FORDHAM COLLEGE AT ROSE HILL NINTH ANNUAL
UNDERGRADUATE RESEARCH
SYMPOSIUM

Showcasing Undergraduate Research in the Sciences, Social Sciences, and Humanities

Wednesday, April 13, 2016
Noon to 5 p.m. | McGinley Center | Rose Hill Campus
Dear Attendees,

Welcome to the 9th Annual Undergraduate Research Symposium at Fordham College at Rose Hill. Today we celebrate the accomplishments of our 317 dynamic undergraduate students who have engaged in original research, as well as our dedicated faculty mentors who have shared their own passion and curiosity for knowledge with these students.

Creating new knowledge and sharing it with their colleagues and peers, the work of our presenters reflects a deep commitment to academic excellence. We are proud of them all.

We are grateful to all who contributed to the success of this event: presenters, co-authors, faculty mentors, as well as faculty and staff, friends, family, alumni, and guests. We encourage you to attend the conference sessions, view the posters, and ask these outstanding young scholars about their work.

Finally, I would like to extend a special thanks to the following persons and groups for their exceptional generosity of time and enthusiasm toward this event: the staff members and student workers of the FCRH Dean’s Office; the FCRH Undergraduate Research Grants Committee*; Jessica Baker and Nicole Sano of Fordham’s Office of Marketing and Communications, Cody Acuri and Carol McNamara of Students Affairs, and the generous support of the Fordham College Alumni Association.

Warmest Regards,

Erin Burke, J.D.
Director of Undergraduate Research

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The Ninth Annual Fordham College at Rose Hill
Undergraduate Research Symposium
April 13, 2016 | McGinley Center | Rose Hill Campus

Schedule of Events

11:00am  Registration Opens for Symposium Participants

12pm-3pm  Oral Presentations
          *Lunch Served in Conference Rooms*

3:00pm  Celebratory Remarks
         Jonathan Crystal, Ph.D.
         *Associate Vice President for Academic Affairs*

         Boniface A. Zaino, FCRH ’65 & Alison Zaino
         *Supporters of Undergraduate Research*

3:15pm  Presentation of Fordham Undergraduate Research Faculty Mentor Awards

3:30pm-5pm  Poster Presentations
             McGinley Ballroom and McGinley Lounge
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<td>Law and Social Justice</td>
<td>Evolving Attitudes toward Women and Gender Roles</td>
<td>Archaeology and Ethnology</td>
<td>Integrative Neuroscience</td>
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<td>1-2 pm</td>
<td>Faith &amp; Unrest in the Middle East</td>
<td>Women, Media and Contemporary Politics</td>
<td>Models in the Sciences</td>
<td>Sleep, See and Pray: Mental Health and Learning</td>
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<td>Violence, Torture and Contemporary Politics</td>
<td>Exploring Fine Arts</td>
<td>Advanced Topics in Financial and Quantitative Analysis</td>
<td>Meeting College Student Challenges</td>
<td>Meeting Challenges of Contemporary Urban Life</td>
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ORAL PRESENTATIONS:
NOON-1PM

**Law and Social Justice**
Music Room 12-1pm

- Oral-29: The Impact of Substance Use and Trauma Stress Reactions in a City Court Treatment Program, *Anthony Fortuna*
- Oral-18: Al Smith, Catholic Bishops, and FDR: At the intersect of social policy and ecclesial influence, *Nicholas Sawicki*
- Oral-16: Calling the Cops: Conversations about Racism in Policing, *Sarah Allison*

**Evolving Attitudes toward Women and Gender Roles**
McGinley 234 12-1pm

- Oral-1: Examining Attitudes About Working Mothers: The Effects of Time, Education, and Gender, *Mikela Ryan*
- Oral-32: Gender Differences in Competition and Distribution, *Michael Guadio*
- Oral-14: Kathak Dance Through and Beyond the Male Gaze, *Monica Sobrin*

**Archaeology and Ethnology**
McGinley 235 12-1pm

- Oral-47: Understanding the Maya: Archaeological Investigation at Blue Creek, Belize, *Margaret Desmond*
- Oral-44: The Status of Infants in the Ifugao Family Unit: A Case Study in the Old Kiyyangan Village Based on Infant Jar Burials, *Margaret Desmond*

**Integrative Neuroscience**
McGinley 236 12-1pm

- Oral-22: Cognition and Impact Severity Correlation, *Davis DeFontes*
- Oral-12: Convolutional Neural Networks as Models of Human Visual Selectivities, *Ivan Iotzov*
- Oral-7: Impaired cone photoreceptor response due to lack of phagocytosis receptor protein αβ5 integrin or its ligand MFG-E8 is associated with normal cone morphology but elevated cone opsin expression, *Diana Shao*

**The Environment and Pollutants**
McGinley 237 12-1pm

- Oral-55: Development of nanoscale-iron chelators to stimulate erythropoietin expression under hypoxic conditions, *Steven Romanelli*
- Oral-5: First-row transition metals based electrocatalysts for cost-efficient fuel cells, *Título Aimola*
- Oral-11: Computational and Empirical Studies of Pyrazoline-Based Dendrimers for use as Encapsulating Agents, *John Caruso III*
# ORAL PRESENTATIONS:
## 1PM-2PM

## Faith and Unrest in the Middle East
**Music Room 1-2pm**

- Oral-24: Democracy Groups as a Social Space for Convergence in the Jordanian Political Activist Community, *Jérémie Langlois*
- Oral-25: A Lived Religion Approach to Muslim Youth Experience: Challenges and Responses to Muslim Identity, *Thomas D’Agustino*

## Women, Media and Contemporary Politics
**McGinley 234 1-2pm**

- Oral-53: Women's Active Engagement in Acts of Civil Disobedience in Ukraine from WWII to the Euromaidan, *Maria DeCasper*
- Oral-51: Political Knowledge in a Digital World, *Anisah Assim*
- Oral-41: Political Efficacy Among African American Women, *Niara Walden*

## Models in the Sciences
**McGinley 235 1-2pm**

- Oral-26: Constructing a Holographic Higgs: The Guage/Gravity Duality and Lattice Quantum Field Theories, *George Davila*
- Oral-17: Bottom Up Approach to Rebuilding Tissue at the Nanoscale, *Grant Knoll*
- Oral-2: L2-Syntaxin 18 Binding Motif Necessity in Infection, *Emma DeGrace*
- Oral-4: Fabrication of Core-Shell, Transition Metal Nanowires as Catalysts for Glucose Sensors, *Alexis Kassotis*

## Sleep, See and Pray: Mental Health and Learning
**McGinley 236 1-2pm**

- Oral-45: The Effects of Color within Environment on Cognitive Performance, *Nicholas Eliades*
- Oral-13: Simone Weil and Mental Health: A Theological Approach to Reframing Depression, *Ailie Posillico*

## Science and Our Environment
**McGinley 237 1-2pm**

ORAL PRESENTATIONS:
2PM-3PM

Violence, Torture and Contemporary Politics
Music Room 2-3pm

Oral-8: Redux or Revolution? The Irish Nexus of Anglo-American Counterinsurgency and Torture in the Muslim World, Joseph O’Brien
Oral-20: The Purpose and Prevalence of Torture in Mexico from 1968-2000, Thomas Samuelson

Exploring Fine Arts
McGinley 234 2-3pm

Oral-58: Representations of the Artist-Figure in Nabokov's Pale Fire, Amy Palen
Oral-56: Examining Teresa Deevy's Critique of Gender Roles in Katie Roche, Jennifer Beall
Oral-54: The Golden Apple: Pietro Andrea Mattioli's Influence on the Usage of the Tomato in Renaissance Italy, Cristina Iannarino
Oral-38: Hogarth: Culturally Relevant and Reflective - Looking at Hogarth's Marriage a-la-mode and A Harlot's Progress, Christiana Shovlin
Oral-36: Collaborative Jazz-Hop: Its Driving Motivations and Musical Implications, Samuel Farnum

Advanced Topics in Financial and Quantitative Analysis
McGinley 235 2-3pm

Oral-59: Decreasing Uncertainty and Identifying Arbitrage Opportunities in the Equity Option Market, Matthew Scheivert
Oral-57: Valuable Partnerships: Corporations and Small Businesses, Grace Martin
Oral-52: Pirate Trading Platform: Open-source algorithmic trading for the average investor, Aaron DeVera
Oral-15: Principled Profits: Evaluating B Corp as a Stakeholder Value Model of Corporate Governance, Rebecca McSween

Meeting College Student Challenges
McGinley 236 2-3pm

Oral-50: Are We Ready? The Process of Preparation by Students for an International Medical Volunteer Trip, Margaret Desmond
Oral-30: The University as a Democratic Reality? Student Loans and Student Lives, Timothy Bouffard
Oral-28: Life Satisfaction and Depression During the Transition to College, Tiffany McKay
Oral-23: Classically Conditioned Relaxation Responses Among College Students, Julia Yon

Meeting Challenges of Contemporary Urban Life
McGinley 237 2-3pm

Oral-42: Gentrification and Urban Displacement Surrounding Fordham University's Bronx Community, Ryan Fleites
Oral-34: Residential Segregation in New York City and Washington, DC, Jennifer Willis
Oral-31: Feeding America's Growing Cities: The Role of Urban Agriculture in the Future of Food Distribution and Access, Leigh Anne Statuto
Oral-3: Parental Involvement in Preschools: A study of immigrant parents, Anthoula Vasiliou
Oral-1

Examining Attitudes About Working Mothers: The Effects of Time, Education, and Gender
Mikela Ryan, Sociology and Anthropology, Fordham College at Rose Hill, Matthew Weinshenker*, Sociology and Anthropology, Fordham College at Rose Hill

This paper discusses the impacts of time, education, and gender on the evolution of attitudes towards working mothers and egalitarian partnerships. Analysis of this topic is based on data collected by the General Social Survey (GSS) in 1977, 1988, 1998, and 2014. I proposed that the further back I examined the more negative views I would find about women in the workplace, that the more highly educated a person was the more support they would show for egalitarian partnerships and working mothers, and that females would have more positive views than males about their own perceived gender roles. The results show that these each of the hypothesis were supported. Those who have not attended college usually have traditional expectations of gender roles, while those who have attended some college or completed college have more egalitarian attitudes. When education is held constant, females always show stronger support for more egalitarian roles when compared with their male counterparts. The change over time in attitudes is incredible and is the strongest predictor of these attitudes. Support for working mothers and more egalitarian partnerships will continue to steadily increase, but women themselves will continue to be more supportive of their own gender roles when compared with the opinions of men. As time goes on attitudes about women’s gender norms will continue to be less traditional and the desire for more egalitarian partnerships will gain traction.

Oral-2

L2-Syntaxin 18 Binding Motif Necessity in Infection
Emma DeGrace, Biological Sciences, Fordham College at Rose Hill, Xavier Simon, Biological Sciences, Fordham College at Rose Hill, Patricio Meneses*, Biological Sciences, Fordham College at Rose Hill

HPV is the most common sexually transmitted infection, and while most mucosal HPV strains are benign, several strains can lead to genital warts and cancers such as cervical, vaginal, and oropharyngeal. HPV 16 and 18 account for 50 and 18 percent of all cervical cancer cases, respectively. The HPV virus consists of DNA held within a protein shell, or capsid. The protein capsid of HPV is composed of two major proteins: L1 and L2. The L2 protein has been shown to be necessary for infection. In this project, a motif of an L2-syntaxin 18 binding site on the L2 protein was mutated to see if the region is necessary for infection. The residue in particular is only five amino acids long (40-45) and is responsible for the binding of the L2 protein to the trafficking protein syntaxin 18 of the endoplasmic reticulum.

Oral-3

Parental Involvement in Preschools: A study of immigrant parents
Anthoula Vasiliou, Sociology and Anthropology, Fordham College at Rose Hill, Orit Avishai*, Sociology and Anthropology, Fordham College at Rose Hill, Emily Rosenbaum*, Sociology and Anthropology, Fordham College at Rose Hill

Parental involvement is often identified as a significant factor for children’s academic success. This study aims to add to the literature on low-income Latino immigrant parents’ involvement by focusing particularly on such parents of preschool-age children and their involvement within the school environment. This is achieved through semi-structured interviews with eighteen parents and seven staff members at a preschool center in the Bronx, New York. Their involvement is assessed using three indicators: participation at events/use of services, communication with teachers and staff, and selection of a kindergarten program. It was found that these parents placed great value on their children’s education and were most engaged in activities that directly related to their children’s academic progress, but less engaged in aspects that had to do with the family or other personal issues. To improve the frequency of these parents’ involvement within the school, the staff should normalize the idea of seeking assistance for social services through the school by expressing the availability of these resources more efficiently, forming more direct connections with outside agencies and increasing the communication between parents and staff through home visits.
Oral-4

Fabrication of Core-Shell, Transition Metal Nanowires as Catalysts for Glucose Sensors
Alexis Kassotis, Psychology, Fordham College at Rose Hill, Christopher Koenigsmann*, Chemistry, Fordham College at Rose Hill

Over 9.3% of the U.S. Population suffers from Diabetes Mellitus. Therapy relies on accurate determination of serum glucose levels. There has been a recent interest in developing enzyme-free sensors for measuring blood glucose concentration because they are more robust and easier to produce than sensors based on the glucose oxidase enzyme. Current limitations of enzyme-free detectors are their dependence on expensive platinum (Pt) metal and their low selectivity for glucose among other species such as urea and amino acids in biological fluids. To overcome existing limitations, we have designed a new class of electrocatalysts consisting of inexpensive transition metal cores coated with precious metal shells for the glucose oxidation reaction. The proposed sensing platform is designed to increase cost-effectiveness since the precious metal content is localized only at the catalytic interface. Transition metal nanowires were created using an ambient, solution-based method, allowing for control of both wire composition and aspect ratio. We have also successfully developed approaches to deposit thin precious metal shells on the surface of the transition metal nanowires with control over the composition and thickness of the shell. Our synthetic methods allow us to tune the composition and structure of the catalytically active surface sites, which we expect will allow for higher overall catalytic activity and selectivity for glucose.

Oral-5

First-row transition metals based electrocatalysts for cost-efficient fuel cells.
Túlio Aínola, Chemistry, Fordham College at Rose Hill, Christopher Koenigsmann*, Chemistry, Fordham College at Rose Hill

The main goal in this research project is to develop new and more cost-effective catalysts for Polymer Electrolyte Membrane Fuel Cells (PEMFCs). PEMFCs are promising devices for power generation with low environmental impact because they use hydrogen gas as its fuel and produce water as its only byproduct. The hydrogen oxidation reaction (HOR) and the oxygen reduction reaction (ORR) are catalyzed by platinum or other precious metal nanoparticles supported on carbon catalysts. However, high catalyst and precious metal loadings are required because of slow reaction kinetics and poor long-term durability. Recent reports have shown that one-dimensional and core-shell nanostructures are significantly better catalysts for fuel cells. Aiming to further reduce the high costs of platinum catalysts, first-row transition metals will be used as inexpensive core materials on which we will deposit thin precious metal layers. The target core-shell nanowires will be synthesized by an efficient method that is beneficial because it employs green chemistry, relies on non-toxic solvents and is performed under ambient conditions. We expect that tuning the size and composition of the core and the thickness and composition of the shell will allow us to produce a highly active fuel cell catalysts with low platinum loadings.

Oral-6

Ethnic/Racial Identity, Sleep Quality, and Daily Life Satisfaction
Jennefer Ortega, Psychology, Fordham College at Lincoln Center, Bridgette Betzler, Psychology, Fordham College at Lincoln Center, Tiffany Yip*, Psychology, Fordham College at Rose Hill

The current study explores how dimensions of ethnic/racial identity and sleep quality predict life satisfaction. Components involved in determining this relationship include private regard—one’s own feelings about belonging to the ethnic/racial group as well as his/her own feelings towards their ethnic/racial group—and ethnic/racial centrality—the degree to which one feels their ethnicity/race impacts one’s own identity (Scottham et al., 2008; Sellers et al., 1998). Research has suggested that ethnic identity is not a moderator on life satisfaction (Shin et al., 2010), which leads to the question if what makes up an ethnic identity has an effect on sleep quality and life satisfaction. The sample consisted of minority high school males (n = 50; M age = 15.2 years old; Ethnicity/race: 19% African American, 12% Asian, 65% Hispanic, 4% Other). Participants were asked to complete a set of surveys on a nightly basis for two weeks, including the Multidimensional Inventory of Black Identity (MIBI), the Student Life Satisfaction Scale (SLSS) and the Pittsburgh Sleep Quality Index (PSQI). Results suggested that the effect of private regard on life satisfaction was mediated by sleep quality.
Oral-7
Impaired cone photoreceptor response due to lack of phagocytosis receptor protein αβ5 integrin or its ligand MFG-E8 is associated with normal cone morphology but elevated cone opsin expression
Diana Shao, Integrative Neuroscience, Fordham College at Rose Hill, Silvia Finnemann*, Biological Sciences, Fordham College at Rose Hill

In mammalian eyes, phagocytosis of photoreceptor debris by retinal pigment epithelial (RPE) cells is important for long-term maintenance of photoreceptor function. MFG-E8 and αβ5 are two proteins known to be necessary for the phagocytic activity of RPE cells. Electroretinogram recordings of retinal neuronal activity in response to light previously performed in the lab had shown that αβ5 knockout and MFG-E8 knockout mice have impaired cone photoreceptor responsiveness to light compared to wild type mice. In this thesis study, we aimed to test if cone structure or composition were altered in the two strains of knockout mice. We found that western blotting αβ5 knockout and MFG-E8 knockout retina had higher concentrations of the light-sensing protein cone opsin than wild type retina. However, fluorescence microscopy of retinal sections in wild type, αβ5 knockout, and MFG-E8 knockout mice revealed no obvious difference in cone outer segment length or density. We conclude that the impaired function of cones in αβ5 knockout and MFG-E8 knockout mice is most likely not due to a difference in morphology but possibly due to abnormal protein content of cone photoreceptors.

Oral-8
Redux or Revolution? The Irish Nexus of Anglo-American Counterinsurgency and Torture in the Muslim World
Joseph O'Brien, Political Science & History, Fordham College at Rose Hill, W. David Myers*, History, Fordham College at Rose Hill

The links between U.S. torture in counterinsurgency campaigns and the French experience in Algeria deserve the attention they receive from scholars; however, the similar political and legal dynamics as well as the similar tortures employed during American and British campaigns in the Muslim World have been largely overlooked. This survey sheds light on this long-overlooked relationship. The campaigns in Iraq and Afghanistan exhibited provisional military governance, the presence of paramilitary organizations, and expanded state power which facilitated the use of torture and coercion. A similar context prevailed in Aden and Palestine, following a pattern set by the British during their twentieth century campaigns in Ireland. The “five techniques” and their forerunners, developed by former Black and Tans’ in Palestine, display striking similarity to U.S. tortures in their sexual nature. However, a direct lineage between U.S. and U.K methods is limited because essential elements of these tortures are descended from French techniques. British and American forces also widely viewed adversaries ethnically different from them through an orientalist filter. This was influenced by the self-identification of insurgents which motivated and justified torture and coercion among both nations’ forces. American torture in the Muslim World is neither a redux to nor a revolutionary advancement from the British example. Instead, it is a phenomenon governed by similar geopolitical circumstances and somewhat inspired by an irregular British torture tradition of expanded power, ad hoc methods, and bigoted attitudes which were forged and fully realized in Ireland following their maturation in the Muslim World.

Oral-9
Pain-Mediated Changes in Trigeminal Ganglion Vasculature
Matthew Challman, Integrative Neuroscience, Fordham College at Rose Hill, Silvia Finnemann*, Biological Sciences, Fordham College at Rose Hill

Chronic pain, defined any pain that lasts more than 3 months, affects 11.2% of adult Americans at some point in their lives, and can rarely be cured. Some chronic pain, such as neuropathic pain, is caused by damage to the nervous system itself, sensitizing peripheral nerves and leading to a hyper-excitible state in which no stimulus is needed to cause pain. Nerve injury of this type is reported to cause an increase in the extent and architecture of blood vessels in the sensory ganglia in rats. However, the methods used in that study to analyze vasculature involved tissue slicing and 3D reconstruction of the ganglia, which is time consuming and risks loss of data. New methods of tissue clearing can achieve transparency of the entire tissue, allowing for 3D imaging without the disruption of tissue architecture. The objective of this study was to determine whether there are changes in the vasculature of the brain and trigeminal ganglion in a pain model mouse. Brains and trigeminal ganglia (TG) of control and pain model mice underwent clearing and immunohistochemistry. Tissues were imaged using a confocal Leica SP5 microscope and images were analyzed using Imaris software and ImageJ. In our pain model, increases in total vasculature volume were statistically
significant compared to controls (Student’s t-test, t(3)=6.82, p=0.0064). These results support the theory that a hyper-excitible environment, made up of factors including the increased blood flow resulting from over-vascularization, may lead to the hypersensitivity in neurons and result in chronic pain.

Oral-10

**Smartwatch-based Activity Recognition: A Machine Learning Approach**

Jessica Timko, Computer and Information Sciences, Fordham College at Rose Hill, Catherine Gallagher, Computer and Information Sciences, Fordham College at Rose Hill, Andrew Schreiber, Mathematics, Fordham College at Rose Hill, Kenichi Yoneda, Computer Science, Fordham Graduate School of Arts and Sciences, Gary Weiss*, Computer and Information Sciences, Fordham College at Rose Hill

Smartwatches and smartphones contain accelerometers and gyroscopes that sense a user’s movements, and can help identify the activity a user is performing. Research into smartphone-based activity recognition has exploded over the past few years, but research into smartwatch-based activity recognition is still in its infancy. In this research we compare smartwatch and smartphone-based activity recognition, and smartwatches are shown to be capable of identifying specialized hand-based activities, such as eating activities, which cannot be effectively recognized using a smartphone (e.g., smartwatches can identify the “drinking” activity with 93.3% accuracy while smartphones achieve an accuracy of only 77.3%). Smartwatch-based activity recognition can form the basis of new biomedical and health applications, including applications that automatically track a user’s eating habits.

Oral-11

**Computational and Empirical Studies of Pyrazoline-Based Dendrimers for use as Encapsulating Agents**

John Caruso III, Chemistry, Fordham College at Rose Hill, Amy Balija*, Chemistry, Fordham College at Rose Hill

Organic pollutants in the drinking water supply present a serious threat to both human and environmental health. Current means of removing organic pollutants from aqueous solutions such as activated carbon and reverse osmosis are becoming inadequate. Consequently, new methods of extricating organic pollutants including polycyclic aromatic hydrocarbons (PAHs) from water are needed. Dendrimers are an attractive vehicle for pollutant removal due to their large interior voids which can entrap small organic molecules. This research focused on developing pyrazoline-based dendrimers and investigating their ability to encapsulate pyrene, a carcinogen. In this talk, attempts at synthesizing a pyrazoline-based dendrimer will be discussed. Additionally, computational studies on detecting encapsulation with H-NMR spectroscopy will also be shown.

Oral-12

**Convolutional Neural Networks as Models of Human Visual Selectivities**

Ivan Iotzov, Integrative Neuroscience, Fordham College at Rose Hill, Daniel Leeds*, Computer and Information Sciences, Fordham College at Rose Hill

The visual selectivities of neurons in the intermediate ventral stream of visual processing remain as of yet poorly understood. While there have been significant advances in understanding the higher and lower visual areas, intermediate areas pose distinct challenges that call for novel approaches in understanding their visual selectivities. Recently, the computer vision field has made some very promising breakthroughs using convolutional neural nets (CNNs), and I am testing these as models for human visual processing. I am comparing a set of fMRI neural responses from humans viewing natural images, to the responses of the artificial “neurons” within the CNN at various steps in the image processing. The CNN being used is a model that has been pre-trained on the ImageNet database of approximately 1.2 million natural images. The first 5 layers of the network are the convolutional layers that contain the image filters, or kernels, that will be used as the models for human visual selectivity. Currently, I am focusing on CNN layer 2, but will broaden my analysis throughout the course of this project. In my preliminary findings, about 25% of the kernels have a strong match ($|r| > 0.2$) with at least one voxel within the visual stream, with most of the matches concentrated in V2.
Simone Weil and Mental Health: A Theological Approach to Reframing Depression
Ailie Posillico, Psychology, Fordham College at Rose Hill, Brenna Moore*, Theology, Fordham College at Rose Hill

The most recent version of the Diagnostic Statistical Manual for Mental Disorders (DSM-5) provides parameters for establishing a mental illness. According to the DSM-5, a mental illness is explained as a behavioral or psychological manifestation within an individual that reflects an underlying psychobiologic dysfunction. The consequences of this manifestation must hinder an individual’s daily ability to function to fit the category of mental illness. Furthermore, the manifestation must not primarily be a result of social deviance or conflicts with society, nor may it be merely a reaction to a common stressor, for example, the death of a loved one (DSM-5, 2012). Of those US adults diagnosed with a mental health condition, depression leads at 26% cases (Kessler, Chiu Demler O & Walters, 2005). Although not a diagnostic criteria for depression, rumination or the obsessive, abnormal reflection upon an idea or deliberation over a significant decision, is a common feature of this illness (APA, 2000). The analytical rumination (AR) hypothesis proposes that depression’s function is to minimize the disruption of rumination and sustain the analysis of complex problems (Andrews & Thompson, 2009). This existential approach to understanding depression therefore postulates that mood symptoms consistent with depression may be adaptive and so beneficial. As AR hypothesis supplies a somewhat controversial frame to today’s understanding of depression, Simone Weil (1909-1943) French philosopher, political activist, and prolific writer approached suffering with a technique contrary to that of her contemporaries. Writing during a time of great suffering, Weil comments that those who suffer “have no need for anything in this world but people capable of giving them attention” (Weil 114). The present research aims to establish ways in which the theological ideas of Simone Weil can be a guide to reframing diagnoses of mental illness, specifically depression, in hopes of combatting present negative stigma correlated with mental health issues.

Kathak Dance Through and Beyond the Male Gaze
Monica Sobrin, Women’s Studies and English, Fordham College at Rose Hill, Orit Avishai*, Women’s Studies, Fordham College at Rose Hill

Kathak, one of the ancient classical dance styles of North India, has a rich history spanning from the ancient Brahminical tradition to Mughal courts, the British Raj, and finally the post-colonial state. Unfortunately, its tale is also one of misogyny; throughout India’s history, Kathak has not solely been a detached, innocent art form that was acted upon by outside imperialist and colonial forces. Rather, it has been used as a tool to influence particular power dynamics and cultivate specific ways of thought by those in the position of power. Today’s accepted narrative has been written and rewritten – at the expense of lower-class Muslim women who helped shape the dance’s development and formation – to appeal to middle-class and western audiences. This paper traces the chronicle of Kathak dance throughout its history and explores feminist reinterpretations in (1) Mughal Court, (2) British Colony, and (3) “post-colonial” state. By critically analyzing, deconstructing, and intentionally reclaiming Kathak’s history throughout these eras of Indian history it is possible to avoid the deterioration of the art, resist further oppression of marginalized voices, and examine the effects of imperialism the “post-colonial” state.

Principled Profits: Evaluating B Corp as a Stakeholder Value Model of Corporate Governance
Rebecca McSween, Economics, Fordham College at Rose Hill, Troy Tassier*, Economics, Fordham College at Rose Hill

Many business leaders agree that climate change threatens their businesses and society. Firms have often used philanthropy and corporate social responsibility to address this threat, meaning that their principally profit-maximizing businesses “give back” to society outside of their revenue-producing activities. In contrast, other corporate models integrate environmentally sustainable practices into the way the business generates revenue, including the use of “greener” inputs and business models that directly benefit society. The B Corp is one such model, which requires that a corporation document how its business activities create a positive impact on the environment and society. B Corps must sustain this positive impact, otherwise they forfeit the designation. Currently, there are 1,400+ B Corps around the world, the majority of which are in the United States. Compared to the entire population of companies, the community of B Corps is very small, but it is also growing. This study aims to address the potential future growth of the B Corp model. Stakeholder Theory research has indicated that creating value through key relationships is
imperative to business success and ethical behavior. As a stakeholder value model, the B Corp has the potential to offer additional benefits to a wider range of stakeholders than a primarily profit-maximizing model. While several factors will probably constrain its growth somewhat, the B Corp model will likely expand in number and influence.

**Oral-16**

**Calling the Cops: Conversations about Racism in Policing**

Sarah Allison, American Studies, Fordham College at Rose Hill, Michelle McGee*, American Studies, Fordham College at Rose Hill

Over the past few years, debate surrounding racialized police violence has come to the forefront of American consciousness. This violence is in no way a new phenomenon, yet the recent volume of deaths at the hands of police officers, alongside other instances of brutality, is cause for concern, if not outrage. Given that police are employed to protect the communities they serve from violence and crime, the strategies they have in place are failing far too often. Too many officers have blood on their hands, and too many families suffer the consequence. My research investigates policing strategies around the United States, as well as scholarship about the relationship between police and communities. Relying on interviews conducted with police officers, this project explores how departments are addressing racism in their operations, and how they are fostering accountability to the communities they serve. Officers expressed very diverse understandings of racism as a problem. Some articulated a systemic analysis of racism, and clearly saw its impact on their work. Others did not see this impact at all. Ultimately, the rigor and extent of departments’ programmatic responses to racism was tied to the degree of urgency and gravity with they framed racism. This urgency and gravity was revealed in whether departments, and officers, explicitly engaged with the history of law enforcement in communities of color (and how it weighed on their current relationship) and whether they saw the potency of racial bias as something that demanded active prevention.

**Oral-17**

**Bottom up Approach to Rebuilding Tissue at the Nanoscale**

Grant Knoll, Biological Sciences, Fordham College at Rose Hill, Ipsita Banerjee*, Chemistry, Fordham College at Rose Hill

The use of nanomaterials for tissue engineering (TE) applications has grown greatly over the last ten years. We have developed two nanocomposites comprising the polymers polyethylene glycol PEG and polyhydroxyethylmethacrylate poly HEMA which were separately attached to a self-assembling peptide Fmoc-Valyl-cetylamide (FVC) to develop new three-dimensional scaffolds that have the potential to be utilized in corneal tissue regeneration. The scaffolds were then conjugated with type I collagen which plays a quintessential role in the ECM of corneal tissue. To increase the biocompatibility of the scaffolds and to mimic corneal tissue, we then functionalized the composites with a specific peptide sequence with a high affinity toward corneal endothelial cells which was integrated into the hybrid polymer-peptide system. The thermal properties of the scaffolds were established using differential scanning calorimetry (DSC). The optical properties of the scaffolds were determined using a refractometer, showing that the materials could refract light. The mechanical properties were assessed using atomic force microscopy (AFM), and the results indicated that the scaffolds matched up closely with native human cornea. Multiple cell studies were conducted such as an MTT cell proliferation assay, cell migration, tube formation assay, and a sircol red insoluble collagen assay. These studies further confirmed the potential for these scaffolds to be used in corneal tissue regeneration.

**Oral-18**

**Al Smith, Catholic Bishops, and FDR: At the intersect of social policy and ecclesial influence**

Nicholas Sawicki, Theology, Fordham College at Rose Hill, R. Bentley Anderson*, African and African American Studies, Fordham College at Rose Hill

Alfred E. Smith, Governor of New York and Democratic Nominee for President in 1928, transformed New York into a model for governments seeking to serve the needs and best interests of its citizens. There was not an area of public concern that Smith’s administration did not address, e.g. care of widows and orphans, labor union laws, building safety and fire code enforcement, civil reform, transportation, recreation, etc. Each one of the areas that Smith addressed in his 8 years as Governor directly corresponded to one of the 40 points put forward in a document in 1919 by the U.S. Catholic Bishops, titled “The Bishops Program of Social Reconstruction.” It should be noted that Smith was the only Catholic Governor in the United States at the time and the launch of the document corresponded perfectly with the beginning of his tenure as Governor and it seems New York State was the only State to undertake such sweeping civil
and social changes during this era. This notion of the intersecting between social policy and ecclesial influences extends further to the 1930’s with ‘The New Deal.’ Franklin Delano Roosevelt was Al Smith’s protégé in New York, having nominated him twice for the presidency at the Democratic Convention and as Smith’s direct successor in the gubernatorial office – thus inheriting all of Smith’s programs. The voices that shaped the 1919 Bishops’ document are clearly visible throughout the molding of the New Deal, and this continued intersecting of the political and ecclesial is shown here.

**Oral-19**

"The Clash of Civilizations" Debunked: Assessing the Religiosity of "Religious Conflict" in the Middle East

Katherine Labonte, Political Science & Middle East Studies, Fordham College at Rose Hill, John Entelis*, Political Science, Fordham College at Rose Hill

The purpose of this paper is to both analyze and criticize Samuel Huntington's Clash of Civilizations theory which asserts that conflict in the post-communist world will exist on civilizational lines. Too often, however, the Clash of Civilizations argument has been used to dismiss conflict in the Middle East as simply "religious conflict" and thus “the way things are” when this is not always the case. Thus, this paper will argue not only that Huntington has incorrectly reduced the Middle East to an "Islamic" civilization, but that currently ongoing conflicts in the Middle East are not as deterministic and entrenched in religious differences as we may believe. Factors such as the political landscape, historical influences, and current geopolitical tensions have played a major role in currently ongoing conflicts in the Middle East. This paper will analyze the Arab-Israeli conflict, internal conflict in Lebanon, and the Sunni-Shi’a conflict by examining their historical roots, as well as their present status in the region as examples of conflicts that are largely caused by factors other than religion, and as counterexamples to the Clash of Civilizations argument. Ultimately, this paper hopes to shed new light on ongoing conflicts in the Middle East so that an effective and thorough solution may be found.

**Oral-20**

The Purpose and Prevalence of Torture in Mexico from 1968 to 2000

Thomas Samuelson, History, Fordham College at Rose Hill, W. David Myers*, History, Fordham College at Rose Hill

Since the end of Mexico’s one party rule in 2000, there have been calls from both Mexican citizens and human rights groups for the government to release classified documentation pertaining to the widespread killing and torture of civilians carried out by Mexican presidents in the late 20th century. One event of most interest to them is the Tlatelolco Massacre in 1968 in which the PRI government surrounded thousands of students and proceeded to shoot and mortar them. To many, this little known event would be defining moment in relations between citizens and the state. From 1968 to 2000, the overall image that emerges in Mexico is one in which the states secretly perpetrated human rights violations like torture, while simultaneously presenting a facade of a nation striving to end torture through laws. While many in this period knew the atrocities or experienced the oppression first hand, little to no work has been done in english or spanish on the scale or the reason for these atrocities. In light of that fact, this study examines both the extent to which the Mexican government from 1968 to 2000 violated its own laws through torture and violence, and furthermore examines the purpose behind these egregious acts. Through the use and translation of countless human rights reports, biographies of victims, historical sources, Mexican laws, international treaties, and recently declassified information, this works argues that these illegal actions were not only continuously perpetrated throughout this period, but were also pursued for different reasons over time.

