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SYMPOSIUM OF UNIVERSITY RESEARCH AND CREATIVE EXPRESSION

FRIDAY, APRIL 13, 2018: 10 A.M. - 4 P.M.

LOCATIONS

REGISTRATION AND SESSIONS

16 W. 61ST ST.

KEYNOTE SPEAKER

STUART ISACOFF

“IMAGINATIVE THINKING FROM ARTS TO SCIENCES”

NYIT AUDITORIUM ON BROADWAY

1871 BROADWAY

BETWEEN 61ST AND 62ND STREETS



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THE COLLEGE OF ARTS AND SCIENCES

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INAUGURATION
OF THE
NYIT PRESIDENT
HANK FOLEY



Dear NYIT faculty, staff, students, and friends,
Welcome to the 15th Annual SOURCE at NYIT!

Creative expression and participating in research with faculty members have become integral parts of a student's educational experience at NYIT. SOURCE is intended to provide a unique opportunity for students to present their research and creative scholarly work in collaboration with faculty members and their mentors. SOURCE also provides a common ground for interdepartmental, interschool, and interdisciplinary communication. I am very pleased to inform you that this year 99 abstracts were accepted and more than 180 undergraduate and graduate students of NYIT, representing nearly all our campuses, schools, and colleges, have authored or co-authored these abstracts. The depth and breadth of the projects are strong indications of the quality of our teaching and learning at NYIT. I would like to take this opportunity to congratulate all the students for their academic excellence at NYIT.

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

Sincerely,
Roger Yu, Ph.D., Chair SOURCE Committee



KEYNOTE SPEAKER

STUART ISACOFF

Imaginative Thinking From Arts to Sciences

Abstract

Art is often thought of as subjective and hazily defined, science as precise and incontestable. Yet, at the core of each lies human imagination. As Arthur Koestler put it: "The glory of science is not in a truth more absolute than the truth of Bach or Tolstoy, but in the act of creation itself." This presentation explores why.

About Stuart Isacoff

Stuart Isacoff, a pianist, composer and writer, is the author of *When the World Stopped to Listen: Van Cliburn's Cold War Triumph and Its Aftermath* (Alfred A. Knopf). His other books for Knopf include *A Natural History of the Piano: The Instrument, the Music, the Musicians—From Mozart to Modern Jazz and Everything In Between*, and the highly acclaimed *Temperament: How Music Became a Battleground for the Great Minds of Western Civilization*. A winner of the prestigious ASCAP Deems Taylor Award for excellence in writing about music and a 2017 recipient of the Cremona (Italy) Music Award for Communication, he is a regular contributor to *The Wall Street Journal*.

Isacoff lectures frequently at schools, museums, and festivals here and abroad. He has done presentations on the intersection of science and art at the Los Alamos National Laboratory in New Mexico, and the Perimeter Institute for Theoretical Physics in Canada.



2018
Symposium of University Research
and Creative Expression
(SOURCE)

PROGRAM

9:15 – 10:15 a.m.

REGISTRATION and BREAKFAST

16 W. 61st Street, 11th floor

Doors open at 9 a.m.

10:15 – 11:45 a.m.

ORAL PRESENTATIONS

16 W. 61st Street

noon – 1 p.m.

KEYNOTE SPEAKER

NYIT Auditorium on Broadway

1 – 1:30 p.m.

LUNCH

NYIT Auditorium on Broadway

1 – 2 p.m.

POSTER EXHIBIT

16 W. 61st Street, 11th floor

2 – 3 p.m.

ORAL PRESENTATIONS

16 W. 61st Street

3:15 – 4 p.m.

CERTIFICATE PRESENTATION

NYIT Auditorium on Broadway

MORNING ORAL PRESENTATIONS

LOCATION	16 W. 61st St. ROOM 820	16 W. 61st St. ROOM 1029	16 W. 61st St. ROOM 1026
MODERATOR	Professor Michael Hadjiargyrou	Professor Blair Hoplight	Professor Navin Pokala
10:15 a.m.	Smit Baua “Holographic Imaging Systems Using Single Frequency Microwave Data”	Jamila Primus, Michael Sophia, Francheska Niveyro, Michael Zerbo, Anthony Drew “Does Race or Social Background Confirm a Stereotype to the Brand and/or Type of Alcohol Consumed?”	Kashif Uddin, Taha Siddiqui “Understanding How Neural Circuits Encode Behaviors”
10:30 a.m.	Siyi Song, Lisha Wu “Comparative Study of Cloud Computing and Fog Computing”	Joseph Mure, Caitlin Appel, Michael Trainor, Daniel Lembo “Sleep Deprivation and Aggressive Behavior”	Harbir Singh Randhawa “Neuromodulator Deficient Worms”
10:45 a.m.	Mengdi Yan, Shaojun Chen, Jiang Huan “Evaluation and Optimization of Threat Intelligence Sharing”	Thomas Brennan, Brooke Basso, Kimberly Geiger, Ashley Miller, Christopher Sarubbi “Examining Perceptions of Homosexuality in Athletes and Non-Athletes”	Kunnal Patel, James Defalco “Drug P on Tetrahymena”
11 a.m.	Keshav Kowshik Hallimysore Ramakrishna “Advanced Crash Detection System”	Mashrika Ahmed “Effects of Psychiatric Hospitalization on Children and Adolescents”	Eric Kibitel “C. Elegans Olfactory Chemotaxis”
11:15 a.m.	Candace McCoy, Ariana Rennie, Allison Fowler, Ashtie Kanhoye “Breakdown Prevention Within Mission Control”	Desislava Ivanova “The Effect of Nonverbal Communication Through Smell and Sound on Consumer Behavior”	Simran Kaur “Cas9-Mediated Genome Engineering of C Elegans”
11:30 a.m.	Ramanjit Kang, Angel Rodriguez “Does Age Impact Cognition and Balance in People with Parkinson’s Disease Compared with Healthy Older Adults?”	Tiara Place, Maria Lombardo, Sebastian Cacioppo, Austin Carino, Stuti Shah “Memory Recollection of Crime Scenes”	Jerin John, Humna Aminullah “Express Histamine Degradation in Transgenic Worms”

AFTERNOON ORAL PRESENTATIONS

LOCATION	16 W. 61st St. ROOM 820	16 W. 61st St. ROOM 1029	16 W. 61st St. ROOM 1026
MODERATOR	Professor Spencer Turkel	Professor Youjeong Kim	Professor Blair Hoplight
2 p.m.	Elizabeth Belnap “Imperial Decay: Dorian Gray As the Picture of the British Empire”	Maximillian Ganz “Delineation of Vertebral Pedicle Morphology to Assist Surgeons in Minimally Invasive Spinal Surgery”	Radamanthys Chourdakis, Sheraine Peart “Advertising Awards Case Studies”
2:15 p.m.	Hannah Smith “Female Inequality in Literature and Film”	Simran Polce “Analyzing the Phenotypic Effects of Genetic Deletion of Cytochrome C Oxidase Subunit 5 Homologs in Budding Yeast”	Bernarda Franco, Mitchell Stogel, Jason Aviles “Knitting Neighborhoods”
2:30 p.m.	Vyshnavi Kodali “The Immigrant Experience”	Kayla Bomani “The Lived Experience of Student Athletes in the Pre-Licensure Nursing Program”	Krista Marcovecchio “Power and Prey in Los Angeles: Cryonic Thaw for Humane Justice”
2:45 p.m.	Ruchika Kapoor “Self-Fulfilling Prophecy in Education”	Yunqi Xu “The Practicalities of Traditional Chinese Medicine in the 21st Century”	Dhanha Bien-Aime, Kexin Liu, Mateo Alarcon, Isabella Staples “NYIT Student Agencies Revamp Church Presence in Community”

POSTER EXHIBIT

“A New Technology Vertical Axis Wind Turbine”	Max Aginskiy
“A Service Learning Experience of Challenges and Solutions: Sustainability of Indian Subcontinent Farmers in Beed District of Maharashtra”	Tahera Aktar
“Role of Gap Junction Isoform and Carboxyl-terminus of Connexins in Intercellular Endocytosis”	Olivia Albert
“Neanderthal Facial and Cranial Reconstruction”	Maryann Assaf, James DeFalco, Sara Elkordy, Eteete Dan, Hebah Hassan
“Effects of Motrin on Yeast and Tetrahymena”	Marco Basone, Eric Kibitel
“CSR at the Crossroads: UAE Consumers and Marketers”	Aziza Bobokulova
“Dormancy Veins in LA: Parasitic Revival”	Jesus Ceballos
“Yeast As a Model System for Drug Efficiency Against Protein Secretion and Metabolic Regulation and Cell Signaling”	Bill Choi, Abdallah Sattar

“Bionic Health-Inspired Stone Pavilion”	Arkadiusz Chrobak, James Giustiniani, Santiago Molina, Louis Bruni, Vanessa Rocha, Carlos Chica, Nicole Fatone
“Illustrated Cinemagraphs”	Christopher Chung
“Cell Biology”	Emily Cook, Ashley Reji
“The Water Cleaning System”	Elis Cucka
“Finding Phages from Household Kitchen Sponges”	Linesha Davis, Gokberk Simsek, Olivia Albert
“Recreation of a Human Organ using Modeling Clay”	Francis Deocampo, Farhat Majeed, Beyza Kosif
“Effects of Drug B on Saccharomyces Cerevisiae”	Fatma Eldomyati, Summer Khan
“Continuous and Transparent Authentication of Haptic Users”	Fatimah Elsayed
“Cell Biology”	Gabriella Genua, Eteete Dan-Udoka
“Holocaust Infographic”	Michael Gordon
“Can We Trust Our Lab?”	Ema Graceni
“Quadruplex DNA in Normal Human Crystalline Lenses: Cell Death Characterization”	Megha Gupta, Adarsh Pillay, Ali Haidery, Abdallah Sattar, Umay Mughal
“IOM: Professional Issues in Nursing”	Shadae Headley
“That Shopping Space Is Mine! Consumers’ Reactions to a Personal Space Infringement”	Yichen Huang, Jie Wang
“Cosmic Culture”	Nicholas Huber, John Echeverria
“The Science of History: Why the Egyptians Never Smiled for Pictures”	Jasmine Kannikal
“Isolation of Novel Pseudomonas Bacteriophage from a Kitchen Sponge”	Lovejit Kaur, Brianna Weiss, William Krotz, Emily Cook
“The Function of Drug L: Cell Biology Lab”	Maria Kazmi, Michael Mirham
“Computational Modeling of Micro-Calcification on the Endothelial Layer and Blood Flow Interaction”	Ian Kelly
“Functions of Drug ‘E’”	Sophia Khan, William Krotz
“Acute Effect of Osteopathic Manipulative Medicine on Upper Extremity Tremor in Parkinson’s Disease”	Siu Lam Koo
“Dynamic Control of Differential-Drive Wheeled Mobile Robot”	Ian Krivoruk
“Comparative Analysis of DNA Extraction Methods: “Kitchen Counter DNA Lab” Versus Commercially Available Kits”	Matthew Leiman, Jacqueline Gribko, Kevin Lee
“Apple Inc. Infographic”	Nihar Makwana
“Reduce? Reuse...Recycle!”	Crystal Miller
“The Great Pacific Garbage Patch”	Emely Molina
“Assessing the Impact of Global Health on the Specialty Choices for Physician Trainees: Comparing Osteopathic and Allopathic Students”	Pooja Navlani
“The Blue Green Economy”	Zandile Ncube, Christian Wade, Teresa Ferreira
“Policy Change in Nursing”	Margarita Nektalov
“Chronic Dantrolene Treatment Attenuates Cardiac Dysfunction and Reduces Atrial Fibrillation Inducibility in a Rat Myocardial Infarction Heart Failure Model”	Colleen Nofi, Allan Migirov

“Molecular Dynamics of Chiral Molecular Tweezers”	Nugzar Noniashvili, Meina Aziz, Faris Al Harbi, Tahera Aktar, Faris Alshammari, Imtinan Alsulemani, Deborah Oreonitolo, Chelsea Duncan, Mariam Gabriel, Angela Huang, Chuxuan Wang, Joshua Kahane, Kamrun Khyer
“Minimally Instructed Bimanual Reaching Movements Begin at the Same Time but Terminate at Different Times Depending on Target Distance”	Janki Panchmatia
“Devoured”	Kaitlin Parker
“Metformin Inhibits Autophagy and Mitophagy in Cardiomyocytes”	Rahul Patel
“Coordination of Reaching Movements and Postural Maintenance”	Stephanie Perez, Derek Deluca
“Thyroid Hormone Treatment Improves Cardiomyocyte Contractility and T-tubule Organization in Failing Rat Hearts”	Jerrin Peter
“Institute of Medicine - Nursing Barriers”	Junior Phrophe
“The Replacement of Qualitive Characterization with Quantitative Characterization in the Detection of Precancerous and Normal Cervix Cell Nuclei”	Zamiur Rahman
“Drug ‘K’”	Alex Raju, Shaheryar Gill
“Bioluminescent Algae Culturing Chamber with Automatic Control & Monitoring System”	Ariana Rennie, Ashtie Kanhoye, Yirou Cui
“Nursing Shortage, Nurse Job Dissatisfaction, and the Male-Female Pay Gap: Three Issues in Professional Nursing”	Angelica Ruiz
“Colorimetric DNA Scanner: Calibration for Characterization of Exotic Nucleic Acids”	Abdallah Sattar, Siraat Zafar, Ali Haidery, Thomas Beague
“Variation in Inner Ear Morphology of Early Mammaliaforms”	Ramza Shahid
“The Neural Basis of Olfactory”	Tianyu She, Yan Li, Jason Wu, Daniel Mogel, Syed Asim Ahmed
“Automated Poly Stainer Employed for Histology Lab (BIOL 245L): H & E Staining, Feulgen Reaction and Immunohistochemistry”	Ansel Shibu, Farah Dimsuyu, Rohitha Roy, Michelle Defay
“Cell Biology: The Study for Drug ‘P’”	Taha Siddiqui, Jerin John
“Drug ‘P’ Cell Biology”	Gokberk Simsek, Harbir Singh Randhawa
“Effect of Drug ‘K’ on Saccharomyces Cerevisiae”	Tina Stefanovic, Maryann Assaf
“Steroids and Infertility”	Manpreet Virk, Pritu Saha, Fatima Soomro
“Methamphetamine Enhances Methicillin-Resistant Staphylococcus Aureus Osteomyelitis in Mice”	Danny Warda
“Metropolitan Transportation Authority Infographic”	Jodie Wenzelberg
“Average Annual Temperature of Forty Major Cities”	Charles Werner
“Examination of Inner Ear Morphology and Hearing Specialization in Extinct Toothed Whale, <i>Cotylocara Macei</i> ”	Deborah Winograd
“PCR Reaction”	Kurt Wolf
“Developing Protocols and Acquiring Tissue Samples to Preserve Bone and Cartilage Using Different Fixatives: Controls for a microCT Scanner”	Anthony Yodice, Georgio Desmornes
“Direct Sequencing of RNAs and Their Modifications Based on LC-MS”	Ning Zhang
“The Effect of Drug G on Cell Growth”	Alex Zimmerman, Anne Marie Ardito
“Investigating the Correlation Between Sensory Processing Dysfunction and Executive Dysfunction”	Ashley Zizzo, Austin Collein, Krysta Como, Leigh McCarthy, Florence Cui, Michelle Rock, Angela Buscemi

A New Technology Vertical Axis Wind Turbine

Student Presenter: Max Aginskiy

Faculty Mentor: Stanley Greenwald

Department: Environmental Engineering

School/College: School of Engineering and Computing Sciences, Old Westbury

GPT Energy LLC is developing a new type of wind turbine technology, called Green Power Tower (GPT), which has different working principles compared to existing wind turbine designs. The cylinder-shaped tower shown in **Error! Reference source not found.**, is a multi-level omnidirectional vertical axis wind turbine with no moving parts on the outside, generating electricity from wind colliding with the structure from any direction and redirecting it up towards interior impellers on above levels. Each level of the turbine has one impeller (**Error! Reference source not found.**), which blades are rotated from the movement of wind redirected from the level below, thus creating an interior vertical wind tunnel with multiple impellers along the entire height of the structure. All spinning impellers within the structure are connected through an axle with an electric generator located at the base of the structure.

Unlike other vertical axis turbines, GPT's vertical axis design allows it to be scaled to significantly larger sizes that are comparable to conventional industrial scale horizontal axis turbines. Due to no moving parts outside, this design allows it to be safe for wild life, solar cells can be also installed over the inclined wind redirecting walls to enhance GPT's power generation capacity, and it is more versatile for installation in different locations. For example, GPT can be attached to large buildings, which is schematically shown in **Error! Reference source not found.** In addition, due to very stable and light structure with generator at the bottom, GPT can be placed on floatable platforms as an ideal substitute to conventional offshore wind farms.

