, Darshil Ajudia, and Katherine Kingsly
Engineering Student Explores Careers in Game Design	Christian Hodge
Bioinformatic Analyses of Gene Expression During Normal and Abnormal Fracture Repair	Rishika Thayavally
The Effects of Pre-Lab Mindfulness Exercises on Student Engagement	Gianna Davillas and Gianna Petrillo
The Relationship between Gender and Desired Specialties in Osteopathic Medical Students	Helen Wong, Pauline Huang, Anisa Raidah, Lucas Hildreth, and Naveed Tariq

Exhibition Hall 16 W. 61st St., 11th floor	
A Multivariate Approach to Cervical Cancer Detection: Utilizing Indistinct Nuclear Shape and Texture Features for Improved Classification	Mary Margarette Sanchez, Dono Shodieva, and Angel Singh
Informal Resiliency	Santiago Hernandez
The Relationship Between Patient Height and Depth of Cardiac Structures: Potential Implications for Transesophageal Echocardiography	Alec Toufexis, Luke Zappia, and Maher Kazimi
Mapping Lola Pulido	John Mari
Assessment of PDE5 Inhibitory Activity of Novel Compounds for Potential Therapeutic Applications in Alzheimer's Disease	Ahnaf Zaman and Justin Edward
The Future of Telehealth	Dennis Lysov, Yelizabetha Skorokhod, and Shivani Rana
Does Intention to Practice Osteopathic Manipulative Techniques Depend on Specialty Choice?	Pauline Huang
Two Klebsiella Pneumoniae Bacteriophages Isolated from NYIT Wastewater	Sultan Mirza, Ameer Menwer, Gina Nagib, Catherine Istafanos
Predicting Change of Direction on NBA Games	Tamzid Ullah
Mind is a Prison	Shikha S. Gandhi
Osteopathic Medical Student Preferences for Residency Programs with Osteopathic Recognition	Naveed Tariq, Anisa Raidah, Pauline Huang, Helen Wong, Lucas Hildreth

Exhibition Hall 16 W. 61st St., 11th floor	
Genome Analysis of Two Related Bacteriophage Therapy Candidates Infecting Citrobacter Freundii	Jessica Wang and Anna Makedonska
Peroxisome Proliferator-Activated Receptor Gamma (PPARγ) Deacetylation: a Promising Therapeutic Strategy to Control Metabolic Dysregulation in Obesity	Shang Lee
From Genes to Tumors: Decoding the Molecular Mysteries of Choroid Plexus Carcinomas	James Virga
Anesthetic Considerations of Endovascular Aortic Repair	Michael Gao
More Than Iron Man's Butler: JARVIS, an AI for Surgeons Performing Laparoscopic Cholecystectomies	Jennifer Guo, Kyle Gillani, and Chloe Chai
Osteopathic Physicians in Sports Medicine Journals: An Analysis of Authorship Rates and Publication Trends from 2017 to 2021	Nicholas Piniella, Hannah English, Robert Steinberg, Sanket Desai, and Karthik Madhira
Phishing for S. Aureus Bacteriophage: From Campus Toilets to Student Noses	Jerry Qiu, Srinidhi Gadula, Alex Hwang
Novel Treatment for Bronchoconstrictive Diseases: Relaxation of Airway Smooth Muscle by Gelsolin Peptide	Shani Kahan
The Effect of Osteopathic Medical Students' Age on Favored Specialty	Anisa Raidah, Lucas Hildreth, Helen Wong, Pauline Huang and Naveed Tariq

A Case Paraneoplastic Granuloma Annulare Associated with Metastatic Lung Cancer

Student Presenter: Iya Agha

Faculty Mentor: Maria Pino

School/College: Osteopathic Medicine, Old Westbury

This case presentation represents an unusual presentation of Paraneoplastic Granuloma Annulare. Please find the abstract from the case presentation below.

For the poster, I would like to present this case.

A 60-year-old Caucasian woman with a 15-year smoking history presented with new, asymptomatic, pink lesions that gradually appeared over a period of 6 weeks. Physical examination revealed erythematous annular and nummular plaques on her upper and lower extremities, chest, and abdomen (Figure 1A and 1B). A shave biopsy from the right thigh revealed focal areas of necrobiotic collagen in the superficial portion of the dermis, surrounded by histiocytes, multinucleated giant cells, and lymphocytes, consistent with granuloma annulare (GA) (Figure 2).1.

Design of Lightweight Web Based SQLI Detection Using ML Algorithm

Student Presenter: Akshay Vallinayagam, Veera Venkata Sai Krisna Sunkara, Jasneet Singh Parmar

Faculty Mentor: Maryam R. Aliabadi

School/College: Engineering & Computing Sciences, Vancouver

In the modern era, SQL Injection Attack is a severe threat to the ongoing cyber world's security, especially for many web applications that are hosted online. This attack significantly alters the database and causes substantial damage, making it one of the top security risks, according to OWASP TOP 10. In this paper, we develop a lightweight ML-based detection system based on the Xgboost classifier algorithm and implement it in a live web application. We train and test the ML model with a dataset of around 30000 entries, including regular and SQLi queries. The qualified model is then deployed in a live web application built using python FLASK to detect and prevent SQL injection attempts. With the suggested model, we were able to achieve an F1 score of 0.996 and accurately detect and log SQL injection attacks.

Lycan's Venture

Student Presenter: Ilan Cohen-Vasquez

Faculty Mentor: Michael Hosenfeld

School/College: Architecture & Design, Manhattan

This project is a series that I have been working on over the past few years about a Girl named Isabelle Lyca who goes on a journey to figure out why the empire kidnapped her mother and meets many interesting people that would aid her on her journey and to learn about the secrets of the world of Lycan's Venture and the many gods and deities who have heavily influenced the world.

Microwave Imaging of Non-Metallic Media

Student Presenter: Sammy Ahmed

Faculty Mentor: Reza K. Amineh

School/College: Arts & Sciences, Manhattan

Microwave imaging has seen various applications ever since it was introduced, it's used in the medical field for detecting diseases. However, it has great potential to be applied in the manufacturing industry, and my research will see its application in scanning PVC pipes. In which, a combination of circuits and programming has been designed to move microwave scanners along the PVC pipes in order to form a full scan. The results of which can be mapped out in a diagram. Antennas have been positioned to surround the pipe to both send microwaves to the pipe and receive a modulated signal that can be represented in said diagram. Any abnormalities within the signal/diagrams can be attributed to defects in the pipe. Thus, proving itself as a great asset in quality control for newly made pipes.

Overexpression of OCA6 found in drug F resistant clones of Leu- Saccharomyces cerevisiae

Student Presenter: Jay Doshi

Faculty Mentor: Navin Pokala

School/College: Arts & Sciences, Old Westbury

Antimicrobial drugs can function as protein inhibitors that disrupt essential metabolic functions. As a defense, certain yeast is able to upregulate genes, so the produced proteins dilute the effects of the drugs. In the experiment, unknown Drug F hindered yeast mitosis, killing the yeast at last. To find protective genes, my partner and I conducted a high copy suppressor selection. This entails growing wild-type yeast in rich media and attacking the cells with serial dilution of Drug F. We then noted the specific diluted concentration of drug that killed most but not all yeast and used it to find candidates of resistance. To be specific, we mixed this goldilocks concentration into agar plates before adding yeast carrying various pieces of genomic DNA in plasmid. The following week, we extracted single colonies of growth, plating some in rich-media and others in leucine negative media and allowed them to grow. After one week, we purified the plasmid DNA from the resulting single colonies and transformed them into E. coli for amplification. The E. coli plasmid was purified and sent for sequencing. We investigated 5 genes from the reading, with OCA6 emerging as a probable candidate being protective against Drug F. OCA6 is needed to replicate DNA before mitosis. More research is needed to know if this exact gene is in fact causative for resistance.

Remote Control P-47 Fighter Airplane

Student Presenter: Vincent Carbone, Winson Wang, Umair Tahir, Briana Hobert

Faculty Mentor: James Scire

School/College: Engineering & Computing Sciences, Old Westbury

The NYIT chapter of the American Society of Mechanical Engineers (ASME) has been working on this remote-control replica of a WW2-era Republic P-47 fighter plane. This project has helped our club gain more members, taught students about electronics and 3D printing, and allowed us to have fun! This P-47 plane has an all-3D printed fuselage and wings printed using MakerBot 3d printers. The plane is equipped with a 7.4 Volt LiPo battery, a 1000kV brushless motor, a hobbywing platinum v4 speed controller, and a flysky fs-i6 receiver and transmitter. It is also equipped with a small camera that can be viewed via a set of fat shark scout goggles to navigate the plane through its adventures.

Hexapod Robot Kit

Student Presenter: Briant Rogers, Alessandro Naccarato, Anmol Takhar

Faculty Mentor: James Scire

School/College: Engineering & Computing Sciences, Old Westbury

This prefabricated, assembly-required kit was a great beginner project to teach our future engineers how to build and to code. The chassis and the legs are made of laser-cut acrylic. Its legs move with the aid of multiple servo motors controlled by a circuit board powered by Arduino and C++.

NAACP Challenges Birth of a Nation

Student Presenter: Sophia Yocelyn Rodriguez

Faculty Mentor: Jonathan Goldman

School/College: Management, Manhattan

When it came to the development of this mock web page, I truly immersed myself in the process of research. I explored various archives of New York City in the 1920s and became very interested in an article that was articulated by the NAACP. This film was in regard to the glorification of the Ku Klux Klan. My research entails how this film affected the community of colored people in New York City during the 1920s and how they took action against the film. But most importantly, how to articulate all this information into a website page by ensuring that the color scheme reflects the serious matter at hand and the layout highlights the images on the web page.

Noise Pollution Solution: A Study on Sound Dampeners

Student Presenter: Inaya Syed

Faculty Mentor: Michael Nizich

School/College: Engineering & Computing Sciences, Old Westbury

As suburban cities are overcrowded, there is a surplus of noise pollution being produced. From yard work to cars, anyone can admit noise is prevalent in suburban spaces. Noise pollution can also disturb people while working on assignments often. The researcher goals are to produce sound dampeners for utilized machinery, i.e., leaf blowers. To reduce noise pollution, the researcher produced three-dimensional models to adhere to leaf blowers. These models were manufactured using a three-dimensional printer, PLA filament, and an online model of the design. Utilized machinery sound dampeners are what society needs due to demands of everyday life, for example, studying or performing tasks, to not be interrupted.

Lack of Healthcare Resources and Professional Training for Domestic Violence victims in Emergency and Urgent Care settings

Student Presenter: Bairavi Maheswaran and Jaspreet Kaur

Faculty Mentor: Joerg Leheste

School/College: Osteopathic Medicine, Old Westbury

Domestic Violence has been a prevalent issue in recent years and with the social isolation due to the pandemic cases have increased. During the pandemic, domestic violence cases in the United States increased by 8.1% and in 2021, the NYPD has stated around 721 domestic violence cases, 17.2% of which led to homicides. However, as cases are increasing, there is a lack of health, screening, and support services for domestic violence patients in emergency and urgent care settings. We deduced through analyzing statistical data surrounding domestic violence post-pandemic, research based on medical education, and analysis of accreditation bodies for medical curriculum in the United States; that healthcare students and professionals are inadequately trained for treating and interviewing domestic violence patients. There is a lack of curriculum within our pre-clinical medical education and residency programs on how to approach, screen for, and garner trust with a domestic violence patient, hence the severity of these patients is often overlooked and not cared for. Further, this creates a lack of competency, confidence, and comfortability in our physicians and students dealing with such sensitive topics. Hence our study aims to showcase these barriers for domestic violence patients, and further implement an educational intervention to provide healthcare students with the necessary coursework they need to instill care for these patients.

New Paradigm on Neurodegeneration and Possibly Autoimmunity from ALS/FTD and Its Genetic Hallmarks

Student Presenter: Mike Chung

Faculty Mentor: Maria Plummer

School/College: Health Professionals, Old Westbury

Recognition of amyotrophic lateral sclerosis (ALS) and frontotemporal dementia (FTD) as a spectrum of neurodegenerative disease is rapidly evolving. Both disorders have been shown to overlap in their pathology, genetics, and clinical presentations. Recent investigations have identified genetic hallmarks that concretely bridge those highly heterogenic disorders as a spectrum. The discovery of hexanucleotide repeat expansions in chromosome 9 open reading frame 72 (C9orf72), TAR-DNA binding protein (TDP)-43 proteinopathy, and their implicated functions in neurodegeneration and autoimmunity suggests possible underlying pathogenesis of ALS/FTD and toxic neurodegeneration at large. The autoimmunity aspect of C9orf72 is particularly exciting as it may elucidate a novel paradigm that not only encompasses the origin of neurodegeneration, but also that of autoimmunity. Here, we briefly review the latest findings of functions of TDP- 43 and C9rof72 and further discuss the possibility of an overarching theme in neurodegenerative diseases.

The Duality of Marjane Satrapi / 100 Demons: Traumatic layering of Self

Student Presenter: Lasharrifia Shelton

Faculty Mentor: Lissi Athanasiou-Krikelis

School/College: Architecture & Design, Manhattan

Visual Presentation on key themes in the graphic novel memoirs 100 Demons and The Complete Persepolis.

Cost Analysis of Routine Histopathological Evaluation of Specimens Following Total Ankle Arthroplasty

Student Presenter: Nicholas Andriani and Aidan Papalia

Faculty Mentor: Randy Cohn

School/College: Osteopathic Medicine, Old Westbury

Routine histopathological examination of orthopedic surgical specimens is a standard practice at many institutions. Previous studies have demonstrated that this practice seldom altered patient management following total hip & knee arthroplasty as well as knee & ankle arthroscopy. As a result, the value of such practices has come into question. The purpose of this study is to determine the cost-effectiveness of routine histopathological analysis of specimens obtained during total ankle arthroplasty (TAA).

A Mitochondrial Myopathy-Related Missense Mutation in ADP/ATP Carrier Destabilizes the Carrier Structure

Student Presenter: Yllka Valdez

Faculty Mentor: Steve M Claypool

School/College: Arts and Sciences, Old Westbury

ADP/ATP carriers (Aac) are crucial for energy production in the mitochondria with a role in the proper functioning of oxidative phosphorylation (OXPHOS). Aac is located in the inner membrane of the mitochondrion and exchanges ADP into the matrix, and ATP out of the cytosol. Aac2 is the only isoform in yeast necessary for OXPHOS, relying on cardiolipin (CL), a phospholipid in the mitochondria. Findings of a patient show a missense mutation in ANT1, an isoform in mammalian Aac, affecting the functioning of the protein. This allele (ANT1L141F, corresponding to yeast Aac2L155F) indicates mitochondrial myopathy, estimated to reflect impairment of mitochondrial function. The patient mutation is located where Aac interacts with CL and yeast Aac2 carrying a glutamate point mutation at the corresponding position of the patient mutation (yAac2L155E) fails to interact with CL. We aimed to identify the pathological mechanism behind the patient mutation by comparing growth, expression, and structural folding status to the mutant. Results in the SDS PAGE/western blotting illustrated that the mutant is expressed similar to wildtype Aac2, thus the mutant Aac2 amount present is not a cause of defect. Blue native-PAGE showed that the structure of each Aac2 mutant was destabilized. The results suggest that disrupted interactions between Aac2 and CL result in destabilized structure, thus leading to mitochondrial dysfunction and human disease.

Promoting Resources to Prevent HPV Cancers

Student Presenter: Riya Sood and Beatrice Carpo

Faculty Mentor: Joerg Leheste

School/College: Osteopathic Medicine, Old Westbury

There is a lack of national awareness of Human Papillomavirus (HPV) and HPV-related cancers due to an insufficient amount of public service announcements (PSA), written materials, and discussion of HPV in academic curricula. Furthermore, accessibility of consultation services from non-profit organizations and healthcare providers is limited [1]. In line with the World Health Organization's goal to eliminate cervical cancer globally within the next century, it is important to start increasing awareness within our own state. An approach to reduce HPV cancer incidence should be modeled after the HIV prevention and awareness campaign used in NY State's education system, which has proved to be successful in decreasing state-wide rates of HIV [4,5]. Examples of distribution materials include digital and print resources emphasizing the HPV associated risk tied to gynecologic cancers and the importance of HPV vaccines. Need analysis indicates resources need to be specifically targeted toward high risk and rural populations. Public data should be medically accurate and include multiple types of cancers (penis, anus, oropharynx), not just gynecologic cancer [3]. Additionally, it is important to address increasing rates of vaccine hesitancy due to the COVID-19 pandemic and the stigma of HPV as a sexually transmitted infection [2]. Information to promote vaccination for both men and women to limit the spread of HPV needs to be strictly scientific and unbiased.

Cannabidiol (CBD) as a Promising Anti-Cancer Drug Through Activation of Endoplasmic Reticulum (ER) Stress Mechanisms

Student Presenter: Ariel Shaddaie and Samantha Cornwell

Faculty Mentor: Dong Zhang

School/College: Osteopathic Medicine, Old Westbury

Cannabidiol (CBD)'s potential as a promising anti-cancer drug is attributed to its low toxicity levels and its ability to inhibit the growth of certain cancers in mouse tumor models. The endocannabinoid receptors, CB1 and CB2, play a crucial role in regulating cellular calcium homeostasis in the cytoplasmic and endoplasmic reticulum (ER) membranes, and CBD affects these receptors. The Unfolded Protein Response (UPR) pathway is activated if there is prolonged ER stress, and it targets cells for apoptosis, this pathway is the target of CBD. In our study, we used Western blotting to investigate the effects of CBD on melanoma and normal skin fibroblast cells. Our multi-cancer project validated RNA-sequence data on multiple cancer cells treated with 5 μM CBD, showing upregulation of CHOP and PARP in A375 cells. These markers, both CHOP and PARP, are indicative of activation of the UPR pathway, which is associated with CBD-induced apoptosis. Different cancer cell lines have varying sensitivity to CBD-induced apoptosis, with A375 melanoma cells requiring a concentration of CBD (1.087 μM) to induce apoptosis. We are continuing to investigate the effects of CBD on other cell lines and are developing a staining technique to evaluate its impact on normal skin fibroblast cells.