**Oral-21**

An Uneasy Courtship: Nixon, Labor, and the Supreme Court

Melanie Sheehan, History and American Studies, Fordham College at Rose Hill, Steven Stoll*, History, Fordham College at Rose Hill

While the AFL-CIO successfully lobbied against the nominations of Clement Haynsworth and G. Harrold Carswell to the Supreme Court in 1969 and 1970, similar efforts to block the nomination of William Rehnquist in 1971 failed. I contend that the Rehnquist proceedings reflect changes that split the AFL-CIO from its allies and made the organization's testimony vulnerable to charges of hypocrisy. While the AFL-CIO criticized the conservative stances of Haynsworth, Carswell, and Rehnquist on civil rights, its opposition to the Philadelphia Plan and its failure to address affiliates' discriminatory practices undermined the AFL-CIO’s relationship with the NAACP and opened the
organization’s testimony to charges of hypocrisy, which the union could not deflect without NAACP support. Further, the law and order issue, largely absent in the Haynsworth and Carswell hearings, predominated the Rehnquist proceedings. Nixon deliberately tied the issue with the rise of the New Left as part of his “blue-collar strategy.” As radical elements gained influence in the Democratic Party, the AFL-CIO chose to abandon the party rather than promote compromise reforms. AFL-CIO leaders became more closely tied to the Nixon administration and offered their full-fledged support for the controversial invasion of Cambodia. Thus, former allies lost credibility in Congress by adopting radical stances, while the AFL-CIO’s condemnation of Rehnquist’s law and order views and his support for expanded executive power could, like its civil rights testimony, be dismissed as hypocritical.

Oral-22  
Cognition and Impact Severity Correlation  
Davis DeFontes, Neuroscience, Fordham College at Rose Hill, Daniel Leeds*, Computer Science, Fordham College at Rose Hill

Many definitions of impacts have been created with different units of measurement that seek to provide a measurable line at which a possibly dangerous impact can be said to have occurred. However, these definitions of impacts alone lack significance when relating brain performance to an impact of variable severity. We hypothesized that as the values of these impact accelerations and measurements grew larger, the cognitive success of the subject would decrease thus resulting in a higher D-Prime value found in our cognition tests. We set out to utilize seven previously determined impact measurements to elucidate new values and weights for measures of impacts received by candidates undergoing a boxing training session. We created a cognitive aspect by testing the boxers after their boxing matches on a word recollection task. Their cognition data was then recorded dependent upon the accuracy and speed of their responses. We ran a correlation between the average of the three largest values of each of the seven impact measurements, and the D-Prime values of our boxers from their cognition test and received the values of -0.492 for PLA, -0.5176 for PRA, -0.1965 for PRV, -0.2080 for HIC_15, -0.2618 for HIC_36, -0.3228 for GSI, & -0.5035 for GAMBIT. These results were not impressive data through which to support our hypothesis that with a greater magnitude of impact measurement will come a larger D-Prime value and thus decrease in cognitive function.

Oral-23  
Classically Conditioned Relaxation Responses Among College Students  
Julia Yon, Psychology, Fordham College at Rose Hill, Margaret Andover*, Psychology, Fordham College at Rose Hill

The current study aims to answer the question: Can a particular scent be a conditional stimulus for a classically conditioned relaxation response? Research shows that odors associated with a specific emotional state can later influence behavior in a manner consistent to the emotional state (Herz, Beland & Hellerstein, 2004). Furthermore, neuroanatomy heavily supports the claim that our olfactory system is especially primed to learn significance of odors (Herz, Eliassen, Beland & Souza, 2004). Participants will be classically conditioned for 5 weeks to evoke a conditional relaxation response in the presence of a specific scent (essential oil). By pairing a neutral stimulus (in this study, a scent), with an unconditional stimulus (abbreviated progressive muscle relaxation), it is hypothesized that relaxation will become a conditional response and the specific scent will become a conditional stimulus. Participants will exhibit significantly decreased patterns of physiological responding consistent with relaxation (i.e., skin conductance level, heart rate) during exposure to the familiar stimulus than during exposure to the novel stimulus. This pilot research project may hold implications for increasing the effectiveness of this specific self-soothing coping skill.

Oral-24  
Democracy Groups as a Social Space for Convergence in the Jordanian Political Activist Community  
Jérémie Langlois, Political Science-Middle East Studies, Fordham College at Rose Hill, John Entelis*, Political Science, Fordham College at Rose Hill

Despite the immense amount of attention it received the wake of the Arab Spring, there is a surprising dearth of work dedicated to contemporary contentious politics in the Middle East, particularly where regime change did not occur. This could not be more true of the Hashemite Kingdom of Jordan, where the landscape for contentious politics is frequently described as ineffective due to structural restrictions, cautious in the face of regional security threats, and most importantly--severely fractured along ideological lines. While protests in 2011-2013 saw activists from across the political spectrum collectively demand reforms, there is little evidence to suggest that this has since translated into
a cohesive cross-ideological movement. In a climate where rights of assembly are routinely curtailed and ideological factionalism extends even in social university settings, a milieu for the inter-ideological discourse necessary to form such a movement seems absent. However, foreign funded democracy groups that “work to strengthen democratic institutions” frequently hold events, workshops, and discussions that bring together politically-engaged youth from diverse backgrounds and ideologies. Using social capital and collective action theory, and measuring social trust as an indicator, this work seeks to test whether there exists a positive correlation between activists’ out-group trust and democracy group event attendance and involvement. This work will provide insight into cross-ideological coalition building in contemporary Jordan while also offering an experimental methodological approach to incorporating social capital theory into political science research.

Oral-25

A Lived Religion Approach to Muslim Youth Experience: Challenges and Responses to Muslim Identity
Thomas D’Agustino, Theology, Fordham College at Rose Hill, John Seitz*, Theology, Fordham College at Lincoln Center

This article describes the results of a months-long qualitative study that examines how the spiritual lives and faith practices of Muslim youth in New York City are affected by negative political, cultural and social discourses and uses the theoretical lens of "lived religion." By approaching the study of religion as lived human experience, this research explains some of the ways that Muslim youth respond to external pressures on a daily basis and how these responses may shape their religious identities. The particular responses that are examined are "resistance," "remembrance" and "reclamation." The study engages with written sources that deal with relevant topics such as childhood faith development, U.S. policy that targets Muslim American youth in particular, as well as excerpts from interviews that were conducted for this study with Muslim high school students from Brooklyn and Queens.

Oral-26

Constructing a Holographic Higgs: The Guage/Gravity Duality and Lattice Quantum Field Theories
George Davila, Physics, Fordham College at Rose Hill, Christopher Aubin*, Physics, Fordham College at Rose Hill

Quantum gravity is an area of research that seeks to merge Einstein’s theory of general relativity, which describes gravity, with the so-called Standard Model of particle physics. Despite the fact that these theories comprise our most fundamental understanding of the Universe, we have no idea how they actually work together. Ambitious programs such as string theory and loop quantum gravity have produced marvelous mathematical models, yet absolutely no experimental evidence. This isn’t to say neither is correct, yet the question remains: how can abstract theories of quantum gravity be related to more experimentally verifiable particle theories? This research aims to examine relationship between the two using techniques from both quantum gravity research and quantum field theory research. The massless Lee-Wick model, which describes the scalar field of the Higgs Boson is to be examined and placed on the lattice, which essentially means there’s a lower bound to how far it can travel in space or time. The novel part of this research is using lattice radial quantization (LRQ) to do this. LRQ is a method of putting quantum field theories (QFTs) on the lattice so that the scale invariance of the QFT is preserved. Scale invariant theories can be related to quantum gravity theories through what is known as the AdS/CFT correspondence. In this research program we will explore this relationship in depth, and examine the properties of the associated quantum theory.

Oral-27

Vertical Transport of Aerosol Particles across Mountain Topography near the Los Angeles Basin
John Murray, Engineering Physics, Fordham College at Rose Hill, Stephen Holler*, Engineering Physics, Fordham College at Rose Hill

Transport of aerosol particles is known to affect air quality and is largely dependent on the characteristic topography of the surrounding region. To characterize this transport, aerosol number distributions were collected with an Ultra-High Sensitivity Aerosol Spectrometer (UHSAS, DMT) during the 2015 NASA Student Airborne Research Program (SARP) in and around the Los Angeles Basin in Southern California. Increases in particle number concentration and size were observed over mountainous terrain north of Los Angeles County. Chemical analysis and meteorological Lagrangian trajectories suggest orographic lifting processes, known as the "chimney effect". Implications for spatial transport and distribution will be discussed.
Oral-28

Life Satisfaction and Depression During the Transition to College

Tiffany McKay, Psychology, Fordham College at Rose Hill; Sheena Jeswani*, Psychology, Fordham College at Rose Hill

The transition from high school to college can be difficult for students; students who fail to have a successful adjustment and transition to college may be more likely to drop out (Enochs & Roland, 2006). Some students may adjust to college more easily than others. While trying to adjust to college life, many students begin to question their relationships, directions in life, self-worth, and identity—these emotional problems can manifest into anxiety, low self-esteem, or depression (Gerdes & Mallinckrodt, 1994). The purpose of this study is to assess the different factors, such as health, agency, support, college activities, and social relations that might influence college adjustment, depression, and perception of life satisfaction. A survey was distributed to the incoming freshman at Fordham University, prior to the fall semester. The sample consisted of 184 participants, 71% female and 28% male. Results indicated a positive relationship between: agency and health status (r=0.64), health and support status (r=0.51), social relationships and agency status (r=0.61), social relations and support status (r=0.68), life satisfaction and social relationships status (r=0.48). Additionally, there was a negative relationship between depression and social relationship status (r=-0.41). The important factors related to successful transitions to college were examined. The four factors of status: health, agency, social relationships, and support were used to determine which factors were prevalent in individuals with higher life satisfaction and individuals more likely to experience depression.

Oral-29

The Impact of Substance Use and Trauma Stress Reactions in a City Court Treatment Program

Anthony Fortuna, Psychology, Fordham College at Rose Hill; Keith Cruise*, Psychology, Fordham College at Rose Hill

According to the Risk Needs Responsivity model for rehabilitating offenders, treatment plans for offenders in programs designed to decrease recidivism are most effective when level of risk and client needs are matched with the treatments provided. This means offenders with higher recidivism risk need higher intensity treatment, and that changeable treatment factors (e.g., mental health problems) should be targeted for intervention. The present study examines intake and treatment outcome data for approximately 75 participants in a New York City court mandated drug treatment. The goal of the program is to link participants to treatment for existing substance use issues, while decreasing criminal thoughts and recidivism as an alternative to incarceration. This study is examining the impact of mental illness, specifically symptoms of posttraumatic stress disorder (PTSD), as a responsivity factor that can impact treatment outcomes. This study is investigating if active symptoms of PTSD, measured at intake, are related to short-term treatment success or failure and the interaction between level of substance use problems and PTSD symptoms in predicting treatment outcome. Data collection for this study is currently in progress and scheduled for completion by 3/28 with all data analysis completed for presentation at the symposium. Results predicting short-term treatment outcomes will help determine to what extent PTSD symptoms impact treatment response and to what extent substance use treatments currently being used in the treatment program need to be trauma-informed.

Oral-30

The University as a Democratic Reality? Student Loans and Student Lives

Timothy Bouffard, American Studies, Fordham College at Rose Hill; Michelle McGee*, American Studies, Fordham College at Rose Hill

There are currently over forty million students in the United States alone who have taken out student loans in order to pay for their education. With the signing of the Higher Education Act in 1965, the student loan program was created as a public good, but has since turned into a burden on students whose total debt has amassed over one trillion dollars. This paper will focus on the history of the student loan program and its legislative background, the current policies, political climate and lack of consumer protections that negatively affect a student’s ability to pay for the loans, and current student’s views on what has since become a broken program based off of a broken and outdated system.
Feeding America’s Growing Cities: The Role of Urban Agriculture in the Future of Food Distribution and Accessibility

Leigh Anne Statuto, Urban Studies, Fordham College at Rose Hill, Rosemary Wakeman*, Urban Studies, Fordham College at Rose Hill

The current challenges of poor food distribution, accessibility, and production faced by residents of urban food deserts will be exacerbated by the increasing rate of urbanization. Existing income inequalities present within cities are the root cause for the limited access and connections to healthy foods that a large percentage of city residents living below the poverty line face. Moreover, these city dwellers are at a significantly higher risk for developing chronic health issues. My research explores whether urban agriculture can be a viable solution for feeding America’s growing cities especially in areas of lower income. Through case studies of urban agricultural practices within two American cities, Portland, OR and New York City, my thesis explores the impact of these efforts and determines whether they can be implemented into other cities. My research concludes that, although traditional urban agricultural practices cannot entirely sustain a city, these efforts instead provide the city with invaluable opportunities for business entrepreneurship, community development, and food education. Through these urban agricultural initiatives, those living in food deserts are able to access healthy food options despite the growing economic divide. Cities should slowly work towards increasing the percentage of food produced within city limits through urban agriculture. Ultimately, the solution to these interconnected issues is multifaceted and must include the implementation of urban agriculture, the preservation of local city foodsheds, and the involvement of government in introducing various efforts and incentives that highlight the necessity of agricultural practices and equal food access.

Gender Differences in Competition and Distribution

Michael Gaudio, Economics, Fordham College at Rose Hill, Subha Mani*, Economics, Fordham College at Rose Hill

Competitive behavior is favorably rewarded in the labor market; yet, women choose to compete less than men do. Since the stone ages, men generally hunted for food whereas women cared for the young. A number of hypotheses from a variety of studies have concluded that differences in risk preferences, performance, and self-esteem may explain why men compete more frequently than women. One important mechanism, however, has not been extensively examined in this context – distributional preferences. In this paper, I will specifically explore the role of distributional preferences in explaining why men compete more than women controlling for differences in risk preferences, egalitarian behavior, and gender. Contrary to existing findings, I find no gender differences in choice of the competition wage scheme. I also find no gender differences in the choice of distributional preferences and/or risk preferences in our sample.

Aero Agent for Aedes aegypti Control Population

Aryadne Guardieiro, Computer and Information Sciences, Fordham College at Rose Hill, Damian Lyons*, Computer and Information Sciences, Fordham College at Rose Hill

As it is known, Brazil and other countries from South America have been facing an epidemic of diseases like Dengue Fever and Zika, which are spread by a mosquito named Aedes aegypti. In this context, the purpose of this project is to build a robot which would help to control the Aedes aegypti population. There are studies pointing that male mosquitoes have a very sensitive system of audition which makes them able to find a female mate, due to the female flight sounds. In this project I will construct a small quadcopter robot equipped with a sound generator. These sounds will be used by the drone to attract the male mosquitoes and then kill them using some device without poison. The advantages of this approach are that it avoids widespread use of insecticide and just Aedes aegypti mosquitoes will be affected. In the future, this robot will be modified to collect data and discover where the biggest swarms of mosquitoes...
Residential Segregation in New York City and Washington, DC

Jennifer Willis, English, Fordham College at Rose Hill, Olena Nikolayenko*, Political Science, Fordham College at Rose Hill

This paper examines causes of residential segregation in two American cities. It is hypothesized that a city with a higher incidence of income inequality, a higher proportion of the immigrant population, and a more rigid land zoning regime is more likely to have a higher level of segregation. This study selects Washington, DC and New York City as case studies due to differences in their level of residential segregation. These cities are administratively divided into smaller units, council wards and boroughs, respectively. The Index of Dissimilarity, measuring the degree to which the minority group is distributed differently than whites across census tracts, is used as a measure of residential segregation. This index ranges from 0 (complete integration) to 100 (complete segregation). According to the most recent data, New York City has a significantly higher level of Black/White segregation than Washington, DC metropolitan area. Additional socio-demographic data for this study are retrieved from US Census Bureau. The empirical analysis demonstrates that income inequality is much higher in Washington, DC than in NYC, but the size of the immigrant population is twice as high in New York City. In addition, this study finds that both cities lack legislation that explicitly outlaws segregation and have vague land zoning laws. This study contributes to the growing literature on urban development and socioeconomic inequality in contemporary America.

Neville's Notebook: The Plants of Harry Potter and their Real-Life Inspirations

Colette Berg, Environmental Science, Fordham College at Rose Hill, Jude Jones*, Philosophy, Fordham College at Rose Hill

Neville Longbottom is a minor character in the popular Harry Potter series by J.K. Rowling. He begins as a shy and awkward boy, but gradually grows into a confident and brave young wizard, who is particularly talented in growing magical plants. He later becomes the Herbology professor at Hogwarts. This semester, I wrote a weekly blog, entitled Neville’s Notebook, about the many plants that appear in Harry Potter and the real-life plants that inspired them. The characters encounter and use hundreds of plants throughout the series to create potions, cure illnesses, and sometimes they even battle with plants such as the Whomping Willow and Devil’s Snare. It’s easy to see why magical plants might hold fascination. However, I think that real plants are just as magical as those of the series. Each week, I pick a plant from the series to discuss. In a humorous and informal manner, I discuss real life plants which are similar. Recent posts include “Incredibly Deadly Trees”, where I discussed the most dangerous poisonous trees, and “Magical and Botanical Latin”, where I wrote about Carl Linnaeus and the use of Latin in the Harry Potter books. I use the Harry Potter series as a jumping-off point to discuss complex biological topics such as evolutionary arms races, invasive species, and convergent evolution. My goal is to inspire wonder at the natural world and curiosity about the world of plants.

Collaborative Jazz-Hop: It’s Driving Motivations and Musical Implications

Samuel Farnum, English, Fordham College at Rose Hill, Larry Stempel*, Art History and Music, Fordham College at Rose Hill

Recent collaborations between jazz and hip-hop artists have suggested a breakdown in distinctions that have long separated these two genres. Today, with active partnerships between jazz and hip-hop, we are faced with a new genre produced on the basis of entirely new, collaborative principles—a genre I have coined as collaborative “Jazz-Hop.” My research goals are defined by two areas of inquiry, one of cultural and the other of musical context. I first ask: What are the motives behind the recently active collaborations between jazz and hip-hop artists? To answer this question, I will examine motivating factors fueling this genre within three areas previously defined by scholarly research: potential financial benefit (for relevant artists, producers, and record labels), the search for authenticity or new cultural relevance (especially in terms of Black music traditions), and creative musical potential (a means by which artists sought new creative outlets). For my second question I ask: What are the musical implications of active “jazz-hop”? How does collaborative “jazz-hop” represent the musical aspects of its foundational genres—jazz and hip-hop? How are the musical aspects of each genre presented? Are they changed, and if so, are these changes limiting or liberating? Through the research process I found that designating this wave of genre-defying collaborative work
under a new genre signifier—collaborative “Jazz-hop”—did not account for the wide range of unique contextual parameters (motivations, musical implications, etc.) associated with each musical project supporting this phenomenon.

Oral-37

The Colonial American Iron Industry

Caitlin Hufnagle, Anthropology, Fordham College at Rose Hill, Allan Gilbert*, Sociology and Anthropology, Fordham College at Rose Hill

This thesis will examine the growth of the iron industry in the American colonies, specifically focusing archaeological and sociopolitical history. Iron had a much larger impact on the infrastructural and socio-economic development of Colonial America than it might otherwise seem. The Middle Atlantic Colonies in particular had the natural geological ingredients necessary to smelt iron on an industrial level. Specifically, there was an abundance of bog ore near the coast, and mineral ore at many points inland, coupled with ample sources of calcium for flux in the form of oyster shells or limestone. Additionally, these natural resources combined with the geography of the area, which included many interlocking streams and rivers which could be used to power the mills in addition to transporting the smelted iron. These factors provided the foundation for a successful basis of operation for numerous bloomeries, furnaces and forges. Not unsurprisingly, by 1750 the colonists had established themselves as major suppliers of pig and bar iron to British manufacturers and by 1775, they were the world’s third largest iron producers. The colonies flourishing production of iron therefore helped place them in an economic position from which they could attempt to extricate themselves from British empirical power. This thesis, then, will attempt to examine to what extent the iron industry contributed to colonial economic and political power, in addition to attempting to re-insert iron into this narrative, where it has often been left out.

Oral-38

Hogarth: Culturally Relevant and Reflective - Looking at Hogarth’s Marriage a-la-mode and A Harlot's Progress from a feminist perspective

Christiana Shovlin, Women's Studies, Fordham College at Rose Hill, Orit Avishai*, Women's Studies, Fordham College at Rose Hill

My work focuses on the representations of women, particularly in relation to their syphilis, in Hogarth’s Marriage a-la-mode and a Harlot’s Progress. These works are very unique in that they read a lot like 18th century comic books: they feature characters who experience a journey to reveal a moral end. Both of these works are a series of paintings that gained immense popularity for themselves, as well as for their author, William Hogarth. They were later turned into engravings, and were mass produced and distributed throughout 1730’s-1740’s London. What I found was that the female characters behaved differently and in a more visible fashion than the male characters when forced to confront their syphilis. I then related the works to the culture of 1730’s London by claiming that this seemingly unique picture of a feminized syphilis was not unique at all. Authors like Spenser, Fracastoro, and Donne, and painters like Bronzino, were depicting the colloquially termed: “serpentine disease” as a feminine plague. The disease itself manifested in these works as raw female sexuality and sexual deceit. My claim was cemented by Hogarth’s own treatise on Beauty: The Analysis of Beauty (1753). In describing the ideal line of beauty, Hogarth coins the term “serpentine line”: he exemplifies this line in a diagram of a woman’s corset. By linking a seemingly unrelated aesthetic line to a canonical syphilitic term, Hogarth cements himself in a tradition which holds women’s disease as vastly more culturally transgressive than that of men.

Oral-39

Out of the Park: Visual Representations of Black Baseball during the Rise and Ruin of the Negro Leagues

Julie Lewis, American Studies, Fordham College at Rose Hill, Michelle McGee*, American Studies, Fordham College at Rose Hill

Over the course of baseball’s history and the gradual movement towards integration in the sport, white mainstream media sought to contain black baseball in a singular, stereotypical form - one characterized by an abhorrent lack of athletic ability, intelligence, and moral character. Conversely, the black press crafted a multifaceted visual identity, not only to supplant negative images with more favorable ones, but also to establish that no single representation monolithically stood in for blackness. From the beginning of the modern baseball era in the 1850s until the heyday of the Negro Leagues nearly a century later, the visual representations of black baseball were critical tools in contesting the limitations and presumptions of segregation, countering white beliefs about athletic and moral superiority. The
analysis of this visual record reveals how visibility was integral in establishing black baseball as a legitimate ethnic institution, constructing racial pride and identity in African American communities, and determining the economic success (and eventual failure) of the Negro Leagues.

**Oral-40**

**How Presidential Candidates Use Social Media in the Race for the White House**  
Joseph Vitale, Urban Studies, Fordham College at Rose Hill, Mark Naison*, Urban Studies, Fordham College at Rose Hill

Many researchers have tried to explain the use of mass media in presidential elections. This research project focuses on the use of social media — particularly Twitter — in presidential elections. Since the advent of information technology in the late 1990s, political campaigns have used the Internet for a range of purposes: to share policy positions, to provide candidate backgrounds, to promote events and to encourage web users to make monetary donations. Presidential candidates began doing this in the mid-2000s, though researchers identify the 2008 election as a pivotal moment for the Internet’s role in presidential elections. During that year, Barack Obama’s campaign used the Internet to introduce him to the American electorate and gather grassroots support across the country. His successful campaign provided a framework for future candidates across the political landscape. This research project analyzes hundreds of “tweets” by candidates in the 2012 and 2016 presidential elections, and identifies significant trends and patterns in content and frequency. This data shows that presidential candidates are using social media for the same things President Obama did in 2008, but have added new elements of inter-personal dialogue to increase interaction and gain popularity with voters. Additionally, presidential candidates are using Twitter in new ways that optimize the amount of interaction they receive from other users. Finally, this research discusses the implications of new uses for social media, including its effects on partisan rhetoric and inter-candidate dialogue, as well as its capacity to generate feedback loops.

**Oral-41**

**Political Efficacy Among African American Women**  
Niara Walden, Political Science, Fordham College at Rose Hill, Olena Nikolayenko*, Political Science, Fordham College at Rose Hill

Research shows that people of color and women tend to have lower levels of political efficacy. This study examines why some African American have a higher level of confidence in their ability to grasp politics and influence political processes in the country. Specifically, this project explores the effects of political generations, civil service, and place of residence on the individual’s sense of political efficacy. First, it is hypothesized that African American women belonging to the Baby Boomer generation will have a higher level of political efficacy than the Millennials. Second, government employees are likely to have a stronger sense of political efficacy. Third, the level of political efficacy is likely to be higher in the South than in the North. The data from in-depth interviews with African American women provide an empirical basis for this study. I conducted interviews with 12 respondents, representing various generations, being employed in multiple sectors, and coming from different parts of the United States. One of the main findings that emerges from this study is that people who grew up during times of civil unrest and, in particular, resided in areas where civil disobedience was common tend to believe more in the individual’s ability to bring about political change. This study is timely and important, since political efficacy is central to political engagement. It is especially critical to understand sources of political efficacy during an election year to boost electoral participation of marginalized groups.

**Oral-42**

**Gentrification and Urban Displacement Surrounding Fordham University’s Bronx Community**  
Ryan Fleites, Urban Studies, Fordham College at Rose Hill, Mark Naison*, Urban Studies, Fordham College at Rose Hill

This paper explores whether residents of three Northwest Bronx neighborhoods -- Bedford Park, Belmont, and Fordham Road-- fear that gentrification and urban displacement will be the consequence of their proximity to Fordham College at Rose Hill campus. I administered over twenty interviews in each neighborhood with community leaders, business owners, and residents to discover the thoughts and feelings that pertain to this subject. Essential findings I have unearthed are that individuals are worried about being priced out and displaced, that Fordham College at Rose Hill has a direct effect on gentrification and displacement in the community, and that Fordham College at Rose Hill will have a lasting impact in the evolution of these three neighborhoods in the next 15-20 years. Based on the review
of literature and interviews, I have concluded that the Bronx is going through a period of gentrification and urban displacement, with Fordham College at Rose Hill being a main contributor.

**Oral-43**

**The Use of Novel Biodegradable Polymers to Remove Pollutants out of Water**

*Patrick Janeczko, Chemistry, Fordham College at Rose Hill, Amy Balija*, Chemistry, Fordham College at Rose Hill*

The threat of pollutants in the water supply has gained nationwide attention recently due to the events in Flint, Michigan. As these events show, polluted water supplies pose a serious threat to public health. Current methods used to remove organic pollutants from water are not sufficient, therefore new approaches are necessary. One method proposed is the use of polymers constructed from a variety of biodegradable hydrophobic segments in order to encapsulate hydrophobic pollutants. A series of block-poly(δ-decalactone)-block-poly(L-lactide) systems were synthesized by varying the molar ratios of δ-decalactone and L-lactide. These polymers are believed to have pollutant encapsulating properties because of their hydrophobic segments. The synthesis methodology and characterization of these polymers will be presented. Initial research shows that L-lactide segments play an important role in the removal of a photochromic dye out of dilute aqueous solution although varying the molar ratio of the monomer segments seems to have no effect on the extraction efficiency.

**Oral-44**

**The Status of Infants in the Ifugao Family Unit: A Case Study in the Old Kiyangan Village based on Infant Jar Burials**

*Margaret Desmond, Sociology and Anthropology, Fordham College at Rose Hill, Kathryn Krasinski*, Sociology and Anthropology, Fordham College at Rose Hill*

Infants are an understudied demographic in archaeology due to the fragility of infant skeletons which limits evidence in the archaeological record, and therefore jar burials of infants provide a unique opportunity to examine both material culture and skeletal remains of infants. The excavation of ten jar burials at Old Kiyangan Village, located in the Ifugao province of the Philippines, allowed for analysis of the morphology of the jars to better understand rituals surrounding this burial practice with the goal of increasing knowledge about the status of infants in Old Kiyangan Village. While research has been conducted about jar shape and decoration for jar burials at other sites in Southeast Asia, this study emphasizes comparison of the jars’ sizes and shapes to draw conclusions about their significance as well as studying the skeletal remains within each jar, all of which were determined to be perinates. Measurements were taken of each jar at distinct features (for example: height of neck, thickness of body, total height of vessel) to obtain ratios for comparison. Then the final analysis of these results drew upon existing literature of kinship in Ifugao, pottery traditions in Ifugao, funerary archaeology, infant archaeology, and theories of personhood to make new inferences about the status of infants in Old Kiyangan Village and the significance of jar burials. The jar morphology comparison revealed no consistency in jar shape and size, however the lack of discernible pattern does not signify that the jar is unimportant but may indicate haste in burying the infant and the necessity of a protective barrier between the infant and the physical world. This is further supported by the age of the skeletal remains (perinates), existing theories of the womb-like symbolism of burial jars, and ethnographic evidence that strict timelines are followed in present-day Ifugao for infant burials.

**Oral-45**

**The Effects of Color within Environment on Cognitive Performance**

*Nicholas Eliades, Urban Studies and Visual Arts, Fordham College at Rose Hill, Emily Rosenbaum*, Sociology and Anthropology, Fordham College at Rose Hill*

In a 2009 study, researchers Ravi Mehta and Rui (Juliet) Zhu tested the effects of blue and red color schemes on cognitive performance. They found that these colors positively affected the cognitive task performance of participants in the study – red improved “detail-oriented task” performance and blue improved “creative task” performance. These results show a potential for real-world application in places like schools and offices; however, the researchers only manipulated the color of the testing materials given to participants, and further research is needed for any application outside an experimental setting. In the current study, I have instead tested participants in environments of different colors. By researching environmental effects, this study intends to evaluate how colored environments could be used to improve real-world exam performance and other tasks involving of cognitive performance.
Oral-46
Promoting growth or violence? An analysis of US foreign aid in the context of the 21st century Central American fight against gangs
Kathryn Hulseman, International Political Economy, Latin American and Latino Studies, Fordham College at Rose Hill, Idalia Bastiaens*, Political Science, Fordham College at Rose Hill

In 2015, the homicide rate in El Salvador surpassed that of Honduras and it was labeled the new “murder capital” of the world. Gang activity has contributed greatly to this extreme violence as the Mara Salvatrucha and Barrio 18 gangs regularly engage in street warfare. El Salvador is not the only state to experience such violence: Mexico similarly has one of the top ten highest homicide rates globally, according to the WorldBank. The United States has taken an active role in the issue, funding efforts to increase judicial and police capacity while targeting the drug trade. Despite the substantial amount of foreign aid allocated by the United States to Mexico and El Salvador, the violence has continued. The existing literature offers mixed conclusions about the effectiveness of foreign aid for promoting peace, and much of that aid focuses on civil conflict and rebel-instigated violence, both of which are inherently different from gang violence. This research examines the relationship between the inflows of foreign aid and the level of violence in Mexico and El Salvador, comparing the effectiveness of different aid strategies. I predict that aid prioritizing development projects, such as the Central American Regional Security Initiative in El Salvador, is associated with larger reductions in violence than security-focused aid, like the Mérida Initiative in Mexico. Through regression analysis, I find that aid to Mexico does correlate to a higher level of violence, suggesting that aid oriented towards security and law enforcement may not be the most effective way to combat gang violence.

Oral-47
Understanding the Maya: Archaeological Investigation at Blue Creek, Belize
Margaret Desmond, Sociology and Anthropology, Fordham College at Rose Hill, Kathryn Krasinski*, Sociology and Anthropology, Fordham College at Rose Hill

This research is a comprehensive literature review of the archaeology research done at Blue Creek as well as other relevant discoveries and theories in Mayan archaeology. Blue Creek is a Mayan archaeological site located in northern Belize along the Rio Bravo where the Mayan Research Program has been excavating for over twenty years. It is a not a large city compared to other Mayan urban centers of the time, however the archaeological record has revealed that it was a fairly wealthy city with extensive and well-developed trade networks. There have been discoveries of large amounts of jade at the Blue Creek site. The major themes and focuses of the archaeological investigation at Blue Creek that will be addressed in this review are the Mayan city and society based on World Systems Theory, adaptation of landscapes by the Maya, theories of abandonment and the collapse of the Maya, the use of wetlands agriculture, and the structure of elites within Mayan society. The evidence excavated at Blue Creek and theories developed by the researchers working at this site will be considered in the light of research that has been conducted at other Mayan sites.

Oral-48
No State For the Kurds: An Analysis of the KRG and Iraqi Kurdistan
Jacqueline Gill, Middle East Studies and Political Science, Fordham College at Rose Hill, John Entelis*, Middle East Studies, Fordham College at Rose Hill

I am currently writing a thesis on Kurdish nationalist movements with a primary focus on Iraqi Kurdistan under the KRG. I am analyzing the domestic and international political and economic factors that both strengthen and limit the KRG’s chances of creating an independent Kurdish state. I will look at potential regional inhibitors and allies of the KRG including: the United States, Russia, Turkey, Iraq, Iran and Syria. I will also focus on the Kirkuk region and the pros and cons of a Kurdish rentier economy which include vast oil wealth and Dutch Disease. The paper will argue that an independent Kurdish state cannot survive in the current political and economic climate of the Middle East due to poor international support and the instability of a small rentier economy.
Oral-49

Applying Linear Block-Poly(ε-Caprolactone)-Block-Poly(L-Lactide) Systems in the Removal of Organic Pollutants from Water
Katrina Bernhardt, Chemistry, Fordham College at Lincoln Center
Amy Balija*, Chemistry, Fordham College at Rose Hill

Significant amounts of pollution in drinking water are attributed to pharmaceuticals and cosmetics, and the organic microparticles derived from these products cannot be satisfactorily removed by conventional water treatment systems. However, recent research has indicated that polymers can be used as encapsulation agents to effectively trap and remove these organic pollutants from aqueous environments. Research in the Balija group has focused on rapidly synthesizing biodegradable linear block copolymers constructed of distinct hydrophobic and hydrophilic regions and using them to remove organic pollutants from water. The synthetic, structural, and functional advantages of these novel polymers encourage the effective removal of Rose Bengal, a model of an organic pollutant. Linear block-poly(ε-caprolactone)-block-poly(L-lactide) was prepared with different proportions of ε-caprolactone and L-lactide monomers to examine the effect of varying the ratio of the hydrophilic to hydrophobic regions on the encapsulation abilities of the polymer. The polymers were analyzed using 1H NMR spectroscopy, size-exclusion chromatography, and scanning electron microscopy. In the encapsulation studies, a significant decrease in the absorbance of the aqueous phase was observed with UV-Vis spectroscopy, indicating high encapsulation efficiency for the polymers. Additional results examining pollutant removal efficiency will be discussed in this presentation.