Our multiple tests with many prototypes, shown in **Error! Reference source not found.**, have proven that power output of GPT is proportionate to number of levels of the structure. This gives us the indication that large enough GPT technology can generate power output that is competitive with conventional wind technologies at significantly lower costs of production, installation, and maintenance. Our goal is to prove this theory by building and testing significantly larger prototypes. Prior to that, there are experimental tests that need to be conducted for three major objectives including optimizing the shape of inclined wind redirecting walls, optimizing the shape of blades, and a comparative study with horizontal wind turbines. Results obtained from experimental test will be also used for validation purposes in computer models. The grant will help us to perform these experimental tests and to develop an economically and technologically feasible model of GPT for mass production.

Effects of Psychiatric Hospitalization on Children and Adolescents

Student Presenter: Mashrika Ahmed
Faculty Mentor: Angela Rachidi
Department: Behavioral Sciences
School/College: College of Arts and Sciences, Manhattan

Some children do not have safe environments at home, so they use it as an excuse to stay at the hospital. Many self-inflict themselves or suffer from depression and anxiety so they must stay in an institution for some time. Others are suicidal and are a threat to themselves or others around them. As an intern in a psychiatric unit at the Elmhurst Hospital, I intend to find out whether the services they are receiving are helping them feel and function better. I want to find out whether it is helpful for the parents to leave their children at a psychiatric unit so that their children perform better at home and school. My goal is increase knowledge on the effects of hospitalization.

Today, many kids and teenagers are suffering from unstable mental health. Communication with in-patients first hand may lead to an increase in understanding of their mental health better. The effectiveness of causes and consequences of choosing to stay at a psychiatric unit is something that is worthy to be studied. In addition, learning more about the differences in services for kids with different diagnoses will aid in a better understanding of them and their personalities.

A Service Learning Experience of Challenges and Solutions: Sustainability of Indian Subcontinent Farmers in Beed District of Maharashtra

Student Presenter: Tahera Aktar
Faculty Mentor: Niharika Nath
Department: Life Sciences
School/College: College of Arts and Sciences, Manhattan

With support from the Edward Guiliano Global fellowship, I will travel to the villages of Beed District, Maharashtra State and observe the widely overlooked issue of sustainability suffered by rural Indian farmers, which is caused by drought, shortage of funds and a lack of education on alternative effective methods of farming. By collaborating with the non-profit organization Save Indian Farmers (SIF), I would like to visit these farmlands and inform farmers about the success rates in growing cash crops that can be exported as precursors to the synthesis of products such as plastic. During my time there, I want to apply my fluency in technology and social media to my service-learning project by documenting and sharing first hand case studies at SOURCE from the farmers and their families. Overall, agriculture constitutes a large requirement for habitability that needs our direct attention. By physically being there with the families, observing and documenting these issues via videography, we can put into perspective the immediate need for awareness of the issues faced by third world farmers and their families in regard to their education and health, and perhaps draw more overseas assistance for them upon return.

Role of Gap Junction Isoform and Carboxyl-terminus of Connexins in Intercellular Endocytosis

Student Presenter: Olivia Albert
Faculty Mentor: Randy Stout
Department: Biomedical Sciences
School/College: College of Osteopathic Medicine, Old Westbury

Gap junctions (GJs) are a type of cell-cell connection. They are made up of GJ channels that act as protein-based tubes that traverse the plasma membranes of adjacent cells to provide a direct pathway for exchange of ions and small molecules. Each cell provides half of the protein channels that form GJs. When cell endocytosis pathways act upon the GJs to remove them from the membrane protein from one of the cells is pulled into a double membrane intracellular vesicle called a connexosome.

Protein domains within the carboxyl-terminus have previously been shown to control endocytosis and organization of the GJ structure. We hypothesized that the carboxyl-terminus and mutations would affect endocytosis characteristics. Using image analysis software in double-blind experiments, we quantified the number of connexosomes and connexosome average diameter using a strategy that allows identification of connexosomes. Additional data is needed for statistical comparisons between treatment groups.

An initial and novel result of this work is the demonstration that Cx47 (expressed in oligodendrocytes *in vivo*) can pull wild-type and mutant Cx43 into the Cx47 expressing cells. This will be important knowledge to aid in our understanding of how astrocytes and oligodendrocytes communicate in the healthy and diseased brain. This work was supported by the NYITCOM Department of Biomedical Sciences, an In-House Grant and the ARC program.

Neanderthal Facial and Cranial Reconstruction

Student Names: Maryann Assaf, James DeFalco, Sara Elkordy, Eteete Dan and
Hebah Hassan
Faculty Mentor: Claude Gagna
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

Neanderthals were a group of archaic humans that suddenly became extinct approximately 40,000 years ago. These organisms first appeared in Europe, and over time expanded into Southwest Asia, Central Asia and finally, North Asia. This research project involves the reconstruction of a male Neanderthal skull and face, based on a plastic model of the skull and comparative analysis of images from the Museum of Natural History and peer-reviewed journal articles. The cranial cavity and facial features were reconstructed using modeling clay (Das Modeling Materials: FILAGroup, Italy) and by using model paints (Testor). Muscle recreation was based on a scan of the cranial cavity of the plastic skull model by a laser scanner. By scanning (i.e., 3-D scanner: NextEngine Model 2020i) the skull we were able to more accurately represent the musculature and geometric features. Additionally, we used a 3-dimensional printer to create a smaller reference model (i.e., MakerBot Replicator Z18. PLA 1.75 Filament by Hatchbox). One student utilized sophisticated software to aid in placing layers of muscle, skin and hair onto the skull. Our group will also look at the work of others who reconstructed the face of Neanderthals. Additionally, we examined the similarities and differences between modern human and Neanderthal facial muscles and cranial cavities. We hope that our model offers new insights into the reconstruction of a Neanderthal's face and a comparative anatomical analysis of a Neanderthal's face versus a modern human's face.

Effects of Motrin on Yeast and Tetrahymena

Student Presenters: Marco Basone and Eric Kibitel
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

Motrin is a common over-the-counter drug. We find that it is an efficient killer of yeast cells growing in sucrose containing media. A biochemical assay of yeast enzyme secretion suggests Motrin may affect growth in sucrose by affecting the secretion of invertase, an enzyme required for sucrose metabolism. Secretion often requires proper cytoskeleton function. Using another eukaryote called Tetrahymena; we will examine the effects Motrin has on other processes that also require cytoskeletal function, such as endocytosis and cell motility, to see whether Motrin indeed functions in this manner.

Holographic Imaging Systems Using Single Frequency Microwave Data

Student Presenter: Smit Baua
Faculty Mentor: Reza Amineh
Department: Electrical and Computer Engineering
School/College: School of Engineering and Computing Sciences, Manhattan

In direct microwave holographic imaging, conventionally, wideband data is required to obtain range resolution. They can provide qualitative 3D images of the inspected media. With these methods, the 3D object is reconstructed as a set of 2D image slices at several range positions. However, acquisition of wideband data requires large antennas and complex electronic circuitry. Additionally, measuring S -parameters of the antennas by frequency sweep takes time while measurement time is critical in many applications. Besides, in wideband imaging, the results are prone to errors due to the dispersive properties of the media. In this study, we demonstrate the possibility of using single frequency microwave data and an array of receivers to achieve range resolution. This paves the way towards developing 3D holographic microwave or millimeter wave imaging systems using single frequency data.

Imperial Decay: Dorian Gray as the Picture of the British Empire

Student Presenter: Elizabeth Belnap
Faculty Mentor: Jonathan Goldman
Department: English
School/College: College of Arts and Sciences, Manhattan

This paper examines Oscar Wilde's *The Picture of Dorian Gray* in the context of the British Empire and the exploitation of colonized people under British reign. Through research into the history of the British Empire, the artifacts and knowledge that Dorian Gray collects, and the role opium played in British colonialism, I show that Wilde depicts British culture (particularly British aristocratic culture) as dependent on violent exploitation of colonized peoples.

The Picture of Dorian Gray is the story of a young, breathtakingly beautiful man. When he wishes his portrait could grow old and tired instead of him, he unknowingly gets his wish. When he realizes what has happened, the protagonist goes through his life selfishly, leaving a trail of corruption and death. His corruption and debauchery go hand in hand with his materialism; he spends an entire chapter collecting artifacts and treasures from all over the British Empire, decorating his home with symbols of violent, exploitative colonialism. Furthermore, he spends the entire novel, spanning eighteen years, addicted to opium.

The story ends with Dorian, unable to face the horror and guilt of his actions, destroying the painting that has aged in his place, and dying at its feet, his body suddenly old and decrepit. Dorian Gray's death mirrors the way the British Empire could not continue to ignore with impunity the horrors they were inflicting.

NYIT Student Agencies Revamp Church Presence in Community

Student Presenters: Dhanha Bien-Aime, Kexin Liu, Mateo Alarcon, Isabella Staples
Faculty Mentor: John Hanc
Department: Communication Arts
School/College: College of Arts and Sciences, Old Westbury

Last semester as Account Executive of the Carleton Group (Student Advertising/PR Agency) in the Old Westbury campus we had a unique client for our agency. The Congregational Church of Manhasset in Long Island needed our help with branding. The church was concerned with attracting and gaining membership of a diverse, younger crowd of church members. The church spearheaded a new program called the Center for Wellbeing. It would be a center for wellness and mindfulness for church members. It would be a way to attract brand new younger and diverse members and to be in the church besides Sunday. The problem was that they did not have a logo. The logo for this center will be submitted. Also with the help of ProdCo (Student production team) my team produced a video about the church. The video will be used on the church website. The logo and video were created as a way to brand the church for new members. The logo shows the different aspects of the Center for Well Being and the video gives you an audio-visual look into the church as a whole physically and the voices of faithful members.

CSR at the Crossroads: UAE Consumers and Marketers

Student Presenter: Aziza Bobokulova
Faculty Mentor: Vanaja Vadakepat
Department: Marketing
School/College: School of Management, Abu Dhabi

Corporate Social Responsibility (CSR) is a corporation's initiatives to contribute to sustainable development by delivering economic, social and environmental benefits to society with an aim to build trust among stakeholders. Studies by Lee & Shin (2009) and Caroline et al (2013) claim that among all stakeholders, customers are the main motivators to implement social responsibilities for any firms.

UAE consumers are risk-averse with a marginally high purchasing power; building customer brand trust with quality service is a challenge in the UAE. Because issues of trust persist. The increased flow of UAE consumers to overseas medical treatment (Hassani, 2012) highlights these questions of trust in local firms. In this context, I believe that retaining customer trust through CSR-driven marketing strategies that meet the expectations of customers is essential for local firms to accomplish sustainable growth.

Objective: This study aims to examine the gap between UAE consumers CSR perceptions and UAE marketers CSR promises. The hypothesis will be developed based on the review of the literature on Corporate Social Responsibility and my market observations. A sample of 100 consumers from the Abu Dhabi market will be randomly selected for a survey. The survey will be done with a pre-tested questionnaire distributed among consumers.

The outcome of this study: A research article with findings and suggestions (1) to support firms to develop a better understanding of consumers' perceptions as they develop strategies for the UAE market (2) to serve as a reference resource to NYIT students to learn more about CSR and UAE market.

The Lived Experience of Student Athletes in the Pre-Licensure Nursing Program

Student Presenter: Kayla Bomani
Faculty Mentor: Elaine DellaVecchia
Department: Nursing
School/College: School of Health Professions

Being a student athlete in a pre-licensure nursing program certainly has its advantages and disadvantages. In some instances, nursing education programs expect these student athletes to choose between their collegiate sport team or being a committed nursing student. Living the life of a student athlete one tends to make sacrifices for both academics and athletics performances. Nursing student athletes understand that they are committed to playing two roles. Therefore, it is known that schoolwork is always the priority and assignments need to be handed in as early as possible to give attention on the upcoming athletic competitions. There are many advantages that tag along with being a nursing student athlete. Nursing athletic students can respond to patient alterations in the clinical environment because it is vital to react to the numerous actions of their rivals on the court. In addition, they manifest great time management and prioritizing skills to effectively juggle school, sports, and other responsibilities. Moving forward, nursing student athletes are truly confident in their aptitudes and are goal oriented. These students always know what they want and how to get it done in a precise manner. Welcoming student athletes into the nursing program grants more diversity within the nursing workforce, which is always a positive thing to uphold. As this holds many advantages, there are some disadvantages that follow. Juggling being a nursing athlete, study time, socializing, and personal time are decreased. Increased absences from class due to game obligations may result in student athletes' grades to drop while in season. In some cases, it is difficult when they miss clinical experiences because it is hard to duplicate that experience. Missing class results in missed material and could hinder a nursing students progress as a result. All in all, being a nursing student athlete has its ups and downs, but if one put his/her mind to it and works hard one can be successful with both.

According to Michelle Bartlett (2016), occupational stress among licensed nurses has been reported to be the highest level of job stress among all health professionals. Being able to prepare student nurses through various educational programs to provide a taste of how this career can be ultimately stressful provides insight on the mental health status experienced by nursing students. There is a gap on how stress differs from nursing students and the general college student population. In addition to being an athlete, nursing students endure a rigorous curriculum and demanding course loads.

Examining Perceptions of Homosexuality in Athletes and Non-Athletes

Student Presenters: Thomas Brennan, Brooke Basso, Kimberly Geiger, Ashley Miller and Christopher Sarubbi
Faculty Mentor: Dina Karafantis
Department: Behavioral Sciences
School/College: College of Arts and Sciences, Old Westbury

College is considered a new experience and a fresh start for incoming freshmen. However, many gay and lesbian students feel that college is considered an unwelcoming and unsupportive place. Many gay, lesbian, and bisexual athletes fear that taking part in sports at the college level is not safe. In fact, 43% of homosexual players on sports teams conceal their sexual orientation. Research supports this claim that the sport settings are hostile environments for lesbian, gay, and bisexual students. However, as time has progressed, so has the decrease of "homophobia." Changing laws, such as acceptance of gay marriage, have led to a change in social norms and the decline of prejudice against homosexuals. In one of the first studies conducted on openly gay high school athletes, the results showed that their coming out to their teammates was more positive than they themselves could have hoped for. At the college level, a study had found that college athlete men held no prejudice towards homosexuality. Their acceptance of homosexuality carried over to acceptance of bisexuality as well. A majority of Americans are now generally accepting of homosexual lifestyles. Despite these promising findings, many still see college as an unwelcoming place to homosexuals. The current study examined perceptions of homosexuality of college athletes and non-athletes. We hypothesized that 1) college athletes would hold more negative attitudes towards homosexuals versus non-athletes; 2) females would be more empathic than males; 3) religion and undergraduate major would serve as mediators.

Dormant Veins in LA: Parasitic Revival

Student Presenter: Jesus Ceballos
Faculty Mentor: Naomi Frangos
Department: Architecture
School/College: School of Architecture and Design, Old Westbury

An Apparatus for Variable Site Architecture.

Dormancy is a period in an organism's life cycle when growth, development and physical activity are temporarily stopped. In urban environments, dormancy tends to be closely associated with economical, political and social conditions in a city grain. Dormancy occurs at all scales, from molecular structures, to city infrastructures. Focusing on Los Angeles' most prominent natural vein, the LA river have now become mere legal divisions, losing their relationship to the river. With the proliferation of the automobile, highways quickly overtook the urban landscape as the new infrastructural network linking these areas together. While LA's environmental life cycle is in drought, and its lucrative entertainment industry has turned the LA river into a backdrop for film scenes, the car driven sprawl of the city has lingered life away from its catalyst, creating pockets of underutilized space adjacent, above and beneath it. How can these veins coalesce to create a new urban pulse that energizes the social life of LA, invigorating its natural and environmental life cycles? How can the intersection of these urban vacancies draw activity from Hollywood, Venice beach and Sunset Blvd to create new hubs for dwelling within its infrastructures?

In understanding the urban cycles of dormancy, rapid growth, climate conditions and cultural influences that have left the LA River to be overtaken by dead zones, new life will be re imagined by injecting ecological, cultural and spatial interventions along its path and its adjacent sites. This proposal takes a piece of cultural history that made Los Angeles - popular to the world - its film industry and integrates back into event architecture. Knowing that the river has been used as a film location in the past because of its long uninterrupted trajectory offers the opportunity to design an apparatus that could be used for film and theatre "event" space by mapping famous movie locations and framed views of the city, nature and identifiable icons to use as backdrops for these events.

A series of raised event pavilions on these mapped out specific sites will be oriented, positioned, and - derived by site lines - and camera angles. Keeping the ground plane free of any programmed space will allow the local passerby to freely be hidden from or a part of the scenery or event. Spanning from Taylor yards an abandoned train station down to the iconic 6th street bridge, this successive rhythm gives the notion of life growing out of the river and spilling to its local urban fabric. Phased out development with an emphasis on catalyst sites starting at historically important film set points of interest and interconnected with pockets of self-irrigating green spaces between event pavilions aims to draw attention back to the river once again.

