



UGRC Undergraduate
Research
Conference

Proceedings

March 25-26, 2015

Hunter College Undergraduate Research Conference

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Oral Presentation Abstracts

Wednesday, March 25th, 2015
Oral Presentation Session #1
9:00am-11:30am

<p>1</p>	<p>Presenter: Krishna Mehta, <i>Biological Sciences and Studio Art</i> Muse Scholar Faculty Mentor: Dara Meyers-Kingsley</p> <p>Bridging the Gap between the Arts and the Sciences</p> <p>The sciences and the arts have formed a strong connection through my experiences always feeding off and influencing each other. Previous experience at a psychology/ neuroscience lab has taught me how scientific inquiry can affect artwork as it teaches us about how the brain perceives, interprets and responds to visual stimuli. My research at Denis Pelli's lab at NYU focused on the number of cortical neurons used to see. The task given to the subjects consisted of repeated tests to determine which of the visual squares connected the highest contrast. Furthermore a mathematical equation was used through the computer program to determine how many neurons were used to solve each task. Results showed that on average, the number of neurons used for each of the contrast tasks was 50. Throughout the course of the research I learned how I could use the intricate information provided by my scientific inquiries to enhance my artwork. By understanding how the brain perceives contrast, I was able to make active decisions in my artwork regarding color combinations, background and foreground subjects and space throughout the paintings. The presentation includes specific examples using my previous artworks as examples in which I have applied the knowledge acquired through my research. These interaction between the sciences and the arts need to be better understood and applied to every individual's life.</p>
<p>2</p>	<p>Presenter: Daniela Mikhaylov, <i>Biological Sciences and Music</i> Macaulay Honors College Co-authors: Christina Spevak, Christopher Park Faculty Mentor: Karen Phillips</p> <p>Investigating the Role of Translation in Normal and Malignant Hematopoiesis</p> <p>Acute myeloid leukemia (AML) is characterized by numerous somatic mutations and altered gene expression. To understand the effect of translation in AML, we investigated loss-of-function mutations in two pathways frequently upregulated in AML. 4EBP double knockout mice were used to investigate the effect of increased translational initiation. Mice harboring the AML-associated SRSF2 were used to study the effect of the spliceosome factor mutations on translation. Bone marrow cells were isolated from the long bones and spines of wild-type (WT), 4EBP1/2 DKO and SRSF2 mutant mice and enriched for a hematopoietic stem cell marker called cKit. Translation profiles were characterized using sucrose gradients, which separates non-translating ribosomes (monosomes) from translating ribosomes (polysomes) based on their different densities. RNA concentrations in each fraction were analyzed. RNA percentages in each</p>

	<p>fraction were plotted to show the distribution of sub-polysomes and polysomes and their RNA content within the sucrose gradient fractions. In 4EBP mice, there was an increase in polysomal RNA in the Mut compared to the WT, showing an increase in translation in the mutant. In SRSF2 mice, there was a decrease in polysomal RNA in the mutant compared to the WT, consistent with a global decrease in translation. These experiments demonstrate that loss-of-function mutations in 4EBP and SRSF2 have opposite effects on translational efficiency. As expected, loss of 4EBP protein induced more translation, while mutations in SRSF2 unexpectedly resulted in less translation. Future studies are needed to determine whether these changes in translation affect leukemia initiation, and whether such changes are caused by specific mRNAs. Identification of such targets will provide therapeutic potential in the treatment of leukemia.</p>
3	<p>Presenter: Amanda Arita, <i>Psychology</i> Thomas Hunter Honors Program Faculty Mentor: Cheryl Harding</p> <p>Are Mold-exposed Mice Depressed: Immobility in the Water Maze</p> <p>Many people who live in moldy buildings complain of memory problems and depression. Past research from our lab showed that mold exposure reduces spatial learning abilities. To test mold's effects on spatial learning, we used the Morris Water Maze (MWM), a behavioral test where a mouse must find a hidden platform within a pool. Mice must use distal landmarks around the room to orient to the platform. We have found that mold-exposed animals take longer to find the hidden platform than their mold-free counterparts. Many studies found that immune activation, like that caused by mold exposure, frequently causes depression. In the MWM, floating is often used as a measure of depression. The general assumption is that the animal has lost its motivation to find the platform. My hypothesis is that mold treatment increases floating, and that this contributes to the increase in latency to find the escape platform. The subjects used were 24 adult male C57Bl/6 mice. The subjects were randomly assigned to three separate conditions; the intact spore group (IN) received intact <i>Stachybotrys</i> spores, the extracted spore group (EX) received spores that had toxins removed and proteins denatured, and the control group (CON) received saline vehicle. Intact and extracted spores were used for two reasons: to determine whether symptoms were caused by spore's toxins or structure and to be able to generalize findings to other mold species. I am currently testing my hypothesis to determine if depressive behavior may partially explain the poor performance of mold-exposed animals.</p>
4	<p>Presenter: Hila Chase, <i>Biological Sciences</i> MARC (Maximizing Access to Research Careers), Muse Scholar, Thomas Hunter Honors Program, and Yalow Scholar Co-authors: Natalie Reznikov, Matthew Singer, Vlad Brumfeld, Ron Shahar, Stephen Weiner Faculty Mentor: Derrick Brazill</p> <p>The Matrix: Revealing a Basic 3-Dimensional Structural Motif in Trabecular Bone</p> <p>Investigating the structural and mechanical properties of bone is imperative to understanding bone as a functional tissue. Trabecular bone, the spongy matrix of bone filling the cortical shell in many skeletal regions, helps absorb and distribute forces when bones are loaded. Many bone diseases result in inferior structural integrity, which can lead to higher risk of fracture. In order to diagnose, treat or artificially replace bone, a deeper understanding of the three-dimensional trabecular structure and its relation to skeletal function is crucial. Trabecular bone has been</p>

	<p>found to develop a specific orientation according to the forces applied over an organism's lifetime. Thus many studies have focused on specific aspects of the matrix, like directionality, porosity, connectivity or strut-thickness, but no attempt had been made to identify the recurrent, topological motif of trabecular bone. Using a high-resolution microCT, we scanned the proximal femora of eleven humans aged between 1.6 and 63 years old. Digital isolation and analysis of the trabecular interior revealed a robust structural motif within all specimens. The inter-trabecular angles (ITAs) we found suggest a tetrahedral motif, which implies the structural principle of Tensegrity. In tensegrity, elements are in a state of either compression or tension, retaining stability against multidirectional loading. These angles therefore suggest an inherent, underlying tetrahedral motif in trabecular bone that contributes greatly to its structural integrity. This study is the first to investigate a local motif of trabecular bone, and with further research has the potential for a broad range of significant discoveries and applications.</p>
5	<p>Presenter: Kaity Tung, <i>Biological Sciences</i> Macaulay Honors College Co-authors: Amrita Chatterjee, Suman Mukhopadhyay, Deven Patel, David Foster Faculty Mentor: David Foster</p> <p>Rapamycin-induced G1 Cell Cycle Arrest Employs both TGF-β and Rb Pathways</p> <p>The mammalian target of rapamycin complex 1 (mTORC1) is a critical regulator of G1 cell cycle progression. Two key substrates of mTORC1 are ribosomal subunit S6 kinase (S6K) and eukaryotic initiation factor 4E (eIF4E) binding protein-1 (4E-BP1). We reported previously that simultaneous knockdown of S6K and eIF4E causes a transforming growth factor-b (TGF-b)-dependent G1 cell cycle arrest in MDA-MB-231 human breast cancer cells. Rapamycin inhibits the phosphorylation of S6K at nano-molar concentrations in MDA-MB-231 cells; however, micro-molar concentrations of rapamycin are required to inhibit phosphorylation of 4E-BP1 – the phosphorylation of which, liberates eIF4E to initiate translation. Micro-molar doses of rapamycin are required for complete G1 cell cycle arrest – indicating that 4E-BP1 is a critical target of mTOR for promoting cell cycle progression. Data are provided demonstrating that G1 cell cycle arrest induced by rapamycin is due to up-regulation of TGF-b signaling and down-regulation of Rb phosphorylation via phosphorylation of the mTORC1 substrates S6K and 4E-BP1 respectively. These findings enhance the current understanding of the cytostatic effects of mTORC1 suppression with therapeutic implications.</p>
6	<p>Presenter: Elizabeth Savarese, <i>Psychology</i> Thomas Hunter Honors Program Faculty Mentor: Jeffrey Parsons</p> <p>Assessing the Relationship between Alcohol Consumption and Sexual Harassment among LGBT Military Personnel</p> <p>Despite increased awareness and the implementation of prevention programs, drinking rates as well rates of reported harassment among active duty military personnel, continue to increase. Considering that lesbian, gay, bisexual and transgender (LGBT) military personnel may be at heightened risk of experiencing harassment, both sexual harassment and harassment based on perceived sexual orientation, it is possible that this group may also be at heightened risk of problematic drinking. Additionally, the amount of resiliency an individual possess' may also influence problematic drinking. In order to study the relationship among these variables, data</p>