Oral-50

Are We Ready?: The Process of Preparation by Students for an International Medical Volunteer Trip
Margaret Desmond, Sociology and Anthropology, Fordham College at Rose Hill
Kathryn Krasinski*, Sociology and Anthropology, Fordham College at Rose Hill

International volunteer trips are becoming increasingly common among college students. These students spend their breaks traveling to new countries where they experience a new culture and witness extreme poverty. This new phenomenon has raised questions about power dynamics and benefits related to volunteering internationally. In this research, undergraduate students were interviewed about how they had prepared for a medical volunteer trip to Guatemala. Interviews revealed that students were well-intentioned yet mainly focused on preparation as a means to improve their own experience rather than focusing on the community in which they would be living. In addition, there seemed to be an interest in yet lack of commitment to the preparation process. However, the interviews also revealed that most students had a fundamental awareness of the issues associated with international volunteer trips, particularly the issues of privilege and power dynamics. I argue that such awareness is important to avoiding negative aspects of international volunteer trips, yet a stronger commitment to preparation and to the experience of the community must be developed. This study is only half of the story of international volunteer trip preparation as it is necessary to understand the experience of the community in which the students volunteered. Future study of how the preparation by the students affected the community will be beneficial to evaluating these preparation strategies.

Oral-51

Political Knowledge in a Digital World
Anisah Assim, Political Science, Fordham College at Rose Hill
Olena Nikolayenko*, Political Science, Fordham College at Rose Hill

Political Knowledge is considered by many to be a foundational need for a good democracy. For this reason the determinants of political knowledge are of great interest to social scientists. One of the focuses in the area of political knowledge research over the course of the past decade has been the impact of social media on political knowledge. However, much of this research has ignored other aspects of the digital news gathering experience. The research on how different manners of digital interaction with news content impact political knowledge is limited. As the digitally native generation has come of age while older generations have shifted to online news gathering it is more important than ever to understand the most effective means of digitally conveying news information. My presentation on this topic will consist of an overview of my research on how news gathering habits influence political knowledge levels. This research includes both qualitative and quantitative methods of assessment.
As of 2014, more than 75 percent of securities trading was automated, and yet very few market actors beyond large banks have the access and resources to conduct automated trading. With this project, we present the first platform for automated trading developed without proprietary access to markets, exchanges, or special technology. The current programs we have developed for the platform take advantage of arbitrage opportunities found with a stock’s bid-ask spread. The first program, Finder, uses a value-investing approach to identify industries and stocks to target. The second program, Executor, takes a position in a predetermined stock and uses event-driven algorithms to maximize the likelihood of selling at the best time. The platform is engineered around technologies such as Robinhood LLC’s API, Python, and algorithms developed by the research team. Our testing demonstrates an ability to capture market data at a speed with which we can perform actions automatically and have those actions be based on a decision set determined by investing principles, a risk appetite, and the market environment. The development of this project creates implications for everyday market actors who may not have had access to their own personal automated trading technology before.

The dominant gender norms frequently serve as an impediment to women’s engagement in acts of civil disobedience. This study examines how women in Ukraine challenged the dominant social norms and participated in civil resistance against the regime. In particular, this study investigates women’s activism from the World War II to the EuroMaidan protest campaign, commonly known as the EuroMaidan. A number of women put up resistance to the communist regime in the post-WWII period. Similarly, a large number of women became engaged in the 2013-2014 protest campaign against the incumbent government by assuming various roles on the main protest site, a tent city installed on the capital city’s main square Maidan. Women were not only cooks and nurses, but they also facilitated the dissemination of information about political violence, coordinated the distribution of in-kind support, and even joined a squad, guarding the encampment. Using original data from in-depth interviews with female activists and multiple secondary sources, this study explores how and why women became active participants in civil disobedience. This study contributes to extant research on gender, protests, and democratization in Eastern Europe.

In 1544, Sienese herbalist and physician Pietro Andrea Mattioli published his seminal work, I discorsi. This groundbreaking herbal included the first classification and description of the tomato in European literature. Its subsequent editions (the 1555 updated edition in particular) included the first European name for the tomato, "pomi d'oro" and a detailed illustration of the plant that demonstrated its increased cultivation in the Italian peninsula in the decade between Mattioli’s first publication and his updated edition. Spurned because of its mistaken relation to the controversial mandrake, the tomato was generally condemned or ignored by Europeans. An extended research project for the History Department’s Mannion Society, this research will demonstrate the invaluableness of Mattioli’s writing; it was this ingenious herbalist, amidst the suspicion, who encouraged the usage of the tomato as a culinary ingredient. As a result of Mattioli’s influential suggestion, European herbalists, botanists, and physicians from John Gerard to Rembert Dodoens repeated Mattioli’s observations that would dominate herbal literature in almost every major
European language for centuries. As a result, the tomato’s association with Italians superseded the tomato’s status as a New World ingredient and its true colonial origins, cementing the tomato’s exalted position in not only the Mediterranean diet, but also, Italian cultural cuisine.

**Oral-55**  
**Development of nanoscale-iron chelators to stimulate erythropoietin expression under hypoxic conditions**  
*Steven Romanelli, Biological Sciences, Fordham College at Rose Hill, Ipsita Banerjee*, Chemistry, Fordham College at Rose Hill

Chronic obstructive pulmonary disease (COPD) is characterized by the destruction of the alveoli within the lungs and is classified as the third leading cause of death in the United States. A major setback in COPD treatment stems from our inability to accurately detect its onset and the mechanism of disease progression is only modestly understood. Thus to overcome this, we propose a nanoscale-iron chelator with two specific functions: (i) to function as a biosensor for COPD progression; and (ii) to function as a therapeutic to stimulate erythropoietin (Epo) protein production to overcome the hypoxic (low oxygen) state. We will synthesize iron-chelating nanoparticles from complex cyclic and polyamines for this specific work. Characterization of the nanoparticles will be examined by transmission and scanning electron microscopy in addition to Fourier transform infrared spectroscopy and 1HNMR, 13C NMR spectroscopic methods and their chelating ability will be examined in the presence of heme proteins in sheep’s blood and will further be confirmed using surface plasmon resonance. To assess hypoxia levels, nanoparticles will be studied in the presence of a Hep3B cell line and NADPH-oxidase assays will be conducted to observe Epo expression. Thus we propose novel nanoparticle chelators for application in studying the underlying mechanism of COPD with potential clinical significance in understanding this disease.

**Oral-56**  
**Examining Teresa Deevy’s Critique of Gender Roles in Katie Roche**  
*Jennifer Beall, Medieval Studies, Fordham College at Lincoln Center, Angela O'Donnell*, English, Fordham College at Rose Hill

This paper explores Teresa Deevy’s 1936 play Katie Roche as a subversive text used to critique the cultural and political enforcement of traditional gender roles in Irish society. Although well known in the 1930s and 1940s for writing six plays for the Abbey Theatre and several more for radio broadcasts, Teresa Deevy’s works have received little attention since her death in 1963. This paper relies on a textual analysis of Katie Roche, contemporary reviews of its original performance, and current scholarship in Irish theater studies to examine the play’s critique of gender roles within its cultural and historical context. Through analyzing these aspects of the play, this paper seeks to bring greater attention to Teresa Deevy and contribute to the emerging studies of her life and works.

**Oral-57**  
**Valueable Partnerships: Corporations and Small Businesses**  
*Grace Martin, Urban Studies, Fordham College at Lincoln Center, Bruce Berg*, Political Science, Fordham College at Lincoln Center

The NYC Department of Small Business Services (SBS) presents tools to entrepreneurs and business owners to unlock their potential economic success. According to the conception, NYC small businesses are essential to the commercial vitality and cultural character of their neighborhoods. Small businesses compete for these markets with corporations that have less at stake in expanding and risk-taking. Corporate and small business collaboration has become a decisive tool in the area of business, in neighborhoods that support its strategic partnership. By focusing on the interaction between corporations and small businesses, the effectiveness of the partnership for maximum economic earning potential and community support depends on its structure in three phases: philanthropic, transactional, and integrative. The consequences for designing effective collaborations provides more tools for NYC small businesses through understanding the implications of a corporate influence on small businesses and new joint-venture avenues of competition that could be implemented by the NYC SBS.
Oral-58

Representations of the Artist-Figure in Nabokov’s Pale Fire
Amy Palen, English, Fordham College at Rose Hill, Philip Sicker*, English, Fordham College at Rose Hill

This thesis project is an exploration of the way in which assorted characters in Nabokov’s Pale Fire manifest themselves as artists, and use art to confront the irreconcilable contradictions of their existence. Firstly, my research paper delves into the dualities that each character struggles with, and the way these problems impact their lives. These include the balance between the sane man and the lunatic, the artist and the critic, and, most importantly, the drive towards life and the attraction of death. Referencing the Freudian concepts of eros and thanatos, my paper illustrates the way that many characters wrestle with these conflicts, as well as their symbolic and thematic representations in the text. Secondly, my project explains the way in which each character turns to art, in an effort to reconcile these irreconcilable poles. Although their approaches at first seem widely variable, their motivations for making art appear increasingly unified as the paper goes on. I will conclude by asserting that, throughout Pale Fire, Nabokov represents the artist as a figure attempting to negotiate the fundamental, internal tensions between the twin desires for death and life.

Oral-59

Decreasing Uncertainty and Identifying Arbitrage Opportunities in the Equity Option Market
Matthew Scheivert, Economics, Fordham College at Rose Hill, Philip Shaw*, Economics, Fordham College at Rose Hill

This is an ongoing research project that seeks to explore factors of predicting implied volatility backed out of the Black-Scholes pricing model for equity option contracts in an effort to identify option arbitrage opportunities in the mispricing of premiums. This research is beneficial in that it explores the potential to model arbitrage, or riskless profit opportunities, as a function of empirical volatility prediction evidence. Moreover, this work explores simulating riskless hedging and delta neutral strategies derived from the evidence. It is proposed that these strategies be implemented in a variation of the capital structure of a closed end fund.

Oral-60

Intolerance of Uncertainty and Intrinsic Functional Connectivity in the Salience Network
Alec Musial, Integrative Neuroscience, Fordham College at Rose Hill, Amy Roy*, Psychology, Fordham College at Rose Hill

Generalized anxiety disorder (GAD) is a common disorder characterized by an uncontrollable, excessive, and persistent sense of worry, and, therefore, profoundly impacts quality of life of afflicted individuals. Intolerance of uncertainty (IU) is a construct highly associated with pathological worry and is used as a paradigm to better understand GAD. Few neuroimaging studies have examined the impact of IU toward GAD and thus this study aims to investigate neural correlates of IU. Neurocognitive correlates to worry have been explored in patients with GAD and has led to the discovery of a Salience Network that may play a key role in anxious psychopathology. This network contains areas such as the dorsal anterior cingulate cortex, amygdala, and notably the anterior insula. The right anterior insula acts as the region of interest for our study due to the fact that it acts as the key player in the robust network regarding executive cognitive control. More recent studies have examined the connectivity of the insula using resting state functional connectivity magnetic resonance imaging (rs-fcMRI), which enables one to identify fluctuations of different brain areas as temporal correlations while the individual in the MRI scanner does not perform a task. This study will take a seed-based approach via CPAC software to examine rs-fMRI data in the insula and anterior cingulate cortex to see if the connectivity of the regions significantly correlates with IU. This investigative study will hopefully elucidate meaningful information on the impact that these brain regions have on anxiety.
**Poster-1**

**Health Literacy and Pediatric Chronic Kidney Disease**

*Allison Parente, Psychology, Fordham College at Rose Hill, Rachel Annunziato*, Psychology, Fordham College at Rose Hill*

This study aims to investigate levels of health literacy among adolescents diagnosed with chronic kidney disease and in the caregivers of younger children also diagnosed with chronic kidney disease (CKD). Previous studies in adults have shown a correlation between health literacy and medical outcomes. The comprehension of medical information and the ability to apply this knowledge can play an important role in his or her medical care. A 2011 systematic review revealed that differences in health literacy levels were associated with an increase in hospitalizations, frequent emergency room visits, decreased ability to understand medication instructions, and limited comprehension of medical explanations (Berkman et al., 2011). This study will investigate whether or not specific domains of health literacy affect long-term medical outcomes in a pediatric population. The participants of the study include patients ages 10-25, diagnosed with CKD, and their caregivers. These patients are being treated at Mount Sinai Medical Center and need to have been diagnosed at least six months ago.

**Poster-2**

**Contemporary Emirati Art**

*Suzan Sikorski, Middle East Studies, Fordham College at Lincoln Center John Entelis*, Middle East Studies, Fordham College at Lincoln Center*

With international exhibitions entitled “The United Arab Emirates: Past, Present and Future” (2015) and “Sustaining Identity,” (2015) contemporary Emirati art has come to the forefront of art historical discourse. The government of the United Arab Emirates (UAE) is pushing its own initiatives through art, most recently through the international Sharjah Biennial. These exhibitions allows local Emirati artists to consider their national Emirati identity, cultivating a distinctive style within an environment heavily influenced by Western art history. Representing only 10% of the country, Emiratis are in need of sustaining a national identity through cultivating three generations of artistic legacy. Local and international exhibitions raise the questions about how to interpret Emirati art, given its dependence on a history of Western artistic practice. Little work has been done to explore how each generation of Emirati artists sustain their identity while interacting with Western and other local artists. How has working with Western artists allowed Emiratis to explore their own artistic styles? What makes Emirati artists distinct in development from other Arab artists? The preservation of indigenous art can cultivate a sense of national awareness and allow these artists to better participate in global art historical discourse. I am interested in exploring this gap, not by looking at already existing art criticism, but by interviewing the artists themselves at local and international exhibitions.

**Poster-3**

**The Effects of Acid Rain Stimulation on the Growth of Lemna Minor**

*Alina Gandrabur, Biological Sciences, Fordham College at Rose Hill, Sabrina DiMolfetta, Biological Sciences, Fordham College at Rose Hill, Genna Marcin, Biological Sciences, Fordham College at Rose Hill, Joanna Flores, Biological Sciences, Fordham College at Rose Hill, Alison Biltz, Biological Sciences, Fordham Co, Seth Ganzhorn*, Biological Sciences, Fordham College at Rose Hill*

Human emissions of sulfur dioxide have contributed to the formation of sulfuric acid in rain which has been responsible for 55 to 75% of precipitation acidity. In the northeastern United States, an average yearly pH range of 4.05 to 4.3 has been recorded in rain and snow. The occurrence of acid rain could be detrimental to the growth and survival of Lemna minor, a species of duckweed. Lemna minor is an important aquatic plant in wastewater filtering due to its ability to absorb excess nitrogen and phosphates. Previous studies on the effect of pH on Lemna minor have suggested that the optimal range for growth is between 6 and 7.5, and that duckweed has very low growth rates below a pH of 4.5. Because acid rain has an average pH range of 4.05 to 4.3, it is likely that acid rain would negatively affect the growth of duckweed. We will conduct an experiment to determine the effects of various acidic pH levels on the growth of Lemna minor, looking specifically at acidic pHs below Lemna’s optimal pH. Lemna minor will be grown in petri dishes at pH levels of 3.5, 4.5, 5.5, and 6.5 for two weeks. We hypothesize that the highest density of duckweed will be observed at a pH of 6.5, and that the density of duckweed will be lowest at pH values below 4.5, which is comparable to that of acid rain.
Poster-4

Socioeconomic Status and Street Tree Fitness: An Analysis of Environmental Injustice on Park Avenue
Amy Caffrey, Biological Sciences, Fordham College at Rose Hill, Dougan McGrath, Biological Sciences, Fordham College at Rose Hill, Elaina Weber, Biological Sciences, Fordham College at Rose Hill, Matthew Rogacki, Biological Sciences, Fordham College at Rose Hill, Kevin Jimenez-Cowell, Biological Sciences, Fordham College at Rose Hill, Seth Ganzhorn*, Biological Sciences, Fordham College at Rose Hill

New York City’s Park Avenue is home to great disparities in socioeconomic status (SES), along a single street in the entire United States. SES is defined as one’s economic and social position in relation to others according to income, education, and occupation. Often, a neighborhood’s SES is reflected in the abundance, diversity, and quality of parks, green spaces, and other vegetation. It is crucial to understand the human relationship to vegetation fitness, because green space has been shown to have implications on human health. This study aims to measure how tree fitness relates to SES of the surrounding neighborhood. We will use small neighborhoods of residential streets tangential to Park Avenue, and diameter at breast height (DBH) as a measure of tree fitness. The five neighborhoods studied have average median household annual incomes ranging from $15,750 to over $250,000. We predict that the trees growing in areas described as having a lower SES will have a lower fitness level as measured by diameter at breast height (DBH). Analyzing these effects on tree growth is important in understanding how affluence and related environmental care affects tree health.

Poster-5

The Effects of Nitrogen Concentration of Duckweed and Green Algae
James Potts, Biological Sciences, Fordham College at Rose Hill, Maciej Bielen, Biological Sciences, Fordham College at Rose Hill, Vivian Liu, Biological Sciences, Fordham College at Rose Hill, Gabrielle Robertson, Biological Sciences, Fordham College at Rose Hill, Beth Ansaldi*, Biology, Fordham College at Rose Hill

This research project examines the competitive interaction between duckweed and algae. Duckweeds are important to study because they help with bioremediation; they are able to remove nutrients like phosphate and nitrogen from water. Removal of these nutrients is required to treat sewage and wastewater. Algae can also be found in most freshwater bodies and is an important base for many aquatic food chains. However, factors such as excessive fertilization cause algal blooms which inhibit the growth of aquatic organisms. Because algae and duckweed coexist, it is important to understand the interaction between the two. Algae affects the ability of the duckweed to remove excessive nutrients from wastewater, making it important to monitor algae growth. Previous work has shown that at high N levels, the algal inhibition of duckweed is reduced compared to low N levels (Roijackers 2004). We hypothesize that algae will outcompete duckweed at lower concentrations of nitrogen, and at higher concentrations of nitrogen supplementation, the growth rate of duckweed will be greater than the growth rate of algae. Since duckweed is very good at removing nitrogen from water, it self-perpetuates vulnerability to algal competition. Our experiment will consist of three groups: a control group containing only duckweed and two groups with varying concentrations of nitrogen supplementation. We will be measuring pH and both duckweed and algae growth by surface area covered. Our findings may suggest the utility of nitrogen supplementation to prevent algae from inhibiting the growth of duckweed.

Poster-6

The Prevalence of Invasive Species in Urban Environments
Sandra Zajac, Biological Sciences, Fordham College at Rose Hill, Pronab Adhikary, Biological Sciences, Fordham College at Rose Hill, Simratjit Lehal, Biological Sciences, Fordham College at Rose Hill, Jessica Singh, Biological Sciences, Fordham College at Rose Hill, Seth Ganzhorn*, Biological Sciences, Fordham College at Rose Hill

Urbanization is a global trend which negatively impacts ecological biodiversity. For instance, human-altered landscapes allow for the invasion of non-native species. A species is regarded as invasive if it has been introduced, intentionally or accidently, to a non-native location and becomes capable of breeding without further human intervention. Starlings (Sturnus vugaris), once native to Europe, were introduced to New York City in 1890 and spread across the continent. By successfully occupying North America and most other continents, the starling has become one of the most prolific invasive species in the world. Such non-native species can cause substantial harm to the environment and human health, and cause major economic losses. For this experiment, we will compare a conserved remnant forest and an urbanized area. We hypothesize that urban areas will have a greater prevalence of invasive
starlings than non-urban, conserved forest settings. This study will provide new evidence regarding invasive species and urbanization.

**Poster-7**

**Native versus Non-native Tree Species: The impact on bird populations in the The New York Botanical Garden**

Colleen Biemer, Biological Sciences, Fordham College at Rose Hill, Alexander Lazzaro, Biological Sciences, Fordham College at Rose Hill, Marie Rabadi, Biological Sciences, Fordham College at Rose Hill, Paolina Mazzella, Biological Sciences, Fordham College at Rose Hill, Seth Ganzhorn*, Biological Sciences, Fordham College at Rose Hill

Non-native, and some invasive, tree species have been planted in various communities as a result of urbanization. Invasive tree species have been shown to have a considerable negative impact on ecological communities. Studies have shown that native tree species and insect species share a common evolutionary history. In contrast, non-native tree species do not provide the same habitat for insects to reproduce and survive on. Many local bird species rear their young on insect species found predominantly on native trees. We will observe the number of birds utilizing specific native and non-native trees in The New York Botanical Garden. This will entail measuring the frequency of bird visitation of trees over a set amount of time. We hypothesize that total bird abundance and species richness will have a greater frequency in the native tree species. The expected results could suggest that there is an association between native tree species and abundance of bird populations in an area. Future urbanization plans could use the findings of this research to conserve bird populations through the elimination of non-native, or invasive, tree species.

**Poster-8**

**Winter Species Diversity Determined by eDNA**

Alex Janzen, Biological Sciences Sociology and Anthropology, Fordham College at Rose Hill, Evon Hekkala*, Biological Sciences, Fordham College at Rose Hill

In the summer of 2015, Rockefeller University performed a research study which analyzed levels of environmental DNA (eDNA) in New York and New Jersey waterways to determine the presence and abundance of fish species in those waterways. In collaboration with Rockefeller University, we will determine what differences there might be in species in the winter months. We hypothesize that species acclimated to cold environments will be more abundant in winter than those acclimated to warm environments, leading to differences in overall community composition. We will be collecting one liter water samples from the East River and Hudson River, which were analyzed by Rockefeller University. Samples are also to be taken from the lake at the Calder Center to test for species unique to this location. The samples will be filtered, and the eDNA collected using the MoBio Soil Power kit. Then it will be possible to amplify the vertebrate 12S mtDNA with broad-range 12S primers which identify with most species. After adding barcode tags to each amplified library, we will pool the libraries together on MiSeq and search for matches within GenBank. This will provide us with a list of how many times certain DNA sequences appeared in the database, and the frequency of the DNA sequences in the database will correlate with the abundance of the fish in the wild. The use of eDNA in determining present species in a specific area will help us to understand species diversity and how this diversity changes or stays the same seasonally.

**Poster-9**

**Winter Species Diversity Determined by eDNA**

Reba Yohannan, Biological Science, Fordham College at Rose Hill, Evon Hekkala*, Biological Science, Fordham College at Rose Hill

In the summer of 2015, Rockefeller University performed a research study which analyzed levels of environmental DNA (eDNA) in New York and New Jersey waterways to determine the presence and abundance of fish species in those waterways. In collaboration with Rockefeller University, we will determine what differences there might be in species in the winter months. We hypothesize that species acclimated to cold environments will be more abundant in winter than those acclimated to warm environments, leading to differences in overall community composition. We will be collecting one liter water samples from the East River and Hudson River, which were analyzed by Rockefeller University. Samples are also to be taken from the lake at the Calder Center to test for species unique to this location. The samples will be filtered, and the eDNA collected using the MoBio Soil Power kit. Then it will be possible to amplify the vertebrate 12S mtDNA with broad-range 12S primers which identify with most species. After adding
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**Poster-10**  
**Winter Species Diversity Determined by eDNA**  
David Plitt, Biological Sciences, Fordham College at Rose Hill, Evon Hekkala*, Biological Sciences, Fordham College at Rose Hill

In the summer of 2015, Rockefeller University performed a research study which analyzed levels of environmental DNA (eDNA) in New York and New Jersey waterways to determine the presence and abundance of fish species in those waterways. In collaboration with Rockefeller University, we will determine what differences there might be in species in the winter months. We hypothesize that species acclimated to cold environments will be more abundant in winter than those acclimated to warm environments, leading to differences in overall community composition. We will be collecting one liter water samples from the East River and Hudson River, which were analyzed by Rockefeller University. Samples are also to be taken from the lake at the Calder Center to test for species unique to this location. The samples will be filtered, and the eDNA collected using the MoBio Soil Power kit. Then it will be possible to amplify the vertebrate 12S mtDNA with broad-range 12S primers which identify with most species. After adding barcode tags to each amplified library, we will pool the libraries together on MiSeq and search for matches within GenBank. This will provide us with a list of how many times certain DNA sequences appeared in the database, and the frequency of the DNA sequences in the database will correlate with the abundance of the fish in the wild. The use of eDNA in determining present species in a specific area will help us to understand species diversity and how this diversity changes or stays the same seasonally.

**Poster-11**  
**Diatom Abundance and Salinity Levels in Varying Bodies of Water**  
Hannah Kelly, Biological Sciences, Fordham College at Rose Hill, Frank Fontana, Biological Sciences, Fordham College at Rose Hill, Hyun Jeong Kim, Biological Sciences, Fordham College at Rose Hill, Analisa Blanco, Biological Sciences, Fordham College at Rose Hill, Sarah Whorley*, Biological Sciences, Fordham College at Rose Hill

Diatoms are photosynthetic microbes that form the base of aquatic environments. Despite being present in many habitats, diatoms flourish at lower levels of salinity, showing how this organism is adapted to a specific water quality. Water samples each were collected from Bronx botanical garden river, salt marsh, and ocean and were evaluated for chloride, nitrate and phosphate. These results were examined for a relationship with diatom density. We hypothesized that salinity has a significant influence on diatom density: the greater the salt content, a lower level of diatom density will be found in that particular body of water. This is due to both higher salt tolerances among species as well as higher saline levels causing a shift in nutrient availability.

**Poster-12**  
**Water Quality in Green Spaces and Socioeconomic Status**  
Aleksandar Popovic, Biology, Fordham College at Rose Hill, Anthe Nikolaidis, Faria Rahman, Naiem Habib, Sarah Whorley*, Biological Sciences, Fordham College at Rose Hill

Rapid urbanization is occurring across the globe, with over 60% of the Earth’s population projected to live in cities by 2050. As a result, natural ecosystems are being changed and altered into cities and the surrounding metropolitan areas. There have been efforts to incorporate green spaces into cities as a means of access. At the same time, these cities are experiencing segregation along socioeconomic lines, with stark contrasts between wealthy neighborhoods and lower income neighborhoods. The purpose of this study is to investigate water quality within urban green spaces within the context of socioeconomic status to uncover whether there is a correlation between the two factors. Total suspended solids, coliform, turbidity, chloride, nitrogen and phosphorous were measured at 10 different parks within New York and New Jersey to investigate the water quality in those areas. Median household incomes of the communities surrounding the parks were analyzed to investigate the correlation between income and water quality.
Results indicate there is a positive correlation between water quality in public parks and the socioeconomic conditions in surrounding communities.

**Poster-13**

**Effects of Anthropomorphic Contaminants on E. Coli Growth**

Lincoln Zernicke, Biology, Fordham College at Rose Hill, Andrew Julian, Biology, Fordham College at Rose Hill, Matthew Aranow, Biology, Fordham College at Rose Hill, Evon Hekkala*, Biological Sciences, Fordham College at Rose Hill

The addition of human elements to the natural environment has a diverse effect on ecosystems. Our goal is focused on how common human elements, such as road salts, soda, and cigarette butts, can have an impact on bacterial growth, abundance, and rate of change in concentrations in a water source. Using E. Coli bacteria grown on an agar plate culture we will conduct a series of studies measuring their relative abundance given the addition of human contaminants. These results will be compared to a control. Each of the three contaminants, i.e. coke, road salt, and cigarette butts will be added to water. The water containing these contaminants will then be added to bacterial cultures on a set date of growth. These will constitute the three experimental groups. Each experimental condition will be tested with its own separate bacterial culture. Each of these groups will have a corresponding positive and negative control so any differences pertaining to growth, abundance, and rate of change can be noted. We hypothesize that each of these contaminants will show differences in the growth rate and abundance of bacteria in these cultures. We predict that Pepsi, due to its high acidity, inhibits bacterial growth and abundance as compared with controls. We predict that road salt has an adverse effect on bacterial growth and abundance as compared with controls. Lastly, we predict that the addition of the water mixed with cigarette remnants showed little difference in comparison with the control.

**Poster-14**

**The Effect of Cosmetic Microbeads on Freshwater Microorganisms**

Stephen Crowley, Biological Sciences and Anthropology, Fordham College at Rose Hill, Anna Hudson, Environmental Science, Fordham College at Rose Hill, Samantha Jankowski, Psychology and Biological Sciences, Fordham College at Rose Hill, Samantha Levano, Biological Sciences and Humanitarian Studies, Fordham College at Rose Hill, Annelise Tucker, Sarah Whorley*, Biology, Fordham College at Rose Hill

Microbeads are known to have a detrimental effect on aquatic ecological systems but little research has been done to investigate their effects on freshwater microorganism populations. The purpose of this study is to determine whether microbeads have an effect on bacterial growth and diversity in a freshwater environment. We hypothesized that microbeads will absorb nutrients from the surrounding freshwater environment, resulting in decreased bacterial growth and diversity. Whole freshwater samples were collected from the Bronx River in the New York Botanical Gardens. The pH, salinity, turbid state, and concentrations of nitrate and phosphates of the water sample were tested at baseline. Equivalent volumes of microbeads were isolated from toothpaste, face wash, face scrub, body wash, and body scrub. These were applied to TSA plates along with an inoculum of river water. The microbeads and freshwater sample were also placed into a test tube to test for pH, salinity, turbid state, and concentration of nitrate and phosphates weekly for two weeks. Since smaller microbeads have an increased surface area to volume ratio, we expect the smaller microbeads to absorb more nutrients and to observe a higher degree of bacterial growth and diversity on TSA plates with larger microbeads than on plates with smaller microbeads.

**Poster-15**

**Natural Herbicide Effects on Weed Degradation and Soil Composition**

Kelly Becht, Biological Sciences, Fordham College at Rose Hill, Brianna Cali, Biological Sciences, Fordham College at Rose Hill, Julia Hilliard, Biological Sciences, Fordham College at Rose Hill, Anita Kalonaras, Biological Sciences, Fordham College at Rose Hill, Alexa Klink, Biological Sciences, Fordham Colle, Evon Hekkala*, Biological Sciences, Fordham College at Rose Hill

Herbicides, both commercial and natural, have been shown to negatively impact protein synthesis and amino acid absorption in plants, resulting in plant degradation. When compared to commercial herbicides, natural herbicides are predicted to have a lessened impact on the environment; however, the effects of natural herbicides on soil composition for future plants are not known. This study determines which natural herbicide is the most effective in weed degradation and least disruptive to the final soil composition. Salt and vinegar are known to be effective natural herbicides; salt effects proper water absorption and vinegar effects proper ion absorption. The natural herbicide...
treatments in this study include: salt, vinegar, and salt + vinegar. After removing the first plants, new seeds are planted into the same pots containing the natural herbicide treated soil to examine which conditions result in the most stunted growth in the new generation. We predict the results of the first experiment to show that the most effective natural herbicide is the salt + vinegar combination because plants have an optimal osmolarity and pH, which are both disturbed when administered this treatment. We predict the results of the second experiment to show that the salt + vinegar combination will cause the most stunted plant growth because of the mounted effects of disturbed pH and osmolarity remaining in the soil. These results are useful for broad application to future agricultural endeavors as natural herbicides are cheaper and safer options for effectively stunting weed growth while allowing for proper crop regrowth in the localized areas of herbicide administration.

**Poster-16**

**The Efficacy of Catnip Oil as a Botanic Tick Repellent**

Vivian Liu, Biological Sciences, Fordham College at Rose Hill, Thomas Daniels*, Biological Sciences, Fordham College at Rose Hill, James Caccio*, Chemistry, Fordham College at Rose Hill, Richard Falco*, Vector Ecology Laboratory, Louis Calder Center, Mark Green*, Department of Chemistry and Biomolecular Engineering, New York University

Ixodes scapularis, the blacklegged tick, is the primary vector of Borrelia burgdorferi; the bacteria species that causes Lyme disease in the US. The development of practical and effective methods to reduce rates of transmission of tick-borne diseases by reducing exposure to infected ticks is ongoing. Previous studies have found catnip (Nepeta cataria) oil to be effective in repelling mosquitoes and other insects, as well as ticks. However, its efficacy in repelling blacklegged ticks has not been tested previously. The active compounds in catnip are nepetalactones: two ring-fused bicyclic diastereomers (Z,E and E,Z) that differ only in orientation across the ring fusion. Catnip oil samples containing different ratios of the Z,E and E,Z isomers were tested: two were commercially available and one was farm-grown. To evaluate efficacy, Petri dish bioassays were performed in which one half of the dish contained filter paper treated with catnip product at varying concentrations and the other half contained untreated filter paper. Assays lasted for six minutes, each using five naive nymphal ticks whose positions on the plate were recorded every two minutes. Results indicate that both isomers found in catnip are effective in repelling blacklegged ticks. The use of catnip oil as a tick repellent has appealing features: it is a natural botanical product, widespread in nature (easily grown) and the oil is easily steam distilled from the plant. Additional tests will aim to determine duration of effectiveness and explore applications of dissolving catnip oil in a carrier to be used as a topical repellent.

**Poster-17**

**Site-directed mutagenesis on R2 of non-LTR retrotransponson to study RNA binding**

Elaina Weber, Biological Sciences, Fordham College at Rose Hill, Varuni Jamburuthugoda*, Biological Sciences, Fordham College at Rose Hill

Among the most abundant mobile genetic elements in eukaryotes are the non-long terminal repeat (LTR) retrotransposons. R2 is the most extensively studied non-LTR retrotransposable element, and it inserts itself into a specific site in the 28S rRNA in a variety of animal phyla. R2 encodes a 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 or number of the RNA binding domains. The R2 protein from Bombyx mori is used to study the target primed reverse transcription (TPRT) mechanism by which R2 integrates via separate cleavage of the two target sites of DNA. After cleavage, the released 3’ ends are used as primers for DNA synthesis. Notably, the R2 protein binds specifically to 3’ and 5’ regions of the R2 RNA, which makes the study of R2 RNA binding domains important, especially because TPRT is estimated to account for 40% of the human genome. In this study, we plan to use site-directed mutagenesis in the potential RNA binding regions to continue to locate these RNA binding motifs and to explore how the R2 protein binds to 3’ and 5’ RNA in the TPRT mechanism. Two possible R2 RNA-binding regions were chosen for mutation based on phylogenetic studies.
Poster-18

Automatic Smartwatch-Based Gait Assessment
Julia Getsos, Mathematics and Computer Science, Fordham College at Rose Hill, Gary Weiss*, Computer and Information Sciences, Fordham College at Rose Hill

Gait and balance are key indicators of an individual’s overall health. Gait analyses can therefore function as an important clinical tool, but typically requires an experienced medical practitioner. Automatic gait analysis, requiring only commercially available mobile technology, can make gait assessment inexpensive and widely accessible. We propose to use the gyroscope and accelerometer sensors in smartwatches (and smartphones) to automate gait assessment. In particular, we propose to automate the Berg Balance Scale, which is the gold standard for assessing a patient’s static and dynamic balance abilities.