Yeast as a Model System for Drug Efficiency Against Protein Secretion and Metabolic Regulation and Cell Signaling

Student Presenters: Bill Choi and Abdallah Sattar
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

We are studying how a drug, code named L, from the NYIT Drug Library affects cellular function. We use the halo assay on various media to hint at which aspects of cell biology are most affected by the drug (secretion, mitochondria, or metabolic regulation). We then follow up using biochemical and microscopy assays. If the sucrose media plate happens to show a more pronounced effect (halo region of low growth) than the glucose plate, we will know that our drug actively affects the regulation/secretion of invertase since invertase is secreted by yeast to break down the complex sugar into a simple one for easy metabolic use. If the glycerol media plate happens to have a more pronounced effect than the glucose plate, drug L probably primarily affects mitochondrial function since glycerol metabolism requires functioning mitochondria. Tetrahymena endocytosis and chemotaxis assays with our unknown drug sample will be examined to identify the possible effects it has on cell-signaling, given that both processes involve the usage of receptor recognition and communication. By using these two organisms, we hope to determine what specific effects drug L has on living cells.

Advertising Awards Case Studies

Student Presenters: Radamanthys Chourdakis and Sheraine Peart
Faculty Mentor: Fatimah Elsayed
Department: Communication Arts
School/College: College of Arts and Sciences, Manhattan

This year my team of various majors and various professors across schools gathered together and created entries for the biggest advertising awards in the world; and while the tally is still being counted (results shall be announced in April) we worked immensely hard and with great diligence to create case study videos for tackling the opioid epidemic and trying to market a new kind of insurance to Millennials. The results were pretty fascinating.

Bionic Health-Inspired Stone Pavilion

Student Presenters: Arkadiusz Chrobak, James Giustiniani, Santiago Molina, Louis Bruni,
Vanessa Rocha, Carlos Chica and Nicole Fatone
Faculty Mentor: Giuseppe Fallacara
Department: Architecture
School/College: School of Architecture and Design, Old Westbury

The project site is located in the central courtyard of the NYIT-Old Westbury campus, and is surrounded by the College of Osteopathic Medicine and the School of Health Professions. The idea behind the project started as a thesis design studio project. NYIT has commissioned students of the architecture department to reimagine and redesign the existing 500 medical building to the "New School of Health Professions". As the students create their new proposals for the project the idea of a pavilion took shape. The school wants to create a connection space between all the medical professions where students can interact and gather together. School of architecture and design came up with a competition where students would create a central pavilion that is all made out of stone. "Bionic Health-Inspired Stone Pavilion" is the name of the competition. The students are to reinvent the idea of stone construction and create structures fully made out of stone that seem impossible to build yet provide a space for student to gather in. Small bionic pavilion raises a question of sustainability from an interdisciplinary systems standpoint. Seven teams will focus and pay close consideration to material performance as well as structural symbiosis. Each pavilion will generate a highly complex interlocking stone system that uses the latest fabrication and methods of construction. This innovative projects will provide a new place on campus for students to gather at and enjoy socializing with other professions. Each student will generate their own unique shape of the pavilion as well as fabricate and develop a stone construction pattern.

Illustrated Cinemographs

Student Presenter: Christopher Chung
Faculty Mentor: Ashley Gerst
Department: Digital Art and Design
School/College: College of Arts and Sciences, Manhattan

I plan to display my gallery of cinemographs made with Adobe photoshop, Illustrator, and after effects. I also plan to highlight the graphite drawings I use to help myself make these illustrations. These drawings are on 9 x 12 in Stonehenge paper. The cinemographs themselves are female portraits in surreal, melancholy, dream- like states. This link will provide you with the artwork I want to display:

<https://imgur.com/gallery/zXps8>

Cell Biology

Student Presenters: Emily Cook and Ashley Reji
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: School of Arts and Sciences, Old Westbury

We have been studying a drug from the NYIT Drug Collection code-named L. Drug L was tested for killing yeast on various media including sucrose, glycerol and glucose. This growth assay is being followed up by experiments that use biochemical probes of cell function, such as MTT for mitochondrial activity, and invertase for the ability to regulate and secrete enzymes. We will also use live cell assays to probe Drug L's effect on cell division, locomotion, and endocytosis.

The Water Cleaning System

Student Presenter: Elis Cucka
Faculty Mentor: Joseph Pastor
Department: Interdisciplinary Studies
School/College: School of Interdisciplinary Studies and Education, Manhattan

Water is life. There are places in Africa, like Ethiopia, where people are dying because they drink contaminated water. This is a very serious problem and these people need help. My idea is mainly about creating a system that cleans the water of a natural source. This will be done by using chemicals and by rising the water temperature to a certain degree. The inputs are water, sunbeams and chemicals. The output of the system will be the purified water.

My system is related to the energy. It uses solar energy, which is a renewable energy. Solar panel will be the device that will turn solar energy to electrical energy. This energy will be accumulated and then used by the other components of the system.

My system is connected to water. It uses water from a natural source. Then it is purified by increasing the temperature and using chemicals. The output will be clear water without bacteria, viruses and other contaminations.

There will be 12 solar panels that will provide energy, 2 energy accumulators that will keep and save that energy, 3 water heaters that will raise the temperature to a certain degree, wires that will connect the machines, water tap and metal pipes that will transport water, two pumps that will move the water, chemicals that will purify water (like chlorine), a 3D printer that will print the tools or particles to fix the system and a computer that will execute the system processes.

Finding Phages for Household Kitchen Sponges

Student Presenters: Linesha Davis, Gokberk Simsek, Olivia Albert
Faculty Mentor: Bryan Gibb
Department: Life Sciences
School/College: College of Arts and Sciences

Bacteriophages are viruses that are natural predators of bacteria. It is estimated that there are 10^{31} bacteriophages, making them the largest source of genetic diversity. In addition to a wealth of uncovered genetic information, bacteriophages can be used as therapeutics in the treatment of bacterial infections. There are numerous unique bacteriophages for every species of bacteria and they are found in the same environments as the host bacteria. Kitchen sponges are among the most heavily contaminated sources of bacteria in our homes. We isolated a strain of *Citrobacter* from a kitchen sponge and used it as host to find novel a bacteriophage. Some members of *Citrobacter* are opportunistic pathogens that are most often associated with neonatal sepsis and meningitis. Using *Citrobacter* as host, we have isolated and are currently characterizing a novel from a kitchen sponge. These studies will be used to advance our understanding of the host-phage relationships in non-model systems and the isolated bacteriophage could potentially be a used as a therapeutic in fighting infections caused by *Citrobacter* at some point in the future.

Recreation of a Human Organ Using Modeling Clay: Kidney

Student Presenters: Francis Deocampo, Farhat Majeed and Beyza Kosif
Faculty Mentor: Claude Gagna
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

As part of our Human Gross Anatomy course (BIOL-210), we decided to create a model of the human kidney, along with the adrenal gland, ureter and other associated structures, using high quality materials such as white and other colored modeling clay (Das Modeling Materials: FILAGroup, Italy), and Testors enamel paint (Vernon Hills, Il) to color specific structures. We then placed the model on a Tri-Fold Foam Display board (Elmers Guide-Line: 18 by 24 inches) Internal organs of the human body are very complex machines, and being able to construct the kidney from modeling clay helped us better understand all of its internal and external parts (e.g., cortex, medulla, fat layer, calyces, Gerota's fascia). It also helped us understand its relationship to other anatomical structures. It gave us a better three-dimensional perspective of this organ. We wanted to accurately make a model describing the anatomy, and touching upon the histology of this organ. Gloves were always worn during the creation of the model. Different colors represent unique parts of the human kidney (e.g., arteries (red), veins (blue), and tissue (pink)), and give students a hands-on approach to differentiating the various components while understanding how they function together as a unit.

Effects of Drug B on *Saccharomyces Cerevisiae*

Student Presenters: Fatma Eldomyati and Summer Khan
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

We are examining how Drug B from the NYIT library functions. This drug is being studied in via the effects it has on the yeast *Saccharomyces cerevisiae*. Drug B has a large effect in the MTT mitochondrial assay, suggesting it has an effect on the cellular respiration processes. This could mean that the drug interrupts the electron transport chain, possibly uncoupling the proton gradient and resulting in loss of ATP production. Drug B was also tested on motile *Tetrahymena* cells, and appears to stop their movement. If Drug B prevents respiration, this could reduce cell motility, an energy-intensive process. Further experiments will reveal the targets of this drug.

Continuous and Transparent Authentication of Haptic Users

Student Presenter: Fatimah Elsayed
Faculty Mentor: Paolo Gasti
Department: Computer Science
School/College: School of Engineering and Computing Sciences, Manhattan

Telerobotic systems are used to perform critical tasks in sensitive environments. The security of these systems is of paramount importance, because compromising them can result in significant harm. In this paper, we attempt to address threats leading to illegitimate access to telerobotic devices. We conducted an experiment in which users explored a scene using a GeoMagic Phantom Omni haptic device. The scene provided only limited visual feedback, and required users to interact with it by primarily relying on haptic feedback. We recorded how 32 users interacted with the haptic device over 180 sessions. Our results show that haptic signals collected during a session can be successfully used to distinguish between users. As a result, telerobotic operators can be authenticate transparently throughout a session (i.e., continuously) by relying on haptic measurements alone.

Knitting Neighborhoods

Student Presenters: Bernarda Franco, Mitchell Stogel and Jason Aviles
Faculty Mentor: Farzana Gandhi
Department: Architecture
School/College: School of Architecture and Design, Manhattan

Knitting Neighborhoods is an Urban Design proposal developed in our Design V Architecture studio that focuses on addressing the problem of disconnection within the communities in southern Flatbush Avenue in Brooklyn, while at the same time tackling down the concern of flooding in these areas. While analyzing the conditions of the area, the three main issues that were brought to our attention were the racial divide that happens on the East and West neighborhoods of Flatbush Avenue, accessibility and transportation in the Southern area of Brooklyn and coastal flooding due to sea level rise and natural disasters.

Delineation of Vertebral Pedicle Morphology to Assist Surgeons in Minimally Invasive Spinal Surgery

Student Presenter: Maximillian Ganz
Faculty Mentor: Adam Bitterman, Robert Stockton and Kanwarpaul Grewal
Department: Biomedical Sciences
School/Department: College of Osteopathic Medicine, Old Westbury
Department: Orthopedic Surgery
School/Department: Hofstra Northwell School of Medicine, Plainview Hospital

Minimally invasive surgery has become an increasingly common modality for all types of surgical procedures. This trend is true for spinal surgery. Recent studies have identified that minimally invasive transforaminal lumbar interbody fusion (TLIF) spinal surgery is equally safe, provides a decreased amount of perioperative blood loss, decreased post-operative pain rating, decreased length of hospital stay, and increased rate of rehabilitation when compared to open TLIF. However, the study noted that when compared to the open procedure, minimally invasive TLIF did not decrease operative duration and provides equivalent but not superior radiographic results and clinical outcomes.

We retrospectively analyzed the computed tomography scans of 98 patients obtained over a two-week period in multiple hospital centers. This sample provided us with a diverse patient population to compare specific vertebral pedicle morphology with each patient's age, gender, height, weight, BMI and ethnicity. We measured the transverse pedicle angles (TPA) from L1-L5 of all 98 patients resulting in a sample of 980 total measurements. The TPA is the angle between a line from the spinous process to the anterior vertebral body and a line drawn from the mid-axis of the pedicle to the anterior vertebral body midline. This measurement is highly important as it is the entry point for insertion of pedicle screws in TLIF. Our results found significant correlation between patient demographics and TPA. We hope that this new-found correlation will assist orthopedic surgeons in preoperatively planning of minimally invasive spinal surgery, intraoperatively and subsequently improve both radiographic and clinical outcomes.

Cell Biology

Student Presenters: Gabriella Genua and Eteete Dan-Udoka
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

We are studying Drug "F" from the NYIT Drug Library. We are using baker's yeast and the ciliate *Tetrahymena* as model systems for our research. Drug F was more effective in inhibiting growth of yeast on sucrose media than glucose media and glycerol media. Consistent with this, using a biochemical assay, we have shown that Drug F affects the regulation and secretion of invertase, which is secreted by yeast to breakdown a complex sugar to a simple form for metabolic use. We will follow up by examining Drug F's effect on mitochondrial function, cell cycle regulation, and cellular motility.

Holocaust Infographic

Student Presenter: Michael Gordon
Faculty Mentor: Patty Wongpakdee
Department: Digital Art and Design
School/College: College of Arts and Design, Manhattan

The topic I chose to focus on for this particular infographic was the Holocaust that occurred in Europe perpetrated by Nazi Germany from 1933 to 1945. The Holocaust was the systematic, bureaucratic, state-sponsored persecution and murder of six million Jews by the Nazi regime and its collaborators. *Holocaust* is a word of Greek origin meaning "sacrifice by fire." The Nazis, who came to power in Germany in January 1933, believed that Germans were "racially superior" and that the Jews, deemed "inferior," were an alien threat to the so-called German racial community.

I decided to use an infographic to illustrate this topic because it is a unique way to show large quantities of data graphically so it is aesthetically pleasing. The Holocaust was not only about eliminating the Jews, although two thirds of European Jews at the time were exterminated.

I chose the Holocaust for the sole reason that I would like to bring more awareness to others of the true magnitude of the killings committed by the Nazis under Hitler's Third Reich. The total number of deaths attributed to the Holocaust is estimated to be somewhere around 20 million people, that is more than the entire population of New York State in 2017! The unspeakable acts carried out by the Nazis on innocent individuals should not and never will be forgotten.

Can We Trust Our Lab?

Student Presenter: Ema Graceni
Faculty Mentor: Grady Carney
Department: Life Sciences
School/College: College of Arts and Sciences, Manhattan

Science Laboratories are the place where theory turns into practice. However, students do not always get the same experimental results from the same experiment. Calculating percent error and trying to find a good explanation for its presence makes experimental results more accurate. Despite that, students often encounter cases when the percent error is too high. Then, they try to explain it by considering different human mistakes in making measurements. However, even the human mistakes considered, there are cases when a high percent error cannot be explained. What if there is another source of error during the experiment? What if students have been trusting the wrong equipment and end up creating wrong scientific ideas by trying to justify an inexplicable result? Therefore, using accurate and trusty equipment is very important. In school laboratories there are many equipment that come ready from the factory and are trusted to do the calculations for students. Many of them could have just by mistake skipped the step of being double-checked or could have just been damaged on their way to school. Thermometers giving different temperatures for the same solution at the same time, scales showing different masses for the same body, or spectrophotometers showing different absorbance for the same solution are common in school laboratories and lead to such experimental results that students may end up thinking that theory learned in lecture is just theory and never happens in real life. During this quantitative analysis laboratory research, a simple but very important aspect of scientific process is brought to attention, the reliability of laboratory equipment. Since pH meters are widely used during laboratory classes, they are the subject of this research. Three pH meters and three electrodes were used to measure the accuracy and precision of their measurements.

Quadruplex DNA in Normal Human Crystalline Lenses: Cell Death Characterization

Student Names: Megha Gupta, Adarsh Pillay, Ali Haidery, Abdallah A. Sattar and Umay Mughal
Faculty Member: Claude Gagna
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

Purpose: G-quadruplex DNA (G4-DNA) is recognized in telomeres, and non-telomeric genomic DNAs. They regulate normal biological processes (e.g., recombination, transcription, and replication) and pathologies. The lens provides a tissue to examine differentiation, cell cycle, mitosis, and cell death [terminal differentiation (denucleation)]. Therapeutically targeting G4-DNA might prove helpful in treating cataracts, and learning more about the mechanisms that regulate cell death. Previous research shows that there is an increase in ss-DNA, and a gradual decline of canonical B-DNA and Z-DNA in terminally differentiating fiber cells in adult lens. We hypothesize that G4-DNA will be minimal within the central zone epithelium (quiescent), with a gradual increase in the germinative zone and differentiating cells, and then a gradual decline within the nucleated secondary fiber cells.

Methods: Lewis rat eyes were fixed in 10% NBF or Davidson's fixative for 48 hrs. Tissues were processed to obtain paraffin-embedded 3 μ m sections. Colorimetric/fluorescence staining was performed with an anti-G4-DNA MAb and conjugated 2° antibody to locate staining sites and quantify staining intensities. Microscopic procedures were performed using a Leitz DMRB microscope. Quantification of staining was determined as mean optical density (MOD) units (Quantimet 500+ image-analysis system). Results were expressed as the mean \pm standard deviation, and the statistical significance was measured at $p < 0.05$.

Results: Our group successfully demonstrated the presence of G4-DNA in lens tissue. Tissues fixed in Davidson fixative resulted in superior preservation of natural morphology/immunostaining. The highest MODs were seen in mitotic cells. Staining was also identified at weaker MODs within the anterior epithelium and secondary nucleated fibers.

Conclusion: We conclude that G4-DNA is located within the lens and may play a role in regulating epithelium, lens fibers, mitosis, and cell death. Antigen Retrieval suggests that G4-DNA is covered by many G4-DNA binding proteins. G4-DNA gradually declined within the secondary fiber cells, similar to B-DNA and Z-DNA, indicating the destruction of DNA in denucleating fibers. All DNAs examined were undergoing destruction during denucleation. Knowledge of G4-DNA in lens cells and fibers may shed light on the molecular biology of cataracts and cancerous tissues.