Comparison of Penetration Test Tools from the Perspective of Risk Assessment based on AHP method

Student Presenter: Lie Zhou and Xuanyang Luo

Faculty Mentor: Maryam Raiyat Alibadi

School/College: Engineering and Computing Sciences, Vancouver

This paper outlines a method for determining the most appropriate penetration testing tools for comprehensive risk assessment tasks. We have selected four tools – OWASP ZAP, Burp Suite Professionals, Nmap and Intruder – to assess the risk of Company C's web application. The Analytic Hierarchy Process (AHP) was then used to evaluate these tools based on user experience and determine the most suitable tool based on the AHP outcome.

Stand-up Comedy and Storytelling Techniques for Building Communication Skills in Young Scientists

Student Presenter: Ali Gedawi, Lily Newkirk, Alena Yukova, and Ishaan Singh

Faculty Mentor: Eve Armstrong

School/College: Arts and Sciences, Manhattan

In science, as in all areas of human endeavor, effective communication is vital. We participated in a workshop that employed techniques from stand-up comedy and storytelling, to build our communication skills and comfort in front of an audience. Over eight weeks this spring, we learned principles including: organizing a series of moments; enhancing those scenes via detail and dialogue; pacing and timing; awareness and use of body language; identifying and editing out distractions; and – most importantly – listening to the audience. Through this process, we each created unique material based on personal experience. This material has developed into the stories you will hear today. The workshop is co-sponsored by the American Museum of Natural History, and we have performed these pieces there as well.

The Impact of Supply Chain Disruptions Resulting due to Russia-Ukraine War

Student Presenter: Abhishek Rajendra Agrawal and Sarvesh Rajendra Agrawal

Faculty Mentor: Shaya Sheikh

School/College: Management, Manhattan

Since the beginning of 2022, we have witnessed a series of supply chain disruptions (SCDs) with geopolitical, natural, or industrial causes. The focus of our research is to pinpoint the supply chain disruptions that have emerged as a consequence of the Russian-Ukrainian war. We also propose solutions to mitigate the disruption impact on global and local supply chains.

Method for Developing In-Ear Dry Contact Electrode Systems to Measure Electroencephalography

Student Presenter: Ryan Ahmed, Pari Patel, and Yllka Valdez

Faculty Mentor: Michael Nizich

School/College: Arts and Sciences, Old Westbury

Brain aneurysms and epilepsy are serious neurological conditions that cause an alarming number of deaths each year in the United States. Detecting these conditions quickly and developing effective devices is critical to reducing mortality and morbidity rates. Typical symptoms and findings include muscle spasms, numbness, headaches, and abnormal neural activity. However, current EEG headset technology is expensive and often uncomfortable. Therefore, a low-cost, non-invasive device that captures electroencephalography is necessary. Researchers based in New York City developed a diagnostic device, NIURA, which integrates conductive silicone electrode technology with an earpiece. The device uses modified electrocardiogram analog front-end circuitry to detect electrical differences in neural signaling, rather than heartbeats. By applying fast fourier transform, it can identify and display frequencies in real-time on a digital EEG monitor. Frequencies were extracted from complex sine waves consisting of phase, amplitude, and frequency. This technology may potentially create tools for a broad range of neurological abnormalities; assisting healthcare providers in the detection stage of patient care. Ultimately, the development of this device could help reduce morbidity and mortality rates associated with brain aneurysms and epilepsy in the United States.

From the Classroom to the Capitol: Youth Activism Against Dangerous Supplements

Student Presenter: Pari Patel and Ryan Ahmed

Faculty Mentor: Melissa Huey, Mindy Haar, and Chester Barkan

School/College: Arts and Sciences, Manhattan

The Out of Kids' Hands campaign aims to combat the dangerous hold of the over-the-counter weight loss and muscle-building products industry on youth. Despite the continuous reports of these products containing dangerous chemicals and undisclosed ingredients, the United States has placed no restrictions on their sale to minors. Predatory campaigns, including on-the-ground sales tactics, online advertising, and affiliate marketing target marginalized communities. A recent study found that Latinx students had ~40% higher odds of past-thirty-day diet pill use than White peers. Undergraduate students organized advocacy efforts to lead legislation banning the sale of these supplements to minors. Over the past year, the Out of Kids' Hands Bill has had unprecedented legislative success in the six states in which the bill has been introduced. Students have employed effective strategies such as conducting a nationwide survey, designing infographic fact sheets, conducting studies on the harmful effects of these products, writing and publishing journalistic stories, producing video communications, and orchestrating grassroots call-in and email drives to advance the bills through key legislative committee votes. At the end of this presentation, learners will be able to describe the consequences of these products endangering minors, report on crucial policy components to protect them, and analyze the legislative successes for the Out of Kids' Hands bills.

Santhari's Magical Bindi (Children's Book)

Student Presenter: Ambika Siddabathula

Faculty Mentor: Amanda Golden

School/College: Arts and Sciences, Old Westbury

My name is Ambika Siddabathula and I am a senior undergraduate from the New York Institute of Technology. I have worked diligently, over the last 2 years, to create the beautiful journey illustrated in "Santhari's Magical Bindi". The story is about a young South Asian girl (Santhari) who goes to school with a bindi on her forehead. Her classmates, not knowing what it is, make fun of her. This makes Santhari feel isolated and different from the rest of her peers. When she goes home, Santhari's mother tells her the story of the powerful bindi and how the 8 devis/ queens (adi, dhana, dhanya, gaja, santhana, veera, jaya, and vidya) used the magic of the bindi in order to help their villages in different ways. Santhari, more inspired than ever, uses this knowledge to educate her friends and find a new profound appreciation for her hindu heritage. This book is essential for the literature market as there are no other books written about the importance of the bindi targeted towards children. This book also promotes diversity, inclusion, and appreciation of the hindu culture empowering young females to take pride in their heritage.

Machine Learning in Evaluating Solar Levels and Greenhouse Gas Emissions in Puerto Rico

Student Presenter: Sarah Johnson

Faculty Mentor: Jerry Cheng

School/College: Engineering & Computing Sciences, Manhattan

The focus of this research is on utilizing data collected from solar technologies in Puerto Rico, along with datasets on energy emissions, to explore the correlation between the current energy consumption crisis in Puerto Rico and the need for solar energy. The research aims to highlight the importance of renewable energy sources in the postmodern world and evaluate the detection levels of solar energy in Puerto Rico. Additionally, the research seeks to examine the impact of greenhouse gas emissions on the environment and the potential benefits of shifting towards renewable energy sources such as solar power. Overall, this research event aims to shed light on the potential of machine learning techniques for addressing the energy crisis in Puerto Rico and promoting sustainable energy practices.

Susceptibility to Media-Imposed Eurocentric Standards of Beauty and How it Impacts Women of Color's Self-Esteem

Student Presenter: Ariana Hernandez, Yana Kostova, and Briana Alcindor

Faculty Mentor: Melissa Huey

School/College: Arts and Sciences, Manhattan

The eurocentric beauty standard has been a prominent factor in many lives of women of color. Media representation affects young women of color's self-concept and encourages social comparison. Findings indicate that media representations that promote "sexual racism", stereotypes, and beauty standards cause a decrease in self-esteem, sexual repercussions, and internalized racism in students of color (Silvestrini, M. 20201). Our research will measure the participants' self-esteem and conclude how eurocentric beauty standards affect their perception of themselves and others. We hypothesize that high favorability of eurocentric beauty standards represented in the media affects women of color's self-esteem and perception of beauty.

Data will be collected from female NYIT students of all races and ethnic backgrounds and graduating years. This study will be conducted by introducing a repeated measures design test where we will look for a score change after doing a week-long intervention. The survey will measure four variables, (1) Favorability of eurocentric beauty, (2) self-esteem, (3) physical changes women have done in order to fit their understanding of beauty, and (4) attitudes toward media representation susceptibility. After the initial survey completion, participants will receive a newsletter, daily for 5 consecutive days, highlighting women of different ethnicities. After this study is conducted, we will observe the changes over time in favorability of eurocentric beauty.

Mental Health Glamorization in Social Media's Impact on Desensitivity

Student Presenter: Nicole Ziminski, Raul Castillo-Leon, and Alexandra Ortiz

Faculty Mentor: Melissa Huey

School/College: Arts and Sciences, Manhattan

With the continuous growth of technology and social media, there is also a steady trend of increased mental health diagnosis in society. Social media has allowed mental health to be "glamorized," and therefore people are often desensitized to the seriousness of mental illness. This study aims to look at the desensitization levels of mental health in a pre- and post-survey design, after viewing internet clips and posts that 'glamorize' mental health. Surveys will be administered to students at New York Tech, where they will be asked questions about the sensitization of mental illness. The results of this study will highlight whether the 'glamorization' of mental illness online leads to higher desensitization. We hope the results can inform educators and policymakers about the negative effects of posting things that make light of mental illness and encourage individuals to take mental illness seriously.

Does Body Positivity Promote Good Physical Health and Quality of Life?

Student Presenter: Deliesha Gilbert and Aurelie Monthe

Faculty Mentor: Melissa Huey

School/College: Arts and Sciences, Manhattan

With the rise of social media, the body positivity movement has become a hot topic in pop culture in recent years. The origins of the movement can be traced back to the fat acceptance movement of the 1960s, which sought to challenge the discrimination that fat people faced. Since then, the movement has taken many names and faces, with the body positivity movement of the 2010s being the newest one. Starting in 2012 and with the help of social media, the movement seeks to challenge beauty standards and promote body diversity. However, the movement has received both praise and criticism. Supporters see it as promoting body diversity and body acceptance, while critics see it as promoting obesity and lacking nuance when it comes to the overall health of a person. This study aimed to investigate whether or not the body positivity movement encourages individuals to better their physical health and quality of life. Participants were college-aged women who were chosen to do a survey to test how healthy their lives were, as well as their relation to the body positivity movement. The survey was broken into three parts. The first part centered around body image and confidence, the second part focused on body positivity and its relation to it, while the final part centered around healthy lifestyles.

Physical Characteristics That Influence Willingness to Help the Homeless

Student Presenter: Aziza Swift, Jovelis Franchesca Toribio, and Brian Martinez

Faculty Mentor: Melissa Huey

School/College: Arts and Sciences, Manhattan

Homelessness is a growing epidemic in New York City. Nonetheless, homeless individuals are often disregarded, as pedestrians simply walk pass them on their commute without acknowledgement or help. Previous research suggests that aspects such as race, gender, and expressions of emotion have an impact on people's willingness to help the homeless (Morgan et al., 1997). Our research aims to investigate specifically what physical characteristics bring out the willingness of people to interact or even donate to homeless people. We hypothesize that there are three important factors in whether or not individuals are willing to help: 1. Appearance; 2. Signage; and 3. Body Posture. After viewing one of the videos from each aforementioned factor, individuals will be asked to fill out a brief survey about their willingness to help a homeless individual. We hypothesize that individuals with clean clothes, polite signage, and those sitting upright will be the most likely to be helped. Although there aren't many resources to help the homeless, we hope that these findings provide a better way for homeless people to present themselves in hopes of receiving the most help from their fellow New Yorkers.

The Effect of Brain Dehydration on the Efficacy of Cerebrospinal Fluid's Cushioning Effect: A Computational Study

Student Presenter: Puneet Dhaliwal, Emaan Naeem Mughal, Elizabeth Avshalomov, and Milan Toma

Faculty Mentor: Milan Toma

School/College: Arts and Sciences, Old Westbury

Dehydrated brains in sports, industrial works, military operations, emergency scenes, and from adverse drug reactions are often encountered. Symptoms of brain dehydration include dizziness, loss of coordination, and loss of consciousness. In brain dehydration, blood flow to the brain cells is reduced, limiting oxygen and nutrient supply. As a result, blood vessels leak fluids that may lead to swelling in the brain tissue, increasing the cerebrospinal fluid (CSF) while decreasing the brain volume. CSF surrounds the brain and acts as a cushion to protect the brain from impact against the hard surface of the skull. A common practice for combat athletes is to limit water intake to meet the lower weight class, causing them to enter the match in a dehydrated state. Hence, it is imperative to study the mechanism of brain injury and understand how dehydration can lead to secondary injuries. By understanding this mechanism, we can implement preventative measures that will minimize the impact of dehydration and brain injury. Computational models are useful tools to understand the dynamics of brain injuries and to provide insight into how to prevent and treat them without compromising human subjects. Multiple brain models with differing volumes of brain and CSF have been developed to understand the effects of dehydration on the brain. The same external loading is prescribed to all the models and the resulting injuries are assessed based on the response of the models to the impact.

Ovarian Fibroma Presents as Uterine Leiomyoma in a 61-Year-Old Female: A Case Study

Student Presenter: Yakubmiyer Musheyev, Emmanuella Borukh, Benjamin Ilyaev

Faculty Mentor: Maria Levada

School/College: Osteopathic medicine, Old Westbury

Uterine leiomyoma should be considered when a female patient reports symptoms of abdominal pressure and abnormal vaginal bleeding. However, the symptoms of uterine leiomyoma are vast and overlap with other possible diseases that are difficult to distinguish even with imaging studies. This is why it is important for physicians and healthcare providers to keep an open mind and have a broad differential diagnosis. In this case study, we present a 61-year-old post-menopausal female patient who presented to the emergency department with complaints of pelvic and abdominal pain, as well as vomiting and diarrhea. She was admitted for observation. A complete blood count (CBC), comprehensive metabolic panel (CMP), and urinalysis revealed no abnormalities; a pelvic ultrasound and CT scan reported possible adnexal torsion. The patient remained stable, and the pain had subsided when she was seen the next morning by her gynecologist (GYN) who discharged her to follow-up in the office. Subsequent examinations that aided in the diagnosis included, but were not limited to pelvic and transvaginal ultrasounds, an abdominal and pelvic CT, and a pelvic MRI. In this case, the MRI revealed an eleven-centimeter mass that could represent a torsioned pedunculated necrotic fibroid originating from the uterus. Radiology recommended surgical removal.

How Religious and Cultural Identity Buffer the Effects of Internet Susceptibility

Student Presenter: Joshuah Joseph, Ariah Dull, and Brianna Borbon

Faculty Mentor: Melissa Huey

School/College: Arts and Sciences, Manhattan

In the past decade, we have seen a dramatic increase in the amount of time young people in America spend online, especially on sites such as Instagram, Reddit and YouTube (Anderson and Auxier, 2021). As the use of technology in modern life progresses, so does the influence it has on our social lives and physical health. For instance, one of the issues associated with the increase in internet usage is its link to higher levels of depression and anxiety after prolonged use (Aboujaoude, 2017; Saikia, A. M., Das, J., Barman, P., & Bharali, M.D. 2019). College students are also more likely to come across 'memes', or units of cultural information spread by the internet and used as a way to quickly communicate ideas, beliefs, and opinions. Past research has found limited information on what can potentially be done to buffer the effects of high internet susceptibility, so we decided that one factor that could potentially serve as a buffer to high susceptibility to the internet is religiosity. The purpose of our proposed study is to compare internet susceptibility in two groups: 1. General Students; and 2. Students affiliated with a religious institution. The level of susceptibility in our study will be determined based on the extent the memes we have selected have impacted the participants using a survey. We hypothesize that students who score higher on a survey gauging religiosity will be less susceptible to the internet than those who are not strongly affiliated with religion.

A Health Policy Perspective on Maternal Mortality in the U.S.

Student Presenter: Elizabeth Rose

Faculty Mentor: Joerg Leheste

School/College: Osteopathic Medicine, Old Westbury

At present, the U.S. is in a state of crisis regarding maternal mortality (death in pregnancy, during childbirth, or postpartum). From the years 2000 to 2014, maternal mortality doubled from 9.8 per 100,000 live births to 21.5 per 100,000, followed by a slight improvement by 2019 to 17 per 100,000. When stratified by race, the situation further deteriorates, with black women being 3–4 times more likely to die from pregnancy and childbirth-related causes than white women. This discrepancy has been further exacerbated by the COVID-19 pandemic and the recent U.S. Supreme Court decision to overturn the Roe v. Wade ruling, both of which have put disproportionate weight on minorities and those of low socioeconomic status. Preliminary data indicates that maternal death rates during the COVID-19 pandemic were 62% higher and increased nearly twice as fast in states with restrictive abortion policies compared to those with more accessible abortion services. These findings underscore the importance of reproductive healthcare access and highlight the potential negative consequences of restrictive abortion policies. The main objective of this analytical health policy research project is to examine the causes of increasing maternal mortality rates in the US and explore the potential of using Federally Qualified Health Centers to increase accessibility to care. The secondary objective is to monitor and analyze efforts by the new 118th U.S. Congress that could affect the current situation.