	<p>collected from the surveys of 254 active duty LGBT military personnel will be analyzed. It is hypothesized that LGBT service members who experience both harassment based on perceived sexual orientation in the military as well as sexual harassment will report higher levels of alcohol consumption than those who experience low levels of harassment. Furthermore, those who have high resiliency will report lower levels of hazardous drinking among LGBT service members.</p>
7	<p>Presenter: Isabella Divilova, <i>Undeclared</i> Roosevelt Scholar Faculty Mentor: Sean Molloy</p> <p>Rhetorical Analysis of Gender Stereotyping in Commercials</p> <p>Perhaps you've come across Dove's "Real Beauty Sketches" commercial in the last year. This commercial, which has 59,553,696 views and counting on Youtube and was rated the "Best" commercial in 2013 (Adweek), combines smart advertising with a positive social message. However, not all commercials convey positive social messages and feature the average man or women. In fact, it is quite the opposite. More often than not, women are underrepresented in media and in commercials, creating a hierarchy between the sexes where men are deemed superior and women inferior (Wood 31). For instance, women in commercials are portrayed as housewives and are mainly in commercials advertising cosmetics or cleanings agents. Men, on the other hand are usually portrayed as either hyper-masculine, "family men," or seducers and are mainly present in commercials advertising cars, cigarettes, and alcohol (Wolska; Singh). Thus, in my study, I will do a rhetorical analysis of three different types of commercials: the ten Most Watched Ads of 2013, the ten "Best" Ads of 2013, and the ten Most Effective Ads of 2014 (Adweek) to explore to what extent gender stereotyping exists in commercials as well as show how advertisers don't need to perpetuate gender stereotypes to make people buy their products.</p>
8	<p>Presenter: Ruth Hauptman, <i>Computer Science</i> Raab Presidential Fellow and John P. McNulty Scholar Faculty Mentor: Lei Xie</p> <p>Predicting Polypharmacology of Drug Metabolism and Transformation</p> <p>Cytochrome P450 (CYP450) enzymes act on exogenous as well as endogenous substrates. These enzymes play important roles in drug metabolisms and transforming a prodrug into an active drug. The polymorphism of CYP450s accounts for the individual difference in drug responses. Thus information on how drugs interact with CYP450s will be critical for developing safe, effective, and personalized medicine, and recognizing drug-drug interactions. The multi-target binding profile (polypharmacology) of a large number of drugs with CYP450 remains unknown. Experimental screening is both time-consuming and expensive, and will benefit from computational predictions. However, few algorithms are able to reliably predict polypharmacology of CYP450-drug interactions. Here we apply novel multi-label machine learning algorithms and multiple chemical descriptors to predict the binding profile between five CYP450s and uncharacterized chemicals. In our studies, the best model achieves 90% of recall and 61% of precision. It is expected that our model will provide a useful tool for pharmacogenomics and personalized medicine.</p>

<p>9</p>	<p>Presenter: Laura Fonseca, <i>Psychology</i> MBRS-RISE (Minority Biomedical Research Support—Research Initiative for Scientific Engagement) Co-authors: Emmanuel Garcia, Jean M. Quintero, Douglas S. Mennin Faculty Mentor: Douglas S. Mennin</p> <p>When is Neutral Really Neutral? An ERP Study on Positive Emotion Regulation and Neutral Stimuli</p> <p>Human faces non-consciously receive prioritized cognitive processing. Neutral images including faces have been shown to significantly and uniquely impact electrocortical activity, confounding the baseline. Affective disorders, such as anxiety and depression have been associated with hypervigilance to non-threatening “neutral” stimuli and a lower expression of positive emotions. Research has shown that positive emotions enhance optimism, resilience and better physical health among others. Therefore, the present study uses scalp-recorded event-related potentials (ERPs) to investigate the temporal nature of positive emotion regulation (PER) in the context of “neutral” stimuli. Healthy undergraduates (n=25) passively viewed emotional and neutral images (with objects vs. people) selected from the International Affective Picture System, during which electroencephalogram (EEG) was recorded. Stimulus-locked ERPs were then extracted from the raw EEG data. In conjunction with electrocortical activity, we used the Self-focus subscale of the Responses to Positive Affect (RPA), a self-report measure of PER, in order to explore how the degree of positive affect (i.e., high or low) may impact the electrocortical responding (400ms to 1,000ms following stimuli presentation) to emotional and neutral images. Significant interactions were found between neutral images with objects and emotional images in high versus low levels of positive affect. There was no significant interactions found for neutral images with people. Preliminary results suggest that PER may differentially modulate elaborative emotional and non-emotional processing in healthy individuals. Furthermore, analysis and interpretation of electrocortical data has implications for the methodological use of IAPS in clinical and non-clinical research applications, particularly in regards to neutral stimuli.</p>
<p>10</p>	<p>Presenter: Nadiyah Rahaman, <i>Undeclared</i> Yalow Scholar Co-author: Robin Mendelsohn Faculty Mentor: Karen Philips</p> <p>Colonoscopy and Polypectomy in Patients less than 50 Years Old: Indications and Findings</p> <p>Colorectal Cancer (CRC) is the third most commonly diagnosed cancer in the US, and has the third highest mortality rate in men and women. This risk of developing CRC can be elevated through a hereditary predisposition to the disease, commonly present in patients with Lynch Syndrome, where patients have an 80% chance of developing CRC before age 50. In performing this research, our goal was to assess demographics, indications and histologic findings for patients under 50 who had colonoscopy and polypectomy. With IRB approval, we performed a retrospective review of records of 247 patients under the age of 50 who had colonoscopy and adenomatous polypectomy from 1/15/2008 to 8/13/2013 at Memorial Sloan Kettering Cancer Center. Data recorded included: patient age and gender; indication for colonoscopy; polyp location, size and configuration (sessile, pedunculated or flat). In these 247 patients, we found 303 polyps (1-3 polyps per patient). When we assessed demographics we found: 143 (58%) of our 247 patients were women and 104 (42%) were men. Median age: 43 (range, 21-49) years. Most common indications for colonoscopy: family history of CRC, in 78 (32%), personal and</p>

	<p>family history of breast cancer in 68 (28%), and personal or family history of colon polyps in 63 (26%). Average size of polyps: 0.6 (range, 0.3-4.5) cm. Location of polyp (n=303) was: sigmoid, 90 (30%); rectum, 36 (12%); descending, 38 (12%); hepatic flexure, 23 (8%); cecum & IC valve, 33 (11%); ascending, 39 (13%); transverse, 31 (10%); and splenic flexure, 13 (4%). Pathologic configuration, (n=286) was sessile in 229 (80%), pedunculated in 45 (16%), and flat in 12 (4%). In our study of patients younger than 50 years old who had colonoscopy and adenomatous polypectomy, the most common indication for colonoscopy was a family history of CRC. Colonoscopy in these young patients identified small polyps (average 0.6 cm), most often in the sigmoid colon. Currently we are performing genetic analysis of polyps removed at colonoscopy in young patients in order to identify those with hereditary predisposition to CRC (eg due to Lynch Syndrome), in order to enhance CRC screening and prevention in patients at the highest risk.</p>
11	<p>Presenter: Essence Eley, <i>Undeclared</i> Yalow Scholar Co-authors: Margie Hunt, Hai Pham, Rajesh Regmi, Bosky Ravindranath, Perry Zhang, Cesar Della-Biancia Faculty Mentor: Karen Philips</p> <p>Monitoring of Patient Movement during External Beam Radiotherapy for Prostate Cancer</p> <p>Purpose: Radiation therapy (RT) can be used with curative intent for early prostate cancer. In external beam radiation therapy (EBRT), high energy radiation beams are focused on the prostate from a machine outside the body. The beams are aimed as precisely as possible to minimize radiation to healthy tissues. Prostate movement during RT (e.g. due to breathing) may increase the radiation dose delivered to normal, non-cancerous tissue. Rapid, accurate identification of prostate movement during RT may help to maximize radiation dose to the target while sparing normal tissue. The purpose of this study is to evaluate a method to track prostate movement during RT. Methods: Retrospective review was performed of megavoltage (MV) and kilovoltage (kV) images acquired in two patients undergoing treatment for prostate cancer. Each patient had three gold seeds (“fiducials”) implanted in the prostate and received approximately forty treatments using rotational radiotherapy (VMAT) with a Varian TrueBeam accelerator. Proprietary software provided by Varian (iTools capture) was used to collect MV and kV images during each treatment session. SequenceReg2D, software developed at MSK, was used to analyze images, detect the fiducials, and track their actual position relative to their intended position. Registration, the process in which the software looks for fiducials in the image and aligns them with their intended position on a template or reference image, is essential for tracking movement. Registration was performed both automatically and manually, with manual registration used as ground truth. The software produced registration data as text files which were then exported to Microsoft Excel for analysis. Data were analyzed to assess the success rate of automatic registration and the causes of automatic registration failure. Results: Images were acquired for two patients during 25 and 17 treatment sessions, respectively. Among 954 images analyzed by SequenceReg2D, registration was successful by the automatic method in 85% for patient 1 and 60% for patient 2. Manual registration was used as the ground truth because it does not fail. Causes of automatic registration failure included poor MV images, poor kV image quality, and blockage by the radiation field shaping device (multileaf collimator). After excluding images in which did not fall into our criteria for analysis, our success rates were then 95% for patient 1 and 85% for patient 2. Conclusions: For SequenceReg2D, a software program to detect prostate movement during radiation therapy, automatic registration in two patients succeeded in 85% and 60%, respectively. Attention to quality of MV and kV images and to</p>

