FORDHAM COLLEGE AT ROSE HILL 11TH ANNUAL UNDERGRADUATE RESEARCH SYMPOSIUM

AN INTERDISCIPLINARY CELEBRATION OF OUR STUDENTS AND MENTORS

WEDNESDAY, APRIL 11, 2018
NOON—5 P.M. | MCGINLEY CENTER | ROSE HILL CAMPUS
The Eleventh Annual Fordham College at Rose Hill Undergraduate Research Symposium
April 11, 2018 | McGinley Center | Rose Hill Campus

We are delighted to welcome you to the 11th Annual Fordham College at Rose Hill Undergraduate Research Symposium. Today we have the joy of celebrating the incredible work of 331 undergraduates as well as the dedication and time of their faculty mentors. This symposium features 34 oral presentations and 132 posters summarizing results of research projects from across the disciplines, including anthropology, chemistry, environmental studies, international political economy, physics, psychology and visual arts. And there’s more! Today we also officially release the eighth volume of the student-run Fordham Undergraduate Research Journal, which publishes top-notch articles written by Fordham students; we invite you to pick up a copy or read it online.

It has been over a decade since Fordham College at Rose Hill began its undergraduate research program with a small group of students and faculty, primarily in the sciences. Since then, undergraduate research has grown in terms of student participation and broadened across the arts and sciences. The college is proud of the vibrant community of students, faculty, staff and supporters who together can tackle the most challenging questions and create a sense of connectedness around a common passion for inquiry. In this past year, there has been a great deal of action. We received a record number of travel grant submissions. These provide support for our students to present their projects or contribute to conferences around the country. With the generous contributions from our donors, the undergraduate program has grown to support travel as well as providing grants during the fall, spring and summer. We are deeply grateful for this support.

The success of this program and today’s event is due to so many. We are very thankful to our presenters, co-authors, faculty mentors, as well as faculty and staff, family, friends, alumni, and guests. Please enjoy seeing as many presenters and posters as you can and be sure to ask a lot of tough questions.

Finally, special thanks are due to our dear colleagues and friends who do so much to support this program: Susan Legnini, Sonia Montiero, and Sarah Duncan from the FCRH Dean’s Office; the FCRH Undergraduate Research Grant Reviewers, which includes 47 faculty members who give their time and insights throughout the year; our Undergraduate Research Advisory Council Members, Professors Christopher Aubin, Orit Avishai-Bentovim, Edward Dubrovsky, Lewis Freeman, Sarah Grey, Olena Nikolayenko, and Melani Shahin; Seth Knight from Duplicating Services; Logan West of Fordham’s Office of Marketing and Communications; and the generous support of the Fordham College Alumni Association.

Enjoy this wonderful day at FCRH!

Dr. Maura B. Mast
Dean
Fordham College at Rose Hill

Dr. Rachel Annunziato
Associate Dean for Strategic Initiatives
Fordham College at Rose Hill
The Eleventh Annual Fordham College at Rose Hill
Undergraduate Research Symposium
April 11, 2018 | McGinley Center | Rose Hill Campus

Schedule of Events

11:00am Registration Opens for Symposium Participants

12pm-3pm Oral Presentations
Lunch Served in McGinley 237

3:00pm Celebratory Remarks
Maura Mast, Ph.D.
Dean, Fordham College at Rose Hill

Jonathan Crystal, Ph.D.
Associate Chief Academic Officer, Fordham University

Rafael Zapata, M.A.
Chief Diversity Officer, Fordham University

Marc F. Rosa, FCRH '01, C.F.P., C.R.P.C.
Supporter of Undergraduate Research

3:15pm Presentation of Fordham Undergraduate Research Faculty Mentor Awards
Rachel Annunziato, Ph.D.
Associate Dean for Strategic Initiatives
Fordham College at Rose Hill

3:30pm-5pm Poster Presentations
McGinley Ballroom and McGinley Lounge
WITH GRATITUDE TO OUR ALUMNI DONORS WHOSE SUPPORT FUNDS UNDERGRADUATE RESEARCH AND FELLOWSHIPS WITHIN FORDHAM COLLEGE AT ROSE HILL

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## Oral Presentation Session Summary

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ORAL PRESENTATIONS
NOON-1PM

Key Moments in History
McGinley 234 Noon-1pm
Moderator: Elizabeth Penry

Oral-1: Visible Signs of Spanish Imperial Authority: From the Hospital-Pueblos of Vasco de Quiroga to the Plaza Mayor of Felipe IV, Katherine DeFonzo


Oral-3: The Elgin Marbles Affair: Marvels of Antiquity in the Clutches of Empires and Elites, Elizabeth Doty

Girl Power!
McGinley 235 Noon-1pm
Moderator: Olena Nikolayenko

Oral-4: Acts of Resistance Among Young Muslim Women, Leya Maloney

Oral-5: Black Female Performers in a Pornified World: Defying Respectability Politics One Video at a Time, Margarita Artoglou

Oral-6: Maternal Employment and Young Adult Development, Dalaney Vonderahe

Oral-7: Weaving a Sustainable Future: Social Enterprise Partnerships with Female Indigenous Artisans in the Lake Atitlán Region of Guatemala, Rosalyn Kutsch

Medical Advances from Undergraduate Research
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Oral-8: Nutritional Assessments and Obstructive Airways Disease: A Systematic Review, Rachel Lam

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Oral-10: Cost and Length of Stay in New York Hospitals, Rachel Clivaz
ORAL PRESENTATIONS
1-2PM

Blinded with Science: A STEM Showcase
McGinley 234 1-2pm
Moderator: Christopher Koenigsmann

Oral-11: Diagnostic Evaluation of NuMI Hadron Monitor Ion Chambers, Bernadette Haig
Oral-12: Transition Metal-Based Alloy and Core-Shell Nanowire Electrocatalysts for the Oxidation of Small Organic Molecules, Brett Musialowicz
Oral-13: Enhanced Electrocatalytic Oxygen Reduction and Methanol Oxidation Performance in Hollow Pt-Ag Nanoparticles, Gurpreet Singh
Oral-14: Modeling Mid-Level Visual Representations Through Clustering in a Convolutional Neural Network, Amy Feng

Hot Topics!
McGinley 235 1-2pm
Moderator: Sarah Duncan

Oral-15: How to Keep your Relationship Hot and How to Turn it Off, Lea Nguyen
Oral-16: The Video Gaming Industry: Playing the Game of Instant Gratification, Emma Franz
Oral-17: Hooking Up at Fordham, Lea Nguyen
Oral-18: Low Turnout Among Millennial Voters, Brianna Miller

Contributors to Mental Illness
McGinley 236 1-2pm
Moderator: Jillian Minahan

Oral-19: Sleep Quality Association with Non-Suicidal Self Injury, Erin Shanahan
Oral-20: Do Regulation Strategies Increase the Concordance between Subjective and Objective Emotional Experience in Borderline Personality Disorder?, Gracie Jenkins
Oral-21: Risk Factors for Suicide in a Chronic Pain Sample, Anna Gilbert
ORAL PRESENTATIONS
2-3PM

The Environment in Crisis
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Moderator: Bryan Pilkington

Oral-22: What We Know and What We Think We Know: Common Coastal Management Facts and Their Misconceptions, *Colleen Cochran*

Oral-23: Flood Hazard Mapping, Hazard Mitigation Assistance, and the Warming Tides, *A. Hillary Bosch*

Oral-24: Documenting the Economic and Sociocultural Livelihoods of Communities Who Will Be Displaced or Impacted by the Construction of the Polihali Dam, *Corey Glackin-Coley*

The Social Impact of Policy & Religion
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Moderator: William Gould

Oral-25: The Islamic Welfare State, *Julia D’Ambrosio*

Oral-26: An Exploratory Study on the Impact of Cognitive Style, Consumer Demographics and Cultural Values on the Acceptance of Islamic Insurance Products, *Alex Paton Schmidt*

Oral-27: Catholic Visions of Charity, *Meghan Townsend*


A Celebration of the Arts
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Oral-29: Revisiting the Past: The Smithsonian Institution’s Bab edh-Dhra collection, *Sarah Hartman*

Oral-30: Organists Can Be Intellectuals Too! Andreas Werckmeister’s Quadrivial Approach to Musical Thinking, *Melani Shahin*

Oral-31: Dig a Little Deeper; A Closer Look at the American Reception of Disney's *The Princess and the Frog*, *Shannon Yawman*

Oral-32: From Uptown to Downtown in the Boogie Down: Bronx Hip Hop from the 1990s to the Present, *Christie Klima*
Oral-33: Effectiveness of Digital Marketing on College Students: Survey at 2018 AMA Conference, Sean Todd

(11am-12pm)

Oral-34: Perceptions of Microfinance Organizations in the Artisan Markets of Chinchero and Pisac, Peru, Rosalyn Kutsch

(1:30-2:30pm)
Oral Presentations

Oral-1: Visible Signs of Spanish Imperial Authority: From the Hospital-Pueblos of Vasco de Quiroga to the Plaza Mayor of Felipe IV
Authors: Katherine DeFonzo and Sarah Penry
Faculty Mentor: Sarah Penry
College: Fordham College at Rose Hill

Many historians have observed that political leaders from throughout history have deliberately constructed and organized cities under their jurisdiction in a way that clearly conveys their authority. This was certainly the case during the Spanish Golden Age when King Felipe II approved the construction of the new El Escorial royal complex and later when King Felipe IV began a series of significant renovations to the Plaza Mayor in Madrid. This paper argues that a sense of continuity can be established between the attempts by these Spanish monarchs to centralize their authority at home and the efforts of certain missionaries to enforce Spanish authority in the New World. The comparison offered is grounded in research related specifically to the work of Vasco de Quiroga, a Spanish official who would become the first bishop of the Mexican diocese of Michoacán. The hospital-pueblos that Quiroga established in Santa Fé de México and Santa Fé de la Laguna in many ways resembled the communities envisioned by Thomas Moore in his famous work Utopia. The desire for uniformity outlined in Quiroga's Ordenanzas and manifest decades later through the grand architectural projects undertaken by Felipe II and Felipe IV, as well as the centrality of Catholic devotion and worship to daily life in both Spain and Michoacán, reveals that Quiroga and these monarchs would adapt approaches to upholding Spanish authority that are more similar than might be expected given the separation of these men by time and miles.

Oral-2: Aztecs in Nuremberg: The 1524 Latin Translation of Cortes's Letters
Authors: Joshua Anthony and Sarah Penry
Faculty Mentor: Sarah Penry
College: Fordham College at Lincoln Center

My research is on usage of the classics through the framework of humanism by Europeans in the early 1500s to make sense of the discovery of the New World, particularly concerning the conquest of Mexico. There is a Latin translation of Cortes's second and third letters, published in Nuremberg in 1524, which contains a remarkable and often reproduced map of Tenochtitlan. I have translated the translator's introduction, which uses humanism to justify the importance of translating these letters from Spanish to Latin so that a larger European audience could understand them, and I use this document to add to the larger discussion about the part ancient texts played in the intellectual reaction to the Age of Discovery.

Oral-3: The Elgin Marbles Affair: Marvels of Antiquity in the Clutches of Empires and Elites
Authors: Elizabeth Doty and Steven Stoll
Faculty Mentor: Steven Stoll
College: Fordham College at Rose Hill

As the history of British acquisitions demonstrates, the height of imperialistic motivated acquisitions largely grew out of social emphasis and pressure that was placed on a return to/appreciation of the culture of great civilizations like Greece and Rome. By possessing items from antiquity, British superiority became a defined and material space. In a sense, by acquiring these items, Britain felt a sense of entitlement to history. Further, it allowed the British a tangible way to own a piece of the world, while their growing empire was similarly acquiring physical space via the colonies. My research examines how the controversy of British possession of the Elgin Marbles continues to this day and is a source of great national British pride and yet a source of tension for the Greeks. The end goal for my research is to understand how imperialist-driven modes of thinking about acquisitions in the early 19th century is still perpetuated today by museum and acquisitions culture, and most importantly the implications for ethical cultural preservation.
Oral-4: Acts of Resistance Among Young Muslim Women  
Authors: Leya Maloney and Olena Nikolayenko  
Faculty Mentor: Olena Nikolayenko  
College: Fordham College at Rose Hill

There is a debate in the literature about the relative importance of grievances, resources, and identities on protest behavior. This study contributes to the debate by examining protest behavior of young Muslim women in the United States. Based upon in-depth interviews with ten Muslim female college students in New York and New Jersey, this study explores the role of collective identity in shaping women’s protest behavior. In addition, the study investigates how parents’ country of origin and parents’ socioeconomic status influences the women’s propensity to protest. The sampling method allows me to minimize the effects of grievances and resources because all the respondents attend college and deal with anti-Muslim sentiments in post 9/11 America. This study finds that identification with and a sense of responsibility to the Muslim-American community has a profound impact on the women’s propensity to protest against social tolerance. Women from lower socioeconomic backgrounds are also more likely to engage in protest. Moreover, the parent’s country of origin and in particular the degree of political openness in the country of origin shape the women’s choice of protest tactics. The majority of the interviewed women challenge the traditional definition of protest as an overt street action and consider protest as every day acts of resistance. These findings advance scholarly understanding of factors associated with protest behavior of young Muslim women in the United States. This study also adds to gender scholarship by exploring the political significance of Muslim women.

Oral-5: Black Female Performers in a Pornified World: Defying Respectability Politics One Video at a Time  
Authors: Margarita Artoglou and Diane Detournay  
Faculty Mentor: Diane Detournay  
College: Fordham College at Rose Hill

In recent years, mainstream media content has become more explicitly sexual, a shift some scholars refer to as "pornification." Pornification scholars often note the ways in which this trend might serve to justify discrimination and violence against women. However, these scholars often analyze the issue from a single-axis framework by exclusively looking at the ways in which pornification affects white women. This paper analyzes the ways in which explicit expressions of sexuality differ for women of color by considering a racialized history in which Black women did not have ownership over their own bodies and sexual expression. I specifically evaluate music videos by Black female artists and locate examples in which Black women in music, such as Beyonce and Nicki Minaj, simultaneously offer up conventionally sexy images while also challenging assumptions about Black women and Black sexuality. As such, I argue that music videos in which women of color are seen as "pornified" might actually serve the purpose of creating a space in which women can negotiate dominant discourses surrounding Black women's sexualities with genuine expressions of desire.

Oral-6: Maternal Employment and Young Adult Development  
Authors: Dalaney Vonderahe and Nancy Busch Rossnagel  
Faculty Mentor: Nancy Busch Rossnagel  
College: Fordham College at Rose Hill

As many mothers increasingly enter the workforce, more research has been conducted on whether maternal employment is associated with child development. Past research supports that children who had part-time working mothers had better self-esteem and spend more time working on homework. It also supports that an association exists between maternal employment and adolescent’s career trajectories. Interestingly, some research argues that how mothers feel about their jobs is more important than the mothers’ jobs in regard to how their children develop. The present study investigates whether maternal employment is associated with young adult academic motivation and achievement, resilience, career aspirations, and self-worth. It hypothesizes that young adults who had part-time employed mothers during their childhoods would have higher academic motivation and achievement, resilience, career aspirations, and self-perception scores than young adults who had a full-time employed mother or an unemployed mother. Undergraduate Fordham students were asked whether their mothers were employed and for how long. They
then responded to the items on the Academic Motivation Scale, the Brief Resilience Scale, the Career Aspiration Scale, and the Self-Perception Profile for College Students. An independent samples t-test and an ANOVA were conducted to assess the differences in mean scores among the young adults.

**Oral-7: Weaving a Sustainable Future: Social Enterprise Partnerships with Female Indigenous Artisans in the Lake Atitlán Region of Guatemala**
Authors: Rosalyn Kutsch and Barbara Mundy
Faculty Mentor: Barbara Mundy
College: Fordham College at Rose Hill

Since the early 1990s there has been an increase in the investment of foreign nonprofit and for-profit enterprises with the intention of supporting and educating female indigenous textile artisans in rural Guatemala. Presently, there are dozens of foreign-based organizations claiming to empower female artisans and break the cycle of poverty. Though the structure of these organizations differ, they all offer a few key benefits to the women of these artisan cooperatives: access to the international market, knowledge of North American trends and designs, and education and leadership programs aimed at alleviating social problems. Not only do these companies offer the opportunity for increased income for indigenous women, but their fair-trade model urges consumers to play a part in changing global sourcing practices. This study uses primary data collected over a two month period (June-July 2017) through interviews and surveys of over 170 indigenous artisan partners from two social enterprises based in Panajachel, Guatemala. The findings conclude that there is a need to balance the economic success of enterprises with long-term retention rates of artisan partners, to find additional opportunities for artisans to earn income and to better prepare and educate artisans to combat the challenges of the competitive local market. Additionally, there is a need to incentivize enterprise-artisan partnerships through benefits like education for the children of artisans and micro-loans. This study offers recommendations to social enterprises in the Guatemalan textile market to ensure the sustainability of their work and long-term impact on the livelihoods of their artisan partners and contract weavers.

**Oral-8: Nutritional Assessments and Obstructive Airways Disease: A Systematic Review**
Authors: Rachel Lam and Wendy Zencheck-Cavuto
Faculty Mentor: Wendy Zencheck-Cavuto
College: Fordham College at Rose Hill

Improving nutrition is key to the management of metabolic syndrome (MetSyn) which affects more than 1/3 of the US population as well as World Trade Center (WTC) Medical Monitoring and Treatment Program (MMTP) participants. MetSyn biomarkers expressed soon after exposure to the WTC-particulates predict future WTC-Lung Injury (LI) a type of obstructive airways disease (OAD). Nutritional intervention in obstructed patients can improve lung function and have been the focus of clinical trials. To elucidate correlation of nutrition’s effect on OAD, our systematic review includes a summary of dietary questionnaires in OAD patients, allowing us a better understanding of how best to assess our cohort of environmentally exposed subjects with OAD. Databases were searched for nutrition (assessment OR questionnaire OR evaluation) and obstructive airways disease OR chronic obstructive lung disease. Papers were included if they dealt with lung disease, MetSyn, were in English, used human subjects, and were published in the last 10 years; and excluded if they focused on malnutrition, physical activity and psychological health. Final systematic review will be registered with PROSPERO. 423 studies were identified. 364 were identified by the search outlined and 59 by other sources. Once screened, 65 studies were identified. Of these, 29 focused on COPD; 10 on dietary assessments; 26 on relationships between OAD, diet, and MetSyn. Nutritional reviews utilized dietary assessments to identify levels of nutrition and revealed dietary interventions to be an important contributor of better lung function. High caloric diets contribute to MetSyn, which is associated with loss of lung function. Self-made dietary questionnaires were utilized rather than validated questionnaires such as Food-Frequency Questionnaires. Future work will focus on incorporating nutritional assessments and dietary interventions in participants with OAD in our WTC exposed cohort.
Oral-9: Texas Children’s Hospital Transition Study
Authors: Kirk Brouwer, Sarah Duncan and Rachel Annunziato
Faculty Mentor: Sarah Duncan and Rachel Annunziato
College: Fordham College at Rose Hill

Transition into the adult health care system has been shown to be a vulnerable period for pediatric patients with special health care needs. Our research team worked with Texas Children's Hospital to develop a concrete plan for a transitional system as liver patients moved from pediatric healthcare (children's hospital) to adult healthcare facilities, hospitals, and doctors. As the process progressed, the team conducted interviews with patients before and after transfer to adult care settings. Interviews inquired about practical issues within transition as well as the mental health and well-being of patients and families as they transitioned between healthcare providers and facilities. After analyzing the pre-transfer interviews, the researchers found that overall, patients perceived the transition process to be simple and straightforward with the help of their healthcare team, although they generally did not express a detailed, comprehensive understanding of the process. Primary concerns included uncertainty about the progression of the process, and some anxiety and feelings of loss over the changes in doctors and other healthcare providers. In addition, we found that patients largely were not self-managing their care, which is often an expectation in the adult health care system. At this hospital, there is an administrative push to transfer patients at age 18. However, it appears that the transition to self-managed care is still underway at that time. This suggests important implications for preparation of patients on the pediatrics side but also of the need for increased awareness of “where patients are” on the adult side.

Oral-10: Cost and Length of Stay in New York Hospitals
Authors: Rachel Clivaz and Wullianallar "R.P." Raghupathi
Faculty Mentor: Wullianallar "R.P." Raghupathi
College: Gabelli School of Business

In every recent decade, growth in national health expenditures have outpaced economic growth in the United States. As of 2016, U.S health care spending has reached $3.3 trillion or $10,348 per person. Of this $3.3 trillion, 32% is attributed to hospital care. The state of New York in particular spends a significant amount on health care with expenditures at $193 billion in 2014, the second highest in the country. On a per capita basis, residents of New York spent 20% more on health care than the national average in 2014, making New York the 8th highest in per capita health care expenditures in the United States. The question at hand is whether this increase of costs in health spending in New York has led to an increased quality of hospital care. While the concept of hospital quality is rather broad, this research will be narrowed in on exploring quality in the context of average length of stay. Through a data driven analysis of the New York State Department of Health’s SPARCS data sets, several overarching questions will be explored. Is there truly a negative correlation between the average cost per day and the average length of stay and for which diagnoses is this most prevalent? Has the average cost per day increased for New York hospitals, and for which diagnoses is this cost augmentation the highest? Thirdly, has the average length of stay decreased and for which diagnoses is this decrease the most significant? Within these questions, it is expected that various patterns and trends will reveal themselves.

Oral-11: Diagnostic Evaluation of NuMI Hadron Monitor Ion Chambers
Authors: Bernadette Haig and Stephen Holler
Faculty Mentor: Stephen Holler
College: Fordham College at Rose Hill

The performance of the NuMI Hadron Monitor ion chambers was evaluated. Possible sources of ion chamber performance degradation are discussed, based upon analysis of Monitor data. The quality of the signal is reviewed, and it is concluded that the Monitor still functions for its main tasks. Repair is not possible, but replacement of the Hadron Monitor during the 2017 summer shutdown was not deemed necessary. Lastly, a diagnostic apparatus for potential impurity of the helium gas inside the chamber has been designed and installed. A vacuum chamber is connected to the Hadron Monitor exhaust line to collect gas samples. These samples are analyzed by a GCMS (gas chromatograph-mass spectrometer).
Oral-12: Transition Metal-Based Alloy and Core-Shell Nanowire Electrocatalysts for the Oxidation of Small Organic Molecules
Authors: Brett Musialowicz, William Beatrez, Ian Colliard, and Christopher Koenigsmann
Faculty Mentor: Christopher Koenigsmann
College: Fordham College at Rose Hill

Commercial glucose sensors employ the enzyme glucose oxidase to measure blood glucose levels. However, enzyme-based sensors are highly sensitive to environmental factors such as temperature and pH, which can reduce performance. Thus, there is a growing interest in enzyme-free catalysts, such as platinum and other precious metals. Platinum electrocatalysts are active toward glucose oxidation, which enables high sensitivities and low detection limits. However, their high cost and poor selectivity have hindered their widespread use for glucose detection. In light of this challenge, we employ an ambient, surfactantless synthetic method to produce core-shell nanowires consisting of first-row transition metal nanowires coated with thin precious metal shells. The core-shell structure not only reduces the quantity of precious metal within the catalyst but also leads to beneficial electronic and structural interactions between the core and shell. The as-synthesized, core-shell nanowires maintain diameters of 102 ± 11 nm and have tunable compositions ranging from 20% to 60% Pt. The catalytic performance of the nanowires toward the oxidation of small organic molecules, such as glucose, is currently under investigation.

Oral-13: Enhanced Electrocatalytic Oxygen Reduction and Methanol Oxidation Performance in Hollow Pt-Ag Nanoparticles
Authors: Gurpreet Singh, Tulio J. Aimola, Shutang Chen, Sravan Thota, Jing Zhao, and Christopher Koenigsmann
Faculty Mentor: Christopher Koenigsmann
College: Fordham College at Rose Hill

Hollow platinum-based nanostructures have garnered increasing interest recently as electrocatalysts for both the oxygen reduction reaction (ORR) and the alcohol oxidation reactions owing to their unique structural properties. Here, we report the electrochemical properties and size-dependent electrocatalytic activity of hollow, bimetallic PtAg nanoparticles (NPs) synthesized via ambient solution-based techniques. The specific ORR activity of the hollow PtAg NPs increased by a factor of nearly two-fold as the particle size decreased from 22 nm to 6 nm. The activity of the hollow NPs was also significantly higher than that of commercial carbon supported Pt NPs, highlighting the benefits of the hollow morphology. Over the course of an extended durability test, the hollow nanoparticles retained their morphology and composition, and maintained 95% and 87% of their initial surface area and catalytic ORR activity, respectively. In addition to oxygen reduction, we also observed significant enhancements of nearly two-fold in the methanol oxidation activity of the hollow NPs, when compared with commercial carbon supported Pt NPs. X-ray photoelectron spectroscopy (XPS) and cyclic voltammetry data suggest that the enhanced performance is a result of the beneficial structural properties of the bimetallic alloy and hollow morphology.

Oral-14: Modeling Mid-Level Visual Representations Through Clustering in a Convolutional Neural Network
Authors: Amy Feng and Daniel Leeds
Faculty Mentor: Daniel Leeds
College: Fordham College at Rose Hill

The structure of visual perception in the human brain is an open question. Brain regions have been found to be associated with seeing simple lines and shapes, and with seeing broad visual classes. However, intermediate features spanning between line detection and category recognition have been harder to pin down. Recent studies have found Convolutional Neural Networks (CNNs) to be effective predictors of activity across the human visual cortex. New biological insights may be gained by probing the visual representations embedded within CNN layers, and within individual model “neurons” in each layer. In our study, we study how four layers of the Krizhevsky (2012) CNN represent selected patches from real-world photographs. For each layer, we extract the multi-“neuron” output for each image patch. We use K-means clustering to group similar image patches based on similar multi-unit responses within a given layer. Our results align with a previous study on convolution layer 4. Each layer grouped image patches into...
a mix of intuitive and unintuitive clusters – layer 2 appeared connected to textures, boundaries and shapes; layers 3 and 5 appeared connected to more-complete objects/object-parts. Our results suggest a mix of functionally-valuable visual features, partially grouped by layer. Examining fMRI vision data from Kay (2008), we find high-correlations between learned clusters and neuroimaging data; however, we find surprisingly high neuroimaging correlations arising from randomly permuted clusters as well, which requires further study.

Oral-15: How to Keep your Relationship Hot and How to Turn it Off
Authors: Lea Nguyen and David Marcotte
Faculty Mentor: David Marcotte
College: Fordham College at Rose Hill

People often characterize their romantic relationship based on feelings of satisfaction, happiness, conflict, or negativity. Challenges that elicit distress or negativity may predict greater likelihood of breaking up or divorce, which leads some couples to seek professional help. This presentation will examine risk and protective factors for relationship quality and satisfaction in married, heterosexual couples identified in empirical research: Perception of self, perception of daily work stress, depression and perception of demand/withdraw behavior, emotional capital, emotion regulation and constructive communication, and disclosure of marital problems to friends and spouses. Understanding risk and protective factors can modify existing interventions to increase effectiveness. One example, Relationship Education Therapy, is structured to promote satisfying healthy behaviors and prevent future conflicts. Recommendations are given for the “tailored, stepped approach” to relationship education that support the development and maintenance of relationship satisfaction and longevity.

Oral-16: The Video Gaming Industry: Playing the Game of Instant Gratification
Authors: Emma Franzia and Lewis Freeman
Faculty Mentor: Lewis Freeman
College: Fordham College at Rose Hill

With the growing popularity of digital distributors and instant content providers like Steam, Netflix, Origin, Hulu, and Humble Bundle, consumers have more on-demand access to entertainment in the forms of movies, TV shows, and video games than ever before. The millennial generation's desire for speedy satisfaction, accessibility, constant feedback, and instant gratification requires businesses to put a premium on speed, variety, and efficiency. This paper highlights how recent trends in the gaming industry, specifically in regards to indie games and developers, are the direct result of this increase in consumer desire for instant gratification. By closely tracking the video gaming industry for seven months and examining the fluctuating roles of publishers, this paper will provide a concise review of the state of the industry and how the need for instant gratification from the consumer base effects competition and business decisions. By using the video game industry as a model, as well as the plight of indie developers, this study offers a glimpse of the direction future industries must move toward in order to satisfy the needs and demands of the growing millennial generation. This paper offers suggestions of how these observations and findings can be utilized to ensure that creativity and competition are allowed to flourish amidst a growing need for speedy delivery and instant gratification.

Oral-17: Hooking Up at Fordham
Authors: Lea Nguyen and David Marcotte
Faculty Mentor: David Marcotte
College: Fordham College at Rose Hill

Casual sex encounters, known as “hooking up,” are increasingly common among undergraduate college students. This study investigates the impact of membership in a “moral community” and gender on hooking up behavior in a sample of undergraduates at a Catholic University (N = 141). Religious identity affected the degree to which students espoused the Jesuit ideals of cura personalis (care, dignity, and development of the whole person) and being a man and woman for others. Christian students were more likely to espouse Jesuit ideals than Agnostic/Atheist and Other religiously affiliated students. The degree to which students espoused Jesuit ideals did not affect hooking up behavior. Men were
more likely to have longer casual sex partners than women. There were no gender differences in one-time hook-up partners and romantic partners. This work replicates previous findings about the relationship between religious participation and hooking up behavior and identifies the unique role of gender in one type of hooking up relationship.