How An Increase in Muscle Stiffness Correlates with Viscerosomatic Reflex Changes

Student Presenter: Taylor Castro, Anoushka Guha, Abeer Naeem, and Nicole Companion

Faculty Mentor: Sheldon Yao

School/College: Osteopathic Medicine, Old Westbury

Introduction: Viscerosomatic reflexes occur when organs are irritated and cause a somatic finding in the posterior aspect of the spine from T1-L3. Uterine viscerosomatic reflex levels are located from L1-L3. Somatic dysfunctions are diagnosed by finding tenderness, asymmetry, restricted motion, and tissue texture changes (TART) findings in patients. Osteopathic physicians utilize diagnoses of viscerosomatic reflexes to help diagnose and treat patients. Muscle stiffness has been found to be varied at different points during the menstrual cycle via shear-wave elastography; however, there are limited studies on muscle stiffness changes throughout the menstrual cycle measured via dynamic tissue response changes. Results: Subjects were found to have tissue texture changes at L1 and L3 levels, correlating with the uterus. All subjects had somatic dysfunction indicating asymmetry during menses. Data from the MyotonPRO was recorded from 7 healthy female subjects, with 168 data points. The means at each session were recorded and analyzed using Paired Samples Correlations with SPSS Statistical software. A positive correlation between session and stiffness was found between Session 2 and Session 7 (0.773) with a two-sided p value of 0.041. This correlates with our hypothesis that an increase in stiffness correlates with viscerosomatic reflex changes.

Locating Noncanonical DNA Structures (i.e., Z-DNA, Triplex DNA, G4-quadruplex DNA, and i-Motif DNA) in Metabolic Genes (i.e., FH, SDHD, PKM2, and IDH1): The Warburg Effect, Cancer and Genomic Instability

Student Presenter: Juliana D'Amico, Anamika Rao, Prutha Patel, and Lina Elkoulily

Faculty Mentor: Claude Gagna

School/College: Arts and Sciences, Old Westbury

The majority of organismal DNA is canonical right-handed double-stranded (ds-) B-DNA. However, DNA is a dynamic entity that can assume different structures, such as Z-DNA, triplex DNA, G4-quadruplex DNA, i-motif quadruplex DNA, cruciform DNA, hairpin DNA, anti-parallel DNA, and curved DNA. Using three different DNA prediction softwares [i.e., DeepZ (Z-DNA), Triplex Aligner (Triplex DNA), G4Boost (G4-quadruplex DNA), and G4-iM Grinder (i-motif quadruplex DNA)], we examined four metabolic genes (i.e., FH, SDHD, IDH1, PKM2) involved in the Warburg effect and cancer. Left-handed Z-DNA is an alternative ds-DNA molecule. Triplex DNA, G4-quadruplex DNA and i-motif DNA are all multistranded molecules. These unusual DNAs play roles in maintaining normal gene expression and developing pathological conditions. Warburg discovered that the majority of glucose consumed by tumors is fermented to lactate rather than oxidized in pathways that require respiration. His ideas were forgotten for years, until recently, when cancer researchers reexplored his hypothesis that cancer is a metabolic disease rather than a genetic pathology of nuclear DNA. No one has ever examined any metabolic genes for noncanonical DNAs. It's important to locate noncanonical DNAs because these exotic DNA structures play a role in gene instability, which can result in cancer. Knowing the potential segments in genes that contain unusual DNA structures will allow for the development of anti-cancer precision therapies.

Assessing Differences in Palpation Pressure Between First Year and Second Year Osteopathic Medical Students

Student Presenter: Kole Nikprelaj, Abraham Adriel, Syed Faiz, Khalid Aziz-ur-rahman, Jacob Thomas

Faculty Mentor: Milan Toma

School/College: Osteopathic Medicine, Old Westbury

This study analyzes palpation accuracy and pressure differences among OMS I and OMS II students, who learn to diagnose somatic dysfunctions through palpation and identifying musculoskeletal irregularities. A Princess and the Pea test was adapted to assess accuracy and force in palpation. Students located a coin randomly placed under stacks of paper ranging from 100-300 (in increments of 50) while sensors measured their applied force. The study with 12 OMS students (6 of each OMS I and II) showed a link between palpation force and paper stack number. The best accuracy was in the 250-stack group, with similar outcomes for 100- and 300-stacks. All students used equal pressure at their max limit of 8.81 PSI on the largest stack size, but the statistical analysis did not differentiate precision or pressure among groups. As the number of paper stacks increased, palpation force also increased linearly for both OMS I and OMS II. This aligns with previous studies linking the depth of structure being palpated to an increase in pressure used. In the 300-stack group, maximum pressure was consistently applied as found in past research on deeper structures. Accuracy was highest for the 250-stack group while no significant difference was noted between OMS I and OMS II regarding the accuracy or palpation pressure via statistical analysis. These findings suggest that additional training may benefit osteopathic student physicians at all levels of study concerning palpatory skills.

MicroCT Scanning of a Normal Adult Bovine Eye Globe

Student Presenter: Elizabeth Alayev, Kyle Mcpherson, John Mari, Isha Gujare, Anjali Siluveru

Faculty Mentor: Claude Gagna

School/College: Arts and Sciences, Old Westbury

A normal adult bovine eye globe (i.e., black angus) was processed in Davidson's fixative (i.e., alcohol-formalin-acetic acid-based tissue fixative) for 72 hours. Excess fixative was removed with washing in water at room temperature (RT) for 1 hour, and then stored in 70% ethanol (i.e., histology grade). Eye globe was allowed to dry at RT, in the dark. The eye globe was then scanned, using a micro-computed tomography (micro-CT) scanner for visualizing, reconstructing, and analyzing the morphology of the eye globe in three dimensions (i.e., College of Osteopathic Medicine, Imaging Core Facility, Old Westbury, NY). The micro-CT scanner uses X-rays to reveal the internal structure of the eye globe at the microscopic level, without having to section them, i.e., histotechnological processing of tissues in order to obtain tissue sections. The eye globe is not destroyed as part of our investigation of internal structures. The micro-CT scanner our group used was the SkyScan 1173 micro-CT system (Bruker, Carteret, NJ), and it can image samples with submicron resolution or scan objects up to 200mm or more in diameter. The purpose of this project was to begin a series of eye globe scans with tissues processed in different fixatives (e.g., 10% NBF, Carnoy's, Bouin's, FAA), in order to examine the effect of fixation on eye globe structure, and individual components, such as the cornea, lens, and retina.

Comparison of Prevalence of Chapman's Points in Subjects with Dysmenorrhea

Student Presenter: Abeer Naeem, Taylor Castro, and Anoushka Guha

Faculty Mentor: Sheldon Yao

School/College: Osteopathic Medicine, Old Westbury

Introduction: Chapman's points are specific palpable areas which are tender to the touch indicating "fascial congestions" displaying viscerosomatic reflexes of the body1. The phases of the menstrual cycle have varying hormonal fluctuations of estrogen and progesterone causing pain which can be severe in patients with dysmenorrhea. However, there is limited research about the prevalence of muscle tenderness/Chapman's points throughout the phases of the cycle. Conclusion: Uterine Chapman's points proved most prevalent in subjects with dysmenorrhea. There was also an increase in the frequency of points during the menstrual cycle towards the end of the luteal phase which may be related to a progesterone peak. Limitations include small sample size and subjective scale of tenderness. Further research is needed to confirm the presence of Chapman's points and effects of OMT on the points and clinical significance.

Accuracy of Lumbar Somatic Dysfunction Diagnosis in Comparison to Muscle Stiffness Measured by Myotonometry

Student Presenter: Anoushka Guha, Taylor Castro, Abeer Naeem

Faculty Mentor: Sheldon Yao

School/College: Osteopathic Medicine, Old Westbury

Accuracy of osteopathic diagnosis is a fundamental skill necessary for proper evaluation and treatment with osteopathic manipulative treatment (OMT). Studies have shown poor interexaminer reliability in diagnosis in the lumbar spine. One study showed that interexaminer reliability could be improved over time with training and improved assessment of muscle tone and tissue changes. The MyotonPRO myotonometer has been shown to accurately assess muscle tension. This study examined the rate of correlation of somatic dysfunction diagnosis by NMM/OMM specialist and tissue texture changes measured as changes in muscle stiffness and tone overlying the area. Less than half of the somatic dysfunctions diagnoses made by the physician aligned with the objective readings of stiffness and tone. This displays the need for a way to cross-check readings and have a non-biased form of objective measurement during OMT treatments. Limitations include small sample size and varying physician diagnostic styles. Further research is required to determine the benefits of utilizing the MyotonPro to assist in confirming somatic dysfunction diagnosis.

A Comparison of the Clinical Wound Healing Outcomes of Autologous Skin Grafts and Tissue-Engineered Skin Constructs

Student Presenter: Sourish Rathi and Sonika Rathi

Faculty Mentor: Gurtej Singh

School/College: Osteopathic Medicine, Old Westbury

Context: Autologous skin grafts (autografts) are the gold-standard for the reconstruction of wounds but are limited by donor availability. Allogeneic/xenogeneic grafts provide temporary coverage but are eventually rejected. Another type of skin grafts that can be utilized are the tissue-engineered skin constructs: acellular tissue-engineered skin constructs (Acellular TCs) and cellular tissue-engineered skin constructs (Cellular TCs). Objective: This study compares graft incorporation and survival outcomes for autografts, autografts co-grafted with Acellular TCs and Cellular TCs in humans. Methods: All studies assessing the designated clinical outcomes of any of the graft were compared. The three main comparisons were: Co-grafts of Acellular TCs with autografts vs autografts alone, and Cellular TCs versus other grafts/constructs. Results: Graft rejection rates for autografts alone were 3.6%. No significant differences were found in graft failure rates and mean difference in percent re-epithelialization for autografts compared to co-grafts of Acellular TCs with autograft's ($p=0.07$ and $p=0.92$ respectively). There is no significant difference in Vancouver scar scale scores for co-grafts of Acellular TCs and autograft compared to autograft alone ($p=0.09$). No difference in graft failure rate was found for epidermal Cellular TCs compared to autograft ($p=0.55$). Conclusion: Thise shows promising results in wound healing outcomes for newer cellular tissue-engineered skin constructs.

A Review of Management Options for Chronic Pectoralis Major Tears

Student Presenter: Benjamin Hershfeld

Faculty Mentor: Bardia Askari

School/College: Osteopathic Medicine, Old Westbury

Rupture of the pectoralis major muscle typically occurs in the young, active male. Acute management of these injuries is recommended; however, what if the patient presents with a chronic tear of the pectoralis major? Physical exam and magnetic resonance imaging can help to identify the injury and guide the physician with a plan for management. Nonoperative management can be opted for, but is recommended for the elderly, low-demand patient as outcomes are inferior to surgical repair. Although operative management provides better functional outcomes, operative treatment of chronic pectoralis tears does not come without a challenge. Tendon retraction, poor tendinous substance and quality tissue, muscle atrophy, scar formation, and altered anatomy make direct repairs complicated, often leading to the need for auto or allograft use. We review the various graft options and fixation methods that can be used in treating patients with chronic pectoralis major tears. The principle investigator of this project is Dr. Randy Cohn of the Northwell Health Orthopedic Institute.

Preventative Healthcare During the Covid-19 Pandemic

Student Presenter: Joshua Gray

Faculty Mentor: Rajendram Rajnarayanan

School/College: Osteopathic Medicine, Jonesboro

Many people missed appointments with their primary care physicians during the height of the Covid-19 pandemic. This study was a literature review that focused on how these missed appointments and associated preventative health screenings could lead to an increased number of new disease diagnoses, such as breast or lung cancer, in the years following the pandemic. In this review, we considered not only how much of an increase in disease we could expect to see, but also which populations may be disproportionately affected due to missed preventative healthcare screenings. This data allows us to consider both how we could improve the healthcare system for the next pandemic, as well as how we should increase our vigilance against these diseases in the near future.

Single-Sided Focusing of Sound in Layered Materials

Student Presenter: Andrew Wong

Faculty Mentor: Vitaly Katsnelson

School/College: Engineering and Computing Sciences, Manhattan

We analyze a technique to produce a focused wave inside a layered material with access to only one side. Generating a focused wave is important because it can localize flaws and imperfections within the material and distinguish them from the desired properties of a material. In many practical situations, only access to one side of the material is available, so inspection consists of sending incident sound pulses into it and measuring the resulting reflected pulses. The one-sided access, combined with imperfections within the material, pose a challenge to focused wave generation. The main problem we analyze is, given single-sided access only, 'how does one focus sound to a point at a specified time within a one-dimensional layered medium with an unknown velocity profile?' James Rose proposes an algorithm to generate an incident pulse that focuses at a specific point in the material at a specific time after propagation into it. We have developed a computer simulation that implements Rose's algorithm for single-sided focusing and generates a focused wave using single-sided measurements. The program simulates the movement of a one-dimensional wave in the form of a contour plot that shows changes in its speed and amplitude as it passes through interfaces. The program visualizes multiple iterations of Rose's algorithm and shows the generation of a focused wave. We have shown mathematically that in certain cases, an infinite number of iterations will generate a focused wave.

Target Preference Depends on the Relative Effort and (Possibly) Time of Decision

Student Presenter: Ibraheem Qureshi, Elan Adhemi, Rehel Ahmed, and Daniel Tanis

Faculty Mentor: Isaac Kurtzer

School/College: Osteopathic Medicine, Old Westbury

Research on target selection before reach initiation indicates humans have a strong preference to the least effortful reach. We conducted two studies to further explore. Both experiments utilized a start and final target placed 10cm behind and ahead of the right hand, and a 45° shoulder and 90° elbow configuration. Re-directing the moving arm involves near-maximal differences in inertial resistance towards leftward targets (more) versus rightward targets (less). In Expt. 1 (5F/7M, mean age=22.8), two target options were presented soon after movement initiation. In Expt. 2 (7F/1M, mean age=22.1), two target options were presented before movement initiation. Expt. 2 also had a "via target" between the start and end target that subjects had to reach forward then deviate laterally like the motion pattern in Expt. 1. 9 target pairs (± 1,2,3 cm) were intermingled among no-change and one-target change trials. Participants showed more bias to the less effortful option in Expt. 1 than reported in our published study: median = 65% (35 IQR) vs 52% (16 IQR), one-sided rank-sum test, p=.033. Expt. 2 tended to have more bias to the less effortful option, median = 91% ¬(37 IQR), though this didn't significantly differ from Expt.

From the Classroom to the Capitol: Youth Activism Against Dangerous Supplements

Student Presenter: Pari Patel and Ryan Ahmed

Faculty Mentor: Mindy Haar, Melissa Huey, and Chester Barkan

School/College: Arts and Sciences, Manhattan

The Out of Kids' Hands campaign aims to combat the dangerous hold of the over-the-counter weight loss and muscle-building products industry on youth. Despite the continuous reports of these products containing dangerous chemicals and undisclosed ingredients, the United States has placed no restrictions on their sale to minors. Predatory campaigns, including on-the-ground sales tactics, online advertising, and affiliate marketing target marginalized communities. A recent study found that Latinx students had ~40% higher odds of past-thirty-day diet pill use than White peers. Undergraduate students organized advocacy efforts to lead legislation banning the sale of these supplements to minors. Over the past year, the Out of Kids' Hands Bill has had unprecedented legislative success in the six states in which the bill has been introduced. Students have employed effective strategies such as designing infographic fact sheets, conducting studies on the harmful effects of these products, writing and publishing journalistic stories, producing video communications, and orchestrating grassroots call-in and email drives to advance the bills through key legislative committee votes. At the end of this presentation, learners will be able to describe the consequences of these products endangering minors, report on crucial policy components to protect them, and analyze the legislative successes for the Out of Kids' Hands bills.

The Effect of Rhomboid Counterstain on Muscle Tone, Stiffness, and Subjective Pain: A Pilot Study

Student Presenter: Kaitlin Unser, Nicholas Lewis, Rejath Jose, Anvin Thomas, and Alec Toufexis

Faculty Mentor: Milan Toma

School/College: Osteopathic Medicine, Old Westbury

Osteopathic Manipulative Techniques (OMT) can treat many musculoskeletal complaints. Techniques such as Counterstrain (CS) work by relaxing the muscle. This study aims to quantify the effectiveness of CS by analyzing muscle tone (MT), stiffness (MS), and local pain evoked by tender points (TP) of the rhomboid muscle. The TP in the rhomboids was examined via pressure on insertion points. The TP with maximum pain was noted using a muscle marker. Tekscan Flexiforce Sensor is used to measure the pressure needed to elicit TP pain. Myoton Pro measured MT and MS. A CS technique was performed, followed by reassessments of TP pain, MT, and MS five times per person to avoid outliers. One researcher was chosen to evaluate changes in pain, MT, and MS. Paired T-test was performed on the three parameters pre- and post-treatment. The results reveal a significant difference between pre and post-treatment pressure needed for pain (p: 0.01). No significant difference was found for MT (p:0.10) and MS (p:0.54). Nonetheless, median scores were lower post-treatment for both MT (Pre:17.10 Hz; Post:16.70 Hz) and MS (Pre:321 N/m; Post:16.70 N/m). The study shows the efficacy of rhomboid CS in raising the pain threshold of TP. Although no significant differences were found in MT and MS, lower median scores suggest an effect exists. Future studies with larger samples could reveal this effect more clearly. This study's limitations will be addressed by increasing the sample size in future iterations.