	radiation field shaping device placement may lower the registration failure rate. More work is necessary to further improve automatic registration methods and to evaluate the impact of movement tracking during prostate RT on patient outcomes.
12	<p>Presenter: Cody Piggott, <i>English: Creative Writing Concentration</i> Undergraduate Research Initiative Fellow Faculty Mentor: Jeffrey Allred</p> <p>Documentary Books of The Great Depression: A Digital Exhibit</p> <p>I will be assisting Professor Jeffrey Allred in creating an Omeka exhibit of Depression-era “documentary books,” books that combined photographs and nonfiction text to document social problems in the 30s and 40s. The idea is to create a way for users to see how the same photograph migrated among multiple books/magazines/newspapers/exhibits in the period. Our goal is to give users of our exhibit the ability to explore and learn of the social problems in America at a time when photographs were newly prevalent in exposing and documenting the conditions of American people. With the tools provided by Omeka, our exhibit will function in a way to guide the user through the photographs taken in the period, but more importantly how they were used socially, as a means to rally support for change or to simply depict the poor. We are working on a tiny slice of what would become a bigger project, perhaps starting with the work of a single photographer of a collection of books or periodicals. We hope that our project will invigorate users to share in thinking of an important time in American history and how photography and documentary books were used to manipulate and/or provide information to Americans of the Great Depression. Our exhibit is a stand-alone project to serve as a “proof of concept” for a more ambitious site.</p>

Wednesday, March 25th, 2015
Oral Presentation Session #2
2:00pm-4:00pm

13	<p>Presenter: Munazza Alam, <i>Physics and Astronomy</i> Macaulay Honors College and John P. McNulty Scholar Co-presenter: Sara Camnasio, <i>Physics and Astronomy</i> Macaulay Honors College and John P. McNulty Scholar Co-authors: Emily Rice, Kelle Cruz Faculty Mentor: Kelle Cruz</p> <p>Investigating Brown Dwarf Near-Infrared Color Outliers</p> <p>Brown dwarfs are low mass astronomical objects that form like stars, but are too small in mass to sustain hydrogen fusion in their cores; thus, they cool and fade over time to resemble gas giant planets. Some brown dwarfs are classified as either “red” or “blue” according to the ratio of fluxes at two near-infrared wavelength ranges. Blue objects are brighter at shorter wavelengths, whereas red objects are brighter at longer wavelengths. Some blue brown dwarfs, called subdwarfs, have spectral features that suggest low metallicity (heavy metal content) and are known to have old ages. Many red brown dwarfs are known to be young because certain features in their spectra are indicative of low gravity. Most red and blue brown dwarfs, however, are considered “color outliers” because they do not present such spectral features. This project</p>
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	<p>investigates the cause of extreme color in near-infrared color outliers by comparing observations of unusually red and blue brown dwarfs with known young objects and confirmed subdwarfs. Our extensive dataset is currently the largest known compilation of brown dwarf color outliers. We disentangle the physical properties of color outliers in our sample by measuring equivalent widths for neutral potassium absorption lines, a metric for the area inside the absorption line that quantifies line strength. We further compare red and blue brown dwarfs by fitting third-order polynomials to moderate-resolution spectra and comparing coefficients across colors and spectral types. Such analysis can elucidate the underlying atmospheric and physical properties of unusually red and blue brown dwarfs.</p>
14	<p>Presenter: Daphne Ko, <i>Biological Sciences and Chinese</i> John P. McNulty Scholar Faculty Mentor: Jayne Raper</p> <p>Comparing TLF1 and TLF2 Activity Before and After Trypanosome Infection in African Subjects</p> <p>African trypanosomiasis, or African sleeping sickness, is caused by trypanosomes carried in tsetse flies. This disease can infect humans and primates as well as cattle, impacting not just public health, but also the economy and standards of living in affected areas. Trypanolytic factors (TLFs), a small subset of high-density lipoproteins (HDL), allow humans and certain primates to resist <i>Trypanosoma brucei brucei</i> and other animal infective species. So far, two TLFs have been found to provide this resistance: TLF1 and TLF2. Both are part of the innate immune system and form ionic pores in the plasma membrane, causing certain species of <i>Trypanosoma</i> to burst. TLF2 is attached to immunoglobulin M (IgM) and has been observed to have more trypanolytic activity than TLF1. Since IgM levels are elevated when trypanosome infection occurs, our objective is to determine if there is a difference in TLF1 and TLF2 activity before and after treatment for the disease. Through fast protein liquid chromatography (FPLC), we can isolate TLF2 and TLF1 based on size from serum samples, taken before and after treatment and cure, from African patients with trypanosomiasis. Killing assays with <i>T. b. brucei</i> and the samples allow us to compare TLF activity. High TLF2 trypanolytic activity would suggest that it is the major killing factor, as opposed to TLF1. The ratio of TLF2 to TLF1 is anticipated to change during infection.</p>
15	<p>Presenter: Edrean-Neil Kabigting, <i>Biological Sciences and Psychology</i> Muse Scholar Faculty Mentor: Dara Meyers-Kingsley</p> <p>Look Through the Glass: Inspiration and the Process of Song-Writing</p> <p>For many people as children, we've dreamed of becoming famous in our world. For some, they believed the fast track to fame was becoming a rock-star or joining a band. I happened to be one of those people. And who would ever think that my wildest dreams could ever come true? In the summer of 2014, I achieved my dream of creating my own band with a couple of friends of mine called Grand Central Affair. Since then, I've experienced both the fun, excitement, and pain of being in a band. In particular however, I want to speak about one aspect of being in a band: the creation of songs. At eighteen to nineteen years old, I never thought I would have a fully recorded EP with one of my own original songs. In fact, I never thought I would be able to write songs. Yet, I have three original songs that I am going to speak in detail about. I plan to speak about what factors went into their inspiration. I will go into detail on writing lyrics, and on making ideas work into coherent and empathy-driven stories in songs. I plan then to speak about the work it takes to</p>

	<p>make a song, in particular music structure. I will talk about the details of the nights when the light-bulb goes off and the song becomes born. I will speak about the editing I've had to do by myself after a song is created. I will describe the system used by my band in order to make the small-guitar song into a full-fledged song for a band. I will describe the recording process. I will play clips of the songs as well: Rooftop, Glass-Man, and Step Aside.</p>
16	<p>Presenter: Jen Ta Hsu, <i>Sociology</i> Macaulay Honors College Faculty Mentor: Trudy Smoke</p> <p>"Dude" in Everyday American Life</p> <p>In Hsu's (2014) " 'Dude' in Everyday American Life," a major survey on the use of the term "dude" was examined to discover the functions and meanings indexed by "dude" by American men and women in their daily life situations, in comparison to those indexed by the term "man." 10 college men and women, and 10 career men and women were recruited to participate in the present study. The "Dude Questionnaire" as the instrument was used to elicit participants' responses to the frequencies and reasons of their personal uses of "dude" and "man," including the types of persons they used with and whom they think use these two terms the most. The findings revealed that the college men group used these two terms the most mainly to express male solidarity and coolness. By contrast, the career women group used these two terms the least, with only a few occasions when they needed to index casualness. The types of persons they used both "dude" and "man" with most frequently were close friends, siblings, and acquaintances; while professors, boss, and parents were used least with. Even though the range of functions and meanings of "dude" occurred to be narrower than those indexed by "man" in this study, it is predictable that one day "dude" will be more prevalently used than "man" by all ages of Americans, in the light of the subcultures and ideologies associated with "dude" in everyday American life.</p>
17	<p>Presenter: Aleksandr Itskovich, <i>German Language Literature and Chemistry</i> Undergraduate Research Initiative Fellow Faculty Mentor: Shengping Zheng</p> <p>A Versatile Molecule: The Synthesis of Indole and The Art of Organic Chemistry</p> <p>The focus of my presentation will be the organic synthesis of indole, an important natural product. Indole, a heterocyclic aromatic molecule, possesses a number of fascinating properties. In large quantities, indole creates the offensive and heavy odor of feces. When present in low concentrations, however, indole produces a sweet floral scent, and is responsible for the pleasant smell of various flowers. This latter remarkable property has made indole a key ingredient in the perfume industry, used in such scents as Chanel No. 5. In addition, indole is medicinally active and is found in numerous drugs treating diseases like HIV and cancer. Although critical to so many fields, the traditional synthesis of indole suffers from various defects, such as the use of toxic and expensive starting materials, and a laborious methodology. My presentation will outline a new facile and environmentally-friendly synthesis of indole developed in the laboratory of Dr. Shengping Zheng. In a larger sense, however, it will discuss the art of synthetic chemistry and the detective work of the scientific process. By the end, the audience will understand both the synthesis of indole and the broader ideas of organic chemistry.</p>