Poster-19

Alutiiq and Dena’ina house and cache features
Samantha Stangarone, Sociology and Anthropology, Fordham College at Rose Hill, Kathryn Krasinski*, Sociology and Anthropology, Fordham College at Rose Hill

This study aims to differentiate Alutiiq and Dena’ina (two Native Alaskan cultures) house and cache features at the Fish Creek and Cottonwood Creek Villages to reconstruct Dena’ina-Alutiiq interactions. Located along Knik Arm in Southcentral Alaska, Fish Creek is the most important village to Knikatnu peoples, Dena’ina band, because they consider it the birthplace of their band. Ever since the discovery in 1928 of a ground stone lamp, a typical Alutiiq artifact, at Fish Creek, Alaskan anthropologists have hypothesized Alutiiq, or Eskimoan people lived along Knik Arm before the Dena’ina. To explain the modern distribution of these cultures, they have developed complex models for Dena’ina movement into Knik Arm, forcing Alutiiq to move south in Cook Inlet. To date, the oil lamp remains the most cited piece of evidence for these population shifts. However, there are many other plausible ways to explain an isolated stone lamp beyond major population shifts. By identifying differences in structure construction, this project will utilize data from hundreds of cultural features to develop and test the hypothesis that Alutiiq lived at Fish and Cottonwood Creeks. More broadly, it is an important case study in the identification of ethnicities from archaeological remains. Through literature research, field notes, maps, photographs, and radiocarbon dates from house features, this project seeks to contribute to our understanding of the geographic origins and subsequent migrations of modern Dena’ina, and the potential displacement of Alutiiq people to their modern geographic distribution south of Cook Inlet.

Poster-20

Where The Wild Wings Are: A Survey of Bird Diversity
Emma Cleary, Chemistry, Fordham College at Rose Hill, Corey Anco*, Biological Sciences, Fordham College at Rose Hill

Birds make good candidate organisms to study in urban environments because of their ability to survive in smaller spaces than most animals, but bird diversity is negatively affected by the rise of urbanization. We utilized point counts to collect visual and auditory data on bird diversity and abundance between two forested sections of the Bronx Zoo. We detected a greater abundance of birds at Mitsubishi Riverwalk (n = 574 birds) than at Old Riverwalk (n = 221 birds). Similarly, we detected a greater number of species at Mitsubishi Riverwalk (n = 35 species) and concluded that the two sites supported significantly different levels of bird diversity. Lastly, we found Mitsubishi Riverwalk had a significantly greater abundance of invasive birds species than Old Riverwalk (p = 0.0105).
Cold Exposure and Exercise Activates Brown Adipose Tissue

Timothy O’Connor, Biological Sciences, Fordham College at Rose Hill, Alexandria Bradian, Biological Sciences, Fordham College at Rose Hill, Amy Van Hoven, Biological Sciences, Fordham College at Rose Hill, Usha Sankar*, Biological Sciences, Fordham College at Rose Hill

Brown Adipose Tissue (BAT) and White Adipose Tissue (WAT) are fats found in humans. BAT has more mitochondria than WAT and UPC1, a protein that helps uncoupling of oxidative phosphorylation from ATP production resulting in heat release. Therefore, BAT burns glucose to produce heat instead of being stored as fat. If it were possible to harness BAT to burn calories, weight loss methods could arise. This study focuses on how cold exposure and exercise affect the activation of BAT. Previous research shows that exercise and cold exposure can activate BAT; however, research regarding activation of BAT after exposure to cold and exercise in the same day is scarce. We hypothesize that subjects participating in both exercise and cold exposure will activate more BAT and lose more weight than subjects who do one or the other; also subjects who exercise only will lose more weight than subjects exposed to cold only. Over 31 days, 80 healthy white males (ages 20-25 years) with a BMI range: 22-25 will be split into four groups: (1) no cold exposure or exercise, (2) cold exposure, (3) exercise, and (4) cold exposure and exercise. Subjects’ weights will be recorded before and after the 31 days. PET Scans after each exposure/workout using a glucose tracer will observe glucose uptake by BAT. Biopsies of BAT will be collected before the first exposure/workout and after each exposure/workout to record UCP1 levels. Data will be analyzed to support or refute the hypothesis.

The Integration of Robotic Multi-Sensors

Margaret Adams, Computer and Information Sciences, Fordham College at Rose Hill, Damian Lyons*, Computer and Information Sciences, Fordham College at Rose Hill

The research objective of the Computer Vision and Robotics Research Lab is to develop the necessary advances in theory and software to build robot systems. While robotics lends itself to programming and analysis, the computer vision aspect allows for tracking, sensory analysis, and camera feedback. My research focuses on robot behavior and the integration and use of multi sensory information to provide a uniform sensory region around the robot. The Pioneer Robot is equipped with a panoramic camera, which is used to instantly capture 360 degree views of the robot's surroundings. Therefore, the data captured by the camera relays the location of the robot's obstacles back to the computer. The robot is also equipped with sonar sensors, which are used to determine the distance and location of those obstacles. By combining these two sources of data into one protective zone around the robot, I want to show that it is possible to have a body contoured protective zone without extensive use of a tactile "skin" or a multitude of proximity sensors all over the robot. I plan to demonstrate this by showing the ability of the robot to orient itself to any threat that protrudes into the protective zone. Developing this program allows for better tracking, camera usage, and navigation technology, and will allow robots to be used in varying terrains and environments.

Assessment of the Speciation of the Eastern Chipmunk (T. striatus): A Study of the Genetic Differences Between T. striatus fisheri and T. striatus lysteri

Colleen Biemer, Biological Sciences, Fordham College at Rose Hill, Elizabeth Eisenhardt, Environmental Science, Fordham College at Rose Hill, Evon Hekkala*, Biological Sciences, Fordham College at Rose Hill

Chipmunks are small ground squirrels with a variety of ecological roles, including seed and mycorrhizal fungal dispersal, and they are a primary food source for predators. There are 23 documented species of chipmunks in North America with only one species of chipmunk found east of the Mississippi called the Eastern Chipmunk (Tamias striatus). Currently, T. striatus is considered a single species, however, previous research used morphology to divide T. striatus into five subspecies. In “Revision of the American Chipmunks,” Arthur H. Howell divided the T. striatus based primarily on the morphology of the skull and baculum. One of the geographical breaks between two of the subspecies runs through the Hudson Valley in New York. The subspecies, T. striatus lysteri occur north of the break and T. striatus fisheri occur south of the break (Howell 1929). The purpose of this study is to determine if each of these two subspecies are genetically distinct and to what degree. Previous research has found fixed genetic differences between these populations using the mitochondrial 12s gene. In our current project we are using ten anonymous nuclear markers called microsatellites specifically designed for T. striatus on 63 contemporary and 32 historical
individuals (Anderson et al. 2007; Peters et al. 2007). Further research may confirm that these two subspecies are different species genetically. Potential confirmation that these subspecies are different species could lead to more research on the other subspecies of chipmunk, more discussion on diversity and conservation of populations, and potential research on hybridization.

**Poster-24**

**Building the BICEP3 Test Cryostat**

Samantha Walker, Physics, Fordham College at Rose Hill, Chao-Lin Kuo*, Department of Physics, Stanford University

BICEP3, a ground-based telescope stationed in the South Pole, currently employs a cryostat to observe the polarization of the Cosmic Microwave Background, the earliest light in the Universe, by using devices that take advantage of the superconductivity transition of titanium. The cryostat consists of staggered temperature stages at 300 K, 50 K, 4 K, 2 K, 350 mK, and 250 mK that are maintained by both a pulse tube and three stage helium (He4-He3-He3) sorption refrigerator. However, currently the helium refrigerator is experiencing unanticipated heat loading which is decreasing the fridge cycle hold time and thus the number of hours that BICEP3 can observe for in a given period of time. To address this issue, this past summer I worked at Stanford University to construct a thermally-similar cryostat that will be used to test the thermal conductivities of its various internal components at subKelvin temperatures and determine the source of this heat loading.

**Poster-25**

**Diversity and Abundance of Amphibians and Reptiles Along the Bronx River Corridor**

Emma Huntress, Environmental Studies, Fordham College at Rose Hill, Corey Anco*, Biological Sciences, Fordham College at Rose Hill

Nearly half of all amphibian species are in decline and 50% of all freshwater turtle species are considered threatened with extinction. We conducted amphibian and reptile surveys using natural and artificial substrates to assess the diversity and abundance of amphibians and reptiles in two forested sections (Mitsubishi and Old Riverwalk) of the Bronx Zoo. We detected five species of amphibians and reptiles at both sites, but species compositions differed between sites. Furthermore, we found a significant difference in the observation location of amphibians and reptiles recorded during the survey period. These findings highlight the importance of using multiple methods to assess amphibian and reptile populations and can be used to aid additional surveying efforts.

**Poster-26**

**Raman Spectroscopy for the Determination of Cancer Margins in Squamous Cell Carcinoma**

Elaina Mansley, Engineering Physics, Fordham College at Rose Hill, Christopher Mazzeo, Engineering Physics, Fordham College at Rose Hill, Stephen Holler*, Engineering Physics, Fordham College at Rose Hill

Spectroscopic analysis has been used within the medical field for many years, however the usage of Raman spectroscopy in cancer diagnosis is only recently being tested. Raman spectroscopy has the potential to be used as an alternative tool in cancer diagnosis, and the determination of cancer margins through the usage of non-invasive near infrared lasers. This experiment used a Raman probe in order to collect spectroscopic data from tissue samples of squamous cell carcinoma in head, neck, and throat cancer samples as well as their adjacent controls. Results from this study indicate that the location of Raman peaks are identical in the cancerous and controls. However the intensity of these peaks varies, wherein the intensity of the Raman peaks in the cancerous samples is identifiably higher than their adjacent control. Preliminary multivariate statistical analyses of the Raman spectra indicate that discrimination amongst malignant and healthy tissue is possible with this approach. The ability to rapidly and accurately discriminate among healthy and malignant tissue offers surgeons a tool for in vivo analysis that would potentially reduce operating time, facilitate quicker recovery, and improve patient outcome.
Poster-27  
**Examining Soil Quality in Relation to Plant Diversity in NYC Wetlands**  
Faria Rahman, Biological Sciences, Fordham College at Rose Hill, Michael Sekor*, Biological Sciences, Fordham College at Rose Hill

In order to analyze the overall soil quality in NYC wetlands, several aspects of the soil were studied. This study serves to investigate the effects of urbanization on soil porosity, as little to no information is known about this relationship. Soil moisture was measured using a drying oven, and soil porosity within the sand, silt, and clay layers was measured using settling containers. Dry soil samples were sieved to also compare soil porosity. Contrary to what was expected, the site with more clay had higher plant diversity and lower soil moisture. This may have been as a result of the date that each site was created. Further studies should focus on using sites created around the same time frame.

Poster-28  
**Experiences and Perceptions of Bullying Over Time**  
Erica DiSilvio, Psychology, Fordham College at Rose Hill, Rachel Annunziato*, Psychology, Fordham College at Rose Hill

Over the past few decades, research and media attention to the prevalence and implications of bullying have drastically increased. This rising concern with bullying has generated questions regarding changes in perceptions over time, and possible changes in prevalence. To further address these questions, the current study cross-sectionally examines experiences and perceptions of bullying by comparing responses among participants from a wide age range, 18-62 (mean age of 27.24). A total of 187 participants (47.8% female, 52.2% male) responded to a questionnaire addressing their experiences with physical, verbal, and passive-aggressive forms of bullying. The informants were also asked questions addressing their emotional responses to these situations and their general perceptions of bullying. The results of this study indicated that while both groups experienced bullying, the adult population (26+, N=91) experienced significantly higher levels of physical bullying than the younger population. Contrarily, the young-adult population (18-25, N=96) indicated higher levels of experiences with passive aggressive victimization. Experiences of bullying within the school setting were not significantly different between the two groups, and emotional responses to bullying overall did not differ. The results of this study imply that bullying is not a new problem rather the forms of victimization differ between older and young respondents. The increased attention to bullying may reflect changes in parenting and bullying’s manifestation over time. The results also suggest that victimization is in fact an issue that continues into adulthood, and therefore approaches to targeting this problem may need to be broadened.

Poster-29  
**H2Omg: A multivariate water quality assessment of two sites along the Bronx River**  
Alyssa Melendez, Environmental Policy and Humanitarian Studies, Fordham College at Rose Hill, Corey Anco*, Biological Sciences, Fordham College at Rose Hill

Macroinvertebrate sampling and abiotic measurements (temperature, conductivity, and salinity) are common and informative methods used to characterize the quality of a river. In this study, we used a combination of macroinvertebrate sampling and abiotic water quality measurements to compare two sections of the Bronx River, Mitsubishi Riverwalk (a developed site) and Old Riverwalk (an undeveloped site) in the Bronx Zoo. Macroinvertebrate diversity differs greatly between these two sites, and was found to be greater at the Mitsubishi Riverwalk site, while no variation was found among abiotic water quality measurements between the sites. Furthermore, our findings reveal that there can be substantial variation in the biotic communities along different sections of a river, even if abiotic measurements do not readily detect a difference. This highlights the importance of using multiple methods when characterizing and assessing the quality of a given body of water.
Poster-30

The Ethical Implications of Deception in Research
Andrea DeBonis, Psychology, Fordham College at Rose Hill, Zoe Sakas, Biological Sciences, Fordham College at Rose Hill, Erica Howard, Integrative Neuroscience, Fordham College at Rose Hill, Claudia Trahan, Humanitarian Studies, Fordham College at Rose Hill, Elena Wostrel, Psychology, Fordham College at Rose Hill, Erica Howard, Integrative Neuroscience, Fordham College at Rose Hill, Kristen Tobias*, Psychology, Fordham College at Rose Hill

Deception is the act of misleading or wrongly informing someone about the true nature of a situation. In research, deception involves providing false or incomplete information to participants, which is often used to try to uncover truths that are difficult to observe otherwise. However, there are many ethical implications when using deceptive methods with human subjects. Some of these include the violation of respect for persons, manipulation of individuals to volunteer, and disruption of participants’ psychological state. In order for deception in research to be considered ethical, generally it must follow four conditions: there are no alternative methods to conduct the study, the study makes remarkable contributions to science, the deception is expected to have minimal risk, and participants are debriefed immediately following the protocol. To demonstrate the ethical implications involved in deception research, we will discuss four main studies and the benefits and harms associated with each of them. To highlight ethically acceptable deception, we will analyze placebo research and the Asch Conformity experiment. In order to discuss ethically unacceptable deception, we will use the Tearoom Trade study and Milgram’s experiment on obedience to authority.

Poster-31

Design of Peptide-Polyphenol Nanoscale Composites for Antimicrobial assemblies
Alexandra Brown, Biological Sciences, Psychology, Fordham College at Rose Hill, Ipsita Banerjee*, Chemistry, Fordham College at Rose Hill

Antimicrobial resistance is a recurring problem encountered all over the world leading to difficulties related to treatment of diseases. Microbes are constantly evolving and becoming more competent in combating antibiotics and other environmental stresses. Thus, there is a need to develop new antimicrobials that can selectively target microbes. In this work, we have developed a new family of antimicrobial nanoassemblies and explored their effects on both gram positive and negative bacteria as well as fungi. We examined both bacteriostatic and bactericidal effects against Pseudoalteromonas atlantica and Staphylococcus epidermis, as well as fungistatic and fungicidal effects against Rhizopus Oryzae. The nanoassemblies were prepared by self assembly of a variety of naturally available polyphenols, such as ferulic acid and chlorogenic acid which were then derivatized with an antimicrobial peptide sequence to that can accentuate the penetration of the nanoassemblies through the cell membranes of the microbes. The formation of these nanoassemblies was confirmed with FTIR spectroscopy and the morphologies were examined by scanning electron microscopy. The nanoassemblies formed ranged from nanovesicles to nanofibers. Cell proliferation studies were conducted with mammalian kidney cells to assess biocompatibility. For bactericidal and fungicidal evaluation, the microbes were grown on agar plates and the various nanoassemblies showed growth inhibition compared to the control plate. For bacteriostatic and fungistatic studies, the growth of the microbes was quantitatively assessed over time, and the nanoassemblies showed decreased growth. Thus, we have developed a new family of nanoscale antimicrobials that may be targeted specifically toward halting bacterial and/or fungal growth.

Poster-32

Examining Water Quality in New York City Wetlands
Marissa Vacarelli, Engineering Physics, Fordham College at Rose Hill, Michael Sekor*, Biological Sciences, Fordham College at Rose Hill

In order to assess water quality in wetlands across New York City, phosphate levels, pH, and salinity as well as dissolved oxygen, dissolved carbon dioxide, hardness, and nitrate levels, were tested using the LaMotte Limnology kit. The Ramble, located at Central Park, had the highest concentration of phosphate. Inwood Hill, a tidal wetland, had the highest concentration of salt, while Flushing Meadows, a freshwater wetland, had the lowest concentration of salt. The Ramble had the highest pH compared to all of the sites. Future studies should take more sites into account to create a more cohesive understanding of the water quality in New York City wetlands.
Poster-33

Human Disorders and Gene Therapy
Allison Ventola, Biological Sciences, Fordham College at Rose Hill, Antonia Puma, Biological Sciences, Fordham College at Rose Hill, Joseph Akdemir, Biology, Fordham College at Rose Hill, Robert Masci, Biology, Fordham College at Rose Hill, Varuni Jamburuthugoda*, Biological Sciences, Fordham College at Rose Hill

Gene therapy is an experimental technique that uses genes to either prevent or treat genetic diseases. This type of therapy is facilitated by the insertion of a desired gene into vectors which are then directly inserted into the cells of human patients by means of gene replacement, gene knockout, or gene addition. First, if a gene has mutated in a way that inhibits its normal function, the mutated version can be directly replaced with a functional copy of the same gene. Alternatively, the same mutated gene can be inactivated by inserting a random sequence into an exon disrupting the sequence rather than entirely replacing it. Furthermore, an entirely new gene can be introduced into the cell to fight the harmful effects of the mutated gene. Researchers have refrained from using gene therapy extensively as it is a relatively new treatment technique. The safety and efficacy of this method must be further analyzed before allowing it to become more broadly administered to the public. Currently, researchers are utilizing gene therapy in the treatment of neurodegenerative disorders such as Alzheimer’s disease. Researchers determined that the cells of Alzheimer patients responded to growth factors, vitamins or hormones essential for stimulating cell growth, delivered through ex vivo retroviral infection without negative pathological effects. Gene therapy is predicted to be useful in the treatment of hereditary, cancerous, or viral diseases in the future.

Poster-34

Geochemical Analysis in Southcentral Alaska
Kelly Walsh, Sociology and Anthropology, Fordham College at Rose Hill, Kathryn Krasinski*, Sociology and Anthropology, Fordham College at Rose Hill

ICP/MS analysis (Inductively Coupled Plasma Mass Spectrometry) has been conducted on sediment samples from house features at Cottonwood Creek Village, one of the last remaining pre-contact Dena’ina villages in Alaska, occupied from AD 1490 to 1918 – its decline is associated with the outbreak of Spanish influenza. During their history, Dena’ina experienced a transition in political and socio-economic complexity, from a highly mobile and egalitarian culture to a sedentary and stratified culture. These transformations are archaeologically evident through changes in both house structure and contents. However, this village is lacking in evidence of material culture, and oral history does not detail contents and activities of site features. Consisting of over 900 surface features including semi-subterranean houses and cache features, ICP/MS reveals chemical traces of elements present in sediments, and unique chemical signatures correlate to specific human activities. Therefore, this research will be useful in preserving Dena’ina culture, reconstructing past lifeways, and understanding details of spatial organization of the village. Discriminant function analysis reveals that both natural sediments are distinct from anthropogenic ones, and distinctions are evident between house features, side rooms, and cache features. Concentrations of isotopes of Thorium, Rubidium, and Uranium are associated with natural sediments, while isotopes of Cobalt, Copper, Zinc, and Strontium are associated with anthropogenic sediments. Interpretations of these results will enhance oral tradition for the descendant community.

Poster-35

Soil Variations Among Land-Use-Types and the Effect On Plant Growth
Maura Byrne, Biological Sciences, Fordham College at Rose Hill, Robert Ciardullo, Biological Sciences, Fordham College at Rose Hill, Jared Dublin, Biological Sciences, Fordham College at Rose Hill, Christopher Spinelli, Biological Sciences, Fordham College at Rose Hill, Evon Hekkala*, Biological Sciences, Fordham College at Rose Hill

Land-use-type has a crucial influence on the compositional and chemical properties of soil. In this study, the influence of land-use-type on soil composition, pH, and salinity will be examined. By comparing 3 types of land-use: Botanical Gardens, roadside trees, and Fordham University campus, we will examine the effects of different land-use-types on these soil properties and their effects on plant growth. The purpose(s) of this study are 1.) To determine the differences in soil composition, pH, and salinity between the 3 different land-use-types. 2.) To determine how variability in soil content can affect plant growth. We expect the test results to come back with conclusive evidence there is a threshold for which pH, salinity and soil composition are optimal for plant growth. The soil composition will vary for each land-use-type tested. We expect to find high clay composition in samples taken from roadside trees, compared to samples
from parks or campus. The results will most likely show elevated pH levels for each land-use-type, as alkaline soil is common in the urban environment. We also expect to find high salinity levels in all samples. Based on the varying soil conditions and compositions, we conclude that samples must be within the acceptable pH and salinity range for optimal plant growth. If the pH is too acidic or too basic, the soil will not be a good host for life. Likewise, is the salinity level is too high or too low, the seeds will not take root.

Poster-36

Soil Variations Among Land-Use-Types and the Effect On Plant Growth

Robert Ciardullo, Biological Sciences, Fordham College at Rose Hill, Maura Byrne, Biological Sciences, Fordham College at Rose Hill, Jared Dublin, Biological Sciences, Fordham College at Rose Hill, Christopher Spinelli, Biological Sciences, Fordham College at Rose Hill, Evon Hekkala*, Biological Sciences, Fordham College at Rose Hill

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Poster-37

Soil Variations Among Land-Use-Types and the Effect On Plant Growth

Christopher Spinelli, Biological Sciences, Fordham College at Rose Hill, Robert Ciardullo, Biological Sciences, Fordham College at Rose Hill, Jared Dublin, Biological Sciences, Fordham College at Rose Hill, Maura Byrne, Biological Sciences, Fordham College at Rose Hill, Evon Hekkala*, Biological Sciences, Fordham College at Rose Hill

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Poster-38

Soil Variations Among Land-Use-Types and the Effect On Plant Growth

Jared Dublin, Biology, Fordham College at Rose Hill, Robert Ciardullo, Biology, Fordham College at Rose Hill, Christopher Spinelli, Biology, Fordham College at Rose Hill, Maura Byrne, Biology, Fordham College at Rose Hill, Evon Hekkala*, Biology, Fordham College at Rose Hill

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Poster-39

Socioeconomic Distribution of Urban Community Garden Soil Composition & Contaminants

Sarah Voor, Biological Sciences & Sociology and Anthropology, Fordham College at Rose Hill, Lisa Wade, Biological Sciences, Fordham College at Rose Hill, Robert Frerich, Biological Sciences & Psychology, Fordham College at Rose Hill, Elise Thomson, Biological Sciences, Fordham College at Rose Hill, Ola Makara, Biological Sciences, Fordham College at Rose Hill, Elle Barnes, Biological Sciences, Fordham College at Rose Hill, Evon Hekkala*, Biological Sciences, Fordham College at Rose Hill

The recent intensification of the urban agriculture movement has dramatically increased interest in community gardens and urban farming; many benefits are offered by these community endeavors, especially for disadvantaged communities. Community development, social engagement, access to fresh produce, and green space offered by urban gardens all benefit the local populations they serve. However, in the post-industrial setting of many American cities, the threat of soil contamination is a serious issue that urban gardeners must take into consideration. The threat of elevated soil lead (Pb) levels, which in residential areas are associated with elevated children’s blood lead levels (BLL), is especially problematic in urban areas of older housing stock, in which historical usage of lead paint, as well as the combustion of leaded gasoline fuels, has contaminated urban soils. Testing and soil remediation schemes such as the usage of elevated gardening beds are available to address these concerns, but are often cost-prohibitive (making them frequently inaccessible to socioeconomically disadvantaged communities) and have been shown to face a significant risk of recontamination. This study investigates the soil quality profiles at various community gardens in the Metropolitan New York area, by measures of N, P, K, pH, salinity, and heavy metal content (Pb included). The spatial distribution of urban garden soil quality and socioeconomic status is explored using GIS mapping techniques.

Poster-40

Regulation, Resistance, and Religiosity: A Case Study of Homeschool Policy in Texas and Pennsylvania

Emily Grasso, Sociology and Anthropology, Fordham College at Rose Hill, Orit Avishai*, Sociology and Anthropology, Fordham College at Rose Hill

In America today, approximately 1.5 million students are homeschooled. Because education is regulated by state, homeschool policy varies greatly across the country. Some states require parents to provide progress reports and standardized test scores, while others do not even mandate a letter of withdrawal. This project is a comparative study of the regulatory schema of two different states, Pennsylvania and Texas, with the aim of understanding how and why certain policies have developed in each. Pennsylvania is known as one of the strictest states for homeschool families, while Texas is known as one of the most free. I use legislative records, lawsuits, case law, and other resources to study policy, and I analyze how the demographic and political characteristics of each state has influenced policy. I find that religiosity of the homeschool community is a strong indicator of the ability to successfully unify and fight against restrictive regulations. These results provide valuable insight into how states use policy to define the role of the
government versus the role of parents, and what social and cultural factors contribute to the delineation of these roles. This information is significant for future research regarding how these distinctions affect the lives of children and the quality of their education, and subsequently, the future of America.

**Poster-41**

**Conflicts of Interests and the Jeopardizing of Research Integrity**

Anna Maus, Sociology, Fordham College at Rose Hill, Tiffany Lee, Accounting and Information Services, Gabelli School of Business, Teresa Swindal, General Science, Fordham College at Rose Hill, Christopher Indudhara, Biological Science, Fordham College at Rose Hill, Lacey Stribling, Integrative Neuroscience, Fordham College at Rose Hill, Matthew Weinshenker*, Sociology, Fordham College at Rose Hill

Research integrity refers to the trustworthiness of research due to the soundness of its methods and honesty in presentation. The integrity of research can be jeopardized by conflicting interests posed by parties involved in the research process. In research, conflicts of interest will present themselves when financial and intellectual interests introduce bias or corruption to the investigator’s critical and analytical abilities. Researchers are expected to remain impartial and provide critical and unbiased results. The researcher is responsible for maintaining and promoting the public’s trust in the scientific community. Conflicts of interest undermine this trust and invalidate the information put forth by the scientific community. We propose to investigate how conflicts of interest jeopardize the intrinsic and extrinsic validity of scientific research. This poster will present examples of published research that was compromised by conflicts of interests and explore the impact the biased results had on the scientific community and society at large. We will explore measures that can be taken, as well as the policies currently in place, to eliminate conflicting interests from research studies. Proposed studies should demonstrate full transparency, ensuring that all parties involved are fully aware of the personal interests and professional duties of the researcher.

**Poster-42**

**Genetic Map of Bedbugs in NYC**

Zoe Sakas, Biological Sciences, Fordham College at Rose Hill, Sergios-Orestis Kolokotronis*, Biology, Fordham College at Rose Hill

Bedbugs (Cimex lectularius) are an integral part of the indoor biome of New York City, and yet we do not have much information regarding how they spread around the city. Given the diverse patterns of human population movement within the city and the affinity of bedbugs to the human dwelling, we hypothesized that the bedbug infestations in NYC are composed of different genetic lineages that originate from NYC (i.e. endemic), other parts of the country, and various international localities. I collected bedbugs in collaboration with pest management companies from four of the five boroughs to investigate the evolutionary relationships among various infestations and used this information to examine the degree of genetic similarity between infestations and look at them in terms of the geography of the city. To collect this data, I extracted and purified the DNA of bedbugs with a DNA purification kit, amplified a portion of the mitochondrial DNA cytochrome c oxidase I subunit gene (COx1) using insect and bedbug-specific PCR primers and purified the PCR products using the an enzymatic cleanup treatment. The purified PCR products were then bi-directionally sequenced using the Sanger method on a capillary sequencer. The sequences were then compared to one another, and our results revealed that genetic diversity does exist between different bedbug infestations. However, we also observed that bedbugs from different boroughs did not make up separate clades, and we did not see a pattern genetically connecting bedbugs that came from the same boroughs. This may be due to the mobility of New Yorkers throughout the city, and the existence of vast public transportation methods.
**Poster-43**

**Upregulation of HIF-2α to enhance Schwann cell survival**

Christopher Costa, Biological Sciences, Fordham College at Rose Hill, Dianna Willis*, Neuroscience, Burke Medical Research Institute, Weill Cornell Medical College

Oxygen is required for many eukaryotic cellular functions, the most important of which is energy production. The Hypoxia Inducible Factor (HIF) is a transcription factor composed of an alpha and a beta subunit, with three identified human isoforms, and is integral in helping cells survive low-oxygen conditions. When HIF is made under normal oxygen conditions, the enzyme prolyl hydroxylase hydrolyzes HIF, allowing it to be ubiquinated, which tags it for degradation by the cell. In hypoxic (low oxygen) conditions, the hydrolysis that allows ubiquitin to attach to the protein is halted and the HIF protein continues to function, activating the genes responsible for survival. In spinal cord injury, the area of injury becomes hypoxic and can result in secondary injury that is detrimental to recovery. While there are pharmacological methods to inhibit HIF hydroxylation (e.g. Deferoxamine), it would be more beneficial to have cell lines that inhibit HIF hydroxylation indefinitely. The goal of HIF research is to provide cells with greater protection to low oxygen conditions, with the eventual hope of reinserting modified cells into injury sites to help speed recovery. We tested the effectiveness of wildtype human and mutant (non-degradeable) HIF-2α transfection to protect cells in injured areas in primary rat Schwann cells. RT-qPCR and Western blotting confirmed upregulation of HIF-2α gene expression and downstream target gene expression and HIF-2α protein, respectively. Additionally, mutant HIF-2α transfection conferred increased resistance to peroxide insult, a condition similar to a spinal cord injury. This increased survival holds promise for new therapeutic approaches.

**Poster-44**

**Size Distribution and Computational Analysis of Sharps H-Chondrite**

Stephanie Giordano, Chemistry, Fordham College at Rose Hill, Jon Friedrich*, Chemistry, Fordham College at Rose Hill

Meteoritic analysis is a significant study which provides us data that helps us better understand the existence and prevalence of these bodies within our the solar system. Tomography is a useful tool which we have used to analyze size distribution data of chondritic material within meteorites. Computational analysis of tomographic data through IDL programming offers the ability to analyze both size distribution as well as chemical composition of the Chondrite sample. By formulating algorithms which analyze grey scale values and size distribution of chondrules in Sharps H-Chondrite, we are capable of better understanding chemical and physical properties of the samples by drawing parallels to a sample's density and chemical composition, while also conserving the sample.

**Poster-45**

**Relationship between Sleep and Anxiety in children with ADHD**

Alessandro Francia, Integrative Neuroscience, Fordham College at Rose Hill, Amy Roy*, Integrative Neuroscience, Fordham College at Rose Hill

The relationship between anxiety and sleep problems in children with ADHD has not been well studied. Given the impairments associated with this co-morbidity and the existence of effective treatments for sleep disorders in children, we decided to investigate whether children with ADHD and anxiety symptoms present with more sleep disturbances. Data were collected from children between 6 and 12 years old with a clinical diagnosis of ADHD. Children without (n=13) and with (n=15) diagnosed co-morbid sleep disturbances were further assessed using sleep and anxiety scales. We used subjective measures: the Child Sleep Habits Questionnaire (CSHQ), the Epworth Sleepiness Scale (ESS), and Screen for Child Anxiety Related Disorders Parent and Child (SCARED-PC). One objective measure of sleepiness, the Pupillary Unrest Index (PUI), was used as well. Children with ADHD and at least one sleep disturbance exhibited higher levels of sleepiness, poorer sleep habits, and higher anxiety levels versus the group without a sleep diagnosis. This study also found positive correlations between sleep habits and sleepiness. These two measures were also independently correlated with anxiety levels. Our results showed an association between sleep problems and anxiety levels in children with ADHD. These findings suggest that sleep problems in children with ADHD disrupt emotional regulation and they might precede anxiety symptoms. Thus, treatment of sleep disturbances might be an appropriate approach to address ADHD and co-morbid anxiety symptoms because it can dramatically improve children’s quality of life.
Poster-46  
**Nutrition and Well Being among College Students**  
Lauren Hughes, Psychology, Fordham College at Rose Hill, Rachel Annunziato*, Psychology, Fordham College at Rose Hill

In the college environment, there can be many possible factors that affect the psychological well being of students. The present study examined whether eating habits are associated with well being as measured by happiness and perceived stress levels among college students. Participants included 106 students from the Fordham University undergraduate population recruited from the Foundations of Psychology research pool, using the SONA system. Various surveys, including the University of North Florida’s survey of diet and exercise in freshman, the Oxford Happiness Questionnaire, The Perceived Stress Scale, and a demographic survey, were used to collect data from the participants. Healthy eating habits were only endorsed by 35% of respondents. A large number of participants stated that they often skip meals during the week. Specifically, only 28% “always” eat breakfast and surprisingly only 26% “always” eat lunch. The results indicated that students who were more likely to skip meals and engage in unhealthy eating were more likely to have higher levels of stress and less happiness. Students who were likely to skip breakfast had greater stress and lower happiness, while those who were likely to skip lunch had greater stress levels only. The results suggest that a greater emphasis on the importance of a healthy diet by educational institutions may increase the psychological well being of its students. It may be helpful to promote eating three meals a day and conducting further research to determine why college students frequently skip meals, particularly lunch.

Poster-47  
**Self-Assembly and Characterization of Graphene Oxide-Amino Acid Nanoassemblies**  
Patrick Barrett, Chemistry, Fordham College at Rose Hill, Steven Romanelli, Biological Sciences, Fordham College at Rose Hill, Ipsita Banerjee*, Chemistry, Fordham College at Rose Hill

Graphene oxide (GO) has been of great recent interest due to its capabilities to form nanoscale networks and its the presence of functional groups such as carboxyl and hydroxyl groups, as well as its large surface area. Although GO has been studied extensively in the field of nanoscale electronics, but one of the first obstacles for use in biomedical applications is its inherent cytotoxicity. In this work, we first investigated the changes in morphology, the binding interactions, and the self-assembling capability, upon functionalization of graphene oxide with amino acid derivatives. After confirmation of the newly formed conjugate, the drug-loading capabilities were examined by encapsulating a common antioxidant, ellagic acid (EA). The interactions between the self-assembled nanostructures EA were investigated. Additionally, the biocompatibility was explored through cell proliferation studies with chondrocytes; free-radical scavenging abilities were measured. Our results indicate both the successful self-assembly as well as improved biocompatibility and antioxidant properties.