IOM: Professional Issues in Nursing

Student Presenter: Shadae Headley
Faculty Mentor: Frances McGibbon
Department: Nursing
School/College: School of Health Professions, Old Westbury

Nursing has become an important profession and represents a major component in healthcare; nonetheless, there are many aspects that need modification. In 2008, the Robert Wood Johnson Foundation (RWJF) approached the Institute of Medicine (IOM) to propose a partnership that would assess and respond to the need to transform the nursing profession (IOM, 2011). Nurses spend the most amount of time with patients and play an active role in the care they receive. Overcoming barriers in the nursing profession will help initiate change, and allow nurses to perform more competently. It will also supply them with skills that will enhance the care they are providing to patients. The United States healthcare system is currently experiencing many challenges and with the implementation of the IOM report, change in the nursing profession will successfully affect all other healthcare professions. To receive a successful outcome from the issues of the nursing shortage, long shifts with mandatory overtime, and safer patient to staff ratio, a collaboration of nurses and stakeholders is needed. Patients so deserve and it is not fair for them to develop something hospital-acquired, or not receive the best care possible due to a nurse that is burnt out from working extended hours. The IOM Future of Nursing Report offers 10 recommendations that will target these stakeholders, such as the government, consumers, professional organizations, and many others. With combined efforts and participation of each, “(t)ogether, these groups have the power to transform the health care system to provide seamless, affordable, quality care that is accessible to all, patient-centered, and evidence-based and leads to improved health outcomes” (IOM, 2011).

That Shopping Space Is *Mine!* Consumers' Reactions to a Personal Space Infringement

Student Presenters: Yichen Huang and Jie Wang
Faculty Mentor: Colleen Kirk
Department: Management
School/College: School of Management, Manhattan

Psychological ownership refers to the idea that people develop feelings of possession for tangible and intangible objects, even if they do not have legal ownership of the objects. For example, an individual may have feelings of ownership when he or she invests a lot of time in the object regardless of legal ownership. In short, it becomes *mine!* Psychological ownership exists in a subtle way in people's mind and it can result in both positive and negative behavior and outcomes.

We conducted a field study in the context of a convenience store to examine consumers' territorial behaviors using personal space as a target of psychological ownership. Fifty-four participants were recruited on the street, and each of them was given \$3.00 to purchase candy or a snack in the NYIT Manhattan campus convenience store. A researcher posing as a shopper reached directly in front of the shopper to choose an item from the snack stand. The confederate either said nothing, implying ownership of the shopper's personal space, or said, "excuse me," which served to acknowledge the shopper's psychological ownership of the space. Shoppers who were infringed by the other shopper's ownership signal were less likely to pick up the infringer's dropped pen.

Cosmic Culture

Student Presenters: Nicholas Huber and John Echeverria
Faculty Mentor: Rozina Vavetsi
Department: Digital Art and Design
School/College: College of Arts and Sciences, Old Westbury

We explore the hypothetical culture of life in outer space. With the rapid pace of technological advancement, we see companies such as SpaceX coming into the limelight, planning a bright future for spacefaring civilians. The project will consist of six (6) posters displaying what could potentially be real advertisements in the future. We will design posters with a bit of satire in combination with scientific facts to give a glimpse at what space life could be. Areas of life being covered by the posters will be Entertainment (nightlife, theater, sports), Food (fast food, restaurants, grocery), and Housing (hotels, resorts, condominiums).

The Effect of Nonverbal Communication through Smell and Sound on Consumer Behavior

Student Presenter: Desislava Ivanova
Faculty Mentor: Matthew Mecs
Department: Marketing
School/College: School of Management, Manhattan

In today's fast growing world, success is the result of complex skills, both on verbal and nonverbal level. Possibilities of speech – spoken, written, brought to formulas and incorporated in the electronic memory of the computer – are unlimited and essential for evolution, but are not enough. Considering that the man is not entirely rational, “but woven from emotions, being” (Carnegie, 1996), and that the nonverbal communication is the message of our emotional state and attitude towards others, from one side, and from another, it is a way to directly influence our senses, so it is reasonable to affirm that knowledge and appropriate use of nonverbal elements are crucial for prosperity. Namely the establishment of the this relation has predetermined the direction of the current study.

The current scientific article aims to explore the impact of nonverbal communication on consumer behavior. We will take a closer look to the essential role that nonverbal communication plays in the decision-making process in terms of purchasing. Research objectives are related to justify the argumentative value of nonverbal elements, with emphasis on non-verbal communication through sound and smell.

In both, professional and everyday life, what cannot be achieved by words and images, it is possible through nonverbal communication.

Express Histamine Degradation in Transgenic Worms

Student Presenters: Jerin John and Humna Aminullah
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/Department: College of Arts and Sciences, Old Westbury

Artificial neurotransmission systems would give us the ability to re-wire the nervous system. The nematode *C. elegans*, a powerful and popular model organism for neuroscience, does not naturally synthesize or use histamine as a neurotransmitter. Our lab has shown that transgenic worms engineered to express histamine synthesis enzymes and receptors from other organisms can generate and use histamine as a synthetic neurotransmitter. However, these artificial signals remain un-naturally elevated since worms do not have a mechanism for clearing released histamine. We are generating worms that express histamine degradation enzymes, and exploring ways to target them to the correct location to efficiently blunt histamine signaling.

Does Age Impact Cognition and Balance in People with Parkinson's Disease Compared with Healthy Older Adults?

Student Presenter: Ramanjit Kang and Angel Rodriguez
Faculty Mentor: Rosemary Gallagher
Department: Physical Therapy
School/College: School of Health Professions, Old Westbury

Background: The purpose of this study was to examine age-related differences in cognition, using the Montreal Cognitive Assessment (MoCA) and balance, using the Mini Balance Evaluation Systems Test (MiniBESTest) in young and older adults with and without PD to determine the impact of age and disease state on these measures. We hypothesize: (1) older persons with PD would score lower than younger persons with PD, young healthy adults, and healthy older adults, and (2) there would be a positive relationship between MiniBESTest and MoCA performance which would be influenced by both age and disease state.

Methods: Participants were male and female persons with PD (40) and healthy male and female age matched controls (28), ranging from 40-85 years old. There were 24 participants with PD under the age of 65, and 16 participants with PD 65 years and older. There were 11 healthy adults under the age of 65, and 17 healthy adults 65 and older. Participants with PD were 68% male and healthy controls were 64% male. The median Hoehn & Yahr stage was II. Baseline motor assessment was performed using the Unified Parkinson's Disease Rating Scale (UPDRS) part 3. The MiniBESTest and MoCA were then administered. Univariate 2x2 ANOVA's compared the MiniBESTest and MoCA scores by age (under 65 or 65 and older) and group (PD or healthy controls). Post-hoc analyses used Spearman's correlations. Pearson's correlation was used to examine the relationship between MiniBESTest and MoCA scores.

Results: Participants with PD scored lower (i.e. more poorly) than healthy adults on both the MoCA ($p=0.03$) and the MiniBESTest ($p=0.000$). There was no significant main effect of age on MiniBESTest or MoCA scores. A significantly negative correlation between age and MiniBESTest total score was found in the healthy adults ($p=0.008$).

Conclusion: Contrary to our hypothesis, both younger and older adults with PD performed poorly on the MiniBESTest and MoCA when compared to healthy adults. Therefore, disease state, but not the combination of age and disease, influenced cognition and balance. Knowledge of the relationship between cognition and balance using clinic friendly tolls such as the MoCA and the MiniBESTest may lead to more routine cognitive screening and more targeted interventions for people with PD who have balance deficits.

The Science of History: Why the Egyptians Never Smiled for Pictures

Student Presenter: Jasmine Kannikal
Faculty Mentors: Kunal Oak and Mohammad Zaidi
Department: Life Sciences
School/College: College of Arts and Sciences, Manhattan

The Ancient Nubians have historically been renowned for their significant contributions to medicine. In spite of this, extremely poor oral health plagued this population. Paleopathological studies depict pronounced dental deterioration patterns far exceeding normal physiological progression. The advanced wear is popularly attributed to sand particle contamination of their daily diets. However, considering that individual wear mechanisms rarely act in isolation, we propose that adverse biochemical factors arising from regular consumption of tetracycline-fortified beer induced calcium malabsorption, and thus provided a synergistic diathesis in potentiating these effects.

We examine these implications within the context of prevalent therapeutic remedies, bone fluorescence labeling data, and sociocultural attitudes when making the link between tetracycline and the compromised integrity of teeth, while citing the emergence of antibiotics actually predating formally-accepted convention.

Self-Fulfilling Prophecy in Education

Student Presenter: Ruchika Kapoor
Faculty Mentor: Anthony Dimatteo
Department: English
School/College: College of Arts and Sciences, Old Westbury

A self-fulfilling prophecy occurs when, as a result of knowing a certain expectation, a person unintentionally makes those expectations come true. While this is an idea that occurs very often in movies and literature, it is also something that happens in reality as well, and specifically in our education system. More often than not, statistics show students from Black and Latino communities receiving lower grades and having smaller graduation rates. Unable to believe that ethnicity and social class could have such a strong relationship to intelligence, I decided to look into what could be the possible causes of the educational gap amongst these different communities. What I learned was that it is actually the biased expectations of the teachers that contribute to these statistics. Whether it is intentional or not, all teachers have certain expectations for their students and these expectations are shown through their teaching strategies and interactions with the students, ultimately making them very aware of what their teacher believes they are capable of. This expectation possessed by the teachers as a result, becomes a self-fulfilling prophecy with the students knowing what is expected of them ultimately effecting their actions and eventually their education.

Isolation of Novel *Pseudomonas* Bacteriophage from a Kitchen Sponge

Student Presenters: Lovejit Kaur, Brianna Weiss, William Krotz, Emily Cook
Faculty Mentor: Bryan Gibb
Department: Life Sciences
School/College: College of Arts and Sciences

Bacteriophages are viruses that infect bacteria. Recently, in an age of growing antibiotic resistance, bacteriophages are an attractive alternative therapeutic option to help fight bacterial infections. In principle, bacteriophages should be found wherever the host bacteria take up residence. Our kitchens are known to be contaminated with a wide variety of bacteria, and the lowly kitchen sponge is among the most contaminated surfaces in the home, making it an excellent potential source of novel bacteriophage. We have isolated and are characterizing a novel bacteriophage that targets a species of *Pseudomonas*. Certain members of *Pseudomonas* bacteria are opportunistic pathogens with clinical isolates showing increased resistance to traditional antibiotics, so the identified bacteriophage may have therapeutic potential in fight infections.

Cas9-Mediated Genome Engineering of C Elegans

Student Presenter: Simran Kaur
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: School of Arts and Sciences, Old Westbury

We study the nematode *C. elegans* as a model organism for neuroscience, since its nervous system is far simpler than humans, and it is possible to use genetic analysis to map pathways. A barrier to understanding the neuromodulator networks that regulate behavior is the fact they act via G-proteins that are expressed in all tissues; mutations in the genes that encode these proteins result in severe defects since all tissues are affected. More readily interpretable experiments can be done using cell-specific gene knockouts that selectively delete these genes in particular cells only, leaving other tissues intact. This can be done by engineering loxP sites into the genome flanking the G-protein gene of interest, and expressing cre recombinase enzyme only in the desired cells; the recombinase removes the gene between the loxP sites, resulting in a cell-specific gene deletion. To insert the loxP sites, we will use the RNA-guided Cas9 enzyme to generate breaks in the DNA at the sites of interest. I am expressing Cas9 protein in *E. coli* and purifying it. We will inject this purified enzyme with guide RNA to target the genomic locations flanking the G-protein genes, allowing for efficient insertion of the loxP sites.

The Function of Drug L: Cell Biology Lab

Student Presenters: Maria Kazmi and Michael Mirham
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

We are studying how an unknown drug in DMSO solvent from the NYIT Drug Library, code-named Drug L, functions. We will be running various assays using yeast to determine Drug L's target and mode of function. The halo assay revealed that Drug L was most effective in YPG (glycerol) media, suggesting that the drug may affect mitochondrial function. Consistent with this, using the biochemical MTT assay of mitochondrial activity, we found that Drug L reduces mitochondrial function. We also observed a higher level of secreted invertase enzyme activity; since invertase is regulated by the metabolic state, putting these data together suggest that this drug may affect metabolic regulation. We will examine this idea and other possible mechanisms.

Computational Modeling of Micro-Calcification on the Endothelial Layer and Blood Flow Interaction

Student Presenter: Ian Kelly
Faculty Mentor: Dorinamaria Carca
Department: Mechanical Engineering
School/College: School of Engineering and Computing Sciences, Old Westbury

Blood flow within the human body is partly regulated by the rhythmic movement of smooth muscle in the vessel wall. The pressure of the blood flow is produced by the hydrostatic pressure of the fluid against the walls of the blood vessels. Hydrostatic pressure in the arteries is very high near the heart and causes blood to flow to lower pressure zones away from the heart through the narrower arterioles where the flow rate decreases. Hardening of the arteries (atherosclerosis) is a disorder that causes the arteries to become narrowed due to LDL deposits on the inner arterial walls (endothelial layer). Following, the deposits become hardened and calcification (arteriosclerosis) occurs. Atherosclerosis is known as a chronic inflammatory disease and calcification of the arteries is a predictor of cardiovascular disease.

Shear stress in fluid flow is primarily caused by friction between fluid particles. Fluid particles react with the vessel walls as blood flows over human tissue. Resultantly, shear stresses occur on both the endothelial layer and the blood flow at the blood-tissue interface. Therefore, arteriosclerosis cells on the vessel walls affect blood flow through shear stress and vice-versa. The goal of this research is to investigate the effect of early micro calcification on the blood flow and the stress distribution on the endothelial layer.

Functions of Drug “E”

Student Presenters: Sophia Khan and William Krotz
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

We are studying a drug, code name E, from the NYIT drug library. We are using the yeast *Saccharomyces cerevisiae* as a model system. Drug E can kill yeast most effectively on sucrose-containing media, suggesting it can affect protein secretion and metabolic regulation. We can use biochemical assays to probe the drug's effect on metabolism. We will also use live-cell assays to probe Drug E's effect on cytoskeleton function using *Tetrahymena* assays of exocytosis and chemotaxis. We will also examine Drug E's effect on cell division.

C. Elegans Olfactory Chemotaxis

Student Presenter: Eric Kibitel
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

We would like to understand the biological basis of decision-making, how individuals decide between equally attractive choices. The nematode *C. elegans* has a completely mapped nervous system of only 302 neurons, with genetic tools for manipulating the activities of individual cells, making it a powerful model system for studying how behaviors are generated. I am working to discover the concentrations of two odorants *C. elegans* are equally attracted to (isofragrant point). The two odorants I am investigating are Isoamyl Alcohol (gym socks) and Diacetyl (popcorn butter). The worms' response to these odorants is measured using a chemotaxis assay in which animals are placed in the center of an agar plate that has a defined concentration of each odorant on opposite ends of the plate. These plates are then scanned to quantify how many worms went to each odorant. The isofragrant point I identify will be used in subsequent experiments to map the neural circuitry of decision-making by testing animals with perturbed neurons.

The Immigrant Experience

Student Presenter: Vyshnavi Kodali
Faculty Mentor: Anthony Dimatteo
Department: English
School/College: College of Arts and Sciences, Old Westbury

Immigration is a critical component as well as an on-going challenge of the United States. It is vital to understand immigration in order to value what makes immigrants who they are in the first place. To advance my own understanding of immigration, I have analyzed the poetry of a contemporary poet named Naomi Shihab Nye, who not only is the child of an immigrant, but has also spent some time abroad in the land of her ancestors. Upon reading her poems, I have come away with an understanding of immigration on a deeper level and how it affects not only the immigrant in their new country, but the relatives that were left behind in the ancestral land. Nye writes, "We're all poets rippling with/ layers of memories." As both a first-generation American on my father's side and a second-generation American on my mother's side, I'd like to share my story and what I've learned about the immigrant experience.

Acute Effect of Osteopathic Manipulative Medicine on Upper Extremity Tremor in Parkinson's Disease

Student Presenter: Siu Lam Koo
Faculty Mentor: Sheldon Yao
Department: Osteopathic Manipulative Medicine
School/College: College of Osteopathic Medicine, Old Westbury

Background: Hand tremor is a hallmark symptom of Parkinson's Disease (PD) with detrimental effects on quality of life. Traditional pharmacological therapy typically fails to fully alleviate tremor symptoms, creating the need for adjunctive therapy. Osteopathic manipulative medicine (OMM) has been shown to improve gait and motor function in PD, but research on its effects on tremor is limited.

Objective: To determine if an OMM treatment protocol of articular (ART) and muscle energy techniques (MET) to the body would improve tremor symptoms in PD.

Methods: PD Subjects with balance and motor deficits were selected to participate. A subset of three PD subjects afflicted with tremors completed spiral-tracing tests. An OMM protocol including ART and MET of the spine and extremities was applied. Following treatment, the subjects performed the same drawing tests. Four graders evaluated the tests and the deviations were averaged.

Results: Post-OMM drawing tests showed decreases in deviations. Loose spiral tracings had a 5.8% reduction in deviations and tight spiral tracings had a 24% decrease in deviations after OMM treatment.