Synthesis of Multi-Target Directed Ligands for Alzheimer's Disease

Student Presenter: Annette Pietraru

Faculty Mentor: Jole Fiorito

School/College: Arts and Sciences, Old Westbury

Alzheimer's disease (AD) is a progressive neurodegenerative disease that is characterized by initial memory impairment resulting in cognitive decline. AD affects speech, behavior, visuospatial orientation, and the motor system. The main hallmarks of AD include amyloid plaques and neurofibrillary tangles. Due to the complexity of disease, efficient therapies may require pharmacologic agents that are capable of targeting several targets simultaneously. The multi-target directed ligand (MTDL) approach uses a single drug molecule that is able to interact with multiple targets. Through our research, we aimed to synthesize new MTDLs that can be used to target phosphodiesterase type 5 (PDE5) and histone acetyltransferase (HAT), two enzymes found to play a significant role in AD. Previous studies (2018-ISRC project) showed that a combination treatment (PDE5 inhibitor and HAT modulator) in mice improved synaptic communication between neurons in the hippocampus. We designed and synthesized new molecules by combining structural moieties of PDE5 inhibitors and HAT modulators through chemical reactions using commercially available starting materials. Intermediates of the synthesis of the final products were obtained and assessed for purity and composition using NMR, IR, and LC/MS. Future steps will include purifying the final products and testing them for PDE5 and HAT enzymatic activity.

Reversal of Atherosclerosis Leads to Calcification and Aortic Root Dilation in Mice

Student Presenter: Xin (Cindy) Lin and Daniel Kalta

Faculty Mentor: Olga V. Savinova

School/College: Osteopathic Medicine, Old Westbury

Atherosclerosis is a cardiovascular disease caused by cholesterol plaque accumulation, which can lead to cardiovascular mortality and morbidity. Calcification is a condition that can occur within vascular plaques and may increase the risk of atherosclerotic cardiovascular disease events. The effect of vascular calcification in atherosclerotic plaque is not fully understood. To better understand the mechanism of the reversal of atherosclerosis and plaque calcification on cardiovascular physiology, mouse strains with low-density lipoprotein receptor mutation (ldlr, wicked high cholesterol (WHC)), that genetically predisposed the mice to atherosclerotic calcification, and overexpression of tissue-nonspecific alkaline phosphatase (TNAP) in macrophages were utilized. Male mice were induced with atherosclerosis through a western diet and were then switched to a normal diet for the reversal. Cardiac structure parameters were measured using echocardiography and computer tomography (CT) data was obtained to measure the aortic diameter and calcification. The results showed that the reversal of atherosclerosis increased ascending aortic and aortic root diameter, regardless of genotype, and a significant increase in calcification of the aortic root and arch was observed during the reversal process. Calcification was associated with adverse remodeling of the aortic root, leading to dilation of the aortic root diameter.

Effects of Na-Caprate on Leak Pathway Permeability in Renal Epithelium

Student Presenter: Shivani Rana and Leyla Nasr

Faculty Mentor: Kurt Amsler

School/College: Osteopathic Medicine, Old Westbury

Confluent populations of MDCK II cells, a dog renal epithelial cell line, develop circumferential tight junctions joining adjacent cells to create a barrier to the paracellular movement of solutes and water. Previous work demonstrated that treatment of MDCK II and other epithelial cell types with a permeation enhancer, Na-caprate, increases paracellular permeability to both small ions (Pore Pathway) and large molecules (Leak Pathway) but the basis for this increase is not known. Focusing our studies on the less well-understood Leak Pathway, we demonstrate that 1 mM Na-caprate, a non-toxic concentration, increases the Leak Pathway permeability of a size range of fluorescein dextran molecules (4 kDa-40 kDa). Our data suggests that Na-caprate enhances permeability by increasing the number of Leak Pathway openings in confluent MDCK II cell populations without altering the opening size. Previous studies suggest Na-caprate increases paracellular permeability through the activation of phospholipase C (PLC). However, the addition of a PLC inhibitor, U73122, did not affect the ability of Na-caprate to increase paracellular permeability in MDCK II cell populations. In preliminary experiments, inhibition of ERK 1/2 activation with U0126 at least partially inhibited the Na-caprate effect. We are pursuing these findings to define the role of ERK 1/2 activation and the mechanism by which Na-caprate increases Leak Pathway permeability in the MDCK II cell populations.

Why Hearts Fail: Single Molecule Microscopy of Cardiac Myocytes

Student Presenter: Sanketh Kumar

Faculty Mentor: Kaie Ojamaa

School/College: Arts and Sciences, Old Westbury

The contractile function of the heart is dependent on synchronous calcium release from intracellular storage compartments called sarcoplasmic reticulum (SR) through ion channels (Ryanodine Receptors, RyR). Super-resolution microscopy of single molecules of RyR, voltage-activated calcium channels (LTCC), and membrane tethering protein junctophilin-2 (Jph) was used to test our hypothesis that co-localization of these three proteins is disrupted in heart failure. Heart failure was produced by permanent ligation of a coronary artery (myocardial infarction, MI) in female rats. Cardiac myocytes were isolated from the hearts and labeled with fluorescent-tagged antibodies recognizing RyR, LTCC and Jph proteins. Images of these cardiac myocytes were captured using STORM (stochastic optical reconstruction microscopy) to identify clusters of RyR and LTCC, and co-localization of Jph proteins. The integrity of the T-tubule membranes was measured by staining the cardiomyocytes with a fluorescent dye. Echocardiography measured at 4 months post-MI verified heart failure with reduced ejection fraction. Staining showed disorganization and loss of integrity of the T-tubule network in failing cardiomyocytes. STORM imaging showed spatial re-organization of RyR and LTCC clusters with decreased Jph co-localizations. These adverse changes in ultrastructure in failing hearts support our hypothesis that approximation of these proteins at the T-tubule–SR junction is necessary for normal cardiac function.

Left-Sided Presentation of Acute Appendicitis in a Patient with Situs Inversus Totalis: A Case Report

Student Presenter: Anisa Raidah, Faiz Syed, and Nolberto Jaramillo

Faculty Mentor: Dean Olsen, DO

School/College: osteopathic Medicine, Old Westbury

Background: Situs inversus totalis (SIT) is an extremely rare condition in which there is complete reversal of both the thoracic and abdominal organs. Left-sided appendicitis (LSA) is also rare and has been previously reported in the literature to occur in association with SIT, midgut malrotation, and an abnormally long right sided appendix. Case Presentation: A 40-year-old male presented to the emergency department with complaints of acute severe left lower quadrant (LLQ) abdominal pain, nausea and vomiting. He was hemodynamically stable, with LLQ tenderness to palpation and no guarding or rebound tenderness. Laboratory studies and CT scans were remarkable for leukocytosis and SIT with left-sided appendicitis. The patient was managed surgically and recovered well. Discussion/Conclusion: Appendicitis was not initially considered in this patient due to the atypical location. This discrepancy in location can lead to delay in diagnosis of this surgical emergency and increased morbidity associated with undiagnosed appendicitis, thus clinicians should be aware of this rare pathology. This rare case of left-sided appendicitis in a patient with SIT highlights the importance of including it in the differential diagnosis of acute left lower quadrant abdominal pain.

Comparison of Tone and Stiffness Changes to Lumbar Paraspinal Muscle with Varying Osteopathic Treatment Modalities

Student Presenter: Nicole Companion

Faculty Mentor: Sheldon Yao

School/College: Osteopathic Medicine, Old Westbury

Introduction: Osteopathic manipulative treatment (OMT) has been proven effective to treat chronic lower back pain (CLBP) and significantly reduce pain.1 High-velocity low amplitude (HVLA) technique has been shown to be effective in CLBP reduction2; however, there are limited studies comparing efficacy of other OMT techniques. Objective: To investigate the effects of different OMT techniques on lumbar muscle stiffness and tone. Methods: Subjects were treated with 6 OMT sessions over 3 weeks. Three NMM/OMM board-certified osteopathic physicians diagnosed and treated lumbar somatic dysfunctions with OMT techniques of their choice. Tone and stiffness were measured bilaterally at L1 and L3 levels of paraspinal muscle via the MyotonPro, pre and post-OMT. Results: MyotonPRO data was analyzed from 7 healthy female subjects, 168 unique measurements, using paired t-tests with SPSS statistical software. Group 1 was treated with HVLA only (n=52), group 2 was treated with articulatory only (n=80), and group 3 was treated with mixed treatments (i.e. soft tissue, muscle energy) excluding HVLA (n=36). The average tone significantly decreased after HVLA. The average stiffness significantly decreased after HVLA was performed. Tone and stiffness for groups 2 and 3 decreased, but none were statistically significant. HVLA proved most effective in objectively reducing lumbar paraspinal tone and stiffness compared to articulatory and mixed methods of OMT. Further research is needed.

Exploring the Prevalence of KaiC Among Various Microbial Environments

Student Presenter: Melody Lin

Faculty Mentor: Leonidas Salichos

School/College: Arts and Sciences, Old Westbury

While normally associated with eukaryotes, circadian rhythms exist in the microbial world. The first prokaryotes to be found containing a circadian clock were cyanobacteria, dictated by three main genes designated as kaiA, kaiB, and kaiC respectively. The Joint Genome Institute's Integrated Microbial Genomes & Microbiomes (IMG/M) available datasets were used in order to generate lists of genomes that could be assumed to have kaiC. The first lists were generated by downloading the IMG/M's available genome lists organized by environment and the kaiC Pfam list (PF06745), which were then parsed through using custom Perl scripts to find matching IMG genome ID numbers. These initial lists of kaiC were then run through BLAST via the JGI's website, individually for kaiC 1 and kaiC 2 protein domains using the Synechococcus elongatus (strain PCC 7942) amino acid sequences. Then we further filtered the results to increase confidence in the list of genomes containing kaiC, and to differentiate between those containing kaiC 1 or kaiC 2 domain, or both. The results indicate that both domains of kaiC tend to be present, although those with only one domain usually have kaiC 1 rather than kaiC 2. In this study, we are exploring the prevalence and genetic variance among prokaryotes with genes such as the Kai genes.

Learning From the COVID-19 Pandemic: Future Directions of Special Education Infrastructure

Student Presenter: Phoenix Reisner

Faculty Mentor: Joerg R. Leheste, PhD MSc

School/College: Osteopathic Medicine, Old Westbury

The COVID-19 pandemic has left its imprint on the education system worldwide, including the field of special education. Education is a foundational social determinant of health and directly proportional to the quality of health outcomes, and thus an important subject of health policy research. Mass school closures, social distancing, and the sudden shift to remote and hybrid learning have created unique challenges, especially for the most vulnerable students with disabilities, their families, as well as teachers and other professionals. We are now at a crucial period where we must analyze the societal effects of the pandemic on special education and implement the lessons learned toward the improvement of the special education infrastructure to better assist these students and their support system. We have identified several broad areas where improvements need to be made. These include the development of technology-based solutions to increase access and participation in virtual classrooms, to improve access to mental health services for students and their caregivers, to enhance effective collaboration between all entities involved in special education, to address disparities in resource access for marginalized communities, and to enhance continual training and professional development for educators, family members and other special education professionals. Concurrent with this work, we are monitoring and analyzing efforts by the new 118th U.S. Congress towards these goals.

Blood Diagnostic Bot

Student Presenter: Manmeet Multani, Justin Catagua, Luis Carrasco, Navjeet Singh, Ercibel Rubio, Eugene Atiase, and Evan Katradis

Faculty Mentor: Sophie Christman

School/College: Engineering and Computing Sciences, Old Westbury

Our research summary in the technical communication class required creating a dynamic and practical research project that includes software and hardware engineering that entrepreneurs will market. Our product, Blood Diagnostic Bot (BDB), will enhance the user experience when extracting blood from users. The use of BDB will be simple and effective. The analysis and interpretation of blood samples can be made at a fixed setting 24/365. BDB will extract blood and examine the chemical and physical characteristics of blood. The device is equipped with multiple sensors and the blood's chemical composition to display data related to the customer's benchmarks. We aim to market to geriatrics and athletes and expand the product to the public. A product like the BDB in Rutgers takes blood samples with a success rate of 87%. The robot can use near-infrared and ultrasound imaging to locate blood vessels, insert and inject the needle, and pump the blood into the centrifuge. Lastly, the analyzer contains an acrylic chip to house the blood sample and determine the cell count. VitalFlow's Blood Diagnostic Bot will continue to produce robotic and microfluidic (lab on a chip) systems with precision and accuracy. The difference is that BDB will provide home convenience and a broader panel of tests. The primary conclusion of this research is to enable users to make life easier by communicating conveniently with health professionals from their homes and receiving fundamental feedback.

RenewAll

Student Presenter: Dani Gulino, Tron Strapp, Kevin Small, Nick Paterno, Henry Meyer, and Jake Latsko

Faculty Mentor: Sophie Christman

School/College: Engineering and Computing Sciences, Old Westbury

In our Communications for Technical Professions class, we were tasked with creating a dynamic and practical research product, which is called the CleanGen. CleanGen is a machine that utilizes multiple renewable resources which make energy production more efficient, and more accessible. Entrepreneurs will market this product to individual homeowners, and eventually scale it up for larger facilities. Our mission is to create a sustainable environment in America and to reduce pollution through the use of cleaner and more accessible energy production. The company is named RenewAll, and the members consist of undergraduate college students all looking to put their knowledge to a good use. The CleanGen is a modular machine that includes hardware and software, and uses rotational motion powered by renewable resources to generate electricity. We include solar cells, hydro electric, wind turbines, and thermo electric energy. We have a modular base and each energy source will offer a different attachment. This allows people in different climates to utilize the appropriate energy sources and change the attachments according to the weather conditions. Our research indicates this is a new, not patented product. CleanGen is a big step toward the environmental change necessary to stop global warming. The use of fossil fuels has had an extremely negative impact on our planet, and CleanGen aims to help make a positive change in the world.

SmartCuts

Student Presenter: Krishaan Gomes, Hamza Hosein, Dean Maloupi, and Ryan Pirbaks

Faculty Mentor: Sophie Christman

School/College: Engineering and Computing Sciences, Old Westbury

NextGenBarber is in the development stages of their next new hair-cutting product, SmartCuts. It will utilize AI based software and Mechanical and Electrical Engineering. The purpose of this project is to take away human error and utilize the efficiency of machine learning. As a high-end product, it provides a consistent and efficient experience that elevates the user's overall satisfaction. With its premium quality and attention to detail, it's an experience that sets it apart from other options in its class. Its consistent performance and efficient functionality make it a valuable investment for those seeking a top-of-the-line product that consistently meets their needs. The other version of this product is scaled up in order to meet the needs of larger operations. The goal is to have this product available in hospitals, prisons, and schools. The hope is that individuals who cannot receive haircuts when needed will be provided with the resources in order to do so. Many engineers have their own attempts at this product but have never taken it further than a personal project. NextGenBarber is poised to transform the hair care industry with its cutting-edge product, SmartCuts.

Histological Characterization, MicroCT Scanning and DNA Structural Preservation of Chicken Bone

Student Presenter: Juliana D'Amico and Lina Elkoulily

Faculty Mentor: Claude Gagna

School/College: Arts and Sciences, Old Westbury

In order to compare the effects of fixation on bone morphology and preservation of tissue-bound DNA, we examined a healthy adult chicken femur bone, about 4 inches long, obtained from a slaughter house and immediately placed into a fixative, i.e., 10% neutral buffered formalin (NBF). A piece of bone one inch long (i.e., diaphysis) was processed in order to obtain tissue sections, i.e., decalcified and histotechnologically processed, i.e., Formalin-fixed paraffin imbedded. Tissue sections were obtained, i.e., 4 microns thick and stained with Masson-Goldner trichrome. Tissue sections were observed using a light microscope (i.e. Zeiss AXIO Scope A1) and images were captured of the sections using photomicroscopy software (i.e., Infinity Analyze). Pictures of the tissue section were taken at 5, 50, 100, 200, 400, 630, and 1000 (oil) magnification. We examined both the longitudinal and cross-sectional views of the bone. The medullary bone, lacunae, osteocytes, and bone marrow were identified and captured at each magnification. This is the data we will be presenting at SOURCE (i.e. Part 1). Part 2 of our research project involves using a microCT scanner (i.e. Bruker SkyScan 1173), and software (i.e. Dragonfly) to study the morphology of the diaphysis of chicken femur bone. Based off our initial observations with cat and chicken bone (i.e., secondary fixation was used here), past SOURCE projects, we will compare the findings of 10% neutral buffered formalin with that of Davidson's Fixative (i.e., alcohol-formalin-acetic acid). Based on our previous observations, we observed that Davidson's fixative (i.e., primary fixative) penetrated deeper into cortical bone and medullary cavity compared to 70% ethanol and 10% NBF. More research needs to be done in order to standardize our data. We hope to expand this project and retrieve intact, non-denatured DNA [i.e., canonical B-DNA, Z-DNA (alternative form of B-DNA), G4-quadruplex DNA (four-stranded DNA), and i-motif quadruplex DNA (four-stranded DNA)] from the bone to examine the effect/quality of fixation on the structure of nucleic acids (e.g., all these alternative and multistranded DNA molecules play a role in maintaining normal tissues and initiating pathological conditions).

Runge-Kutta Solutions for Monopoles on Curved Spaces

Student Presenter: Devin Alvarez, Beza Nigatu, and Chin Ho Kua

Faculty Mentor: Sophia Domokos

School/College: Engineering and Computing Sciences, Manhattan

We present numerical solutions for "magnetic monopole" objects on conically curved spaces. Magnetic monopoles are hypothetical particles that have nonzero net magnetic charge and are relevant to various systems in string theory. We modeled these objects as two coupled differential equations and used computational techniques to find numerical solutions. In this talk, we describe our solutions as well as the numerical techniques used, including the Fourth Order Runge-Kutta algorithm.