**Oral-18: Low Turnout Among Millennial Voters**  
Authors: Brianna Miller and Rachel Annunziato  
Faculty Mentor: Rachel Annunziato  
College: Fordham College at Rose Hill

The purpose of this research is to gain a better understanding of the current attitudes that millennials and college students, ages 18-26, have regarding the importance of voting in elections. The research conducted for this project was done through surveys and personal interviews. The surveys and personal interviews seek to understand the motivations behind low voter turnout among millennials and explore other potential ways that citizens this age feel that they can make a difference in elections or in enacting policy change. The survey questions begin with demographical information such as age, gender, and educational background. After a brief establishment of previous voting habits, the questions then aim to understand how much impact survey participants feel different forms of civic participation have and how important they are. Other potential means of civic participation include protests, marches, and the usage of social media campaigns and hashtags. The survey then shifts to attempt to understand underlying reasons as to why this group does not vote and gauges responses to potential solutions that are offered to increase voter turnout. Millennials are on the verge of becoming the largest group of eligible voters in the country, and this study aims to understand why a group with so much potential influence does not turn out to exert that power at the polls.

**Oral-19: Sleep Quality Association with Non-Suicidal Self Injury**  
Authors: Erin Shanahan and Margaret Andover  
Faculty Mentor: Margaret Andover  
College: Fordham College at Rose Hill

A growing body of research has demonstrated a relationship between sleep quality and non-suicidal self injury (NSSI), a risk factor for suicide. However, these studies made use of exclusively retrospective participant reports. Efforts to further support and expand upon this relationship between sleep and NSSI must make use of objective measures and precise participant reports to limit reporting bias. The methodology of the current pilot study seeks to do this (i.e. investigate the effects of sleep quality on NSSI) through the use of Actigraphy watches and daily diary entries. Participants (n = 3) wore an Actiwatch on their wrist for 30 days and complete a brief (< 2 minute) online survey each night that assessed NSSI behaviors and urges, daily mood, and perceived sleep quality. The study is ongoing. Currently, 3 participants have completed the study while 6 other participants are currently enrolled or scheduled for their first visit. A total of ten participants will be recruited for this study. The variables of interest are being reported in the data currently collected. Between the three participants who have completed the study, 90 daily diaries were sent out via email and 81 were answered (a response rate of 90%). From these 81 daily diary entries, participants reported an average of 6.33 (s.d. = 5.69) urges to engage in NSSI. In addition, participants reported an average of 4.66 (s.d. = 4.16) instances of completed self injury. It was hypothesized that the more quality sleep acquired by an individual at night, the less likely the individual is to engage in NSSI or experience NSSI urges. Results and conclusions will be presented this April.

**Oral-20: Do Regulation Strategies Increase the Concordance between Subjective and Objective Emotional Experience in Borderline Personality Disorder?**  
Authors: Gracie Jenkins, Caroline Holman, Kate McGrath, Anna Gilbert, Erin Shanahan, and Margaret Andover  
Faculty Mentor: Margaret Andover  
College: Fordham College at Rose Hill

Objective: Research has shown that interoceptive awareness, sensitivity to internal bodily states, may play a role in the ability to regulate emotions, a significant deficit among individuals with borderline personality disorder (BPD).
However, interoceptive awareness has not been directly examined in relation to BPD following exposure to negative stimuli. This study investigates the association between BPD symptoms and interoceptive awareness by analyzing the discrepancy between participants’ subjective report and physiological measurement of emotional responses to negative stimuli. Method: The McLean Screening Instrument for Borderline Personality Disorder was administered to assess BPD symptoms. Participants were presented with negative images from the International Affective Picture System. Participants indicated their subjective emotional experience after viewing each picture, and corrugator EMG was collected as an objective measure of emotional reactivity. Correlations between the subjective emotional response ratings and EMG activity in response to stimuli were calculated to measure concordance. Results: Although statistically non-significant, a trend towards significance and a medium effect size was noted for the association between BPD symptoms and concordance of subjective and objective emotional experience when participants were asked to react normally to negative visual stimuli, \( \beta = .48, t = 2.02, p = .06 \). However, when asked to regulate their emotional reactions to negative stimuli, there was no association between BPD symptoms and concordance, \( \beta = -.28, t = -1.24, p = .23 \). Conclusion: Contrary to hypotheses, increased BPD symptoms were associated with increased positive concordance between subjective and objective emotional experience when asked to react to negative stimuli. This relationship, however, was not significant when participants were asked to purposefully regulate their emotional responses to stimuli. This finding may help to explain mechanisms contributing to emotion dysregulation in individuals with BPD. The poster will further examine these issues, as well as the concordance across different emotion regulation strategies.

**Oral-21: Risk Factors for Suicide in a Chronic Pain Sample**

Authors: Anna Gilbert and Margaret Andover  
Faculty Mentor: Margaret Andover  
College: Fordham College at Rose Hill

This study seeks to examine whether risk factors for suicide in chronic pain sufferers mediate the relationship between depression and suicide attempt history. The selected chronic pain risk factors are pain intensity, pain catastrophizing, and pain avoidance, as previous research has indicated that these variables increase the risk for suicide in chronic pain samples specifically. After excluding data identified as invalid through validity checks embedded in the survey, the final sample consisted of 80 participants. In total, 85% of participants (n = 68) reported experiencing suicidal thoughts in their lifetime, 75% (n = 60) reported making a suicide plan timeframe, and 70% (n = 56) reported a history of at least one suicide attempt. Additionally, 82.5% of participants (n = 66) reported that they had engaged in NSSI. These results support previous findings regarding high rates of suicidal thoughts and behaviors among those who suffer from chronic pain. Three separate mediation models were analyzed through PROCESS. In each model, the association between depressive symptoms and suicide attempt history was mediated by a chronic pain risk factor for suicide. We found significant indirect effects for pain catastrophizing, \( B = 0.02, SE(B) = 0.01, CI = 0.004, 0.04 \), and pain intensity, \( B = -0.002, SE(B) = 0.03, CI = -0.03, 0.04 \), as mediators of the relationship between depressive symptoms and suicide attempt history. In summary, the significant indirect effects of pain catastrophizing and pain intensity contribute to our understanding of the association between depression and suicide attempts among individuals with chronic pain. This will also have important implications for treatment of individuals with chronic pain, as well as suicide prevention efforts aimed at this population.

**Oral-22: What We Know and What We Think We Know: Common Coastal Management Facts and Their Misconceptions**

Authors: Colleen Cochran and John van Buren  
Faculty Mentor: John van Buren  
College: Fordham College at Rose Hill

Many developed coastal communities along the Mid-Atlantic United States experienced severe devastation from Hurricane Sandy in 2012. A suite of hard and soft management options can protect coastal communities in the event of a storm, but there are caveats associated with each, making their use debated among coastal communities, town managers, and politicians. Dunes are the most effective soft and natural defense option; they limited the amount of storm damage from Sandy in coastal communities that had the foresight to maintain them as a management priority.
pre-storm. We explored the opinions and knowledge base of coastal residents and beachgoers regarding the biology of dunes, beach replenishment, management regulations, tax allocation, homeowner rights, and changes associated with Hurricane Sandy. We interviewed NJ residents in two counties, Ocean and Monmouth, because both feature communities with varying forms and levels of coastal protection. Our two-phase social science study began with an exploratory phase using a semi-structured instrument with open-ended questions. In phase I, we elicited the perceptions of 48 participants in six different shoreline municipalities and from these responses, created a structured instrument for an explanatory phase II survey. Phase II consisted of a convenience sample of 300 participants to verify the distribution of knowledge and opinions by demographic characteristics. Opinions on beach replenishment and its practices varied. There exists a general lack of knowledge surrounding dune management, but a clear support for dune fortification. Issues surrounding the safety of developed coastal areas will only grow more important with climate change. The results of this study have many implications for fostering future beach management practices that are community endorsed because of an understanding of the rationale behind decisions.

**Oral-23: Flood Hazard Mapping, Hazard Mitigation Assistance, and the Warming Tides**

Authors: A. Hillary Bosch and Bruce Berg
Faculty Mentor: Bruce Berg
College: Fordham College at Rose Hill

FEMA is the federal agency tasked with organizing, collecting, and distributing resources having to do with the NFIP (National Flood Insurance Program). In order to determine which communities and properties are at risk for flooding in Special Flood Hazard Areas (SFHAs) and therefore would need flood insurance, FEMA created a program called Risk Mapping, Assessment, and Planning, or simply Risk MAP. FEMA also sponsors Hazard Mitigation Assistance, which supports a variety of mitigative initiatives, such as acquiring high risk properties to floodproofing to elevation. In this project I analyze the life cycle of the Risk MAP projects and the BCA Mitigation tool in order to determine if FEMA appropriately accounts for the effects of climate change when mitigating against large-scale hurricanes. For this goal, I use New York City and the aftermath of Sandy as a case study.

**Oral-24: Documenting the Economic and Sociocultural Livelihoods of Communities Who Will Be Displaced or Impacted by the Construction of the Polihali Dam**

Authors: Corey Glackin-Coley and O. Hugo Benavides
Faculty Mentor: O. Hugo Benavides
College: Fordham College at Rose Hill

The Polihali Dam will be the latest feature of the Lesotho Highlands Water Project (LHWP) – a binational water transfer system between the Kingdom of Lesotho and the Republic of South Africa. South Africa receives water and in exchange the government of Lesotho receives revenues and hydroelectric energy. My research involved interviews with one hundred eighty-five individuals from ten villages in the rural highlands of Lesotho who will be impacted or displaced due to the construction, which begins in 2019, of the Polihali Dam and Reservoir. I documented the economic and sociocultural livelihoods of the communities who will be affected by the inundation of villages, fertile fields, grazing lands, roads, and ancestral burial cities. I recorded current access to electricity, sanitation, health, and education services in addition to number of fields and livestock owned because it is important to document how these communities live today in order to analyze how the LHWP impacts their livelihoods. I also learned that public opinion towards the Lesotho Highlands Development Agency (government organization responsible for compensation and restoration policies for project-affected people) is mixed. Many individuals, especially those below age twenty-five, are excited at the prospect of “development” because they are eager for any change that could bring cash jobs, electricity, and water/sanitation services to their communities. In contrast, many individuals, especially those above age fifty, are anxious and angry about the Polihali Dam because they fear that food insecurity will increase, community bonds will dissolve, and compensation from the state will be inadequate.
Oral-25: The Islamic Welfare State  
Authors: Julia D’Ambrosio and Samantha Iyer  
Faculty Mentor: Samantha Iyer  
College: Fordham College at Rose Hill

I am researching the legal codes produced during the first three Islamic Caliphates, specifically those codes which have to do with social welfare and the redistribution of wealth. My argument is that these three Caliphates could be considered welfare states by Western standards. To examine the first three Islamic Caliphates is to examine the foundations of the religion itself and all of the social and political implications of Islam. Abu Bakr, the first of these three Caliphs, ensured during his reign that funds collected through Zakat, or almsgiving, be given exclusively to the poor, disabled, and the elderly. His government also stockpiled food and supplies in every region of the empire in case of a disaster or famine. Umar, the second Caliph, limited the income of government officials and designed a social security system for the empire. Whenever citizens were injured or lost their ability to work, it became the state's responsibility to make sure that their minimum needs were met, with the unemployed and their families receiving an allowance from the public treasury. Umar also introduced the concept of public trusteeship and public ownership when he implemented the Waqf, or the charitable trust system, which transferred wealth from the individual or the few to a social collective ownership. During Uthman’s reign, many of Umar’s socially just fiscal policies remained in place. Umar had placed a ban on the sale of lands and the purchase of agricultural lands in conquered territories. Uthman withdrew these restrictions, in view of the fact that the trade could not flourish. Uthman also permitted people to draw loans from the public treasury. Under Uthman’s economic policies, the empire enjoyed prosperous years under his reign.

Oral-26: An Exploratory Study on the Impact of Cognitive Style, Consumer Demographics and Cultural Values on the Acceptance of Islamic Insurance Products among American Consumers  
Authors: Alex Paton Schmidt and Hooman Estelami  
Faculty Mentor: Hooman Estelami  
College: Gabelli School of Business

The primary purpose of this study is to explore the extent by which consumer acceptance of an Islamic insurance product (Takaful) in a non-Muslim majority country would be affected by consumer knowledge about its Islamic origins. Furthermore, this study identifies the degree to which various psychological traits and demographics of the consumers influence purchase intentions. A questionnaire was distributed to a national sample of 390 respondents, half of whom were told that this insurance product is Islamic and the other half were not. The questionnaire was identical between the two groups and the only difference was the disclosure of the product’s Islamic origins. Additional measures related to consumer demographics, cognitive style and prior experience with insurance products were obtained from the respondents. Regression analysis was used to determine the drivers of consumers' purchase intentions. Purchase intentions for Takaful were found to be lower when the product was presented to subjects as Islamic. In addition, it was established that a consumer’s cognitive style, political orientation, yearly insurance expenditure and views of Islam influence purchase intentions for Takaful. This paper is the first to explore the degree of acceptance of an Islamic insurance product in a non-Muslim majority country (United States) and to investigate the effects of a product’s religion-of-origin on the purchase intentions of American consumers.

Oral-27: Catholic Visions of Charity  
Authors: Megan Townsend and Christine Firer Hinze  
Faculty Mentor: Christine Firer Hinze  
College: Fordham College at Rose Hill

The research conducted for this paper is qualitative. It consists of four interviews: one with the Director of Public Policy for the Archdiocese of NY, one with the Director of Social and Community Development at Catholic Charities, and two with Dominican sisters who work in social services. There is also a brief survey component with responses from seven undergraduate Fordham students involved in volunteering/justice work. The purpose of these interviews was to gather theological attitudes about why Catholics perform charitable acts, whether out of obligation, faith in the
Living Christ, or both. I ultimately aimed to answer this question: are Catholics more willing to alleviate poverty through almsgiving and support of existing social structures, or through personal sacrifice and lifestyle? In other words, how pervasive to most Catholic individuals and families are the duties of charity and care for one's neighbor? Additionally, how close do these charitable actions follow an individual's personal interpretations of charity as outlined in the gospels? My findings, and the answers to these questions for individual Catholics, are complex. Through these interviews I heard many Catholics describe moral and ethical struggles with existing social systems of welfare and charity, but a desire completely linked to their faith in God to exist in these systems and work to improve them. In conclusion, I found that Catholics are more willing to support institutions that aim to help people than they are willing to create their lifestyle around the idea of sacrifice so that others may have more. I explore in the beginning chapters how and why Catholics came to occupy a place of wealth in the United States, how that has evolved, and how that evolution affects the place of Catholics in charitable organizations today. In conclusion, I connect these interviews and histories to theologies by Jon Sobrino, Gustavo Gutierrez, and other liberation theologians.

Oral-28: The Impact of Population Policy on Gender Equality in China
Authors: Yiyang Wang and Olena Nikolayenko
Faculty Mentor: Olena Nikolayenko
College: Fordham College at Rose Hill

Between 1978 and 2014, the Chinese government implemented a one-child policy to alleviate overpopulation. The policy has been widely criticized for its negative social and economic consequences, including female infanticides and the shortfall of working age population. However, some Chinese scholars argue that the one-child policy promoted gender equality by supplying daughters in one-child households with greater access to resources and enabling them to obtain higher education and pursue a career. This study assesses the impact of population control on gender differences in education attainment and income by analyzing statistical data from 1989 to 2016. The findings indicate that it was not until China joined the World Trade Organization in 2001 that the education gap began to narrow down. Meanwhile, the income gap has been steadily increasing. This study contributes to the voluminous comparative politics literature on population policies in East Asia.

Oral-29: Revisiting the Past: The Smithsonian Institution's Bab edh-Dhra Collection
Authors: Sarah Hartman and Kimberly Consroe
Faculty Mentor: Kimberly Consroe
College: Fordham College at Rose Hill

The skeletal remains of the Bab edh-Dhra population, stored in the Smithsonian Institution's Museum Support Center, comprises an important historical collection from an Early Bronze Age Jordanian settlement. This assemblage dates to the Paleolithic, but the majority of the site is from the Early Bronze Age (3300-2000 BC). Initially excavated by Paul Lapp in 1965 and 1967, excavation continued after Lapp's death during the years 1975, 1977, 1979, and 1981. Although this collection is well-known and studied, it has not been completely analyzed in terms of its dental elements. As part of an ongoing research project concerning genetic relationships in the Bronze Age Levant (3300-1200 BC), the morphological characteristics of the Bab edh-Dhra collection are being documented and tested against early research done on this group. These current analyses create further documentation of the important physical characteristics of the dentition, and reveal both genetic and pathological trends in this group, and region, during the Early Bronze Age. By creating a photographic and detailed dental analysis of this population, we aim to inform future researchers working with the collection by making assessments and records of dental characteristics readily available to them. The information collected during the course of four visits to this collection, and the research outcomes, are presented here as they apply to a larger project that is underway to identify ancient migration patterns in the Near Eastern Bronze Age.
Oral-30: Organists Can Be Intellectuals Too! Andreas Werckmeister’s Quadrivial Approach to Musical Thinking
Authors: Melani Shahin and Eric Bianchi
Faculty Mentor: Eric Bianchi
College: Fordham College at Rose Hill

During the early modern period, organists such as J.S. Bach played a fundamental role in the liturgical life of Lutheran churches across Germany. Scholars have studied the German Baroque organ repertoire in great detail, but little research has addressed the philosophical mindsets of organists themselves. During this period, the Boethian categories of theorist, composer, and instrumentalist continued to shape professional hierarchies. Theorists, who studied music using mathematical reasoning, occupied the top rank of this hierarchy of musicians; composers, who composed music based on natural instinct, occupied the middle rank; and instrumentalists, who engaged in the manual task of playing instruments, occupied the bottom rank. Thus organists, as instrumentalists, did not typically participate in academic discourses regarding music, which were dominated by theorists. One notable exception was Andreas Werckmeister (1645-1706), a provincial German organist who has been largely ignored in modern scholarship. Deeply influenced by his Lutheran faith, Werckmeister wrote voluminously on both the practical and philosophical aspects of organ playing. In addition to his own detailed scriptural exegeses, Werckmeister drew on sources that may surprise contemporary readers, such as the astronomical theories of Johannes Kepler and Pythagorean mathematics, to construct an interdisciplinary vision of earthly and divine harmony. Focusing on passages from Werckmeister’s Musicalische-Paradoxal Discourse (1707), I demonstrate the continued relevance that the quadrivium had for practical musicians even as academic theorists left behind this scholastic framework in favor of more rationalistic approaches to musical thinking. More broadly, this paper challenges the assumption that the Lutheran tradition of biblical exegesis and empirical science were necessarily opposed in the minds of early moderns.

Oral-31: Dig a Little Deeper: A Closer Look at the American Reception of Disney’s The Princess and the Frog
Authors: Shannon Yawman and Rachel Annunziato
Faculty Mentor: Rachel Annunziato
College: Fordham College at Rose Hill

The Princess and the Frog stars an archetypally American heroine figure from 1920s New Orleans, Louisiana who chases the American dream of working hard to start her own business. This “princess,” Tiana, is ethnographically unique amongst the other princesses in that she is the first and only black as well as only American princess within the Disney franchise. The historical context surrounding the premiere of the film would arguably set the film up well for success. The release of the film closely followed Hurricane Katrina, the election of the first black president, Barack Obama, and the resurgence of the American dream in the wake of the 2008 economic recession. Yet, domestic box office sales did not even match the production budget, which is very unusual for a Disney princess film. The relative failure of the film demands an answer to an important question. I pose that Tiana and her film are not massively popular within the primarily white Disney audience as a result of this white representation and lack of redemptive white characters, exemplifying the systemic issue of modern racism in the current American society. The implications of the film’s reception will affect racial representation in future Disney films, and are indicative of greater issues in the United States narrative at large, making it an important film to examine.

Oral-32: From Uptown to Downtown in the Boogie Down: Bronx Hip Hop from the 1990s to the Present
Authors: Christie Klima and Mark Naison
Faculty Mentor: Mark Naison
College: Fordham College at Rose Hill

The Bronx is known to be the birthplace of hip hop, a movement of music and performance that has taken the entire world by storm. As the movement has grown, the borough has been a focus of research for many years. However, most of the research that has been conducted on hip hop in the Bronx primarily focuses on the beginnings in the 1970s and early 1980s. The Bronx hip hop scene from the 1990s to the present day is a topic of research that has barely been explored, and the information that has been recorded has only scratched the surface. Through an analysis of oral
histories, government policies, and news recordings, the research in this thesis uncovers the stories of the primary places and people from this era of Bronx hip hop. It showcases how downtown nightclubs had a major influence on the growth of the genre and the careers of Bronx artists, how lyrical content often mirrored the personal behavior of major figures, and how local organizations continue to keep the underground hip hop scene alive in the borough today. The past thirty years have demonstrated that hip hop is still alive and thriving in the Bronx, and the stories of the most influential figures and places from this era deserve to be examined and shared with the world.

**Oral-33: Effectiveness of Digital Marketing on College Students: Survey at 2018 AMA Conference**
Authors: Sean Todd and Marina Carnevale
Faculty Mentor: Marina Carnevale
College: Fordham College at Rose Hill

Fordham Marketing Association attended the American Marketing Association International Collegiate Conference, where we conducted a field survey to gain knowledge on how FMA can most effectively reach Fordham’s Gabelli School of Business students through digital media and better the club’s current marketing strategy among the Fordham community. Our hypothesis stated Facebook and email are the most effective platforms to gain and retain members. Passing students attending the AMA conference were asked to fill out a Google Form while they toured FMA’s conference exhibit. The demographics of the participants from the survey were current undergraduate students at a four-year institution in the United States, studying marketing or a related field. First, participants were asked to list their age, graduating year, major, academic institution and location. Next, they were asked which digital media sources they received most of their updates from (Snapchat, Twitter, Instagram, Facebook, Email; pick two). Finally, they were asked which platform is the least intrusive (Snapchat, Twitter, Instagram, Facebook, Email; pick two). These results allowed us to determine what forms of digital media are most effective for FMA to advertise to Gabelli students.

**Oral-34: Perceptions of Microfinance Organizations in the Artisan Markets of Chinchero and Pisac, Perú**
Authors: Rosalyn Kutsch and Yovana Cruz
Faculty Mentor: Yovana Cruz
College: Fordham College at Rose Hill

This exploratory study examines the perceptions of microfinance models and uses of microcredits by female artisans in the Sacred Valley of Peru in order to determine the most valuable services offered by microfinance institutions. Using a variety of interviews with artisans in the urban markets of Pisac and Chinchero and in two rural communities, factors that motivate or discourage lending from formal financial institutions are identified. As a result of this study it is determined of the interviewees that: a) Artisans in rural communities are more likely to favor group lending because of the perception of difficulty to take out an individual loan from a bank and the convenience and lower transactions costs of non-profit microfinance institutions, b) Self-employed, urban artisans and vendors are more likely to prefer independent loans because of the dislike of obligatory savings accounts, and c) There are many psychological and cultural barriers to obtaining a loan for many artisans in urban markets. Among these is a significant mistrust of formal banking services for lending and saving purposes. As a result there is a trend to organize amongst friends, family and coworkers to create alternative means of lending – usually without interest or high transaction costs. Because of these findings, the author suggests an increase in financial education for artisans and clients in both urban and rural markets, more investment in decreasing the transaction costs of loans to make them more accessible to all clients, and combating the negative perception and mistrust of formal banking institutions by using marketing strategies that are more suited to the culture of rural Andean communities.
Poster Presentations

Visual Arts

Poster-1: Blue Collar Country Club
Authors: Emma DiMarco and Joseph Lawton
Faculty Mentor: Joseph Lawton
College: Fordham College at Rose Hill

In 1958, bowling alleys were “fast becoming one of the most important—if not the most important—local centers of participant sport and recreation.” Nearly sixty years later, they are quickly vanishing or being replaced by hipper “white collar” counterparts with fancy cocktails and celebrity-chef-inspired menus, taking them in a direction far from their working-class roots. Primarily located in the upper Midwest and Great Lakes region, I traveled from Rochester, New York all through the Rust Belt, documenting the disappearance of one of America’s historic past times. This steady decline of bowling alleys was visible throughout the entirety of my trip as I drove around the country, photographing over forty bowling alleys in seventeen different states. One after the other were empty, closed, transformed into another business or barely surviving. I spoke with bowling alley mechanics, owners, civilians and bowlers across America who all spoke of disappearing bowling leagues, a shift in their clientele base, and the difficulty of trying to keep their beloved past time going. Through photographs, I documented this change in the American landscape, producing thousands of images of the decay of bowling in our country along with the decline of fly over country and the blue collar workforce that once thrived there.

Anthropology

Poster-2: In God We Trust?: Science and Pseudoscience in Biblical Archaeology
Authors: Sarah Hartman and Kimberly Consroe
Faculty Mentor: Kimberly Consroe
College: Fordham College at Rose Hill

Archaeology is a scientific discipline that is vulnerable to manipulation by those who seek to profit, romanticize, and alter the past for their own benefit. Archaeological materials associated with Biblical times are especially vulnerable because of the ubiquitous nature of Christianity in modern culture coupled with the public’s general lack of understanding about how archaeology actually happens and works. Biblical literature about Bronze and Iron age materials from the Ancient Near East is rife with pseudoarchaeological claims attempting to support biblical narratives. This distortion of archaeology misleads the public and does a disservice to the culture and people the claims are misrepresenting. By examining three pseudoarchaeological claims, the disparity between the archaeological evidence and its pseudoscientific baggage is explored. These claims – the discovery of the Shroud of Turin, the site of Sodom, and the walls of Jericho – are based on the findings of real archaeological sites and artifacts, but are misrepresented to confirm claims of biblical importance. By analyzing these cases, a conclusion can be made that pseudoarchaeology uses inductive reasoning and bends evidence to support its claims. Starting with an assumption, these pseudoarchaeologists work to support their assumption, rather than gather the appropriate evidence, propose a hypothesis, and test said hypothesis. Analysis of these pseudoscientific claims illuminates the importance of thorough scientific investigation and shows how easy it is to distort evidence and reach false conclusions when scientific research is conducted with an agenda.
Poster-3: Rose Hill Garbology Project Spring 2018
Authors: Dakota Wolf, Claudia Fogel, Isha Khawaja, Shannon Strohmeyer, and Kimberly Consroe
Faculty Mentor: Kimberly Consroe
College: Fordham College at Rose Hill

Clean and effective disposal of garbage is an ongoing concern for the health of both natural ecosystems and human populations. Recycling is as important as ever considering how much waste ends up in both landfills and natural environments. The effectiveness of recycling programs depends heavily on the cooperative initiatives of individuals and communities. This modern material analysis study, otherwise known as garbology, analyzes data collected from over 80 outdoor garbage and recycling bins on the Rose Hill campus. By analyzing the contents of the garbage by both material makeup and weight, trends in recycling behavior emerge and communicate how well the Fordham community is responding to and participating in these green initiatives. This 2018 data is comparable with previous Fordham Garbology projects in order to analyze trends in recycling behavior over long periods of time. Our collected data has shown a trend towards improved recycling habits. Previous years’ projects have found trash bins comprised of up to almost 50% recyclable material when the project first began. This percentage is down to now 17% recyclable material this spring 2018 semester. Comparisons of these data sets are helpful to analyze changes in behavior and the effectiveness of the university’s green initiatives such as added recycling bins. The trend towards better recycling habits is a promising result, proving that Fordham’s Rose Hill campus has been making noticeable improvements over the years and should continue to take steps towards better recycling habits in future years.

Poster-4: Cross Cultural Biomedical Research and Ethical Concerns of Research Among Minorities
Authors: Margaret Shannon, Elizabeth Doty, Andrew Godfrey, Samantha Hamilton, Mario Torres, and Matthew Weinshenker
Faculty Mentor: Matthew Weinshenker
College: Fordham College at Rose Hill

Cross cultural biomedical research is a topic that is highly debated. In this paper, five articles are explored and discussed about research in cross cultural settings in the United States and abroad. There is a large push to increase research with ethnic minority groups, yet racial biases obstruct these studies. In this study, each student found and reviewed one article on the topic before putting them together into one cohesive presentation. The study conducted by Le Grande detailed the lack of research done on indigenous groups and the high likelihood of the participants being exploited. Angell’s article discussed the difficulties researchers face in putting the needs of their patients before those of the studies, as well as the ethical debate on using placebo treatments during studies. “Ethics are Local…” by Christakis examined the differences between Western and non-Western research and the way culture shapes these ethical precepts. Sue talked about the difficulties conducting research with minority groups, as well as the double standard that exists in these studies, such as the need for a caucasian control group. Genetic differences and their effects – the causes, expression, and prevalence in different racial and ethnic groups – were considered by Burchard et al. Finally, Adams et al. talked about the importance of informed consent and the difficulties that arise when working with different populations. The research conducted examines the different aspects and the importance of conducting cross cultural research.