18	<p>Presenter: Guadalupe Terrones, <i>Latin and Ancient Greek</i> Ronald E. McNair Scholar and Solomon Bluhm Scholar Faculty Mentor: David Petrain</p> <p>Socrates and the Athenian Laws</p> <p>Plato's Crito dramatically follows his Apology, in which Socrates is condemned to death by the jury under the Athenian legal system. The Crito presents an incarcerated Socrates dialoguing with Crito, who, as his friend, is attempting to convince Socrates to escape prison by bribery. Trying to dissuade Crito, Socrates personifies in a speech the Athenian laws. The Laws demand Socrates' compliance because of their chief role in his upbringing and consider his reputation, loved ones, and wealth (50a8-54d1). This paper will argue against a traditional interpretation of this speech, which understands the Laws and Socrates to be in agreement. The conception of justice put forward by the Laws echoes that of Crito's argument and that which Socrates projects onto the jurors in the Apology. Socrates critiques such a conception of justice; therefore, he is not in agreement with the Laws. Socrates's superior is, instead, a god. Under this god's guidance, Socrates leads Crito to realize his ignorance. I make my argument first by pointing out linguistic and contextual similarities between Crito's argument and that of the Laws, and then by similarly analyzing Socrates' negative attitude, as it appears in both dialogues, toward the identical arguments.</p>
19	<p>Presenter: Angelina Volkova, <i>Chemistry</i> QuBi (Quantitative Biology and Bioinformatics) Co-authors: Meshkat Haque, Akira Kawamura, Konstantinos Krampis Faculty Mentor: Akira Kawamura</p> <p>From Genotype to Chemotype: 17-Hydroxycyclooctatin</p> <p>Bacteria dedicate a substantial amount of their genome to the production of biologically active molecules that has had significant implications in medicine. <i>Streptomyces</i> MTE4a is a new bacterial species that may be harboring new classes of molecules that meet the increasing demand for the treatment of human illnesses. One such molecule purified from this bacterial strain is 17-Hydroxycyclooctatin. In order to determine the function and biosynthesis of this molecule we decided to analyze the <i>Streptomyces</i> MTE4a genome. DNA isolation methods were used to extract the bacterial DNA and the complete genome was sequenced by the Illumina sequencer and assembled by the Velvet algorithm. We analyzed its assembled genome using a program called the Antibiotics & Secondary Metabolite Analysis Shell, also known as antiSMASH. It revealed over 150 different biosynthetic gene clusters depicting MTE4a's tremendous biosynthetic potential ranging from the production of polyketides to non-ribosomal peptides, siderophores, terpenes, and much more. In search for the gene cluster responsible for 17-Hydroxycyclooctatin biosynthesis, we utilized The Basic Local Alignment Search Tool, also known as BLAST, an algorithm used to compare biological sequence information. As a result, we were able to identify five putative genes that code for enzymes involved in building the structural scaffold of 17-Hydroxycyclooctatin, thereby unraveling a possible biosynthetic pathway. Knowledge of gene locus and respective gene products can be utilized to gain feasible access to novel bioactive molecules and improve the rate of drug discovery.</p>

20	<p>Presenter: Valentyna Kostiuk, <i>Biological Sciences</i> HHMI (Howard Hughes Medical Institute) and Ronald E. McNair Scholar Co-authors: Gayathri Raghupathy, Armin Lahiji, Benjamin Ortiz Faculty Mentor: Akira Kawamura</p> <p>Characterization of the Insulator Activity in the T Cell Receptor-alpha Locus Control Region (TCRα LCR)</p> <p>The TCRα protein plays a crucial role in cell-mediated immune responses and T cell development. The mouse TCRα gene is only expressed in T cells, but shares a complex gene locus with the widely expressed anti-apoptosis gene, <i>Dad1</i>. The TCRα LCR, found between these genes, is thought to organize the spatiotemporal expression patterns of the genes in this locus. An LCR is a cis-acting regulatory element that allows a transgene to overcome position effects in order to be expressed in a spatiotemporally controlled manner. Recent data in our lab suggest that the ability of the LCR to overcome position effects might be mediated via chromatin insulation capacity of certain LCR sub-elements. We aim to understand this insulation activity by examining those specific sub-elements. Using a DNase I sensitivity assay along with qPCR quantitative analysis, we attempted to confirm the transgene insulation by looking at its chromatin state. The insulated transgene was very sensitive to DNase I treatment indicative of its open, euchromatin state. However, in the absence of LCR, the transgene loses its sensitivity to DNase I, probably due to inactivating heterochromatin invasion of the transgene. We next would like to identify the specific sub-elements within the LCR that confer these properties upon a transgene. To do this, we made reporter constructs to test the individual LCR elements in the insulation capacity assay. This project will help us to identify the functional sub-elements of the TCRα LCR in order to use this powerful cis-acting element in potential gene therapy applications.</p>
21	<p>Presenter: Ian Murphy, <i>Urban Studies</i> Co-authors: Josh D'Ambrosio, Jamie Guthrie Faculty Mentor: Charles Starks</p> <p>Housing in Corona, Queens</p> <p>This presentation will focus on Corona, Queens, a largely immigrant neighborhood that has become increasingly popular in recent years. A lower median age in Corona compared to Queens and a lower median income than Queens have created issues in this neighborhood; the most significant of these is a high rate of rent burdened and severely rent burdened residents. This popularity and lower median income has caused the neighborhood to become overcrowded with little change in zoning or land use to help alleviate the problem. There are a growing number of people in the neighborhood that are rent burdened or severely rent burdened. Illegal conversions of garages and overcrowding in units have become an issue in the neighborhood. Median housing prices and median rents in the neighborhood are substantially higher than in the Borough of Queens. There are many empty or underutilized lots in the neighborhood which, with the use of new development techniques, could be used to help with the decrease in affordable housing in the neighborhood. A cluster of affordable housing in the Southeastern corner of the neighborhood could be updated to increase density and add needed affordable housing units. We studied a new technique of redeveloping underutilized parking lots on city owned and New York City Housing Authority owned land.</p>

Wednesday, March 25th, 2015
Oral Presentation Session #3
4:15pm-6:15pm

22	<p>Presenter: Jacob Friedman, <i>Psychology</i> Faculty Mentor: Anthony Klambatsen</p> <p>Henson-style Puppetry Performance and its Effects on Adults who Stutter</p> <p>Stuttering is a speech fluency disorder that affects millions of people. Although its origins are debatable, it has frequently been linked to anxiety, including social anxiety and increased self-awareness. While people who stutter have shown to have disruptive verbal motor control, their manual motor control remains intact, inferring that their hands are not affected by their stuttering. It has recently been found that strategies which therapists deem maladaptive for anxiety have nonetheless been prescribed by speech therapists for stuttering, and thus new modalities for speech therapy should be explored. The present within-groups pilot study attempts to decrease the speaker's self-awareness through dissociative puppetry performance. Ten participants who stutter were given a two-hour workshop during which they practiced synchronizing their speech with the manual manipulation of a hand puppet's mouth. This was in a style utilized by television puppeteers, pioneered by Jim Henson, in which the participants manipulated the puppets above their heads while an elevated camera captured the image of the puppets and fed the live video into a floor-level monitor for the participants to observe. Pretest and posttest measurements accounted for the amount of stuttering before the workshop without the puppet, and afterward while using a puppet. Additionally a survey was given to self-report how fluent the participants felt while using the puppet. Results found that there was a significant decrease in stuttering while using the puppet. Moreover there was a highly significant increase in feeling of fluency while using the puppet. These results may significantly influence speech therapy.</p>
23	<p>Presenter: Rana Khamis, <i>English Literature, Language, and Criticism</i> Faculty Mentor: Angela Reyes</p> <p>Middle Eastern Identity</p> <p>What does it mean to be "Middle Eastern"? Is this an identity that exists in the United States and if so, what are the components of this identity? According to John Tehranian in his book <i>Whitewashed</i>, "Middle Eastern Americans have faced rising, rather than diminishing, degrees of discrimination over time; Oddly enough, however, Middle Eastern Americans are not even considered a minority in official government data. Instead, they are deemed white by law." Therefore, there is quite a contradiction present within this group. I figured that the best way to learn more about how Middle Easterners categorize themselves and the way that others define them is to interview a few first generation Middle Eastern Americans ranging from the age groups of 20-25. The particular interest of my research is in the ways in which Middle Eastern Americans categorize themselves racially and ethnically and through their responses, concluding whether or not the placement of Middle Easterners in the same category as "whites" undermines their true identity or if it is an accurate placement. Middle Easterners are typically underrepresented in the United States, so it is important to grasp an understanding of the distinctiveness of this group of people. What I generated from the answers of the individuals that I interviewed is that they were</p>