The Relationship Between Students' Experience with Online Learning During the COVID-19 Pandemic and Their Feelings on Using Technology in Their Current Classes

Student Presenter: Seneca Pradhan, Melinda Feiner, Isabella Bennett

Faculty Mentor: Nicole Calma-Rodin

School/College: Arts and Sciences, Old Westbury

In this investigation, we explore how students' experiences during remote learning during COVID-19 is related to students' current views of technology within the classroom. During COVID, the use of technology was widespread and overwhelming. Our hypothesis is that students who had a negative experience with online learning during COVID will have negative feelings about using technology in their current classes. We will be administering a survey to students throughout NYIT who are enrolled in online and in person classes at the moment. The survey will contain questions about students' experiences of online learning during the COVID-19 pandemic and their feelings on using technology in the classroom during their current in-person classes. This research could be beneficial in helping both students and teachers cater to the needs and wants of their students in the classroom, as a result of the COVID-19 pandemic.

Alcohol And Aggression

Student Presenter: Brendan Watt, Benjamin Pennino, Prisha Patel, Shana Abraham, and Nicky Jagga

Faculty Mentor: Nicole Calma-Rodin

School/College: Arts & Sciences, Old Westbury

Our study investigates the relationship between alcohol consumption and levels of aggression. Previous studies have shown how an increase in alcohol consumption can lead to more aggressive behavior. There are various factors that play into this such as ambiance, company and occasion. For example, a correlation has been demonstrated between the prevalence of local bars and drink consumption and people's tendency for aggression (Treno et al., 1995). In prior studies, researchers have used various methods such as observation to record levels of aggression after consumption of alcohol. Our study will build on prior work by using the Buss Perry Aggression Questionnaire to assess physical and verbal aggression in college students. We will also measure levels of alcohol consumption. Our hypothesis states that the influence of alcohol will be related to physical and verbal aggression in college students.

Anxiety in Group Work

Student Presenter: Angad Jassal, Mike Gillespie, Alyssa Murtha, and Eric Zhao

Faculty Mentor: Nicole Calma-Rodin

School/College: Arts and Sciences, Old Westbury

This report focuses on investigating whether group work should be implemented more in education to reduce anxiety levels among students. Anxiety is a major problem for students in the classroom. According to a study done by Sato Koichi on the topic of learning languages, a student's fear of making a mistake prevents them from participating in the classroom and anxiety is negatively correlated to classroom performance (Koichi, 2003). In the current study, the participants are tasked with building a boat out of classroom materials within a time limit, while working alone or in a group. Their goal is to craft a boat that can hold as many pennies as possible, whilst keeping the boat afloat. We will be measuring participants' anxiety level after their experience via a survey, to assess whether the participants who worked in groups differed from those who worked individually. The predicted outcome of the experiment would be that those working in groups would feel less anxious than those working individually. If working in groups reduces anxiety, more group work should be implemented into the classroom. This can motivate students to tackle challenging tasks and have a positive effect on learning. This research is relevant to society at large, as it can help teachers determine the methods they should use when assigning work.

Magic Mirror on the Wall, am I Emotionally Intelligent after All?

Student Presenter: Jawaad Nasim, David Harvey, Fatima Khalfan, and Maxine Sanguinetti

Faculty Mentor: Nicole Calma-Rodin

School/College: Arts and Sciences, Old Westbury

In the current study, we plan to investigate the phenomenon of perceived versus actual emotional intelligence (EI). Since previous research on other variables implies that individuals tend to rate their abilities higher than their actual ability (Brackett et al., 2006), we believe that our research will fall in line with these findings. Our group postulates that college students tend to overestimate their levels of EI. We will administer the Self Report Emotional Intelligence Test (SREIT; Schutte et al., 1998), which is a 33-item questionnaire, along with a 1-item Likert-scale question to determine the participants' actual and perceived EI, respectively. We believe that our findings can contribute to the general discussion of perceived versus actual ability, along with the investigation of emotional intelligence.

Memory and Melody

Student Presenter: Irham Saeed, Kaitlyn Broderick, Deborah Benitez, Serena Onbasi, and Serra Issi

Faculty Mentor: Nicole Calma-Rodin

School/College: Arts and Sciences, Old Westbury

For this experiment, we are looking to see if there is an effect of music on undergraduate students' ability to memorize their class material. Music has always been part of many students' studying routines and our study will help support the claim that music plays a positive role in academics. In 2016, a three-part study on grade-level students by Crowther, McFadden, Fleming, and Davis concluded that educational music videos improved knowledge of covered materials, made education more enjoyable, and improved long-term recall of the material. We plan to separate two statistics classes and expose one to a song about hypothesis testing. The song is to the rhythm of a popular song, specifically 'Flowers,' by Miley Cyrus. To quantify the results, two quick assessments will be conducted. We will be measuring whether music truly helps increase memory retrieval for Statistics concepts. Our hypothesis is that college students who memorize their course material using music will perform better on the assessment than those who do not use music. If music improves recall, this can influence future teaching techniques, using songs as a resource for better memory.

Hyperglycemia and Hyperlipidemia Decelerate Mitophagy Flux in Cardiomyocytes

Student Presenter: Srinidhi Gadula, Nidhi Banker, Pravin Vathappallil, Qiangrong Liang, and Tamayo Kobayashi

Faculty Mentor: Satoru Kobayashi

School/College: Arts and Sciences, Old Westbury

Diabetic patients suffer from complications of hyperglycemia and hyperlipidemia, which can lead to cardiovascular problems. The precise mechanism behind this phenomenon is unclear, but it is often associated with cellular damage and metabolic dysfunction. Mitochondria are responsible for energy production within cells, and abnormal metabolic conditions like diabetes can cause mitochondrial dysfunction. Mitophagy, the selective lysosomal degradation of damaged mitochondria, is a critical process for maintaining mitochondrial quality. However, the effects of hyperglycemia and hyperlipidemia on mitophagy in cardiomyocytes are not well characterized. We hypothesized that mitophagy is compromised in cardiac muscle cells by hyperglycemic and hyperlipidemic stresses. In this study, we investigated the effects of high- glucose (HG) and high-fat (HF) conditions on mitophagy in cardiomyocytes. We cultured H9C2 cardiac cells in media containing high levels of glucose (30 mM) and/or palmitate (25uM). The mitochondrial fractions were collected and the mitophagy flux was measured. Western blot analysis showed that the protein levels of microtubule-associated protein light chain 3 form II (LC3-II), a marker of mitophagosome, were reduced by HG and/or HF in either the absence or the presence of lysosomal inhibitors, suggesting inhibited mitophagy flux. Future studies will determine if HG and HF induce diabetic cardiac injury via impaired mitophagy.

More Than A TV Show—How Scrubs Can Color Your Patient's Perspective

Student Presenter: Kyle Gillani and Andrew Cecora

Faculty Mentor: Colleen P. Kirk

School/College: Osteopathic Medicine, Old Westbury

The doctor-patient relationship is the very foundation of medical practice and is a vital determinant of health. Any factors or underlying biases that may influence this relationship can have drastic effects on short- and long-term health outcomes. It is well established that certain colors can elicit vastly different conscious, subconscious, or unconscious reactions in the observer and research exists suggesting an association between the color worn by a physician and the patient's perception of that physician. Further, prior research has documented the challenges faced by female physicians with respect to patient perception of their credibility. We hypothesize that scrub color will interact with the gender of a physician to influence a patient's perception of that physician's competence, warmth, and agreeability. This study aims to build upon the results published by Hribar, et al. with the intent of broadening the relevance and bolstering the rigor of their findings. This will be accomplished via online randomized between-subject experimentation with diverse participants blind to the study's objectives. Dependent measures will include perceived warmth, competence, credibility, and agreeability. Data will be analyzed via ANOVA and bootstrapping for mediation analysis. The researchers further hope to determine whether and to what degree factors such as race, education level, and location, among others, bias a patient's perception of their physician.

Regional Differences in Cerebral Microvascular Calcification Across Elderly Human Subjects With and Without Dementia at Time of Death

Student Presenter: Isabella Romano, Joseph Aabye, Olivia Ballone, Nicholas Weeks, and Kelly Borges

Faculty Mentor: Olga V. Savinova

School/College: Osteopathic Medicine, Old Westbury

Vascular calcification (VC), both a common age-related phenomenon and a consequence of atherosclerosis, is an independent predictor of cardiovascular and cerebrovascular events. While coronary VC results in impaired vasomotor response and reduced myocardial perfusion, less is known about the effects of VC in cerebral microcirculation. We aimed to (1) determine the prevalence and (2) quantify calcification volume throughout brain regions in which VC has been noted in case studies. In a cohort of human donor cadavers with and without dementia documented at time of death, tissue was sampled from five brain regions. Samples were scanned by micro-CT, segmented, and thresholded. Calcification volume was defined as voxel quantity meeting/exceeding 130 HU, and volume exceeding 1×10^6 μm^3 per ROI was considered "positive". Findings were confirmed by histology. All subjects exhibited parenchymal and/or VC in at least one region, indicating that intracranial calcification is more prevalent than published estimates. We noted regional differences within and between groups; consistent with the literature, VC was most prevalent in globus pallidus. Prevalence of hippocampal and posterior cingulate calcification was significantly greater in subjects with dementia (n=6) compared to age-matched subjects.

The Effects of Estrogen Deficiency in Aortic Stiffness and High Blood Pressure

Student Presenter: Harshita Pasupuleti and Yesha Patel

Faculty Mentor: Maria Alicia Carrillo Sepulveda

School/College: Osteopathic Medicine, Old Westbury

Menopause, characterized by low circulating estrogen, often leads to weight gain and puts women at high risk to develop hypertension. In obesity, arterial stiffness precedes hypertension. Our study aims to determine whether arterial stiffness precedes hypertension during menopause. We employed a preclinical model of menopause: 8-week-old female C57BL/6 mice were submitted to bilateral ovariectomy (OVX) under isoflurane anesthesia. Control Group was a sham operation. Four time-points will be studied: 1, 2, 3 and 4 months after OVX. Body weight will be obtained weekly. For each time-points, metabolic and cardiovascular parameters will be recorded. The metabolic parameters are waist circumference; body mass index; food/water intake and urine/fecal output obtained through metabolic cages; glucose tolerance tests; The cardiovascular parameters such as arterial blood pressure will be obtained monthly by using radiotelemetry, a gold standard for blood pressure measurements. Aortic stiffness will be determined by pulse wave velocity measurements by high-resolution ultrasound. Our preliminary data shows that after 7 weeks post OVX, female mice exhibited marked increased body weight, which confirm successful removal of the ovaries and validation of our mice model of menopause. 17B estradiol measurements will be obtained for full characterization of menopause state. Next, we will determine whether arterial stiffness precedes hypertension under low estrogen conditions.

The Need to Improve Transgender Patient Care

Student Presenter: Daniella Abramov

Faculty Mentor: Anthony Errichetti

School/College: Osteopathic Medicine, Old Westbury

The purpose of this poster is to demonstrate the current climate related to transgender patient care among medical students and physicians and to determine how training has improved and can continue to be improved for better healthcare outcomes for the transgender population. There will be a review of literature explaining how lack of training can increase risk of poor outcomes for transgender patients. This review will begin by addressing the research supporting the need for transgender-specific medical education to be received across all specialties, concluding with a special focus on the need specifically in plastic surgery. Current literature demonstrates that even though there have been several steps forward taken by the medical community to improve training for care of transgender patients, a gap in knowledge continues to exist and poses a threat on healthcare outcomes for this population. Furthermore, the review supports that medical students and physicians who have participated in educational activities, such as OSCEs, specific for improving care of transgender patients have positive outcomes and can be used as a reference for future transgender specific training. However, more research needs to be done in order to address the challenges associated with implementing these educational activities and to determine the true long-term impact on medical students and physicians using longitudinal studies.

Malware - A to Z behind Ransomwares

Student Presenter: Ankan Garg and Geovanny Lopez

Faculty Mentor: Sara Kanchi

School/College: Engineering and Computing Sciences, Vancouver

Malware, and ransomware attacks, in particular, have emerged as significant cyber-security threats wherein data is encrypted upon system infection. In the increasingly interconnected world and with the ever-evolving technology stack, ransomware is hitting individual users and big corporations across various business domains hard. When it comes to protection, there is no one size fits all solution, and there is no such consolidated framework that can identify and contain ransomware attacks in one go. We are here to present a framework entailing techniques, tools, and strategies to detect, avoid, and mitigate ransomware. We shall incorporate the modus operandi of the latest ransomware attacks, including some suggestions to contain its spread and bring business back to operation as soon as possible.

Metabolic and Cardiovascular Effects of Homoarginine on Healthy Mice: a Preclinical Study

Student Presenter: Anisa Raidah, Billy Ding, Xin Lin, Daniel Kalta, and Neil Kaungumpillil

Faculty Mentor: Olga Savinova

School/College: Osteopathic Medicine, Old Westbury

Plasma Homoarginine (hArg) is associated with better cardiovascular (CV) and renal prognosis. We previously reported that hArg increases left ventricular (LV) ejection fraction (EF), LV posterior wall thickness (LVPW), and LV mass in mice with chronic kidney disease (CKD) and reduces food consumption. It is unknown whether hArg has similar effects in healthy mice. We analyzed the cardiac and metabolic effects of hArg on healthy versus CKD mice. Healthy mice were supplemented with either placebo, hArg, or arginine (Arg, control for specificity of hArg) for eight weeks. Cardiac function was measured by ultrasound. Intakes (food and water) and outputs (feces and urine) were recorded. The results were compared by ANOVA and compared to the baseline. A two-way ANOVA analysis was conducted to compare CKD (data from our previous study) vs. healthy mice and hArg vs. placebo. In healthy mice, no significant difference was found in cardiac findings or food consumption amongst hArg vs. Arg groups however hArg increased water consumption.

Enhancing the Stability and Activity of Glucose Oxidase Through Interaction with Highly Curved Gold Nanoparticles

Student Presenter: Abdur-Rehman Hussain and Jeleeta Jolly

Faculty Mentor: Jacqueline Keighron

School/College: Arts and Sciences, Old Westbury

Interactions with gold nanoparticles have been shown to enhance the activity of enzymes such as glucose oxidase (GOx) due to the stabilizing effects of the highly curved surface. The enhanced enzyme activity of glucose oxidase can be applied to the area of biosensors. Glucose oxidase here is used as a low-cost model comparison to glutamate oxidase. By measuring the activity of glucose oxidase gold nanoparticle conjugates, we were able to optimize the interaction between enzyme and nanoparticle to enhance the design and function of enzymatic biosensors for glutamate, an important neurotransmitter. Overall, our results indicate that when glucose oxidase is adsorbed to highly curved nanoparticles in a single, densely packed layer, its activity is enhanced over that of enzyme free in solution.

Creating a Lateral Flow Assay to Detect E.coli

Student Presenter: Anjali Bhavsar, Zainab Mubasher, and Emaan Mughal

Faculty Mentor: Jacqueline Keighron

School/College: Arts and Sciences, Old Westbury

The goal of this research project was to design and characterize a fast and effective detection method for an analyte of interest, E.coli, in drinking water. These bacteria, which can infect our body's cells and induce illness, can be found in untreated water. In this study, we will design a test strip similar to the COVID-19 rapid test and see how a targeting molecule, such as an aptamer, can be used in conjugation with gold nanoparticles (AuNP) to detect E.coli. We first conducted research on the components of a lateral flow assay. The components include the sample pad, where the sample comes in contact with the test strip. The conjugate pad, where gold conjugated antibodies are rehydrated by the sample, and where the target molecule binds with the corresponding antibody. A membrane, where the test lines and control lines are found, and the absorbent pad which catches the excess sample. The conjugate pad we created contained Bovine Serum Albumin (BSA) conjugated AuNP as a preliminary test for AuNP flow. BSA is used instead of aptamars for simplicity and to test whether a flow assay with AuNP and BSA would function before moving on to aptamers. Further research would allow for these detection strips to be sent to countries that do not have the luxury of clean drinking water.

Multimodal Presentation on Art Spiegelman's "Maus"

Student Presenter: Jonathan Santos-Febus

Faculty Mentor: Lissi Athanasiou-Krikelis

School/College: Arts and Sciences, Manhattan

In my SOURCE presentation, I will present a multimodal assignment that I created in one of literature classes. I will analyze Art Spiegelman's famous graphic novel, Maus. Maus depicts Spiegelman interviewing his father about his experiences as a Polish Jew and Holocaust survivor. The work employs postmodern techniques and represents Jews as mice and other Germans and the Polish as cats and pigs. First, I will discuss the main character of Spiegelman's story, the author's father, Vladek, who is a survivor of the Holocaust. I will also share a video of the author speaking about how he felt when his book was banned and why it is important to have conversations about the Holocaust. I will also closely analyze some panels from the novels.

Tea on the Global Scale

Student Presenter: Jacqueline Sung

Faculty Mentor: Patty K. Wongpakdee

School/College: Architecture and Design, Manhattan

Tea was discovered accidentally by Emperor Shen Nung in 2732 BC when a leaf from a wild tree fell in his pot of boiling water. He named the brew "cha", the Chinese character meaning to check or investigate. (茶) As foreign trade increased, Chinese growers discovered that they could preserve tea leaves with a special fermentation process. The resulting black tea kept its flavor and aroma longer than the more delicate green teas and was better equipped for export journeys to other countries. Now, tea is consumed world-wide as the most consumed beverage after water. Shipments come in and out of different countries. Here is some information about the global happenings of tea along with some of its benefits!