Poster-5: The Great Apes and Ecotourism
Authors: Melanie Rose Taylor and Reiko Matsuda Goodwin
Faculty Mentor: Reiko Matsuda Goodwin
College: Fordham College at Rose Hill

The world’s great ape populations are threatened by the very thing that is trying to conserve and protect them – human beings. Over the past century there has been a significant weakening of the environmental protection and fortitude surrounding gorillas, orangutans, chimpanzees, and bonobos. Ecotourism, an effort to help spread awareness and raise funds for conservation efforts has actually led to an decrease in great ape health by lessening the gap between humans and the other great apes. Humans bring diseases from outside the environment into contact with these primates which are particularly harmful due to our genetic similarities. The regulations on the closeness of these ecotourism encounters
are quite loose and infectious diseases are now the leading cause of death in mountain gorillas. The increased stress on the environment and diminished comfort in these primates’ lives make them much more vulnerable to disease. Rehabilitated and released primates are also more habituated to human presence therefore permitting such a closeness of contact. The majority of disease occurrences are found in great apes that are semi-free living as well. While ecotourism may bring in much revenue to conservation efforts, the increased contact, habituation, and stress is overall detrimental to their survival.

**Poster-6: It's All About Context: Provenience, Association, and the Importance of Documentation Using a Dental Collection from Bronze Age Turkey**

Authors: Yaohan Wu and Kimberly Consroe  
Faculty Mentor: Kimberly Consroe  
College: Fordham College at Rose Hill

In the laboratory, archaeologists are dependent on detailed and often redundant record-keeping. Documentation is a critical component of archaeological interpretation since accurate information about association between materials is necessary for the testing of hypotheses and future re-investigation. However, data compilation can be problematic due to the significant amount of information produced from different methods, and the anthropogenic factors affecting them. Therefore, establishing a well-organized database is necessary during post-excavation analysis to understand the correlation between different data fields, and ascertain the distribution patterns and relationships between archaeological materials. This research addresses these problems that have arisen in the process of sorting archaeological data by discussing JAVERT, a database for information about a collection of ancient dentition excavated from the Bronze Age site of Alalakh in Hatay, Turkey. The creation and maintenance of JAVERT and the subsequent ability to cross-reference various types of data including information from dental casts, photographs, MNI and NISP counts, morphological and pathological assessments and worker notes about context are discussed. A case is made that post-excavation archaeology documentation is an essential component of archaeological research, and can reduce the number of mistakes that could otherwise limit the spacial and temporal records archaeologists need to conduct accurate scientific research.

**Poster-7: The Use of Garbology to Differentiate Adult and Sub-Adult Material Culture at Fordham's Rose Hill Campus**

Authors: Rachel Smythe, Rachel McGown, Nick Smith, and Kimberly Consroe  
Faculty Mentor: Kimberly Consroe  
College: Fordham College at Rose Hill

Within any healthy human population, sub-adults make up a significant demographic, but archaeological research using material culture tends to focus primarily on adults. Failing to consider sub-adult populations when interpreting the past would be a mistake, as an entire group of cultural participants is underrepresented; yet, this is often the case in archaeological research. Children are often perceived as invisible in the archaeological record because they have unconventional and unexpected relationships with material culture and often are not the sole users of artifacts and spaces. For these reasons, it can be difficult to identify materials used by children and sub-adults. Fordham University’s Rose Hill campus is a unique place to examine discard patterns by sub-adults because Fordham Preparatory School, an all-boys high school, is contained within the campus. The purpose of this study is to determine whether the age difference between high school and college aged students is discernable in the material record collected from outdoor rubbish bins on campus. This project uses survey methods in archaeology and Modern Material Culture Analysis, or Garbology, which allows anthropological researchers to understand the deposition patterns of living populations that can be observed and understood in the present, to better understand the pathways of refuse in past populations. With data collected since 2011, we aim to determine how to differentiate between adult and sub-adult material culture, and whether age difference is visible in the material record of a population where we have prior knowledge of that difference.
Art History

Poster-8: Weaving a Sustainable Future: Social Enterprise Partnerships with Female Indigenous Artisans in the Lake Atitlán Region of Guatemala
Authors: Rosalyn Kutsch and Barbara Mundy
Faculty Mentor: Barbara Mundy
College: Fordham College at Rose Hill

Since the early 1990s there has been an increase in the investment of foreign nonprofit and for-profit enterprises with the intention of supporting and educating female indigenous textile artisans in rural Guatemala. Presently, there are dozens of foreign-based organizations claiming to empower female artisans and break the cycle of poverty. Though the structure of these organizations differ, they all offer a few key benefits to the women of these artisan cooperatives: access to the international market, knowledge of North American trends and designs, and education and leadership programs aimed at alleviating social problems. Not only do these companies offer the opportunity for increased income for indigenous women, but their fair-trade model urges consumers to play a part in changing global sourcing practices. This study uses primary data collected over a two month period (June-July 2017) through interviews and surveys of over 170 indigenous artisan partners from two social enterprises based in Panajachel, Guatemala. The findings conclude that there is a need to balance the economic success of enterprises with long-term retention rates of artisan partners, to find additional opportunities for artisans to earn income and to better prepare and educate artisans to combat the challenges of the competitive local market. Additionally, there is a need to incentivize enterprise-artisan partnerships through benefits like education for the children of artisans and micro-loans. This study offers recommendations to social enterprises in the Guatemalan textile market to enhance their sustainability and ensure the effectiveness of their work and long-term impact on the livelihoods of their artisan partners and contract weavers.

Biological Sciences

Poster-9: Evolution of Resistance to Herbicides in Weeds
Authors: Mary Lally, Maria Aliberti, Claudia Calle-Alvarez, and Varuni Jamburuthugoda
Faculty Mentor: Varuni Jamburuthugoda
College: Fordham College at Rose Hill

Many farmers use herbicides to increase their revenue and control the spread of weeds; however, plants develop resistance to herbicides over time because herbicides target the catalytic pathway of enzymes. There are two ways plants develop resistance: target site resistance (TSR) and non-target site resistance (NTSR). TSR develops from mutations in target enzymes that the herbicides attack, while N TSR functions by increasing plant metabolism of herbicides. Over time, the weeds that hold an herbicide resistance allele survive and reproduce, while the ones who do not have this allele die. In this way, a weed population evolves to become herbicide resistant. To prevent this from happening, scientists and farmers mix herbicides together, sequence herbicides throughout the same crop season, and rotate their produce. Unfortunately, creating cocktails of herbicides has drawbacks. Scientists link herbicide use to certain cancers, birth defects, and other health issues in humans. Herbicides also negatively affect the ecosystem because herbivores may consume plants treated with the chemicals. Resistance to herbicides has monetary implications as well, contributing $26 billion in annual crop losses in the United States, yet herbicides still remain the most effective method to rid fields of weeds. Therefore, since herbicides are integral to the food industry, weeds’ increased resistance to herbicides is especially concerning.
Poster-10: Understanding the Effect of Neighborhood Socioeconomic Status on the Prevalence of Rodents in Parks
Authors: Ciara Walshe, Frank Saris, Richard Chao, Robert Lis, and Justin Pool
Faculty Mentor: Justin Pool
College: Fordham College at Rose Hill

Low socioeconomic status has often been correlated with poor quality of health and higher disease rates. Rodents are known carriers of infectious diseases, parasites and zoonotic agents, all of which can be detrimental to human health. Our aim is to understand how the socioeconomic status of a neighborhood impacts its rodent density. We hypothesized that parks in lower socioeconomic neighborhoods will have a higher density of rodents due to less resources for maintenance of these parks, compared to parks in neighborhoods of higher socioeconomic status. Lack of maintenance may also lead to an accumulation of litter, perpetuating the rodent problem. Quantity of litter and evidence of rodents were measured across three 20 meter transects along the outer perimeters in each of nine parks of varying income levels. Our hypothesis was supported, as parks in low socioeconomic neighborhoods had a higher density of rodents. Our data showed that in middle to high income neighborhoods, the amount of litter and the number of rodent traps increased, indicating more ongoing maintenance and rodent prevention in these parks. We found more rodent burrows in low-income parks and fewer or no rodent traps in middle-income or low-income parks, which was consistent with what we predicted. Our results are important as indicators of park quality, influencing the health of residents in these communities. It is our hope they will be used for recommendations to local governing authorities, legislators, policy-makers and park managers.

Poster-11: Comparing the Effects of Organic Manure vs. Chemical Fertilizer on Radish Growth
Authors: Rachael Meyers, Victoria Wetherby, Nicole Cutrone, Youssef ElFatary, and Justin Pool
Faculty Mentor: Justin Pool
College: Fordham College at Rose Hill

The use of commercial fertilizers has greatly increased over past decades to increase crop yield and overall agricultural efficiency. However, the adverse environmental effects of these products, such as runoff water pollution and excess livestock waste, have raised major concerns for ecologists. Alternatively, farmers and researchers have reverted back to using animal manure and organic compost. Yet, it remains unclear if these organic solutions are comparable to the conventional use of chemical fertilizers. We studied the effects of organic macronutrient versus commercial fertilizer treatments on radishes (Raphanus raphanistrum) grown in sterile soil with randomized block design (n=75). Radishes were planted in autoclaved soil and grown for 3 weeks under varying concentrations of manure or chemical fertilizer, each with fixed Nitrogen-Phosphorus-Potassium (NPK) levels. The average plant length was recorded and upon harvest, the number of leaves, total stem length, stem diameter, and weight were measured for three plants in each pot. We hypothesized that radishes grown in autoclaved soil treated with fixed NPK animal manure will have greater stem length, diameter, and biomass than radishes grown in autoclaved soil chemically treated with comparable NPK. These results will be critical in establishing the effectiveness of sustainable farming as well as providing valuable alternatives to limit chemical waste.

Poster-12: The Role of RhoGTPase on the Pathways that Regulate Neuronal Plasticity and Dendritic Arborization
Authors: Rachael Meyers, Leily Elahi-Zandi, Anna Hudson, Victoria Wetherby, and Usha Sankar
Faculty Mentor: Usha Sankar
College: Fordham College at Rose Hill

Studies have shown that the teaching of a motor skill to rats, subsequent administration of nicotine, and then teaching of a second motor skill causes increased dendritic branching in both hemispheres of the cerebral cortex, and decreased ability to perform the motor skill taught after nicotine administration. It is hypothesized that dendritic branching becomes saturated due to nicotine administration, and thus rats are unable to process new motor skills after prolonged nicotine use. Similarly, fetal alcohol syndrome results in decreased motor functions in affected individuals due to irregular dendritic branching. Polymerized actin filaments in dendritic spines are governed by GTPases, such as Rac1
and RhoA. Previous studies have shown that when Rac, a specific Rho GTPase, is downregulated and in its GDP-bound inactive form, dendritic branching persists. From this we concluded that Rho GTPases play a critical role in the dendritic branching biochemical pathway, and have been shown to have altered function in individuals with fetal alcohol syndrome, leading to decreased dendritic branching and decreased motor coordination. We predict that Rho GTPases will also have altered function in rats given nicotine. In our project proposal, we wish to teach rats a motor skill, inject them with nicotine, and monitor their Rho GTPase activation levels afterwards in order to see if Rho GTPase function is altered and thus potentially responsible for the increased dendritic branching and decreased ability to perform motor skills in rats administered nicotine.

**Poster-13: The Effect of Urbanization on Behavior of Urban Wildlife Along an Urban-Rural Gradient**  
Authors: Diana Abdallah, Sophie Craig, Adrienne Dean, Mamadou Ly, and Elena Hamann  
Faculty Mentor: Elena Hamann  
College: Fordham College at Rose Hill

Urbanization has direct effects on animal behavior and may have some impact on urban wildlife’s response to predators. Increased density of humans in urban settings may lead to habituation to humans or other stimuli, causing alterations to wildlife’s anti-predator behavior, which may increase their risk of predation. This study observes the effect of urbanization on small urban wildlife behavior by examining flight initiation distance (FID) along an urban-rural gradient. Data was collected at three sites representing a gradient of urbanization from New York City to Westchester. We hypothesized that wildlife in urban sites have shorter FID than wildlife in rural sites. These results will be important in understanding the effects of urbanization and increased human presence on animal behavior. They will also broaden our understanding of the general effect of humans’ impact on animal populations.

**Poster-14: The Effects of Tree Bark pH on Lichen Species Richness and Density**  
Authors: Nicole Utah, Nabilah Nishat, Sasha Ramsaywack, and Elena Hamann  
Faculty Mentor: Elena Hamann  
College: Fordham College at Rose Hill

Air pollutants, such as SO2 and NO3-, have been suggested to affect bark properties, such as acidifying bark pH. Certain biological indicators such as lichen species richness on host trees can be used to infer air quality. With the exception of a few acidophilic species, lichen generally prefer to grow on alkaline tree barks. Given that bark pH is influenced by air pollution and that lichen species richness is also related to air pollution, there lies a possible link between bark pH and lichen species richness. We tested the bark pH of trees in determined plots and assessed lichen species diversity and abundance on these same trees. We conducted these surveys in three locations in New York that differed in air quality, from rural sites that should be less polluted to urban sites that should be more affected by air pollutants. In total, measurements were taken on 3 trees per plot x 4 plots per site x 3 locations in New York (36 samples total). We hypothesize that bark alkalinity of the host trees in rural areas will promote a higher abundance and diversity of lichen species growing on them. Field work observations suggest that the less polluted rural areas have higher lichen abundance and species richness. Yet, we still need to assess whether this diversity is correlated with more alkaline bark pH. Through this connection, we aim to demonstrate that bark pH and lichen species richness can be used as a bioindicator for air pollutants and ultimately human health.

**Poster-15: Toxicity of Environmentally-Friendly Products Compared to Their Conventional Counterparts and Their Effects on Daphnia Magna**  
Authors: Joseph Akdemir, Eric Ohlendorf, Francesco Cimino, Lawrence Drejaj, and Justin Pool  
Faculty Mentor: Justin Pool  
College: Fordham College at Rose Hill

Manufacturers have recently put an emphasis on creating more environmentally-friendly household products, specifically those involved in hygiene, such as hand soap and laundry detergent. Although many products claim to be environmentally-friendly, the impact that these products have on the lives of aquatic organisms is not fully understood. This research focused on assessing the detrimental effects of consumer products on aquatic organisms at various
Poster-16: The Effects of Cinnamaldehyde and Xylitol Chewing Gums on Mouth Microbes
Authors: Julia Hughes, Marykate Decker, Francesca Ricciardi, and Marly Katz
Faculty Mentor: Marly Katz
College: Fordham College at Rose Hill

Poor dental hygiene promotes plaque buildup and potential oral diseases. Chewing gum increases salivary flow, causing the neutralization of bacterial acids and bacterial death. Sugar-free gums such as Orbit and Trident contain xylitol. Xylitol is a sugar alcohol that inhibits bacterial metabolism, causing bacterial starvation and eventual death. Conversely, most cinnamon-flavored gums contain cinnamaldehyde, a natural germicide. Studies show that Wrigley’s Big Red Chewing Gum reduced more than 50% of oral bacteria, specifically bacteria residing at the back of the tongue. In this experiment, swab samples collected from the tongue were enumerated for total heterotrophic bacteria on nutrient agar (NA) plates. Samples were taken before and after chewing gum and plated for growth comparison. Plates were incubated at 37°C for 24 hours. Wrigley’s Big Red chewing gum was expected to reduce more oral bacteria than Orbit Wintermint and Trident Tropical Twist, sugar-free gums that lack cinnamaldehyde. Results showed that fewer bacterial colonies resulted after chewing Orbit Wintermint gum than chewing Trident Tropical Twist gum. While results are pending for Wrigley's Big Red gum, it is hypothesized that cinnamaldehyde is a more effective germicide than xylitol.

Poster-17: Tombstone Lichen Abundance in Relation to Highway Vehicular Pollution
Authors: Julia Hughes, John Bruppacher, Marykate Decker, Daniel Khieninson, and Justin Pool
Faculty Mentor: Justin Pool
College: Fordham College at Rose Hill

Vehicular exhaust, an anthropogenic source of air pollution, has led to an increase in the environmental concentration of compounds like sulfur dioxide (SO2), nitrous oxide and carbon monoxide, and have been shown to cause human respiratory disease. Increasing SO2 concentrations have been shown to reduce the growth of lichens, which are symbiotic composite organisms. Thus, lichens can serve as effective bioindicators due to their sensitivity to air quality. Yet, it remains unclear how the edge effects of pollution impact local variation in lichen abundance. In this study, we examined the abundance of lichen in relation to distance from the Long Island Expressway (LIE) assuming that air quality is poorest closest to the LIE. To further assess air quality we used public data on the SO2 levels from the 2015 NYC Community Air Survey (NYCCAS) as reported by the New York City Department of Health. Lichen abundance was estimated using quarter meter quadrats on randomly selected tombstones at regular intervals of increasing distance from the LIE along a transect line measured in 10 meter intervals. Along this pollution gradient, we hypothesized that lichen abundance would increase with increasing distance from the LIE. Our initial results suggest a positive correlation between lichen abundance and increasing distance from pollutant source (LIE), independent of either tombstone material or age. This study aims to demonstrate the usefulness of lichens as bioindicators of air quality, and ultimately assess impacts of air pollutants on human health in urban areas.
Poster-18: A Comparison of Topical Acne Treatments in the Inhibition of Staphylococcus Aureus and Staphylococcus Epidermidis Growth
Authors: Lara St. Clair, Katharine Dixon, Loreta Drezaj, Vasilios Lardas, and Marly Katz
Faculty Mentor: Marly Katz
College: Fordham College at Rose Hill

Topical acne medications are often used to control the proliferation of acne vulgaris. The purpose of this study was to determine the effectiveness of four topical face washes, including Cetaphil, tea tree oil, Exact Px, and a regular bar of soap. Each group member plated Staphylococcus Epidermidis, which had been isolated from their skin, and Staphylococcus Aureus, which was a commercially acquired laboratory strain. The plates were divided into four quadrants to account for each face wash. Using a modified Kirby-Bauer method, a disc was dipped into each face wash and plated on its respective quadrant. We measured the zones of inhibition after an incubation of 37°C for 24 hours in order to determine which topical face wash was the most effective. The largest zones of inhibition were seen in plates inoculated with S. Aureus, especially for the dermatologist prescribed face wash. S. epidermidis samples displayed some resistance, especially to the nonprescription face washes. Resistance in these bacteria could have developed due to the use of face wash over time by each group member. The tea tree oil and bar of soap encountered the greatest bacterial resistance and were the least effective facial cleaners, while Exact Px resulted in the least amount of microbial resistance and was the most effective cleaner. Our study suggests that S. Epidermis has a greater resistance to face washes than S. Aureus and that prescription cleaners are more effective than over the counter products.

Poster-19: A Comparison of Photoreceptor and Mitochondrial Proteins in Wild-Type and MsrA Knock-Out Mice
Authors: Lara St. Clair, Frances Kazal, Francesca Mazzoni, and Silvia Finnemann
Faculty Mentor: Silvia Finnemann
College: Fordham College at Rose Hill

Age-related macular degeneration (AMD) is a blinding disease characterized by oxidative stress and mitochondrial dysfunction in the retina. The purpose of this study was to examine the role of an antioxidant enzyme expressed in the eye, methionine sulfide reductase A (MsrA). MsrA is known to promote mitochondrial respiration and is highly expressed in the retinal pigment epithelium (RPE) support tissue of the retina, which becomes dysfunctional in AMD. Specifically, we wanted to study MsrA’s role in preventing oxidative damage and its effect on protein and organelle content in the RPE of the eye. We previously found that knock-out mice lacking the MsrA enzyme have impaired vision. Here, I performed western blots to compare proteins from wild-type mice and MsrA knock-out mice, and then quantified protein content using ImageJ software. Eight proteins were analyzed; two proteins specific for photoreceptor cones and rods, respectively, and three mitochondrial proteins expressed by all cell types. The results of these tests showed that there were only small differences in protein content between wild-type and knock-out eyes. Differences did not reach statistical significance, mostly because the variability within each set of samples was high. This suggests that knocking out the MsrA gene does not have a significant effect on rod and cone photoreceptor protein structure or mitochondrial content. It is possible that a related enzyme such as MsrB takes over the function of MsrA when it is not present. Such compensation could explain why there is no observable effect when MsrA is not expressed.

Poster-20: Reverse Genetics
Authors: Emily Kobylski, Eileen Casey, Alexandra Jerzynska, Karla Maysonet, and Varuni Jamburuthugoda
Faculty Mentor: Varuni Jamburuthugoda
College: Fordham College at Rose Hill

As opposed to forward genetics, which begins with a mutant phenotype to determine the DNA and protein sequence, reverse genetics begins with a protein sequence and works backwards to find the mutant phenotype. Virus-induced gene silencing (VIGS), a reverse genetic tool, is a method by which one can suppress gene expression in an organism. Typically, this technique is carried out by inserting a gene of interest into a viral vector that can then generate double stranded RNA, which initiates the silencing of the target gene in the organism. Some advantages of VIGS as a
technique is that it is one of the most effective ways to analyze gene function and has been proven to be rapid, accurate, and instrumental for the functional characterization of a large quantity of genes. However, disadvantages of VIGS include that its effects are transient, or impermanent, and the technique is limited to the species in the host range of the virus used. Many modern scientists are using reverse genetics to study RNA virus genomes to develop vaccines. In conclusion, despite its limitations, VIGS is one of the most effective and useful techniques in genetics now and its potential benefits should be explored even more.

**Poster-21: Influence of New York City Commuter Traffic on Subway Surface Antibiotic Resistant Bacteria Abundance**
Authors: Victoria DiVilio, Daniel Levy, Molly McCormick, George Pappous, and Justin Pool
Faculty Mentor: Justin Pool
College: Fordham College at Rose Hill

Public transportation surfaces have frequent interaction with human contact. Viable microorganisms can remain on these touched surfaces, such as stainless steel and plastic, which function as a source of potentially harmful bacteria to people coming into contact with these surfaces. The overuse and misuse of antibiotics in clinical and agricultural applications has led to the widespread development of resistant microorganisms through selective pressures and horizontal gene transfer. We collected swab samples from six New York City (NYC) subway stations in total including two high-traffic, two medium-traffic, and two low-traffic subway stations. At each station, samples were taken from handrails, turnstiles, and ticket purchasing machines. Samples were plated on nutrient agar media plates with or without the addition of antibiotics and incubated at 37 degrees Celsius for 72 hours. We hypothesized that antibiotic resistant bacteria would be detected at higher concentrations in enclosed and crowded areas, such as high traffic subway stations, than in less populated low traffic subway stations. We expected to see a positive correlation between human-surface interaction frequency and the prevalence of antibiotic resistant bacteria. Preliminary results indicate that antibiotic resistant bacteria were present at low concentrations in high traffic subway stations and that total heterotrophic bacteria were more abundant in high traffic subway stations than in low traffic subway stations. This study can provide information to help map the occurrence of antibiotic resistant microorganisms throughout NYC and potentially aid in mitigating the transfer of resistant bacteria in urban areas.

**Poster-22: The Effect of Different Diets on Ghrelin Levels**
Authors: Daniel Alicea, Madiha Baig, Washika Ruhani, Nabilah Nishat, and Usha Sankar
Faculty Mentor: Usha Sankar
College: Fordham College at Rose Hill

While researchers continue to investigate the effect of high-fat diets (HFD) on ghrelin levels, not much research has been done to compare ghrelin levels on different diets. In this study, we aim to compare and contrast the effects of different diets on ghrelin levels, including high-carbohydrate (HCD), high-protein (HPD) and HFDs. 150 healthy males with a mean age of 25.3 (±1.6) years will fast for 12 hours and will be broken up into three groups of 50 subjects: the group treated with a HCD, the HFD and the HPD groups. Blood ghrelin levels in the plasma as well as a self-rank of how hungry the individuals are will be measured before treatment, immediately after, and continuously after at 30 minute intervals. We expect a one-way ANOVA test to show a significant difference of average plasma ghrelin levels between HCD and HFDs. We predict the plasma ghrelin levels to be high for both treatments. In particular, we expect the plasma ghrelin levels for the HCD to drop more drastically than for the HFD. We expect the data to support our hypothesis and to indicate that the HCD induced the greatest decline of ghrelin levels and hunger feelings, which would make it the most satiating macronutrient, in comparison to fats and protein. In addition, we expect there to be an association between the postprandial concentration of ghrelin and feelings of hunger, which would be indicated by the Hunger Visual Analog Score. Understanding the relationship between different diets and ghrelin levels is helpful for nutritionists in designing customized diets for those who seek to maintain their weight.
Poster-23: Spatial Distribution of Escherichia coli in Relation to Distance from Sewage Discharge Points in Three Major New York City Water Bodies
Authors: Jennifer Boyle, Noelle Chaney, Sarah Steirer, Matthew Drozd, and Justin Pool
Faculty Mentor: Justin Pool
College: Fordham College at Rose Hill

Discharge from combined sewer systems into urban water bodies can lead to an elevated risk of infection through recreational contact with contaminated waters. The detection of Escherichia coli, an indicator for the presence of other potentially pathogenic microorganisms, is a commonly used method to evaluate bacterial water quality. In this experiment, we determined the presence of E. coli in samples collected from three water bodies in New York City influenced by wastewater discharge. In each water body, samples were collected at varying distances from a sewage discharge source. We hypothesized that E. coli would be detected at higher concentrations in samples collected closer to sewage discharge points than in samples collected further away from these sources of bacterial pollutants. E. coli were enumerated using the membrane filtration technique and plated on m-TEC ChromoSelect agar. Inoculated media plates were incubated for 24 hours at 37 degrees Celsius. Our results showed that samples collected from the Hudson River and Westchester Creek had higher concentrations of E. coli than samples collected from the East River. E. coli were detected at low and intermediate concentrations in samples collected from the East River. The results of the samples collected from the Hudson River and Westchester Creek did not support our hypothesis. However, the results of the samples collected from the East River supported our hypothesis in regards to the sample collected the furthest from the sewage discharge point, but did not support our hypothesis in regards to the sample collected the closest to the outlet.

Poster-24: The Effects of Ghrelin Administration on Adults with Anorexia of Aging
Authors: Katharine Ferrante, Cassandra Chirieac, Sophie Craig, Gabriella Gante, and Usha Sankar
Faculty Mentor: Usha Sankar
College: Fordham College at Rose Hill

With aging, there is often a loss of appetite due to several factors that can decrease food intake ultimately leading to malnutrition, known as anorexia of aging. Studies have shown a direct correlation between aging and a decrease in ghrelin levels. Ghrelin is a hormone that is known to stimulate appetite in the body and is regulated by energy intake. The objective of this project proposal is to investigate the use and administration of ghrelin, as an infusion, in therapy against anorexia of aging. We hypothesize that a ghrelin infusion administered twice per day to a group of elderly adults with anorexia of aging will result in weight gain and a decrease in other symptoms of anorexia of aging. A randomized, placebo-controlled, longitudinal study, monitoring the participants’ body weight, BMI, plasma insulin, and ghrelin levels for four months is proposed. The study will compare these values and results over three phases: eight weeks prior to the administration of ghrelin, the four weeks of ghrelin administration, and four-weeks post ghrelin administration, measured daily. Fifty participants over the age of 75, who do not display any illness or diseases, other than anorexia of aging, will be recruited. Ghrelin concentrations will be determined using a double antibody RIA. Plasma ghrelin values will be plotted against body weight to visualize any correlations. A one-way ANOVA will be performed on the data to determine the significance of weight difference, if any, between the control and the experimental groups.

Poster-25: Urban and Rural Bird Density and Richness in Lower New York State
Authors: Joseph Gross, Christopher Caceres, Colin Riley, John-Paul Esoldi, and Elena Hamann
Faculty Mentor: Elena Hamann
College: Fordham College at Rose Hill

Urbanization – in ecological terms, the large-scale landscape and small-scale local habitat changes which occur during the expansion of cities – has been shown to influence bird community structure in novel ways. Species richness, relative density, and abundance are often negatively affected by factors of urbanization such as habitat fragmentation. Our study aims to assess the species richness and density of birds in urban environments relative to rural environments. Point counts were conducted in two urban settings and two rural settings in New York. We hypothesized that species
richness would be lower and bird density higher in urban areas versus rural areas. This study will broaden our understanding on the impact of urbanization, as a driver of habitat fragmentation, on bird populations. Birds serve key roles in food webs and species interactions. As insectivores, pollinators, and seed dispersers, they perform important functions for maintaining ecological stability of natural environments, but also impact agriculture, food production, and human health. It is our hope that these results will contribute to future urban planning, taking into consideration the impact it has on local bird species, as well as colonizing bird communities.