Conclusion: Overall, OMM decreased tremor symptoms in the three subjects with PD. Limitation of this study include the scoring of the tremor tracings by hand rather than digitally. Additionally, as the pre- and post-session tracing tests were the same, it is possible that the subject learned the task and improved upon doing it a second time. Further research with a greater sample size and a control arm is warranted to confirm the preliminary positive results.

Dynamic Control of Differential-Drive Wheeled Mobile Robot

Student Presenter: Ian Krivoruk
Faculty Mentor: Sabiha Wadoo
Department: Electrical and Computer Engineering
School/College: School of Engineering and Computing Sciences

In this presentation, a feedback controller is used to control the dynamic model of a Quanser QBOT 2, which is a differential-drive wheeled mobile robot. As a reference trajectory for the mobile robot is set, the controller is designed to control the torques acting on the wheels of the robot to follow the reference trajectory. The torque is controlled such that the actual linear and angular velocity of the robot converges to the reference velocity, with minimal error. For this application, the Back stepping technique is used to design the dynamic controller. Matlab and Simulink is used to simulate the design of the controller, as well as to implement the controller on the QBOT 2 and to validate the simulation.

Comparative Analysis of DNA Extraction Methods: “Kitchen Counter DNA Lab” Versus Commercially Available Kits – Part I

Student Presenters: Matthew Leiman, Jacqueline Gribko and Kevin Lee
Faculty Mentor: Claude Gagna
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

Isolation of genomic DNA has been the foundation of understanding the structure and mechanisms of organic science through molecular analysis. An isolating procedure that is rapid, cost-effective, essential, and accessible to the public would be ideal in both maximizing productivity in a scientific setting and encouraging those in non-scientific and unfunded backgrounds to conduct experiments. In the present study, a comparative analysis between two DNA extraction procedures, Household Extraction method by Dr. Shawn Carlson, Ph.D. and Plasmid DNA extraction by Carolina Biological Supply (i.e., Plant Biotechnology: DNA extraction Kit) (Item # 154704), were conducted to ascertain their relative efficacy for extracting DNA from wheat germ:

Over the counter Materials for DNA Extraction:

1. Distilled or bottled water (glass 1), 120ml (about 4 oz)
2. Salt, 1.5 grams ($\frac{1}{4}$ tsp)
3. Baking soda, 5 grams (1 tsp)
4. Liquid laundry detergent, dish detergent, or shampoo (glass 2), not soap — look for sodium lauryl sulfate on the label, 5ml (1 tsp)
5. Crushed ice to chill the buffer
6. Meat tenderizer
7. Pineapple juice, or contact lens cleaning solution just a dollop

The quality and quantity of the differentially extracted DNA was evaluated through spectrophotometric measurements, gel electrophoresis and DNA melting temperature experiments. Other factors, such as processing time, cost, and intensity of labour for each procedure were also examined. Results indicated that the Carolina Biological Supply kit was more suitable in extracting higher concentrations of pure DNA, whereas the “Kitchen Counter DNA Lab” demonstrated a yield of lower quality. It was determined that the commercially available kit resulted in superior extraction of DNA, namely higher amounts of pure DNA. While the commercially available kit is less cost-effective, it was more effective and less time-consuming than the “Kitchen Counter DNA Lab”. However, it should be noted that the “Kitchen Counter DNA Lab” did yield acceptable amounts of DNA. This project will be continued in the future with other DNA isolation kits, such as the Omega Bio-Tek DNA Isolation Kit (400 Pinnacle Way, Suite 450, Norcross, GA).

Apple Inc. Infographic

Student Presenter: Nihar Makwana
Faculty Mentor: Patty Wongpakdee
Department: Digital Art and Design
School/College: College of Arts and Sciences, Old Westbury

Technology has made so many advances over the past two decades. A lot of the most revolutionary products have come from Apple. They created the iPod and iPhone, which changed the way we viewed mp3 players and smartphones. They put us on the path that we are on and every single one of their products has changed the way we use those items. Apple is one of the largest technology companies in the world and almost anything they release gets sold and because of that I wanted to know more about this large company: the amount of devices sold during the first year versus the amount sold since the day of release, how apple plays a huge role in the global market and the top 10 largest countries with apple usages, looking at apple products versus their competitor's counterparts and finally, stock prices over the past 5 years. All this information gives a good informative view of how Apple as a company is doing in the world.

Power and Prey in Los Angeles: Cryonic Thaw for Humane Justice

Student Presenter: Krista Marcovecchio
Faculty Mentor: Naomi Frangos
Department: Architecture
School/College: School of Architecture and Design, Old Westbury

Freedom is defined as “the power to act, speak, or think as one wants.” When criminal acts are committed, and rights to freedom revoked, how is power redefined? The epidemic of mass incarceration stores over 2.3 million Americans in prison. As part of the justice system’s protocol, perpetrators are engulfed in long tumultuous pilgrimages, devoid of normalcy or community. The standard modern prison is a series of cryonic chambers, where inmate development halts, frozen in time. This concept, built for control, can be considered the antithesis of a healing architecture. In the widely accepted practice of retention warehouses rather than detention centers, with recidivism as the manifestation of failure, how can the design of a new spatial protocol thaw conditions of cryonic stasis in inmates to promote rehabilitation and resuscitate community integration?

Rehabilitative organisms challenge the protocol of isolation aimed at thickening thresholds between custody and freedom. Single units experience inward force of community, invert, then exert positive force outward. Organisms invent relationships between pre and post freedom, where inmates actively participate in healing via varying levels of out-mate exposure, manifesting a connection between stages of incarceration. Models couple inmate-out mate spaces, reorganizing protocol for societal reintegration. Services include mental health counseling, case management, education, training, social services, and spiritual guidance along with gymnasiums, libraries, and varying scales of housing from inmate units to community living. Communal spaces double for commerce, encouraging connections between inmate and public. Organisms are stimuli for social change in gang related areas, reversing the psychology of neighborhood.

Breakdown Prevention within Mission Critical Data Centers

Student Presenters: Candace McCoy, Ariana Rennie, Allison Fowler, and Ashtie Kanhoye
Faculty Mentor: Ehsan Kamel
Department: Engineering and Computer Science
School/College: School of Engineering and Computing Sciences, Old Westbury

Currently most data centers rely on “break-down type of maintenance,” waiting until something breaks down or goes into critical state before fixing the problem. This results in unplanned data centers’ down time, which are economically costly. An assembly of products with a high density of technological design is required for many data centers. There is a need for a detailed and dynamic system in which to house all parts associated with the design within the data center.

Our team will leverage a suite of sensors, software, and an IT management tool, to provide feedback on the status of various components of the data center equipment. We will use wired and wireless sensors to be installed at various racks to provide continuous feedback when certain parameters (e.g., temperature, humidity, and pressure) exceed acceptable values. The data will feed onto a server, where will be recorded in Building Information Modeling (BIM) files for monitoring and tracking purposes that will help pinpoint when the data centers equipment is not working at its optimal rate. These sensors will help us be able to monitor the shape the equipment is in, and alert managers if a piece of equipment needs attention and/or fixing, *before* it breaks down. The system will also have a control element that it can switch into automatically depending on the problem detected. For example, if detected that the temperature is too high the system will automatically turn on or lower the temperature of the Air Conditioning system. If the issue is not fixed through the control system, the system will alert the manager that the issue is not fixable. This will give an opportunity for data center managers to fix the problem at an optimal time, when there is not a high demand or need for the equipment. As the proposed protocol uses *diagnostic maintenance* to pinpoint problems before they take place, we expect that the data centers’ downtime will decrease. This will also cut the economic losses associated with unplanned equipment downtime / failures. Ultimately, the proposed solution will improved the management of data centers.

The software we choose to implement will be able to help with tasks carried out under Systems Engineering. These tasks range from all manner of large scale and small scale data to be organized, collected, and analyzed. We will implement BIM to create a digital replica of the data center. The collected data from the sensors that are placed within the data center, the location of each component within the data center, and all the analysis results will be recorded in BIM files. The software will benefit from organized and recorded data within BIM files to help monitoring and control all racks, the system, and the environment within the data center without physically being present. It generates reports that will give data from the data center and allow analysis to be done on each component and provide information about replacement options. It will also allow users to view each critical part for usage during monthly meetings. The following are a list of different outputs the software will create:



- Inventory list of critical machinery and subcomponents which includes the following information
 - Temperature
 - Humidity
 - Pressure
 - Power
 - Efficiency
 - Life cycle predictions
 - Mapping of parts going into failure
 - Carry out simulations during early stages of design
 - Directory of parts for aftermarket maintenance

Reduce? Reuse...Recycle!

Student Presenter: Crystal Miller
Faculty Mentor: Terry Nauheim
Department: Digital Art and Design
School/College: College of Arts and Sciences, Manhattan

When we think of waste, what do we usually think about? Cars, trucks, and buses (air pollution)? Oil and gas? We never really think about our garbage, let alone our food. About 40% of food produced in America never gets eaten, which is about 365 million pounds of food each day; at the same time, 1 in 8 Americans don't have a steady food supply. All of this is a massive contribution to climate change. Food waste is one of America's dumbest problems, and is one of the easiest problems to fix. The concept, reduce reuse and recycle is something that we were taught as children, but was not regularly enforced as we grew into adulthood. Let's think of a better future for ourselves, and the ones who will come after us.

The Great Pacific Garbage Patch

Student Presenter: Emely Molina
Faculty Mentor: Patty Wongpakdee
Department: Digital Art and Design
School/College: College of Arts and Sciences, Manhattan

Over the years, humans have dumped tons of garbage into the ocean affecting the marine life and the environment. Most of this debris is plastic which takes more than 450 years to biodegrade. I chose this topic for my infographic because it's really important to know the consequences of polluting our oceans. Infographics are an incredible way to provide real information by using graphics. These infographics is about the biggest garbage dump on Earth: The Great Pacific Garbage Patch. It's divided into 2 sections: first, general facts about the garbage patch and second, plastic under sea level and its impact. We need to wake up and find the solutions to keep our oceans free from debris and plastic so that our future generations can have a clean and safe ecosystem. The earth is our home and we need to respect it and keep it clean.

Sleep Deprivation and Aggressive Behavior

Student Presenters: Joseph Mure, Caitlin Appel, Michael Trainor and Daniel Lembo
Faculty Mentor: Emily Restivo
Department: Behavioral Sciences
School/College: College of Arts and Sciences, Old Westbury

The purpose of this study is to examine the effects of sleep deprivation on behavioral outcomes. By the end of this research study, we will have a better understanding on whether or not college students that get less than the suggested 8 hours of sleep are prone to delinquent behavior. Additionally, we will be able to examine if both impulsivity is affected by sleep deprivation. It is very typical for students in college to lose sleep due to studying and schoolwork, jobs, poor time management, and stress. When an excessive amount of sleep is lost, one's judgment can be impaired and the following may occur: aggressive behavior towards people we love or care about, hallucinations, fighting without reason, or acting out in harmful and destructive ways by using drugs or alcohol as a coping mechanism. Sleep deprivation, an important aspect of health and wellness, could potentially lead to a future of long-term behavior that is destructive. This could prevent college students from succeeding in life and their future; this is why it is important to study sleep deprivation and its preventative causes.

Assessing the Impact of Global Health on the Specialty Choices for Physician Trainees: Comparing Osteopathic and Allopathic Students

Student Presenter: Pooja Navlani
Faculty Mentor: Lillian Niwagaba
Department: Center for Global Health
School/College: College of Osteopathic Medicine, Old Westbury

Global Health has had a tremendous impact on the field of medicine and public health and the interest in global health for residents is increasing (Hau, Smart, DiPace and Peck, 2017). This research project will assess the impact of global health on specialty choices for physician trainees. This field “reflects the realities of globalization, including worldwide dissemination of infectious and noninfectious public health risks (De cook, Simone, Davison, and Slutsker, 2013). Global health can prove to be quite beneficial for residents and can help them better enhance their future medical career. Physicians will be treating a wide variety of emigrants and ethnicities; and knowledge of global health can help physicians come up with better treatment plans by understanding risk factors. For example, physicians with better knowledge of global health can help in fields such as infectious diseases, where patients may acquire diseases from traveling abroad and to regions that may be endemic to certain types of diseases. Physicians with broad knowledge of the global burden of disease may be able to better assess where and how the patient contracted the disease.

The goal of this project is to understand the impact global health has had on which specialty choices students get matched to. We will start out by observing osteopathic student matches and then we will compare participation in global health between osteopathic and allopathic students.

For this project, we will be analyzing The National Resident Matching Program (NRMP). The NRMP is an organization that helps medical students match to different residency programs. This program will allow us to extract some data about which residency programs physicians would be matched to. Along with this, we will be surveying medical students on their knowledge of global health and if they participated in any global health related programs. We will also be using internet-based surveys to better assess the impact on global health for training programs.

For this project, we analyzed fourth year medical students who participated in Global Health related activities and graduated from New York Institute of Technology College of Osteopathic Medicine from the years 2015, 2016 and 2017.

The Blue Green Economy

Student Presenters: Zandile Ncube, Christian Wade and Teresa Ferreira
Faculty Mentor: Farzana Gandhi
Department: Architecture
School/College: School of Architecture and Design, Manhattan

This presentation is a proposal for the urban redesign of the lower half of Flatbush Avenue in Brooklyn. The team aimed to have a very light touch with a very big impact on the chosen sites. The Introduction of “The Blue-Green Economy” will not just respond to the needs of the local community but to the environmental and financial issues. It provides “The Green Way” which is all about a new lifestyle, consisting of green roofs, pocket farms, parks, recreational spaces and a bike friendly city system. In order to better emphasize the naturalistic approach, the team decided to provide a full hand drawn presentation.

The Future of Nursing

Student Presenter: Margarita Nektalov
Faculty Mentor: Frances McGibbon
Department: Nursing
School/College: School of Health Professions, Old Westbury

Health care policies are developed to offer promotion and protection to individuals and society. Government officials can attain this goal in a manner that respects human rights. One of such policies is on change in violence towards nurses. Work place violence is categorized into two different categories; physical and psychological violence. Workplace policies in the healthcare must aim to attain certain goals. One of them is to establish and implement interventions that offer prevention in workplace violence against nurses and improve the existing social view of nursing towards disseminating zero tolerance to violence.

The key stakeholders that can be involved in the policy change process include; federal government representatives, healthcare employees such as nurse managers, nurses as well as other workers with the healthcare setting. In the case of implementation, nurses must be involved given the fact they are ones affected by healthcare violence. Healthcare professionals through organized groups obtain source power to change the current policies towards benefiting nurses. Utilization of media is also crucial in the implementation process as they will provide coverage and people will get to know of the changes being undertaken. Changes in the policy assist in prevention of violence against nurses. Increased conflict experienced is mainly between nurse-patient and nurse patient relatives. Although there are other forms of conflict, with the implantation of the policy discussed, zero tolerance to violence will be upheld in the healthcare sector. This will improve quality of care, reduce costs and enhance unity and respect between all the involved parties.

Chronic Dantrolene Treatment Attenuates Cardiac Dysfunction and Reduces Atrial Fibrillation Inducibility in a Rat Myocardial Infarction Heart Failure Model

Student Presenters: Colleen Nofi and Allan Migirov
Faculty Mentor: Youhua Zhang
Department: Biomedical Sciences
School/College: College of Osteopathic Medicine, Old Westbury

Background: Cardiac ryanodine receptor (RyR2) dysfunction and diastolic Ca^{2+} leak have been linked to arrhythmogenesis not only in inherited arrhythmia syndromes but also in acquired forms of heart disease including heart failure (HF) and atrial fibrillation (AF). Thus, stabilizing RyR2 may confer therapeutic effects in these conditions.

Objective: This study is to investigate the effects of stabilizing RyR2 with chronic dantrolene treatment on HF development and AF inducibility in a myocardial infarction (MI) induced HF model in rats.

Methods: MI was induced in adult Sprague-Dawley rats by ligation of the left anterior descending coronary artery. Two weeks following MI surgery, rats with large MI ($\geq 40\%$) were randomly assigned into MI+vehicle (n=14) and MI+dantrolene (10mg/kg/d, n=13) groups. Sham-surgery rats (n=7) served as controls.

Results: Compared to vehicle-treated MI group, 4-week dantrolene treatment significantly improved cardiac function with increased left ventricle (LV) fractional shortening (19.48 ± 3.61 vs 15.43 ± 2.65 , $p < 0.01$), decreased LV end-diastolic pressure (12.58 ± 8.52 vs 21.91 ± 7.25 , $p < 0.01$), left atrial diameter (4.97 ± 0.75 vs 6.09 ± 1.53 $p < 0.05$) and left atrial fibrosis content. Dantrolene significantly decreased AF inducibility (69% in MI-vehicle vs 23% in MI-dantrolene group, $p < 0.05$). Dantrolene treatment was associated with reduced phosphorylation of RyR2, and favorably altered gene expressions involving ionic channels, sympathetic signaling, oxidative stress, and inflammatory markers.

Conclusion: Chronic dantrolene treatment attenuated LV dysfunction and reduced AF inducibility, which were associated with decreased phosphorylation of RyR2 and restoration of many adverse changes in gene expression. Stabilizing RyR2 with dantrolene is a promising treatment in HF and AF.