Online Sports Betting Infographic

Student Presenter: Pat OToole

Faculty Mentor: Patty K. Wongpakdee

School/College: Architecture and Design, Manhattan

Poster Infographic (11x17) that visually overviews statistics about online sports betting. Online sports betting refers to the act of placing wagers on sporting events through internet-based platforms. This type of betting has grown in popularity over the years due to its convenience and accessibility. What sparked my interest is the popularity amongst college students to use fairly new/legalized online betting apps.

It's More Than Baby Blues

Student Presenter: Rachel Goff

Faculty Mentor: Patty K. Wongpakdee

School/College: Architecture and Design, Manhattan

This project is an infographic poster displaying statistics and informative facts on Postpartum Depression. This infographic would be made up of many visual displays such as charts and graphs, as well as some text. The overall goal of this infographic is to provide clear and accessible information to new or expectant mothers as to what Postpartum Depression is so they can determine if they are experiencing symptoms. Oftentimes new mothers are not informed on Postpartum Depression, and this infographic would aid in ensuring every mother has all the information they need to remain mentally and physically healthy in this new chapter of their lives. Sources for project: https://www.cdc.gov/prams/prams-data/selected-mch-indicators.html https://ccmchc.org/wp-content/uploads/2021/08/Ceballos-Wallace-Goodwin-2016.pdf https://www.postpartumdepression.org/resources/statistics/ https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4720860/

All Things Tequila

Student Presenter: Karina Palacios

Faculty Mentor: Patty K. Wongpakdee

School/College: Architecture and Design, Manhattan

In recent years, tequila has become an increasingly popular spirit around the world. The reason why this topic is worth exploring is because it sheds light on the growing demand for tequila, its cultural significance, the varieties of the spirit, and its impact on taste and quality. As a Mexican-American, this gave me the opportunity to learn more about my culture and its roots since it's not mentioned frequently. The objective of this infographic is to inform viewers about its rich history, varieties, production process, and the difference between another similar spirit— mezcal.

Where is Your Accent From?

Student Presenter: Styliani Rallis

Faculty Mentor: Patty K. Wongpakdee

School/College: Architecture and Design, Old Westbury

New York City is the most linguistically diverse metropolis in the world, occupied by speakers of approximately ten percent of the world's 6000-7000 languages. As a bilingual myself, I am always interested in learning about other languages and cultures as well as sharing my own. I will show the breakdown of this data through an information graphic to illustrate the diversity of New York City.

Enhancing Neurotransmitter Detection with Electrochemically Etched Carbon Fiber Microelectrodes and Enzyme-Nanoparticle Functionalization

Student Presenter: Aakash Soni, Stevin Thomas, Sana Naeem, and Abdur-Rehman Hussain

Faculty Mentor: Jacqueline Keighron

School/College: Arts and Sciences, Old Westbury

Carbon fiber microelectrodes (CFMEs) are a useful tool in neuroscience to examine the release of neurotransmitters. A potential application of these microelectrodes unlocks when paired with a nanomaterial scaffold and an enzyme. At the moment, glucose oxidase is being used as a model enzyme with the intention of developing a sensor for glutamate oxidase. This combination can be used to directly quantify the release of the important neurotransmitter, glutamate. In this study, we have applied an electrochemical etching technique for our CFMEs which reduces the diameter of the tip, thus greatly increasing its ability to be inserted into interstitial spaces. This would allow our CFMEs to be wedged into spaces on the cellular level, specifically the synaptic cleft. Therefore, more accurate measurements of neurotransmitters in the synaptic cleft can be conducted.

Men's Mental Health in College

Student Presenter: Subarna Dutta

Faculty Mentor: Patty K. Wongpakdee

School/College: Architecture and Design, Manhattan

At a college level, mental health can take a big toll on students impacting their education, relationship, and their general college experience, causing one to miss out on college activities and the freedom around. However, while we talk about college students, my poster is an infographic that talks about mental health revolving around men. We as a society focus so little on men's mental health that we forget that it can affect them as well. My infographic will discuss the effects that mental health takes upon men and the aftermaths of it, such as the statistics of the number of men that are affected, the usage of substance abuse, emotions that they feel, and suicide. With my poster presentation, I hope to not only give an insight and educate people about how important it is to understand men's mental health, but to grow this awareness in most people and spread the message.

Exploring Quantum Algorithms to Solve a Rubik's Cube

Student Presenter: Joanna Pedretti, Ali Gedawi, Shwetha Jayaraj, Bryan Garay, and Sabrina Wang

Faculty Mentor: Yusui Chen

School/College: Engineering and Computing Sciences, Old Westbury

A Quantum Rubik Cube, meant to show the complexity of a task to generalize, create, and solve a Rubik's cube in various dimensional spaces. On a traditional 3 x 3 Rubik's cube, we rotate it in a 3-dimensional space to solve it on each of its respective faces. Classical methods using machine learning algorithms require much more time, money and effort to run. In this project we propose instead of classical algorithms and computers to solve a 3 x 3-dimensional problem in various quantum states, we propose to utilize a quantum computer, and develop new algorithms to solve, and subsequently lower the time, money, and effort. We will map each individual color as a quantum bit, their values represent the direction rather than the various colors. Thus, each rotation of the scrambled cube will be represented as a quantum gate acting on a collection of qubits. From this, a solved state represents each of these qubits pointing in the correct direction. We then can explore quantities to measure the distance between the solved and scrambled state, such as fidelity of quantum states. Once developing these algorithms, we can easily use this method to minimize the cost function to quickly solve and optimize systems to apply for machine learning algorithms on the quantum realm.

Echocardiographic Features of Mouse Model in Chronic Kidney Disease

Student Presenter: Alexander Malayev, Puneet Dhaliwal, Danyang Ma, Saud A. Nasruddin, and Michael Gao

Faculty Mentor: Olga Savinova

School/College: Osteopathic Medicine, Old Westbury

Patients presenting with chronic kidney disease (CKD) are more likely to have cardiovascular diseases (CVD). Vascular calcification is a hallmark of CVD in patients with CKD. In this study, we aimed to investigate the effect of CKD-induced vascular calcification on the progression and regression of atherosclerotic CVD. Mice with low-density lipoprotein receptor gene mutation were divided into two groups. In the experimental group, CKD was induced by supplementing their diet with 0.2% adenine, a nephrotoxin. Both experimental and control groups were fed a western diet. Standard echocardiograms and carotid-femoral pulse wave velocity (PWV) were obtained at baseline and 18 weeks of age. Cardiac parameters, including heart rate, left ventricular (LV) diameter, and wall thickness were recorded to calculate ejection fraction, cardiac output, and LV mass. A two-way ANOVA was used to determine the effect of adenine on structure and function after adjusting for sex. A significance was accepted at $p < 0.05$. Consistent with our prior observations, our results showed that mice with CKD had reduced heart rate and increased left ventricle internal diameter and wall thickness adjusted to the body weight. Here, we have established a reproducible model of CKD-induced cardiac dysfunction. This model will be used to study lipid abnormalities associated with adenine treatments and the effect of CKD-induced calcification in the progression and regression of atherosclerosis and cardiac physiology.

Does Tissue-Nonspecific Alkaline Phosphatase Deficiency in Hepatocytes Affect Cardiac Function and Arterial Stiffness in Mice with Atherosclerosis?

Student Presenter: Harshul Singh, Saud A. Nasruddin, Neil Kaungumpillil, Danyang Ma, and Michael Gao

Faculty Mentor: Olga Savinova

School/College: Osteopathic Medicine, Old Westbury

Vascular calcification, mineral deposits in the blood vessels and valves, could lead to arterial stiffness, stenosis of the valves and heart failure. Tissue-nonspecific alkaline phosphatase (TNAP) impacts cardiovascular mortality by increasing atherosclerotic plaque calcification. Higher circulating TNAP levels are associated with increased cardiovascular risk. Inhibiting TNAP could improve therapeutic approaches by understanding the effect of calcification on atherosclerosis. Our study was designed to evaluate whether a genetic deficiency of TNAP in hepatocytes can improve cardiovascular outcomes in a mouse model of atherosclerosis. 9-13 mice of each sex were included in the study. All mice had a mutation in the low-density lipoprotein receptor and were exposed to an atherogenic western diet starting from 8 weeks of age for 15 weeks (an intermediate time-point) or for up to one year of age. The echocardiographic data were collected, and the results of the intermediate time-point were analyzed. Data were compared by a two-way ANOVA accounting for sex (males vs. females) and genotype (hepatocyte TNAP knockout vs. wild-type TNAP). No significant effects of TNAP deficiency were observed at the intermediate time-point of the study, we found no significant differences between groups with respect to the left ventricular structure and function and the aortic stiffness. A long-term effect of TNAP deficiency on atherosclerotic calcification awaits further testing.

Saudi Traditional Art: Qatt Alasiri

Student Presenter: Shantha Ali A

Faculty Mentor: Ellie Schwartz

School/College: Management, Manhattan

It's my pleasure to participate in this event displaying some of my Art works showing one of the traditional Saudi arts called Qatt Alasiri. Qatt Al-Asiri, a traditionally female interior wall decoration, is an ancient art form considered as a key element of the identity of the region of Asir. It is a spontaneous art technique carried out largely by women today in the community that involves decorating the interior walls of their houses, specifically rooms for visiting guests. Women invite female relatives of various age groups to help them in their homes, thereby transmitting this knowledge from generation to generation. The base is usually white gypsum and the patterns consist of icons of geometric shapes and symbols. In the past, only women practised the element, but nowadays male and female artists, designers, interior designers and architects practise it, including on other surfaces. The art enhances social bonding and solidarity among the community and has a therapeutic effect on its practitioners. The application of the art in most households ensures its viability within the community, and local individuals have created galleries within their houses in order to safeguard it. Observation and practice are the key methods for transmitting the practice from one generation to the next, and societies, NGOs and individuals all play a key role in safeguarding, promoting and transmitting the related knowledge and skills.

A Comparison of Echocardiogram Parameters in Ehlers-Danlos Syndrome (EDS) Patients with and Without Mast Cell Activation Syndrome (MCAS)

Student Presenter: Anisa Raidah, Nolberto Jaramillo, Casey Sciandra, and Bernadette Riley

Faculty Mentor: Todd J. Cohen

School/College: Osteopathic Medicine, Old Westbury

Background: Mast Cell Activation Syndrome (MCAS) is a chronic multisystem disorder caused by inappropriate mast cell activation. It is commonly associated with EDS, a connective tissue disorder. Cardiovascular manifestations include arrhythmias, blood pressure dysregulation, pericarditis, heart failure, aneurysms, and vasculitis. Echocardiogram parameters in patients with MCD and EDS have not been previously studied. Methods: This study included all MCD patients with EDS and an echocardiogram seen at the Long Island Heart Rhythm Center. Echocardiographic parameters were compared between patients with and without MCD, using the Wilcoxon rank sum test. Data are reported as mean + standard deviation. Results: 35 EDS patients with transthoracic echocardiograms were divided into two groups: MCD (n=12, age 36.4 ± 13.2 years, 11 females, 1 male) and no MCD (n=23, age 37.5 ± 12.1 years, 23 females). There was no significant difference in mean body surface area, left-ventricular ejection fraction, interventricular septal thickness, left ventricular diameter during systole and diastole, aortic diameter, and left atrial diameter. Conclusion: Patients with MCAS have normal echocardiogram parameters that are not significantly different from those without. More studies are needed to characterize this difference.

Literature Review of OMM Lymphatic Drainage Techniques for Patients Suffering from Venous Insufficiency or Peripheral Arterial Diseases

Student Presenter: Iya Agha

Faculty Mentor: Sheldon Yao

School/College: Osteopathic Medicine, Old Westbury

This is an abstract detailing a literature review done in hopes of understanding the benefits of utilizing lymphatic drainage OMT as adjunctive therapy for patients suffering from lower extremity ulcers, venous stasis, and chronic venous insufficiency. A total of eight papers were included after meeting specific inclusion criteria relating to the relevance of the topic and future expansion of this work for a prospective study on improving lymphatic drainage for this patient population. Patients who suffer from venous insufficiency and peripheral arterial disease often present with ulcers or non-healing wounds in outpatient clinics. Utilizing OMM lymphatic drainage techniques to restore patient structure and function is proposed to possibly improve outcomes for patients with non-healing wounds on the lower extremities. As lessening edema is a mainstay for the standard of care therapy for lower leg ulcers, it has been concluded that more research with a greater number of subjects in a randomized setting should be done to further understand the benefits of utilizing these techniques and integrate them into patient care.

Cardio360

Student Presenter: Parker Mixon, Yisrael Feman, Robert Hubley, and Jerry Jose

Faculty Mentor: Todd Cohen

School/College: Arts and Sciences, Manhattan

Cardio360 is a virtual reality (VR) teaching platform designed to enhance the understanding of multi-scale cardiac electrophysiology by medical students. Currently, our platform focuses on single-cell physiology and provides an animated 3D model of the ventricular cardiomyocyte. This model can demonstrate the cellular-level events, such as the magnitude and direction of ion currents, that occur during their respective phases of the normal action potential. Our team is in the process of expanding Cardio360 by modifying the mathematical model in order to visualize cellular-level events that can occur pathologically. Specifically, we aim to create animations that show the effects of genetic mutations, electrolyte disorders, and drugs on the action potential and associated electrocardiogram (ECG). One example would be an animation for visualizing the cellular-level events that occur in the familial sudden death condition called Brugada syndrome. In Brugada syndrome, abnormalities in the Ito current give rise to changes in the action potential and eventually predisposes the patient to a deadly arrhythmia called polymorphic ventricular tachycardia. This is just one of the many phenomena that will be shown in our immersive VR environment. With Cardio360, medical students will have an incredible tool in their arsenal of educational resources that they can use in order to better understand basic and complex cardiac electrophysiology concepts and conditions.

Fluid-Structure Interaction Analyses of Vasculature and Aneurysms

Student Presenter: Faiz Syed and Sahar Khan

Faculty Mentor: Milan Toma

School/College: Osteopathic Medicine, Old Westbury

The application of fluid-structure interaction (FSI) enables a holistic analysis of structural and fluid domains in a system. Using MRI and CT images facilitates the generation of patient-specific models for detailed hemodynamic analyses, making it an indispensable tool to understand vasculature characteristics within the human body. Our PubMed search shows extensive literature backing FSI for modeling vasculature and predicting aneurysm outcomes. The review examined 20 FSI-related articles on vascular modeling and 57 articles discussing its role in creating predictive models for aneurysms. These findings emphasize the advantages of using FSI techniques when analyzing intricate vascular systems with associated pathologies. The utilization of FSI research is gaining significance in medical diagnostics. Technological progress has enabled the measurement of wall shear stress and hemodynamic risk indexes, thereby aiding treatment decisions and enhancing patient outcomes. The application of FSI in modeling blood vessels is an advantageous tool for comprehending and treating brain and aortic aneurysms. Integrating FSI into treatments, like stents, presents therapeutic benefits that underscore its potential in managing degenerative vascular conditions. These discoveries indicate the significance of further exploring FSI as a viable approach to augmenting treatment options for patients with vascular diseases.

Borderlands

Student Presenter: Leah Smit

Faculty Mentor: Kevin Park

School/College: Architecture and Design, Manhattan

My thesis, *Borderlands*, explores the use of projection mapping to create an immersive installation that portrays the harsh reality of the migrant journey across US borders. This installation aims to raise awareness and empathy towards the struggles that migrants face during their journey. *Borderlands* was inspired by choreographer Eileene Vicencio, who has been working as a content advisor on the project. Her insights and perspectives on the migrant journey have influenced the design and narrative of the installation, adding a unique artistic and cultural perspective to the project. The installation is designed to be a multi-sensory experience that engages the audience through visual and audio elements. The projection mapping technique is used to project images and videos onto a three-dimensional surface, creating an illusion of a journey through different landscapes. The sound design complements the visuals, immersing the audience in the journey and creating an emotional connection. As part of my research for *Borderlands*, I looked into the impact of immersive installations in museums and galleries in New York City. I conducted interviews with individuals about their understanding of the border crisis and previous experiences with art that had underlying political or humanitarian themes. These insights have helped shape the design and narrative of the installation, ensuring that the viewers' intended experience is achieved.

Osteopathic Medical Students Preference on Osteopathic vs Allopathic Degree Based on Their Desired Specialty

Student Presenter: Lucas Hildreth, Anisa Raidah, Pauline Huang, Naveed Tariq, and Helen Wong

Faculty Mentor: Sheldon Yao

School/College: Osteopathic Medicine, Old Westbury

Background: Previous studies have looked into perceptions of allopathic versus osteopathic physicians. However, osteopathic medical students' preference on osteopathic vs allopathic degree associated with desired specialty has not been extensively studied. Objective: Examine the effect of desired specialty on perception of osteopathic and allopathic medical degrees. Methods: The research protocol was deemed exempt by the NYIT IRB. A self-administered 43- item confidential questionnaire was distributed to all current medical students at NYITCOM using an email listserv. The questionnaire included items addressing student perceptions toward allopathic and osteopathic degrees as well as desired specialty. The data was collected using Survey Software. The data was compared using a chi-squared test and significance is deemed as a p-value.

The Impact of Music on Kama Muta: A Comparison of Advertisements With and Without Music.