	<p>uncertain and relatively confused about how to classify themselves in relation to other Americans, they resorted to geography in order to categorize themselves, and they rejected the idea of Middle Eastern being linked to whiteness.</p>
24	<p>Presenter: Nicole Krishtul, <i>History</i> Roosevelt Scholar Faculty Mentor: Sean Molloy</p> <p>Burkean Consubstantiality: A Study of Arguments of Identification and Individuality in Brookdale Dorm Rooms</p> <p>In the midst of posters and stacks of ramen noodles, perhaps there is more depth to the typical college student's dorm than meets the eye. In his seminal <i>A Rhetoric of Motives</i>, Kenneth Burke theorizes that rhetoric includes arguments of identification. Through Burke's idea of "consubstantiality," people create connections with others through a common interest or substance while also maintaining their individuality. However, there has been little modern application of his theory. This study examines Burke's theoretical framework through a visual rhetorical analysis of twelve Brookdale dorm rooms supplemented with short subject interviews to explore how students (six male and six female) use their rooms as a physical extension of themselves to create arguments about personal identity. I examine twenty-three characteristics from number of posters to religious symbolism. I find a general pattern that these female students have more objects of personal attachment with family and friends displayed throughout their room, while these male students are more likely to express their own interests through objects that show their hobbies such as music and athletics. Burke believes the purpose of identification is to overcome the division between humans. The study shows that college students try to simultaneously maintain separateness through their individuality and also feel associated with other individuals or a group.</p>
25	<p>Presenter: Ariel Calderon, <i>Biological Sciences</i> MARC (Maximizing Access to Research Careers) Co-author: Martina Kucerova-Levisohn Faculty Mentor: Benjamin Ortiz</p> <p>Analyzing the Role of Silencers and Enhancers in the TCR Alpha Locus Control Region</p> <p>The proper expression of T-Cell Receptor α (TCRα) is regulated by the TCRα Locus Control Region (LCR). TCRα LCR lies between two differentially regulated genes, TCRα and <i>Dad1</i>, and consists of 9 DNase I hypersensitive sites (HS). The TCRα LCR controls the spatiotemporal pattern of gene expression at gene copy number dependent levels. It is able to overcome position effects imposed by random integration sites in the genome. Through studies of the various HS of the LCR, we can better understand which are necessary for LCR function. Currently, we are creating constructs to test the functional interactions of the 5'-most group of four HS regions (HS-1, 1', 7, 8). Based on prior and preliminary data, we hypothesize a mix of positive and negative regulatory interactions between HS1/1' and HS7/8 that are critical for the proper developmental regulation of LCR function. To test this hypothesis, we are linking a reporter gene to different HS combinations. The combinations will enable comparison of LCR function in the absence of the proposed LCR silencers (HS1-6), the presence of the LCR silencers (HS1-8) the absence of the silencers and enhancers (HS1'-6) and the absence of the enhancer only with the presence of silencers (HSΔ1). These various constructs will be transfected via electroporation into T cells, and</p>

	<p>enhancer activity will be assayed through reporter gene expression. Measuring the activity of these LCR variant constructs will provide us with a better understanding of overall LCR function and its role in T Cell development.</p>
<p>26</p>	<p>Presenter: Janis Mahnure, <i>Media Studies</i> Jenny Hunter Scholar and Thomas Hunter Honors Program Co-author: Martina Kucerova-Levisohn Faculty Mentor: Stuart Ewen</p> <p>Bollywood Film and Gender Identities</p> <p>There is a lot of academic discourse regarding Hollywood, and the implications of Hollywood films shaping society. However, there is a lot more research yet to be done on the eastern hemisphere: Bollywood, the world's largest filmmaking industry, producing an average of a thousand films each year and a multitude of drama series. Bollywood cinema, an omnipresent and inescapable force in South Asian society, has paved the way in which people absorb the culture; reflecting events, traditions, values and customs. Unfortunately, much of Bollywood produces problematic ideas about gender and gender identities. By utilizing feminist film theorists, such as Pam Cook and Laura Mulvey who have studied these issues in Hollywood and British cinema, I found that many contemporary works of Bollywood undermine women while issues around gender, gender-based violence, femininity, women's rights and sexuality are so often nullified or ignored. However, it isn't only misrepresentation of women, but also that of men. Bollywood perpetuates ideas about masculinity that have severe consequences. Oftentimes romance films show a man chasing after a woman in such a manner that it would be harassment or even sexual assault and almost all of the contemporary films have dramatic levels of violence in pursuing the woman, asserting violence as a part of masculinity.</p>
<p>27</p>	<p>Presenter: Eileen Clancy, <i>Digital Humanities</i> Thomas W. Smith Academic Fellow Faculty Mentor: Rebecca Brown</p> <p>Reaping the Benefits of Digitization: Sekiko Yoshida, Gender, Race and the Space Race</p> <p>Historian Kim McQuaid notes, "Race and gender are almost invisible aspects of the early Space Age." My research-in-progress into the life of geophysicist Sekiko Yoshida, and other women who participated in scientific and technical labor in the early years of space exploration, used online searches as a starting point when traditional methods did not yield results. I will present a case study of my research and the way that even the most fragmentary historical traces may open new vantage points for women's history. In the voluminous histories of the Space Race, almost nothing has been written about Yoshida's role analyzing cosmic data from the first U.S. satellite, Explorer. Because the formal literature was not helpful, I consulted newly digitized primary and secondary sources, often following only the slimmest of leads. Attempting to reconstruct the cultural and scientific context for Yoshida's life and work, I cast a wide net. What I found astonished me because I had thought that Yoshida's story might be yet another tale of a brilliant, but singular, woman. Histories of women in this era seem to have overlooked the aerospace industry, which employed many women. Planning, designing, manufacturing, launching and tracking satellites required tens of thousands of people. While the majority were men, because the total numbers were so large, and the need so great, many more than a handful of white women and women of color built rockets, plotted orbits, calculated trajectories, wrote computer</p>

	programs, invented rocket fuels, and analyzed the data collected.
28	<p>Presenter: Alex Teachey, <i>Physics</i> Undergraduate Research Initiative Fellow Faculty Mentor: Kelle Cruz</p> <p>The Discovery of New Ammonia Masers in the Galactic Center</p> <p>Our galaxy the Milky Way is permeated by enormous clouds of gas and dust, sometimes many light years across. These clouds are often called stellar nurseries, as they are the sites of star formation, and understanding the processes at work inside these giant molecular clouds gives us insight into the early history of our own solar system and all other star systems. The clouds located at the center of the Milky Way are particularly dynamic; they orbit very close to the supermassive black hole at the heart of the galaxy, and are subject to heating from supernovae and collisions with other clouds. If the conditions are just right they can give rise to a maser, a kind of natural laser that emits light at radio frequencies. Observing these masers therefore allows us to characterize the conditions inside the cloud. In this work we have examined several molecular clouds at the center of our galaxy using data from the Very Large Array radio observatory in New Mexico in an effort to find some of these masers. We report the discovery of at least four new masers arising from energy level transitions of the ammonia molecule. These masers seem to result in a peculiar observational effect whereby the cloud is actually calculated to have a negative apparent thickness. Our results will be of some importance as they complicate the use of the ammonia molecule as a reliable gauge of molecular cloud temperatures.</p>
29	<p>Presenter: Nelly Gordpour, <i>Sociology and Human Rights</i> Muse Scholar and Thomas Hunter Honors Program Faculty Mentor: Dara Meyers-Kingsley</p> <p>A Photographic Study: The Identity of the Iranian-American Diaspora</p> <p>The creation of an individual's identity is an expression of many factors, predominantly composed of group affiliations, such as culture. Bicultural identity is the negotiation between two cultures; it forms a degree of alienation arising from neither belonging to the dominant culture, nor one's ethnic culture. Immigrants have difficulty reconciling this dual identity, as well as the collective identity of their diaspora group. The ties to one's homeland are often embodied through material culture; immigrants may surround themselves with objects and remnants of their former lives. My project focuses on the Iranian-American diaspora. Western notions of liberalism and democracy strongly influenced Iranian identity during the Pahlavi Dynasty. Their identity combines Western notions of freedom and liberty, and cultural traditions of the family. However, the culture in Iran radically shifted after the Islamic regime came to power, and Iranians no longer recognize the country that was once their home. The majority of Iranian-Americans are refugees of the Islamic Revolution, most still live in exile today, neither belonging to the East nor West. These photographs are the first chapter of a larger project investigating this identity, paying particular attention to the role of Western culture and media's influence in identity formation both prior to and after the Islamic Revolution. Photographs of homes and objects illustrate the vibrant Persian culture. Every corner of the homes are carefully curated. Mementos, photographs, furniture, art, Persian patterns or calligraphy, serve as the vestiges of a former life and a nation that no longer exists.</p>

30	<p>Presenter: Steve Salazar, <i>Art History</i> Faculty Mentor: Nebahat Avcioglu</p> <p>A Literary Perspective of the Metropolitan Museum of Art's Islamic Galleries</p> <p>My paper focuses on the Metropolitan Museum of Art's Islamic Galleries, reopened in 2011, and argues that the Galleries could be read as a visual informative essay. Reading the museum display as a text allows us to see the underlying message-bearing context of the Galleries. An informative essay does not present an argument but have a main thesis and is meant to inform. This text is closely related to the story told by the curators who introduces Islamic art through various subtexts under three major subjects. The first is religion, the second theme is war and the third, arabesque. Examples falling under these categories are examined regardless of chronology to indicate how they are part of the story that the curators tell. It is a romantic one, which introduces Islamic cultures to the visitors through mainly what I call the thesis room, located at the entrance to the Galleries. Here one is presented to various objects from different eras and regions. They give the visitors an in-depth view into an area of study that spans thirteen hundred years and all the weight that comes with it and does it through the same contexts that defines most cultures: creed, conflict and scientific exploration.</p>
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Thursday, March 26th, 2015
Oral Presentation Session #4
9:00am-11:30am