Molecular Dynamics of Chiral Molecular Tweezers

Student Presenters: Nugzar Noniashvili, Meina Aziz, Faris Al Harbi, Tahera Aktar,
Faris Alshammari, Imtinan Alsulemani, Deborah Oreonitolo,
Chelsea Duncan, Mariam Gabriel, Angela Huang, Chuxuan Wang,
Joshua Kahane, and Kamrun Khyer

Faculty Mentor: Ana Petrovic
Department: Life Sciences
School/College: College of Arts and Sciences, Manhattan

The traditional use of the tweezer methodology has been developed for determination of the Absolute Configuration (AC) of the chiral guest upon complexation and subsequent chirality transfer to achiral tweezer host. This research project digresses from the conventional use of the tweezer methodology and instead focuses on structural parameters that can be exploited in order to govern the sense and degree of inter-porphyrin helicity (twist) as a results of complexation between chiral tweezer host with achiral guest. Our case study focuses on chiral tweezer for which it has been observed to exhibit an unsuspected change in chiroptical spectral signature (from negative to positive spectral profile) upon its host/guest complexation involving achiral diamines of various lengths. The preferred inter-porphyrin helicity and the overall geometry present in the solvent media of various host/guest complexes is examined via Molecular Dynamics algorithm, implementing recently developed OPLS-3 force field. Besides being of importance in advancing fundamental understanding of possible mechanisms towards chiral control, the results of this research can find implementation in fabricating molecular switches and molecular storage devices.

Minimally Instructed Bimanual Reaching Movements Begin at the Same Time but Terminate at Different Times Depending on Target Distance

Student Presenter: Janki Panchmatia
Faculty Mentor: Isaac Kurtzer
Department: Biomedical Science
School/College: College of Osteopathic Medicine, Old Westbury

Many everyday tasks require coordinating the two arms together, whereas other tasks can be performed independently. Previous studies have reported that bimanual reaching movements to targets of unequal distance are initiated and terminated together and, hence, reflect a bias to synchronizing the arms as a single unit. However, these studies employed verbal instructions biased to moving the hands together and reaction time conditions forcing the subjects to reach as soon as possible. Here we examine the bimanual reaching when subjects receive minimal instructions in order to assess the default coordination pattern. Seven healthy individuals (mean age = 22yro, 3M/4F) interacted with a programmable robot (BKIN Technologies) that allowed free shoulder-elbow movement in the horizontal plane. Visual targets appeared 1, 2, 3, 4, or 6 cm in front of the hand's starting position (25 combinations, random order). They were instructed to "use your left hand to reach for the left target, and your right hand to reach for the right target...there is no requirement to minimize your reaction time". Reaction time of either arm was unaffected by target combination ($p > 0.12$) and the reaches were initiated together (std = 25 ms). However, the movement times of the two arms were largely independent and scaled to its own target distance; a plane-fit of movement time to target distance of both arms indicated a large intra-hand component and weak inter-hand component, ratio $> 15:1$. We conclude that the default coordination pattern is initiating the movements together but terminating the movements independently.

Devoured

Student Presenter: Kaitlin Parker
Faculty Mentor: Michael Hosenfeld
Department: Digital Art and Design
School/College: College of Arts and Sciences, Old Westbury

'Devoured' is a series of images, focused around the concept of being lured into danger by something or someone appealing. A Venus flytrap inspired this idea; an elegant plant that places an object of desire in a precarious position, with the intent of luring in a sort of prey. I want to present such an idea as it may relate to human beings, being lured in by an attractive person into the jaws of a larger predator. From there the concept also took a more figurative form; Representing people who will twist or manipulate others with their words, their mouths, so that they may gain something from someone. The analogy was refined further as I incorporated more medical illustrations. I also drew inspiration from many media portrayals of women who are seemingly reduced to either solely the woman becoming a threat to those around her or being a damsel in distress. I pay homage to both concepts; A woman that is not just in danger, but drawing others to it. The idea of the color scheme is another facet to convey my message. I chose a color palette that is most associated with desire and seduction but is also naturally occurring. This led me to choosing a color palette that focused so heavily on shades of red and burgundy.

Drug P on Tetrahymena

Student Presenters: Kunnal Patel and James Defalco
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

We are studying how a drug, code-named P in the NYIT Drug Library, functions. We will examine Drug P's function using yeast assays of enzyme regulation and secretion, and examine cytoskeleton function using Tetrahymena assays of chemotaxis and endocytosis. Drug P inhibits yeast efficiently on both glucose and sucrose-containing media, suggesting that it may affect a basic cellular process.

Metformin Inhibits Autophagy and Mitophagy in Cardiomyocytes

Student Presenter: Rahul Patel
Faculty Mentor: Qiangrong Liang
Department: Biomedical Sciences
School/College: College of Osteopathic Medicine, Old Westbury

Metformin, a first-line medication for the treatment of type 2 diabetes mellitus, has been suggested by several clinical studies to be cardioprotective. However, the mechanisms underlying metformin's cardioprotection remain debated. One current hypothesis proposes that metformin protects the heart by increasing autophagy in cardiomyocytes, leading to increased removal of protein aggregates and damaged organelles including mitochondria. In this study, we tested this hypothesis using both in vitro and in vivo models. Rat H9C2 cardiac myoblasts were treated with 3 mM metformin for 24 hours and autophagy/mitophagy were determined by Western blot analysis of LC3-II, a well-established marker of autophagic vesicles. Surprisingly, metformin significantly reduced LC3-II levels in both total cell lysates and mitochondrial fractions; and lysosomal inhibitors increased LC3-II in metformin-treated cells to a lesser degree as compared with vehicle-treated cells. These results suggest that metformin inhibited rather than stimulated autophagy and mitophagy, contrary to the current belief. A novel dual fluorescent mitophagy reporter showing reduced mitochondrial fragments being degraded in the lysosomes in the presence of metformin confirmed this. The reduced mitophagy was also found in the heart from the mitophagy reporter mice that received 200 mg/kg of metformin through gavage. Collectively, these results indicate that the cardioprotective benefit of metformin observed in many different models may be through mechanisms other than increased autophagy and mitophagy.

Coordination of Reaching Movements and Postural Maintenance

Student Presenters: Stephanie Perez and Derek Deluca
Faculty Mentor: Rosemary Gallagher
Department: Physical Therapy
School/College: School of Health Professions, Old Westbury

Background: This study offers the first detailed examination of anticipatory postural adjustments (APAs) during upper extremity reaching from a crouched position in healthy young participants.

Methods: Eleven right-handed healthy young individuals participated in this study (8M, 3F; 23-28 y.o). Each assumed a crouched posture with one hand on a separate force plate (AMTI-ORG6) to measure vertical forces. Subjects lifted a small cube in random sequence (60 trials), with particular knee positions (apart, together) and reaching speeds (natural, fast). The go-cue and reaching arm were visually indicated by LEDs on the cube. A two-way Repeated Measures ANOVA assessed differences in vertical force. Values were normalized to individual body weight (BW). MATLAB was used for all analyses.

Results: During postural maintenance, subjects placed 1/3 BW through their arms, with small and consistent bias towards the left arm (~7% more), and did not vary with knee posture, $p > .5$. Greater reaching arm downward forces occurred with knees together versus apart: 2.8% versus 1.8% BW, $p \leq .001$. Greater stance arm upward forces occurred with knees together than apart: -1.8% versus -.4% BW, $p \leq .002$. Neither downward or upward APAs differed between reaching arms, $p > .2$. Natural and fast reaches had a strong within subject correlation of downward and upward APAs with knees together, $p < .001$.

Discussion: Greater postural shifts occurred during tripod versus quadrupedal positioning. No systematic differences were present between arms or reaching speeds. Subjects who expressed large downward APAs had large upward APAs.

Conclusion: These results demonstrate that APAs vary with one's base of support during volitional reaching movements and speeds between both arms. This data serves as a baseline for future studies of normal function during this task, and for understanding compromised function in neurological conditions.

Thyroid Hormone Treatment Improves Cardiomyocyte Contractility and T-tubule Organization in Failing Rat Hearts

Student Presenter: Jerrin Peter
Faculty Mentor: Kaie Ojamma
Department: Biomedical Sciences
School/College: College of Osteopathic Medicine, Old Westbury

Patients with heart failure (HF) experience low blood thyroid hormone (TH) levels, and pre-clinical studies have shown that triiodothyronine (T3) treatment improves cardiac function. We hypothesized that T3 improves myocyte contractility by maintaining transverse tubule (TT) organization in failing hearts.

HF was produced by coronary artery ligation in female SD rats, followed by treatment with T3 (5ug/kg/d) or vehicle in drinking water for 16 wks. Ventricular myocytes were isolated by collagenase digestion and either fixed in 10% formalin for cell morphometric analysis or plated on laminin-coated glass coverslips for T-tubule structural analysis or analyzed for contractility using IonOptix's edge-detection method. Wheat germ agglutinin (WGA)-488 was used to label plasma membranes and TT, and multiple z-stack images/cell were captured by scanning confocal microscopy and quantified for TT organization.

Morphometric analysis of cardiomyocytes using bright-field microscopy, showed a ~30% increase ($p < 0.05$) in cell length in MI hearts compared with sham controls, whereas T3 treatment decreased cell length towards control values. IonOpix measurement of contractile parameters showed significant dysfunction in the relaxation phase of the cardiac cycle (diastole) in myocytes isolated from MI hearts compared to sham, and a significant improvement in diastolic function in T3-treated myocytes. TT periodicity as measured by TTorg analysis of WGA-488 labeled myocytes showed significant disorganization of the TT system in MI myocytes, whereas T3-treatment significantly increased the TT organization.

In conclusion, T3 treatment of animals in HF improved the myocyte TT organization resulting in improved contractile activity, thus supporting the potential therapeutic utility of T3 in HF.

Memory Recollection of Crime Scenes

Student Presenters: Tiara Place, Maria Lombardo, Sebastian Cacioppo, Austin Carino and Stuti Shah
Faculty Mentor: Andrew Costello
Department: Behavioral Sciences
School/College: College of Arts and Sciences, Old Westbury

Eyewitness identification is crucial in criminal prosecution. Even though it is important, it is also an unreliable source of evidence. With new technology, there are ways that we can improve the methods of identification procedures. Two of the most common methods of identification are corporeal lineups and static photo arrays. In the past few years, technology has made improvements in identification accuracy by establishing new methods of identification, such as, dynamic video lineups and dynamic photo arrays. Through our research, we are examining those two new techniques. The purpose of this study is to determine how accurate each method of identification is. After assessing all four methods (dynamic video line ups, corporeal lineups, dynamic photo arrays and static photo arrays), we will determine the accuracy of each and which one produces less misidentifications. In order to prevent misidentification, we staged a crime in front of 300 NYIT college students. 5 days later, we brought back these students and split them up into 4 groups in order to examine the different methods of identification. We recreated a corporeal lineup, dynamic photo array, dynamic video lineup and a static photo array. We tested the reliability and the accuracy of each. If the study produces significant results for dynamic photo array and dynamic lineups, these techniques can be easily adopted by practitioners to obtain better identification of suspects and prevent misidentification of innocents.

Analyzing the Phenotypic Effects of Genetic Deletion of Cytochrome C Oxidase Subunit 5 Homologs in Budding Yeast

Student Presenter: Simran Polce
Faculty Mentor: Gavin McStay
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

Without the mitochondria, known to many as the powerhouse of the cell, much of life as we know it would not exist. According to the endosymbiotic theory, mitochondria evolved in the early years of eukaryotic life, indicating that they were once able to function as independent cells. An integral function of the mitochondria is Oxidative Phosphorylation, which is vital to the production of ATP, the energy source of the cells. Oxidative Phosphorylation consists of two processes: the electron transport chain and the ATP synthase complex. The four protein complexes of Oxidative Phosphorylation include complexes I, II, III, and IV. They are also known by the following names: NADH-coenzyme Q oxidoreductase, Succinate-Q oxidoreductase, Q-cytochrome c oxidoreductase, and Cytochrome c oxidase, respectively. The last complex of the electron transport chain is cytochrome c oxidase, which is present in organisms that use oxygen as the final electron acceptor. In mammals, there are thirteen different subunits, encoded by genes in the mitochondria and nucleus. In yeast, one of the subunits of cytochrome c oxidase has two isoforms, Cox5a, a nucleus-encoded gene expressed during normal atmospheric oxygen concentrations and Cox5b, expressed during oxidative stress and low oxygen concentrations. A similar protein, MTC3, which was identified as having similar protein structure as Cox5a and Cox5b, has been identified. The purposes of this project were to generate genetic deletions of Cox5a, Cox5b and MTC3 in W303 wild-type yeast to analyze phenotypic differences this had on the aerobic respiration capacity and mitochondrial function of these cells.

Does Race or Social Background Confirm a Stereotype to the Brand and/or Type of Alcohol Consumed?

Student Presenters: Jamila Primus, Michael Sofia, Francheska Niveyro, Michael Zerbo and Anthony Drew
Faculty Mentor: Blair Hoplight
Department: Behavioral Sciences
School/College: College of Arts and Sciences, Old Westbury

Societal views are the leading source of information in today's world. It is mainly responsible for creating stigmas of different cultural groups. Stereotypes created based on the type of alcohol consumed is highlighted through social media outlets such as Facebook, Instagram, etc. There are distinct types and or brands of alcohol that have been designated for a specific culture or demographic. The researchers hypothesized that there will be specific characterizations of a person based off of the type of alcohol they consume. The investigation was conducted as an exploratory study, where we collected data from consenting behavioral science students from NYIT with an online survey. The survey was asked to categorize people who drink alcohol. It includes different brands and types of alcohol such as (Hennessy, Bud-light, and Margarita's). This study will help enlighten the relationship between branding and stereotypes.

Institute of Medicine - Nursing Barriers

Student Presenter: Junior Prophete
Faculty Mentor: Frances McGibbon
Department: Nursing
School/College: School of Health Professions, Old Westbury

The role of nurses is one that is undergoing constant redesign as the profession seeks to deal with various challenges emerging due to the changing healthcare landscape and patients' needs. Currently, graduate training has enabled nurses to go beyond their historical job description of assisting physicians without adding their input to now being able to independently assess, diagnose, and manage problems affecting their patients. However, various policy-makers have currently limited the ability of nurses to practice to the full scope of their training. Nevertheless, increased advocacy and demand for medical practitioners may enable nurses to obtain the privileges they need. Another key issue in nursing is the absence of nurses in policy-making despite the fact that they are the best advocates for patient needs. Consequently, the lack of a patient-centered approach that nurses could have provided has led to hospitals being business-oriented leading to care being compromised to some extent. As a result, there is a need for nurses to ascend into leadership positions that will enable them to engage in policymaking. Finally, the lack of a streamlined education pathway to entering the field as a nurse has led to nurses generally lacking competencies that would enable them to deal with current challenges. There is a need for the education system to be updated to ensure nurses are equipped with essential competencies that will contribute to their delivery of evidence-based care.

The Replacement of Qualitative Characterization with Quantitative Characterization in the Detection of Precancerous and Normal Cervix Cell Nuclei

Student Presenter: Zamiur Rahman
Faculty Mentor: Niharika Nath
Department: Life Sciences
School/College: College of Arts and Sciences, Manhattan

Cervical cancer is one of the leading causes of cancer-related deaths in women worldwide. The Papanicolaou smear test is used to visually screen cervix cells for the disease. Correct analysis of the test's results depends mostly on the appearance of the nucleus in cells. A precancerous cell may have an enlarged nucleus or irregularity in shape. However, manual visual interpretation of normal and abnormal premalignant cells in Pap smears is subjective and known to have interpretation error. Therefore, computerized analysis of nucleus shape can be useful. The aim of this study was to investigate fifteen nucleus shape features and determine how the various shape features could differentiate normal and abnormal cells. Two sets of 30 nucleus images each were used from the Pap Smear Benchmark Dataset for normal and abnormal nuclei as the standard and used as ground truths. A test set of data contained 10 normal nucleus images and 10 abnormal nucleus images sourced from Agartala Hospital, Tripura, India, that were screened by the cytologist. The images were analyzed for fifteen shape features using CellProfiler classifier stable 2.2.0, an open-source software. The 15 parameters used to quantitatively analyze the nuclei in pixels were a) Eccentricity b) Major axis length c) Minor axis length d) Orientation e) Compactness f) Area g) Center x h) Center y i) Extent j) Perimeter k) Solidity l) Form factor m) Euler number n) maximum radius o) median radius. In the Benchmark Dataset images, the average major axis length (pixel μm) of abnormal nuclei was greater than that of normal nuclei ($78.19 + 24.33$ vs. $51.23 + 5.39$), the average eccentricity factor of cervical cell nuclei was found to be higher in the abnormal nuclei than in the normal nuclei ($0.63 + 0.12$ vs. $0.55 + 0.16$, mean \pm standard deviation) and implies somewhat higher deviation from a symmetric shape. The average compactness values of abnormal nuclei and normal nuclei were comparable. The areas (pixel μm^2) of abnormal nuclei were higher and had more variation ($3994.7 + 2622.4$) than normal nuclei ($1660.8 + 377.4$). The average perimeter of abnormal nuclei was about two folds greater than that of normal nuclei. However, abnormal nuclei had lower average center values, meaning the coordinate points farthest from the edge, compared to normal nuclei. The dataset from Agartala hospital also showed differences in these shape features for normal and abnormal cells. These results indicate that normal and abnormal cervix cells can be quantitatively characterized by using four nuclear shape features. The characteristic numbers obtained from this experiment have potential in automated detection of precancerous and cervix cell nuclei. Future goals include analyzing more cells in the standard dataset and hospital dataset and using support vector machine for the four identified features.