Poster-48  
**Investigating Plant Diversity and Anthropogenic Effects in NYC Wetlands**  
Danielle Shtab, Environmental Studies, Fordham College at Rose Hill, Michael Sekor*, Biological Sciences, Fordham College at Rose Hill

Using arcGIS we studied anthropogenic effects present in New York City urban wetlands and examined their impacts on plant diversity. Focus was on parameters such as: topography, population density, fragmentation and the percent land cover of impermeable surfaces. Plants were surveyed in Flushing Meadows, Ramble, and Inwood Hill. Results led us to the conclusion that anthropogenic effects have a weak yet present relationship to the diversity of plants in the urban wetlands of New York City. As opposed to the percent of impermeable cover, fragmentation and population density had a more evident relationship (in these sites) with plant diversity. Future research should focus on invasive plant species, the curvature and width of roads within a one mile radius; as well as the purpose the wetland was created for and its current usages.
Rapidly Mutating Diseases

Ciara Walshe, Biological Sciences, Fordham College at Rose Hill, John-Paul Esoldi, Biological Sciences, Fordham College at Rose Hill, Kyrstin Belthoff, Biological Sciences, Fordham College at Rose Hill, Washika Ruhani, Biological Sciences, Fordham College at Rose Hill, Theodore Lampropoulos, Biological Sciences, Varuni Jamburuthugoda*, Biological Sciences, Fordham College at Rose Hill

Rapidly mutating diseases cause outbreaks by escaping the immune system response and because of the inability to create a vaccine to target their ever-changing genomes. Diseases mutate by two different mechanisms: antigenic shift and antigenic drift. Antigenic shift is a sudden change in the disease that is caused by the combination of two different strains of a disease when they infect the same cell through the mechanism of genetic reassortment, reemergence, and invasion. An antigenic drift occurs when small changes through nonsynonymous substitutions within the genes of a disease take place slowly over time as it replicates. When the genetic changes accumulate, the body’s immune system is unable to recognize these viruses with the antibodies built up from the different strains. Two examples of rapidly mutating diseases that increases virulence through these mutations include HIV and Influenza whose genetic material is encoded in RNA. Mistakes or mutations occur frequently because RNA is an unstable molecule and does not have the 3’ to 5’ exonuclease activity of DNA polymerase as a proofreading mechanism. The mutations are generally beneficial to the survival of the virus which allows the mutation to reproduce itself. A case study of an outbreak of Hepatitis C, a rapidly mutating virus, which occurred in Spain determined that an anesthesiologist caused the outbreak by examining the genomes. Scientists today use DNA sequencing to describe new strains of viruses and identify the origin of a virus, causes for infection, and possibly develop vaccines for prevention.

Chromosomal Abnormalities

Matthew Drozd, Biological Sciences, Fordham College at Rose Hill, Jennifer Boyle, Biological Sciences, Fordham College at Rose Hill, Nicole Utah, Biological Sciences, Fordham College at Rose Hill, Laura Wright, Biological Sciences, Fordham College at Rose Hill, Ryan Davis, Biological Sciences, Fordham College at, Varuni Jamburuthugoda*, Biological Sciences, Fordham College at Rose Hill

Chromosomes are structures created to aid in the segregation of DNA during cell division. Mutations may occur within specific genes, which does not affect the structure of the chromosome. An example of this is the inherited autosomal recessive disease, Sickle Cell Anemia. The autosomal recessive disease alters the hemoglobin molecules into a “sickle shape.” On chromosome 11, a gene, hemoglobin-Beta, only found on this chromosome is mutated. Achondroplasia, a common cause of dwarfism, is a autosomal dominant bone growth disorder caused by a gene mutation in the FGFR3 gene. Chromosomal disorders can occur during the formation of reproductive cells, or they can be inherited. Structural disorders such as translocation, deletions, and duplications, result from breakages in a chromosome, and can occur randomly or be inherited from a parent. Numerical disorders occur when a cell carries a complete extra set of chromosomes, this is known as polyploidy. Trisomy, a type of numerical disorder, occurs when one extra complete chromosome is present. Trisomy 21, commonly referred to as Down Syndrome, is characterized by the presence of a whole or partial extra copy of chromosome 21, and nondisjunction, mosaicism, and translocation are generally shared within each type of Down Syndrome. Down Syndrome can be diagnosed through screening and diagnostic tests performed prenatally, or through the analysis of a patient’s karyotype. Another numerical disorder is Klinefelter Syndrome which creates an extra X chromosome in men’s typical XY configuration; creating 3 or more sex chromosomes.

The effects of drought and herbivory on Brassica rapa differing in flowering time

Gabrielle Cremone, Psychology, Fordham College at Rose Hill, Siobhan Rueda, Biological Sciences, Fordham College at Rose Hill, Paul Supple, Biological Sciences, Fordham College at Rose Hill, Steven Franks*, Biological Sciences, Fordham College at Rose Hill

Brassica rapa is a plant that varies greatly in time to first flowering. This plant rapidly evolved earlier flowering in response to a natural drought, and has also been artificially selected for rapid cycling. The goal of the study is to determine how three populations of Brassica rapa respond to drought conditions, and how this response affects herbivory. In our current study, we are subjecting the plants to different water conditions. The experimental plants are receiving normal water conditions for the first half of the growth cycle followed by drought conditions for the second
half. Preliminary results indicate that the fast plant population flowers first. Our expected results are that the fast plant population will have a higher total flower production; however, the natural population will show a greater change in flowering time in response to drought conditions. Following the growth of the plant, two different trials will be conducted with an herbivorous insect, Pieris rapae. The choice trial will determine the preference of the caterpillar and the no-choice trial will determine performance. Our expected results are that the caterpillar will prefer the fast plant population that was subjected to drought conditions. Implications of this study are that fast plants allocate more resources to rapid growth, to allow for earlier flowering time and survival, and less resources to defending against herbivores.

Poster-52

Germination rates among floral types in Triodanis perfoliata
Alison Biltz, Biological Sciences and History, Fordham College at Rose Hill, Steven Franks*, Biological Sciences, Fordham College at Rose Hill

It is currently unclear why mixed-mating systems are common in plants, but studies evaluating germination rates among different floral types may help provide insight. Triodanis perfoliata, an annual herb, produces both open, showy flowers (chasmogamous, CH) and closed flowers (cleistogamous, CL). Closed flowers are obligately selfing, and open flowers are generally outcrossed, though they can be selfed. To examine the effects of flower type and mating type on seed germination, we grew Triodanis plants in the greenhouse and collected seeds from CL flowers, from selfed CH flowers (CHs), and from outcrossed CH flowers (CHox). A study was then conducted to determine whether CHox, CHs, and CL flower progeny differ in germination rate and success and whether their germination rates are affected by being frozen for several months directly prior to germination, which simulates winter conditions. Early results suggest that CL and CHs progeny have higher germination rates than CHox progeny and that CHs and CHox progeny are also more susceptible to mold during germination. All seed types experienced reduced germination rates when previously frozen, with CHox progeny experiencing the lowest germination rates after freezing. These results suggest that CL progeny may be more successful at germinating under varied conditions, which differs from the results of previous studies. These results show that germination rates can be influenced by floral and mating type, as well as their interactions with other conditions, which potentially helps to explain the advantages of mixed mating systems.

Poster-53

Noise of NYC
Quinn McGovern, Sociology and Anthropology, Fordham College at Rose Hill, Hugo Benavides*, Anthropology, Fordham College at Rose Hill

John Cage’s silent “4:33” is one effective example of how we study sound. The piece itself is almost paradoxical, a piece composed of nothing, yet one that forces the listener to hear the otherwise unnoticed natural sounds of a quiet auditorium with a heightened sense of awareness. Drawing from what Cage is investigating with his silent piece, I have used recording equipment to sample, compile, and contrast the sounds of New York City as they naturally occur. The musical profile of Cage’s “4:33” inspired me to further consider the impact of these soundscapes when they are moved from their “natural” context and placed into a musical one; in a sense, my work is a reversal of Cage’s attempt to present natural noise in a musical setting. This creative project which I have entitled “Noise of NYC” is the synthesis of originally composed music and recorded samples of urban life. The pieces of music within this project are inspired by and directly incorporate around raw city sounds from specific places in New York City. With it, I encourage a treatment of the cultural role of sound in what is perhaps the noisiest place in the world.

Poster-54

The Role Internalizing Disorders Play In the Social Problems Faced by Young Children with Attention Deficit Hyperactivity Disorder
Katherine Melz, Psychology, Fordham College at Rose Hill, Amy Roy*, Psychology, Fordham College at Rose Hill

Previous studies have found that in children with ADHD, the social problems they often face are made worse by co-morbid psychiatric disorders, such as anxiety and depression. We predicted that young children with ADHD would experience social problems, that children with co-morbid ADHD and internalizing disorders would experience more social problems than children with just ADHD, and that depression would be more significantly associated with social problems than anxiety in children with ADHD. The sample consisted of 162 participants between the ages of 6 and 9 and predominantly with ADHD. The Depression, Anxiety, and Social Skills scales of the Behavior Assessment
System for Children, Second Edition (BASC-2) were used. As predicted, children with ADHD showed poorer social skills based on parent and teacher report than healthy controls. Additionally, children with co-morbid ADHD and internalizing disorders exhibited worse social skills according to parent report than children with ADHD without these comorbidities. However, there was no significant difference in social skills based on teacher report between children with co-morbid ADHD and internalizing disorders and children with just ADHD. There was a significant negative correlation between social skills and depression, but no statistically significant correlation between social skills and anxiety. A Fisher’s Z test showed these differences in correlations to be significant. Knowing that certain internalizing disorders exacerbate the social problems faced by children with ADHD should help to address and improve these problems in the future.

Poster-55

When the Sixties Became Too Hot to Handle: How Johnson’s Policies Fueled American Inflation
Melanie Sheehan, History and American Studies, Fordham College at Rose Hill; David Hamlin*, History, Fordham College at Rose Hill

The combination of Lyndon Johnson’s political strategies and his personal beliefs and ambitions resulted in policies that fueled American inflation. Unwilling to sacrifice either his Great Society programs or the Vietnam War, Johnson promoted spending policies that pumped excessive amounts of money into the American economy, forcing prices and wages upwards. This unwillingness to sacrifice was increasingly mirrored by the American people as citizens became disillusioned with the war effort and frustrated with the gradual nature of change brought on by the Great Society. The lack of support for government aims only worsened prospects for curbing inflation, as union contracts abandoned wage guideposts and the threat of urban riots compelled Johnson to continue domestic spending. Thus, because of the desire of the American people and the Johnson administration to simultaneously achieve both international and domestic goals, exorbitant sums of money flooded the American economy, resulting in inflation.

Poster-56

Data Fabrication and Plagiarism
Christina Dowe, Psychology, Fordham College at Rose Hill; Melissa Leeolou, Psychology, Fordham College at Rose Hill; Jamie Toto, Psychology, Fordham College at Rose Hill; Sophia Myers, Psychology, Fordham College at Rose Hill; James McGowan, Psychology, Fordham College at Rose Hill; Matthew Weinshenker*, Psychology, Fordham College at Rose Hill

Scientific rigor is a pillar of substantiated research claims, which is an essential component in theory development. Much retesting and modification of testing is necessary in order to make findings concrete and support scientific theories. However, this inquisitive process is periodically abused by unethical research conductors, who tamper with their data in order to obtain correct results. While the causes for data fabrication and falsification are potentially unexplainable, the outcome is, at minimum, socially detrimental. Media outlets often perpetuate unsubstantiated research claims. Sources that are not strictly scientific have an inherent tendency to attract viewers with innovative claims, and do not always verify research methodology. This may discourage ethical integrity. Collectively then, society is often misinformed. Here we examine four cases in which ethical violations led the public to believe erroneous findings. These four studies include a correlational study of pesticides and Parkinson’s disease, a study of cancer treatment in relation to heredity, a study about vaccine usage and autism, and a study of rabbit blood in relation to HIV. Although thus far only a small percent of falsified scientific research has been publicly denounced, it is clear that ethical rigor requires constant vigilance. We emphasize that ethical data reports are paramount to not only scientific integrity, but also to social welfare.
Differential sensitivity theory proposes that individuals vary at the biological level, and specifically with regard to genetic variation, in the degree to which they are sensitive to environmental influences on their development. First proposed by Belsky (1997, 2005), differential sensitivity theory posits that individuals experience sensitivity to their environment in both positive and negative settings in a “for better or worse” manner. Candidate genes analyzed in most gene-environmental interaction studies involve neurotransmitters concerned with the dopaminergic system (MAOA, DRD2, etc.) which has been linked to reward sensitivity and sensation seeking, the serotonergic system (5-HTT) which has been linked to sensitivity to punishment and displeasure, and the neurotransmitter GABA (GABRA2, GABRG1) which has an inhibitory influence on neural excitability in the brain (Simons, Beach, Barr, 2012). Differential sensitivity has also been supported in the context of school intervention programs. This review examines the few empirical studies to date that have tested genetic differential sensitivity in the context of school-based interventions, and explores the intervention outcomes of students that do and do not possess specific variants of candidate genes. This literature review was prepared to complement work done in Dr. Joshua Brown’s research lab, on his quasi-experimental study titled “Reviewing and Collecting Evidence of Gene-based Differential Susceptibility to School-based Social-Emotional Learning Interventions,” focused on differential sensitivity in the context of social emotional learning interventions in NYC public schools. Findings from this study may assist in better matching school-based intervention supports to student social-emotional and academic needs.

Worldviews—individual’s fundamental perceptions on social and existential reality—have been identified in a number of studies as having a significant effect on psychological health. Developmental theories suggest that worldview may vary as a function of age (more specifically, worldviews are thought to decline during adolescence/young adulthood and grow stronger in old age). Similarly, research (as well as conventional wisdom) indicates that religion also plays a crucial role in the formation of worldviews. Past research concerning these predictor variables has yet to examine age and religion simultaneously and with the same sample. We conducted a multiple regression analysis using self-report data from the General Social Survey. Age and religion were tested as possible predictors of worldview. Only age was found to be a significant predictor of worldview. These results are presented as a pilot study meant to inform our ongoing research examining a more complex model between these variables. Specifically, the results of this multiple regression have led us to adopt a meditational model where worldviews mediate the correlation between age and a fourth variable present in much of the age and worldview literature—altruistic behavior. The non-significance of the religion variable as a predictor of worldview as well as the literature highlighting religion’s regulating effects leads us to examine it as a moderating variable in the age, worldview, and altruism model.

Genetically modified organisms (GMOs) were first introduced in 1973 when it was discovered that segments of DNA could be transferred from one organism to another. In 1982, the FDA approved the first GMO humulin, which is recombinant human insulin. They are now incorporated in 80% of processed foods in the U.S. Genetic engineering is a method of manipulating the genes in an organism with recombinant-DNA techniques in order to change that organism’s genotype and phenotype. The genetic engineering process that produces GMOs most often utilize viruses and bacteria to implant the desired gene(s) into the target organism. The effects of such changes can lead to more efficient production of food, more nutritious food, and decreased input costs. Genetically modified golden rice was
created to contain switched on genes encoding for B-carotene in order to help solve global vitamin A deficiency issues. However, some people in developed countries around the world are beginning to be skeptical towards GMOs because of possible ecological ramifications of GMOs are the endangerment of animals through pesticides that are used with GMOs as well as putting biodiversity of ecosystems at risk. Some studies have shown that pigs fed “genetically modified corn” over six months, had severe gastric inflammation in comparison to pigs fed unmodified corn. New developments using the CRISPR/Cas9 technique have shown that it is possible to target and remove genes inside of a plant without incorporating foreign DNA into the plant genome, creating disease-resistant crops without the need for a GMO label.

**Poster-60**

**Evolution of resistance to chemicals such as penicillin, pesticides and herbicides**

Eryk Kropiwnicki, Biological Sciences, Fordham College at Rose Hill, Shelby Cheever, Biological Sciences, Fordham College at Rose Hill, Eni Kokici, Biological Sciences, Fordham College at Rose Hill, Thomas Buckley, Biological Sciences, Fordham College at Rose Hill, Varuni Jamburuthugoda*, Biological Sciences, Fordham College at Rose Hill

Uncontrolled application of antibiotics and the strong and flexible metabolism of microbes have increased antibiotic resistance in the past few decades. Antibiotics such as penicillin, pesticides and herbicides remain effective but they do not eradicate their respective class of microbes. A small number of microbes, that have a different genetic makeup from the initial population, survive and reproduce (i.e. bottleneck effect). The new populations formed from the surviving microbes contain the resistance gene(s) and thus render many of our current antibiotics ineffective. This phenomenon incites scientists to consider and develop new antibiotics that can combat these new strains of microbes. First, scientists must develop a better understanding of the mechanisms that allow microbes to develop resistance to antibiotics. They have studied two main types of resistance called intrinsic and acquired resistance using PacBio RS II systems to study methylations of microbes’ DNA, as well as other techniques such as PCR, Disk Diffusion Method, E-Test and Mechanism Specific Tests. These methods allow scientists to advise the public about preventative measures and about the correct use of antibiotics, an example being the antibiotic, “Fad”, which has application to human health as well as animals’ and plants’.

**Poster-61**

**Heroin Addiction in the United States and Combatting it with Safe Injecting Facilities**

Emily Hill, English, Fordham College at Rose Hill, Kimberly Consroe*, Anthropology, Fordham College at Rose Hill

This study analyzes the number of national overdose-related deaths caused by heroin throughout the United States from 2000-2014. Patients prescribed opioids for pain management have a high-potentiality to become addicted. Due to the high prices of opioids, this addiction becomes a financial burden to those that receive a household income of $20,000 or less a year. As a result, individuals are forced to find a cheaper option for pain management: heroin. As heroin is an illegal substance, health care professionals are not able to monitor those that use it. The unfortunate result of this is the increasing rate of deaths related to heroin overdoses. From 2013 to 2014, heroin overdose deaths increased 26% and have tripled since 2010. Another devastating result of an addiction to an injectable drug is HIV and Hepatitis C infection. In 2010, 8% of new HIV infections were as a result of unsafe injecting practices. In 2007, there was a 65% prevalence of HCV infection amongst injection drug users. The research conducted supports the first step in combating the epidemic is establishing safe injecting facilities that are currently present with positive results in Australia, Denmark, and Ireland. These facilities would launch beginning in places with high heroin overdose related death incidences. From the evidence provided by the facilities in Europe and Ireland, individuals began to adopt behaviors that lowered risk of infection, namely using clean needles and practicing proper needle disposal. In addition, these facilities allowed for a quick response time of 1-5 minutes for overdoses.
**Poster-62**

**Trajectories for Girls in Foster Care: Risk Factors and Treatment**

Katharine Malcolm, Psychology, Fordham College at Rose Hill, Kimberly Consroe*, Sociology and Anthropology, Fordham College at Rose Hill

The New York City foster care system processes approximately 250,000 children into foster care each year. Although foster care is intended to serve as a temporary placement while a safer environment is located for the child, most children spend an average of two years in foster care. Children in foster care could spend a significant amount of time there, putting them at a greater risk for delinquent behavior. Girls and boys in foster care face different risk factors that contribute to delinquency. An important factor for girls is placement instability; research suggests that girls are more susceptible to environmental factors such as family interaction. Most interventions for youth in foster care are geared towards boys. These interventions target different risk factors, and are less effective at treating girls than treatments that are created specifically with girls in mind. A growing number of women and girls are becoming involved in the criminal justice system. More research needs to be done to create effective treatments for girls across age groups. Treatments that target specific risk factors faced by girls in the foster care system would help reduce the risk of involvement in the juvenile justice system, and benefits could carry over into a reduction in the number of women involved in the criminal justice system.

**Poster-63**

**The Bioarchaeology of Chinese Immigration**

Yaohan Wu, Sociology and Anthropology, Fordham College at Rose Hill, Kimberly Consroe*, Sociology and Anthropology, Fordham College at Rose Hill

The First Wave of Chinese immigrants came to the Western United States to work as gold miners and railroad laborers in the mid-19th to 20th centuries. Anti-Chinese marginalization in this period left this population with overcrowded housing, contaminated water supplies, insufficient medical resources and repeated violence, which resulted in malnutrition, occupational stress, pathology and trauma; all of which are visible on the human skeleton. However, literature about early Chinese immigrants in North America reveals a lack of focus on bioarchaeological evidence from this community and trans-Pacific immigration in general. This research addresses this problem by using skeletal evidence from archaeological sites in California, Montana and Nevada, to understand the physical toll of the discrimination endured by this early immigrant population. Evidence from these sites suggests a history of anti-Chinese marginalization, and a case is made that more work is needed to understand the lives of Chinese Immigrants in the American West, through which society can have a better sense of the positions of early Chinese immigrants in relation to others.

**Poster-64**

**Ethical Considerations in International Medical Research**

Joanna Flores, Biological Sciences, Fordham College at Rose Hill, Veronica Kot, Biological Sciences, Fordham College at Rose Hill, Sara McLaughlin, Psychology, Fordham College at Rose Hill, Joseph Rametta, Economics, Fordham College at Rose Hill, Matthew Batarseh, International Political Economy, Fordham College, Matthew Weinshenker*, Sociology and Anthropology, Fordham College at Rose Hill

International research is organized, scientific study of a shared issue by researchers in different countries. Though ethical issues are important in all forms of research, international studies are subject to political and cultural ethics at national and international levels. We discuss ethics in the research of diseases that grow rapidly and spread internationally. Ethics in medical research are intertwined with higher stakes at international levels. Researchers must abide by many countries’ rules and regulations, ensure informed consent across cultural differences, and be wary of undue participant coercion in developing nations. To explore the ethics of international medical research, we analyze ethical standards in light of the recent research efforts designed to understand the Zika virus and its potential link to microcephaly. With the United States established as a world power, where do we draw the line so that our foreign interventions do not breach ethical standards in vulnerable nations? When US biomedical ethics is based on a first-world, Western lens, how can researchers ethically navigate differing standards in Brazil?
**Poster-65**  
Site-directed mutagenesis on R2 of non-LTR retrotransposon to study RNA binding  
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Among the most abundant mobile genetic elements in eukaryotes are the non-long terminal repeat (LTR) retrotransposons. R2 is the most extensively studied non-LTR retrotransposable element, and it inserts itself into a specific site in the 28S rRNA in a variety of animal phyla. R2 encodes a 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 or number of the RNA binding domains. The R2 protein from Bombyx mori is used to study the target primed reverse transcription (TPRT) mechanism by which R2 integrates via separate cleavage of the two target sites of DNA. After cleavage, the released 3’ ends are used as primers for DNA synthesis. Notably, the R2 protein binds specifically to 3’ and 5’ regions of the R2 RNA, which makes the study of R2 RNA binding domains important, especially because TPRT is estimated to account for 40% of the human genome. In this study, we plan to use site-directed mutagenesis in the potential RNA binding regions to continue to locate these RNA binding motifs and to explore how the R2 protein binds to 3’ and 5’ RNA in the TPRT mechanism. Two possible R2 RNA-binding regions were chosen for mutation based on phylogenetic studies.

**Poster-66**  
Gender Role Conflict and Non-Suicidal Self-Injury  
David Schillinger, Psychology, Fordham College at Rose Hill, Margaret Andover*, Psychology, Fordham College at Rose Hill

Gender role conflict (GRC), a negative psychological state caused by rigid gender norms, has been associated with depression (Rice, 2013; Rodav, Levy, & Hamdan, 2014; O’Neil, 2015). Non-suicidal self-injury (NSSI), the deliberate damage to one’s own body without suicidal intent, has also been associated with depression. Many studies have found men and women to have comparable rates of NSSI among nonclinical samples (Andover, Pepper, & Gibb, 2007; Heath, Toste, Nedecheva et al., 2008). The role of GRC in NSSI among men, however, has not yet been investigated. Therefore, the purpose of this study is to examine the relationships between GRC and the frequency of NSSI, and depression as a moderator of the relationship between GRC and NSSI. The final sample consists of 184 male participants from the United States who were recruited and completed a survey online. We hypothesize that GRC will statistically predict NSSI history and frequency. In addition, we hypothesize that GRC will be associated with intrapersonal, but not interpersonal, functions of NSSI. Over half of participants (57.1%, n = 105) reported engaging in NSSI behaviors. GRC statistically predicted NSSI frequency, β = 0.16, t = 2.04, p = .04. This relationship was moderated by depression, with increased GRC associated with increased NSSI frequency among individuals with high (t = 2.34, p = .02), but not medium or low, levels of depression. The results of this study will help to further our understanding of the reasons that men self-injure, and can aid in the development of therapies to treat such men.

**Poster-67**  
DNA Forensics  
Eugenie Hughes, Biological Sciences, Fordham College at Rose Hill, Theresa Mandile, Biological Sciences, Fordham College at Rose Hill, Soulin Haque, Biological Sciences, Fordham College at Rose Hill, Megan Molnar, Biological Sciences, Fordham College at Rose Hill, Varuni Jamburuthugoda*, Biological Sciences, Fordham College at Rose Hill

DNA forensics focuses on analyzing genetic information in criminal investigations and paternity testing. This technology was only developed in the early 1980s, and it was not used in a crime scene until 1987. Forensic investigators use DNA fingerprinting to detect the differences in the gene sequences between individuals. In this technique, the DNA from the person in question is sequenced and then compared to a known sequence, such as the sequence of DNA found at a crime scene. Humans share 99.9% of DNA, so sequences that are unique to individuals must be compared. Two types of these sequences are STRs and SNPs. DNA databases are filled with profiles of short tandem repeats (STRs), which are efficient for mapping specific traits and for following the flow of genetic material in a population. There is increasing interest in single nucleotide polymorphisms (SNPs), the most common form of mutation in the genome. STRs and SNPs have multiple advantages and disadvantages. For example, STRs have multiple alleles per marker allowing it to fill DNA databases, whereas SNPs have only two alleles per marker making it less informative. However, SNPs do exist all over the genome, are more common than STRs, and have much lower
mutation rates than STRs because they are conserved in certain populations. Despite the positive application of DNA fingerprinting technology to forensic investigation, there are ethical concerns involved in keeping a database of DNA sequences.

**Poster-68**

**Determining age of insulin resistance appearance in Caucasians, African Americans, and East Asians**

Emily Bruder, Integrative Neuroscience, Fordham College at Rose Hill, Colin Riley, Biological Sciences, Fordham College at Rose Hill, Usha Sankar*, Biological Sciences, Fordham College at Rose Hill

This study aims to determine an age at which individuals of different ethnicities begin to express decreased insulin sensitivity, making them more likely to develop type 2 diabetes. Current research says African Americans are more likely overall to develop diabetes than Caucasians and East Asians. However, this research lacks data involving blood glucose analysis between different ethnicities to determine exact timing of onset. This study attempts to figure out if African Americans, on average, have a significant decrease in insulin sensitivity earlier in life compared to Caucasians and East Asians. We hypothesize that African Americans will express significant decrease in insulin sensitivity earlier in life than East Asians or Caucasians. The data for this study will be gathered through an Oral Glucose Tolerance test, which examines blood glucose levels after ingestion of a specific glucose amount. In this experiment, three ethnicities will be tested (African American, Caucasian, and East Asian) amongst 7 age groups (18-26, 27-35, 36-44, 45-53, 54-62, 63-71, and >71). There will be a total of 420 subjects, with 140 subjects designated to each ethnicity, and 20 subjects designated to each age group. Blood will be drawn and examined every 30 minutes for 2 hours to obtain levels of blood glucose. Focus will be placed at 120 minutes where we will be looking for a jump in blood glucose levels greater than 10 mg/dL from one age group to another. This will provide us with the evidence for which age group began the expression of significant decreased insulin sensitivity.

**Poster-69**

**3-D Imaging Using Stereoscopic Vision**

Elizabeth Orsini, Engineering Physics, Fordham College at Rose Hill, Hannah Abdoo, Engineering Physics, Fordham College at Rose Hill, Stephen Holler*, Engineering Physics, Fordham College at Rose Hill

The purpose of this research is to produce advanced 3D visuals by superimposing images which allow for viewing depth perception. By utilizing MatLab, we can create images that the brain can process in 3-Dimensions when viewed through anaglyph glasses. The main purpose of this research is to remove humans from potentially dangerous situations and replace them with robots that can provide advanced visuals. Additionally, operations are often performed by medical doctors using robots that can only provide 2-Dimensional views, this development would aid in determining distances and perceiving depth using robots. This is a simplistic method that can be incredibly versatile. This research will aid in developing a deeper understanding of potential usages for 3-Dimensional imaging while remaining relatively easy to implement.

**Poster-70**

**Microevolutionary immunogenetic responses to blood parasite infection in American robins in the Greater New York area**

Sarah Voor, Biological Sciences & Sociology and Anthropology, Fordham College at Rose Hill, Sergios-Orestis Kolokotronis*, Biological Sciences, Fordham College at Rose Hill

Evolutionarily related to the parasitic protozoa that cause malaria in humans, avian malaria is the result of infection of bird hosts with mosquito-borne hemoparasites belonging to the subclass Haemosporidia. Avian malaria once served as a model for the investigation of human malaria, but today is important in investigating host-parasite interactions, offering insight into the role balancing selection can play in shaping the evolution of the host’s immunogenetic profile. As temperatures rise globally and the range of avian hemoparasites expands, understanding avian malaria is of increasing interest for conservation biology and policy. In recent years, MHC class I genes have been the target of much investigation for the associative role they play in host susceptibility to hemoparasite infection. In passerine species, the highly polymorphic exon 3 of MHC class I genes has been demonstrated to be highly variable, rapidly evolving to meet diversifying selection pressures by pathogen presentation in what is widely known as an ‘evolutionary arms race’. It is recognized that higher levels of MHC class I gene variability are associated with a greater ability to resist a variety of pathogens. This study investigates MHC class I gene allelic diversity in a population.
of American Robins (Turdus migratorius), a species with an unusually high infection prevalence in the Metropolitan New York area (90%).

**Poster-71**

**Testosterone Replacement Therapy in Males with Hypogonadism**

Laura Calisi, General Science, Fordham College at Rose Hill, Meaghan Roszyk, Psychology, Fordham College at Rose Hill, Janeliz Fernandez, Biological Sciences, Fordham College at Rose Hill, Usha Sankar*, Biological Sciences, Fordham College at Rose Hill

Male hypogonadism is a condition in which the body does not produce an appropriate level of testosterone causing a delay in masculine growth and development during puberty, deterioration of muscles, lack of secondary sex characteristics and reduced bone mass resulting in a shorter stature. Testosterone replacement therapy is the treatment for hypogonadism in young boys inducing physical growth and maturity in order to achieve normal height and bone density. The purpose of this study is to determine the optimal time to administer adult testosterone therapy in order to prevent and reverse the symptoms of hypogonadism. We are interested in identifying whether it is better to initiate therapy at the onset of puberty or at the end. The studies we read focused on how hypogonadism affects the body and the effectiveness of treatment, not the optimal time of administration. In our study, we focused on determining the correlation between age at the start of therapy and effectiveness of the treatment. To complete this study, 100 participants are separated into five groups of twenty; twenty without hypogonadism and the remaining with the condition. We will begin with a pre-treatment assessment measuring the bone density, height, and testosterone levels of all the participants. After 6 months of therapy and at an age of 24, the same variables will be measured and the results analyzed. We predict that the boys receiving treatment at the initiation of puberty will have the most optimal results in both height and bone density at the normal range.

**Poster-72**

**Decelerated Growth In Solid Renal Carcinoma As a Result of Low Unsaturated Fat Diets**

Casey Chun, Biological Sciences, Fordham College at Rose Hill, Adele Heib, Biological Sciences, Fordham College at Rose Hill, Usha Sankar*, Biological Sciences, Fordham College at Rose Hill

Tumor cells initiate changes in their local environment that compromise normal homeostatic conditions. These changes alter the physiology of the underlying tissue that undermine the effectiveness of chemotherapy and radiation. Several characteristics account for these changes, which include and are not limited to rate of cell proliferation, hypoxia, low extracellular pH, increase in tumor vasculature, histology, etc. Previous research established a notable change in cancer cells’ dependence on polyunsaturated fatty acids as an alternative fuel source. To circumvent and capitalize on these changes, this study aims to explore the relationship between altering patient diets and what implications dietary changes have on tumor physiology, growth, and metabolism. We hypothesize that if a diet low and/or devoid of unsaturated fatty acids is implemented, there will be a decreased rate of tumor growth in the patients adhering to this diet. This experiment will only focus on patients with renal carcinomas, as this type of cancer has a relatively high survival rate and is involved with the excretory system. Using CBC panels, MRI and CT scans, we will monitor the growth of renal tumors in patients with stage 1 renal cancer for six months as they follow a low fat diet modeled off of Memorial Sloan Kettering’s Cancer Center sample patient meal plan. We will compare the baseline readings taken from the patients on the first day of the experiment with the data collected over the experimental period to determine whether or not our hypothesis is correct.

**Poster-73**

**Unphysical states in staggered chiral perturbation theory**

George Davila, Physics, Fordham College at Rose Hill, Christopher Aubin*, Physics, Fordham College at Rose Hill

Modern particle physics has been constructed under a framework called the Standard Model, a complex and theoretically rich framework that has been shown to agree with enumerable experimental observations. Through the Standard Model, hundreds of particles can be shown to arise from only a handful of fundamental particles. Yet the Standard Model only predicts phenomena up to certain energy levels and offers limited insight into why particles have the properties that they do. Additionally, even though it explains particle physics to an incredible degree of precision, there are various aspects of the theory (such as gravity, the structure of neutrinos, to name only a few) that are not explained by the Standard Model. Contemporary research focuses on constructing models beyond the Standard Model, with the hope being to construct a theory that produces the Standard Model in the low energy limit and gives rise to
new physics at high energies. This project will use Staggered Chiral Perturbation Theory (ChPT), applying the techniques of lattice QCD to study phases of what are known as staggered fermions. Understanding these phases will help ensure that they are not used in simulations done during this research or in simulations carried out by other research groups. This will ensure that the simulations and calculations done in this field can actually be used to understand physical theories, and eventually be used to extend the Standard Model.