Student Presenter: Bhavi Doshi, Nehal Beniwal, Pradhyumna Alone, Darshil Ajudia, and Katherine Kingsly

Faculty Mentor: Colleen Kirk

School/College: Management, Manhattan

Music has been an important part of advertisements and has been shown to increase their emotional impact. Background music in commercials contains elements that arouse responses from the target consumers either by a touching advertising message or triggering consumers' past experiences. Past research has supported the hypothesis that music evokes emotions which increase the likelihood of a product being purchased by consumers. Building on past research, the current study aims to assess the impact advertisements with and without music have on the feeling of being moved, known as kama muta, and if kama muta has any effect on the intent to purchase the product being advertised. The study will be investigated with 200 Mturk participants, in a randomized between-subjects experimental design, who would be administered the Kama Muta Scale, and the Intent to Purchase scale, as well as the Crying Proneness Personality Trait scale, after showing the advertisement. Thus, it would be hypothesized that there would be a difference between the kama muta levels of advertisements with and without music and that higher kama muta would have a higher intent to purchase the product. Keywords: advertisement, music, kama muta, purchase to intent.

Engineering Student Explores Careers in Game Design

Student Presenter: Christian Hodge

Faculty Mentor: Vanessa Viola

School/College: Engineering and Computing Sciences, Old Westbury

Over the past semester, I have investigated game design and game developer careers; which was conducted and accomplished through an annotated bibliography research paper as part of my FWS with the Art & Architecture Library. If approved to present at the SOURCE event, my poster will illustrate my findings and the potential of these two career paths. Below is a brief summary of those findings. Choosing the right career as a STEM major can be intimidating when you want to study in fields that you believe fit your passions & aspirations. Yet, the lack of motivation that I've witnessed within the Engineering/ Computer Science spaces seems to be more drastic. So, I'm here to help my fellow students by providing them with a possible alternative career choice being Game Design or Game Developer. While video game designers are involved in all the creative aspects of making a game, game developers or programmers are responsible for the actual coding and technical aspects. Like any professional field, careers in game design/ development allow you to have a specialization which highlights your strengths to future employers. Some vital specializations that many students possess are management, creative content, level design, and even programming. By showcasing these as well as understanding how obtainable a career in game design/ development can be, I hope to inspire anyone having trouble deciding their future and searching for love in their studies.

The Polish Crested Chicken's Herniated Brain: What's on its Mind?

Student Presenter: Mohit Shah

Faculty Mentor: Akinobu Watanabe

School/College: Health Professions, Old Westbury

How do brain morphologies change over time? Studies on this topic generally rely on incomplete fossil records to infer evolutionary changes occurring across millions of years or by using model organisms that target a single species. These methods limit our ability to understand actual evolutionary mechanisms. In this study, we introduce a promising model to look at how new brain configurations develop over time. The Polish crested chicken (PCC) is a breed of chicken that has been artificially selected for its crest of feathers on its head. Notably, this phenotype is associated with a cranial protuberance of the skull and a cerebral herniation that occupies this protuberance, leading to a 'dumbbell-shaped brain'. Despite having only recently diverged from domesticated chicken breeds, like the white leghorn chicken (WLC), this unique brain morphology is found only in PCCs. To define and differentiate the internal brain anatomy of PCCs, we CT-scanned head samples of both PCC & WLC chickens intending to create a high-resolution 3D brain atlas. Preliminary results indicate that PCCs possess a proportionally smaller hyperpallium and proportionally larger hippocampus when compared to WLCs. This data may indicate distinct behavioral or functional differences between the two breeds. Future research will help clarify the origins of unique brain morphologies, including our own, and how internal neuronal structures and connections respond to drastic changes in brain configuration.

Bioinformatic Analyses of Gene Expression During Normal and Abnormal Fracture Repair

Student Presenter: Rishika Thayavally

Faculty Mentor: Leonidas Salichos

School/College: Arts and Sciences, Old Westbury

Fracture healing is a complex process that involves regeneration in order to restore the bone's proper structural and functional integrity. Physiological bone repair is a multistep process that involves the formation of a hard and soft callus, endochondral ossification and remodeling. Though healing times vary depending on the case, most human fractures heal within 6 to 12 weeks. However, approximately 10% of fractures fail to heal, resulting in a delay or nonunion. Nonunions typically require surgical intervention to promote proper healing and can have a significant impact on an individual's quality of life. Despite advancements in scientific understanding and treatment methods, the rate of fracture nonunions remains fairly constant. Moreover, the molecular differences between physiological fracture repair and nonunions remain elusive. To gain a better understanding of these differences, we conducted a total RNA sequence analysis of human fracture callus (representing normal healing) and nonunion tissues (oligotrophic and hypertrophic). Bioinformatic analyses revealed that thousands of genes are expressed. Additionally, specific signaling pathways are also activated. Previous studies have identified specific pathways affected by miRNA and we were able to confirm this using RNA sequence analysis. Through differential gene expression analysis, we also hope to identify relevant biological pathways that may be affected in the three conditions.

The Effects of Pre-Lab Mindfulness Exercises on Student Engagement

Student Presenter: Gianna Davillas and Gianna Petrillo

Faculty Mentor: Sheldon Yao

School/College: Osteopathic Medicine, Old Westbury

Medical students have high stress levels as they need to balance many aspects of their lives. This includes lectures, labs, research, extracurriculars, and their personal lives. Mindfulness techniques have become more popular as a way to alleviate some stress. To help increase student engagement during the Osteopathic Manipulative Medicine (OMM) lab, mindfulness exercises were used to promote student focus and engagement. Our goal was to determine their effectiveness in improving first and second year OMM laboratory sessions. At the beginning of each OMM lab, students were given an exercise to do for approximately 5 minutes. Exercises included palpation, meditation, or breathing techniques. Once the semester ended, a survey was sent to first- and second-year students to assess the effectiveness of the exercises. The survey received 103/322 responses from first-year students and 104/301 responses from second-year students. Results indicated that 49.5% of 103 respondents and 38.5% of 104 respondents found the exercises very helpful. Additionally, 30.1% and 28.9% of first- and second-year respondents respectively believe the exercises were moderately helpful. A small percent found the exercises not very helpful or not at all helpful. Overall, the survey revealed that most students found the exercises to be helpful in their engagement and learning during OMM lab. Further studies should be done to assess the effects of incorporating mindfulness techniques into classroom settings.

The Relationship between Gender and Desired Specialties in Osteopathic Medical Students

Student Presenter: Helen Wong, Pauline Huang, Anisa Raidah, Lucas Hildreth, and Naveed Tariq

Faculty Mentor: Sheldon Yao

School/College: Osteopathic Medicine, Old Westbury

Diversity in medicine, especially in gender equality of provider, has been a goal of many professional organizations, like the American Association of Colleges of Osteopathic Medicine (AACOM). Starting in 2020, female matriculants to osteopathic medical schools surpassed male matriculants. With this new change in demographics, general perceptions of osteopathic medical students should be re-established. To determine whether diversity in medicine extends to residency and career selection, we are examining the relationship between gender and desired specialty. A self-administered 43-item confidential questionnaire was distributed to all current medical students at NYITCOM using an email listserv. The questionnaire included items addressing student perceptions toward OMM, demographics, and desired specialty. 249 students completed the questionnaire. A chi-square analysis on the association between "desired specialty" and "male or female" resulted in a statistically significant p-value of 0.001. Compared to the female group, the male group preferred medical or surgical specialties with higher proportions. The female group preferred primary care specialties. Many factors are known to influence the specialty pursued by medical students; this statistically significant difference indicates that gender may be an important determinant for career choice.

A Multivariate Approach to Cervical Cancer Detection: Utilizing Indistinct Nuclear Shape and Texture Features for Improved Classification

Student Presenter: Mary Margarette Sanches, Dono Shodieva, and Angel Singh

Faculty Mentor: Niharika Nath

School/College: Arts and Sciences, Manhattan

Cervical cancer screening using pap smear staining and microscopy is a manual process that can be time-consuming and prone to human error. Our research investigates nuclear features to improve detection efficiency and classification. We examined the potential of indistinct nuclear shape (Nuclear Minor Axis and Major Axis Length) and texture features (Angular Second Moment (ASM), Contrast, Correlation, Inverse Difference Moment (IDM), and Entropy) to discriminate normal, moderate, and severe dysplastic cells of a benchmark dataset. We used Cell Profiler to extract the nucleus and its features, then conducted non-parametric tests, specifically Rank Sum and Kruskal-Wallis to determine statistical significance. Rank Sum results indicated that all texture features discriminated Normal vs Severe while most for Normal vs Moderate dysplastic cells (except for IDM).

Informal Resiliency

Student Presenter: Santiago Hernandez

Faculty Mentor: Farzana Gandhi

School/College: Architecture and Design, Manhattan

My thesis work Involves research about Moravia, a town in Medellin Colombia. Originally a landfill, the informal settlement of Moravia in Colombia was first occupied by its residents who arrived as trash pickers. Interestingly, trash collection and management and infrastructure are absent in the informal community today. The settlement also suffers from issues of flooding, polluted creeks, steep topography, unpaved and narrow roads or steep stairs, soil movement, and lack of sewage and freshwater supply. With my project I am proposing a new system of recycling, upcycling, and water filtration that will also bring new forms of the economy to Moravia's residents. This will comprise (1) a decentralized trash dock collection system, (2) trash compaction, recycling, and composting as separate facilities, and finally, (3) a water treatment plant. educating and encouraging new relationships with trash, offering new formal opportunities for the economy, and developing a clean, environmentally resilient, and socially vibrant community, each element will be programmed with public activities and participation. sensitive to the self-built context, these insertions will be a form of urban acupuncture and will encourage participatory design and construction, where appropriate.

The Relationship Between Patient Height and Depth of Cardiac Structures: Potential Implications for Transesophageal Echocardiography

Student Presenter: Alex Toufexis, Luke Zappia, and Maher Kazimi

Faculty Mentor: Nathan Thompson

School/College: Osteopathic Medicine, Old Westbury

The close anatomical relationship between the esophagus and cardiac structures has lent itself useful in a myriad of diagnostic and interventional procedures. However, no study has investigated the potential relationship between patient height and the depth of cardiac structures. The purpose of this study is to evaluate this potential relationship for the optimization of catheter length and probe placement.

Phylodynamic analysis of Hepatitis D Virus in Italy

Student Presenter: Nayan Pallothu

Faculty Mentor: Leonidas Salichos

School/College: Health Professions, Old Westbury

Hepatitis D virus (HDV) is responsible for 48 million infections worldwide. Transmission of HDV can occur either through coinfection or superinfection with hepatitis B (HBV). In combination with HBV, hepatitis D has the highest fatality rate of all hepatitis infections, at 20%. HDV has a wide geographic prevalence in many countries in Western and Central Africa, however, the history of genotype 1 is mostly unknown. Using a Bayesian coalescent skyline analysis, two noticeable upticks in population growth are noticed, around the early 1700s and a more significant increase in population in the early 1900s. The analysis also revealed most patient sequences clustered with Genotype 1 and it is possible to infer that they can be further divided into 2-3 major clades. These clades show a common ancestor between 1935 and 1955 suggesting the introduction of HDV to the region the patient data was sourced from was around this time. The Birth and Death model displayed a mutation rate of 3.04E-4 with a 95% HPD interval of 3.45E-5 to 5.72E-4. Through the Birth Death Skyline Serial Analysis, the Reproductive number (Re) was estimated for 5 distinct periods. The estimated Re per period were 1.4, 1.5, 1.4, 1.4, and 4.15 respectively. After the virus was introduced in Italy, our data shows that there has been a significant increase in its reproduction number, suggesting that every person is now responsible for a little more than 4 infections.

Mapping Lola Pulido

Student Presenter: John Mari

Faculty Mentor: Katherine Williams

School/College: Arts and Sciences, Old Westbury

Originally assigned as a multimodal literary analysis for a literature course, this poster displays the riveting story of a Filipino-American called Eudocia Tomas 'Lola' Pulido. Events from her birth in Tarlac Province to her toil raising the Tizon children in Seattle, Washington are chronicled as described from the perspective of one of the Tizon children - Alex. Although Alex Tizon, a Pulitzer Prize-winning journalist, is no longer with us, this poster seeks to capture the essence of his article "My Family's Slave", Lola, in a clockwise timeline and map of her life.

Assessment of PDE5 Inhibitory Activity of Novel Compounds for Potential Therapeutic Applications in Alzheimer's Disease

Student Presenter: Ahnaf Zaman and Justin Edward

Faculty Mentor: Jole Fiorito

School/College: Arts and Sciences, Old Westbury

This research study aims to determine the IC-50 values of four phosphodiesterase 5 (PDE5) inhibitors, namely II-47, II-58, II-51, and II-53. PDE5 is an isoform of the phosphodiesterase enzyme family that selectively cleaves cGMP to GMP. It has been shown that PDE5 has a role in the transcriptional regulation of proteins that affect neurogenesis and synaptic plasticity. The inhibitors were tested against PDE5 enzyme activity using a high-performance liquid chromatography-mass spectrometry, and the concentration required to inhibit 50% of enzyme activity was determined. The results showed that all four compounds exhibited inhibitory activity against PDE5, with IC50 values ranging from 1.37 to 15.46 uM. In particular, II-51 exhibited the highest potency among the inhibitors tested, with an IC50 value of 1.37 uM. This advances research for potential applications of PDE5 inhibitors such as Alzheimer's Disease and other related disorders.

The Future of Telehealth

Student Presenter: Dennis Lysov, Yelizabeta Skorokhod, and Shivani Rana

Faculty Mentor: Joerg Leheste

School/College: Osteopathic Medicine, Old Westbury

Due to the growing need during the COVID-19 pandemic, the CDC issued guidance for telehealth use in February 2020, followed by the 2021 Expanded Telehealth Access Act providing reimbursement eligibility to healthcare practitioners under Medicare. By analyzing this emerging platform, we aim to identify strategies for the optimization of telehealth utilization for improvements in primary care patient encounters. This analytical health-policy review investigates and interprets information published articles associated with the Centers for Medicare & Medicaid Services (CMS), National Library of Medicine (NLM, Pubmed), Library of Congress, and other vetted resources. We drew conclusions based on the current legislation regarding consequences and stakeholder positions in telehealth. Telemedicine provides opportunities for diagnosis, treatment, education, and rehabilitation, and allows the monitoring of patients with a variety of chronic diseases. Studies indicate that telemedicine intervention lowers hospitalization time and reduces mortality rates compared to standard outpatient care. It also reduces socioeconomic disparities regarding access to care and provides equal opportunities to patients from rural areas. Telemedicine emerges as a solution allowing access in a flexible, affordable, and value-based way.

Does Intention to Practice Osteopathic Manipulative Techniques Depend on Specialty Choice?

Student Presenter: Pauline Huang

Faculty Mentor: Sheldon Yao

School/College: Osteopathic Medicine, Old Westbury

Background: Utilization of osteopathic manipulative techniques (OMT) across medical specialties has not been well studied. In our survey, we seek to determine if there are differences in perception towards utilization of OMT amongst medical specialties before students graduate from medical school. Goal: Examine the relationship between specialty choice and intention to utilize osteopathic manipulative techniques Methods: The research protocol was deemed exempt by NYIT IRB. A self-administered 43-item confidential questionnaire was distributed to all current medical students at NYITCOM using an email listserv. The questionnaire included items addressing student perceptions toward OMM, student demographics, and desired specialty. The data was collected using Survey Software. The data was compared using a chi-squared test and significance is deemed as a p-value.

Two Klebsiella Pneumoniae Bacteriophages Isolated from NYIT Wastewater

Student Presenter: Sultan Mirza, Ameer Menwer, Gina Nagib, and Catherine Istafanos

Faculty Mentor: Bryan Gibb

School/College: Arts and Sciences, Old Westbury

Phage therapy is a promising approach to treating bacterial infections that involves the use of bacteriophages, which are bacterial viruses that can infect and kill bacteria. Klebsiella pneumoniae is an opportunistic bacterial pathogen that is usually non-fatal, but this bacterium readily acquires antibiotic resistance genes, making it a growing public health threat. To better understand the characteristics of these phages, researchers have isolated two samples of sewage water collected from the NYIT wastewater treatment facility called Century Club and Twin Flame. Century Club infected just the isolated host, while Twin Flame was able to infect three additional strains of K. pneumoniae, suggesting a broader host range. Genome sequencing of both phages is currently underway to further reveal their characteristics and help determine if either phage harbors therapeutic potential.

Alice Multimodal Project

Student Presenter: Esther Bilenkin

Faculty Mentor: Lissi Athanasiou-Krikelis

School/College: Engineering and Computing Sciences, Manhattan

A multimodal project on Alice in Wonderland covering some of the many avenues in which the author ridicules the then-current market for children's literature, its legacy since the time of its publishing, how removed from the source material some of its modern iterations have become, and some media which still capitalizes upon it to date.

Predicting Change of Direction on NBA Games

Student Presenter: Tamzid Ullah

Faculty Mentor: Richard Meyers

School/College: Engineering and Computing Sciences, Manhattan

There is an algorithm on the Internet that maps a win probability graph for NBA basketball games that evolves as the game progresses. My project will emulate this algorithm where it finds the probability of a team's winning a game following each scoreboard change that occurs during the game's progress. Based on the time remaining and the nature of the last points scored, the algorithm will predict the probability of a given team being the eventual winner. We obtained the data to apply on the algorithm from the history of games played from ESPN.com.