Drug “K”

Student Presenters: Alex Raju and Shaheryar Gill
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

We are currently studying a drug, code-named K within the NYIT Drug Library. As indicated by the halo assay, drug K is able to kill yeast in all media, but is most powerful on glycerol containing media. As a result, it can be inferred that drug K might possibly have an effect upon mitochondrial function. Further functional studies will be conducted using yeast assays of enzyme regulation and secretion as well as Tetrahymena assays of exocytosis and chemotaxis in order to probe for cytoskeleton function.

Advanced Crash Detection System

Student Presenter: Keshav Kowshik Hallimysore Ramakrishna

Faculty Mentor: Ahmed Awad

Department: Computer Science

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

Cars are everywhere and used as a basic means of transportation, but sometimes accidents occur where they tend to collide with each other. The accident occurs due to road and climatic conditions and sometimes because of driver's lack of concentration on road. The person who causes accident may be afraid to face the law hence evade the accident scene. This type of accident is known as Hit and Run accident case. In such case, it is difficult to identify the culprit and no one attends to the victim. The solution is by implementing a system, in which it can identify the culprit and extendable to safeguard the life of victim by attending them. Automobile details like registration number, driver's name, chassis number, make of the vehicle and Radio Frequency Identification (RFID) number of the vehicle will be stored in the database, which is maintained in Road Transport Office (RTO). Whenever cars met with an accident, the system reads the RFID number of the vehicle with which it has met with accident. It stores and displays RFID number and captures the image of accident, which can be used to find the culprit. By using RFID number, the details of the culprit are traced out from the database in RTO.

Neuromodulators Deficient Worms

Student Presenter: Harbir Singh Randhawa
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

Neuromodulators regulate and organize complex behaviors. The nematode *C. elegans* has only 302 neurons and a fully mapped wiring, making it a powerful model system for neuroscience research. Two *C. elegans* mutants are known to be deficient for the two main classes of neuromodulation: *cat-1* mutants lack biogenic amine transmission, while *unc-31* mutants lack neuropeptide transmission. I am working to construct a double mutant deficient for both neuromodulation classes. Once constructed, this new neuromodulator-deficient strain will be a "chassis" for constructing synthetic neuromodulator systems that test ideas of how hormones program nervous systems.

Bioluminescent Algae Culturing Chamber with Automatic Control & Monitoring System

Student Presenters: Ariana Rennie, Ashtie Kanhoye and Yirou Cui
Faculty Mentor: Bryan Gibb
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

Bioluminescent Algae is an emerging topic of research in various industries due to its unique characteristics and bioluminescent reaction to agitation. As these dinoflagellates illuminate in the ocean resulting from a reaction by luciferase. The algae require a specific environment to grow which includes saltwater with essential minerals and nutrients as well as a light source to produce photosynthesis to generate energy and glucose. The bioluminescent reaction is typically induced at night when the algae is disturbed through the breaking of ocean waves, and deregulated in the day.

Although, scientists have a reasonable idea of how this reaction works, there are still questions regarding, how the bacteria sense the force and how the mechanical signal translates into chemical signals that result in the bioluminescent reaction.

Dr. Gibb, an associate professor in the life sciences department at NYIT, would like to further understand these processes, and develop potential applications for various industries with potential impact to engineering, healthcare, education, entertainment, energy, and art sectors.

Our team will be collaborating with Dr. Gibb to design and develop a culturing chamber that simulates the algae's growth environment and includes features to monitor and control specific parameters that affect the algae to further this research.

The proposed chamber will include:

- Efficient lighting system to support inverted circadian cycle
- Portable external and embedded electrical housing
- Embedded electrical system for monitoring and control
- Sensors for Temperature, Pressure, Oxygen and Carbon Dioxide
- Control system for Temperature to ensure algae survival and growth

Nursing Shortage, Nurse Job Dissatisfaction, and the Male-Female Pay Gap: Three Issues in Professional Nursing

Student Presenter: Angelica Ruiz
Faculty Mentor: Frances McGibbon
Department: Nursing
School/College: School of Health Professions, Old Westbury

Introduction: The nursing profession has undergone considerable changes during the past few decades. Some of these changes have been spurred by the advent of new technologies (e.g., electronic health care records). Other changes have been due to federal legislation (e.g., the Affordable Care Act). Nevertheless, certain problems have tended to persist. The purpose of this paper is to describe three current, important, and related issues in the nursing profession: the shortage of registered nurses (RNs) in the United States, low job satisfaction among RNs, and the pay gap between female and male RNs. Additionally, this paper will look at the scope, impact, and significance of these issues.

Summary: The nursing profession has been plagued by a persistent shortage during the past two decades, a shortage that is predicted to increase over time. As the Institute of Medicine of the National Academies (2011, p. 26) has noted, "there are concerns regarding the number of nurses available to meet the demands of the health care system and the needs of patients, and there is reason to view as a priority replacing at least 900,000 nurses over the age of 50. . ." This shortage is different from previous nursing shortages, such as the one experienced during the post-World War II period and will require different solutions. The nursing shortage has increased the stress experienced by working nurses, who have to work harder and longer due to a lack of adequate staff. As a result, many nurses are dissatisfied with their jobs. However, lack of staff is not the only reason why nurses are dissatisfied with their jobs. Poor management also plays an important role. Little has been done to address the issue of nurse job satisfaction. Finally, the earnings gap between male and female nurses persists, with male RNs earning more than their female counterparts. Although legislation has been passed to address gender discrimination in the workplace, this gap shows no sign of decreasing.

Colorimetric DNA Scanner: Calibration for Characterization of Exotic Nucleic Acids

Student Presenters: Abdallah Sattar, Siraat Zafar, Ali Haidery and Thomas Beague
Faculty Mentor: Claude Gagna
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

DNA microarrays are powerful biomedical research tools that can be used to study gene expression. Two types of DNA microarray scanners are commercially available for the research scientist, in order to quantitate results and obtain data, namely, fluorescent and colorimetric DNA microarray scanners. Microarray scanners are employed in functional molecular biology, gene expression and drug discovery research. Some important features of DNA microarray scanners are sensitivity, resolution, scan area, and rapidity of scan. Microarray scanners have red, green, and blue excitation wavelengths and a wide choice of up to 12 emission filters that enable imaging of fluorophores (e.g. Cy3, Cy5).

The Colorimetric Microarray Scanner (ArrayIt® SpotWare™) opens up a novel way of characterizing DNA microarray data (i.e., non-fluorescent approach). The colorimetric DNA microarray scanner is an excellent complement to the more standard fluorescence scanning technology. The colorimetric system allows for the use of horseradish peroxidase (HRP) and alkaline phosphatase (AP) conjugated labels. Our SpotWare™ Colorimetric DNA and RNA Microarray Scanner allows for 12 standard 25 x 76 microarray glass substrate (i.e., solid support) slides. It allows for high-speed colorimetric scanning of chromatic detection of reaction products, western blots, and micro-western microarrays for research and clinical diagnostic procedures.

Calibration of the SpotWare™ Colorimetric DNA and RNA Microarray Scanner is essential in order to use the device for DNA-based research. It will allow for the characterization of canonical, alternative and multi-stranded nucleic acids immobilized to microarray surfaces, namely non-fluorescent detection methods.

Variation in Inner Ear Morphology of Early Mammaliaforms

Student Presenter: Ramza Shahid
Faculty Mentor: Simone Hoffman
Department: Anatomy
School/College: College of Osteopathic Medicine, Old Westbury

The inner ear has undergone marked transformations in Mesozoic mammaliaforms, culminating in extant therians with greater ranges of hearing frequencies than most vertebrates. This ability has been associated with the elongation and coiling of the cochlear canal following the loss of the lagenar macula, ossification of the primary and secondary laminae, and ossification of the cribriform plate. The acquisition of these features in the few documented taxa appears mosaic, but could this reflect intraspecific or interspecific variation? To test whether cochlear canal length and curvature, presence of a lagenar macula, and ossification of laminae was variable in early mammaliaforms we micro-CT scanned 37 isolated petrosals of the basal mammaliaform *Morganucodon* from two Early Jurassic Glamorgan fissure fills. The endocasts reveal that the cochlear canal is short and fissure-specific with the average lengths ranging from 1.82 mm to 2.06 mm. In all specimens, the apex is gently curved and expanded, suggesting the presence of a lagenar macula. None of the specimens preserve ossified laminae, but a shallow groove is visible on the reconstructed endocasts, extending from the base of the canal, between the perilymphatic foramen and the fenestra vestibule, to the apex. A similar groove for the base of the secondary osseous lamina is variably present in extant monotremes. Our qualitative data suggest the presence of a lagena and variation in cochlear length in *Morganucodon*. Interestingly, this variation is linked to different fissures and might represent variation in different populations or possibly in different species within *Morganucodon*. Quantitative assessment of cochlear shape using 3D geometric morphometrics is ongoing.

The Neural Basis of Olfactory - CAPTCHA

Student Presenters: Tianyu She, Yan Li, Jason Wu, Daniel Mogel, and Syed Asim Ahmed
Faculty Mentors: Gonzalo Otazu Aldana
Department: Biomedical Sciences
School/College: College of Osteopathic Medicine, Old Westbury

CAPTCHA, which stands for Completely Automated Public Turing Test to Tell Computers and Humans Apart, has been the gatekeeper against spam and computer-generated accounts, monitoring and restricting online account generation. Numerous forms of CAPTCHA exist, primarily superimposing random streaks, or markings, overtop a string of identifiable characters that need to be submitted for approval; in other words, the superimposed image acts as a distractor that prevents computer recognition. This task is difficult for computers because of a feed-forward mechanism, which prevents it from recognizing known characters, or stimuli, in the presence of a novel background distractor. However, humans are capable of this identification with relative ease, perhaps due to the presence of additional processing pathways other than feed forward. We hypothesize that this ability can be extended to olfaction in mice; mice may be able to complete an assigned task associated with an already familiar stimulus, even when a novel background distractor is overlaid. Mice will be conditioned to identify several pairs of odors each associated with “go” and “stop” commands that will evoke either commencement or cessation of water consumption, respectively. After consistent associations with the odors and behaviors have been reliably made, a novel background distractor—an olfactory CAPTCHA—will be introduced in addition to familiar stimuli. If pathways regarding olfaction other than feed forward exist, the mice will be able to complete the associated learned task irrespective of a novel background distractor. We will use optogenetic techniques to test the role of cortical feedback on this computation.

Automated Poly Stainer Employed for Histology Lab (BIOL-245L): H & E staining, Feulgen Reaction and Immunohistochemistry

Student Presenters: Ansel Shibu, Farah Dimsuyu, Rohitha Roy and Michelle Defay
Faculty Mentor: Claude Gagna
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

NYIT has an automated microscope slide-staining machine (Neutec Group Inc.) in order to automatically stain multiple tissue slides at the same time in a matter of minutes. Dr. Gagna and his Independent Research III (BIOL-493) class are trying to incorporate this new technology into his Histology Lab course (BIOL-245). This automated device will be used with a variety of different histotechnological processing protocols (e.g., H&E, Feulgen Reaction, Gram Negative, Gram Positive, Acid Fast, Trichrome, and Wright's Stain).

In the past, up to dozens of lab technicians were used in order to stain and prepare individual slides. However, with technological advances such as the Poly Stainer machine, we can now save time and reagents while mass-producing correctly prepared slides at a more efficient rate. According to Prichard, J. W. (2014), "Automating the immunohistochemistry section of your laboratory will free up technologist time to perform cutting and embedding. In larger laboratories, histotechnologists on multiple shifts, each with individual tendencies and variable interruptions, could benefit from the standardization provided by automation." Using machinery such as the Poly Stainer will reduce human error as well as establish congruence throughout all the slides. According to Gagna CE, et al. (2007), "DNA staining techniques need to be improved to achieve more accurate data". The Poly Stainer is a programmable staining instrument with a memory capacity of 10- programs, each with 10 different positions. It can be used to stain up to 20 slides, with four reagent containers and an airflow-drying compartment (IUL, 2013).

Students will process individual slides the traditional way in addition to using the Poly Stainer Machine in order to learn the steps of the process and compare the two methods. This will provide an understanding of the general concept of tissue staining. Having NYIT, students learn to use new technologies, such as the Poly Stainer, will give them an advantage in the workplace and possibly open new career paths, such as that of laboratory technician.

Cell Biology: The Study for Drug “P”

Student Presenters: Taha Siddiqui and Jerin John
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

We are studying how Drug “P” from the NYIT Drug Library affects cellular functions. We are using yeast and the motile ciliate *Tetrahymena* for our studies. We have found that our drug appears to affect the production of invertase, an enzyme secreted by yeast to metabolize sucrose. We will also test Drug P’s effect on mitochondrial function. We will also examine whether Drug P affects the ability of *Tetrahymena* to carry out cytoskeleton-intensive processes such as endocytosis and chemotaxis.

Drug "P" Cell Biology

Student Presenters: Gokberk Simsek and Harbir Singh Randhawa
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/Display: College of Arts and Sciences, Old Westbury

We are performing experiments in order to determine the mechanism of Drug P from the NYIT Drug Collection on the metabolism and function of yeast and Tetrahymena cells. Drug P decreases the secretion of invertase, an enzyme that catalyzes the hydrolysis of sucrose into glucose and fructose. This suggests it may affect secretion or metabolic regulation. Consistent with this, Drug P has an especially large effect on yeast grown in sucrose-containing media. We are also investigating other possible targets of Drug P, such as the mitochondria and cytoskeleton.

Female Prejudice in Film & Literature

Student Presenter: Hannah Smith
Faculty Mentor: Amanda Golden
Department: English
School/College: College of Arts and Sciences, Old Westbury

The implications of the social expectations of women have been seen in film and literature dating back to the creation of the arts. These expectations fall across a large spectrum of unfair social prejudices, such as: class differences of men and women, physical appearance, and differences in communication. This presentation will give the audience the ability to recognize female inequality both in the real world, as well as in fictional literature and film. To do this, I will focus on the main characters of specific pieces and consider how their stories would have been different if they were created with the opposite gender.

My discussion will have two parts, one focusing on literature, the other on film. For my literature segment, I will discuss the differences between Nnendi Okorafor's novella "Binti", to that of Mary Shelley's "Frankenstein". For my two films, I will compare Del Toro's "The Shape of Water" to Alex Garland's "Ex Machina". With my goal to encourage thought in my audience, I want to make my ideas as relatable as possible. The "Me Too" and "Time's Up" movements have encouraged more discussion of female inequality. The presence of female prejudice in literature and film shows how deeply rooted the thoughts of female expectations really are. Not only are women in the real world facing these issues, but also fictional characters in stories are facing the same hardships. My discussion will provoke thought in both men as well as women, enabling my audience to recognize prejudice and catalyze change in the wave of equality for all women, fictional or not.

Comparative Study of Cloud Computing and Fog Computing

Student Presenters: Siyi Song and Lisha Wu

Faculty Mentor: Sonali Chandel

Department: Computer Science

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

In today's world of smartphones and 24*7 connectivity, people need access to their data on the go. Cloud Computing allows people to save their computer storage and use a virtual space for storing digital information on the Internet. However, it has many limitations and disadvantages. A solution to handle this problem has been created by the industry, which is called Fog Computing, which compensates the defect of cloud computing largely by applying distributed computers. Fog computing improves transmission time, saves costs, strengthens safety and is better accessible. So far, researchers and industry have mostly focused on Cloud Computing due to which people are not aware of the benefits of Fog Computing. Therefore, we decided to do this project to compare various aspects of these two technologies, which include finding differences in their concept, architecture, applications, cost, security, and their field of application to find out the advantage that one has over the other. Technology developments follow people's expectations, takes a path to optimize weaknesses and provides more benefits. In the future, Fog computing will keep evolving, and a growing number of people may have access to this new technology. Cloud and Fog computing will be shared across large fields to achieve data sharing. Our research is aimed at helping people become aware of the better one so that they can choose the one that fits their requirements the best.

Effect of Drug "K" on *Saccharomyces Cerevisiae*

Student Presenters: Tina Stefanovic and Maryann Assaf
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

We are studying the mechanism of a chemotherapy drug code-named "K" in the NYIT Drug Library, using *Saccharomyces Cerevisiae*, also known as baker's yeast. Since drug K appears to alter protein secretion or metabolic regulation, we will examine the drug's function on yeast. This will be done through yeast assays of enzyme regulation and secretion, as well as the study of cytoskeleton function using *Tetrahymena* assays of exocytosis and chemotaxis. We will also study how the mitochondrial activity of the cells is affected by K.