**Poster-74**

Characterization of the Interactions between MyoGEF and a Tight Junction-Associated Protein MUPP1

Genna Marcin, Biological Sciences, Fordham College at Rose Hill, Qize Wei*, Biological Sciences, Fordham College at Rose Hill

Tight junctions not only play a central role in establishing polarized epithelial and endothelial barriers, but are also linked to intracellular signaling centers to control epithelial-cell proliferation, polarization and differentiation. A line of studies further demonstrates that loss of tight junctions is implicated in promoting cancer cell migration, tumorigenesis, and tumor metastasis. It has also been shown that a multiple PDZ domain-containing protein called MUPP1 interacts with tight junctions and acts as a scaffold protein to recruit intracellular signaling molecules to the sites of tight junctions. A previous screening from Dr. Wei’s laboratory has identified MUPP1 as an interacting partner of nonmuscle myosin II-interacting guanine nucleotide factor (MyoGEF) that can activate the small GTPase protein RhoA and promote cytokinesis and cell migration through regulation of the actomyosin cytoskeleton. In this study, we used yeast two-hybrid and in vitro pull-down assays to characterize the interactions between MyoGEF and MUPP1. Our results showed that MyoGEF interacted with PDZ domains 10 and 13, but not 11 and 12, in MUPP1. We also found that deletion of three amino acid residues from the C-terminus of MyoGEF abolished the MyoGEF-MUPP1 interaction, suggesting that the PDZ-binding motif at the C-terminus of MyoGEF was required for interactions with MUPP1. Our findings suggest that the MUPP1-MyoGEF interaction may recruit MyoGEF to the sites of tight junctions, where MyoGEF activates RhoA and potentially contributes to the regulation of tight junction organization and cell migration.

**Poster-75**

Potential Avian Reservoir Competence for Tick-borne Pathogens in the Northeastern U.S.

James Potts, Biological Sciences, Fordham College at Rose Hill, Thomas Daniels*, Vector Ecology, Fordham College at Rose Hill

The blacklegged tick (Ixodes scapularis) is an important arthropod disease vector in the US, responsible for transmitting three major human pathogens: Borrelia burgdorferi, Anaplasma phagocytophilum, and Babesia microti, the causative agents of Lyme disease, human granulocytic anaplasmosis, and babesiosis, respectively. Another common tick species, Ixodes dentatus, has been found to transmit the three pathogens. Both tick species feed on birds, which have been implicated in the spread of blacklegged ticks into new areas. Several avian species have been identified as competent reservoirs for these tick-borne pathogens. This means they can harbor and transmit the disease agents to uninfected ticks that in turn, can later transmit the agents to a new host in a new area. The goal of this project was to identify potential bird reservoirs of three common tick-borne pathogens based on evidence of their presence in larval I. scapularis and I. dentatus collected from birds captured at the Louis Calder Center, Fordham’s biological field station in Armonk, NY. Since the pathogens of interest are not transmitted from female tick to eggs, the presence of these agents in larval ticks is indicative of transmission from the bird to tick. In all, 159 larval ticks were collected from 14 species of birds in 2010-2011. Quantitative polymerase chain reaction was used to determine pathogen presence within the ticks. The larvae found on four of the bird species tested positive for Borrelia burgdorferi, while the larvae from ten species tested positive for Anaplasma phagocytophilum. No larvae tested positive for Babesia microti.
Poster-76

Chondrule Analysis of Unequilibrated Ordinary Chondrite NWA 8709

Juliette Strasser, Chemistry, Fordham College at Rose Hill; Jon Friedrich*, Chemistry, Fordham College at Rose Hill

Chondrites are meteorites that have experienced very limited chemical or physical changes since their formation in our solar system 4.5 billion years ago. Among the many chemical groups of chondrites, the ordinary chondrites are the most abundant chondritic meteorites that fall to the Earth. Ordinary chondrites can be further subdivided into three distinct groups: the H, L, and LL chondrites. One of the main features of these ordinary chondrites is the presence of chondrules, which are spherical mineral accretions that run through the meteorite. We can use a progression of tomographic scans of the chondrites in order to trace the chondrules through the matrix of the chondrite. We perform this analysis using an image manipulation program TrakEM2, which is an ImageJ plug-in. This summer, we focused on one unequilibrated ordinary chondrite, NWA 8709, and analyzed the chondrule size distribution and chondrule orientations. We also performed some bulk chemical analysis using the inductively coupled plasma mass spectrometer in order to further classify the chondrite. Our study produced data on NWA 8709 that is synergistic with other data on the physical properties of H, L and LL chondrites being collected in Dr. Friedrich’s research group.

Poster-77

Uses of Green Fluorescent Protein

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Green Fluorescence Protein (GFP) is frequently used in biochemistry and molecular biology as a reporter gene. Two proteins, aequorin and GFP, were isolated from Aequorea aequorea. Aequorin is activated by Ca2+ and some of the aequorin luminescence energy then excites the GFPs, which produces the characteristic green fluorescence. GFPs are able to fold even when fused to cellular proteins, allowing it to be incorporated into a vector that contains a gene of interest without compromising the gene’s functionality. Using a fluorescence imaging instrument, the gene of interest can be directly tracked in vivo, providing data such as its cellular mechanism and pathway, localization, and function. Another useful application of GFP is Fluorescence Resonance Energy Transfer (FRET), which involves the use of two fluorophores to determine the proximity of two different proteins. GFP has also been used to study the rate a membrane diffuses using Fluorescence Recovery after Photobleaching (FRAP). Chromophore research, for example, could permit a greater exploration of protein dynamics as seen in the recently developed Brainbow technique.

Poster-78

Effects of siRNA knockdown of growth factors on diabetic retinopathy

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Diabetic retinopathy is a complication of Type II diabetes that can often lead to blindness. The increased plasma osmolarity, as a consequence of increased circulating glucose has been shown to increase the production of Vascular Endothelial Growth Factor (VEGF) which leads to the over-vascularization of the retina that characterizes diabetic retinopathy. Other growth factors including Endothelial Growth Factor (EGF), basic Fibroblast Growth Factor (bFGF), and Transforming Growth Factor- Beta 2 (TGF-B2) have also been implicated. Current therapies use monoclonal antibodies to VEGF and competitive antagonists, which have many extra-ocular side effects. The use of siRNA in vivo could slow progression of diabetic retinopathy. To investigate the efficacy of such a method, we suggest applying siRNAs to retinal pigment epithelium cells cultured in a hyperosmotic solution, created by increasing the concentration of sodium chloride, to mimic diabetic conditions. The efficacy of each siRNA target will be determined via in vitro mRNA knockdown levels (quantified by RT-qPCR) and protein levels, assessed via Western Blotting. In vivo tests will also be performed on Mus musculus with these siRNA targets. Should the animal trials show a decrease in the incidence and/or progression of diabetic retinopathy, a human trial program could be developed.
Poster-79
Are Changes in Cannabis Use Associated with Clinical Outcome and Medication Use in Participants at Risk for Psychosis?
Samantha Jankowski, Psychology and Biological Sciences, Fordham College at Rose Hill, Ann Higgins D’Alessandro*, Psychology, Fordham College at Rose Hill

Some studies have suggested that cannabis use may be a risk factor for psychosis, while others have proposed no link. However, few studies have explored the impact of changes in cannabis use on clinical outcome and medication use in participants at high risk (CHR) for psychosis. Analyses were conducted under the guidance of Dr. Ricardo Carrion at Zucker Hillside Hospital, one of the sites in the Early Detection, Intervention, and Prevention of Psychosis Program (EDIPPP) for preventing psychosis among adolescents, funded by the Robert Wood Johnson Foundation (2007-2011). Cannabis use, attenuated positive and negative symptoms, functioning, neurocognition, and medication (antipsychotics and antidepressants) treatment were prospectively assessed over two years in 185 CHR individuals ages 12 to 25. Participants were divided into groups based on cannabis use: 126 non-users, 21 continuous users, 9 decreasers, and 29 increasers. Conversion to psychosis was not significantly different among the groups and comprised 6.5% of the sample. Mixed models analyses indicated no main effect of cannabis on positive and negative symptoms; however, positive symptoms had a significant cannabis x time effect. Significant differences in global neurocognition revealed poorest neurocognitive performance in non-users and highest performance in decreasers. No significant differences were observed in functioning. Repeated measures ANOVAs revealed that continuous users used less antidepressants than the other groups, while decreasers used more antipsychotics. These results indicate that cannabis use does not appear to worsen symptoms (despite differences in medication) or be associated with cognitive decline and conversion rates. Future studies should continue to explore these relationships.

Poster-80
Effects of Blue Light on Melatonin Levels, REM Sleep and Reaction Time
Elise Thomson, Biological Sciences, Fordham College at Rose Hill, Wajiha Khan, Biological Sciences, Fordham College at Rose Hill, Amanda Tedino, Psychology, Fordham College at Rose Hill, Sabrina DiMolfetta, Biological Sciences, Fordham College at Rose Hill, Usha Sankar*, Biological Sciences, Fordham College at Rose Hill

Current research has found that short blue wavelengths, which are emitted from self-luminous devices such as laptops and tablets, have an adverse effect on REM sleep. Specifically, research has revealed that short blue wavelengths, in comparison to long red wavelengths, inhibit melatonin production and disrupt circadian rhythms. However, literature specifically examining light emission by iPhones and the effects of light filtering applications is limited. We are interested in exploring the effect of different wavelengths of light emitted from iPhone devices on circadian rhythm and the implications of using such devices on cognitive abilities. We hypothesize that exposure to cell phones emitting blue light before bed will cause a decrease in melatonin production and amount of REM sleep, as well as greater reaction time in comparison to exposure to phones utilizing blue light filtering applications which emit red light. Over a span of two weeks, we will measure the salivary melatonin levels of 50 college students before and after they use their iPhones for one hour. During one week, we will measure the changes in melatonin and amount of REM sleep using short blue wavelengths while during another week we will measure any changes that occur when utilizing red light applications. We will examine differences in reaction time under both conditions using a simple reaction test. We will compare the data collected when subjects are exposed to blue light to the data collected under exposure to red light to determine whether or not our hypothesis is supported.

Poster-81
Combination treatment with proteasome inhibitors bortezomib and marizomib in glioblastoma multiforme
Megan Mandile, Chemistry, Fordham College at Rose Hill, Paul Smith*, Chemistry, Fordham College at Rose Hill

Glioblastoma multiforme (GBM) or “Grade IV Astrocytoma” are highly aggressive brain tumors with a median survival rate of around 14 months. Cancer cells, in general, have high levels of misfolded or mutated protein leading to an increase in proteasome activity. This distinction makes them prime targets for proteasome inhibition. The proteasome inhibitor bortezomib (BTZ), was approved by the FDA in 2003 as a therapeutic treatment for myeloma. Marizomib (MRZ), another proteasome inhibitor, has also been tested in vitro with promising results. The efficacy and clinical relevance of the drugs have motivated research for their effect in other diseases such as GBM. Since both MRZ and BTZ have been shown to work best in combination, we were motivated to pursue reasonable additions. Previous research has shown a connection between cysteine flooding and proteasome-induced death, therefore
suggesting the potential efficacy of cyst(e)inase in combination with MRZ. Ingenuity Pathway Analysis revealed a commonality in terms of the ubiquitination proteasome pathway and LSD1 knock-down, prompting the use of tranylcypromine in combination with BTZ. We found a synergistic effect with one set of dosages of MRZ and cyst(e)inase. However, we were unable to observe any synergy with any other combinations or with BTZ and tranylcypromine combination. Further examination of the various genes involved in the IPA protein ubiquination pathway is needed to assess particular interactions. Additionally, an investigation of the differences between LSD1 inhibition and LSD1 knockdown is needed to fully understand the results of the IPA in comparison to the experiments.

**Poster-82**

Hair cortisol analysis as a biological index of chronic physiological stress

Michael Tynes, Psychology, Fordham College at Rose Hill, Farjahan Akhter, Chemistry, Fordham College at Rose Hill, Margaret Sullivan, Chemistry, Fordham College at Rose Hill, Paul Smith*, Chemistry, Fordham College at Rose Hill, Tiffany Yip*, Psychology, Fordham College at Rose Hill

Increased experience of stress as a result of ethnic-racial discrimination is a proposed mechanism for the higher frequencies of diseases and mortality among people of color. The present study exists within a larger experimental paradigm exploring associations between ethnic-racial identity, discrimination, and physiological stress indicators. In the present study, hair cortisol (CORT) is utilized as a measure chronic physiological stress and relationships between participant CORT levels, reported experiences of discrimination, and numerous psychological outcomes are investigated. Unlike blood and saliva CORT levels, which are routinely utilized as point measures of physiological stress, hair CORT measures provide indices of chronic stress over defined periods of time, quantifiable by the average human hair growth rate of 1 cm/month. CORT is released from the adrenal cortex in response to stress and is incorporated into growing shafts of hair. Following procedures detailed in Meyer, Novak, Hamel, and Rosenberg (2014), our research team sampled 2 cm of the root segment of participant hair. Samples were washed and ground into a fine powder, from which CORT was extracted and analyzed using a commercially available ELISA kit. Assay data was converted to pg CORT per mg hair. The present poster outlines this methodology and provides sample data. Data were collected and analyzed through a joint effort between Fordham University’s departments of chemistry and psychology. This project is the first to utilize hair CORT measurements in the context of ethnic-racial discrimination and provides valuable insight into the long-term processes mediating discrimination’s outcomes.

**Poster-83**

Polyploidy

Julia Hughes, Biological Sciences, Fordham College at Rose Hill, Brianna Blunck, Biological Sciences, Fordham College at Rose Hill, Youssef Elfatatry, Biological Sciences, Fordham College at Rose Hill, Joseph Michael, Biological Sciences, Fordham College at Rose Hill, Rachel Varon, Post Baccalaureate Student, F, Varuni Jamburuthugoda*, Biological Sciences, Fordham College at Rose Hill

Polyploidy, or whole gene duplication, is a condition in which diploid cells acquire one or more additional sets of chromosomes. Polyploidy most often occurs as a result of nondisjunction of homologous chromosomes during mitosis or meiosis. Two distinct forms of polyploidy exist, aneuploidy and euploidy. Aneuploidy is characterized by an addition or subtraction of one of the specie’s chromosomes. Conversely, Euploidy, polyploids with multiples from a complete set of chromosomes from a specific species, includes autoploidy and allopolyploidy. Autopolyploidy is an organism that receive two sets of chromosomes from a single parental species, whereas allopolyploidy is an organism that receives more than two sets of chromosomes from different species. Polyploidy is common most in plants, especially angiosperms and crop plants. Historically, Russian plant geneticist Karpechenko discovered polyploidy and hybridization when crossing a cabbage and a radish. With this knowledge, plant breeders used polyploidy to overcome hybrid sterility. Phylogenetic and taxonomic studies have been done to identify the beginning of polyploidy events. DNA sequencing and genetic mapping have been difficult since many different factors such as gene family complexity and the reproductive system influence the ease of discrimination. Methods such as next generation sequencing have been developed to overcome these limitations. Current research is being done to study the alterations in genomic structure and genome expression, leading to new plant phenotypes that could be genetically advantageous.
**Poster-84**

**Epigenetics and Autoimmune Diseases**

Emily Hargous, Biological Sciences and Mathematics, Fordham College at Rose Hill, Kathleen Brodowski, Biological Sciences, Fordham College at Rose Hill, Katherine Sitler-Elbel, Environmental Science, Fordham College at Rose Hill, Varuni Jamburuthugoda*, Biological Sciences, Fordham College at Rose Hill

Epigenetics is the study of the modifications of an individual’s genomic function by means of histone modification, DNA methylation and noncoding RNAs, as well as external factors such as exposure to drugs, aging, diet, and other environmental stimuli. Without altering the DNA sequence, epigenetic modifications are passable to daughter cells. While epigenetics can have positive impacts on individual livelihood, these genomic modifications can also be detrimental to one’s health by altering autoimmune function. Autoimmune diseases arise when an organism fails to recognize its own constituent parts and as a result, its immune system responds by attacking healthy cells. Epigenetics is believed to play a role in this initiation due to external factors that can modify the development of these diseases. The impact of epigenetics on skeletal, nerve, and blood vessel systems can be seen in cases of Rheumatoid Arthritis, Lupus, and Kawasaki disease, hindering normal immune function. DNA hypermethylation is thought to be involved in the progression of Kawasaki disease. Histone acetylation and over expression of particular microRNAs in Rheumatoid Arthritis patients is known to contribute to the progression of the disease. T cells, in patients with Lupus, when treated with methylation inhibitors lose their ability to present antigen receptors that function in autoimmunity. In case studies of monozygotic twins, these genetic and epigenetic mechanisms appear to contribute to susceptibility to autoimmune diseases. The purpose of these studies is to show the correlation between epigenetic mechanisms and the pathogenesis of autoimmune diseases.

**Poster-85**

**Telomerase and Aging**

Kristina Soltesz, Biological Sciences, Fordham College at Rose Hill, Sepora Alkozai, Biological Sciences, Fordham College at Rose Hill, Arjeta Cosaj, Biological Sciences, Fordham College at Rose Hill, Alexandria Sedlak, Biological Sciences, Fordham College at Rose Hill, HuiHua Ye, Biological Sciences, Fordham Colle, Varuni Jamburuthugoda*, Biological Sciences, Fordham College at Rose Hill

Telomeres are repetitive DNA sequences located at the ends of chromosomes, and they protect the chromosomes from degradation. Telomerase, an enzyme in eukaryotic cells that lengthens telomeres, plays a critical role in protecting against the loss of vital information encoded in DNA. Discovered by Elizabeth Blackburn in 1984, telomerase consists of a TERC component that acts as an RNA template and a TERT component that acts as a reverse transcriptase. Telomeric DNA length diminishes with each cell division, eventually causing cellular senescence that is linked to aging. Mutations in the genes that express telomerase and its associated proteins cause disorders associated with the shortening of chromosomes and premature aging. Dyskeratosis congenita occurs as a result of mutations in the genes which code for the RNA template sequences and protein subunits that bind to telomerases to stabilize the enzymes. Werner’s syndrome stems from mutations in the expression of the WRNp protein that compromise the integrity of the telomeres. Hutchinson-Gilford Progeria Syndrome affects the nuclear matrix protein Lamin A, leading to cellular instability and the production of progerin, which leads to shortened telomeres. Current research is aimed at artificially extending telomeres using pluripotent stem cells to help patients suffering from diseases related to defective or insufficient telomerase and shortened telomeres.

**Poster-86**

**Investigation of Proline-rich Tyrosine Kinase 2 (PYK2) and Focal Adhesion Kinase (FAK) in HPV16 Infection and Viral Trafficking**

Kathleen Brodowski, Biological Sciences, Fordham College at Rose Hill, Patricio Meneses*, Biological Sciences, Fordham College at Rose Hill

Human Papillomaviruses (HPVs) are small, non-enveloped dsDNA viruses that cause genital warts as well as cervical, vaginal, and oropharyngeal cancers. After the basal keratinocyte cells of the stratified epithelium are exposed to the virus, HPV16 enters the cells and traffics to the host cell nucleus to proceed with infection. PYK2, a non-receptor tyrosine kinase of the focal adhesion kinase (FAK) family, is believed to play a role in many signal transduction pathways including those leading to epithelial-to-mesenchymal-transition (EMT), an important process for cancer metastasis, as well as those involved in HPV16 internalization. It has been observed that PYK2 depletion results in early viral capsid localization with lysosomes, the unfolding of the viral capsid, and virus retention in the trans-Golgi
network. These three events interfere with viral infection. Although multifunctional, we hypothesized that inhibition of PYK2’s kinase activity would result in a decrease of HPV16 infection. Using a dual inhibitor of PYK2 and FAK, a decrease in HPV16 infection was observed in HaCaT cells compared to those treated with dimethysulfoxide (DMSO) and other controls. Determining PYK2’s role in signal transduction pathways will serve as an important avenue of study in HPV infection. A deeper understanding of the internal trafficking of HPV16 is crucial in developing preventative medicines.

Poster-87  
Exploring the Link Between Celiac Disease and Type 1 Diabetes  
Erin Collier, History, Fordham College at Rose Hill, Megan Valenza, Sociology and Anthropology, Fordham College at Rose Hill, Ian Villagran, Biological Sciences, Fordham College at Rose Hill, Usha Sankar*, Biological Sciences, Fordham College at Rose Hill

Autoimmune diseases develop when an individual’s immune system, which is responsible for protecting the body against foreign substances, incorrectly recognizes its own healthy cells as foreign and attacks them. Celiac disease is an autoimmune disorder of the gastrointestinal tract, in which upon the consumption of gluten, the intestinal villi are destroyed. Type 1 diabetes is an autoimmune disorder that prevents insulin synthesis. The aim of this experiment is to determine whether or not individuals with Celiac disease are more susceptible to developing type 1 diabetes than those without Celiac disease. Our main assumption is that people with Celiac disease have a higher probability of being diagnosed with type 1 diabetes, than individuals without Celiac disease due to their increased susceptibility to developing anemia. Anemia is associated with decreased red blood cell count, and it is our assumption that this decrease leads to a larger percentage of glycated hemoglobin, which is formed by the attachment of glucose to hemoglobin to the blood. Since they are predisposed to having high blood glucose concentrations, they might be at a higher risk to developing type 1 diabetes. In order to determine whether there is an increase in the incidence of type 1 diabetes in patients with Celiac disease, patients from Montefiore Medical Center and Saint Barnabas Hospital will be tested for Celiac disease using the tissue transglutaminase antibody test, for type 1 diabetes using both the glycated hemoglobin (A1c) test and the ketone urine test, and anemia using a complete blood cell count.

Poster-88  
Design of an Aquaculture Pond and Supporting Structures in a Rural Ugandan Village  
John Murray, Engineering Physics, Fordham College at Rose Hill, Elaina Mansley, Engineering Physics, Fordham College at Rose Hill, Grace Bolan, Engineering Physics, Fordham College at Rose Hill, Christopher Mazzeo, Engineering Physics, Fordham College at Rose Hill, Kiersten Schmidheiser, Business Administration, Gabelli School of Business, Caio Garcia, Engineering Physics, Fordham College at Rose Hill, Delaney Coveno, Engineering Physics, Fordham College at Rose Hill, Julie Milea, Engineering Physics, Fordham College at Rose Hill, Vanessa Gutierrez, Computer Science, Fordham College at Rose Hill, Rachel Clivaz, Finance, Gabelli School of Business, Matthew Speck, Engineering Physics, Fordham College at Rose Hill, Michael Yu, Physics, Fordham College at Rose Hill, Martin Sanzari*, Engineering Physics, Fordham College at Rose Hill

A project of the Fordham University chapter of Engineers Without Borders USA, the first fish pond in a proposed series of five was designed and implemented adjacent to the Omorio Village of Uganda’s Serere District. Under the supervision of professional engineering mentors, faculty of the Department of Physics & Engineering Physics, and EWB-USA, the chapter planned the construction details of an in-ground pond and supporting structures, including intake and drainage systems and storage facilities. An operations manual and a business plan were created to ensure the sustainable success of this project, in keeping with the mission of Engineers Without Borders. The chapter will continue monitoring this project remotely as it plans its next implementation in the coming months.
**Poster-89**  
Analyses of the interactions between MYOGEF and microspherule protein 1 (MCRS1)
Matthew Challman, Integrative Neuroscience, Fordham College at Rose Hill, Qize Wei*, Biological Sciences, Fordham College at Rose Hill

Metastasis is the ability of a cancer cell to break away from its place of origin and spread through the bloodstream to other parts of the body. It is a key feature of cancer leading to death—without it, many cancers would have no way of traveling to the brain, liver, and other vital organs. MYOGEF is a guanine exchange factor that is highly expressed in breast cancers with high metastatic potential. MCRS1 is an oncogene coding for a protein that is overexpressed in many different cancers. When MCRS1 is knocked down, cancer cells show difficulty in dividing and invading other tissues. Based on a previous screening from Dr. Wei’s laboratory, MCRS1 interacted with MYOGEF. The purpose of this study is to characterize the interactions between MYOGEF and MCRS1 using yeast two-hybrid and in vitro pull-down assays. Our results showed that the C-terminal, but not the N-terminal, half of MYOGEF binds to a forkhead associated domain (FHA) that is situated at the C-terminal half of MCRS1.

**Poster-90**  
Personality Assessment Using Computer Based Tools
Medha Sharma, Integrative Neuroscience, Fordham College at Rose Hill, Amy Roy*, Psychology, Fordham College at Rose Hill

High Behavioral Inhibition (BI) is an indicator of the presence of various anxiety disorders. The higher an individual’s degree of behavioral inhibition is, the more likely the presence of an anxiety disorder. In the past studies, when testing adults for their level of behavioral inhibition, the most common method to do so is the self-report questionnaire. Unfortunately, there are many issues with self-report questionnaires, such as consistency motif and the social desirability rule. Using a behavioral test to measure BI is a much more accurate representation of an individual’s degree of BI. Our research used a role-playing computer game where the participant could choose their own avatar to act out various social scenarios along with the AMBI questionnaire, a more reliable self-report questionnaire to measure BI. We hypothesized that the scores on the AMBI would positively correlate with the scores on the computer based personality assessment measuring behavioral inhibition. Although the results showed no correlation nor were they significant, future research could use a larger sample and future extensions can be made to measure the degree of correlation between the computer task and the symptomatology in individuals with anxiety disorders or PTSD.

**Poster-91**  
Hacking Google Trends to Predict Voter Turnout
Aaron DeVera, Economics, Fordham College at Rose Hill, Joseph O’Brien, Political Science and History, Fordham College at Rose Hill, Robert Hume*, Political Science, Fordham College at Rose Hill

Americans’ access to the internet and their use of search engines like Google has grown tremendously over the past decade. As the common facets of everyday life are performed more frequently on the internet, producers and marketing research firms have found aggregate search trend data, like the data provided by Google Trends, to be helpful in forecasting sales and consumer preferences. Even outside of market research, Google Trends are indicative of public interest in a wide variety of topics. Since Google search trends provide insight into levels of public interest and are statistically related to certain behaviors they might also provide a window into public interest in voting in a given election as well as the likelihood of individuals in a certain area to do so. Therefore, we hypothesize that the amount of Google searches for the location of polling places is positively correlated to voter turnout, given the parameters of time period and geolocation. We discuss the complexity of predicting voter turnout in political science literature, our methodology, and finally test our hypothesis within the state of New Jersey. We find that the voter turnout and Google Trends in New Jersey November General Elections from 2004-2014 is correlated to 80.97%. From there, we will test similar data from the other 49 states during the same time period. Ultimately we conclude that the utilization of Google Trends data within proprietary predictive models may help enhance the accuracy of campaigns’ voter turnout predictions.
Poster-92
Geochemical Compositional Analysis in Historical Archaeology: Insight into Regional Origins of Philadelphia Redware Ceramics
Sarah Voor, Biological Sciences & Sociology and Anthropology, Fordham College at Rose Hill, Bryn Prieto, Sociology and Anthropology, Fordham College at Rose Hill, Maria Tauqeer, Chemistry & Sociology and Anthropology, Fordham College at Rose Hill, Allan Gilbert*, Sociology & Anthropology, Fordham College at Rose Hill

The field of Archaeometry applies scientific methods to archaeological questions. Geochemical compositional analysis, a subfield of Archaeometry, is rarely used in U.S. historical archaeology, but offers invaluable insight into questions of archaeological significance. This study explores the geochemical composition of a collection of Philadelphia Redware ceramics with the intention of using similarities in geochemical signature to provide insight into the regional origins of the materials used to manufacture these artifacts. Some red earthenware sherds recovered from archaeological sites in Philadelphia and the Lower Delaware Valley region—mainly the fancy, refined wares—are often indistinguishable from English imports, and a question about their origin has emerged. We are testing whether the Philadelphia region reveals consistent compositional signatures that can be distinguished from similar redwares from other regions for which we have access. Philadelphia ceramics (116 specimens) were sampled in 2015, and current work has involved using statistical analysis on the data resulting from Inductively-coupled plasma-mass spectrometry (ICP-MS) analysis. Quantitative work has employed R Statistical Software for cluster and discriminant analyses, as well as SPSS correlation analysis.

Poster-93
Symbolic-numeric Computing to Analyze Three-Dimensional Images from Point Clouds
Edward Haarmann, Mathematics, Fordham College at Rose Hill, Robert Lewis*, Mathematics, Fordham College at Rose Hill

We employ expectation maximization in trying to separate outliers (corrupted data points) from inliers (true data points) iteratively, represented by different Gaussian distributions. We use a computer algebra system that uses the Dixon Resultant to solve systems of four polynomial equations that arise from the use of the expectation maximization. The separation of outliers and inliers using the methods discussed is extraordinarily important to computer imagery. More specifically, we will apply these techniques to the use of LiDAR (Light Detection and Ranging) imaging systems, an important method used in robotics, computer vision, digital photogrammetry, computational geometry, digital building modeling, forest planning, etc.

Poster-94
Expressive Language Impairment and Emotion Dysregulation in Young Children
Abigail Collins, Psychology, Fordham College at Rose Hill, Amy Roy*, Psychology, Fordham College at Rose Hill

Research indicates that children who have problems regulating their emotions have higher rates of specific language impairments (SLI) than those without (Cole et al., 2010). Emotion dysregulation often results in frequent temper outbursts, which can be cause for clinical concern (Wakschlag et al., 2007). In the present study both parent and self-reported measures will be used to examine language development and emotion regulation among three groups recruited as part of a larger study of temper outbursts in children: children with severe temper outbursts (TO), children with ADHD without such outbursts, and healthy comparisons (HC). The sample for these analyses consisted of 188 participants (25% females, 75% males) between the ages of 6 and 9. I hypothesize that the TO children will have poorer language functioning than TDC or ADHD children and that children with poorer language functioning will exhibit more frequent and severe outbursts. There were strong correlations across many measures supporting a relationship between language ability and the ability to regulate emotions. Children with lower CELF scores exhibited more temper outbursts according to the STT (r = -0.25, p = 0.037). Further analyses of variance (ANOVA) will be used to compare groups, followed by post hoc analyses see where the differences in language function and emotion regulation ability are among groups. Children with temper outbursts have lower expressive language functioning than children without temper outbursts, which may suggest that expressive language is an important factor to consider when assessing and treating children with severe emotion dysregulation.
**Poster-95**

**Why Clinical Trials Fail**

Vivian Liu, Biological Sciences, Fordham College at Rose Hill, Katherine Petrini, Psychology, Fordham College at Rose Hill, Maciej Bielen, Biological Sciences, Fordham College at Rose Hill, KatrZYna McNeal, Psychology, Fordham College at Rose Hill, Daisy Reinoso, Biological Sciences, Fordham College at Rose Hill, Victoria Mulhern, Psychology, Fordham College at Rose Hill, Matthew Weinshenker*, Sociology and Anthropology, Fordham College at Rose Hill

Clinical research is essential for determining the efficacy and safety of newly developed drugs and treatments. Many populations suffering from a wide range of diseases and disorders have benefited from the findings obtained in clinical trials. However, it is important to remember that clinical research studies rely on human subjects. This reality raises numerous ethical concerns that must be taken into consideration in order to protect the rights and welfare of the participants. Although there have been improvements in regulations implemented to maintain the safety of human subjects, there are still recent instances of participants experiencing calamitous treatment. For example, in 2015 a Phase 1 clinical trial in France led to the hospitalization of five participants and the death of a sixth. Our research focuses on the ethical issues involved in the use of placebos in clinical trials, informed consent, and the advantages and disadvantages of participating in different phases of clinical trials. Informed consent is a key component of ethically conducting research on human subjects. Additionally, our research addresses relevance of two types of therapeutic misconceptions which is the tendency for research participants to have unrealistic expectations of benefiting from participation in clinical trials and misunderstanding the purpose of research opposed to practice. Our research will also discuss the special considerations required when using highly vulnerable populations as participants. It is important for biomedical researchers to be aware of these ethical issues in order to continue to advance medicine in a humane manner.

**Poster-96**

**Characterization of the Putatively Heterodimeric Proteinaceous Ichthyotoxin of Pterois volitans**

Zachary Mattes, Chemistry, Fordham College at Rose Hill, Nina Le, Chemistry, Fordham College at Rose Hill, Paul Smith*, Chemistry, Fordham College at Rose Hill

The growth in applications of the field of toxicology has increased interest in researching the components and mechanisms of venoms. A type of lionfish, Pterois volitans, contains a venom that causes intense pain, fever, and swelling in humans and is composed of a proteinaceous toxin with α and β-subunits. The symptoms may be due to an increase in intracellular calcium ion concentrations, which could suggest potential pore-forming properties in the P. volitans toxin, also found in stonefish toxin. The amino acid sequence of the P. volitans toxin has been derived; however, the quaternary structure of the protein toxin has yet to be characterized. Understanding the structure of the toxin will provide clues as to the mechanism of toxicity. The process of characterizing of the proteinaceous toxin of P. volitans has commenced with extraction and partial purification of the toxin, assessment of pore-formation using the liposome assay, and biophysical analysis of the toxin under varying conditions. The confirmation of pore-forming properties along with a detailed structure of the protein toxin will provide insight as to the role of the protein structure in the process of toxicity and reveal any correlations between the symptoms the toxin causes and the effect of the toxin on cells. Future research would involve crystallization of the toxin to determine the structure. The research could also lead to medical applications in the form of an antivenom, medicinal delivery system, or cell-specific lysis treatment.

**Poster-97**

**The effect of herbivory on the mixed mating system of Impatiens capensis in the field**

Colette Berg, Environmental Science, Fordham College at Rose Hill, Steven Franks*, Biology, Fordham College at Rose Hill

Many angiosperms have a mixed mating system. This means that they produce two types of sexually reproducing flowers: cleistogamous flowers, which are obligately self-pollinating (or selfing), and chasmogamous flowers, which are traditional open flowers that are facultatively outcrossing and tend to depend on insect pollinators. More research is necessary into the factors that affect the ratio of chasmogamy to cleistogamy in angiosperms with mixed mating systems. One such factor is resource allocation. Chasmogamous fruits are much more energetically expensive, so different factors which reduce available resources could be expected to decrease the level of chasmogamy in an individual. Resources can be limited in the field due to herbivory. This field study investigated the effects of herbivory on the mating system of Impatiens capensis. The study did not find a significant correlation between herbivory and
the ratio of chasmogamy to cleistogamy. However, there was still a trend which negatively linked chasmogamy and herbivore damage which would be worth future investigation.

**Poster-98**

**Tour Guide**

Zhiyi Zhou, Visual Arts, Urban Studies, Fordham College at Rose Hill, Joseph Lawton*, Visual Arts, Fordham College at Lincoln Center

This series consists of color and black-and-white photographs shot with a digital SLR camera and a large-format view camera during a one-month trip to Cuba in the summer of 2015. Attracted to vernacular architecture, the photographer explored living spaces in urban and rural contexts. The photos present interweaving natural and man-made landscapes of Havana and Viñales Valley in contemporary Cuba.