**Poster-26: Determining the Location of mRNA Expression in Cells and Tissues: FISH-Fluorescence In Situ Hybridization**
Authors: Kaitlin Hiciano, Nora Kuka, Brigid Cruser, Chloe Jaquenoud, and Varuni Jamburuthugoda
Faculty Mentor: Varuni Jamburuthugoda
College: Fordham College at Rose Hill

Fluorescence in situ hybridization (also known as FISH) is a cytogenetic technique that uses fluorescent probes. In the 1960s, researchers realized that molecular hybridization could be used to identify the position of DNA and RNA sequences in situ, or within the cell, which is different than the other techniques at the time, such as Northern Blotting. Since this realization, many refinements, including switching from radioactive probes to the more stable, safe, and easy-to-see fluorescent probes, have increased the versatility and sensitivity of the procedure to the extent that in situ hybridization is now considered an essential tool in cytogenetics. Since FISH maintains the cell structure, FISH can provide information as to the location of mRNA in tissues and cells. While FISH has a lot of benefits in diagnostic techniques such as HER2 testing in breast cancer and the Human Genome Project, there are some downsides to its use. The technique itself is time-consuming and requires specialized equipment to visualize the results, which are hard to quantify. Further limitations of FISH include potential false-positives, false-negatives, and other inaccuracies, such as a higher concentration of a desired sequence in certain areas, potentially leading to a variety of results depending on the observed area. Despite the prominent role of FISH in diagnostics, it has recently been shown to lack precision compared to new sequencing methods such as Next-Generation Sequencing.

**Poster-27: Using Gene Therapy to Target Primary Brain Tumors**
Authors: Thomas Christensen and Patricio Meneses
Faculty Mentor: Patricio Meneses
College: Fordham College at Rose Hill

Glioblastoma affects 13,000 new patients each year. It has among the worst prognosis of all cancer types, with a mortality rate of 50% within a year of diagnosis and 90% within three years. Many conventional treatment strategies are ineffective for glioblastoma. Cancerous cells become enmeshed and intertwined with normal neural tissue, preventing surgical resection, and the blood-brain barrier makes the delivery of chemotherapeutic drugs problematic. Among the alternative treatment strategies being developed for glioblastoma is gene therapy, in which genetic material expressing therapeutic protein molecules is inserted into target cells using a vector, usually a virus. This project aims to develop a gene therapy vector which uses a HPV pseudoviral vector to insert the genetic material for a fusion protein consisting of streptolysin O, a cytotoxin, and PEPvIII, which binds the toxin to EGFRvIII, ultimately inducing cell death. EGFRvIII is an oncogenic mutant of EGFR, and has been shown to express at high rates in glioblastoma. We have successfully produced this construct in bacterial colonies and transfected into mammalian cells. Stable cell lines have been established that should synthesize the protein of interest. We are currently performing tests such as Western blots to confirm that these cell lines are producing this protein. Additionally, we have transfected a construct containing the GFAP promoter into multiple cell types and shown that it restricts gene expression to glial cells. We aim to add our fusion protein gene to this construct to increase specificity of expression to glial cells.
**Poster-28: The Effectiveness of Limestone as a Buffering Agent for Acid Rain**
Authors: April Rich, Nicole Porco, Christopher Seymour, August Kublin, and Justin Pool
Faculty Mentor: Justin Pool
College: Fordham College at Rose Hill

Soil composition is known to have a strong influence on plant growth. Acid rain caused by human activities like manufacturing and burning fossil fuels negatively changes the chemical makeup of soil by lowering its pH. The presence of limestone in soil can buffer acid deposition and maintain the quality of the soil, helping plants to grow. In this study we investigated the effect of adding limestone on the growth of Brassica rapa using simulated acid rain. Brassica rapa is a fast-growing plant that optimally grows in slightly acidic soil. We studied plant growth using height as our parameter for plant health, comparing plants grown with different amounts of limestone applied either to the surface of the soil or mixed throughout. Three trials of two plants per pot with added 2, 7, and 12 g of CaCO3 were watered with dilute sulfuric acid (pH: about 4) every 3-4 days for three weeks. We hypothesized that plant growth would be greatest in the soil with the highest concentration of limestone using the mixed application method. However, probably as a result of complications while performing the experiment, as well as its small scope and sample size, we did not find statistically significant differences among any of our plant variables. Although not statistically significant, a tendency was found for the surface application method to improve growth. Despite any shortcomings, our results and further experimentation with this phenomenon could potentially direct soil remediation processes in areas affected by acid deposition to ensure healthy plant growth.

**Poster-29: Observing Effects of Nitrogen Runoff in Aquatic Environments**
Authors: William Margolin, Peter Gaffney, Thom Sanchez, Shawna McGoldrick, and Elena Hamann
Faculty Mentor: Elena Hamann
College: Fordham College at Rose Hill

Recent anthropogenic intensification of agricultural practices have amplified the total nitrogen (TN) levels in aquatic environments, which is often a limiting nutrient for cyanobacterial biomass accumulation. In the presence of excess nitrogen, bacterial blooms may occur, leading to a decrease in dissolved oxygen availability and large scale effects in interconnected food webs. The resultant hypoxic epilimnion can be detrimental to the survival of surrounding organisms, including Daphnia pulex, which we chose as our model due to its essential role in freshwater food webs. While research has been conducted on the many relationships of Daphnia pulex as both predator and prey, there is a lack of understanding in how it interacts with other parts of the environment, such as the harmful cyanobacterial blooms. Here we studied short-term effect of total nitrogen variability on food webs using an array of microcosms (n = 15) seeded with cyanobacteria, daphnia, and varying levels of nitrogen. We hypothesized that aquatic environments exposed to total nitrogen above 0.5–1.0 mg TN/L would trigger an increase in cyanobacterial growth leading to a reduction in dissolved oxygen, decreasing the overall fitness of aquatic invertebrate Daphnia pulex. These results will be critical for understanding the full impact of excess nitrogen runoff in aquatic environments and cascading effects in food webs.

**Poster-30: The Effectiveness of the 16L1.CT Antibody in Preventing HPV Infection**
Authors: Angelina Grebe and Patricio Meneses
Faculty Mentor: Patricio Meneses
College: Fordham College at Rose Hill

Human papillomavirus (HPV) is the most frequently contracted sexually transmitted infection and can cause both genital warts and various cancers, the most common of which being cervical. The two most oncogenic types of HPV are HPV 16 and 18; thus, this research focused on the mechanism of HPV 16. The capsid of HPV consists of two proteins, the L1 and the L2. It has previously been shown that after the initial binding of the viral particle to the human host cell, the capsid undergoes a conformational change that seems to expose a previously shielded intercapsomeric C-terminus region of the L1 protein. An antibody, referred to as the 16L1.CT antibody, was created off this peptide sequence revealed on this portion of the L1 protein with the thought that this antibody could potentially prevent HPV infection. The experiment performed to test the effectiveness of this antibody involved HaCaT cells being subjected...
to three different environments: one in which nothing was administered, one in which the cells were infected with pseudovirions, and one in which the cells were infected with pseudovirions and then treated with the antibody. Then, using immunofluorescence, the different cell samples were visualized in order to observe whether or not the antibody prevented the pseudovirion from reaching the Golgi apparatus. Determining if this antibody is effective is important because it represents a relatively inexpensive way to prevent HPV infection.

**Poster-31: The Effects of Sulfur Dioxide Concentration on Lichen Abundance and Biodiversity in New York City Cemeteries**
Authors: Kathleen Brodowski, Dagny Blackburn, Eileen Pawlik, Allison Ventola, and Justin Pool
Faculty Mentor: Justin Pool
College: Fordham College at Rose Hill

Lichen, a complex life form that is a symbiotic relationship between a fungus and an alga, is typically found on trees, rocks, and tombstones. Variations in sulfur dioxide (SO2) air concentration levels between rural and metropolitan areas are known to significantly impact the growth of lichen. Sulfur dioxide gas impacts the essential process of photosynthesis within lichen: as SO2 air concentration increases, lichen chlorophyll activity decreases and lichen growth is limited. We visited three separate cemeteries in the New York City metropolitan area with varying levels of SO2 air concentration. Sulfur dioxide concentration data was obtained from the New York City Department of Health and Mental Hygiene and the New York State Department of Environmental Conservation for each of the cemeteries. The percentage of lichen cover and the number of species represented on tombstones (n=50) at each of the three sites was measured. We determined biodiversity by identifying the different lichen species within 6 in2 quadrat samples. The three sites represent a pollution gradient of SO2 air concentration on an urban to rural gradient. We hypothesized that lichen abundance and biodiversity would decrease as sulfur dioxide air concentration increases. Thus, the cemetery with the highest levels of SO2 in the air will yield the least lichen biodiversity and coverage on tombstones. The results of this study are important in understanding the effects of air pollution on the ecology of lichen biodiversity. In addition, these results may provide information about the air quality in local parks.

**Poster-32: The Role of Melatonin Receptors in Adult Neurogenesis**
Authors: Angelica Storino, Michelle Ngo, Tasha Tombo, Vanessa Wendler, and Usha Sankar
Faculty Mentor: Usha Sankar
College: Fordham College at Rose Hill

Melatonergic receptors are located in cell membranes where they bind to hormone melatonin, secreted by the pineal gland. Melatonin receptor type 1a (MT1) and melatonin receptor type 1b (MT2) are G-protein coupled receptors involved in the neuroprotective action of melatonin. Upon activation, the receptors dimerize into either a MT1 homodimer or MT1/MT2 heterodimer. It is suspected that the presence of MT1 alone leads to increased neurogenesis as a result of increased concentration of brain-derived neurotrophic factor (BDNF). However, these effects are not well understood, especially in pathological conditions. Our proposed study will investigate neurogenesis in three groups of transgenic Alzheimer's mice: wild-type, MT1 knock-out, and MT2 knock-out. After exogenous chronic melatonin administration, mice will be sacrificed and the granular cell layer of each group will be compared by the quantification and volumetric measurement of DCX-labelled cells. An increase in granular cell layer reflects neuritogenesis and neurogenesis due to the growth of DCX-labelled cell dendrites and an increase in number of the cells themselves. We expect our data to demonstrate a significantly larger granular cell layer in mice with the MT2 knock-out compared to both wild-type and MT1 knock-out mice. These results will contribute a better understanding of melatonin’s role in adult neurogenesis and may suggest the importance of interfering with MT1 and MT2 mechanisms to improve neuronal deficient conditions, such as Alzheimer’s. Drugs that increase the actions of MT1 (agonists) and decrease that of MT2 (antagonists) should be investigated as possible therapies.
Poster-33: Modern Techniques in Paleopathology
Authors: Ryan Wolfe, Angelo Mabasa, Connor Reynolds, Emily Sayegh, and Varuni Jamburuthugoda
Faculty Mentor: Varuni Jamburuthugoda
College: Fordham College at Rose Hill

Paleopathology is the study of ancient diseases in humans. The development of new diagnostic procedures has allowed researchers to interpret human remains for diseases and to understand health-related patterns in the ancient world. Macroscopic techniques allow researchers to observe human remains, diagnose the causes of bone lesions, and draw conclusions about genetics, infections, and trauma in ancient peoples. Scanning electron microscopy has allowed for the examination of blood cells, organic molecules, and chromosomal matter to understand ancient diseases and date human remains. Imaging techniques using radiography, xeroradiography, and CT scanning can reveal more details about skeletal remains and other diseases, as well as determining demographics. Biochemical techniques have allowed researchers to probe ancient humans on the cellular and molecular level through the use of chemical and toxicological tests. Analyzing biomolecules in bone and hair, paleopathologists can determine ancient diets. Immunogenetics, too, are being used to analyze the antigens, antibodies, and DNA of ancient humans, allowing researchers to understand more about diseases and the genetic predispositions to them. Bacterial DNA is also important to the understanding of the relevance of infections like malaria and the plague in ancient societies. Some drawbacks, however, lie in the contamination of remains by flora, fauna, and handling by researchers, as well as the high expense of performing biochemical tests on every single specimen from an archaeological dig. Nevertheless, paleopathology provides valuable insight into the environments, genetics, and diseases of the ancient world and can help us to answer the medical questions of today.

Poster-34: Use of iDNA from Leeches to Monitor Biodiversity Through Identifying Leech Host Preference
Authors: Salma Youssef, Mai Fahmy, and Evon Hekkala
Faculty Mentor: Evon Hekkala
College: Fordham College at Rose Hill

Increasing threats to biodiversity in Madagascar’s tropical forests from poaching and habitat destruction show the necessity of developing techniques to monitor biodiversity that are noninvasive and efficient. Ingested invertebrate DNA (iDNA) from leeches is a potential new biodiversity sampling technique to detect species diversity and distribution in tropical forests. This technique involves the extraction of iDNA from blood meals in leeches. The DNA is then sequenced and analyzed using DNA barcoding to identify the host species of the leeches. The benefit of this technique over traditional sampling methods, such as cameras, is its precision and cost effectiveness. However, the use of iDNA from leeches needs to be further studied to see if it can provide accurate results. The goal is to better understand leech biology and any host and/or habitat preferences to determine if this new approach can produce unbiased results. Our studies will help develop and apply the use of iDNA from leeches as a relevant biodiversity sampling technique. We have been working on refining our PCR reactions using the Cox1, 16s, and 12s primers. We alternated the DMSO and BSA concentrations in our reactions to achieve more precise amplification. We found that the levels of DMSO and BSA do not have a strong effect on the potency of the reactions. Our preliminary results have revealed Malagasi leech hosts such as snakes, frogs, and small rodents.

Poster-35: Determining the Function of a Gene in the Context of the Whole Organism-Knockout Mouse
Authors: Salma Youssef, Gabrielle Ma, Teraesa Vitelli, Madison White, and Varuni Jamburuthugoda
Faculty Mentor: Varuni Jamburuthugoda
College: Fordham College at Rose Hill

A knockout mouse is a mouse with a gene deletion or inactivation from its DNA. When a gene is knocked out, the proteins that are expressed by the gene can no longer be produced. Thus, many research experiments use this technique to target specific genes and examine the knockout mouse to reveal the function of the gene and its corresponding proteins. Methods used to make the knockout gene include gene targeting using vectors and CRISPR. To create the mutant mice, the researcher inserts a silenced copy of the target gene into mouse embryonic stem cells. Often times, a gene for a visible characteristic is also inserted with the silencing gene, such as one that changes a mouse’s fur color
from white to brown. Therefore, visible changes in phenotype and sequence testing ensure the researcher that the
given mice have the mutation incorporated into their genome. Furthermore, the results from the mice experiments
might be able to be extrapolated to humans because some highly conserved genes will share high homology, such as
with the p53 producing gene that suppresses tumors. Some of the limitations of the experiment include the ethical
issue of mouse sacrifice necessary in order to perform the knockout, as well as concerns revolving animal welfare in
labs. Although ethical issues arise from the use of mice for experimental purposes, the results have been invaluable to
modern medicine.

Poster-36: Proposed Study Assessing the Impact of Low-Intensity Exercise on Baroreflex Sensitivity
Authors: Liat Shenkar, Mehak Sawhney, Sabrina Sayegh, Yibing Zhou, and Usha Sankar
Faculty Mentor: Usha Sankar
College: Fordham College at Rose Hill

Dehydration during exercise has various cardiovascular effects including tachycardia, decreased blood pressure, and
decreased orthostatic tolerance, that is, symptoms that are exhibited when upright posture is assumed, such as
lightheadedness, blurred vision, and chest discomfort. Previous research conducted by Charkoudian et. al analyzed
the effects of exercise-induced dehydration on arterial baroreflex sensitivity. Baroreflex sensitivity is a measurement
used to quantify how much control the baroreflex exerts on heart rate. The study found that baroreflex sensitivity
decreased significantly in response to exercise dehydration. While these findings allow us to draw conclusions about
cardiovascular control in response to high-intensity exercise, we wish to assess the impact of hydration on
cardiovascular outcomes with respect to lower intensity exercises, such as yoga. To test the hypothesis that exposure
to heat stress and/or dehydration during low intensity exercise increases arterial baroreflex sensitivity, we propose to
assess baroreflex sensitivity in 60 healthy subjects at baseline and after completing an hour of exercise. 20 participants
will perform yoga at ambient temperature in a euhydrated state, 20 will perform under heat stress in a euhydrated
state, and 20 will perform under heat stress in a mildly dehydrated state. We expect that the participants who exercised
in a euhydrated state will have the same level of dehydration pre-exercise and the participants who exercise in a mildly
dehydrated state will have the highest level of dehydration pre-exercise. We also expect that the mildly dehydrated
group will have the highest post-exercise arterial baroreflex sensitivity among the three groups.

Poster-37: Surveying Lichen Species Richness in Urban Greenspaces
Authors: Sarah Loftus and James Lewis
Faculty Mentor: James Lewis
College: Fordham College at Rose Hill

As lichen photosynthesize and derive all of their nutrients from the atmosphere, lichens are quite sensitive to air
pollution. The disappearance of sensitive lichen species can be an early indicator of an environment’s air quality.
Previous research has shown that lichen species richness decreases in environments with high sulfur dioxide (SO2)
and particulate matter (PM) levels; but no previous studies have focused exclusively on lichen species richness and
PM levels in an urban environment. Cars are a prominent source of particulate matter. With this knowledge, lichen
species richness in relation to PM levels was investigated. Lichen species were visually identified and assessed via
plot surveys across Prospect Park and Green-Wood Cemetery in Brooklyn, NY. Data on particulate matter levels was
captured through the use of an Airbeam. By survey plotting from a green space’s edge to its center, the distance from
sources of PM (cars) on lichen species richness was also assessed. In conclusion, the data supported the two hypotheses
of lichen species richness negatively correlating with both high PM levels and proximity to sources of PM (busy
roadways).
Poster-38: Investigating an EGFRvIII-Targeted Fusion Protein for Use in Cancer Therapy
Authors: Francesco Cimino, Joseph Akdemir, Lawrence Drejaj, Daniel Levy, and Patricio I. Meneses
Faculty Mentor: Patricio I. Meneses
College: Fordham College at Rose Hill

Current methods of cancer treatment are often accompanied by adverse side-effects, most notably hair loss, nausea, fatigue, weakness, and malaise, typically resulting from non-specific damage to healthy tissue by the therapeutic agent itself. This research project will develop a new anti-cancer therapy, utilizing a targeted fusion protein, to reduce healthy tissue damage. This fusion protein combines the properties of two molecules previously used in cancer therapy studies, and synergistically employs their individual functions in order to create a new approach to cancer treatment that is both target-specific and effectively toxic. The PEPvIII peptide is complementary to an epitope found on the mutant Epidermal Growth Factor Receptor variant III (EGFRvIII). The peptide’s specificity exclusively targets EGFRvIII positive cancer cells so that the other half of the fusion protein, consisting of a toxin named Streptolysin O (SLO), may induce a pore upon delivery. The induction of the pore will result in concentration gradient disruption and eventual cell death. Transfecting three epithelial rat glioma cell lines provides a mammalian model for the expression of this mainly bacterial fusion protein. Stable integrants from these transfections have been isolated via antibiotic selection and are currently being assessed for protein production and efficacy. The ultimate results of this research will increase the knowledge on SLO, as well as what is known about EGFRvIII tumors, which predominantly present in malignant brain tumors. The ultimate goal of this project is to provide a new means by which to combat EGFRvIII positive malignancies, thereby improving prognostic outcomes for patients.

Poster-39: Intracellular Trafficking of HPV Directed by Minor Capsid Protein L2
Authors: Sophie Craig and Patricio I. Meneses
Faculty Mentor: Patricio I. Meneses
College: Fordham College at Rose Hill

Human papillomavirus (HPV) is the most common sexually transmitted infection. According to the CDC, 79 million Americans are infected. A few types of the virus can cause cancer; most cases of cervical cancer are caused by HPV, as are many cases of anal, penile, and oral cancer. The capsid proteins of HPV, major capsid protein L1 and minor capsid protein L2, direct the way the virus moves through a host cell and allow the virus to establish viable infection. Current knowledge of the L1 protein has led to the development of Gardasil, a vaccine that is estimated to have reduced HPV infection by up to 90 percent. As there is more known about the L1 protein than the L2 protein, further investigations of the L2 protein could help advance efforts to combat the virus. Pseudoviruses (PsVs) that mimic viral infection but do not contain viral DNA were made to assess the role of L2 in viral infection. We will present data obtained with a mutant L2-containing pseudovirus that is deficient in infection, and compare infection between a normal pseudovirus and a pseudovirus with a modified L2 protein. This understanding of how the virus moves through the cell may provide insight for the development of more effective vaccines – a vaccine that uses both L1 and L2 could prove to be a cheaper and more viable method to combat HPV.

Poster-40: Generating Antibodies In Vitro and In Vivo
Authors: Mrika Gocaj, Elizabeth Khalil, Kienna Matus, Lisa Kazmierczak, and Varuni Jamburuthugoda
Faculty Mentor: Varuni Jamburuthugoda
College: Fordham College at Rose Hill

Antibodies are a central component of the body’s defensive immune system for their ability to target antigens that are recognized as harmful. They interact with antigens in a lock-and-key model because of a distinct site on the antigen called the epitope that the antibody specifically recognizes. This specificity to particular antigens has been manipulated for biopharmaceutical treatment and in screening and diagnosis in the biomedical field. Antibodies are produced by B-lymphocytes as antigen-specific receptors. Their production can be monoclonal or polyclonal depending on the antibody culture desired. Monoclonal antibodies (mAbs) are produced from a single parent cell and make up a homogenous mixture with specificity to a single epitope on an antigen. They are currently at the forefront of research in regards to their ability to create an antigenic defense in organisms that are immunocompromised or even
immunodeficient. Polyclonal antibodies are produced from different B cell lines to form a mixture of antibodies that each bind to different epitopes on the same antigen. The production of antibodies by in vivo, within a living organism, and in vitro, within a controlled environment like a test tube, has made the use of antibodies in research productive and efficient. In vitro cloning has been especially useful in biotechnology to construct recombinant antibodies that resolve the drawbacks of monoclonal antibodies. The productivity of cell lines that produce antibodies has improved 100-fold over the last 15 years due to the engineering of in vitro cell cultures.

**Poster-41: Use of GFP in Cell and Molecular Biology**
Authors: Isabella Mascio, Samantha Milano, Shareen Wong, Bilguutei Enkhsaikhan, and Varuni Jamburuthugoda  
Faculty Mentor: Varuni Jamburuthugoda  
College: Fordham College at Rose Hill

A green fluorescent protein (GFP) was discovered in a small bioluminescent jellyfish, *Aequorea victoria*, by Osamu Shimomura in 1962. He was awarded with a Nobel Prize in 2008 for this discovery, as his work set a path of revolutionary applications throughout cell and molecular biology. This protein can be used to mark the gene of a specific protein so that the protein of interest can be visualized by the GFP under ultraviolet light. GFP allows scientists to easily locate the protein, organelle, or cell of interest. The inclusion of GFP in a protein may change the function or location of that protein, necessitating the use of a control. Research in many areas, including cell biology and drug discovery, utilize GFP to monitor gene expression and protein localization. Although GFP’s have many beneficial functions, they also have several problems and limitations. For example, cellular toxicity may result from aggregating fluorescent proteins, and generating free radicals from exciting GFP for an extended time. Certainly, most GFP applications do not result in overt toxicity, but it has been shown that GFP can induce apoptosis, causing difficulty to establish stable cell lines expressing GFP. GFP is already a useful tool for marking specific proteins, but it has been engineered to be even more useful. Green is no longer the only color of GFP and having more than one color allows for new techniques that can make interactions between different proteins visible.

**Poster-42: Rapidly Mutating Viruses**
Authors: Alexis Verwoert, Logan Clair, Matthew Savattieri, Michael Aman, and Varuni Jamburuthugoda  
Faculty Mentor: Varuni Jamburuthugoda  
College: Fordham College at Rose Hill

Genetics plays a large role in the study and prevention of the influenza virus. This virus constantly changes in two ways. One is by “antigenic drift”, or the accumulation of mutations that code for antibody-binding sites. The influenza virus also changes by “antigenic shift”, or the abrupt combination of two or more different viruses to form a subtype of virus containing a mixture of surface antigens from the original strains. The influenza virus type A undergoes both of these types of changes, while type B only undergoes the more gradual process of antigenic drift. Because of this, influenza type A evolves more rapidly than type B. Over time, the accumulation of these small genetic mutations results in the inability of the original antibodies to recognize the new mutated strain of the virus. This lack of recognition is the reason why people can get the flu repeatedly, and is also the reason why the flu vaccine composition must be reviewed and modified annually. To combat the evolving viruses, the Centers for Disease Control and Prevention monitors the genome of circulating influenza viruses through genome sequencing. Sequencing has traditionally been accomplished through “the Sanger reaction;” however, recently virologists have switched to “Next Generation Sequencing (NGS)” methods. These new methods provide much more detail about the genome of influenza. Once the genomic composition has been reviewed, vaccines to combat the mutated virus can be produced. In the United States, the FDA has approved of three different technologies to produce these vaccines: egg-based flu vaccine, cell-based flu vaccine, and recombinant flu vaccine.
**Poster-43: Telomerase, Aging, and Cancer**
Authors: Farida Ahmed, Jacqueline Diforte, Philip Mongelluzzo III, Abby Tse, and Varuni Jamburuthugoda
Faculty Mentor: Varuni Jamburuthugoda
College: Fordham College at Rose Hill

Telomerase is a reverse transcriptase that adds tandem repeats to the ends of telomeres. It extends the longevity of cells and protects chromosome ends from degradation. Somatic cells have low levels of telomerase activity, thus they exhibit a phenomenon called replicative senescence which limits the number of times the cell can divide. Every time a somatic cell divides, the length of the telomere shortens and this leads to the progressive aging of the cell. Telomere shortening in studies showed a decrease in the response rate to stresses such as wound healing and hematopoietic ablation as well as an increase in random malignant tumors in mice. While telomerase activity is low in somatic cells, telomerase activity is high in over 85% of cancer cells. Therefore, high telomerase activity serves as a warning sign of cancer. The discovery of how telomerase activity is linked to cancer has lead to research involving how to inhibit telomerase to prevent cancer and how to utilize telomerase activity to screen for the progression of cancer. Uncovering more about telomerase will benefit many facets of the medical field, one of which includes discovering a solution to cancer treatment and improving our methods of cancer screening.

**Poster-44: Mechanism of Infantile Hypertrophic Cardiomyopathy: Expression of the Human ELAC2 Protein in Drosophila**
Authors: Joanna Theophilopoulos and Edward Dubrovsky
Faculty Mentor: Edward Dubrovsky
College: Fordham College at Rose Hill

Hypertrophic cardiomyopathy is a heart condition in which the myocardium becomes abnormally thick, making the heart an inefficient pump. Infantile HCM has an extremely poor prognosis. One third of children diagnosed before age one will experience heart failure that results in death or need for transplantation. Mutations in the human ELAC2 gene have been associated with infantile HCM. However, the precise role that variants play in the development of HCM is still unclear. ELAC2 encodes for RNase Z, an endoribonuclease that is responsible for processing the 3’ end of tRNA molecules. Because RNase Z is highly conserved among eukaryotic organisms, the Drosophila RNase Z ortholog may be a promising source of insight for studying the mechanisms of HCM. In Drosophila, knockout of the dRNaseZ gene causes larval growth arrest and eventually death. In this study, I created constructs encoding the human ELAC2 gene for fly transformations using the pCaSpeR-hs and pCa4B2G expression vectors. These are being used to introduce the human gene into the Drosophila genome. A future goal of this study is to introduce both the wild type and mutant forms of the ELAC2 gene into the Drosophila genome. By doing so, I will be able to analyze associated heart phenotypes and underlying molecular mechanisms of HCM, and ultimately elucidate the role of ELAC2 in the pathology of the disease.

**Poster-45: The Role of Cutaneous Squalene in the Invasion of the Epidermis by Pseudogymnoascus Destructans**
Authors: Nabilah Nishat and Craig Frank
Faculty Mentor: Craig Frank
College: Fordham College at Rose Hill

The mammalian epidermis is composed chiefly of specialized epithelial cells named keratinocytes that occur in four distinct strata, and the lipids of the top stratum (the stratum corneum) are a mixture from both the extracellular matrix secreted by keratinocytes, and sebum produced by the sebaceous glands. It consists of free fatty acids (FFAs), triacylglycerols, diacylglycerols, monoacylglycerols, wax esters, squalene, cholesterol, and cholesterol esters. Some free fatty acids and their wax esters have been shown to inhibit the growth of Pseudogymnoascus destructans (Pd), the fungus that causes White-nose Syndrome (WNS) in North American bats by invading the epidermis. We thus wanted to determine if the cutaneous lipids that are not composed fatty acids also inhibit Pd growth. Laboratory experiments with Pd cultures containing different concentrations of squalene were thus conducted. The results of these
experiments revealed that squalene has negligible effect on the growth of Pd at physiologically relevant concentrations. It thus appears that only certain types of cutaneous FFAs and their esters affect the growth of this fungus.