Understanding How Neural Circuits Encode Behaviors

Student Presenters: Kashif Uddin and Taha Siddiqui
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

We are interested in understanding how neural circuits encode behaviors. The nematode *C. elegans* has a fully mapped nervous system of only 302 neurons, yet is able to perform many complex behaviors. Glutamate, GABA, and acetylcholine are the three primary neurotransmitters in animals ranging from worms to humans. We have obtained mutant animals deficient for each of these. We are crossing these mutant strains to each other to construct a strain deficient for all three neurotransmitters. This neurotransmission-deficient strain will be a powerful platform for building synthetic neurotransmission systems that test models of neural circuit function, and for designing circuits that produce novel behaviors.

Steroids and Infertility

Student Presenters: Manpreet Virk, Pritu Saha and Fatima Soomro
Faculty Mentor: Niharika Nath
Department: Life Sciences
School/College: College of Arts and Sciences, Manhattan

How do steroids affect infertility long term and short term in both genders? How does this lead to PID and other transmitted diseases through sexual orientation?

Anabolic steroids are known as testosterone derivatives that are used by athletes for their anabolic properties. However, scientists have questioned the effects of testosterone for decades. Steroids can cause major changes in an individual's body however; nobody knows the real effects that are long term. Steroids are an organic compound that contains four rings of carbon atoms, it includes hormones such as alkaloids and vitamins. A hormonal change has a major affect to the female genital tract by causing lower abdominal pain, which decreases the chances of getting pregnant and menstrual abnormalities. Due to the change, a swelling or inflammation may occur in the uterus, fallopian tubes and ovaries. This may cause a bacterial infection known as pelvic inflammatory disease (PID). Pelvic tuberculosis is silent disease, which stays for 10-20 years long causing infertility problems. However for men, sperm forms when the luteinizing hormone (LH) and follicle hormone (FSH) are working directly on the testicles. The testicles contain special cells known as leydig cells that have to be turned on in order to produce natural testosterone. This occurrence results in a high level of testosterone to be present in the testicle and a normal amount of testosterone in the blood stream. When men use steroids, it tricks the body into thinking that the testicles do not have to produce testosterone resulting in a low amount of testosterone in the testicles despite the normal or high levels in the blood stream. This situation then causes the follicle stimulating hormones to not release; leading the testicles to shrink and produce little if any sperm. Although steroids are known for bodybuilding the effects of it are gruesome. The extreme change in testosterone level affects the (LH) and (FSH). Low testosterone not only results in reduction of sperm count but also erectile dysfunction (ED).

Methamphetamine Enhances Methicillin-Resistant *Staphylococcus Aureus* Osteomyelitis in Mice

Student Presenter: Danny Warda
Faculty Mentor: Luis Martinez
Department: Biomedical Sciences
School/College: College of Osteopathic Medicine, Old Westbury

Significance: Methamphetamine (METH) is an extremely addictive central nervous system stimulant abused by ~35 million individuals globally. The intoxicating effects of METH alter judgment and reduce inhibitions, leading people to engage in unsafe activities that put them at risk of infections. Although there is a clear clinical association of METH use and soft tissue infections caused by MRSA, the effect of METH on osteomyelitis caused by MRSA has not been investigated.

Hypothesis: *We hypothesized that METH enhances osteomyelitis in mice infected with MRSA.*

Methods: All animal work was approved and monitored by the IACUC of NYIT COM. Chronic METH use was mimicked by daily intraperitoneal drug injection of gradually increasing dose over a period of three weeks. Osteomyelitis was surgically induced in the experimental group. Mice were euthanized on days 1, 7, 14, and 21 post-infection and bones were harvested.

Results: METH enhances MRSA induced osteomyelitis of the murine bone. Data were tested using multiple T-test and two-way ANOVA. METH Treated experimental group showed Significantly higher bone bacterial burden, higher levels of IL-6, IL-10, INF-Gamma and TNF-Alpha compared to the control group. Also, enhanced colonization and more severe inflammation and bone destruction was demonstrated in histology slides.

Conclusion: Our results demonstrate that METH modulates bacterial colonization and enhance its pathogenicity.

Metropolitan Transportation Authority Infographic

Student Presenter: Jodie Wenzelberg
Faculty Mentor: Patty Wongpakdee
Department: Digital Art and Design
School/College: College of Arts and Sciences, Manhattan

I chose to design an infographic on the MTA or the Metropolitan Transportation Authority because I found it interesting to see the comparisons since I am a long-time user of the MTA. Infographics is a unique way to show large quantities of data graphically, so it remains aesthetically pleasing and educational.

Many commuters deal with the horrible rush hours, delayed trains, and the ever-rising cost of the metro card. So, my infographic shows the comparison of a single vs. a weekly vs. a monthly. Then I go on to compare the annual ridership of NYC boroughs vs. modes of transportation. I also show a timeline of important dates from when the MTA first opened to current events. I also talk about the track trash as well as the death toll. Information graphics is important because it is able provide a ton of information in an aesthetically pleasing way that is understandable to all audiences.

Average Annual Temperature of Forty Major Cities

Student Abstract: Charles Werner
Faculty Mentor: Patty Wongpakdee
Department: Digital Art and Design
School/College: College of Arts and Sciences, Old Westbury

Nowadays, infographics are useful tool in displaying important information; they take dull information, and illustrate it in an interesting and informative way. Today global warming is a very talked about subject, some believe in it and some don't. I wanted to investigate a topic relating to global warming to gather my own opinion on the matter. I chose to create an infographic on averaged annual temperature of forty major cities (from 1995-2015); I thought this was a great topic to create for an infographic because it was very information based and it was relevant to the present day world. In order to illustrate the information, I had to take the annual temperature of forty specific cities and find the average temperature of each over the last twenty years; this was very information based, but the infographic was used to simplify it. After investigating the temperatures of different cities over the past twenty years, I didn't find drastic changes, there were fluctuations over time, but nothing too noticeable. Even though this information does not confirm global warming, it is still important to help prevent it from occurring. Overall, this infographic explores the averaged global temperatures of major cities around the world, as well as informing the audience of how an infographic can be used to displaying a large amount of information.

Examination of Inner Ear Morphology and Hearing Specialization in Extinct Toothed Whale, *Cotylocara Macei*

Student Presenter: Deborah Winograd
Faculty Mentor: Jonathan Geisler
Department: Anatomy
School/College: College of Osteopathic Medicine, Old Westbury

Echolocation is a form of biological sonar used by a few vertebrate groups, such as bats and dolphins, to navigate their environment and find prey. Odontocete echolocation requires various anatomical structures in order to produce ultrasonic sound and then receive the echoes. While all extant odontocetes echolocate, it is unclear when this adaptation evolved. *Cotylocara macei* is an Oligocene fossil discovered in South Carolina that is thought to have echolocated based on its facial anatomy. We predict that the inner ear morphology of the species would indicate an ability to hear at ultrasonic frequencies, including a high ratio of secondary bony lamina to cochlear length and large spiral ganglion canal diameter. The petrosal bone of *Cotylocara macei* was scanned in 2014 with High-Resolution X-ray Computed Tomography. Using the program Amira, 1765 microCT slices were segmented into five components: scala tympani, scala vestibuli and media, scala undifferentiated, base of cochlea, and semicircular canals. Amira and manual measurements were taken using the resulting 3D model. *Cotylocara macei* inner ear measurements were then compared to previously described values using Principle Component Analysis. Surprisingly, the PCA places *Cotylocara* closer to archaeocetes, a paraphyletic group that includes the ancestors of all modern cetaceans, than to other odontocetes. Regardless, this study raises an interesting question on the development of cetacean echolocation; that is whether the ability to produce ultrasonic frequencies and ability to hear them were evolutionarily uncoupled.

PCR Reaction

Student Presenter: Kurt Wolf
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

The (PCR) polymerase chain reaction is a commonplace and critical procedure in biomedical research. This method amplifies specific DNA sequences, and is used for every aspect of DNA assembly and molecular analysis. Unfortunately, the high cost of the required heat-stable DNA polymerases greatly limits its use. We obtained a plasmid that drives the production of the efficient and accurate Pfu polymerase in E coli as a poly-histidine fusion protein. We can grow and induce E coli cells containing this plasmid to produce this enzyme in large amounts. After breaking the cells open, I use a nickel-conjugated column to selectively purify the histidine-tagged enzyme from other E coli proteins. We can produce ~\$100,000 worth of enzyme in a couple of weeks, greatly expanding the scope of experiments that can be done at NYIT, both for research and teaching.

The Practicalities of Traditional Chinese Medicine in the 21st Century

Student Presenter: Yunqi Xu
Faculty Mentor: Beverly Butcher
Department: Interdisciplinary Studies
School/College: School of Interdisciplinary Studies and Education, Nanjing

The healthcare sector has greatly transformed over the past century via huge advances in science and technology. Modern, or rather, orthodox medicine follows the way of hypothetical deduction, while Traditional Chinese Medicine (TCM) uses an inductive approach. Being fundamentally different, modern physicians find it difficult to explain the science behind TCM, with concepts such as qi (circulating life force) and jingluo (meridian) being labelled as pseudoscience, and thus obsolete in the 21st century. However, TCM has thousands of years of rich history. Many people around the world still utilize TCM for various treatments, claiming many intangible benefits that would otherwise not be possible with 'Western Medicine'. Nevertheless, TCM may indeed have its place in modern medicine. It would be myopic to deem TCM as obsolete by viewing it through the prism of Western Science. This research paper will aim to dissect the issue via the following approaches: (1) What is considered an effective medicine? (2) What are the similarities and differences between TCM and Western Medicine? (3) Which areas of TCM can be modernized in order to better cater to the patients of the 21st century? (4) Which areas of TCM can complement Western medicine? Based on a comprehensive review of various papers published on TCM, this paper asserts that TCM is still essential in the 21st century. TCM is more effective against certain illnesses, and proper understanding and modernization of TCM could lead to a renaissance in medicine.

Evaluation and Optimization of Threat Intelligence Sharing

Student Presenters: Mengdi Yan, Shaojun Chen, Jiang Huan
Faculty Mentor: Sonali Chandel
Department: Computer Science
School/College: School of Engineering and Computing Sciences, Nanjing

With rapidly growing cyber-attacks and security threats, we need a more reliable and stable solution for information protection. Threat intelligence helps in detecting upcoming cybercrime and preventing it by collecting a host of data and analyzing illegal Internet behavior. By using big data sharing and promptness of detection, it becomes more powerful. The application of threat intelligence is limited on account of several challenges. The solution to overcome these obstacles and making most of it involves efficient data sharing and guaranteeing the safety and quality of information exchange. For better protection and quality, controlled access to intelligence information and a grading standard revising the criteria in diagnosis for security breaches is needed respectively. This project will focus on improving the efficiency in sharing threat intelligence by rethinking the size and composition of a sharing community, filtering the shared intelligence of low-quality by grading the trust level of a community member and the quality of a piece of intelligence based on various external environment variables. We will try to find out a few solutions to the challenges of threat intelligence because the sharing willingness of the community members and the ability of intelligence analysts in reading and distributing reports varies. We hope, our research can fill in some security margins in the case of continually changing attacking approaches to help various organizations make a better decision in handling the unforeseen and unexpected attacks.

Developing Protocols and Acquiring Tissue Samples to Preserve Bone and Cartilage Using Different Fixatives: Controls for a MicroCT Scanner

Student Presenters: Anthony Yodice and Georgio Desmornes
Faculty Member: Claude Gagna
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

The purpose of this research project was to obtain tissues that were processed with different histotechnological procedures, so that they could be used in several undergraduate courses as controls to study the morphology of tissues using a microCT scanner. When studying the anatomy and physiology of an organism, it becomes necessary for scientists to visualize and, when possible, to physically explore what they are studying. Histology helps them achieve this goal. Fixatives not only stop the decay of tissue, but they also preserve the cells as close to their natural state as possible. By using light and electron microscopes to study the morphology of tissues, researchers can better understand the 3-dimensional characteristics of tissue. The morphological study of tissues such as bone and cartilage has been facilitated using histology. Chemical fixation of these two types of tissues is a method used to preserve bone and cartilage while subsequently trying to keep the characteristics and properties of these tissues stabilized, as if they were alive and functional. Many different fixatives are available for use to preserve tissue. However, we used two different liquid fixatives, namely 10% Neutral Buffered Formalin (NBF), and Formalin-Acetic Acid-Alcohol (FAA). Bones and cartilage were obtained from slaughterhouse chickens and these tissues were fixed for 48 hours and then extensively washed to remove excessive fixative. Bone was then stored in 70% ethanol. Other bone and cartilage samples were processed the same way, but were decalcified. Having bone and cartilage fixed in two different fixatives, with and without decalcification, allows us to have four differently processed tissue samples. This will allow us to use the microCT scanner to obtain a variety of 3-D morphological images as part of an instructional course. At the conclusion of this experiment we hope to determine which fixative is most effective at preserving internal bone morphology; furthermore, we desire to inspect it under a microCT Scanner for the second part of the overall experiment.

Direct Sequencing of RNAs and Their Modifications Based on LC-MS

Student Presenter: Ning Zhang
Faculty Mentor: Shenglong Zhang
Department: Life Sciences
School/College: College of Arts and Sciences, Manhattan

RNAs play crucial cellular functions in all living cells; they can store genetic information and can act as catalysts in biological processes. There are various chemical modifications harbored within RNAs such as structural modifications in *t*RNA and mRNA, but methods to identify and locate these RNA modifications at a single-base resolution are very limited. To understand the structural and functional roles of different RNA modifications within biological organisms, we are developing a LC/MS-based RNA sequencing allowing direct and *de novo* read out of the primary RNA sequences and analysis of the chemical modifications simultaneously.

The use of liquid chromatography-mass spectrometry (LC-MS) offers a number of advantages in biomolecule analysis because of its high sensitivity and its ability to provide insightful structural information. The combination of chromatographic retention time and molecular mass has provided a powerful tool to sequence and analyze RNAs with modified nucleosides¹. However, the reported method was limited to short synthetic single stranded RNA and cannot read multiplexed RNA sequences. Herein, we developed a new strategy below to physically separate two mass ladders, thus extending this method to enable sequencing of more complicated biological RNA like *t*RNAs and analysis of their associated modifications.

We apply formic acid degradation of *t*RNA to produce short RNA oligos and physically separate pools of 5' and 3' ladder components from the crude degradation products by using catch-and-release method, such as biotin/streptavidin binding. We have introduced biotin to the 3' end of degraded *t*RNA using T4 RNA ligase with a biotinylated AppCp as a substrate, and then applied the biotin/streptavidin capture technique to separate the two ladders. Therefore, we are able to physically separate two ladders with streptavidin beads, thus significantly simplifying the data analysis, and making it possible to sequence more complicated RNA samples. It is critical to improve the efficiency in the labeling step, thus, we have been developing new protocols to add tags to *t*RNA^{Phe} from brewer's yeast to be sequenced. Our preliminary LC/MS data shows that we can observe one sigmoidal curve corresponding to one ladder as expected when we plotted their masses against their retention times (t_R). With the simplified LC/MS data and newly-developed algorithm, we expect that it will be easier to read out RNA sequences automatically.

The Effects of Drug G on Cell Growth

Student Presenters: Alex Zimmerman and Anne Marie Ardito
Faculty Mentor: Navin Pokala
Department: Life Sciences
School/College: College of Arts and Sciences, Old Westbury

We are studying how a drug, code named Drug G in the NYIT Drug Library, functions. We are using baker's yeast as a model system. We find that Drug G kills yeast efficiently on glucose-containing media, suggesting that Drug G may have an effect on basic processes required for cell growth. We will use live cell and biochemical tests of particular cellular processes to identify potential targets of Drug G. We will also probe cytoskeleton function using Tetrahymena assays of endocytosis and chemotaxis.

Investigating the Correlation Between Sensory Processing Dysfunction and Executive Dysfunction

Student Presenters: Ashley Zizzo, Austin Collein, Krysta Como, Leigh McCarthy,
Florence Cui, Michelle Rock and Angela Buscemi
Faculty Mentor: Kelly Lavin
Department: Occupational Therapy
School/College: School of Health Professions, Old Westbury

Sensory processing disorder (SPD) exists when sensory information is not processed and/or organized into appropriate responses. This atypical sensory processing often causes the child to have difficulties in modulating their behaviors.

Executive function (EF) is an umbrella term for the neurologically based skills involving mental control and self-regulation. EF includes a set of processes that involve managing oneself and one's resources in order to achieve a goal. Children who have difficulty simultaneously accessing and utilizing these skills are considered to have executive dysfunction. (EFD) Occupational therapists frequently work with children who present with both SPD and EFD; however, research examining a possible correlation between the two disorders does not exist. As a result, therapists frequently address the two disorders independent of each other. This research study is attempting to fill this gap by examining the executive functioning skills of children with a known SPD. Understanding if the two disorders are related is the first step in this area of study and can lead to earlier detection of the disorders, improved evaluation methods and future research.

A descriptive, quantitative research design via survey format is being utilized. Participants, parents of children ages 8-18 with a diagnosis of SPD, are currently being recruited through social media and data is being collected.

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