**Poster-99**

**Dissecting the interactions between MYOGEF and PDLIM7**

Kevin Jimenez-Cowell, Biological Sciences, Fordham College at Rose Hill, Qize Wei*, Biological Sciences, Fordham College at Rose Hill

Rho GTPase signaling plays a critical role in the regulation of many biological processes such as cell migration and cell division. The research in Dr. Wei’s laboratory has been focusing on understanding how MYOGEF, a guanine nucleotide exchange factor that can activate the small GTPase protein RhoA, regulates cell migration and cell division. A preliminary screening in Dr. Wei’s laboratory has shown that MYOGEF interacts with PDLIM7, which contains one PDZ domain and three LIM domains. One of the central regulatory roles for the PDZ and LIM domains is to regulate the organization of the actomyosin cytoskeleton. In particular, PDLIM7 can not only be anchored to the actomyosin cytoskeleton through its PDZ domain but can also be associated with various signaling molecules through its LIM domains. A previous undergraduate student, Christopher Sollecito, has been able to demonstrate that amino acid residues 392-565 in MYOGEF interacted with the LIM domains of PDLIM7. However, it is still unclear whether all three LIM domains in PDLIM7 are required for the MYOGEF-PDLIM7 interaction. Also, the minimum residues in MYOGEF required for the MYOGEF-PDLIM7 interaction are yet to be determined. In this study, we have used yeast two-hybrid and in vitro pull-down assays to further dissect the interactions between MYOGEF and PDLIM7.

**Poster-100**

**Mental Health Research: Bipolar Disorder**

Clare Shanahan, Psychology, Fordham College at Rose Hill, Maura Byrne, Psychology, Fordham College at Rose Hill, Abigail Collins, Psychology and Bioethics, Fordham College at Rose Hill, Nina Le, Chemistry, Fordham College at Rose Hill, Lauren Stanco, Psychology, Fordham College at Rose Hill, Nicholas Genovese, Psychology, Fordham College at Rose Hill, Matthew Weinshenker*, Sociology and Anthropology, Fordham College at Rose Hill

As knowledge surrounding mental illnesses has become more advanced, there has been a decrease in stigmatization, followed by an improvement in treatments and research methods. However, because mental health research can involve vulnerable populations, there are many ethical issues associated with research on mental health. Ethical considerations include informed consent, genetic testing, placebo controlled trials, methods of treatment, and the socioeconomic status of research participants. This poster will focus on ethical concerns associated with the research on bipolar disorder, a specific mental health disorder characterized by periods of mania and depression. This disorder is the focus of many mental health studies because of its overall impairment that can persist despite pharmaceutical intervention. People with bipolar disorder are vulnerable in regards to informed consent, so our research will highlight the influence of bipolar disorder on their decision making capacity. This study will also present historical examples of unethical research that has been performed on individuals with bipolar disorder and the more ethical modern treatment studies. Many ethical guidelines and principles now play an important role in mental health research, which ultimately provide us with vital information to develop more accurate diagnoses and treatments for mental health disorders. This presentation will address a wide range of ethical concerns that should be considered in designing bipolar disorder research.
Oxytocin is a hormone produced by the hypothalamus, most known for its involvement in child labor. It is called the “love” hormone for its role in romantic relationships, where higher oxytocin levels correlate with a greater sense of connection between two partners. Oxytocin is also involved in male bonding, as between father and son. This experiment targets the effects of oxytocin on risky social behavior and decision-making. The first segment of this study will administer a questionnaire gauging risk-appetite to participants under and over 25 years of age. The second segment of the study will place participants in group simulations presented with social behavior scenarios. Before the second segment, participants will be given either a placebo or nasal spray of oxytocin. Blood will be drawn before and 20 minutes after the nasal spray. ELISA will measure plasma oxytocin. The third segment will be a live study of college student behavior, with two groups of 20 participants each: one experimental, one control. Basal oxytocin rates for all subjects will be measured using ELISA. They will self-record their activities for ten days. In the first two segments, the younger group will show higher mean risk-appetite scores, and the oxytocin experimental group will conform more to risky, group decisions. In the second segment, experimental groups will indicate more instances of peer-influenced risky behaviors than the control groups. This experiment shows that higher oxytocin levels lead to risky behavior. This is influenced by the factor of age, as younger people show riskier behavior.

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**Poster-104**

**Do Experiences Matter? A Look at Behaviors and Conditions in Veterans with Varying Combat Experiences**

Lauren Whitmore, Psychology, Fordham College at Lincoln Center
Keith Cruise*, Psychology, Fordham College at Rose Hill

This study is investigating whether specific combat experiences impact adjustment to veterans transitioning out of the military to civilian life. Previous research has confirmed that combat experiences are associated with negative outcomes. However, far less have addressed whether this association is impacted by specific types of combat experiences. Utilizing data from 215 OEF/OIF veterans from the New York city area, empirically derived factors representing types of combat experiences are being investigated utilizing self-reported exposure data from the Combat Experiences Questionnaire. Derived factors and associations with negative outcomes after the transition out of the military to civilian life (e.g., symptoms of PTSD, alcohol misuse, poorer physical health, and military to civilian stressors) are also being investigated utilizing self-report questionnaires assessing these outcomes (AUDIT-C, PCL-M, PHQ-15, and the M2C-Q). Data analysis is underway and will be complete by 3/30/16 with key study findings reviewed in this presentation. The study will help inform transition services being used with veterans participating in transition program and mental health assessment practices for veterans returning from combat.

**Poster-105**

**A Comparison of Former Interns versus Non-interns in Critical Skills**

Olivia Cortellini, Psychology, Fordham College at Rose Hill, Karen Siedlecki-Burgoon*, Psychology, Fordham College at Lincoln Center

This study examined whether former college interns would perform better in the workplace as compared with their peers who did not have previous internship experience. It was hypothesized that former interns would outperform their peers in ratings of cognitive skills. Employers and advisors of recent graduates were surveyed about participants’ performance in the workplace or graduate school. No significant differences were found between interns and non-intern on measures of overall workplace performance; however, non-interns were rated higher on average than their peers in their writing effectiveness skills.

**Poster-106**

**Resiliency in Working Mothers: A Qualitative and Quantitative Analysis**

Amelia AuBuchon, Psychology, Fordham College at Rose Hill, Samantha Steimle, Psychology, Fordham College at Rose Hill, Mary Procidano*, Psychology, Fordham College at Rose Hill

Existing scientific literature on working and parenting emphasizes the burden of work on family roles, the role strain, emotional overload, and marital conflict. This study, however, examined the resilience and “nonresilience” of mothers who work outside of the home. Approximately 40 women—of varying socioeconomic backgrounds, ethnicities, and careers—were interviewed. These interviews were later transcribed and coded for themes of agency, communion, contamination, and redemption. Interviews were further analyzed and coded for data regarding childcare practices, education level, marital status, and family stressors, and this information will be a focus of the presentation. It was hypothesized that agency was positively correlated with communion. This correlation, in addition to qualitative data of marital status and interpersonal support or nonsupport, signifies that those with greater agency also have a better relationship with others and have support systems to rely on. SPSS was utilized to run correlations between the themes of agency and communion. The results suggest that women are highly successful and actually thrive on combining these two roles, and this suggests that further research should be completed on the positive experiences many working mothers have regarding both motherhood and their careers. The data also suggest that perhaps legislation regarding more comprehensive childcare options, more flexible working schedules, and paid parental leave should be seriously considered.
Poster-107
Nivolumab Treatment Following Sunitinib Pretreatment in Renal Cell Carcinoma Patients
Christopher Mazzeo, Engineering Physics, Fordham College at Rose Hill, Muhammad Afridi, Biological Sciences, Fordham College at Rose Hill, Siobhan Rueda, Biological Sciences, Fordham College at Rose Hill, Maria Sermania, Biological Sciences, Fordham College at Rose Hill, Usha Sankar*, Biological Sciences, Fordham College at Rose Hill

Renal cell carcinoma (RCC), an aggressive type of cancer found in the tubules of the kidney, has a five year survival rate of only 10%. It has been shown that pre-treatment of Sunitinib, a tyrosine kinase inhibitor, aids with the expansion of tumor infiltrating leukocytes and a decrease of levels of myeloid derived immunosuppressor cells (MDSC) in patients with 3rd and 4th stage RCC. It has also been shown the PD-1 inhibitors, such as Nivolumab, are effective in causing an immune response to cancers with high mutational loads. This study will set out to quantify the expansion of TILs and the decrease in MDSC levels when Sunitinib pre-treatment is followed by a Nivolumab treatment regimen. TIL levels will be quantified via CD8+, CD3+, CD4+, and CD45+ staining and manual counting over 10 high power fields. MDSC levels will be quantified via fluorescent activated flow cytometry. The cells were extracted and cultured for 25 days and the different conditions were applied in vitro. It is predicted that there will be an increase in TIL levels in patients treated with both Sunitinib and Nivolumab when compared to patients receiving only one of these treatments and a control group receiving neither treatment. It is also predicted that there will be a similar decrease in MDSC levels in patients receiving both Sunitinib and Nivolumab and also Sunitinib alone. Areas for future research include determining how strongly correlated the mutagenic load of a cancer is to a positive prognosis with this type of treatment.

Poster-108
Green Synthesis of Poly (-d-valerolactone)-poly (-L-lactide) and Its Ability to Remove Pollutants from Water
Patrick Jennings, Chemistry, Fordham College at Rose Hill, Amy Balija*, Chemistry, Fordham College at Rose Hill

The effective removal of pollutants from aqueous environments is important for the purification of public water supplies. Previous studies in the Balija lab involved the formation of block co-polymers using δ-decalactone and L-lactide. These polymers have been shown to remove dyes such as Rose Bengal and Bromophenol Blue effectively from water. To determine whether the length of the side chain in the lactone impacts pollutant removal, alternative lactone monomers were proposed to be utilized. In this presentation, studies focusing on replacing δ-decalactone with δ-valerolactone and modifying L-lactide concentrations will be discussed. The resulting polymers have been analyzed by 1H NMR spectroscopy and size exclusion chromatography (SEC) to determine purity and molecular weights. Preliminary studies suggest that the use of δ-valerolactone results in more efficient removal of Rose Bengal from water.

Poster-109
Use of High-Throughput Robotic Technology for Protein Crystallography
Carolyn Allain, Chemistry, Fordham College at Rose Hill, Paul Smith*, Chemistry, Fordham College at Rose Hill

Protein crystallography is a branch of biochemistry focusing on structural biology and the determination of three-dimensional macromolecular structures through x-ray diffraction. Macroscopic protein crystals grown in solution are exposed to x-rays in order to produce diffraction patterns for structural analysis and the resolution of diffraction data is affected by the quality of the crystals and the conditions in which they are grown. Crystals are typically grown in trays that require multiple nano-liter quantities of protein and screening solution, making the accuracy of concentrations in solution wells subject to human error. Use of high-throughput robotic technology greatly increases the quality of crystal tray production since the machines are able to quickly measure, mix, and dispense the required volumes effectively; robotic technology has been utilized in preparing solution screens for the production of crystals in various conditions as well as in dispensing protein for growth. The precision of high-throughput technology allows for exact measurement of volumes on a large scale that greatly increases the ease and speed of tray preparation while simultaneously decreasing well contamination and error. The use of such machinery has greatly increased the efficiency and caliber of the crystallographic process and represents the vital role of cutting edge technology in research.
Research Ethics in Older Adults

Kristen Guzman, Psychology, Fordham College at Rose Hill, Colette Berg, Environmental Science, Fordham College at Rose Hill, Victoria Von Ancken, Environmental Studies, Fordham College at Rose Hill, Amada Hassan, Psychology, Fordham College at Rose Hill, Vasiliki Soldatos, Biological Sciences, Fordham Co, Kristen Tobias*, Psychology, Fordham College at Rose Hill

The goal of research across the lifespan is to further our understanding of, and find therapeutic solutions to, the various physical and mental ailments that occur as humans age. Older individuals, typically defined as 60 years and older, potentially represent a vulnerable group due to physical conditions (e.g. pain), mental impairment, or terminal illness associated with aging. The capacity to consent in healthy older adults has been studied and found to be reliable and valid. However, the capacity to consent in older adults affected by the ailments mentioned above may become compromised, leading to ethical dilemmas (e.g. therapeutic misconception) that must be considered when working with this population. For example, when working with older adults who are physically impaired, the physical suffering they experience can potentially alter decision making, and they may consent to a drug trial which, under normal conditions, they would not consent to. Additionally, older adults with mental impairments (e.g. dementia) may not be able to understand the study at the level needed to give consent. Finally, research with older adults suffering from terminal illness happens at a time when the proximity to death increases the vulnerability of the patient, which may alter their understanding of the research. A possible solution for the problems outlined above is for older adults to create a health care proxy who advocates for the patient during the consent and research process. Our presentation looks at past literature involving research with older adults while focusing on the unique considerations of this vulnerable population.

Forensic Photography

Joseph Guarnaccia, Sociology and Anthropology, Fordham College at Rose Hill, Kimberly Consroe*, Sociology and Anthropology, Fordham College at Rose Hill

The practice of forensic photography, or forensic imaging, is undertaken primarily to be used in conjunction with the judicial process (Gall & Payne-James, 2011). Digital imaging has become an increasingly important part of this process, with prosecution and defense counsellors relying more and more on photographs or videos to support their cases; cases have either progressed or been lost purely on the content of a photograph (Gall & Payne-James, 2011). Though conditions are sometimes detrimental to high-quality technical imaging, careful steps must be taken to obtain the most optimal images possible. Forensic photography requires a full understanding of the principles and techniques of photography and the ability to support and explain such details in court as a complete package (Gall & Payne-James, 2011). Be it a difference in the particular set of equipment, illumination, camera filters, wavelengths of light, or image formatting, a forensic imager must know the intricacies of photography wholly and thoroughly so that his or her contributions to a legal case may serve as admissible pieces of evidence. The following review of literature is applied to photographs taken for a research project done in the summer of 2015 regarding ancient adult human dentition from a late Bronze Age population in the northern Levantine city of Alalakh in Hatay, Turkey. Ultimately, due primarily to budget and time constraints, the 2015 study did not employ all of the techniques nor use all of the equipment recommended by the present articles. Nonetheless, the study employed every method within reasonability, given the circumstances.

Meaning Structure in Self-defining Illness Episodes in Young-adult Cancer Survivors

Tessa Santarpia, Biological Sciences, Fordham College at Rose Hill, Cailee Tallon, Psychology, Fordham College at Rose Hill, Mary Procidano*, Psychology, Fordham College at Rose Hill

The association of positive and negative meaning to self-defining experiences, predicts resilient development among those who have overcame health adversities. The Domain Specific Appraisal Scale investigates meaning structure, in the narratives of 100 young-adults who have survived cancer. The scale adheres to the complex nature of critical self-defining memories, which shape future life adjustment. The importance of meaning acquired from relational contexts in the face of serious life-altering events, has a significant impact on future development, and outlook on life. Furthermore, The Life-Tasks Model’s assessment of of these patterns simultaneously allows for the comparison and prediction of resilient development, as it is able to identify people’s abilities to continue to pursue their goals, despite
stressful life events. Consequently, this project inspires a variety of direction for future research, specifically in therapeutic attempts to modify associations that individuals make with self-defining experiences, ultimately instilling a sense of personal responsibility and growth.

**Poster-113**

**Bacterial Surface Colonization of Personal Laptop and Fordham University Computer Keyboards**

Jessica Lajoie, Biological Sciences, Fordham College at Rose Hill, Kristen Whitehead, Biological Sciences, Fordham College at Rose Hill, Julia Escobar, Business Administration, Gabelli School of Business, Frances Kazal, Sociology and Anthropology, Fordham College at Rose Hill, Jacqui Johnson*, Biological Sciences, Fordham College at Rose Hill

Bacterial surface colonization and the potential for infection transmission through contact with bacterial surfaces pose threats to public health. Bacterial ubiquity is often overlooked in the most mundane, but frequently used places; for instance many do not consider the microbial abundances on keyboards. Using culture-based assays, we evaluated overall bacterial abundances and verified the presence of Staphylococci, a group of organisms including opportunistic pathogens, on computer keyboards. The goals of this experiment were to determine the extent of bacterial colonization on computer keyboards, compare bacterial abundances on Fordham University keyboards and personal laptop keyboards, and assay for the presence of Staphylococci with the use of Mannitol Salt Agar (MSA). We hypothesized that bacterial abundances would be greater on Fordham University keyboards than on personal laptop keyboards. Preliminary data show that both personal and library keyboards support viable bacterial cells, including Staphylococci. Library computer keyboards grew as much as 24 colonies per 2.25 cm² key, whereas a single key from the personal computers grew as much as 17 colonies per 2.25 cm² key. All computers exhibited Staphylococci growth, and the presence of S. aureus is indicated. Further data are anticipated to support the hypothesis that public use computers, on average, contain significantly more and a larger variety of microorganisms.

**Poster-114**

**The Effects of Roundup on the Physical Environment and the Implications for the Ecosystem**

Joseph Michael, Biological Sciences, Fordham College at Rose Hill, Evon Hekkala*, Biological Sciences, Fordham College at Rose Hill

Roundup® is a glyphosate based herbicide that is widely used throughout the globe, especially in agriculture. After being sprayed on plants, Roundup® can enter the soil and have a large array of effects on the soil quality, soil microbiomes, and off-target species, such as agricultural food products. In our research, we show how the pH of the soil and water changes in response to spraying different concentrations of Roundup® on bean plants. We also tested the impact of Roundup® on the soil microbiomes by observing the growth of commensal soil organisms. Additionally, we investigated whether residues of Roundup® could be detected in the leaves of bean plants, which would demonstrate that Roundup® can enter the food chain. This was done using a spectrophotometer set to specific wavelengths of glyphosate. We predicted that Roundup® will decrease the pH of the soil and water, and kill beneficial soil microorganisms, thereby significantly impacting plant growth. Our predictions were supported, as it was found that Roundup® decreased the pH of the soil and water. The growth of the soil microorganisms was observed to decrease with increasing concentrations of Roundup® use. There were also detectable residues of glyphosate in the leaves of the plants, leading to the conclusion that it can also be transferred to the actual beans. The results from this experiment demonstrate that Roundup® not only impacts the health of the soil, but can also be mitigated through the food chain and have an impact on human health.

**Poster-115**

**Analyzing the interactions between MYOGEF and a component of erythrocyte cytoskeleton SPTA1**

Dougan McGrath, Biological Sciences, Fordham College at Rose Hill, Qize Wei*, Biology, Fordham College at Rose Hill

Erythroid spectrin, a major component of the membrane cytoskeleton of erythrocytes, plays a central role in maintaining the shape and elasticity of red blood cells, thus conferring to erythrocytes the capability of travelling through the circulatory system while withstanding shear and stress in the process of circulation. The basic molecular organization of erythroid spectrin is a heterodimer consisting of an alpha-subunit (SPTA1) and a beta-subunit (SPTB1). Mutations in the SPTA1 or SPTB1 gene have been associated with hereditary elliptocytosis. Importantly, it has also been shown that RhoA, a key component of Rho GTPase signaling, is localized to the erythrocyte membrane...
and implicated in the regulation of erythrocyte cytoskeleton. However, it is essentially unknown whether and how Rho GTPase signaling is implicated in regulating the shape and elasticity of red blood cells. A previous screening in Dr. Wei laboratory has identified SPTA1 as an interacting partner of MYOGEF, a guanine nucleotide exchange factor that is capable of activating RhoA and is involved in the regulation of cell division and cell migration. In this study, we constructed various cDNA fragments encoding different regions of MYOGEF or SPTA1 and examined their interactions using yeast two-hybrid and in vitro pull-down assays. Our results showed that the C-terminal region of MYOGEF interacted with the EF-hand motifs that are situated at the C-terminal region of SPTA1. We propose that the MYOGEF-SPTA1 interaction may lead to MYOGEF-mediated RhoA activation at the erythrocyte membrane, thus contributing to the regulation of membrane cytoskeleton in erythrocytes.

Poster-116
"The Effects of Roundup on the Physical Environment and the Implications for the Ecosystem."  
Hifza Ishtiaq, Biological Sciences, Fordham College at Rose Hill, Vishall Bhoopsingh, Biological Sciences, Fordham College at Rose Hill, Tasnima Elahi, Biological Sciences, Fordham College at Rose Hill, Joseph Michael, Biological Sciences, Fordham College at Rose Hill, Évon Hekkala*, Biological Sciences, Fordham College at Rose Hill

Roundup® is a glyphosate based herbicide that is widely used throughout the globe, especially in agriculture. After being sprayed on plants, Roundup® can enter the soil and have a large array of effects on the soil quality, soil microbiomes, and off-target species, such as agricultural food products. In our research, we show how the pH of the soil and water changes in response to spraying different concentrations of Roundup® on bean plants. We also tested the impact of Roundup® on the soil microbiomes by observing the growth of commensal soil organisms. Additionally, we investigated whether residues of Roundup® could be detected in the leaves of bean plants, which would demonstrate that Roundup® can enter the food chain. This was done using a spectrophotometer set to specific wavelengths of glyphosate. We predicted that Roundup® will decrease the pH of the soil and water, and kill beneficial soil microorganisms, thereby significantly impacting plant growth. Our predictions were supported, as it was found that Roundup® decreased the pH of the soil and water. The growth of the soil microorganisms was observed to decrease with increasing concentrations of Roundup® use. There were also detectable residues of glyphosate in the leaves of the plants, leading to the conclusion that it can also be transferred to the actual beans. The results from this experiment demonstrate that Roundup® not only impacts the health of the soil, but can also be mitigated through the food chain and have an impact on human health.

Poster-117
Simulating Homing with Stereovision Using Databases  
Luca Del Signore, Computer Science, Fordham College at Rose Hill, Damian Lyons*, Computer and Information Sciences, Fordham College at Rose Hill

Homing with Stereo Vision (HSV) is a robot navigation method, that compares two images and calculates the proper vector needed to arrive at the location in the goal image using a stereo camera to achieve depth perception and thus greater accuracy than previous visual homing methods. Through 200 trials with two Pioneer 3-AT robots, my research advisor Dr. Damian Lyons has demonstrated the improved performance of HSV over previous homing methods, which had to rely on maintaining a highly accurate geometrical map of all the obstacles in their environment. These homing methods can effectively navigate robots through their physical environments; but a more efficient means of testing HSV is needed to speed our conducting of visual homing research, which the goal of my project, HSVD (Homing with Stereovision with Databases), will provide. The development of HiSS used image databases to make testing easier. HSV does not yet have such technology for running virtual trials, and this need motivated my research. My current work involves automating the process of collecting stereo images for databases and software that is effective at navigating a virtual robot through them. The potential benefit of this project will be to improve the efficiency and effectiveness of HSV by refining the software system and lowering both time and financial research costs. There are many applications of visual homing not only in the field of robotics but potentially in consumer technologies that can see and navigate routes through visual space.
Potential Avian Reservoir Competence for Tick-borne Pathogens in the Northeastern U.S.

James Potts, Biological Sciences, Fordham College at Rose Hill, Thomas Daniels*, Biological Sciences, Fordham College at Rose Hill

The blacklegged tick (Ixodes scapularis) is an important arthropod disease vector in the US, responsible for transmitting three major human pathogens: Borrelia burgdorferi, Anaplasma phagocytophilum, and Babesia microti, the causative agents of Lyme disease, human granulocytic anaplasmosis, and babesiosis, respectively. Another common tick species, Ixodes dentatus, has been found to transmit the three pathogens. Both tick species feed on birds, which have been implicated in the spread of blacklegged ticks into new areas. Several avian species have been identified as competent reservoirs for these tick-borne pathogens i.e., they can harbor and transmit the disease agents to uninfected ticks that, in turn, can transmit the agents to a new host. The goal of this project was to identify potential bird reservoirs of three common tick-borne pathogens based on evidence of their presence in larval I. scapularis and I. dentatus. Since the pathogens of interest are not transmitted from female tick to eggs, the presence of these agents in larval ticks is indicative of transmission from the bird to tick. Birds were mist-netted and examined for the presence of ticks at the Louis Calder Center, Fordham’s biological field station in Armonk, NY. In all, 159 larval ticks were collected from 14 species of birds in 2010-2011. All ticks were removed and tested by quantitative polymerase chain reaction (qPCR) to determine pathogen presence. Larvae found on four of the bird species tested positive for Borrelia burgdorferi, while larvae from ten species tested positive for Anaplasma phagocytophilum. No larvae tested positive for Babesia microti. Results suggest that several species of birds are competent reservoirs for two tick-borne disease agents and may contribute to the spread of infected ticks in the region.

Activation of Signal Transduction Pathway in Cells With Strong Replication Stress

Paul Supple, Biological Sciences, Fordham College at Rose Hill, Carla Romney*, Biological Sciences, Fordham College at Rose Hill

Cells with Mre11 knockdown experience vulnerable DNA damage/ replication process (replication stress) (Kondratova 2015). Two pathways, the PI3K-Akt pathway and the Ras-ERK pathway, play key roles in cell proliferation and, consequently, in the development of cancer (Sever 2015). Our preliminary phospho-proteomics shows that the ERK pathway is activated in Mre11 knockdown CHO cells. This activation of the ERK pathway is believed to be the cell's attempt to compensate for the replication stress caused by the knockdown of Mre11, an important DNA repair protein. Our research has shown that the knockdown cells experience stunted growth relative to control cells, leading to our hypothesis that ERK activation partially compensates for slow growth. To show that ERK is indeed activated in the Mre11 knockdown cells we performed both a Western blot and cell sensitivity assay. In our assay we analyzed the sensitivity of normal and knocked down CHO cells to two drugs: MK-2206, an Akt inhibitor, and GDC-0994, an ERK inhibitor (both in clinical trials). Our results from the sensitivity assay suggest that Mre11 knockdown cells are dependent on the ERK pathway for proliferation, however, the Western blot results do not support the claim to the same extent. Due to the inconclusive results of our study, we plan to perform several other experiments, including additional Western blots and Muse count and viability assays.

Characterization of Phosphate and Sulfate Molecules in Protein Crystal Density

Laurel Jones, Chemistry, Fordham College at Rose Hill, Paul Smith*, Chemistry, Fordham College at Rose Hill

A common method to determine the structure of proteins is to use protein crystallography. There are several software packages available to help determine the structure of protein based on electron density, but no tool exists to identify phosphate and sulfate molecules within protein crystal structures. These molecules are common in protein crystals, because they are introduced via the crystallization process. Using proteins in the Protein Data Bank as models, we have created an algorithm using the PHENIX platform to find and classify unidentified small molecules within protein crystal structures. This algorithm searches a given crystal structure for unassigned small molecules, then calculates a series of parameters (such as volume, correlation with both sulfate and water molecules, inverse correlation, and charge) for each unidentified molecule and uses a support vector machine to determine its identity. The algorithm currently assigns a molecule as either a phosphate molecule, sulfate molecule, or a water molecule, though more small molecules will eventually be added to the algorithm. Additionally, we intend to add more refinements to the algorithm such as adjusting parameters of the support vector machine and classifying proteins by resolution. Our goal is to test
this algorithm on all of the proteins in the Protein Data Bank to check the reliability of the assignment method and to classify unassigned small molecules within protein crystal structures. This algorithm is intended to be published as a package within the PHENIX toolkit.

**Poster-121**

**The Influence of Noise Pollution on Bird Diversity**

Tasnima Elahi, Biological Sciences and Sociology and Anthropology, Fordham College at Rose Hill, James Lewis*, Biological Sciences, Fordham College at Rose Hill

Wetlands are important habitats in urban landscapes that provide nesting opportunities for wetland breeding birds, while also providing food resources for both native and invasive birds. One method of assessing wetland quality is by studying the changes in bird communities, given that birds are a powerful indicator species. Previous studies indicate that anthropogenic noise may have damaging effects on the individual fitness of birds by acting as a physiological stressor. The purpose of this study was to observe if there is a correlation between noise pollution and the bird species richness in wetland sites. It was hypothesized that if there are lower levels of noise pollution in wetlands, then we will observe a higher bird species richness. 10-min fixed point counts were conducted at four randomly chosen points at wetland locations, during which all birds heard or seen within a 50-m radius were recorded using a dependent-observer approach. Participants also used the Decibel 10th mobile app during their 10-min fixed point counts to record noise levels. The bird data that was collected demonstrates that as the average noise levels increases the average bird richness in wetland sites decreases. The maximum noise levels in wetland sites do not influence the average bird richness in wetland sites significantly. Further analysis shows that the noise pollution in an area is more strongly correlated with the abundance of native and invasive bird species, rather than the richness of native and invasive bird species present.

**Poster-122**

**The Effects of Roundup on the Physical Environment and its Implications for the Ecosystem**

Tasnima Elahi, Biological Sciences and Sociology and Anthropology, Fordham College at Rose Hill, Evon Hekkala*, Biological Sciences, Fordham College at Rose Hill

Roundup® is a glyphosate based herbicide that is widely used throughout the globe, especially in agriculture. After being sprayed on plants, Roundup® can enter the soil and have a large array of effects on the soil quality, soil microbiomes, and off-target species, such as agricultural food products. In our research, we show how the pH of the soil and water changes in response to spraying different concentrations of Roundup® on bean plants. We also tested the impact of Roundup® on the soil microbiomes by observing the growth of commensal soil organisms. Additionally, we investigated whether residues of Roundup® could be detected in the leaves of bean plants, which would demonstrate that Roundup® can enter the food chain. This was done using a spectrophotometer set to specific wavelengths of glyphosate. We predicted that Roundup® will decrease the pH of the soil and water, and kill beneficial soil microorganisms, thereby significantly impacting plant growth. Our predictions were supported, as it was found that Roundup® decreased the pH of the soil and water. The growth of the soil microorganisms was observed to decrease with increasing concentrations of Roundup® use. There were also detectable residues of glyphosate in the leaves of the plants, leading to the conclusion that it can also be transferred to the actual beans. The results from this experiment demonstrate that Roundup® not only impacts the health of the soil, but can also be mitigated through the food chain and have an impact on human health.

**Poster-123**

Female relationships and dominance hierarchy in a group of captive lutung (Trachypithecus cristatus) at the Bronx Zoo

Richard Flamio, Biological Sciences, Fordham College at Rose Hill, Emily Casper, Biological Sciences, Fordham College at Rose Hill, Reiko Matsuda-Goodwin*, Sociology and Anthropology, Fordham College at Rose Hill, Colleen McMahon*, Mammal Department, Bronx Zoo, Wildlife Conservation Society, Bronx, NY

Studies on Asian colobines have shown that not all species are structured in egalitarian age-graded groups. While previous research on silvery lutungs (Trachypithecus cristatus) in the 1960’s has reported that wild populations lack dominance hierarchies, a study on a captive group of this species in Sri Lanka reported the presence of a clear-cut female dominance hierarchy. To examine whether a dominance hierarchy is also found in a captive T. cristatus group (7 females, 3 males) at the Bronx Zoo, NYC, we collected 60 hours of social behavior data on group
members in Spring 2015. We used focal animal sampling method and recorded data at 2-minute and 5-minute intervals during feeding and non-feeding periods, respectively. We used steepness and igraph packages of R (v.3.2.2) to compute various parameters of a dominance hierarchy and draw social networks. We found that the female dominance hierarchy in our study group was non-linear (modified Landau's h= 0.4838, p= 0.3887) and shallow (steepness = 0.1519). Normalized David's scores for the highest-ranking female and the lowest two females were 3.618 and 2.644, respectively. The highest-ranking female was consistently dominant and central in agonistic interactions. Predominance of triadic interactions over dyadic interactions may be the reason for non-linearity. This short study was unable to find out what factors are directly involved in causing some contest competition. Further investigations are necessary to find if dominance hierarchies are unique to captivity or if wild studies had different group structures (larger groups with more males) that differentially influenced female relationships.

**Poster-124**

**Demystifying Complex NMR Signal Splitting**

Ameen Al Qadi, Chemistry, Fordham College at Rose Hill, Paul Smith*, Chemistry, Fordham College at Rose Hill

Normal NMR spectra are difficult to interpret at times as they can conflict with theory and understanding of how NMR phenomena due to the intramolecular activities of a molecule. In order to de-convolute a complex spectrum 3 NMR spectra were produced by: an NMR machine, textbook calculations, and Quantum ab-initio calculations via the computer program Gaussian. Ethyl-Camphorsulfonate was used and the ethyl hydrogens were focused on as the initial 1H NMR spectrum showed unusual peaks for said hydrogens. Preliminary results show that the NMR machine, textbook calculations, and Gaussian mostly agree on how the ethyl hydrogens ought appear on the spectrum with the exception of the complex multiplicity and three hydrogens on the end of the ethyl group. The textbook calculations offer the most insight into what the complex splitting should appear as, whereas Gaussian spectra shows the three hydrogens on the end of the ethyl as three unique groups that each have their unique chemical shifts and J-coupling constants. Though two of the three hydrogens have chemical shifts, which are relatively similar, one of the hydrogens is shifted upfield enough to cause a significant difference. We suspect that this may be due to conformational factors in the molecule, allowing for intramolecular hydrogen bonding to the adjacent sulfate group. Further investigation will involve re-calculating the NMR spectra to take into account these conformational factors in order to produce a spectrum that represents the molecule better, and hopefully apply similar methodology to NMR spectra in general to aid in structural elucidation.