**Poster-46: Drosophila as a Model Organism to Study HCM Mutations**

Authors: Marisa Mercadante, Gabriella Pandolfelli, Michelle Ngo, Ekaterina Migunova, and Edward Dubrovsky

Faculty Mentor: Edward Dubrovsky

College: Fordham College at Rose Hill

Infantile hypertrophic cardiomyopathy (HCM) is a genetic disease in humans which causes cardiac muscle cells to enlarge and the heart’s walls to thicken. The thicker walls can block blood flow out of the heart. HCM is the leading cause of cardiac death due to exertion in adolescents. Particularly severe forms of infantile HCM have been attributed to mutations in the ELAC2 gene. Fruit flies, or Drosophila melanogaster, possess a homolog to ELAC2, called RNaseZ gene. Therefore, we can use flies as a model organisms in the study of HCM mutations. Our project’s goal is to determine the effects of HCM mutations on flies. To accomplish this, we created two stocks of flies with different HCM mutations. We then performed experiments to characterize the physical effects of these mutations and compared them to control flies. We tested the effects of HCM mutations on viability at the larval and pupal stages, fertility of adult males, and the fitness of adult males and females. We also performed histological analysis on the hearts of Drosophila larva to measure the thickness of the walls of the heart. From this data, we have drawn preliminary conclusions that the HCM mutations result in thicker heart walls, reduced physical fitness, and reduced fertility in HCM homozygous flies and sterility HCM hemizygous flies. These results can be used to develop new research questions that would further the general understanding of the HCM allele and its effects in flies.

**Poster-47: Human Disorders and Gene Therapy**

Authors: Mary McDermid, Savannah Coppola, Lindsay Bjorklund, Tia Stathis, and Varuni Jamburuthugoda

Faculty Mentor: Varuni Jamburuthugoda

College: Fordham College at Rose Hill

Gene therapy is the “deliberate introduction of genetic material into human somatic cells for therapeutic, prophylactic or diagnostic purposes”. It can be used to treat human disorders by 1) removing or 2) deactivating the defective gene, 3) DNA intervention in the mitochondrial DNA, 4) repairing the defective gene, 5) adding a therapeutic gene, or lastly 4) a genetic vaccination. In most cases, however, scientists add a therapeutic gene. Common human disorders that gene therapy is utilized for is Parkinson’s, Hemophilia, Severe Combined Immunodeficiency (SCID), Alzheimer’s, and many different types of cancer. Gene therapy was first approved in America in 1990, and since then has carried many ethical and moral questions. One major ethical concern deals with introducing transplanted genes into the germ line. These genes then have the ability to be passed down to future generations. However, some believe this could be beneficial, saving future generations from enduring disease.

**Poster-48: Chromosomal Abnormalities**

Authors: Merve Karakaya, Jacqueline Tobin, Quinn Maguire, Michael Reyes, and Varuni Jamburuthugoda

Faculty Mentor: Varuni Jamburuthugoda

College: Fordham College at Rose Hill

Chromosomal abnormalities are genetic mutations or anomalies in chromosomal DNA that often lead to disorders and health issues within the body. This genetic phenomenon most often occurs during cellular division due to an error in the process of duplicating and dividing genetic material found within chromosomes. Chromosomes are structures within cell nuclei that are composed of tightly compacted DNA. During the processes of cellular division, such as mitosis and meiosis, a multitude of chromosomal abnormalities can occur. Some of the more common types of abnormalities include deletions, duplications, inversions, and numerical abnormalities. As previously stated, these chromosomal abnormalities often result in severe health issues or disorders which can be identified with relative ease by physicians and specialists. Technological advancements enable us to detect abnormalities during pregnancy. Screening tests such as amniocentesis involve the extraction and analysis of amniotic fluid to determine whether any genetic disorders are present. While this procedure presents little risk to the mother and fetus, some entirely
noninvasive procedures exist as well, which rely upon ultrasound to detect potential genetic anomalies. With the advancement of our knowledge of chromosomal abnormalities as well as the technology used to detect them, we can become increasingly capable of detecting, treating, and potentially curing genetic disorders.

**Poster-49: Aging in Mice is Associated with Decline of Retinal Debris Phagocytosis by the Retinal Pigment Epithelium**

Authors: Tasha Tombo, Francesca Mazzoni and Silvia Finnemann  
Faculty Mentor: Silvia Finnemann  
College: Fordham College at Rose Hill

In the mammalian eye, a monolayer of retinal pigment epithelial (RPE) cells diurnally removes photoreceptor debris belonging to the adjacent neural retina. This phagocytosis mechanism is crucial in maintaining vision. Aging is the biggest risk factor for age-related macular degeneration, the most common cause of adult blindness in the United States. While we know that the number of RPE cells in the eye decreases with age, age-related reduction of RPE functionality is not well understood. We hypothesized that the RPE’s phagocytic capacity may decline with age. We investigated vision by recording cone- and rod-specific electroretinograms (ERGs) and the activity of RPE cells by quantifying phagosomes in 2-(young), 12-(middle-age), and 24-(old-age) month-old mice. Mice were sacrificed at light onset when the phagocytic process peaks. RPE flatmounts were immunostained and imaged on a confocal microscope. The cone ERGs indicated that cone function declined from young to middle-age but not from middle- to old-age. Unlike cone responses, rod responses were significantly lower at old age compared to middle age. Cone and rod interneuron responses significantly differ between all ages. The quantification of phagosomes revealed a roughly 50% decrease between young mice and both aged groups. Phagosome numbers did not differ between middle-age and old-age. Altogether, our results demonstrate that RPE phagocytic activity is impaired to the same extent at middle- and old-age. As rod vision continues to decline from middle- to old-age, it is unlikely that impaired phagocytosis is the cause. Further investigation should assess molecular mechanisms associated with aging.

**Poster-50: Epigenetic Effects of Air Pollution on the Human Genome**

Authors: Laxshika Raveendran, Regana Alicka, Lexie Neffinger, Emma-June Orth, and Varuni Jamburuthugoda  
Faculty Mentor: Varuni Jamburuthugoda  
College: Fordham College at Rose Hill

Epigenetics is the study of changes in gene expression that are not caused by a change in the DNA sequence. These changes can arise for a number of reasons, such as environmental exposures, diet, lifestyle, and stress, and can be heritable across generations. This project seeks to address the connection between gene expression and exposure to air pollutants. Of the six criteria air pollutants defined by the EPA, exposure to four of these pollutants – ground level ozone, particulate matter, lead, and carbon monoxide – has been shown to alter gene expression through epigenetic mechanisms such as DNA methylation, RNA interference, or the binding of epigenetic factors to histone tails. Further research regarding the influence of air pollution on the epigenome, and especially its effect between generations, is important because it can demonstrate a further need for clean air policy, specifically in urban and low-income areas. By studying the epigenetic inheritance of genes influenced by air pollutants, we can gain a better understanding of this process and move toward solutions to the epigenetic risks associated with it.

**Poster-51: Site-Directed Mutagenesis of R2 Non-LTR Retrotransposon Protein to Study RNA Binding**

Authors: Antonia Puma and Varuni Jamburuthugoda  
Faculty Mentor: Varuni Jamburuthugoda  
College: Fordham College at Rose Hill

Non-LTR retrotransposable elements are highly abundant genomic parasites of most eukaryotes. One of the most characterized members of this class is R2, an element that exclusively inserts into a highly conserved sequence of the 28S rRNA genes, encoding single polypeptide with reverse transcriptase (RT), endonuclease, and nucleic acid-binding domains. While the enzymatic and DNA binding domains of the R2 protein have been characterized, little is known of the locations of number of the RNA binding domains. The extreme sequence specificity of R2 has enabled extensive
studies of its retrotransposition mechanism in which an endonuclease cleaves the chromosomal target site and the element’s RNA transcript is directly reverse transcribed into the cleavage site. This mechanism, known as Target Primed Reverse Transcription (TPRT), is believed to be used by all non-LTR retrotransposons and is similar to the mechanism used by group II introns and telomerase. The exact process of binding to the 3’ and 5’ regions of R2’s RNA transcript, critical for the TPRT mechanism, is unknown. To elucidate this process, we used site-directed mutagenesis to mutate a highly conserved region in the thumb region of the RT domain of the R2 protein. We then transformed competent JM109 cells and conducted mini prep analysis for DNA sequencing.

**Poster-52: Genetics in Forensic Science**
Authors: Kaitlyn Lavan, Alyssa D’Avanzo, Melissa Arfuso, Jessica O’Keeffe, Konrad Zawojski, and Varuni Jamburuthugoda
Faculty Mentor: Varuni Jamburuthugoda
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Today, DNA found at a crime scene can be used to identify suspects, convict people of crimes, and exonerate falsely accused individuals. In 1987, there was the first conviction based on DNA evidence and since then DNA has been used to convict thousands of felons and exonerate innocent people. DNA found at crime scenes must be isolated using proper techniques and precautions, since it is highly degradable. Forensic analysts compare the DNA found at a crime scene to reference samples, consisting of the victim and suspects’ DNA. Polymorphic short tandem repeats (STR’s) found throughout the human genome in the specimen of interest are used as a genetic identifier. The DNA of interest is then amplified through polymerase chain reaction (PCR). PCR is used to produce a larger quantity of the isolated DNA, even if it is partially degraded. Another forensic analysis technique concerns restriction fragment length polymorphisms (RFLPs) that serve as molecular markers to detect differences in homologous DNA sequences. Some limitations include false matches and contamination from DNA exposure to airborne contagions. Forensic scientists are able to minimize these limitations by packaging to avoid cross-contamination, wearing proper gear, and avoiding speaking, coughing, sneezing, etc. that would contaminate the sample.

**Poster-53: Antibacterial Effectiveness of Various Oral Debriding Agents**
Authors: David Forlano, Robert Palacios, Kathleen Brodowski, Olivia Giannakopoulos, and Marly Katz
Faculty Mentor: Marly Katz
College: Fordham College at Rose Hill

Oral debriding agents contain antibacterial properties to control microbial growth and biofilm formation on the crowns of teeth. Various forms of manufactured oral debriding agents have been introduced to the market, in addition to the rise of natural alternatives. The extent to which these marketed products and natural alternatives control bacterial growth has not yet been studied extensively. The purpose of this study was to examine the effectiveness of several readily available commercial brands including: Crest, Colgate, Arm and Hammer, and Pronamel. Additionally, the effectiveness of toothpaste alternatives including: hydrogen peroxide, ethanol, coconut oil, and mouthwash were evaluated. We used a modified Kirby Bauer method to determine the effectiveness of these chemicals against bacteria collected from teeth numbers 22-27 on the lingual surface and plated on Mueller Hinton agar (MHA) using sterile cotton swabs. Inoculated media plates were incubated at 37 degrees Celsius for 24 hours and zones of inhibition were measured as a means of comparing the effectiveness of the antibacterial properties of the oral debriding agents tested. Our results show that commercial toothpaste products were more effective in controlling microbial growth than alternative oral debriding agents. Of the commercial toothpaste products, the most effective oral debriding agent brand was Arm and Hammer. Our results supported our initial hypothesis that commercial brand toothpastes have greater antibacterial properties than natural alternatives. However, future research pertaining to the quantity and application techniques of these oral debriding agents is still necessary.
**Poster-54: Investigation of HPV16 L2 Protein Interaction with Histone 2B**
Authors: Jenna Zuromski, Navida Wazeed, Janeliz Fernandez, Soodah Manzoor, and Patricio Meneses  
Faculty Mentor: Patricio Meneses  
College: Fordham College at Rose Hill

Human papillomavirus (HPV) is the most widespread and deadly sexually transmitted disease in the world, as infection is a direct cause of cervical cancer. Researchers have revealed the severe underestimation of cervical cancer mortality rates between 2000-2012. Two current HPV vaccines have been shown to provide protection in eligible HPV-negative females 14-19 years of age. Both vaccines target L1, the major protein comprising the shell-like capsid that encases the virus. L1 is present only until the virus injects its DNA into the host cell, limiting vaccine protection to those who have not been infected by the virus. This led to a shift in focus toward the minor capsid protein, L2. L2 is responsible for protecting and guiding viral DNA through the host cell to the nucleus, where the virus establishes infection. DNA is packaged by wrapping around histone proteins, which are found in every cell nucleus. We hypothesize that L2 must interact with a host cell’s histone protein, H2B, during delivery and packaging of viral DNA. This will be tested by using a mammalian 2-hybrid system. L2 and H2B-GFP will be cloned into plasmids containing a binding domain (BD) and an activating domain (AD), respectively. Once these plasmids are inside skin cells, L2_BD and H2B-GFP_AD proteins will be produced. L2_BD will attach to a reporter plasmid. If L2 and H2B interact, the activating domain attached to H2B will activate the binding domain attached to L2, leading to the production of a pink-hued protein encoded by the third reporter plasmid.

**Poster-55: Seasonal Molecular Diet Analysis in Urban Coyote (Canis latrans)**
Authors: Emily Hargous and Carol Henger  
Faculty Mentor: Carol Henger  
College: Fordham College at Rose Hill

The global spread of urban development can either displace or entice various wild animals from their native environment. While many larger animals actively avoid metropolitan areas, some utilize the space and thrive in cities; such is the case for coyotes, Canis latrans. As coyotes move into New York City and the surrounding area, they adapt to their surroundings and exhibit differences in both diet and behavior that allow them to flourish. This results in a novel coexistence between coyotes and humans that affects their diet. As such, studying the diet of large carnivores in an urban environment helps dissect the increasingly complex trophic levels within their community. Studies have shown that urban coyotes ingest anthropogenic food, but few have shown a correlation between ingestion of anthropogenic food and seasonality. This study seeks to determine the seasonal prevalence of anthropogenic food use in the diet of NYC coyotes. I extracted DNA from coyote fecal samples from the summer and winter months, amplified the sequences, and used next-generation sequencing to identify the various diet items present in the scat. The results of this study will contribute to research seeking to identify the spatial and temporal variation of the coyote diet.

**Poster-56: Signatures of Selection in NYC Brown Rats**
Authors: Linelle Ann Abueg and Jason Munshi-South  
Faculty Mentor: Jason Munshi-South  
College: Fordham College at Rose Hill

Urbanization usually imposes stresses on organisms, but a few species are able to thrive in urban environments. Rattus norvegicus is one species well-known for its urban distributions, and figuring out if it has experienced selective pressures in urban environments can elucidate potential selective pressures exerted by urbanization. The availability of genome-wide datasets allows for analyses that simultaneously look at many loci to detect any potentially under selection. I used two methods (BayeScan and PCAadapt) on two single nucleotide polymorphism (SNP) datasets to look for outliers that could provide insight into selective pressures posed by urbanization. BayeScan did not find any outliers in the NYC dataset, indicating that there is no evidence that selection is occurring among parts of NYC. For the NYC dataset, PCAadapt detected 619 outliers, while the global dataset yielded 4,115 outliers. Overrepresented gene ontology (GO) terms among genes containing these SNPs were discovered. Terms related to cell signaling were overrepresented in both datasets, while the NYC data also yielded overrepresented GO terms related to metabolism,
such as insulin secretion and steroid metabolism. While the overrepresented GO terms related to neuronal function are numerous, further study to solidify a link between SNP and fitness would be required to come to conclusions about how or why nervous function may be under selection. Previous research found evidence for selection on carbohydrate and lipid metabolism in NYC Peromyscus leucopus, suggesting that adaptation of metabolic functions may be common in urban rodents.

**Poster-57: The Role of Melatonin Receptors in Adult Neurogenesis**
Authors: Vanessa Wendler, Michelle Ngo, Angelica Storino, Tasha Tombo, and Usha Sankar
Faculty Mentor: Usha Sankar
College: Fordham College at Rose Hill

Melatonergic receptors are located in cell membranes where they bind to the hormone melatonin, secreted by the pineal gland. Melatonin receptor type 1a (MT1) and melatonin receptor type 1b (MT2) are G-protein coupled receptors involved in the neuroprotective action of melatonin. Upon activation, the receptors dimerize into either a MT1 homodimer or MT1/MT2 heterodimer. It is suspected that the presence of MT1 alone leads to increased neurogenesis as a result of increased concentration of brain-derived neurotrophic factor (BDNF). However, these effects are not well understood, especially in pathological conditions. Our proposed study will investigate neurogenesis in three groups of transgenic Alzheimer's mice: wild-type, MT1 knock-out, and MT2 knock-out. After exogenous chronic melatonin administration, mice will be sacrificed, and the granular cell layer of each group will be compared by the quantification and volumetric measurement of DCX-labelled cells. An increase in granular cell layer reflects neuritogenesis and neurogenesis due to the growth of DCX-labelled cell dendrites and an increase in number of the cells themselves. We expect our data to demonstrate a significantly larger granular cell layer in mice with the MT2 knock-out compared to both wild-type and MT1 knock-out mice. These results will contribute a better understanding of melatonin's role in adult neurogenesis and may suggest the importance of interfering with MT1 and MT2 mechanisms to improve neuronal deficient conditions, such as Alzheimer's. Drugs that increase the actions of MT1 (agonists) and decrease that of MT2 (antagonists) should be investigated as possible therapies.

**Poster-58: Genetically Modified Coffee**
Authors: Bethany Regan, Annabel Azziz, Rachel Pak, Daniella Toto, Greg Lombana, and Varuni Jamburuthugoda
Faculty Mentor: Varuni Jamburuthugoda
College: Fordham College at Rose Hill

Coffee is a crop of extreme economic importance, ranking second in international trade after crude oil and with a global retail value of over $20 billion in 2010-2011. Coffee growers worldwide have consistently attempted to generate new coffee strains with desired traits, such as insect or disease resistance, using traditional breeding techniques. However, these techniques are not particularly accurate and often take several decades to reach fruition due to coffee’s long generation time; in addition, some genes encoding desired traits for coffee are not readily available within the genome. This has led to recent efforts to produce transgenic coffee. For example, in 1999 the coffee species C. canephora and C. arabica were genetically modified to carry resistance to the coffee pest known as the leaf miner. In 2006, C. canephora was genetically engineered to be resistant to the herbicide ammonium glufosinate. In 2010, the coffee species C. arabica was genetically modified to be resistant to the coffee berry borer, towards which coffee has no natural resistance. As with all GMOs, there are various concerns regarding the introduction of genetically modified coffee onto the market, including allergenicity and the transfer of herbicide-resistant genes to non-coffee plants.

**Poster-59: Drug Therapy Produces a Greater Increase in Utrophin Production Than Exercise in the mdx Mouse Model of Duchenne Muscular Dystrophy**
Authors: Kasey Harrington, Jane Doveala, William Maughan, Jake Keszthelyi, and Usha Sankar
Faculty Mentor: Usha Sankar
College: Fordham College at Rose Hill

Duchenne Muscular Dystrophy (DMD) is a genetic muscular disease in which a mutation in the dystrophin gene renders the protein products of this gene nonfunctional. DMD is a progressive muscular degenerative disease that
results in shortened life expectancy. Dystrophin is a cytoplasmic protein in skeletal muscles that stabilizes the sarcolemma. Lack of functional dystrophin leads to muscle damage and wasting away of muscle tissue. Utrophin is a homologue of dystrophin that is able to stabilize the sarcolemma in the absence of dystrophin, making it valuable in treating patients with DMD. Research has shown that utrophin is produced in DMD patients after aerobic exercise, however, this type of exercise has negative long term effects on the cardiac and diaphragm muscles of DMD patients. Our proposal aims to evaluate alternative treatments, estimating feasibility of implementing these treatments as well as analyzing their respective effects. We will investigate production of utrophin through anaerobic exercise, which could be accomplished without negatively impacting the cardiac muscle and diaphragm. Furthermore, we will examine drug therapy as a more beneficial means of utrophin production relative to the exercise programs, circumventing damage to cardiac and diaphragm muscles. The means of delivering drug therapy will be through TAT-µUtr, which allows for administration of recombinant Utr by combining it with cell-penetrating TAT protein. We predict that TAT-µUtr will produce the greatest increase in utrophin production, with anaerobic exercise causing the smallest increase. This project is expected to prompt further investigation into drug therapy as a means of treating DMD.

Poster-60: The Effects of Experimental Flower Removal in B. rapa Under Drought and Control Conditions
Authors: Conor Gilligan, Eryk Kropiwnicki, and Steven Franks
Faculty Mentor: Steven Franks
College: Fordham College at Rose Hill

Angiosperms may react to flower removal in one of three mutually exclusive ways. Firstly, some may overcompensate through producing a greater number of inflorescences than they would have under normal conditions; secondly, some may equally compensate through growing a similar complement of flowers to their unmanipulated counterparts; and lastly, some may undercompensate through diverting resources to non-reproductive tissues, and, as a result, produce fewer flowers. Many studies have investigated the various responses of flowering plants to tissue damage or to flower removal. However, few studies have involved the experimental removal of flowers at different ontogenetic stages in an annual plant’s life cycle to ascertain its capacity for compensatory flower growth. Furthermore, previous work has not investigated the degree to which compensation is influenced by abiotic stress such as drought. In this study, I grew 240 Brassica rapa plants under control and drought watering conditions, while also subjecting the plants to four separate flower removal treatments at different ontogenetic stages in their life cycles. I hypothesized that under control watering conditions, plants whose flowers were removed at an early stage would produce a greater number of inflorescences during their life cycles, and concomitantly, have greater fitness (overcompensation). I also hypothesized that under drought watering conditions, plants undergoing flower removal would produce fewer flowers overall, and have decreased fitness (undercompensation). Both of my hypotheses were supported by my experiment. Under control watering conditions, I found that plants experiencing early flower removal had significantly greater lifetime inflorescence production than unmanipulated plants. In the drought conditions, plants with flowers removed produced significantly fewer inflorescences than unmanipulated plants. These results show that both overcompensation and undercompensation can occur in response to removal of or damage to floral tissue, and that the result can depend on abiotic conditions such as drought.

Poster-61: Using eDNA to Monitor Stream Salamander Populations in the NYC Metropolitan Area
Authors: Elsa Au-Yeung and Nicole Fusco
Faculty Mentor: Nicole Fusco
College: Fordham College at Rose Hill

Urbanization is widely known to affect diversity and abundance in many different species. Stream salamanders play a vital ecological role and can be greatly affected by urban disturbance. The Northern two-lined salamander (Eurycea bislineata) and the Northern dusky salamander (Desmognathus fuscus) populations are abundant in the northeast, but have been have been shown to be less abundant and appear in fewer streams as they did historically in NYC. We have designed an experiment using eDNA (environmental DNA) from freshwater streams to detect two of New York’s stream salamanders; E. bislineata and D. fuscus, and plan to use this as a non-invasive sampling technique to monitor urban populations. We will design species-specific primers from the Cytochrome Oxidase I (COI) mitochondrial gene to amplify, identify species, and estimate abundance from eDNA extracted from the water using qPCR. The eDNA
methods efficiency will be compared to traditional visual encounter survey field methods. We will perform a pilot study at the Louis Calder Center Biological station in Armonk, NY and perform subsequent field studies in a suburban park (Mianus River Gorge Preserve), where we have known presence/absence data on these species, and will eventually utilize this technique in urban parks (Staten Island Greenbelt) in NYC. Our study will hopefully aid in conservation and urban planning efforts in hopes to maintain critical habitat for aquatic species in our NYC parks.

**Poster-62: The Effects of Simulated Acid Rain on Brassica Rapa Fast Plants**
Authors: Eryk Kropiwnicki, Daniel Arroyo, Omar Darwish, James Ottaviano, and Elena Hamann
Faculty Mentor: Elena Hamann
College: Fordham College at Rose Hill

In the past, acid rain had widespread negative effects on urban ecosystems due to unregulated SO2 and NOx emissions, and impacted plants through decreased growth, flowering, increased leaf necrosis, and numerous other factors. While stricter emissions legislation is in place nowadays, the effects of modern industrialization in urban areas are still observable in precipitation. Studies have documented the negative effects of acid rain, but few have studied the effects on Brassica rapa cultivars, which include many important crop species. Here we watered plants with varying concentrations of nitric acid to simulate levels of rain acidification. We studied the effects of four levels of water pH ranging from 4-7 on the growth rate, amount of flowering, and leaf necrosis of B. rapa over a three-week period on 20 plants in each treatment group. 60 plants were simulated under acid conditions (pH 4-6), and 20 plants under a tap water control condition (pH 7). We hypothesized that, as water pH decreases, the amount of growth and flowering will decrease, whereas the amount of leaf necrosis will increase. While our results showed that plant growth was not significantly inhibited by higher nitric acid concentration, bud production and number of flowers decreased with decreasing pH levels. As such, acid rain simulated by nitric acid seems to have important negative repercussions on crop yield rather than growth. To conclude, our study shows that the effects of acid rain need to be better studied to fully understand their impact on plant productivity and especially crop yield.

**Poster-63: The Presence of Coliform Bacteria in Common Coffee Making Appliances**
Authors: Josiah Hendler and Marly Katz
Faculty Mentor: Marly Katz
College: Fordham College at Rose Hill

Household appliances, such as dishwashers and coffee makers, can become favorable environments for opportunistic microbial organisms. Many factors may influence microbial abundance, including high temperature, low pH, presence of detergents, usage frequency, and water hardness. The primary concern regarding water bacteria is not the number of microbes, but rather if potentially harmful bacteria are present, such as coliforms. The goal of this study was to determine if coliform bacteria are present in the water sampled from two coffee makers before and after the machines are cleaned. Water samples were enumerated by performing the presumptive test and reported as a Most Probable Number (MPN) of coliforms per 100ml. Additionally, the water tank and spout of each coffee maker were swabbed and plated on Levine Eosin methylene blue (EMB) agar. The media were incubated for 24 hours at 37°C. The pre-cleaned presumptive test indicated a substantial amount of coliform growth in the water of the multi-cup coffee maker whereas no coliform growth was found in the water of the single-cup coffee maker. Additionally, both pre and post cleaned appliances yielded non-coliform bacterial growth from the samples. The EMB plate results revealed some bacterial growth; however, there was no Escherichia coli, an indicator bacterium for coliforms, present in the water tank and spout samples for both coffee makers pre and post cleaning. Further studies could uncover the identity of the non-coliform bacteria and determine whether it poses a potential risk to those using the coffee makers.
Poster-64: How Well Do Common Household Disinfectants/Antiseptics Work in Controlling Microbial Growth on a Cutting Board?
Authors: Kyrstin Belthoff, Danniele Garceau, Jean Marie Gizzo, Pashka Peraj, and Marly Katz
Faculty Mentor: Marly Katz
College: Fordham College at Rose Hill

One major health concern in the kitchen is the growth of microorganisms on surfaces used to prepare raw meat. The use of effective disinfectants and antiseptics on these surfaces is essential in order to minimize exposure to potentially harmful pathogens. In this experiment, we utilized a modified Kirby Bauer method to test the effectiveness of common household disinfectants and antiseptics on a cutting board following exposure to raw chicken and raw salmon. Control Mueller-Hinton (MH) and Sabouraud Dextrose Agar (SDA) plates were collected by swabbing the clean cutting board, prior to exposure to the chicken and salmon. The pieces of raw chicken and raw salmon were then placed on opposite sides of the cutting board. We determined the presence of bacteria (MH plates) and fungi (SDA plates) on the cutting board after exposure to the raw meat by collecting swab samples from the area under the raw chicken and raw salmon and plating on both MH and SDA media after 5 and 10 minutes of exposure. Filter paper discs treated with bleach, bacitracin, ethanol or Ajax soap were placed on each plate. The MH plates were incubated at 37 degrees Celsius for 24 hours, and the SDA plates were incubated at 25 degrees Celsius for seven days. After incubation, the zones of inhibition for each antiseptic/disinfectant disc were measured in order to evaluate their effectiveness. We found that bleach was most effective at preventing both bacterial and fungal growth, while Ajax soap was the least effective.

Poster-65: A Study of Bacterial Growth on Lip Balm
Authors: Megan Czachor, Justin Chionchio, Sam Crowley, Tom Arikian, and Marly Katz
Faculty Mentor: Marly Katz
College: Fordham College at Rose Hill

The public is often warned about sharing lip balm, in fear of transferring potentially harmful microorganisms from one individual to another. There is a lack of research, however, on the ability of bacteria to grow on tubed lip balm. In this study we enumerated total bacteria in samples, collected from ChapStick Original and ChapStick Medicated, on nutrient agar (NA). One Original and one Medicated were sampled and plated immediately after being opened, in order to serve as a comparison to samples taken after two weeks of use. To control for bacterial contamination from the air, another set was left uncovered for 30 minutes before being sampled and plated. Duplicate samples from each ChapStick were plated; one set was incubated at 25°C and the other at 37°C both for 24 hours. All of the plates were analyzed to determine if bacterial growth had resulted. There was no bacterial growth on plates that were incubated at 25°C. Of the plates incubated at 37°C, bacterial growth resulted from the newly opened Original, both used Originals, and on one of the used Medicated. Overall, more bacteria were enumerated from the used Original in comparison to the used Medicated. This study is limited due to the small sample size; however, it appears lip balm may collect bacteria from the lips, not from the air, and medicated products may reduce the amount of bacteria grown.

Poster-66: Lichen Richness over a Small Spatial Scale
Authors: Blair Brunetti, Mohammedasad Khan, Kayla Sanchez, Jacqueline Tobin, and Elena Hamann
Faculty Mentor: Elena Hamann
College: Fordham College at Rose Hill

With the rise of industrialization and major urban cities, air pollution has become a rapidly growing concern with detrimental effects on both natural ecosystems and overall human health. Much of this pollution comes from continuously increasing automobile traffic. The Bronx has many heavily trafficked road ways like Pelham Parkway, but retains some of the area’s original forest in the New York Botanical Garden (NYBG). Air quality can change over fine spatial scales, influencing local ecosystems. Lichens absorb nutrients from the atmosphere, so even fine changes in air quality can kill sensitive bioindicator species. We studied the richness of lichen on trees at three 10x10 meter plots every 60 meters along a transect moving away from the Pelham Parkway into the NYBG. We hypothesized that lichen richness will increase with distance from a pollution source, even at fine-spatial scales. This study will further understanding of the effect of forest patches on air quality in urban environments. Our results may provide insight for
city planners into the power of green areas for air remediation so they may allocate resources towards the prevention of human health issues associated with air pollution.