31	<p>Presenter: Stephanie Azzopardi, <i>Biological Sciences</i> Faculty Mentor: Karen Phillips</p> <p>Characterizing PLX4032 Resistant Melanoma in Zebrafish Chimera Assay</p> <p>A zebrafish chimera assay was used to characterize the circulation, extravasation, and tumor outgrowth of PLX4032 resistant melanoma cells in comparison to non-resistant melanoma cells. One zebrafish melanoma cell line was cultured with dimethyl sulfoxide (DMSO) additive, referred to as DMSO Z-mels. A second line of PLX4032 resistant cells, referred to as R1 Z-mels, was generated by culturing Z-mels in the presence of drug. Embryos were transplanted at 48 hours post fertilization with either DMSO Z-mels or R1 Z-mels. The cell lines were labeled with green fluorescent protein (GFP) to allow for in vivo fluorescent imaging at 1, 7, and 14 days post transplantation. At Day 1 the DMSO and R1 Z-mel transplants exhibited similar circulation of cells. At Day 7, the DMSO Z-mel transplants exhibited some extravasation, while the R1 transplants exhibited increased extravasation, visualized as a thick lining of cells around the blood vessels. At Day 14, the DMSO Z-mel transplants exhibited tumor outgrowth in the tail. The R1 transplants exhibited an increased presence of pigmented tumor outgrowth in the tail. Pigmentation presented with GFP positivity in 63% of resistant transplants, compared to only 18% of nonresistant transplants. In our zebrafish model, PLX 4032 resistant melanoma cells exhibited increased extravasation at Day 7 and increased presence of pigmented tumor outgrowths at Day 14 post transplantation. Further study is needed to characterize and understand the molecular mechanisms present in PLX4032 resistant melanoma cells. My findings, if confirmed in subsequent research, may have implications for treating patients with metastatic cancer.</p>
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32	<p>Presenter: Alessandra Majchrzyk, <i>Sociology and Media Studies</i> Thomas Hunter Honors Program and Community Scholar Faculty Mentor: Thomas DeGloma</p> <p>Taking Comedy Seriously: A Sociological Analysis of Humor</p> <p>What does your taste in comedy say about you? Comedy is frequently treated as a mystifying experience that evades reason. However, humor is not an incomprehensible phenomenon; it is a part of our social reality and can be analyzed through the lens of culture. Historically, comedy has been a vehicle for social critique. From comedic plays in Ancient Greece, to Jonathan Swift's satirical essay "A Modern Proposal," comedy has a disposition for transgression. It would be a leap to propose that all comedy is social critique, for humor can be conventional as well. However, the underlying structure of comedic logic creates a strong tendency towards social criticism, making it an ideal topic for cultural analysis. When we laugh at a joke, we are, in a sense, participating in a discussion. In this regard, laughter is an expression of agreement. But what are we agreeing with? In order to understand the message of humor, one must ask "What are we laughing at?" Answering this requires an understanding of the social cultural logic of comedy. By using the Weberian ideal types, comedy can be mapped into four different types, each with its own characteristics and fundamental logic. After analyzing a diverse array of modern comedy television and stand-up, it became clear that most humor revolves around two dimensions. It uses ambiguities or incongruities to either challenge culture or affirm everyday life. Classifying comedy into ideal types allows us to better understand what we are laughing at, and perhaps more importantly, why.</p>
33	<p>Presenter: Amine Elghouayel, <i>Psychology with Neuroscience and Chemistry</i> MBRS-RISE (Minority Biomedical Research Support—Research Initiative for Scientific Enhancement) Co-authors: Mark Hauber, Jason Young Faculty Mentor: Jason Young</p> <p>The Influence of Blue Mood on the Experience of Anticipated Regret</p> <p>Previous studies have defined regret as a negative, cognitively mediated emotion triggered by the consideration of outcomes resulting from the alternative decisions a person could have made had they chosen differently. These alternative outcomes are commonly referred to as counterfactuals. Similarly, anticipated regret (AR), is triggered by a person's consideration of the potential outcomes alternative options could produce prior to the person's commitment to a decision. In this study, we investigated whether a person's mood influenced the level of AR they generate. In a pilot study, 8 participants were shown sad mood inducing pictures from the International Affective Picture System (IAPS), and 4 participants were shown neutral pictures prior to completing a decision task. Galvanic Skin Response (GSR) was measured for each participant over the extent of the study. Preliminary results indicated that participants were physiologically more stimulated during the decision task than when they were viewing pictures. Results regarding the difference of AR generated between groups are the subject of continued investigation.</p>

34	<p>Presenter: David Michael, <i>Philosophy</i> Philosophy Honors Program Faculty Mentor: Omar Dahbour</p> <p>An Inquiry Into Mankind's Domination of Nature</p> <p>As far as social theories go, there are countless conceptions and inquiries on the interactions between mankind. Given that the magnitude of social theory is relatively large, it should follow that there has to be at least one theory that attempts to provide insight and explanation to the nature of social interaction and its development. As a species, humans are the most developed and unique forms of life known to date; there are obvious traits that set us apart from other animals, such as the ability to reason being one of the greatest characteristics of all. Although that is something to be proud of, there does also exist controversy as to where that uniqueness has led humans throughout the course of history. Such a controversy lies within mankind's relationship with nature, namely, its domination. It is evident throughout history and time that humans have always strived to be master of their domains and have, seemingly at first, succeeded at doing so. In the broadest way of defining "domination of nature," it can actually be viewed quite literally as mankind seeking and attempting to master the natural world with which it once coexisted. The vast connections between nature and the various aspects of society and interaction are worthy of investigation because, essentially, mankind is a part of nature and thus are inseparable. As a result, various open-ended questions arise such as, what is the cause of our drive to dominate nature, what is its goal, and what are the consequences?</p>
35	<p>Presenter: Jaime Jaget, <i>Media Studies</i> Muse Scholar and Thomas Hunter Honors Program Faculty Mentor: Dara Meyers-Kingsley</p> <p>Finding Your Voice in New York Theater Arts</p> <p>As a sophomore at Hunter College, I interned at Rattlestick Playwrights Theater in Marketing and Development. I was soon hired as its Education Associate to expand and oversee its apprentice program, the Middle Voice Theater Company. Featuring directors, actors, playwrights, and designers from varying socioeconomic backgrounds, the Middle Voice Theater Company is a small cohort of artists, ages 18-28. Their work embraces risk and encourages ensemble to invoke social change. Middle Voice believes that through conversations on topics such as race, identity, and freedom, come artists who develop work with unique individualized perspectives. Although Middle Voice devotes much of its time to producing full-length workshop productions, I recently helped develop an educational workshop series challenging both teens and young adults to find their voices. In November 2014, Middle Voice established a new artistic partnership with Hunter College's freshman Muse Scholars. Here, Middle Voice used text by James Baldwin to inspire intimate conversations involving race, sexuality, and the American dream. Over the course of two-weeks, these freshmen were challenged to think critically and create work as a result of conversations facilitated by Middle Voice Company members. This presentation will evaluate the use of conversation as the source in theater making. Additionally, it will explore the artists' and students' journeys as they discovered their voices at Hunter College.</p>