**Poster-125**

**The Effect of Face Wash on Different Common Skin Bacterial Species**

John Castro, Biological Sciences, Fordham College at Rose Hill, James Ramsey, Biological Sciences, Fordham College at Rose Hill, Frank Sikorski, General Science, Fordham College at Rose Hill, Samuel Davey, Biological Sciences, Fordham College at Rose Hill, Jacqui Johnson*, Biological Sciences, Fordham College at Rose Hill

Bacteria have been identified to inhabit many different areas including those under high stress, and low nutrient availability. Moreover, many bacteria live inside the human body and are vital to maintaining a well-functioning body. However, bacteria on the skin such as, Propionibacterium acnes, have been shown to cause acne and are targets for many pharmaceutical companies developing face washes. Although P. acnes was not available, several other bacterial species common to the skin flora: Pseudomonas aeruginosa, Staphylococcus epidermis, were used in this experiment along with Kocuria rhizophila as a representative of P. acnes and Staphylococcus aureus as an opportunistic pathogen of the skin. The goal of the experiment was to determine what face wash kills harmful bacteria causing acne and oiliness, while allowing normal skin flora to grow. In order to do so, we researched which bacteria commonly cause facial blemishes and oiliness. Common skin flora bacteria and harmful bacteria were characterized based on their infectious abilities, and similarity to P. acnes. We also created test tubes with water and the following different face washes: Neutrogena, Cetaphil, Simple and soap. Using sterile discs soaked in different kind of face washes we observed if any zones of inhibition had developed according to each face wash for each of the bacterial species mentioned above, as well as which bacteria are associated with the normal flora of the skin. Our results showed that face washes of all brands kill bacteria with no specificity to whether the bacterium is normal skin flora or possessing similar characteristics of P. acnes. This is a problem because stripping away the good bacteria on one’s face can lower your immune system and lead to more blemishes. Future research can compare how these bacterial colonies build resistance in response to different face washes.
Poster-126

Factors Predicting Teen Driving Behaviors After a High School Driver Safety Program
Brianne Roche, Psychology, Fordham College at Rose Hill, Ann Higgins D'Alessandro*, Psychology, Fordham College at Rose Hill

Teen driver safety is an issue of interest to psychologists as well as newly licensed drivers and concerned family members. To address the needs for safer driving practices and reduce motor vehicle crashes caused by adolescents, the Brain Injury Alliance of New Jersey (BIANJ) implemented a safe driving program in New Jersey high schools called the U Got Brains Champion Schools Program (UGBCSP). Based on data collected during the original evaluation (Center For Injury Research and Prevention at The Children’s Hospital of Pennsylvania, 2014), this research project used the existing dataset to consider the effects of students’ personal demographic characteristics as well as their team leader status in predicting driving attitudes and behaviors. Analyses included factor analyses of 37 items on students’ driving attitudes and behavior, which resulted in eight outcome variables about their own and their friends’ driving behaviors. MANCOVAs and regressions were used to test hypotheses. MANCOVA results confirmed the hypothesis that UGBCSP student team leaders would score higher on measures of safe driving behaviors and engagement in the program and rate the program as having a higher range of impact than students generally. They also showed that students’ personal characteristics, specifically age, gender, and ethnicity, impacted the eight outcomes for students generally and for team leaders. A series of regressions showed demographic characteristics and team member status variably significantly predicted the eight driving outcomes. Thus, the program seemed to impact some students more than others, suggesting even successful programs should consider methods for reaching all students.

Poster-127

Viral Detection by Video Acquisition of Spatially Multiplexed Whispering Gallery Mode Sensors
Matthew Speck, Engineering Physics, Fordham College at Rose Hill, Stephen Holler*, Engineering Physics, Fordham College at Rose Hill

Whispering gallery mode (WGM) resonances in micro-optical cavities provide a sensitive means for interrogating the local environment. This includes potential applications such as the diagnosis and treatment of viruses and types of cancer. The WGM biosensor typically works by monitoring shifts in the resonance wavelength as target analytes adsorb onto the surface of the microcavity. Fiber coupled resonator schemes have demonstrated impressive sensitivity down to single protein adsorption events. In these devices, a single bus waveguide is used to couple light into the resonance mode while monitoring the spectral transmittance. In this coupling/detection geometry the spectral signatures of multiple resonators on a single bus waveguide become interleaved and may overlap each other when the resonances shift. In order to overcome these complications we have developed a spatially multiplexed approach utilizing video acquisition of microspherical resonators. As the excitation laser is tuned through the microspheres’ resonances characteristic blinking occurs due to light leaking out of the high-Q mode towards the camera. Synchronized tuning and acquisition allow the WGM spectra of multiple microspheres to be recorded without interference. This approach will be demonstrated using the Human Papillomavirus (HPV) as the target analyte.

Poster-128

Violence Risk Assessment in Civil Psychiatric Patients using the HCR-20, Version 3
Meghan Maria Banks, Psychology, Fordham College at Rose Hill, Barry Rosenfeld*, Psychology, Fordham College at Rose Hill

Assessment and prevention of violence are critical in care, management, and treatment of psychiatric patients. Clinicians have to make decisions about inpatients’ violence risk however; their unaided clinical judgment often results in a number of false positives. As a result, there is a considerable need for an accurate measure of violence risk, especially at the time of psychiatric hospital admission. Given that there is limited research on the predictive accuracy and validity of the HCR-20, Version 3 in psychiatric settings, the current study assessed the short-term risk of violence in civil psychiatric patients using the HCR-20, Version 3. The first research question addressed whether the HCR-20 Case Prioritization rating would predict the occurrence of violence after 6 months. The second research question addressed whether the Case Prioritization and Severity of Violence ratings would predict the severity of violence over the following 6 months. The third research question addressed whether the HCR-20 Case Prioritization rating would predict the frequency of violence after 6 months. The sample comprised 64 inpatients admitted to an urban psychiatric hospital primarily diagnosed with schizophrenia or schizoaffective disorder or a mood disorder. Violence risk ratings
Poster-129  
**The Effects of Psilocybin on the Anxiety Associated with Stage 4 Chronic Lymphocytic Leukemia**

Kristin O'Grady, General Science, Fordham College at Rose Hill, Suzanne Forlenza, General Science, Fordham College at Rose Hill, Usha Sankar*, Biology, Fordham College at Rose Hill

This research proposal is designed to suggest the use of the hallucinogen psilocybin (4-phosphoryloxy-N,N-dimethyltryptamine) as an anxiety reducer and to quantifiy the psychological effects of the substance via physiological measures. As a serotonin agonist and an agent that decreases cerebral blood flow, we expect intravenous psilocybin to temporarily decrease anxiety in terminally-ill male leukemia patients between the ages of 45 and 65 one week after diagnosis of Stage 4 Chronic Lymphocytic Leukemia. After extensive literature review, we posit that physiological indicators of anxiety reduction would include decreased blood flow to the amygdala and increased serotonin levels in the blood. We also agree that these indicators can be measured in conjunction with psychological survey data. Methods for our proposal would include taking measurements from three groups of 30 men each, including an experimental group, a placebo group, and a control group. From each participant, we would take three brain fMRIs, draw three serotonin blood-level measurements, and administer three Beck Depression tests and State-Trait Inventory tests each at designated points before, 90-120 minutes after, and one week after psilocybin treatment. We expect the results to demonstrate the short term anxiety-reducing effects of psilocybin through significantly increased serotonin levels and significantly decreased blood flow to the amygdala in the experimental group. The scope of the proposal does not include experimentation on the long-term effects of psilocybin as an anxiety reducer.

Poster-130  
**The Effects of Deep Learning on the Classification Accuracy of Gait Biometrics**

Christopher Hayduk, Computer and Information Sciences, Fordham College at Rose Hill, Gary Weiss*, Computer and Information Sciences, Fordham College at Rose Hill

As a member of the WISDM Lab, I will be doing research into deep learning and its effects on biometric gait recognition. At the lab, we use the sensors in watches and phones in order to classify people based on their gait. In our previous research, we were able to classify people based on their gait fairly accurately. However, if we used data from multiple days, our accuracy dropped considerably. This is due to small changes in our gaits that occur on a day-to-day. For example, wearing different clothes or shoes could affect the quality of our classifications. Thus, I will be attempting to show that using several deep learning algorithms, mainly denoising autoencoder and recurrent neural networks, will improve our data and the accuracy of our classifications. To complete this project, I will be doing research into various areas of machine learning and artificial intelligence in order to learn how each model operates and is configured. After completing this research, I will run tests on our data set which should improve the accuracy of our classifications. Any positive results would be fairly significant because the ability to reliably identify people using small gait samples as a biometric indicator could have great implications for many fields, such as security.

Poster-131  
**The Effects of Cutaneous Lipid Composition in Bats on the Growth of Pseudogymnoascus destructans**

Johanna Monro, Environmental Science, Fordham College at Rose Hill, Craig Frank*, Biological Sciences, Fordham College at Rose Hill

White-nose Syndrome (WNS) is a disease of hibernating bats that is caused by severe cutaneous infection with the fungus Pseudogymnoascus destructans (Pd). Some bat species are resistant to cutaneous infection with Pd, and thus are resistant to WNS as well. The mammalian epidermis contains a mixture of many different lipid types, including monoacylglycerols, triacylglycerols, and free fatty acids (FFAs). The relative concentrations of these different lipid types in the epidermis varies with mammalian species. The goal of this study was to determine the effects of these epidermal lipids on the growth of Pd. Laboratory culture experiments were conducted where Pd was grown on media that contained: 1) both an unsaturated (oleic acid, 18:1) and a saturated (stearic acid, 18:0) FFA found in the epidermis of bats, 2) a monoacylglycerol of 18:1, and, 3) a triacylglycerol of 18:0. The results of these experiments revealed that the growth of Pd was reduced by ~86% by the addition of 18:1 monoacylglycerol to the media. The addition of 18:0 in either the FFA or triacylglycerol form to the media also inhibited the growth of Pd. These findings indicate...
that one factor that may enable some bats species to better resist cutaneous infection with Pd, and thus WNS as well, may be the concentrations of these lipid types in the epidermis.

Poster-132

Before the feces even hits the fan: A look at coliform ubiquity in public bathrooms
Thomas Mistretta, Biological Sciences, Fordham College at Rose Hill, Victoria Sieverson, Biological Sciences, Fordham College at Rose Hill, Matthew Wolman, Biological Sciences, Fordham College at Rose Hill, Jacqui Johnson*, Biological Sciences, Fordham College at Rose Hill

Public bathrooms are sites that are likely to spread diseases, making it important that we maintain sanitary conditions. With this, we collected samples from the bathrooms of Freeman Hall on the Fordham University Rose Hill campus to find if any coliforms are present. Coliforms are Gram-negative bacteria found in fecal matter that can indicate conditions for pathogenic bacteria. We used Eosin Methylene Blue agar (EMB) and Endo agar to inhibit gram-positive growth and detect lactose fermenting bacteria. We swabbed surfaces in three ranges: the toilet, the toilet stall, and the sinks of each bathroom. Two surfaces within each range were swabbed: one that is commonly touched by humans, one that is not. We worked under the hypothesis that we would find the most coliform growth in the region closest to the toilet. The close, handled areas produced growth on all six Endo plates and two of the three EMB plates, while the not handled area produced no growth on any of the plates. The stall area produced growth on two of the three handled Endo plates and no growth on the EMB plates, the not handled areas produced no growth on any of the plates. The sink area produced growth on all three handled Endo plates and the data collected suggests that the Freeman bathrooms are cleaner than predicted, but coliforms were still present throughout the bathroom area with growth appearing in all ranges, with the handled surfaces being the most contaminated.

Poster-133

“Let’s play ball!”: How Cyberball may reflect feelings of discrimination
Steven Smith, Psychology, Fordham College at Rose Hill, Tiffany Yip*, Psychology, Fordham College at Rose Hill

Cyberball is an online game developed by Kip Williams and has been modified by David Yeager and his colleagues in order to be able to manipulate the playing of the game, add names, and add pictures of other players. Cyberball has been used in the past to demonstrate ostracism and discrimination within and between individuals, in a wide array of domains. The present study seeks to examine how individuals perceive exclusion from play in Cyberball. The participants will be randomly assigned to play Cyberball with computer-generated confederates, and these confederates will appear to be either the same race of the individual, or a different race from the individual. The game will be manipulated so that the participant will be excluded from the game. Individuals are administered a questionnaire immediately before or immediately after completing the game to determine how they perceive exclusion. Sample data will be presented to demonstrate the utility of this method.

Poster-134

Healthy Lifestyle Engagement and Well-Being in College
Introduction to Behavioral Health Manresa Scholars Program, Psychology, Fordham College at Rose Hill, Rachel Annunziato*, Psychology, Fordham College at Rose Hill

The transition to college life is a time when lifestyle habits often change and this could impact overall well-being. The purpose of the present study was to examine whether eating habits and exercise are associated with well-being as measured by happiness and perceived stress levels among college students. Participants (N=106) were recruited from Foundations of Psychology classes. After informed consent procedures, they were asked to complete a short battery of questionnaires on Qualtrics consisting of items from the University of North Florida’s survey of diet and exercise of freshman (Rodriguez, 1999), the Oxford Happiness Questionnaire (OHQ; Hills & Argyle, 2002) and the Perceived Stress Scale (PSS; Cohen, 1994). Based on survey responses, participants were split into two groups depending on how healthy they rated their eating habits; 37 participants endorsed “healthy” eating habits while 69 described “unhealthy” eating. Overall, happiness and stress were strongly correlated, r = -.56, p < .01. Independent-samples t-tests were conducted to determine if there were differences on the OHQ and the PSS by eating habits. The “healthy” students had significantly higher scores on the happiness measure, mean score = 4.29 (SD=.52) versus 3.82 (SD=.74) for “unhealthy” respondents. High ratings of stress, above normative levels, were comparable between the groups. Finally, students who reported exercising for their “general health” were significantly happier and less stressed. In
conclusion, healthy eating habits appear to be uncommon in college but those who endorse them describe greater happiness. Overall health consciousness may confer an additive benefit of less stress.

**Poster-135**

**The Effects of High Altitude on Respiratory Function**  
Jozef Venglar, Biological Sciences, Fordham College at Rose Hill, William Smith IV, Biological Sciences, Fordham College at Rose Hill, Devin Adams, General Science, Fordham College at Rose Hill, Usha Sankar*, Biological Sciences, Fordham College at Rose Hill

The respiratory system, being vital to human survival and efficiency, is the area of interest for our research, in terms of determining if being exposed to high altitude has an effect on respiratory function for individuals native to lower altitudes. According to previous studies, humans that live in high altitudes where low pressure levels are found, have larger lung volumes than humans that aren’t native or don’t reside in high altitudes areas. Also studies have found that for any given energy expenditure, the ventilation increases proportionally with altitude, which carries with it-increased stress levels. Based on the given information, we hypothesize that those exposed to low barometric pressure will initially experience higher levels of salivary cortisol (stress levels) and increased ventilation rate based on lung capacity. After several weeks of exposure, the body will acclimatize leading to an increase in total lung volume, a decrease in respiratory ventilation needed to get suitable levels of oxygen, and a decrease in cortisol levels over time. In order to perform this research, forty suitable volunteers will be gathered, which will be divided into a control group and an experimental group, consisting of healthy male and female non-smokers aged from twenty years of age to thirty years of age. Prior to relocation, the lung capacities, ventilation rate as well as cortisol levels will be obtained from all individuals to establish a base line of comparison. One group of individuals will continue to live at sea level and be compared with the experimental group that are relocated to a higher altitude for three months, based on their lung capacity (being measured in mL by a spirometer), cortisol levels, and ventilation rate. Based on the results, we will be able to determine whether or not the hypothesis is correct and gain knowledge of the bodily responses and adaptations to different external environments.

**Poster-136**

**Flexible Conformations of Generalized Cyclohexane**  
Louis Moskovitz, Mathematics, Fordham College at Rose Hill, Robert Lewis*, Mathematics, Fordham College at Rose Hill

The research was to adequately portray all possible flexible conformations of the compound cyclohexane generalized so that the common angle $\alpha$ between bonds is not necessarily the usual one, 109.5 degrees. This hexagonal molecule with equal distance between each point was broken down so that all six carbon locations could be found using three angles. These angles included the internal angle of the ring $\alpha$, the angle $\beta$ makes with the xz plane, and the angle another point makes with the xz plane $\gamma$. Once all points were calculated under these three angles, we used the computer algebra system Fermat to discover when the Dixon resultant is 0, which corresponds to flexibility. A specific case was initially tested with a given $\alpha$ of 109.5 degrees. Dixon was able to solve for all carbon locations based on a single angle $\beta$. Dixon then was able to simplify the conditions to determine each carbon location throughout flexing, based on the set angle $\alpha$. We found that if the angle $\alpha$ was between $\sqrt{3}$ and $\sqrt{3}/3$, there was a single flexible conformation, but when $\alpha$ was less than $\sqrt{3}$, there are two unique flexible conformations. Maple then allowed animations of cyclohexane given any constant $\alpha$ to be made. Further tests included differing the lengths between carbons so there were two alternating lengths, but the data was inconclusive. The implications include further understanding of the chemical cyclohexane and reactions based on flexibility along with different flexible structures one can make.
Major histocompatibility complex (Mhc) genes are known to play integral roles in pathogen resistance. Many studies have investigated the association between MHC class I alleles and the prevalence of blood parasites in different passerine species. We investigated Mhc genes from blood samples of four avian malaria-infected birds and four non-infected birds in three different passerine species, European Starling (Sturnus vulgaris), Northern Cardinal (Cardinalis cardinalis) and Field Sparrow (Spizella pusilla), previously collected in New York, New Jersey and Pennsylvania. Bioinformatic analysis will be carried out to investigate the evolutionary history of those MHC class I alleles across multiple species, and to estimate the signs of natural selection and recombination acting on those genes. I will attempt to establish a correlation between specific immunogenetic profiles and blood parasite infections and coinfections. I hypothesize that distinct nucleotide variants of exon 3 will be identified, and the greatest diversity will be among non-infected passerines. Greater diversity would provide these birds with an advantageous ability to detect and resist a broader range of intracellular pathogens. The results of this study will contribute to my senior thesis, building on my prior work on the genetic characterization of avian malaria parasites.

Roundup® is a glyphosate based herbicide that is widely used throughout the globe, especially in agriculture. After being sprayed on plants, Roundup® can enter the soil and have a large array of effects on the soil quality, soil microbiomes, and off-target species, such as agricultural food products. In our research, we show how the pH of the soil and water changes in response to spraying different concentrations of Roundup® on bean plants. We also tested the impact of Roundup® on the soil microbiomes by observing the growth of commensal soil organisms. Additionally, we investigated whether residues of Roundup® could be detected in the leaves of bean plants, which would demonstrate that Roundup® can enter the food chain. This was done using a spectrophotometer set to specific wavelengths of glyphosate. We predicted that Roundup® will decrease the pH of the soil and water, and kill beneficial soil microorganisms, thereby significantly impacting plant growth. Our predictions were supported, as it was found that Roundup® decreased the pH of the soil and water. The growth of the soil microorganisms was observed to decrease with increasing concentrations of Roundup® use. There were also detectable residues of glyphosate in the leaves of the plants, leading to the conclusion that it can also be transferred to the actual beans. The results from this experiment demonstrate that Roundup® not only impacts the health of the soil, but can also be mitigated through the food chain and have an impact on human health.

The use of reusable water bottles has become increasingly popular in an effort to reduce waste and to be more eco-friendly. However, improper washing and storage of these bottles can produce conditions conducive to bacterial growth. In this study, we investigated which type of reusable water bottle results in the greatest bacterial contamination. Samples of tap water were collected from a reusable plastic, glass, and stainless steel bottle, as well as a disposable plastic bottle. Water from an unopened, disposable plastic bottle was also sampled. We hypothesized that the water sample from the reusable plastic bottle would give rise to the greatest bacterial growth because of plastic’s hydrophobic quality. Using serial dilutions, samples from each of the five types of bottles were diluted and plated onto nutrient agar medium. This was done in order to grow isolated bacterial colonies that could be easily observed and counted. The standard plate count method was used to determine the number of viable bacterial cells present by
counting the number of colony forming units of each sample. Our results indicated that most bacterial growth occurred in the reusable metal bottle, followed by the disposable plastic bottle and the reusable plastic bottle. Although reusable water bottles might be better for the environment, they may harbor bacteria. Further research should involve replicating this experiment, and can expand to include the effect of water bottle filters and purified water.

**Poster-140**

**On the Role of Iodine in the Photocatalysis of Oxygen Reduction at a Silver/Silver Iodide Electrode**

Francesco Caruana, Chemistry, Fordham College at Rose Hill, Kateryna Huz, Chemistry, Fordham College at Rose Hill, Jacob Robinson, Chemistry, Fordham College at Rose Hill, Christina Daniels, Chemistry, Fordham College at Rose Hill, John Amato, Chemistry, Fordham College at Rose Hill, John McMahon*, Chemistry, Fordham College at Rose Hill

The oxygen reduction reaction is the bottleneck to efficient energy production from fuel cells. The exchange current density for oxygen reduction at platinum is $2 \times 10^{-7}$ A cm$^{-2}$. Comparatively, the reduction of iodine to iodide supports a large exchange current density of 0.4 A cm$^{-2}$. We examined the photovoltage generated upon irradiation of Ag/AgI, Ag/AgBr, and Ag/AgCl electrodes in oxygen-saturated electrolyte and found the voltages to be directly proportional to the difference between the standard reduction potential for oxygen reduction and that for halogen (I$_2$, Br$_2$, Cl$_2$) reduction. That is, we have demonstrated coupling between the oxidation of halide ion ($I^-$, Br$^-$, Cl$^-$) and the reduction of oxygen. For example, coupling oxygen reduction to iodide oxidation follows the equation below.

$$2I^{-}(surface) + 2H^+(aq) + \frac{1}{2}O_2(aq) \rightleftharpoons I_2(surface) + H_2O(\ell)$$

The reaction exploits the high exchange current density of the iodine reaction. Oxygen reduction at platinum requires a large negative overvoltage to compensate for the low exchange current density, thereby reducing the power output of a fuel cell. Such compensation is unnecessary at irradiated Ag/AgI. The efficiency-busting oxygen overvoltage at platinum is revealed in polarization curves by the large drop in cell voltage accompanying current draw. Equivalent polarization curves for the fuel cell with the irradiated Ag/AgI cathode show nearly flat voltage response to current draw. While the improved reaction kinetics (current) of the coupled reaction of iodide with oxygen promises improved efficiency for fuel cells there are drawbacks: The Ag/AgI photovoltage is lower than the thermodynamic voltage for the oxygen/water pair and irradiating the cathode presents engineering challenges.
NYC Water: Testing Levels of Coliform Activity in Recreational Waterways
Jacquelyn Ramos, Biological Sciences, Fordham College at Rose Hill, Joni Horton, Natural Sciences, Fordham College at Lincoln Center, Sig McDonald, Biological Sciences, Fordham College at Rose Hill, Vivek Arora, Biological Sciences, Fordham College at Rose Hill, Jacqui Johnson*, Biological Sciences, Fordham College at Rose Hill

The quality of water in open rivers used daily by boaters, rowers, fishermen, and bathers has been tested for the presence of coliform bacteria. These bacteria are a marker for fecal contamination. Researchers collected samples of water from three commonly used recreational waterways; the Hudson, East, and Harlem Rivers respectively. Three standard, widely used tests were applied to investigate the presence of coliforms: presumptive, confirmed, and completed. Tubes of lactose broth were inoculated with specific amounts of river water. Given that E. coli bacteria have a natural property of fermenting lactose and producing gas, their presence was suspected starting with the presumptive test. Researchers then used the confirmed test to further the investigation, inoculating plates of Eosin Methylene Blue (EMB) agar and testing for lactose fermentation and gas production, two attributes of gram-negative, coliform bacteria. The isolated bacteria from the EMB plates were then inoculated onto a nutrient agar slant and Durham tubes filled with lactose broth. These tests confirmed gas producing, lactose fermenting, non-spore bacteria within the Hudson, East, and Harlem rivers. The results were then compared to the recommended water quality levels set by the Environmental Protection Agency (EPA) to determine the relative safety of the waterways.

Pyrazoline Ring Formation Using Aldol Condensation Products as a Strategy to Construct New Dendrimer Architectures
Jeremie Keller, Chemistry, Fordham College at Rose Hill, Amy Balija*, Chemistry, Fordham College at Rose Hill

Dendrimers are highly branched macromolecular structures containing peripheral branching groups connected to a central core. Due to the presence of interior voids, dendrimers have been proposed for many applications involving complex formation with small molecules. For example, dendrimers are envisioned as entrapping agents to remove pollutants from drinking water and the environment. New dendrimer architectures are needed for such applications to reach their full potential. In this presentation, the attempted synthesis of a novel dendrimer structure containing pyrazoline rings will be discussed. The most challenging step of this synthesis is the formation of a pyrazoline ring. In order to find optimized pyrazoline formation conditions and ideal substrate combinations to form a dendrimer, a collection of new starting materials has been synthesized and subjected to the pyrazoline ring formation. Attempts at preparing the pyrazoline based dendrimer will be highlighted.

Self-Management in Pediatric Endocrinology: Assessment and Correlates
Danny Lee, Psychology, Fordham College at Rose Hill, Rachel Annunziato*, Psychology, Fordham College at Rose Hill

Pediatric endocrinology patients are taught to self-manage their health care. We examined self-management (SM) among T1DM and understudied patients with growth deficiencies, who may receive human growth hormone (HGH) treatment for several years, as well as its mental health correlates among patients and parents. Patients ages 8-17 with T1DM (N=47, mean age = 13.05, range = 8-17) or receiving HGH treatment for short stature (N=56, mean age = 13.24, range = 8-17), were recruited with a parent. Patients completed measures of depression, the CDI, and anxiety, the SCARED. Parents were given measures of depression, the CES-D, and distress, the IES. Both parties completed a validated measure of SM. For T1DM patients, level of SM was significantly correlated with age (r for patient report and age = .54, p < .01; r for parent report and age = .54, p < .01) but for HGH these values were non-significant (r’s = .18, .35 respectively). For T1DM, SM was correlated with patient depression (CDI), r = .34, p = .03 and parent distress (IES), r = -31, p = .04 but not with anxiety or parent depression. In conclusion, for T1DM, SM increased with age and was more distressing to both patients and parents, but in different directions. In the HGH group, age and mental health correlates were unrelated to SM level. These findings are indicative of perhaps less emphasis on SM for pediatric patients receiving time-limited treatments but also of its complicated impact on families when the regimen is life-long.
Poster-144  
**The Amount of Coliforms Present in Freshmen Dormitory Bathrooms**  
Sierra Hollenbach, Psychology, Fordham College at Rose Hill, Aleksander Richards, Biological Sciences, Fordham College at Rose Hill, Peter Gorski, Biological Sciences, Fordham College at Rose Hill, Jacqui Johnson*, Biological Sciences, Fordham College at Rose Hill  

At Fordham University, the communal bathrooms in the most populated freshmen dormitories can serve anywhere between 20-30 students on a floor. These heavily trafficked bathrooms can create a large gradient of harmful bacteria. In our research, we wanted to know how many coliforms were present in the communal bathrooms of freshmen dormitories. The evidence of coliforms is important because they are often a marker for the presence of fecal matter as well as disease-causing pathogens. In order to answer our question, we obtained samples from one female bathroom in Alumni Court South, Loschert Hall, and Martyr’s Court dormitories. We predicted that Martyr’s Court dormitory would have the highest number of coliforms found in the bathroom. We are analyzing the samples from the bathroom handles and faucets by plating them on Endo agar. Endo agar is selective in that it only allows Gram-negative bacteria to grow. It is also differential in that coliform colonies will appear red after incubation. The colonies on the plate will be counted using a standard plate count (SPC) method. If we find large amounts of coliform colonies from the samples, it will emphasize the importance of hygiene and cleanliness in a communal bathroom setting. This means the use of proper hand washing protocols, hand sanitizers, and more frequent cleaning and disinfection of the bathrooms. A solution could be installing bathroom doors that can be pushed open instead of having a handle.

Poster-145  
**Evidence for neural processing of task-irrelevant streams in complex auditory environments**  
Juin-Wan Zhou, Engineering Physics, Fordham College at Rose Hill, Sally Cole, Psychology, Bard College, Elyse Sussman*, Dominick P. Purpura Department of Neuroscience, Albert Einstein College of Medicine  

The auditory system is constantly bombarded with sound, and yet is able to differentiate one sound stream from the mixture of streams that enters the ears. This process is called auditory scene analysis (ASA). To what extent the background sound is processed is not fully known. It is unclear whether the auditory system segregates the unattended background sounds into distinct streams or if it is undifferentiated noise. Recent studies using only frequency as the differentiating cue have shown stream segregation, but with limited processing. We hypothesized that strengthening streaming by characterizing sounds through multiple cues: location, sound envelope, sound type, and frequency would reduce the attentional load and allow more resources to be available to process unattended streams. Subjects were presented with auditory stimuli while EEG was recorded. Processing of unattended streams was indexed using the mismatch negativity (MMN) component of event-related potentials (ERP). The presence of MMN in unattended streams provides preliminary evidence that streaming occurs, and demonstrates further processing of task-irrelevant streams. The results of this study can be applied to future research methods regarding ASA, and provide a better understanding of the process. The findings of ASA studies can be applied to clinical settings in improving the quality of life in patients with auditory processing disorders, autism spectrum disorders, and age-related hearing loss.

Poster-146  
**Sleep Quality and Performance on a Problem Solving Task in Young Adults**  
Katrazyna McNeal, Psychology, Fordham College at Rose Hill, Alessandra Palladino, Psychology, Fordham College at Rose Hill, Tiffany Le, Psychology, Fordham College at Rose Hill, Anika Masand, Psychology, Fordham College at Rose Hill, Molly Zimmerman*  

Previous research has indicated that sleep quality has a strong influence on cognition. However, relatively little is known about the relationship between sleep quality and problem solving, a complex aspect of cognition. This study utilizes actigraphy watches, which track activity level, to measure sleep quality and the Groton Maze Learning Task to measure problem solving ability in a sample of 54 undergraduate participants. The Groton Maze Learning Task is a computerized visuospatial maze problem solving task in the CogState neuropsychological battery that has been validated for the use of cognitive testing. The sample consisted of 41 women (75.9%). Forty six participants described themselves as not Hispanic or Latino (85.2%), and the mean age of the sample was 19.94 (SD = 1.27). It was hypothesized that poorer sleep quality, defined as shorter total sleep or more awakenings during sleep, would be correlated with worse performance on the Groton Maze Learning Task. The results revealed significant correlations between wake after sleep onset and maze recall duration, \( r_s = .31, p < .05 \), and maze recall moves per second, \( r_s = - .31, p < .05 \). There was a trend towards significance between wake after sleep onset and maze recall errors, \( r_s = .24 \),
The relationship between wake after sleep onset and maze learning errors also approached significance, \( r_s = .28, p = .05 \). The findings indicate that poorer sleep, defined as more interruptions during sleep, resulted in more errors and poorer recall on a problem solving task.

**Poster-147**

**The Effects of Deep Learning on the Classification Accuracy of Biometrics**

James Stahl, Computer Science, Fordham College at Rose Hill, Chris Hayduk, Computer Science, Fordham College at Rose Hill, Andrew Johnston, Computer Science and Mathematics, Fordham College at Rose Hill, Gary Weiss*, Computer Science, Fordham College at Rose Hill

Biometrics is the study of measurable biological characteristics. Because biometric measures are unique to individuals, they are commonly used for identification purposes. When one unlocks a phone using its fingerprint scanner or logs into a laptop by looking at its front-facing camera, that person is using his or her unique biological qualities as a key to open the device. This kind of mobile biometric identification is experiencing a renaissance as mobile processors increase in power and decrease in cost. The Wireless Sensor Data Mining Laboratory (WISDM Lab) aims to utilize this power and challenge what is possible in the ways of sophisticated biometric profiling, all on easily available phones and watches. In the lab's previous research, people were able to be classified based on their gait fairly accurately. However, using data from multiple days made this accuracy drop considerably. This is due to small changes that occur in people's gaits on a daily basis. For example, wearing different clothes or shoes could affect the quality of the classifications. Thus, this project is focused on using Deep Learning techniques to improve the accuracy of the classifications. The Deep Learning techniques used will be denoising autoencoders, recurrent neural networks, and convolutional neural networks. This endeavor is not only incredibly significant, but also entirely unique to the WISDM Lab.

**Poster-148**

**Reorientation and Isotropization of Liquid Crystals Under Gas Diffusion**

Anthony Tantillo, Physics, Fordham College at Rose Hill, Petr Shibayev, Physics, Fordham College at Rose Hill*

Reorientation and isotropisation of liquid crystals induced by organic solvent vapors was studied experimentally in relation to the use of liquid crystals as gas sensors. Reorientation and isotropisation were studied in the droplets deposited on the flat surface and on the tip of the hollow fibers. The anisotropy of gas diffusion was studied in the films and droplets of different sizes deposited on the surfaces with planar and homeotropic conditions. It was revealed that the diffusion coefficients differ approximately by a factor of two for liquid crystals in planar and homeotropic orientations. It was also shown that interference pattern created by passing light in liquid crystalline droplets deposited on the planar surface and on the tip of the hollow fiber can be used in detection of very small concentration of vapors. The model of diffusion is suggested and molecular dynamics simulations of the diffusion in liquid crystals with different molecular orientation are performed. The molecular dynamics simulations were performed on a time scale of about tens nanoseconds. In general they confirm the experimental results, but provide larger differences (by a factor 2 to 4) for diffusion coefficient in liquid crystals with planar and homeotropic orientation.

**Poster-149**

**Investigating the Link Between the Human Musical Memory Network and Cortical Regions Preserved in Late-Stage Alzheimer’s Disease**

Arthur Vansuetendael V, Integrative Neuroscience, Fordham College at Rose Hill, Amy Roy*, Fordham College at Rose Hill

This meta-analytic study explores the link between the regions in the brain implicated in the processing and production of autobiographically salient musical memories, and the cortical regions most commonly spared by the progress of Alzheimer’s Disease (AD). Significant success in the palliative care of mid to late-stage AD patients using music-assisted reminiscence therapy, as well as recent neuroimaging studies localizing these processes in these spared regions give support to music therapy’s viability as a robust palliative treatment for middle and late-stage AD.
This study uses the meta-analytic algorithm GingerALE to consolidate available neuroimaging studies on the cortical regions responsible for human musical memory, and map these activations against the anatomy of late-stage AD. This comparison will help to deepen conclusions of earlier research (Jacobsen et. al 2015, Hseih et. al 2011, and Janata 2009 among others) implicating these cortical regions, and their functions, as extremely important in the development of new paradigms for palliative care of AD.

Poster-150

The Effects of Extreme Precipitation on Soil Biogeochemistry in the Riparian Zone of Low-Order Watersheds

John Turner, Biological Sciences, Fordham College at Rose Hill, Xiupeng Zhang*, Biological Sciences, Fordham College at Rose Hill, J.D. Lewis*, Biological Sciences, Fordham College at Rose Hill,

Previous research has indicated that sleep quality has a strong influence on cognition. However, relatively little is known about the relationship between sleep quality and problem solving, a complex aspect of cognition. This study utilizes actigraphy watches, which track activity level, to measure sleep quality and the Groton Maze Learning Task to measure problem solving ability in a sample of 54 undergraduate participants. The Groton Maze Learning Task is a computerized visuospatial maze problem solving task in the CogState neuropsychological battery that has been validated for the use of cognitive testing. The sample consisted of 41 women (75.9%). Forty six participants described themselves as not Hispanic or Latino (85.2%), and the mean age of the sample was 19.94 (SD = 1.27). It was hypothesized that poorer sleep quality, defined as shorter total sleep or more awakenings during sleep, would be correlated with worse performance on the Groton Maze Learning Task. The results revealed significant correlations between wake after sleep onset and maze recall duration, $r_s = .31, p < .05$, and maze recall moves per second, $r_s = -.31, p < .05$. There was a trend towards significance between wake after sleep onset and maze recall errors, $r_s = .24, p = .10$. The relationship between wake after sleep onset and maze learning errors also approached significance, $r_s = .28, p = .05$. The findings indicate that poorer sleep, defined as more interruptions during sleep, resulted in more errors and poorer recall on a problem solving task.
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