**Poster-67: The Effect of Early Life Stress on Mechanisms Underlying the Development of Maternal Behavior**  
Authors: Helene Leonard and Marija Kundakovic  
Faculty Mentor: Marija Kundakovic  
College: Fordham College at Rose Hill

This study aimed to identify whether and how early life stress affects the mechanisms underlying the development of maternal behavior in mice. More specifically, the researchers investigated the hypothalamic gene expression of the estrogen receptor alpha (ERα) and beta (ERβ), the oxytocin receptor (OTR), estrogen related receptor Y, arginine vasopressin, vasopressin receptor, DNA methyltransferase 1, and DNA methyltransferase 3A in the adult mice exposed to stress early in life compared with levels in control, age-matched animals using nucleic acid isolation and quantitative real-time PCR. We saw significant differences between control and maternal groups (p=0.047) and between control and paternal groups (p=0.010), complicating our understanding of ERRY’s role.

**Poster-68: The Effect of Urbanization on Coyote Ecology and Behavior in the New York City Area**  
Authors: Chloe Jaquenoud, Antonia Puma, Nouralison Abdella, Saima Haque, Sina Golmohammadi, and Justin Pool  
Faculty Mentor: Justin Pool  
College: Fordham College at Rose Hill

Over the past hundred years, coyotes have expanded their range to the eastern United States, leading to their increased presence in urban spaces such as Chicago and New York City. Studies completed in Chicago and Los Angeles have indicated larger home ranges are positively correlated with higher activity levels during hours of least human interaction. Coyotes have only recently begun to populate New York City, an extremely dense and geographically isolated city. Little is known about the effects of intense urbanization on their behavior. We hypothesized: 1) The presence of coyotes in New York decreases as the degree of urbanization increases; 2) Coyotes vary their activity levels in densely populated areas in order to minimize human interaction; 3) Prey species availability differs with the degree of urbanization. Camera trap data was collected from Westchester and the Bronx, and results were compiled with data from research groups working in the New York City area spanning from 2017 to 2018. We compared relative abundance of wildlife communities across sites and tested for correlations in coyote abundance and activity patterns along the urbanization gradient. Understanding the interactions of coyotes across varying degrees of urbanization and their role in these ecosystems is crucial for wildlife management, human-coyote conflict mitigation, and preservation of native ecosystems.

**Poster-69: Impact of Pharmacist Intervention Among Older Adult with the Disease Triad of Chronic Kidney Disease, Diabetes and Hypertension**  
Authors: Adalain Meier and Jacqui Johnson  
Faculty Mentor: Jacqui Johnson  
College: Fordham College at Rose Hill

Chronic Kidney Disease (CKD) is often associated with the comorbid conditions of Diabetes Mellitus Type 2 (DMT2) and hypertension. Management of these conditions is crucial in maintaining quality of life for older adults with CKD. Patients with the triad are also at high risk for medication-related problems (MRPs). With proper interaction between clinical pharmacists and primary care providers, the number of MRPs that occur among older adults with the triad of CKD, DMT2 and hypertension should be minimized. This retrospective cohort sub-study analyzed clinical pharmacist intervention through ProHealth Physicians Inc. across 350 primary care and specialty health care providers in the state of Connecticut. Recommendations regarding MRPs were made by a clinical pharmacist, and documented in the Electronic Health Record after analysis of the patient’s medication list between the dates of June and October 2017. Three hundred patients were included in the study. Patient characteristics and the number of occurring MRPs per patient were measured, and primary care physician implementation of the recommendations was analyzed. Older adults with a combination of CKD, DMT2, and hypertension were observed to experience a high number of
preventable MRPs. Inclusion of clinical pharmacist intervention in the primary care process was shown to be beneficial to overall quality of patient care as it was seen to minimize future reported MRPs, and is shown in this study to be well accepted by primary care clinicians. More physician access to pharmacist input of patient medication lists is necessary when caring for high-risk older adults.

**Poster-70: The Effect of NaCl and MgCl Deicer Salts on Brassica Rapa, the Wisconsin Fast Plant**
Authors: Washika Ruhani, Madiha Baig, Daniel Alicea, and Elena Hamann
Faculty Mentor: Elena Hamann
College: Fordham College at Rose Hill

Long-term exposure to salinity can negatively impact plants, ultimately leading to early senescence. During winters, sodium chloride based salts are commonly used as deicers on roadways and sidewalks, which have severe detrimental effects on adjacent vegetation. Although some studies have demonstrated that alternative salts, other than NaCl, have less detrimental effects on adjacent vegetation, it remains unclear which alternative salts are less harmful on plant growth and development. Here, we used a two factor factorial design to compare the effects of magnesium chloride to sodium chloride by watering with two different concentrations of 4g/L and 14 g/L salt solutions on fast plant growth. We grew plants for three weeks under five treatments (each including 6 plants): two groups were treated with low concentrations of either MgCl or NaCl, two were treated with high concentrations of either MgCl or NaCl, and one group was grown as a control. All of the plants were exposed to similar external factors such as water availability, soil type, and exposure to sunlight. We monitored date of germination, and measured plant height, number of leaves, buds and flowers. We hypothesize that the fast plants grown with MgCl will have less damage than those grown with NaCl. We predict that the plants treated with lower concentrations of either salt will be less damaged than those treated with higher concentrations. Ultimately, understanding which road salts are more or less harmful is imperative for the preservation of biodiversity while providing alternative measures for road salts that will maintain safety.

**Poster-71: Long Island Land Use: Influences on Nitrate and Phosphate Concentrations in Coastal Embayments Along an Urban-Rural Gradient**
Authors: Andrea Lifrieri, David Forlano, Genie Hughes, Robert Palacios, and Justin Pool
Faculty Mentor: Justin Pool
College: Fordham College at Rose Hill

Nitrate and phosphate, when present at elevated concentrations, are indicators of nutrient pollution in aquatic ecosystems. Despite previous research on nitrate and phosphate levels along the urban-rural gradient of Long Island, there is a lack of research on how current urbanization and agricultural practices in Long Island have affected these parameters. We determined nitrate and phosphate concentrations at six coastal embayment sites spanning the urban-rural gradient of Long Island using LaMotte phosphate and nitrate test kits. We hypothesized that water samples collected from the extremes of the urban-rural gradient along the south shore of Long Island would display elevated levels of nitrate and phosphate compared to samples collected along the midpoint of this gradient. We predicted that the elevated nitrate and phosphate levels were due to the higher population densities and increased levels of fertilizer runoff that characterize the extremes of the urban-rural gradient. Our results will be critical for the people of Long Island, as their sole source of drinking water is the groundwater influenced by the application of nutrient-rich fertilizers at the land surface. Water quality management in this area has direct implications in public health and ecosystem stability, including the extensive use of coastal embayments for recreational activities and aquaculture.

**Poster-72: Combining In Vivo and Ex Vivo Exposure to CO to Prevent Renal Ischemia/Reperfusion Injury**
Authors: Leah Blowes, Alexander Curreri, Michael Krakowski, Melya Pak, and Usha Sankar
Faculty Mentor: Usha Sankar
College: Fordham College at Lincoln Center

It has been shown that Ischemia and Reperfusion (I/R) injury can be reduced using ex vivo treatment of kidneys with a CO-UW solution. Additionally, other studies have found that in vivo treatment of kidney recipients with CO pre- and post-transplant can also reduce the occurrence of I/R injury. Based on these findings, we propose a treatment
using a combination of ex vivo and in vivo treatment methods. Four rat groups will be treated with pre- and post-
transplant in vivo CO exposure; ex vivo CO exposure; a combination of in vivo and ex vivo treatment methods; and
no CO treatment for control. Prior to transplantation, the recipients will receive in vivo treatment, consisting of a 30-
day confinement in a glass chamber maintained at a constant CO level of 20 ppm. Immediately following organ
removal, kidney grafts will be preserved in 500mL of 5% CO-UW solution applied for 24 hours at 4ºC and then
transplanted into the recipient. An additional post-transplant in vivo treatment will be administered for 60 days in the
CO-induced glass chamber. We predict that I/R injury will be the most reduced in the subjects that receive both in
vivo and ex vivo treatments combined, compared to those that receive one treatment and/or neither treatment. The
results will show no adverse effects from pre-transplant COHb levels, and we expect that creatine levels in subjects
receiving combination treatment will return to normal at a faster rate than the other groups.

Poster-73: Generating Antibodies In Vivo and In Vitro
Authors: Elizabeth Khalil, Kienna Matus, Lisa Kazmierczak, Mrika Gocaj, and Varuni Jamburuthugoda
Faculty Mentor: Varuni Jamburuthugoda
College: Fordham College at Rose Hill

Antibodies are a central component of the body’s defensive immune system for their ability to target antigens that are
recognized as harmful. They interact with antigens in a lock-and-key model because of a distinct site on the antigen
called the epitope that the antibody specifically recognizes. This specificity to particular antigens has been manipulated
for biopharmaceutical treatment and in screening and diagnosis in the biomedical field. Antibodies are produced by
B-lymphocytes as antigen-specific receptors. Their production can be monoclonal or polyclonal depending on the
antibody culture desired. Monoclonal antibodies (mAbs) are produced from a single parent cell and make up a
homogenous mixture with specificity to a single epitope on an antigen. They are currently at the forefront of research
in regards to their ability to create an antigenic defense in organisms that are immunocompromised or even
immunodeficient. Polyclonal antibodies are produced from different B cell lines to form a mixture of antibodies that
each bind to different epitopes on the same antigen. The production of antibodies by in vivo, within a living organism,
and in vitro, within a controlled environment like a test tube, has made the use of antibodies in research productive
and efficient. In vitro cloning has been especially useful in biotechnology to construct recombinant antibodies that
resolve the drawbacks of monoclonal antibodies. The productivity of cell lines that produce antibodies has improved
100-fold over the last 15 years due to the engineering of in vitro cell cultures.

Center for Ethics Education

Poster-74: Ethical Issues in Cross-Cultural Social Research
Authors: Sarah Reis, Ilanys Almonte, Jennifer Levine, Jordan Perroni, Emmanuel Raudales, and Bryan Pilkington
Faculty Mentor: Bryan Pilkington
College: Fordham College at Rose Hill

Most of the standardized and accepted methods and practices of social science research have been developed in
Western nations, tailored to comply with their general norms and customs. This can become ethically problematic
when applying them to cross-cultural social research studies that involve non-western or minority populations, whose
cultures and customs vary greatly from Western norms. There is a concern that these groups are put at risk for
disturbance by research methods that were not framed with them in mind. To unpack this issue, this research study
first traces the ethical and methodological issues and concerns that can arise from cross-cultural social research done
with these populations, and will exemplify these through the examination of paradigmatic cases. For example, some
of the possible ethical issues that arise with cross-cultural social research include the violation of cultural values,
sociolinguistic miscommunications, and the violation of social interactional rules. This study will then argue for more
conscious awareness of these ethical issues and propose methodological safeguards to protect those at-risk groups and
their fragile cultural structures and identities and urge their adherence by researchers. Among other solutions, this
study will promote the use of collaborative research models and cultural sensitivity as possible safeguards. These
proposed methodological protections still acknowledge researchers’ desire to understand the complexities of various cultures, but prioritizes the preservation of at-risk groups and respecting their cultural identity.

**Poster-75: Ethical Dilemmas in Mental Health Research**
Authors: Alexandria Sedlak, Kalilah Fajerman, Catherine Napoli, Casey Sartori, Alicia Winchel, Bryan Pilkington, and Matthew Weinshenker
Faculty Mentor: Bryan Pilkington and Matthew Weinshenker
College: Fordham College at Rose Hill

This paper focuses on the ethical issues within mental health research. The primary concerns surrounding this area of research include informed consent and the stigmatization of the population with mental health disorders. By examining specific groups within this population – schizophrenia patients, bipolar patients, and those with cognitive disabilities – we will discuss the challenges that researchers face when studying this vulnerable population while working to uphold ethical standards. Previously, it was believed that mental illness diminished the decision-making capacity of the individual, therefore making all mental health patients’ decisions invalid. Carpenter, Gold, and Lahti discovered that schizophrenia patients do not perform as well as non-ill persons on initial informed consent capacity assessments. More recently, however, Cea et. al’s experiment with moderate to mild mental retardation patients uncovered that it is possible for the mentally ill to give consent to research participation. While progress has been made in recent years, Loue’s study regarding HIV and bipolar disorder in black men who have sex with men displays the stigmatization that still exists around mental health illnesses. More research studies with mentally ill participants are the key way to spread knowledge about the needs of this population and reduce negative stigmas. Our paper will discuss how the reduced capacity of mentally ill participants can be addressed by taking extra steps and precautions during the informed consent process. By including educational interventions in this process and tailoring to the needs of the study’s specific population, researchers can ensure that mentally ill participants’ autonomy is protected during studies.

**Chemistry**

**Poster-76: Biomineralization of Fucoidan-Peptide Blends and Their Potential Applications in Bone Tissue Regeneration**
Authors: Harrison Pajovich and Ipsita Banerjee
Faculty Mentor: Ipsita Banerjee
College: Fordham College at Rose Hill

Osseous tissue is vital for structural support, the facilitation of movement, the protection of viscera, and the regulation of mineral and acid-bases homeostases. Tissue engineering is designed to restore, regenerate and replace tissues and organs. In this research, we developed a novel, biomimetic scaffold for tissue engineering applications for bone tissue. Layer-by-layer and self-assembly methodologies were used to construct the final scaffold. Fucoidan (Fuc), a natural polysaccharide derived from brown seaweed algae, and gelatin (Gel) were conjugated to form a template. Next, the sequence MTNYDEAAMAIASLN (MTN), derived from the E-F hand domain of a calcium-binding peptide, was incorporated. To mimic the extracellular matrix of bone tissue, the Fuc-Gel- MTN constructs were allowed to assemble in simulated body fluid (SBF) to induce biomineralization, resulting in the formation of beta-tricalcium phosphate and hydroxyapatite (HAp). The complete scaffolds were found to possess an average Young’s modulus of 0.32 GPa (n=5) with an average surface roughness of 91 nm. Rheological studies show that the biomineralized scaffold exhibited higher storage and loss modulus compared to composites formed before biomineralization. Thermal phase change data were studied DSC and TGA analysis. XRD and EDS analyses showed a biphasic mixture of beta-tricalcium phosphate and HAp. The scaffold was found to promote cell proliferation and differentiation and displayed actin stress fibers which indicate the formation of cell-scaffold matrices in the presence of MT3C3-E1 mouse preosteoblasts. Osteogenesis and mineralization were found to increase with Fuc-Gel- MTN-beta- TCP/HAp scaffolds. Therefore, we have developed a novel scaffold for possible applications in bone tissue engineering.
Poster-77: Testing the Composition-Dependent Catalytic Activity of Binary and Ternary Pt-Pd-Au Alloy Nanowires for the Electrochemical Oxidation of Small Organic Molecules
Authors: Nicole Smina, Kathryn Kingsbury, and Christopher Koenigsmann
Faculty Mentor: Christopher Koenigsmann
College: Fordham College at Rose Hill

Platinum is an important catalyst for the oxidation-reduction reactions in environmentally-friendly direct alcohol fuel cells and in glucometers used to monitor the oxidation of glucose in the bloodstream of diabetics. However, pure platinum is expensive and, in the case of fuel cell catalysis, tends to irreversibly bind to carbon monoxide, an intermediate in the methanol oxidation process, decreasing its practical applicability and effectiveness. Our project aims to reduce costs and improve catalytic effectiveness by synthesizing nanowire catalysts of platinum (Pt), gold (Au), and palladium (Pd) alloys. Au-Pt wires were first synthesized using an ambient template-based method. Scanning electron microscopy (SEM) revealed that the nanowires have a uniform morphology. Energy dispersive X-ray spectroscopy (EDX) revealed that the composition of the wires can be tuned from 15% - 85% Pt by varying composition of the precursor solution employed in the synthesis. X-ray powder diffraction (XRD) revealed that the wires are crystalline and are composed of the desired face-centered cubic alloy-type phase. Work is underway to characterize the electrochemical and catalytic properties of these wires toward the oxidation of small organic molecules such as glucose and methanol, as well as to synthesize and characterize Au-Pd alloy nanowires.

Poster-78: Synthesis of Platinum-Coated Transition Metal Nanowires as Catalyst for Glucose Oxidation
Authors: William Beatrez, Brett Musialowicz, Ian Colliard, Alexis Kassotis, and Christopher Koenigsmann
Faculty Mentor: Christopher Koenigsmann
College: Fordham College at Rose Hill

Electrochemical detection of glucose is a critical technology for millions of Americans with diabetes who need to track their blood glucose levels. In this project, we focus on developing a new catalyst architecture for the effective oxidation and detection of glucose. We have developed a two-step procedure to synthesize 50-nm nickel nanowires and coat them with a thin platinum shell. The first step of the process involves a solution-based technique that employs commercially available polycarbonate filter membranes as a template for the growth of nanowires. This past year, our lab optimized a procedure to isolate the nickel nanowires in solution. In the second step, nanowires are coated with platinum through a spontaneous galvanic displacement reaction that takes in place in aqueous solution. This synthetic approach allows the composition of the wire in terms of the platinum-to-nickel ratio to be tuned by varying the concentration of the K2PtCl4 precursor. Work is underway to characterize the platinum-coated nickel nanowire product, including x-ray diffraction, transmission electron microscopy and inductively coupled plasma mass spectrometry. Additionally, we will characterize electrochemical and catalytic properties of our product by means of cyclic voltammetry.

Poster-79: The Power of NMR Prediction Programs
Authors: Creston Singer and Donald Clarke
Faculty Mentor: Donald Clarke
College: Fordham College at Rose Hill

NMR chemical shifts are often predicted using computer programs (e.g. ChemNMR, which is used at Fordham in connection with organic chemistry lab). When stereochemistry such as prochiral centers are involved, predictions do not match experimental spectra. Diastereotopic methyl groups such as in 1,3-diisopropyl-2-(4-nitrophenyl)imidazolidine or dimethyl ester tartaric acid are a common example of this problem. Quantum chemical programs such as Gaussian correctly predict diastereotopic differences in chemical shifts. However, the standard program calculates these shifts for the lowest energy model of a molecule at zero degrees Kelvin in solution. Therefore, it does not account for rotation about chemical bonds or inter- or intra-molecular effects which occur in solution at room temperature and thus will also have errors. This error becomes clear when data gathered in lab is compared. Overall, while neither predictive program is perfect, when used in tandem with each other and with experimental data, the three sets of data can be useful in both correcting each other while also pointing out research areas for future study.
Poster-80: Synthesis and Characterization of Polymeric Copper Cyanide Complexes
Authors: Christina Sheedy, Thomas Stavola, Michael Gleeson, Joseph Dayrit, Brooke Morsell, Leena Rachid, and Peter Corfield
Faculty Mentor: Peter Corffield
College: Fordham College at Rose Hill

Our group is attempting to design new mixed-valence copper cyanide network polymers where incorporation of CuII into the CuCN network will help to provide charge neutrality. We synthesize products either by air oxidation of cyanocuprate(I) mixtures in the presence of amines, or by cyanide reduction of Cu(II) complexes with the amine bases. In some cases, as in Cu2(CN)3L, where L is N,N’-diethylethylene diamine, the presence of a tetrahedral anionic template such as perchlorate, produced a mixed-valence 3D polymeric compound, rather than the monomers otherwise obtained. In other cases an anionic Cu(I) network was obtained, with the protonated base co-crystallizing to preserve charge neutrality. Thus 2D networks were obtained for complexes B=Cu2(CN)3 with B=diethylammonium or B=tetramethylammonium, and a 3D network with B=protonated N-methylethanolamine. A 2D anionic Cu(I) network was also obtained with the base N,N’-dimethylpropylenediamine, except that the charged base appears to have reacted with cyanide to form a cyclic guanidinium cation, in a reaction perhaps catalyzed by copper cyanide moieties. When the amine bases were replaced with glycinate, a complex 2D Cu(I) anionic network resulted, with charge neutrality provided by Cu(II)gly22+ and Na+ ions. Products were characterized primarily by infrared spectroscopy and single crystal X-ray diffraction, as well as C, H and N analyses, thermal gravimetric analysis, electron spin resonance, and X-ray powder diffraction.

Poster-81: Altering the Stereoselectivity of Benzoin Reduction
Authors: Joshua Merritt and Fariborz Firooznia
Faculty Mentor: Fariborz Firooznia
College: Fordham College at Rose Hill

An essential component to a proficient understanding of Organic Chemistry is recognizing steric effects and their contribution to chemical reactions. An exemplary experiment featuring this phenomenon is the reduction of benzoin with NaBH4, producing a meso vicinal diol. The Felkin-Anh model for nucleophilic addition to the carbonyl group suggests the reduction will heavily favor the least sterically hindered path, and 1HNMR analysis of the meso product confirms this at a nearly 100% (de)diastereoselective ratio. Yet, in an experiment developed by Dr. Saba, it was demonstrated that converting the ‘medium’ sized -OH group to a benzoyl group shifted this diastereomeric ratio to almost even (5:6). Dr. Saba’s work illustrates that the addition of a bulkier ‘medium’ group can alter the diastereoselectivity of the NaBH4 reduction against the typically favored reduction product. However, this strategy lacks a crucial component, three-dimensionality. We posited that by adding three-dimensional groups of increasing bulkiness to the ‘medium’ groups, we could push this diastereomeric ratio in favor of the typically unfavored product. Using this method, we aim to create an Organic Chemistry teaching lab that encourages students to conceptualize molecular interactions in three dimensions. Our preliminary results have been promising, showing that addition of the bulky tert-butyldimethylsilane (TBDMS) yields a 2:1 ratio in favor of the less favored diastereomer, and addition of the even bulkier trisopropylsilane (TIPS) has forced that ratio to 3:1. Given the success of these trials, we feel confident that the addition of the yet bulkier tert-butyldiphenylsilane (TBDPS) will push that ratio further yet.

Poster-82: Purification and Functional Analysis of E4orf1, a Small Viral Protein with Potential Therapeutic Possibilities
Authors: Ameen Al Qadi, Richard Chao, Olivia Killilea, Steven Simon, and Paul Smith
Faculty Mentor: Paul Smith
College: Fordham College at Rose Hill

E4orf1 is the first open reading frame of the 4th Early region of the Adenovirus genome. The expression of E4orf1 in primary endothelial cells (PEC) enables long-term survival and propagation of PEC’s while preserving their vascular structure for months in the absence of sera and exogenous cytokines. Current endothelial stem cell propagation
requires an exacting environment including numerous growth factors and cellular extracts that are therapeutically incompatible. The ability of E4orf1 expression to promote ex vivo stem cell survival presents a route for generating a wide range of therapeutically compatible cultured cells and tissues. While it is unknown how E4orf1 expression results in these remarkable phenomena, it is known that E4orf1 interacts with numerous cell scaffolding proteins, including Dlg1, and these interactions ultimately promote AKT activation. Despite over a decade of research on the cellular effects of E4orf1 expression, no structural or in vitro biochemical data exists for this protein and no large-scale purifications have been reported. We have successfully purified an isoform of E4orf1 through recombinant bacterial expression and various chromatographic techniques. Size exclusion chromatographic analysis of purified E4orf1 revealed the protein to be a trimer, which is consistent with the trimerization observed in sequence homologs of E4orf1. Additionally, deoxycholate has been shown to modulate E4orf1 oligomerization, which we hope will facilitate future crystallization studies. Through pulldown assays, we confirmed robust interaction between E4orf1 and the PDZ domains of human Dlg1, recapitulating behavior of E4orf1 seen in vivo.

**Poster-83: Surface Raman and Galvanostatic Measurements of Bis-Pyridyl-Acetylene and Bis-Pyridyl-Ethynyl-Benzene Adsorbed at Silver in the Photocatalysis of Oxygen Reduction**
Authors: Nahian Sadique, Zubair Shabbir, Jean Marie Gizzo, Dannielle Garceau, Zihan Wang, and John McMahon
Faculty Mentor: John McMahon
College: Fordham College at Rose Hill

We observed a photovoltage at a silver cathode that had been coated with bis-pyridyl-acetylene (BPA) or bis-pyridyl-ethynylbenzene (BPEB) and immersed in an oxygen-saturated electrolyte. The photovoltage indicates catalysis of oxygen reduction during the irradiation period. Catalysis of oxygen reduction with silver may find application in fuel cells where expensive platinum is used for the catalysis. BPA was synthesized by first synthesizing the precursor molecule, bis-pyridyl-ethylene (BPE) followed by addition of bromine and dehydrohalogenation in strong base to form the acetylene. BPEB was synthesized similarly but with double equivalents of both bromine and base. The triple bonds in BPA and BPEB provide less oxidizable, but easily reducible, adsorbates that serve as the electron acceptors in a metal-to-adsorbate electron transfer. The resulting anionic adsorbate readily donates electrons to oxygen catalyzing its reduction. In-situ surface Raman scattering for the adsorbates helps identify the anionic character of the adsorbates. Cyclic voltammetry measurements and comparison of surface Raman scattering from the adsorbates at silver sols and electrode surface with that of neat BPA and BPEB implicate the role of complexation to silver at a roughened electrode. Destruction of symmetry accompanying complexation of one of the nucleophilic nitrogens to silver is further suggested by the surface Raman spectra. Relative intensities of the in-phase and out-of-phase ring to acetylene stretches (at 1155 cm⁻¹ and 1173 cm⁻¹, respectively for BPEB) signal the drop-in symmetry that accompanies complexation to silver. Structure of the photovoltage vs. time plots suggests slow regeneration of the catalysts following photocatalysis.

**Poster-84: Effect of Gold and Silver Nanowires on the Efficiency of Dye-Sensitized Photoelectrochemical Cells**
Authors: Elizabeth Morisseau and Christopher Koenigsmann
Faculty Mentor: Christopher Koenigsmann
College: Fordham College at Rose Hill

Solar cells are a renewable form of energy that offer a promising alternative to fossil fuels. However, the cost of current solar cell technology is prohibitive to most consumers. The goal of my project is to improve the efficiency of dye-sensitized photoelectrochemical cells (DSPC) by incorporating silica-coated metal nanowires into the photoanode of the solar cell. We take advantage of a property of metals called surface plasmon resonance (SPR), in which the collective movement of electrons causes light to scatter. This scattering effect concentrates light within the cell and increases the short circuit current density. We have optimized the procedure for synthesizing 50nm diameter core-shell nanowires using a two-step modular synthesis. Scanning electron microscopy confirms that the metal nanowires are coated with a thin silica shell with an average thickness of 16.520 ± 7.962 nm. Work is underway to incorporate the core-shell nanowires into the photoanodes of functioning DSPC devices to characterize their effect on the device efficiency.
**Poster-85: Biophysical Characterization of Micro-Structured E4orf1, a Viral Protein with Profligate Association Properties**

Authors: Prakhar Yadav, Kymani Dyer, Jhovan Morrison, and Paul Smith
Faculty Mentor: Paul Smith
College: Fordham College at Rose Hill

The first gene of E4 genomic region of all adenoviruses encodes a small (~120 amino acid) protein responsible for many of the changes in cell metabolism that occur during adenoviral infection. This protein, E4orf1, interacts with numerous cell scaffolding and regulatory proteins and heterologous expression of E4orf1 results in altered cellular localization of many such interacting partners in vivo. Employing bacterial recombinant expression, we have purified an isoform of E4orf1 as a soluble N-terminal Maltose Binding Protein (MBP) fusion. This fusion protein displays the trimeric oligomerization and PDZ-binding properties previously observed for E4orf1. Proteolytic cleavage of the MBP fusion partner results in the formation of an E4orf1 aggregate that is highly refractory to dissolution in detergents or chaotropic solutions. Electron micrographs of this aggregated material reveal a uniformly punctate dispersion of spheroid particles roughly 2μm in diameter, consistent with characterization in suspension using dynamic light scattering (DLS). These particles are reminiscent of the punctate accumulations of E4orf1 seen in immunofluorescence analysis and we hypothesize that E4orf1’s propensity for strong self-association is intrinsic to its role in binding to and redirecting the localization of host cell proteins. In support of this hypothesis, our studies reveal that these E4orf1 particulates maintain their affinity for PDZ binding, suggesting that the aggregated form of E4orf1 we observe may mimic a functionally relevant physiological arrangement of E4orf1.