36	<p>Presenter: Mert Keceli, <i>Biological Sciences</i> Co-authors: Anibelky Almanzar, Jayne Raper Faculty Mentor: Jayne Raper</p> <p>Antimicrobial High Density Lipoprotein: The Good Cholesterol</p> <p>Some primates are resistant to infection of most subspecies of African Trypanosomes because of an innate immunity factor known as trypanosome lytic factor (TLF). TLF is found in about 1% of high-density lipoproteins (HDLs-the “good cholesterol”) and it is comprised of various lipids and proteins including apolipoprotein A-1 (APOA-1), haptoglobin-related protein (Hpr), and the pore forming protein apolipoprotein L-1 (APOL-1). The mechanism of action of TLF against African Trypanosomes is that the TLF molecule binds to the flagellar pocket of the parasite where it is endocytosed and delivered to the lysosome. Since this compartment is acidic, the TLF molecule gets activated causing the release of the pore forming protein, APOL-1, leading to an osmotic imbalance and the lysis of the parasite. Besides killing trypanosomes, previous in vitro studies in the lab have shown that TLF has lytic activity against some organisms that can survive in acidic environments of vacuolar compartments such as non-encapsulated Bacillus species. Using a BSL2 approved encapsulated strain of Bacillus cereus, I want to test whether the capsule provides protection against TLF. This strain is genetically similar to B. anthracis and has been implicated in anthrax-like diseases due to two major plasmids that code for capsule and toxin production. An ex vivo model is currently being implemented by infecting macrophages with germinating spores of Bacillus species to emulate an in vivo infection and to screen for protection enabled by the capsule. I am also screening for plasma membrane disruptions, if any, via microscopy using a lipophilic dye, FM4-64, and flow cytometry techniques using a cationic cyanine dye.</p>
37	<p>Presenter: Betty Lung, <i>Humanities and Medicine</i> Thomas Hunter Honors Program Co-author: Diane Reidy-Lagune Faculty Mentor: Karen Phillips</p> <p>Use of Mitotane in Adrenocortical Carcinomas: Risk and Benefit</p> <p>Adrenocortical Carcinoma (ACC) is a rare but devastating disease, with short life expectancy and reduced quality of life. Therapy options are limited. Mitotane, an oral adrenocorticolytic agent, is often used as treatment in the adjuvant and metastatic setting. However, Mitotane’s therapeutic window is low and toxicities increase with elevated blood levels. Our goal was to assess outcomes of patients with metastatic ACC using RECIST criteria who received Mitotane therapy, in order to determine treatment toxicities and effectiveness. In this retrospective, IRB-approved study, we identified 19 patients with metastatic ACC treated with single agent Mitotane at our institution from 3/15/1989 to 5/27/2014. All patients had follow-up at MSK, including CT scans classified as improved, stable, or progression of disease using Response Evaluation Criteria in Solid Tumors (RECIST) by the study radiologist (n=18) or interpreting radiologist (n=1). Medical records were reviewed to determine patient demographics. Toxicities were classified by Common Terminology Criteria for Adverse Events (CTCAE) as mild/moderate (Grade 1-2) or severe/life-threatening (Grade 3-4). Grade 3-4 toxicities were observed in 4/19 patients (21%) and included adrenal insufficiency, depression, fatigue, rash, nausea, and vomiting. In spite of Mitotane, 95% of patients showed progression of disease. One patient (5%) had partial response with progression-free survival of 5 months but required 9g of Mitotane daily and experienced grade 3</p>

	<p>depression. Findings in our small cohort suggest that this therapy has significant toxicities and minimal therapeutic benefit. Randomized, prospective, multi-institutional studies are urgently needed to identify more effective, less toxic therapies for ACC.</p>
38	<p>Presenter: Paulina Toro Isaza, <i>Sociology</i> Mellon-Mays Undergraduate Fellowship Faculty Mentor: Michael Wood</p> <p>"Choose Your Character!" Player Identity and Avatar Choice in Single-Player vs. Multi-Player Video Games</p> <p>As interactive media, video games are theorized to have extraordinary pedagogical potential in regards to identity. Some scholars have suggested that video games allow identity experimentation through the use of avatars. This paper is an attempt to answer to what extent this identity experimentation takes place - if it takes place at all. Does this identity experimentation occur along the lines of social identities such as gender, race, or are players concerned with other kinds of identity experimentation? Studying players' selection of avatars and players' understanding of their avatar choices can help answer this question. Previous research in this area has focused on avatar selection within multi-player games in which an avatar is presented to other human players in a virtual environment. The researcher theorizes that players are more likely to experiment with identity in single-player games than in multi-player games.</p>
39	<p>Presenter: Gianna Torre, <i>Art History (Pre-Med)</i> EnCORE (Memorial Sloan Kettering's Enhanced Clinical Oncology Research Experience), Thomas Hunter Honors Program, and Yalow Scholar Co-authors: Ayc Gucalp, Tiffany Traina, Karen Cadoo Faculty Mentor: Karen Phillips</p> <p>Serum Magnesium Levels in Patients with Metastatic Breast Cancer on Pertuzumab</p> <p>Purpose: HER2, a transmembrane epidermal growth factor receptor, is overexpressed in ~20% of breast cancers. Pertuzumab (P) antibody improves overall survival from HER2+ metastatic breast cancer (MBC) when added to chemotherapy and trastuzumab. Profound hypomagnesaemia (hypoMg) was observed in a pt with HER2+ MBC receiving P without other cause. HypoMg has been noted with other agents targeting this pathway but not in the clinical trials of P. Our purpose was to describe incidence of hypoMg in pts receiving P in clinical setting. Methods: IRB-approved retrospective review of medical records yielded 177 pts with HER2+ BC receiving P at Memorial Sloan Kettering from 10/16/13 to 5/27/14. Data recorded included history, treatment, serial Mg levels, and other potential causes for hypoMg. Statistics are summarized, including 95% confidence intervals (CI). Results: Of 177, treatment setting was adjuvant in 78, local recurrence in 4, and metastatic in 95. 67 pts with HER2+ MBC had concurrent Mg testing available for review. HypoMg was found in 10/67 (15%, 95% CI 6.5-23.6%). Mean time from P initiation to hypoMg was 303 (range, 20-1022) days. Other potential causes of hypoMg seen in 5/10 pts included: prior platinum agents (n=3), inpatient hospitalization (n=1), and antibiotic therapy/diarrhea (n=1). Conclusions: HypoMg was found in 15% of HER2+ MBC pts treated with P. This small retrospective study suggests a possible association between P therapy and hypoMg. Further study is ongoing to compare incidence of hypoMg in pts with breast cancer who are not receiving P.</p>

40	<p>Presenter: Maria Elizabeth Rodriguez Beltran, <i>English Literature</i> Undergraduate Research Initiative Fellow Faculty Mentor: Janet Neary</p> <p>The Law “of the Oppressor” becomes the Sword of the Oppressed</p> <p>In many of his texts Frederick Douglass (1817?-1895) identifies himself as an American and as a Christian; but what does it mean to be an American? What does it mean to be a Christian? This is what Douglass intends to answer through his writing. Douglass redefines the concept of “American,” which he understands as very different from the one that existed at the time, not only in the South of the United States, but in the entire country. Douglass reinterprets the Constitution of the United States and the Bible, declares himself a better and more accurate interpreter of both of these texts, and uses these texts as the basis for his new definition of “American” and “Christian.” In this paper I show how Douglass becomes a literary critic, and in some ways creates his own theory in order to answer questions of identity. I will be analyzing Douglass’s complex and fascinating relationship with religion, and how his views change over time, for he reflects different things in his first narrative in 1845 than in his narrative 1855 narrative <i>My Bondage and My Freedom</i>. What happens with Douglass during these ten years that change his views so significantly? In order to answer this, I turn to his speech “What to the slave is the Fourth of July?” (1852) (delivered in New Bedford and mentioned at the end of his 1855 narrative, although the speech itself is not included), and his articles in <i>The Liberator</i> and <i>The North Star</i> newspapers. I also analyze the early 19th century constitution and compare the constitution to the Bible through Douglass’s eyes. I argue that Douglass saw the Bible and the constitution as equivalent, not as contradictory, while his friend William Lloyd Garrison saw the constitution as limiting for the abolition of slavery. Douglass returns to the purity of the Bible and the Constitution for he believed that these texts originally support his abolitionist ideals and his morals. Douglass sees both the Bible and the Constitution as texts of laws, but laws that support equality among all humans. Through his interpretations of these texts, which in a great way motivate his fight for abolition, Douglass becomes a reformer of his time.</p>
41	<p>Presenter: George Zakusilo, <i>Biochemistry</i> Co-authors: Michael Murphy, Frida Kleiman, Bin Tian Faculty Mentor: Frida Kleiman</p> <p>Regulation of Alternative Polyadenylation in DNA Damage Response</p> <p>Alternative polyadenylation (APA) is a vital co-transcriptional/RNA processing regulatory mechanism able to give rise to various mRNA transcripts from the same gene. APA in 3’ untranslated regions (UTR) regulates 3’UTR length, impacting mRNA stability and translation, whereas APA in introns (intron-APA) regulates coding sequences of mRNA, impacting the proteome. Using 3’ extraction and deep sequencing method (3’READS), in collaboration with Dr. Tian, we identified genes that exhibited APA events upon UV-induced DNA damage. 3’READS results in highly accurate polyadenylated sites mapping and quantitative measurement of APA isoforms expression. Strikingly, analysis of 3’READS data showed that many genes associated with DNA damage response (DDR) underwent intron-APA after UV treatment. To understand the mechanism(s) involved in intron-APA we focused our studies at a few DDR-involved genes, such as CDKN1A (encoding p21) and POLR2A (encoding the largest subunit of RNA polymerase II). We prepared plasmid constructs with sequences corresponding to that of the intron-polyadenylated transcripts of CDKN1A and POLR2A. This strategy will allow us to mimic the effect of DNA damage</p>

on intron-APA and identify its cellular functions. So far we have overexpressed the intron-APA isoform of CDKN1A and observed changes in the level of endogenous p21, in a p53-independent manner, in non-UV treated cells. As the expression of DDR genes is affected in cancer cells, our studies might contribute to the development of new therapies.