Towards a New Model of Experiential Learning for the Quantum Programmer

Student Presenter: Shwetha Jayaraj

Faculty Mentor: Michael Nizich, Roger Yu, and Yusui Chen

School/College: Engineering and Computing Sciences, Manhattan

This work is my final graduate thesis on quantum computing methods from the College of Engineering & Computing Sciences. I will be pulling from the experiential education in quantum technologies I've gained from traveling to TechCrunch, insights gained here in Manhattan from the diverse students in NYIT, and most recently upon discussing quantum programming tools with presenters at the University of Tokyo, which have added to the collaborative education track I've developed in studying quantum technology at New York Tech. Abstract: Quantum technologies have applications in the world that we have not historically learned about or been made aware of in an educational setting. Knowledge transfer is already difficult with this individual method and often requires specific mentorship from those already within the various corporate quantum industries. The processes discussed in this project are in hopes of meeting the bottleneck in quantum computing education issue directly by outlining the methodology for how any curious quantum student may be able to get their brains thinking and hands directly on tools to begin testing out the unconventional computational power available at their fingertips despite not having a personal quantum computer! By developing a curiosity-driven educational mindset of a technical student, the intended goal of building an interdisciplinary quantum experiential program can be achieved by any learner, as outlined in within this project roadmap.

Mind is a Prison

Student Presenter: Shikha S. Gandhi

Faculty Mentor: Michael Overby

School/College: Architecture and Design, Manhattan

This painting embodies the intricate workings of the mind, with its plethora of thoughts and actions that shape our daily lives. It depicts the mind as both a sanctuary and a prison, a place where we can nurture our ideas and dreams, but also a place where we can feel trapped by our thoughts. Just as our eyes are said to be the windows to our soul, the mind is a window into our innermost being, where we confront joys and struggles. The painting's theme is derived from the multifaceted nature of the human brain. It portrays the overwhelming complexity of our thoughts and the challenge of navigating through them. Despite our best efforts to clear our minds of unnecessary clutter, we often find ourselves unable to escape the constant stream of ideas and emotions that flood our consciousness. Through this painting, the artist invites us to explore the intricate landscape of our minds, embrace its beauty and complexity, and find peace within the chaos. It is a powerful reminder that while our minds can be both a source of comfort and discomfort, they are ultimately a reflection of our unique humanity.

Genome Analysis of Two Related Bacteriophage Therapy Candidates Infecting Citrobacter Freundii

Student Presenter: Jessica Wang and Anna Makedonska

Faculty Mentor: Bryan Gibb

School/College: Arts and Sciences, Old Westbury

Antibiotic resistance is a growing public health crisis as antibiotic treatment of bacterial infections grows less effective with bacteria becoming increasingly resistant. Citrobacter freundii is a member of the Enterobacteriaceae family, a group of Gram-negative facultative anaerobes that inhabit a wide variety of environments. C. freundii is a treatable opportunistic pathogen, but antibiotic-resistant strains are making infections more difficult to treat. Bacteriophages are viruses of bacteria that lyse the cells that they infect and are currently being investigated as a potential therapy for treating bacterial infections. We isolated two bacteriophages that infect C. freundii from wastewater. The phages have myovirus morphology and are extremely lytic against the host bacteria. The genome of one of the phages was refractive to restriction enzyme digestion, which may be due to the presence of DNA-modifying enzymes in the genome. The genomes of both phages were sequenced and found to be approximately 180 kb long. A comparative genomic investigation reveals that both phages are related, but other more closely related phages have been found, and additional investigation of the genome appears to show that these bacteriophages are reasonable candidates for phage therapy.

Peroxisome Proliferator-Activated Receptor Gamma (PPARγ) Deacetylation: a Promising Therapeutic Strategy to Control Metabolic Dysregulation in Obesity

Student Presenter: Shang Lee

Faculty Mentor: Maria Alicia Carrillo Sepulveda

School/College: Osteopathic Medicine, Old Westbury

PPARγ plays a role in glucose and lipid metabolism that can be regulated by acetylation causing vasculo-protective role and obesity-related role in metabolic dysregulation. We hypothesized that PPARγ deacetylation prevents obesity-induced glucose and lipid dysregulation in male mice. Eight-week-old male mice with deacetylated PPARγ containing a LYS to ARG mutation (2KR mice) and C57BL/6 mice were randomized into two experimental groups. Control Groups (n=8 C57BL/6; n=5 2KR); standard diet (5% fat) and Western Diet (WD) Groups (n=12 C57BL/6; n=5 2KR); WD (21% fat) for 16 weeks. Body weight was measured weekly and metabolic parameters monthly. Serum triglyceride and total cholesterol were analyzed via blood samples post terminal. Mid-scapular brown adipose tissue (BAT) was collected for histological analysis. Both cohorts developed obesity as confirmed by increased body weight, BMI, and waist circumference. Obese C57BL/6 mice exhibited glucose intolerance, elevated fasting blood glucose levels and cholesterol levels. Obese 2KR male mice did not exhibit changes in fasting blood glucose level but showed elevated cholesterol levels. Also, 2KR obese female mice showed protection against hypercholesterolemia. The analysis of BAT from obese C57BL/6 mice showed larger unilocular droplets while obese 2KR mice maintained the phenotype. Our results show that PPARγ deacetylation protects against metabolic dysregulation caused by obesity despite weight gain.

From Genes to Tumors: Decoding the Molecular Mysteries of Choroid Plexus Carcinomas

Student Presenter: James Virga

Faculty Mentor: Haotian Zhao

School/College: Osteopathic Medicine, Old Westbury

Tumors of the choroid plexus (CP) arise from neuroepithelium and predominantly occur in children. During development, specific developmental programs assure the fate of CP epithelial cells via SHH signaling, resulting in a pseudostratified sheet of multiciliated epithelial cells. Phenotypically, CP tumors exhibit a monociliated phenotype driven by repression of the Gemc1 transcriptional network. As previously shown, mouse models with persistent SHH and NOTCH signals, or loss of Trp53 and Rb, result in CP tumors recapitulating CP carcinoma (CPC) in humans, featuring monociliated epithelial cells. Pediatric cancers are notorious for displaying dysregulated transcriptional mechanisms resulting in tumorigenesis. Master transcription factor Sox2 plays a role in development in the ventricular zone, CP, and roof plate, while also contributing to cancer stemness, tumorigenesis, and drug resistance. Sox2 is highly expressed in roof plate progenitors yet significantly reduced in epithelial cells. Gene expression studies demonstrate aberrant Sox2 expression in human CP tumors, implicating a role in tumor development. Considering the potential for Sox2 to coordinate various transcriptional programs in development and cancer, we hypothesize that Sox2 plays a vital role in CP tumor formation.

Anesthetic Considerations of Endovascular Aortic Repair

Student Presenter: Michael Gao

Faculty Mentor: Greg Saggio

School/College: Osteopathic Medicine, Old Westbury

Anesthetic management of a ruptured AAA requires the availability of typed and crossmatched blood products as well as adequate intravenous access, preferably large bore central venous access. EVAR is the preferred method of treating a ruptured AAA as it allows for less blood loss, decreased risk of infection, and a lower mortality rate likely associated with the avoidance of intrathoracic and abdominal exposure. Endovascular access to the aneurysm allows for local, regional, and neuraxial anesthesia to be used in order to avoid GETA and the associated myocardial depression. However, GETA minimizes patient discomfort, and provides immobilization, analgesia, and apnea during stent deployment. Vasodilators or transcutaneous pacing can be used during stent deployment to lower the mean arterial pressure and mitigate the risk of stent migration. Permissive hypotension during this period should be balanced with adequate renal and cerebral perfusion.

Isolation and Characterization of Staphylococcal Bacteriophages targeting MRSA

Student Presenter: Hamza Nagarwala

Faculty Mentor: Bryan Gibb

School/College: Arts and Sciences, Old Westbury

Methicillin-resistant Staphylococcus aureus (MRSA) is listed as a serious threat by the CDC due to its prevalence and antibiotic resistance. About 2% of all people carry MRSA on their skin or in their nose, which can turn into a severe infection when the skin is broken during injury or surgery. This makes them a potential danger post-surgery, especially in orthopedic surgeries. Surgical site infections of MRSA have a mortality rate of 12.9%. MRSA infections of the bone are difficult to treat with antibiotics, so alternative therapeutic strategies are needed. Bacteriophages are viruses that infect bacteria and may be useful as therapeutics to treat bacterial infections, including those caused by MRSA. To explore the potential of bacteriophage therapy in orthopedic infections, we isolated a bacteriophage that infects a bioluminescent strain of MRSA developed for a mouse-infection model that enables visualization of the bacterial infection in a living mouse. We isolated two phages from commercial cocktails used for treating infections in eastern Europe that infect both the clinical S.aureus strain. These bacteriophages infected the strain inconsistently and only when the host was grown at 30 °C. To improve the therapeutic potential of these bacteriophages, we conducted sequential propagation at 37 °C to select for mutants that infect better at the body temperature of a mouse.

Evaluation of sequencing technologies on bacteriophage genomes

Student Presenter: Yamini Patel, Srinidhi Gadula, Michael Kaczmarski, and Nigel Oommen

Faculty Mentor: Bryan Gibb

School/College: Arts and Sciences, Old Westbury

A student research initiative called SEA-PHAGES seeks to identify and describe novel bacteriophages (viruses that infect bacteria) from environmental materials, especially soil. Next-generation sequencing technologies enable the rapid and cost-effective sequencing of genomes. SEA-PHAGE sequences one bacteriophage genome from each section using an Illumina MiSeq sequencer, which does a fantastic job providing accurate genomes, however, Illumina sequencers are expensive and sequencing reactions become cost-effective only when performed on a large scale. Oxford Nanopore developed a different sequencing technology, which is cheaper to purchase and operate, making it attractive for use in undergraduate research projects. However, there are looming questions and concerns about the accuracy of Nanopore sequencing and whether this data is of sufficiently high quality to be used as the sole source of sequencing data when publishing bacteriophage genomes. We present two case studies of bacteriophages Argan and Janeemi, isolated in Arthrobacter globiformis NRRL B-2880 from soil on Long Island New York by SEA-PHAGE students at New York Tech. In an effort to explore the efficacy of Oxford Nanopore technology, the genomes of Argan and Janeemi were sequenced using a MinION at New York Tech. The analysis comparing assembled genomes of Argan and Janeemi from the two sequencing methods is underway and will be presented in full at SOURCE.

More Than Iron Man's Butler: JARVIS, an AI for Surgeons Performing Laparoscopic Cholecystectomies

Student Presenter: Jennifer Guo, Kyle Gillani, and Chloe Chai

Faculty Mentor: Stephen DiRusso

School/College: Osteopathic Medicine, Old Westbury

Performed more than 750,000 each year in the US, laparoscopic cholecystectomies (LCs) are among the most common surgical procedures. A large part of a trainee's education is learning to identify and avoid critical landmarks during the operation. Cholecystectomy AI/Surgeon's JARVIS (JARVIS) takes advantage of the increasing reliability of artificial intelligence (AI) to help identify structures observed in the 'critical view of safety' (CVS), helping to avoid potentially devastating complications like bile duct injury (BDI). This study aims to determine the congruency between attending surgeon identification of critical landmarks and JARVIS identification of those landmarks during an LC. Surgeons will evaluate images taken of the CVS during LCs, then their responses will be compared with those of JARVIS on the same images. Data will be evaluated using analysis of variance and regression analyses. The researchers expect that the results will show high congruency between human and AI identification of landmarks in the CVS, bolstering the utility of AI in surgical education.

Comparative Genomic Analysis of Arthrobacter Phages Isolated and Sequenced at NYIT

Student Presenter: Ahnaf Zaman

Faculty Mentor: Bryan Gibb

School/College: Arts and Sciences, Old Westbury

Bacteriophages, also known as phages, are viruses that target specific bacterial hosts. Arthrobacter, a genus of Gram-positive bacteria commonly found in soil, is a notable phage host. Each Fall, a group of undergraduate researchers isolates and characterizes novel bacteriophages from soil as part of a special general biology lab section called SEA-PHAGES. Typically, six to ten phages are isolated. At the end of the semester, the SEA-PHAGE program sequences the genome of just one of the isolated phages, which serves as the subject of study in the Spring semester focusing on genome annotation and bioinformatics. Since 2019, NYIT students isolated twenty phages that infect Arthrobacter globiformis, and seven of these were sequenced. We set out to isolate and sequence the genomes of the other thirteen phages using Oxford Nanopore MinION sequencer at NYIT. The previous Arthrobacter phages that were sequenced were classified into two different groups called clusters. We hypothesize that the remaining Arthrobacter phages will be members of the same two groups. We will use bioinformatic tools to conduct a comparative genomic assessment of these newly sequenced phages. We will also attempt to identify genetic regions that explain phenotypic behavior, such as plaque morphology that relates to how the phage infects the bacterial host. This work will expand the library of sequenced phage genomes and our ability to probe how bacteriophages function and evolve.

Osteopathic Physicians in Sports Medicine Journals: An Analysis of Authorship Rates and Publication Trends from 2017 to 2021

Student Presenter: Nicholas Piniella, Hannah English, Robert Steinberg, Sanket Desai, and Karthik Madhira

Faculty Mentor: Joanne DiFrancisco-Donoghue

School/College: Osteopathic Medicine, Old Westbury

In 2019, 6% of practicing orthopedic surgeons held DO degrees. Historically, the sparsity of DOs at major research institutions may have limited their research opportunities. This study examines current trends in authorship and journal articles in sports medicine journals. Four journals were reviewed: American Journal of Sports Medicine, Arthroscopy, Orthopaedic Journal of Sports Medicine, and Clinical Journal of Sports Medicine. All issues were searched during the years 2017, 2019, and 2021. Only original research articles conducted in the United States were eligible for inclusion. Articles were categorized and the number of authors and their degrees were recorded. Descriptive statistics are reported. The proportion of DOs was compared using chi-square analysis. Of 2939 articles, 1282 were excluded. Of the 1657 eligible articles, 91 had at least one DO author (5.5%). Articles were most commonly about the knee (32.5%) and hip (17.5%). Across the 1657 articles, 11387 authors were identified (6.9 authors per article), of which, 7082 were MDs (62.2%) and 127 were DOs (1.1%). Of the 127 DOs, 32 were first authors and 10 were last authors. From 2017 to 2021, the number of DO authors increased from 23 to 57, and the proportion of DOs to all physicians increased from 1.1% to 2.2% (p=0.007). While DO publishing rates in sports medicine journals have doubled since 2017, DO authorship is still lacking compared to MD counterparts, perhaps due to differences in institutional funding.

Phishing for S. Aureus Bacteriophage: From Campus Toilets to Student Noses

Student Presenter: Jerry Qiu, Srinidhi Gadula, and Alex Hwang

Faculty Mentor: Bryan Gibb

School/College: Arts and Sciences, Old Westbury

Staphylococcus aureus, a prevalent strain of pathogenic bacteria, has been recognized as the second greatest contributor to global deaths from bacterial pathogens with approximately 119,000 cases of infection in the bloodstream and 20,000 deaths. Staphylococcus is one of the most prevalent bacterial infections in the world which is commonly found in the environment and in the nose and skin of humans. Antibiotic-resistant forms of S. aureus such as methicillin-resistant S. aureus (MRSA) and vancomycin resistant S. aureus (VRSA) are widespread in community-acquired and hospital-acquired infections, which are challenging to treat with traditional antibiotics. With the growth of antibiotic-resistant strains of Staphylococcus aureus, it is vital to find other forms of future treatment for infection. Bacteriophages are viruses that infect bacteria and are often found in areas inhabited by the host bacterial species. As a result, bacteriophages offer a promising alternative treatment for treating challenging infections caused by S. aureus. During Fall 2022, students in a research class sampled bathrooms across NYIT in an effort to identify S. aureus strains and locations that could be used for bacteriophage isolation. Many bathrooms had putative S. aureus isolates, which are in the process of being sequenced, but the bathroom in Riland clinic had no isolated candidates. Our initial efforts to isolate bacteriophages from these sites proved unsuccessful, so we opted to isolate phages.

Novel Treatment for Bronchoconstrictive Diseases: Relaxation of Airway Smooth Muscle by Gelsolin Peptide

Student Presenter: Shani Kahan

Faculty Mentor: Roger Yu

School/College: Osteopathic Medicine, Old Westbury

Asthma, a chronic respiratory condition with bronchoconstriction, affects approximately 300 million people worldwide. Current asthma treatments, such as β-agonists and steroids, do not suffice in controlling as many as approximately 38.4% of children and 50% of adult patients with asthma. In this project, a novel mechanism was explored to treat bronchoconstriction. This approach involves modifying airway smooth muscle (ASM) constriction utilizing short phosphatidylinositol 4, 5 bisphosphate (PIP2) binding peptide of Gelsolin. We tested our hypothesis using mouse precision-cut lung slices. Peripheral lung luminal airway diameter change to various constrictive agonists and the effect of the gelsolin peptide were observed using phase-contrast microscopy. Gelsolin peptide caused significant ASM relaxation to pre-existing Gq-coupled agonist MCh-induced constriction, in models representing treatment for clinical asthma attack. Gelsolin peptide pretreatment also attenuated subsequent MCh-induced constriction, suggesting the peptide can be used to prevent asthma attack. Furthermore, when treated with caffeine and ryanodine, to deplete the intracellular calcium stores targeted by IP3, the relaxation effect of the gelsolin peptide was no longer observed. In conclusion, the project findings support the hypotheses that gelsolin peptide attenuates ASM constriction and that the relaxing effect of the peptide is due to its PIP2 binding.