**Poster-86: Examining Chondrule and Clast Sizes in the CM Chondrites LaPaz Icefield (LAP) 04515, LAP 04527, and LAP 04565**

Authors: Marlene Louro and Jon Friedrich
Faculty Mentor: Jon Friedrich
College: Fordham College at Rose Hill

Primitive meteorites called chondrites contain chondrules, sub-mm sized silicate spherules formed early in our solar system’s history. Understanding chondrule size is important for the development of astrophysical models for the formation of chondrules. Little is known about the chondrule size-frequency distribution in a group of chondrites called the CM chondrites. Extensive aqueous alteration of the minerals has occurred in many CM chondrites, making it unclear as to what is considered a chondrule and where exactly their boundaries are located. Additionally, along with chondrules, there are chondrule-like objects contained within these chondrites, making it more difficult to identify individual chondrules. Chondrule fragments may also be present. These pose challenges when attempting to measure their diameters. Using a scanning electron microscopy, we imaged three thin sections of chondrites with back scattered electrons: LaPaz Icefield (LAP) 04515, LAP 04565, and LAP 04527. Using Photoshop, we were able to identify and digitally outline individual chondrules. We were then able to determine their areas which will aid in our classification of the chondrules. LAP 04514 had a mean diameter of 76μm±66, LAP 04565 had a mean of 32μm±29 and LAP 04527 had a mean of 26μm±23. These results suggest that LAP 04656 and LAP 04527 were most likely obtained from the same meteorite sample. Our data offer opportunities to examine the frequency and types of chondrules and clasts with respect to size and angularity, in addition to examining the idea of complementarity between chondrules, matrix, and other chondrite components.

**Poster-87: The Effect of Zirconium Doping on the Efficiency of Titanium Dioxide Dye-Sensitized Photoelectrochemical Cells**

Authors: Lauren Beglin and Christopher Koenigsmann
Faculty Mentor: Christopher Koenigsmann
College: Fordham College at Rose Hill

Dye-sensitized photoelectrochemical cells (DSPCs) are a promising platform for capturing solar energy because they can be configured to convert solar energy to electricity or to liquid solar fuels. DSPC photoanodes consisting of
titanium dioxide (TiO2) nanoparticles (NPs) are favorable due to their stability and economic viability, although efficiencies remain low compared to other solar cell types. In an effort to improve the efficiency of TiO2 DSPC photoanodes, TiO2 NPs will be doped with varying amounts of zirconium (Zr), which is expected to modify the electronic structure of the TiO2 semiconductor, resulting in an increased voltage output in assembled DSPCs. Using a two-step hydrothermal technique, anatase TiO2 nanobelts were synthesized. The product was determined to have the desired crystalline anatase phase of titanium dioxide via X-ray powder diffraction (XRD). Scanning electron microscope (SEM) images revealed their belt-like morphology and nanoscale size. Work is underway to develop a sol-gel method for synthesizing Zr-doped TiO2 NPs with a Zr molar composition ranging from 2-9%, which will also be characterized using XRD analysis and SEM imaging. The Zr-doped TiO2 NPs will be used in the production of Zr-doped nanobelts for DSPC photoanodes. To test the efficiency of the Zr-doped TiO2 NP photoanodes, they will be assembled into dye-sensitized solar cells, the efficiency of which will be determined using a solar simulator.

**Computer and Information Sciences**

**Poster-88: Wireless Sensor Coverage in Three Dimensions**
Authors: Alexander Koniuta and Habib Ammari  
Faculty Mentor: Habib Ammari  
College: Fordham College at Rose Hill

This work involves the 3D-based space coverage problem. The range of effect of wireless sensors is spherical, but spheres do not provide complete coverage of the 3D space. Thus, discreet shapes that fit within the radius of the sphere must be used to approximate the volume. The better the shape fits the circle, the more optimally the sensors can be placed, and the fewer sensors used. In the past, shapes have been found which are more than eighty percent the spatial efficiency of a sphere while still meeting the space-covering requirement. This work attempts to find another such shape through development of an algorithm that simultaneously deforms four kissing spheres and the coverage gap between them in order to find an equivalence point that is space covering.

**Poster-89: Uncovering Online Terrorist Activity Using Neural Networks**
Authors: Anthony Motto, Angjelo Marku, and Gary Weiss  
Faculty Mentor: Gary Weiss  
College: Fordham College at Rose Hill

In the ongoing fight against ISIS and other terrorist organizations, it has become apparent that communication across the Internet has become their ultimate platform upon which to spread information and propaganda. Current countermeasures have included sifting through data from online web pages and social media platforms, and using teams of people to evaluate the content found and pursue any extremist threats that they discover. Given the immense scope of the Internet, a task like this can take many working hours to uncover relevant information, let alone act upon any extremist communications found. Our research hopes to provide a solution for this in the form of a neural network classifier, a kind of artificial intelligence. By using techniques such as word embeddings and topic modeling, it is possible to derive relevant information from documents that can be used as input for a neural network. The goal is to create a neural network that can be fed information extracted from online sources using these techniques, and then classify this information as being benign or extremist in nature. Prototype models have already been developed that achieve this goal with high accuracy.

**Poster-90: Sensor Deployment for k-coverage in Wireless Sensor Networks**
Authors: Catherine Alabanza and Habib Ammari  
Faculty Mentor: Habib Ammari  
College: Fordham College at Rose Hill

Wireless Sensor Networks have been rising in popularity as they have many different applications. Sensors have a variety of sensing modalities such as temperature, light, sound, and vibration. While they are very effective in detecting
events, the sensors’ usage is limited by their battery power and sensing range. This paper will discuss the optimal sensor deployment such that each sensor in a network will be using energy efficiently and will effectively achieve k-coverage. A wireless sensor network achieves k-coverage when any event can be detected by at least k number of sensors simultaneously. We will consider the various placements of a fixed number of sensors with fixed sensing ranges to determine which is the best configuration to ensure that there will be no point in a sensor network that is left insufficiently covered. It is important to study the problem of sensor deployment, as holes in sensor coverage can have major consequences in real life applications.

Poster-91: Tracking Cybercrime with Image Similarity
Authors: James Stahl and Gary Weiss
Faculty Mentor: Gary Weiss
College: Fordham College at Rose Hill

Though originally intended to provide privacy to Internet users such as whistleblowers and those with state-censored web access, the Dark Web enabled by Tor has since become a boon to cybercriminals. Taking advantage of its anonymity, they are able to perform illicit activities such as drug trafficking and financial fraud over the Internet. This online medium allows them to provide features to their customers previously not available to these markets, such as user reviews, categorization, and product images. This project is based on the idea that the inclusion of product images can be exploited to gain information about these vendors. Using image similarity metrics, one could track vendors across Dark Web marketplaces who use the same or similar images for their products. In addition, this would expose possible relationships between vendors; perhaps one vendor is buying from another to resell the product and is reusing the original vendor’s images. In order to establish similarity between images, several methods have been explored. These methods rely on “hashing” images, or transforming the images into a string of characters. Though image hashing and comparison is an area of research that has been explored, this application of it is novel. It is on a new kind of data (Dark Web markets) and thus comes with a new set of challenges. These challenges include acquiring a dataset, accomplishing image attribution, and scaling with the growing size of markets on the Dark Web. Accomplishing this has been achieved through computing a hash based on downscaled images and then correlating these hashes based on Hamming distance.

Economics

Poster-92: Determinants of Food Security: Evidence from Nigeria
Authors: Santiago Sordo Palacios and Mary Beth Combs
Faculty Mentor: Mary Beth Combs
College: Fordham College at Rose Hill

While Nigeria is now a relatively food secure country, its northeastern region is still at a high risk of famine. This project uses the Nigeria General Household Survey of 2016 to isolate the determinants of food security in Nigeria. Specifically, it tests the results of a 2014 study conducted in Malawi by Sitieni et al., which found that off-farm labor increases food security in the short run but decreases it in the long run. A metric for food security, which is a flipped aggregate of nine food insecurity-indicating questions, was used as the dependent variable in a weighted least squares regression. My results reinforce the findings of the Malawi study. Specifically, the positive and statistically significant coefficient on hours worked for a household business represents the impact of shorter-term enterprises. Meanwhile, a negative and statistically significant coefficient on hours worked for a salary represents the long-term effect of long-term employment. Although further research is needed to correct for endogeneity between food security and labor market choices, this project represents a step forward in understanding the determinants of food security.
Environmental Science

Poster-93: The Effect of Wax Esters on the Growth of Pseudogymnoascus Destructans, the Causative Agent of White-Nose Syndrome
Authors: Lauren Beglin, Nabilah Nishat, and Craig Frank
Faculty Mentor: Craig Frank
College: Fordham College at Rose Hill

White-Nose Syndrome (WNS) is an emergent disease that has killed over 6 million bats in the eastern US and Canada. The condition derives its name from the telltale white fungal growth, identified as Pseudogymnoascus destructans (Pd) that appears on the muzzle, wings, and ears of affected bats. Subcutaneous infection with Pd results in over-winter mortality rates in excess of 98% for affected populations. We conducted laboratory Pd culture experiments at 4.0-12.0°C to determine the effects of three saturated free fatty acids and six wax esters all containing a 12-carbon alcohol on Pd growth. The growth of Pd was greatly inhibited by the free fatty acid pentadecanoic acid (15:0), and the wax esters lauryl laurate (12:0-12:0), lauryl palmitate (12:0-16:0), lauryl palmitoleate (12:0-16:1), lauryl oleate (12:0-18:1), and lauryl linoleate (12:0-18:2) in the high temperature condition (10-12°C). In general, saturated free fatty acids do not inhibit Pd growth at the concentrations typical of bat epithelium, while wax esters of saturated short chain alcohols and saturated short chain fatty acids inhibit Pd growth, as do wax esters of unsaturated fatty acids.

Environmental Studies

Poster-94: Medical Experiences of Burmese Refugees in the United States: The Karen Ethnicity Perspective
Authors: Natalie Wodniak and John van Buren
Faculty Mentor: John van Buren
College: Fordham College at Rose Hill

The nation of Burma (now Myanmar) has endured a civil war for over 60 years. The Karen ethnic group, located in southeastern Burma, is one of the many minority groups that has been forced to flee the nation. This study examined the medical experiences of Karen refugees who have been resettled to the United States. During a two month period, structured interviews were conducted with 39 refugees in 3 U.S. cities – Fort Wayne, Indiana; Amarillo, Texas; and Buffalo, New York – where large populations of Karen refugees have settled. The interviews, which were recorded and transcribed, included questions about their usage of traditional medicine both in Burma and in the U.S., their satisfaction with Western medicine, and their experiences in the American healthcare system. Nearly all of the refugees primarily used traditional medicine in Burma, but of the 39 refugees interviewed, only 6 felt able to continue to use traditional methods in the U.S. While most of the interviewees trusted Western medicine and had positive experiences with American doctors and hospitals, 15 of the refugees expressed dissatisfaction and distress with obtaining health insurance and confusion over its coverage. This study brings to attention the need to improve refugee healthcare, both by encouraging traditional practices and assisting refugees with insurance coverage. In addition, broadly, findings indicate that refugees do not feel that traditional practices are accepted in the U.S. which may have implications on health care utilization and ultimately well-being. Further research is needed to examine these relationships.
French Studies

Authors: Margaret Fahey and Audrey Evrard
Faculty Mentor: Audrey Evrard
College: Fordham College at Rose Hill

In 1995, French director Matthieu Kassovitz released La Haine to international acclaim. The film became a prototype for a new genre, le cinéma de banlieue, and inspired successive future films. La Haine, along with more recent films Tout ce qui brille (2010) and Dheepan (2015), are set within the banlieues, or suburbs, of Paris. Notably, each film focuses on minority groups and their efforts to escape the banlieues. The dynamic between the three films makes a statement on the present and past political state in France. The twenty-year time span between the release of La Haine and Dheepan concludes that the situation in France’s banlieues has not changed drastically and suggests that it is perpetuated by French principles of integration and assimilation. Further evidence to support this belief comes from sociologists and film experts. I argue that banlieues marginalize members of French society by creating a societal hierarchy, as depicted in these three pieces of French cinema. The three films support this belief and demonstrate how themes have persisted to emerge in cinema as a reflection of the actual state of banlieues in France. This societal hierarchy physically isolates individuals, often first or second-generation immigrants, who live in these stigmatized neighborhoods and creates an inescapable cycle. The marginalization of French banlieues in film highlights a broken system and the complications that isolation, lack of economic and social mobility, and racism have on the individuals who live within these banlieues.

Integrative Neuroscience

Poster-96: Developmental Changes in Amygdala Functional Connectivity During Middle Childhood
Authors: Teona Iarajuli and Amy Roy
Faculty Mentor: Amy Roy
College: Fordham College at Rose Hill

The amygdala is a brain region that contributes to emotional expression, particularly fear, rage and aggression. The affective and cognitive processes involved in emotion regulation are thought to emerge from connections between the amygdala and the prefrontal cortex. Recent evidence suggests that maturation of amygdala-prefrontal circuits during childhood underlie the development of emotion regulation skills. The present study used resting-state fMRI to examine the relationship between amygdala intrinsic functional connectivity (iFC) and age in a sample of typically developing children, ranging from 5-9 years old (n=39). We further examined how this connectivity was related to emotion lability, using a parent-report scale, the Emotion Regulation Checklist (ERC). Results show decreases in iFC between the right and left amygdala with increasing age. Additionally, right amygdala iFC to left amygdala correlated with the ERC Lability/Negativity scale (r=0.32, p=0.04), suggesting that age-related decreases in bilateral iFC of the amygdala may play a role in decreasing lability in children.

Poster-97: Intrinsic Functional Connectivity of the Habenula in Children with ADHD
Authors: Melissa Arfuso and Amy Roy
Faculty Mentor: Amy Roy
College: Fordham College at Rose Hill

The habenula is a small brain region that is part of the epithalamus. It directly regulates dopaminergic and serotonergic circuits through the ventral tegmental area and substantia nigra. Both of these circuits are implicated in reward processing, and show deficits in children with ADHD, suggesting that habenula function may be irregular in ADHD. Because the habenula is thought to contribute to reward prediction error, habenular function may also be associated with lower frustration tolerance often observed in children with ADHD and other disruptive behavior disorders. To
test these hypotheses, this study examined the intrinsic functional connectivity (iFC) of this brain region in children (ages 5-9 years) with (n=84) and without ADHD (n=40). Following psychological assessments, children participated in a 6-minute resting state scan. Neuroimaging preprocessing was done using the Configurable Pipeline for the Analysis of Connectomes (C-PAC). Seed-based iFC used a 2 mm radius habenula regions of interest, identified individually from normalized T1 weighted images. Groups did not differ in age, sex, or movement during the scan. Results showed consistent decreased connectivity in the ADHD group as compared to the healthy controls in both the left and right habenula. Each side of the habenula yielded two clusters to the bilateral putamen. Both clusters showed a significantly decreased left and right habenula iFC in the ADHD group as compared to controls. Overall, our results suggest disruption in the iFC in the habenular network of children with ADHD through possible dysregulation of dopaminergic pathways.

**Poster-98: Impact of Western Diet Consumption on Hippocampal Volume in Children**
Authors: Kyrstin Belthoff and Amy Roy
Faculty Mentor: Amy Roy
College: Fordham College at Rose Hill

Background: Consumption of a diet high in fat and sugar (referred to as a western diet, WD) has been linked to hippocampal-dependent cognitive deficits in both humans and animals, as well as reduced BDNF expression, blood-brain barrier integrity, and neurogenesis within the hippocampus of animals. Further, reduced hippocampal volume has been associated with WD consumption in adults and obesity in children. This study aimed to determine whether there is a relationship between consumption of a high-fat, high-sugar diet and hippocampal volume in children.

Methods: Participants included 20 children ages 5-9 (mean 7.4, SD 1.4; 80% male), who were free of psychiatric diagnoses. Parents of participants completed the Youth/Adolescent Food Frequency Questionnaire, a 77-item measure that captures diet content in children. Additionally, children participated in an MRI scan session in which a high resolution weighted anatomical scan was completed. FreeSurfer imaging software was used to extract volumetric segmentations of subcortical grey and white matter.

Results: Percentage of daily calories consumed from both fat and sugar was not significantly correlated with hippocampal volume. When evaluated individually, percentage of daily calories consumed from sugar was also not significantly correlated with hippocampal volume. However, percentage of daily calories from fat was negatively correlated with left hippocampal volume (r=-.621, p=.005), suggesting greater fat consumption is associated with decreased hippocampus size.

Discussion: Future directions include completing studies with larger sample sizes and determining whether the effects of WD on the hippocampus are dependent on whether obesity is present.

**Mathematics**

**Poster-99: Biomimicry in Wave Energy Capture**
Authors: Robin Happel and Rolf Ryham
Faculty Mentor: Rolf Ryham
College: Fordham College at Rose Hill

Almost half the world’s population lives along coastlines. For this reason, wave energy capture technology is something of a dark horse among the renewables sector. Although rarely used at present, the possibility of converting kinetic energy from ocean waves into electricity holds tremendous promise. And, from wind turbine blades patterned on the fins of humpback whales, to honeycombs hidden in countless everyday objects, biomimicry is similarly being recognized as a realm of unexplored potential. In using nature as a model for engineering, we see evolution as a form of experimentation, and as essentially millennia of iterative design. In this study, we will explore possible ways to model wave energy capture on marine life. More specifically, diatoms and radiolarians will be considered as a model for more durable buoys (Diatoms and radiolarians are microscopic organisms that grow symmetric, geometric shells, making them relatively easy to reproduce via 3d printing). Over millennia, diatoms and radiolarians have evolved shells that both capture the current and provide stable support. This duality of durability and buoyancy is a promising model for wave energy capture systems that are better able to withstand storm surges. Using 3d printing and
mathematical modeling, this project represents a brief exploration of the possibilities of biomimicry in buoys that capture wave energy, as well as how to design storm surge-resistant structures more broadly.

**Poster-100: Bernstein Polynomials and Approximations**  
Authors: Jeremiah Hyslip and Hans-Joachim Hein  
Faculty Mentor: Hans-Joachim Hein  
College: Fordham College at Rose Hill

This project is an investigation of a class of functions known as Bernstein polynomials, and the Weierstrass Approximation Theorem. The fundamental theorems and ideas essential to this project have been presented, proved, and applied to specific examples of functions. The accuracies of the approximations generated by this theorem were analyzed, and there was a subsequent investigation of the concavity of these approximations. Additionally, the efficiency of this theorem was tested using concrete examples, and it was implemented using computer software. The software that was used, namely Octave, was able to provide a good idea of relatively how well certain implementations of this theorem worked, based on the code.

**Modern Languages**

**Poster-101: Effects of Individual Differences (Handedness) on Language Processing**  
Authors: Nopell Wong, Justin Esposito, Elizabeth Wood, Catherine Aumiller, and Sarah Grey  
Faculty Mentor: Sarah Grey  
College: Fordham College at Lincoln Center

Individual biological differences can influence neural mechanisms used during language processing. In the current study, we focused on handedness in particular as an individual difference that can impact language processing. Right-handers with a left-handed blood relative are known as familial sinistrals (FS+), and for the purposes of this study, right-handers with no left-handed blood relatives are known as non-familial sinistrals (FS-). It is hypothesized that the results will show differences in language processing between the FS+ and FS- populations. We used event-related potentials to test morphosyntactic processing between the two groups. In previous research, the distinction between the FS+ and FS- populations has not always been made; homogeneity in neural mechanisms used during language processing has often been assumed in past neurocognitive models. This study aimed to extrapolate on the results of handedness in Tanner and van Hell’s original study from 2014 and provide greater support for the influence of familial sinistrality on language processing.

**Physics and Engineering Physics**

**Poster-102: Glassy Oligomer Sensitivity to Volatile Organic Compounds**  
Authors: Lee Anne Vigilia, Daniel Carrozzi, Anthony Panariti, Thomas Stoke, Gustavo Schwartz, and Petr Shibayev  
Faculty Mentor: Petr Shibayev  
College: Fordham College at Rose Hill

The sensitivity of chiral liquid crystals (CLCs) to their surrounding environments enables them to be useful gas sensors. The various CLCs used in this experiment were studied to determine their sensitivity to certain volatile organic compounds (VOCs), namely toluene, cyclohexane, and ethanol. Liquid crystal siloxane oligomers have a high melting point and form a glassy state at room temperature; they were “physically” modified by being blended with low molar mass compounds with a lower melting point. The liquid crystalline blends were placed in a vacuum-sealed container filled with a gaseous VOC for fifteen minutes. The samples were examined by optical and atomic force microscopies (AFM). Responses to VOC treatment were found in all experiments. AFM studies are especially interesting as they point to subtle changes in the very thin surface layer and, therefore, occur during much shorter times of treatment and/or lower concentrations of VOCs. Each solvent was found to have its own impact on surface pattern studied by AFM. The changes observed in AFM are also discussed from a theoretical viewpoint.
Poster-103: Lattice Quantum Chromodynamics and Chiral Perturbation Theory at Low Energies
Authors: William Charles and Christopher Aubin
Faculty Mentor: Christopher Aubin
College: Fordham College at Rose Hill

We explore in detail the results given by unphysical lattice quantum chromodynamics (QCD) simulations with staggered quarks and their relation to staggered chiral perturbation theory (SChPT) at low energies. Analysis of such simulations allows us to examine two phases, depending upon the breaking of specific lattice symmetries: the physical, unbroken phase where the continuum limit of the lattice simulation corresponds to the real world, and a broken phase which has no physical continuum limit. Using previously generated lattice configurations, we numerically measure the mass spectra of pions as a function of the masses of their constituent quarks in order to see if the observed spectra agree with the theoretical predictions given by SChPT. By examining these spectra in the unbroken as well as broken phases we hope to compare the masses of different mesons given by lattice QCD and SChPT to determine whether SChPT is a good effective theory outside of the physical phase. If SChPT is valid then it should correctly predict both physical and unphysical situations at low enough energies.

Poster-104: Going to Nanoscale by Surface Patterning
Authors: Thomas Stoke, Anthony Panariti, Lee Anne Vigilia, Daniel Carrozzi, and Petr Shibayev
Faculty Mentor: Petr Shibayev
College: Fordham College at Rose Hill

Polymers forming glassy states are notable for the creation of nanostructures on their surfaces. Liquid crystalline glassy polymers are of interest due to the inherently higher molecular order they possess. This allows for creation and observation of a number of unique patterns on their surfaces. These patterns may be induced by intelligent heating or light irradiation. In this work, we used conventional polymer glasses and nanoparticles to decorate and replicate such patterns on the surface of glassy chiral liquid crystalline polymers. The polymers were studied by Atomic Force Microscopy. It was observed that both chiral polymers and replicas can be decorated with nanoparticles and form a variety of surface patterns. The possibility of using these patterns for the creation of metamaterials is discussed.

Poster-105: Micro-Structured Microsphere-Fiber Probe as a Diagnostic Device
Authors: Marissa Vaccarelli, Bernadette Haig, Ryan Riviere, and Stephen Holler
Faculty Mentor: Stephen Holler
College: Fordham College at Rose Hill

Micro-structured fiber-optic probes are convenient means for delivering laser light for in vivo applications, such as spectroscopic analysis of cancerous tissue. Additionally, similar approaches also find methods for examining captured particulate matter and determining the spatial resolution of inference patterns of the 1951 U.S. Air Force test target. The probe used in these three experiments is comprised of an optical fiber with a microsphere, a ball lens positioned at the end of the fiber, monolithically formed at the distal end. Using a CO2 laser, this ball lens is formed by heating the end of the fiber while rotating uniformly. The absorption of the infrared light results in melting glass which forms a spherical bead at the end of the fiber. The microsphere size may be varied by changing the initial fiber and duration in the beam; smaller spheres may be formed by starting with a tapered fiber. The probe focuses light propagating through the fiber to a location beyond the front surface of the microsphere.

Poster-106: Improving Current Models of Prostheses Using Three Dimensional Printing Techniques
Authors: Marissa Vaccarelli, Vassilios Fessatidis, and Stephen Holler
Faculty Mentor: Stephen Holler
College: Fordham College at Rose Hill

Exploring the rapidly expanding field of lightweight and cost-effective prostheses, this project uses three-dimensional printing to create alternate designs of the e-NABLE Raptor Hand and Flexy Hand to create a prosthetic hand that
provides the user with a greater range of movement. This research began with the construction of individual three part fingers, followed by a palm, wrist and forearm. Modified Arduino code enabled motor rotation providing rudimentary finger movement. For improved coordination, a Myoware muscle sensor was later implemented. Lastly, a heart rate monitor was added in to record supplementary user data for a cohesive prosthetic.

**Psychology**

**Poster-107: Salivary Cortisol Associations with Induced Acute Stressors, Demographics, Diurnal Factors, and Seasonal Factors**
Authors: John-Paul Esoldi, Michael Tynes, and Tiffany Yip
Faculty Mentor: Tiffany Yip
College: Fordham College at Rose Hill

Stress plays a significant role in psychological, physiological, and emotional health as it can stimulate or inhibit a multitude of biological processes which have the propensity to manifest in individuals in a manner detrimental to long-term health. Being that perceived stress, both chronic and acute, physiologically induces inflammation, all organ systems may be negatively affected making individuals more prone to a variety of diseases and immunological disorders. When an individual perceives an event as stressful, a series of physiological mechanisms and pathways are activated, specifically the activation of the sympathetic and adrenomedullary systems and of the hypothalamic–pituitary–adrenal (HPA) axis, which leads to increased cortisol release into the bloodstream. In this current study, four salivary cortisol samples were obtained from undergraduate students at a medium-sized urban university who participated in a separate ongoing study. During this other study, participants were exposed to a race-related stressor while taking a memory test in the laboratory setting. The aim of this current study is to examine how different variables (gender, race, year in college, time of day, and time of year) correlate with and influence the cortisol concentration in the four salivary samples of individuals following the induced stressor. Salivary samples have been analyzed using ELISA assays and are currently nearing completion. In accordance with previous research, it is hypothesized that there will be significant differences among the groups of each of the variables in cortisol concentration and reactivity across the four saliva samples from each participant.

**Poster-108: Scene Processing Abilities in Relation to Navigation**
Authors: Carli Grace and Elissa Aminoff
Faculty Mentor: Elissa Aminoff
College: Fordham College at Rose Hill

The purpose of this study on visual processing was to assess scene processing abilities in individuals using a variety of behavioral tasks. Tasks included answering questions that queried how well different aspects of a scene were processed (depth, semantics, color). Moreover, scene stimuli were presented in different contexts, surrounded by a picture frame or a window frame, which varied the more picture-like qualities or scene-like qualities of the stimulus. Behavioral data was investigated through accuracy and reaction time. In addition, behavioral performance was examined with respect to navigation ability. Santa Barbara sense-of-direction scale was used for a self-report navigation evaluation. Using this assessment, we separated good navigators from bad navigators and contrasted their accuracy and reaction rates. The study showed a trend towards faster reaction time in the good navigator group over the bad navigator group, suggesting an increased fluidity of scene understanding in the good navigators. Varying the context of the scene presentation did not modulate performance in the good navigators. However, within the bad navigator group, scene-like presentation of the images trended towards slower reaction time than the picture-like presentation. These results may help support a difference in the neural and psychological mechanisms of scene processing among individuals with different navigation abilities.
**Poster-109: Certain Aspects of Technology Found to be Linked to Anxiety in Social Interactions**
Authors: Alexandria Sedlak and Rachel Annunziato  
Faculty Mentor: Rachel Annunziato  
College: Fordham College at Rose Hill

Research on technology is abundant, especially in terms of addiction behaviors and social anxiety. Most research in the literature examines how social anxiety affects technology usage. This study furthered this research by examining the effects that technology usage behaviors have on anxiety in social interactions. Fordham University undergraduate students (N = 129) were given two questionnaires, the MIUAS and SIAS, which measured technology usage across a number of subscales and social anxiety, respectively. This study hypothesized that high technology usage would lead to increased anxiety in social interactions. Results from the correlation analyses show that there are some significant correlations between certain aspects of technology and anxiety in social interactions. Video gaming seemed to be linked to greater anxiety levels, r = .220, p = 0.012. Another more significant correlation was that an increase in the number of online friends that one does not know is associated with higher anxiety levels, r = .262, p = 0.004. An alternate finding was that the number of friends one has and knows on Facebook is negatively correlated with one’s social anxiety, r = -.213, p = 0.019. These results demonstrate that some aspects of technology usage are associated with people’s anxiety in social interactions, particularly in the case of online friendships, but more research will be necessary to determine just how much of an impact it has. This would be extremely important for learning about technology-induced anxiety and considering behavioral strategies to help alleviate anxiety in social interactions.

**Poster-110: Using Boundary Extension to Understand Scene Processing: The Effect of Scene-Likeness**
Authors: Alyssa Shannon and Elissa Aminoff  
Faculty Mentor: Elissa Aminoff  
College: Fordham College at Rose Hill

This study used boundary extension as a tool to investigate whether scenes viewed through a window or in a picture frame are more scene-like. Boundary extension is a scene-specific phenomenon that occurs when one remembers a picture with wider boundaries than it was shown originally. The greater the effect of boundary extension, the more scene-like a stimulus is. Previous fMRI studies showed that the activity in the neural regions of the brain involved in scene perception were modulated by these different viewing contexts (window or picture frame). This study seeks to understand if this neural difference may arise from one presentation being more scene-like than another. Participants were asked in the study trial to remember scenes presented in a window frame or in a picture frame. Afterwards, participants judged whether the scene shown during the test trial looked zoomed in, zoomed out, or the same as the original image. It was predicted that scenes viewed through a window would be more scene-like and therefore exhibit a larger boundary extension effect than those viewed through a picture frame. After testing the data with ANOVA, it was shown that the results support our hypothesis as scenes presented through a window showed significantly greater boundary extension than those shown in a frame. Several post-hoc analyses are currently being explored to further understand the data.

**Poster-111: The Role of Immune Function and Genetic Mutation on the Lifespan of Drosophila**
Authors: Sarah Steirer and Molly Zimmerman  
Faculty Mentor: Molly Zimmerman  
College: Fordham College at Rose Hill

Systematic aging is classified as an overall deterioration of both physical and mental functioning across an organism’s lifespan, eventually terminating in death. Until recently, we have had a rather primitive understanding of how aging occurs. However, recent scientific discoveries have started to elucidate the mechanisms by which organs and tissues, including the brain, undergo functional decline in aging. The goal of this project is to determine which cell types and brain regions in Drosophila are most influential on the process of aging through immune gene knockdown or gene overexpression in different regions of the brain to identify which immune genes and brain regions are most significant to aging. During the course of the semester, I investigated whether different immune pathways in the brain affect aging, specifically, how Cactus knockdown in different regions and cell types of the nervous system affects aging.
This was accomplished using the GAL4/UAS genetic system, which allows for spatial and temporal control of the expression of different immune genes. Unfortunately, with the limited scope of time, results were unable to be accurately calculated. Aging research is extremely important in today’s society, with human lifespan increasing as well as aging fitness. Understanding these pathways and neurons in the hypothalamus could lead to important discoveries and cures for aging diseases such as Parkinson’s and Alzheimer’s, which are still not well understood.

**Poster-112: Do Feelings and Knowledge about Aging Predict Ageism?**
Authors: Cassandra Cooney, Jillian Minahan, and Karen Siedlecki
Faculty Mentor: Jillian Minahan and Karen Siedlecki
College: Fordham College at Rose Hill

Ageism against older adults is a prevalent issue in the U.S. and has consistently been found to negatively impact older adults. Research has shown that diminished cognitive performance, psychological well-being, self-esteem, and worse self-perceptions of aging may result from exposure to ageist attitudes or behaviors. Thus, understanding what factors predict ageism is imperative. The current study examined aging anxiety, knowledge of aging, death anxiety, and intergenerational contact frequency and quality as predictors of ageism in a sample of individuals (N=419) between the ages of 18 and 86 years via an online survey. Participants’ average age was 46.09 (SD=19.28); 79.50% were female, and 85.70% were White. Hierarchical regression analyses revealed that higher levels of aging anxiety and lower levels of knowledge of aging, frequency of contact, and quality of contact were related to higher levels of ageism beyond the influence of demographic and well-being factors (e.g., positive and negative affect, depression, life satisfaction). Although death anxiety was significantly related to ageism, the relationship was fully mediated by aging anxiety. Aging anxiety only partially mediated the relationship between knowledge of aging, frequency of contact, and quality of contact and ageism. Finally, knowledge of aging, frequency of contact, and quality of contact were examined as moderators, and knowledge of aging was found to buffer the impact of aging anxiety on ageism. Overall, these findings suggest that there are important predictors of ageism that may potentially serve as future targets for intervention.

**Poster-113: Implicit and Explicit Attitudes of Coaches Towards Mental Health Disorders in Collegiate Athletes**
Authors: Emily Fronk and Nancy Busch Rossnagel
Faculty Mentor: Nancy Busch Rossnagel
College: Fordham College at Rose Hill

In recent years, there has been increased attention on reducing mental health disorders in elite athletes due to the psychological strain that they endure often being overlooked and mismanaged. Past research has focused on athletes’ elevated prevalence of mental health disorders, as well as the negative stigma attached to these disorders, which acts as a barrier against seeking treatment. Due to their role in mentoring and shaping athletes’ personal, professional, and athletic development, examining coaches’ perceptions could have critical implications for understanding mental health disorders. Therefore, this study investigated coaches’ attitudes towards mental health disorders in collegiate athletes and how this aligned with athletes’ perceptions of their coaches’ attitudes. Participants included 88 coaches and 369 athletes from six schools in the Atlantic 10 Conference, who completed the Community Attitudes towards the Mentally Ill questionnaire and three Implicit Association Tests. Results indicated that coaches did not have negative explicit attitudes towards those with mental health disorders, but that they did have significantly negative implicit attitudes. Athletes perceived their coaches as having significantly negative attitudes only in the category of “bias”. Coaches wanted players to discuss mental health disorders with them and believed they were approachable. However, athletes anticipated being uncomfortable discussing a mental health disorder with them nor would they encourage a teammate to do so. The results suggest there is a need for resources that improve coaches’ implicit attitudes towards mental health in order to reduce negative stigma, promote help-seeking behaviors, and better manage mental health disorders in collegiate athletes.
Poster-114: The Relationship Between Neuroticism and Perceived Stress
Authors: Daniella Toto and Molly Zimmerman
Faculty Mentor: Molly Zimmerman
College: Fordham College at Rose Hill

Stress is defined as a strained physical or emotional state resulting from unwanted and demanding circumstances. Abnormal and prolonged stress responses lead to physical distress. Perceived stress is the way in which we think about the stress we experience. Perceived stress has been associated with poor cognitive function and physical deterioration. Prior studies have shown that an individual’s personality can impact their perceived stress levels. This study seeks to examine the relationship between personality traits and perceived stress specifically in young adult college students (N=187). College students are at greater risk of experiencing high levels of stress. Participants’ perceived stress levels were measured using the Perceived Stress Scale-14 (PSS-14). Participants’ personality traits were defined using The Big Five Personality Traits (emotional stability (neuroticism), intellectual openness, agreeableness, extraversion, and conscientiousness) and measured using the 50-International Personality Item Pool (50-IPIP). Individuals with lower emotional stability, extraversion, and conscientiousness were found to have higher levels of perceived stress. Results from this study may be useful to students by increasing their understanding of the relationship between their personality and their perceived stress.

Poster-115: The Relationship Between Sleep and Perceived Stress as a Function of Season
Authors: Daniella Toto and Molly Zimmerman
Faculty Mentor: Molly Zimmerman
College: Fordham College at Rose Hill

There is strong evidence that young adults experience both sleep-related issues and elevated levels of stress. Stress is defined as a strained physical or emotional state resulting from unwanted and demanding circumstances. The way in which we think about the stress we experience is commonly defined as perceived stress. Studies have linked higher levels of perceived stress with poor cognitive function and physical deterioration. This study seeks to examine the relationship between sleep and perceived stress specifically in young adult college students (N=187). Participants’ perceived stress levels were measured using the Perceived Stress Scale-14 (PSS-14). Participants’ sleep quality was measured using actigraphy (total sleep time, wake after sleep onset (WASO), sleep onset latency, and sleep efficiency). We found no significant difference in perceived stress levels across seasons. In general, higher perceived stress was related to poorer sleep function. Results from this study will increase students’ knowledge of the role their sleep plays in the amount of stress they experience.

Poster-116: How Does Anxiety Impact the Relationship between Neuroticism and Perceived Stress?
Authors: Daniella Toto and Molly Zimmerman
Faculty Mentor: Molly Zimmerman
College: Fordham College at Rose Hill

There is evidence that stress is linked to development of anxiety and mood disorders; therefore, anxiety and stress are often conceptualized as being related, yet still distinct. Stress is defined as a strained physical or emotional state resulting from unwanted and demanding circumstances. The way in which we think about the stress we experience is commonly defined as perceived stress. Perceived stress has been associated with poor cognitive function and physical deterioration. Prior studies have shown that an individual’s personality can impact their perceived stress levels. This study seeks to examine the role anxiety plays in the relationship between personality traits and perceived stress in young adult college students (N=187). Participants’ perceived stress levels were measured using the Perceived Stress Scale-14 (PSS-14). Participants’ personality traits were defined using The Big Five Personality Traits (emotional stability (neuroticism), intellectual openness, agreeableness, extraversion, and conscientiousness) and measured using the 50-International Personality Item Pool (50-IPIP). Participants’ anxiety symptoms were measured using the Beck Anxiety Inventory (BAI). Results showed that perceived stress was related to personality in both individuals with elevated anxiety and without elevated anxiety. This suggests that the relationship between perceived stress and personality persists above and beyond the influence of anxiety symptoms.
Poster-117: The Relationship Between Education and Rates of PTSD in Military Personnel
Authors: Kristjana McCarthy and Keith Cruise
Faculty Mentor: Keith Cruise
College: Fordham College at Rose Hill

The veteran population has frequently found itself at the center of psychological studies, particularly studies regarding post-traumatic stress disorder (PTSD). In this study, we examined the specific background factor of the level of education of service members in relation to PTSD. More specifically, we investigated if the level of education of a former enlisted member of the military is a predictor of PTSD after controlling for level of combat exposure, age, and gender. The current study hypothesizes that a lower education level, high school and below, is a risk factor for PTSD amongst enlisted members ranked E1-E4. This hypothesis was tested using 199 participants from the Resilience Center for Veterans and Families. Veterans within this program are post 9/11 veterans returning from Iraq or Afghanistan seeking mentorship and services from the Resilience Center to aid in their transition to the civilian world. The participants were sorted into four groups: group one consisted of E1-E4 with a high school degree and below, group two was E5-higher with a high school degree and below, group three was E1-E4 with an associates and higher, group four was E5-higher with an associates and higher. An ANCOVA will be run in order to investigate the relationship between education and rank. The findings of this study, if significant, can aid in the targeted counseling of soldiers who are lower in rank with less education before a deployment.

Poster-118: Readiness to Quit Smoking Among Smokers in Substance Use Treatment: Associations with Perceived Stress, Severity of Substance Use, Concerns for Relapse and Gender
Authors: Siwen Xie and Haruka Minami
Faculty Mentor: Haruka Minami
College: Fordham College at Lincoln Center

The smoking prevalence among the substance use population remains higher than the general population, resulting in greater smoking-related morbidity and mortality rates. Given many smokers in substance use treatment are hesitant to quit smoking during their initial recovery, understanding the factors that impede smokers' readiness to quit will help develop effective interventions for this high-risk population. The current study investigated the relations between perceived stress (PS), the severity of substance use (SSU), and readiness to quit smoking as well as the moderating role of concerns for relapse (i.e. concerns that quitting smoking would hurt one's recovery process (CR)) and gender among smokers receiving substance use treatment. Baseline data from 60 adult smokers receiving substance use treatment, who participated in a randomized controlled trial designed to encourage Tobacco Quitline use were used. Regression analyses showed a significant main effect of concerns for relapse, but not the severity of substance use or perceived stress, on both continuous and binary (yes/no) measures of readiness to quit in the next 30 days. Moreover, significant interaction effects (PSxGender, PSxCR) on continuous, but not binary, readiness to quit were found, such that only among men and those with lower concerns for relapse, higher perceived stress was significantly associated with reduced readiness to quit. For smokers receiving substance use treatment, providing psychoeducation to alleviate concerns that quitting smoking may hurt recovery may help increase readiness to quit, and stress management interventions may be especially beneficial among men and those with minimal concerns for relapse.

Poster-119: Caregiver-Related Correlates of Medication Nonadherence
Authors: Dominique Calandrillo, Claire Dunphy, Arjeta Cosaj, Kirk Brouwer, Ronen Arnon, and Rachel Annunziato
Faculty Mentor: Rachel Annunziato
College: Fordham College at Rose Hill

Nonadherence to medication post liver transplant is prevalent among children and adolescents. Because children rely on parents or other caregivers to provide medication management assistance, nonadherence to medication regimens may be associated with caregiver practices. This study sought to determine caregiver-related factors associated with nonadherence in pediatric post-liver transplant patients. Patients aged 0-12 and their caregivers were recruited from Mount Sinai’s Pediatric Liver/Liver Transplantation Program (N=34). Caregivers were asked to complete 8
questionnaires regarding occupation, education, social support, symptoms of distress, comprehension of health information, perceptions of illness, parenting practices, and their child’s management, knowledge, and challenges of medications and illness. Patient medical records were analyzed within 6 months of enrollment to determine tacrolimus levels in the blood; a higher standard deviation of tacrolimus indicates more erratic adherence. Correlational analyses were conducted. Results indicated that 35% of patients were considered nonadherent to their medical regimens. Tacrolimus standard deviation levels were higher in patients with less knowledge about their illness and less responsibility for managing their medication regimens, suggesting greater nonadherence. Adherence was associated with patients who were older in age and who had greater responsibility in medication management. Importantly, socioeconomic status was not correlated with nonadherence. In conclusion, nonadherence was common in this sample of young children, and it was only linked to one of the possible correlates studied. These results suggest that offering education and shared responsibilities may improve management of medication adherence among children.

**Poster-120: Using a Convolutional Neural Network to Analyze Scene and Non-Scene Regions of the Brain with Emphasis on the Ventral Stream**

Authors: Mario Badro and Elissa Aminoff
Faculty Mentor: Elissa Aminoff
College: Fordham College at Rose Hill

This study utilizes AlexNet, a deep convolutional neural network, to investigate scene selective and non-scene selective regions of the brain active during scene processing. Using AlexNet features, differences in elicited activity between scene regions (PPA, RSC, and TOS) and non-scene regions (DLPFC and Early Visual) were explained. The results are explained within the framework of the ventral stream of visual processing, which is concerned with classification, while contrasting it with the dorsal stream, which is concerned with spatial processing. The prediction was that AlexNet, a network designed to classify visual images, would correlate stronger with scene regions within the ventral stream than with those within the dorsal stream. I used representational similarity analyses to compare AlexNet features with fMRI responses to viewing scenes. Linear regressions were performed and the resulting R-values, indicating the strength of the correlation, helped support our hypothesis. Within scene selective regions, R-values were strongest for the PPA, located within the ventral stream, and were weaker for the RSC and TOS, located within the dorsal stream. Our hypothesis was further supported by comparing the results with control regions, the DLPFC, and a region in Early Visual cortex. Moreover, we examined these results using Pearson correlations in split-half analyses and found the results were reliable. In conclusion, the results are able to support the hypothesis that AlexNet performs similar processes to that of the ventral visual stream of the brain and therefore reveals how information of scenes are represented across the different brain regions.

**Poster-121: Relationships Among Autobiographical Memory Qualities and Non-Clinical Mood Characteristics**

Authors: Emily McFadden and Karen Siedlecki
Faculty Mentor: Karen Siedlecki
College: Fordham College at Rose Hill

Much of the literature surrounding mood and memory compares clinically depressed individuals with a healthy control group. The findings show that depressed participants report fewer positive autobiographical memories, suggesting that depression may be related to a bias against positive material in autobiographical memories. The present study examines whether this finding can be replicated using non-clinical samples. It was hypothesized that increased depressive symptomology would predict less positive autobiographical memories, a more positive mood or affect at the time of retrieval would predict more positive memories, and greater satisfaction with life would predict more positive memories. One hundred and forty-four participants (mean age=27.74, SD=4.63; 93.1% Caucasian; 86.1% female) completed an online survey assessing depressive symptoms, mood, positive/negative affect, and life satisfaction. Participants also retrieved six autobiographical memories and completed a questionnaire assessing characteristics of the memories, including memory valence (whether the memory was positive or negative). The correlations among the valence of the autobiographical memories and level of depressive symptoms were not significant, but were in the directions hypothesized. For example, participants with higher scores on the depressive symptoms were more likely to recall memories that were negative in valence.
measure rated their memories as less positive and more negative. For some memories, weak but significant correlations existed between positive affect and memory valence, negative affect and memory valence, and life satisfaction and memory valence, also in the directions hypothesized. These results, despite being limited by a small and non-diverse sample, support previous findings and suggest further research is necessary in the fields of mood and memory.

**Poster-122: Social-Emotional Knowledge and Language Development in Dual and Monolingual Language Learners**  
Authors: Anna Weis and Joshua Brown  
Faculty Mentor: Joshua Brown  
College: Fordham College at Rose Hill

The increasing number of dual language learners (DLLs) in the U.S. prompts an interest into the research of this group’s development in order to better meet their needs. To expand the literature on language and social-emotional development, this study asks the questions: 1) how does language development effect social-emotional knowledge in DLLs, and 2) how does this relationship compare to that of their monolingual peers? In the beginning of their preschool years, DLLs may be linguistically behind their monolingual English speaking peers because they are learning two languages rather than one. However, according to reports, these students do not seem to fall behind on social emotional development even though they may have a more difficult time communicating with monolingual peers and teachers. The current study examines information on language ability and social-emotional competencies in monolingual and DLL preschoolers who participated in a larger study that is evaluating the effects of a new social emotional learning curriculum implemented by the Jumpstart organization. This information will then be analyzed to determine the level of effect that language ability has on social-emotional competencies among the two language groups.

**Poster-123: Individual Work Performance, Work Satisfaction, Perceived Stress, Quality of Life, Anxiousness, and Depressive Attitudes of Union and Nonunion Construction Workers**  
Authors: Luke Martin and Haruka Minami  
Faculty Mentor: Haruka Minami  
College: Fordham College at Rose Hill

American Labor Unions have grown exponentially during times of economic upheaval and instability. However, recently the decline of unions across the greater United States has increased. These unions, especially in the private sector, have been under constant scrutiny due to the changing markets and the ability of nonunionized companies to resist these unionizing efforts. Recently, labor unions, specifically construction unions, have been under consistent scrutiny within the NYC metro area. Historically, unions have advocated for better working conditions, higher performance of its members, and overall higher aspects of quality of life for its members. This study examined the differences in workplace satisfaction, individual job performance, and overall aspects of quality of life between union and non-union construction workers. Regression analyses showed no discernible difference in workplace satisfaction or quality of life with regards to anxiety, depression, and perceived stress scores. A significant regression equation was found with regards to individual job performance with age being the only actual significant coefficient. A significant regression equation was found in the form of individual job performance being highly predictive of workplace satisfaction. Furthermore, the significant equations found were shown to have very small effect sizes and low variance accounted for in all models. Further psychologically oriented research is needed to understand how unions interact with employers and members, and the role they play in affecting attitudes regarding performance, satisfaction, and overall quality of life.

**Poster-124: Disclosure, Discrimination, and Mental Health of Minorities**  
Authors: Caroline Lucy, Gabrielle Piela, Molly Johnston, Jennifer Burgos, and Nicole Andreoli  
Faculty Mentor: Nicole Andreoli  
College: Fordham College at Rose Hill

Previous research has shown a relationship between minority status and poor mental health, including higher rates of depression, stress, and anxiety. Additionally, minority groups often face discrimination, contributing negatively to
well-being. This study sought to investigate how those with a minority identity, specifically immigrants, those who have had an abortion, and sexual, gender or racial minorities report levels of anxiety, stress, depression, and optimism differently than those without such identities in the political and cultural context of Donald Trump's presidency. Voting choice and perceived discrimination were also investigated in relationship to these variables. We anticipated that minority individuals would report higher levels of depression, stress, and anxiety, and lower levels of optimism. Results revealed interesting relationships that did not support these hypotheses. First, while results supported previous literature that perceived discrimination is positively correlated to depression, anxiety, and stress, and negatively to optimism, minority status did not have any influence on these variables. Second, those who responded that they were not LGBTQ reported significantly less discrimination than those who preferred not to answer, but no differently than those who were LGBTQ members. Next, those who did not answer who they voted for reported significantly higher depression and stress, and lower optimism than those who indicated that they voted for either Clinton or Trump. These results indicate that there may be important differences between those who feel comfortable disclosing personal or sensitive information, specifically sexuality or voting choice, and those who do not. Future research should investigate this further to understand how nondisclosure affects mental health.

**Sociology**

**Poster-125: Clinical Trials Research: An Ethical Review of Compensation & Disclosure of Genetic Results**
Authors: Caroline Lucy, Gianna Insogna, Luke Martin, Hadas Richardson, Joanna Theophilopoulos, and Matthew Weinshenker
Faculty Mentor: Matthew Weinshenker
College: Fordham College at Rose Hill

Clinical trials are four-phase tests of medical, surgical, or behavioral interventions including drugs, devices, activities, or procedures in order to test the safety and efficacy of a new treatment for the general population. While there are several rules outlined in reports such as the Presidential Commission Report, Belmont Report, IRBs, and informed consent procedures that are in place to protect participants’ rights, there is much debate surrounding various ethical dilemmas in clinical trials. This presentation will focus on two such dilemmas: the payment of clinical research subjects, and disclosure of genetic results to participants. We begin by explaining what clinical trials are, why they are conducted, who is involved, the four phases, and participant protection rights. Next, we will discuss the issue of ethically compensating participants, including the differences between fair compensation, undue inducement, and coercion. We will then describe current and proposed approaches to disclosing genetic results to individuals and review a study that surveyed attitudes toward genetic disclosure in relation to clinical trial participation. We conclude by providing several examples of disclosure and the results of these incidents.

**Poster-126: Deception in Research**
Authors: Alexandra Martocci, Cynthia Collini, Jillian Meyer, Dana Scozzari, Calandra Stavroudis, and Matthew Weinshenker
Faculty Mentor: Matthew Weinshenker
College: Fordham College at Rose Hill

This presentation seeks to analyze the ethical concerns that arise when deception is present, intentionally or unintentionally, in research. Deception involves the researcher providing incorrect or incomplete information to their research subjects where the goal is to mislead them to gain certain types of information from the study. However, deception arises unintentionally sometimes when the participants and the researchers are not clear with one another about the specifics of the study. Controversial experiments such as the Milgram experiment (1961) have led to increased regulations on when deception in research is permitted and necessary. Researchers are instructed to use deception as a last resort method to gain the data that they are seeking. Before a study is implemented, an Institutional Review Board (IRB) must approve a consent procedure which does not include, or which alters, some or all of the elements of informed consent. There is still an ongoing debate about whether or not deception in research is necessary or ethical, as participating in this process may lead to negative psychological impacts. Lastly, we will analyze these
documented psychological impacts from participants exposed to both direct and indirect deception in order to
determine whether deception is necessary and ethical.

**Poster-127: Research Integrity and Conflicts of Interest**
Authors: Molly Oshinski, Brianna Sullivan, Katherine Horgan, Rena Brand, Francesca Collini, and Matthew
Weinshenker
Faculty Mentor: Matthew Weinshenker
College: Fordham College at Rose Hill

Results are often manipulated by researchers, who violate established guidelines, due to conflicts of interests and poor
research integrity. These issues affect research outcomes as well as the population that the research is studying. We
examine different ways that researchers manipulate these results through methods such as guessing, dubious
definitions, questionable measurement, and poor statistics. We also establish reasons for why researchers manipulate
their results, such as how economic and political benefits can limit what researchers’ study, how they conduct research,
and how they disseminate the findings. The differences between biomedical and social research are studied to
determine if integrity and conflicts of interest differ between the two disciplines. Finally, we examine current policies
which have been put into place as preventative measures against conflicts of interest and their effectiveness within the
research community. By studying conflicts of interest and considering the effectiveness of current preventative
policies, we hope to shed light on the current research climate and provide ways to improve it.

**Poster-128: Children and the Elderly**
Authors: Lauren Conlon, Jennifer Anderson, Evan Finnerty, Brianna Horan, Adara Mifsud, and Matthew
Weinshenker
Faculty Mentor: Matthew Weinshenker
College: Fordham College at Rose Hill

This presentation evaluates issues of informed consent, participant vulnerability, and the protection of autonomy in
research literature involving children and the elderly. We will provide evidence that the elderly have been highly
underrepresented in research due to limitations in compromised health, susceptibility to dangers, reduced
communication, and cognitive function. The work will emphasize the importance of ensuring that participants have
full decisional capacity to consent when conducting research on the elderly, especially elders with mental impairments.
The presentation also reviews adjustments made by ethnographic researchers in their approaches to the consent and
interview processes to account for age and mental capacity when conducting research on both children and the elderly.
As children’s roles in the research process have been re-evaluated, more and more researchers seek active assent from
child participants. With this in mind, we will cover the method of process-consent in order to delineate contextual and
behavioral cues related to the child’s decision on consent. We will also consider the Willowbrook Hepatitis study,
which raised ethical concerns regarding parental consent in a vulnerable population that led to medical
accomplishments. Assessment of research risks should reflect the diversity among individuals in the groups under
investigation. Overall, we will argue that it is important for researchers to pay greater attention to ethical principles
when conducting research on both children and the elderly.

**Poster-129: The Effects of Community Gardens on Crime in the Bronx**
Authors: Matthew Iannone and Emily Rosenbaum
Faculty Mentor: Emily Rosenbaum
College: Fordham College at Rose Hill

The occurrence of crime in low-income areas is aided by the area’s physical decay and lack of social cohesion that
comes from it. Recently, studies have suggested that the inclusion of communal spaces such as parks, community
centers, and gardens may help to reverse urban blight and increase social order and social organization, thus increasing
social cohesion. When property falls into decline it is a sign in the neighborhood that residents do not care about their
land and will not do anything to remedy the destruction. The crime opportunity for potential criminals is high when
there is nobody watching. This study aimed to test these theories in the Bronx. The locations of 108 community
gardens and 8,158 violent crimes from 2016 to 2017 were translated into their respective Neighborhood Tabulation Areas (NTA) in order to compare crime rates between the 38 neighborhoods of the Bronx. Social, economic, demographic, and housing data from the American Community Survey (ACS) provided the variables used to observe the effects of community gardens on the crime rates for each NTA. This study aims to contribute to the new field of environmental criminology by demonstrating the crime mitigating effects of community gardens.

**Strategy and Statistics**

**Poster-130: Effects of the Expansion of the American University System on Domestic Advanced Literacy Rates**
Authors: Robert Magee and Falguni Sen
Faculty Mentor: Falguni Sen
College: Fordham College at Rose Hill

The domination of the university system in American society is a contemporary phenomenon critical to understanding the current and future position of the American populous’s educational standing. Four-year college enrollment has skyrocketed over 29% between 1994-2014, and the number of accredited Title IV institutions has gone up over 10% between 2000-2014, with a staggering 33.4% of adults age 25 and older holding a bachelor’s degree in 2016, compared to ~22% in 1994. A main function of the university system in the United States is to increase the literacy rates of its populous; however, there has never been an evaluation of whether the university system, over the last half century, has meaningfully increased the average American’s level of advanced literacy. Using data collected in the IALS (International Adult Literacy Survey), ALL (National Assessment of Adult Literacy), and PIAAC (Program for the International Assessment of Adult Competencies) from the time series 1994-2014, it appears that advanced literacy rates of the college educated demographics within the time series population have not changed in a statistically significant manner. This indicates that despite the rapid expansion of the American university system, domestic advanced literacy rates of the population within the time series have not changed. This implies that colleges have not taught the educational tools needed to score higher on advanced literacy tests designed to specifically measure college educated individuals. It can thus be concluded that colleges and universities have not sufficiently educated their students over the last two decades.

**Women, Gender, and Sexuality Studies**

**Poster-131: Q+: A Short Film**
Authors: Colleen Granberg and Orit Avishai-Bentovim
Faculty Mentor: Orit Avishai-Bentovim
College: Fordham College at Rose Hill

This project is an analysis and critique of how conventional notions of sex, gender, and sexuality are evolving through the medium of a short film, no more than 40 minutes in length. “Q+” looks at the role that social media and pop culture have played in shifting public attitudes towards LGBTQ+ issues, and explores the ways in which different institutions – whether they be religious, legal, or social – impose oppressive gender and sex roles at the expense of individual people. The film is split into three chapters, and each one will follow a main character – one genderfluid, one asexual, and one lesbian – through a series of vignettes about their life. It is a coming of age story that pulls from the works of gender and queer theorists like Judith Butler, Anne Fausto-Sterling, and Georgiann Davis (among others), and also relies heavily on anecdotal research that has been conducted with Fordham students across various genders, races, sexualities, and abilities. The process is open and inclusive, giving actors an opportunity to collaborate with the script and share their feedback to help shape their characters, and with LGBTQ+ actors cast in every role. The main goal of the film is to be an accessible piece of LGBTQ+ media for people who do not have LGBTQ+ inclusive education. This film will give voice and representation to identities that are misrepresented or underrepresented in most mainstream media.
Marketing

Poster-132: Effectiveness of Digital Marketing on College Students: Survey at 2018 AMA Conference
Authors: Nicole Into, Sean Todd, and Marina Carnevale
Faculty Mentor: Marina Carnevale
College: Fordham College at Rose Hill

Fordham Marketing Association attended the American Marketing Association International Collegiate Conference, where we conducted a field survey to gain knowledge on how FMA can most effectively reach Fordham’s Gabelli School of Business students through digital media and better the club’s current marketing strategy among the Fordham community. Our hypothesis stated Facebook and email are the most effective platforms to gain and retain members. Passing students attending the AMA conference were asked to fill out a Google Form while they toured FMA’s conference exhibit. The demographics of the participants from the survey were current undergraduate students at a four-year institution in the United States, studying marketing or a related field. First, participants were asked to list their age, graduating year, major, academic institution and location. Next, they were asked which digital media sources they received most of their updates from (Snapchat, Twitter, Instagram, Facebook, Email; pick two). Finally, they were asked which platform is the least intrusive (Snapchat, Twitter, Instagram, Facebook, Email; pick two). These results allowed us to determine what forms of digital media are most effective for FMA to advertise to Gabelli students.
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