Thursday, March 26th, 2015
Oral Presentation Session #5
2:00pm-4:30pm

42	<p>Presenter: Diane Kogan, Biochemistry EnCORE (Memorial Sloan Kettering's Enhanced Clinical Oncology Research Experience) Faculty Mentor: Karen Phillips</p> <p>Does Age Make a Difference? Mammogram Findings in Women 80 Years of Age and Older</p> <p>Breast cancer is leading cause of death in women. Prognosis is better when cancer discovered early, mammography screening starting age 40 recommended. Few studies addressed when screening should end. We evaluated mammogram findings in women 80 and over to determine how often cancer was found during routine screening. Retrospective review of 1,262 women 80 and older without palpable masses seen in 2010 was performed. Records reviewed to determine whether biopsy was recommended and biopsy results. Positive predictive value (PPV) was number cancers number lesions undergoing biopsy. Cancer detection rate (CDR) was number cancers detected number mammograms performed. Risk factors, present in 1,105 (87%) women included prior breast cancer (929, 74%), family history (124, 10%), prior high risk lesions (40, 30%), BRCA mutations (5, 0.4%), other (7, 0.6%). Biopsy recommended in 49 (4%) mammograms. Findings leading to recommendation were mass (30, 61%), calcifications (13, 27%), other (6, 12%). Biopsy performed in 38 lesions, yielding cancer (27, 71%), benign findings (6, 16%), high-risk lesions (5, 13%). PPV of biopsy 27/38 (71%), CDR 27/1,262 (2.1%). 24 histologies known, 6 (25%) ductal carcinoma in situ (DCIS), 18 (75%) invasive carcinomas with ductal in 12, lobular in 4, mixed in 1, papillary in 1. Cancer stage (n=24) was 0 (6, 25%), I (11, 46%), II (7, 29%). CDR 2.1%, higher than 0.3-0.5% CDR for screening mammography in general population. PPV of biopsy was 71%, most (71%) cancers Stage 0 or I. Screening mammography can detect early cancer with high PPV in women 80 and older.</p>
43	<p>Presenter: Peter Finlon, Anthropology Community Scholar and Thomas Hunter Honors Program Faculty Mentor: Aminata Maraesa</p> <p>The Wellness Zone: Direct Sales and Fitness Culture in Punta Gorda, Belize</p> <p>This report, based on ethnographic research conducted in the Wellness Zone, the only gym in Punta Gorda, Belize, examines the roles that gender, economic development, and culturally-specific health beliefs play in the sale of Herbalife-branded health and fitness products and services. To answer the question of if and how these North American diet and fitness products are successful in this small, developing Latin American town, I joined the gym as a member for three weeks in 2013 and conducted interviews with the owners and clients. Drawing on the work of Peter Cahn (2011), I examine the success of the marketing models of Herbalife and the Wellness Zone given the unique economic and social structure of this small town in a developing</p>

	<p>Latin American economy. To explain the significant and varied health benefits reported by many of the clients, I use Daniel Moerman's (2002) idea of a "meaning-response" to demonstrate how community support, encouragement without shame, and an accessible, well standardized blueprint for a healthy lifestyle can cause dramatic, transformative effects to be attributed to drink mixes and aerobics DVDs, especially for women. This research complicates ideas of exploitation and fraud frequently associated with multilevel marketing companies, the diet and fitness industry, and the introduction of N. American products into the Global South.</p>
<p>44</p>	<p>Presenter: Emmanuel Aprilakis , <i>Classical Studies</i> Macaulay Honors College and Solomon Bluhm Scholar Faculty Mentor: David Petrain</p> <p>Plato's Crito: Is Phthia a Place of Death or Escape for Socrates?</p> <p>Although nearly every facet of Plato's Crito has been thoroughly explored since antiquity, a much smaller, singular, yet extremely significant event in the story has not drawn enough attention from scholars. In section 44 of the Dialogue, Socrates relays his dream to his friend Crito, in which a beautiful woman comes to mention the potentiality of his arrival in Phthia in three days. She speaks in the dactylic hexameter of the Iliad, quoting Book 9 of Homer's macabre epic, which prompts the overwhelming majority of scholars to understand this dream incorrectly, equating Phthia with death. Although Socrates does use the dream to predict when he will die, the allusion to Achilles' dilemma in the Iliad is meant to express a true parallel with Socrates' own situation, rendering Phthia a potential escape, while also establishing a link between Socrates himself and the greatest Achaean warrior-hero, Achilles.</p>
<p>45</p>	<p>Presenter: Miriam Jovanovic, <i>Undeclared</i> Undergraduate Research Initiative Fellow Faculty Mentor: Elizabeth Geltman</p> <p>How has Executive Order (EO) 13211, Entitled "Actions Concerning Regulations that Significantly Affect Energy Supply Distribution & Use," Impacted the Ability of the Federal Government to Regulate Public Health and the Environment?</p> <p>Our research team will explore the question: Has Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use" impacted the government's ability to regulate hydraulic fracturing ("fracking") practices and public health law? We will be conducting qualitative research using LawAtlas WorkBench to see if regulations post-EO13211 has had a positive, negative, or neutral impact on public health law. There are many regulations created after EO13211 which have been affected by it. We will select a random sample to code and review. We will collect, evaluate, and sort data using predetermined codes with LawAtlas and Excel. This project will culminate in an article that will summarize the of data, a code sheet explaining how data was sorted, an abstract which clarifies our findings in text, graphics and charts and a press release or blog entry of our results.</p>

46	<p>Presenter: Steven Hall, <i>Chemistry</i> MBRS-RISE (Minority Biomedical Research Support—Research Initiative for Scientific Enhancement) Co-author: Akira Kawamura Faculty Mentor: Akira Kawamura</p> <p>Insight into the Immunostimulatory Molecules Present Within Juzen-taiho-to</p> <p>Juzen-taiho-to (JTT) is an oriental formulation of ten herbs known for immune-boosting activities. It is widely used in East Asia to boost the immunological functions of patients with various ailments, including, fatigue, anemia, and even cancer. However, little is known about the immunostimulatory factors in JTT. This is an important problem because without the knowledge of immunostimulants, it is difficult to control the quality to ensure safety and efficacy. The objective of this study was to characterize immunostimulants in JTT. Our working hypothesis was that major immunostimulatory factors in JTT were non-toxic variants of Lipid A (LA). This hypothesis was based on our earlier study. To test the hypothesis, component herbs of JTT were subjected to a series of extractions that had been optimized to enrich LAs. The resulting extracts exhibited chromatographic profiles and immunostimulatory activities that were consistent with LAs. Importantly, mass spectrometry identified ions consistent with structural variants of LA. Taken together, current findings corroborate the notion that LA variants play important roles in the immunostimulatory activity of JTT. Since LAs are produced by gram-negative bacteria, an emerging paradigm is that the herbs in JTT do not necessarily produce immunostimulants but enrich beneficial bacteria that can safely stimulate the human immune system. This work is supported by the RISE program at Hunter College, Grant # GM060665.</p>
47	<p>Presenter: Khalifa Stafford, <i>Psychology with Neuroscience Concentration</i> MBRS-RISE (Minority Biomedical Research Support—Research Initiative for Scientific Enhancement) and Thomas Hunter Honors Program Co-authors: Teresa Milner, Sanoara Mazid, Tracey Van Kempen, Elizabeth Waters, Bruce McEwen Faculty Mentor: Victoria Luine</p> <p>Female Rat Hippocampal Delta Opioid Receptors Following Stress and Oxycodone Exposure</p> <p>Recent studies have demonstrated distinct sex differences in opioid systems related to learning within the rat hippocampus following exposure to chronic stress. After exposure to chronic immobilization stress (CIS), female opioid systems displayed a reduction of delta-opioid receptors (DORs) in dendrites in the CA3, while males showed a decrease in PARV-containing interneurons and no change in levels of DORs. Although these results suggest that upon CIS, sex differences play a role in altered learning, CIS changes and sex differences in the opioid system following drug addiction have not been explored. This study investigates if CIS alterations in the opioid system in females could accelerate associative memory mechanisms important for drug addiction. We hypothesize that chronic stress induced changes in the CA3b opioid system in females leads to elevated sensitivity to oxycodone and the promotion of drug-related associative learning. To begin to test this central hypothesis, we will examine if CIS induced alterations of the hippocampal DORs are maintained or further enhanced following acute oxycodone administration by using quantitative light and electron microscopic immunochemistry. At the light level, the levels of DOR-iR were unchanged. Electron microscopic analysis of the CA3b region showed alterations in morphometry of dendrites while in the dentate gyrus (DG), the morphometry of dendrites, the density and partitioning ratio of DORs were altered. In the DG, DORs on the plasma</p>

	<p>membrane increased following oxycodone exposure in preparation for the next ligand binding. These findings aid in our understanding of the sex differences related to drug abuse.</p>
48	<p>Presenter: Brian Lamberta, <i>Urban Studies and Public Policy</i> Macaulay Honors College Co-authors: Erika Larsen, Michael Benediktsson Faculty Mentor: Michael Benediktsson</p> <p>The Real Small Business Killer</p> <p>Our research with Professor Mike Benediktsson analyzes the correlation between gentrification and the arrival of chain stores in a neighborhood. Our research project seeks to understand why some Brooklyn neighborhoods have seen an increase in mom-and-pop stores and others have seen an increase in chain stores during Mayor Michael Bloomberg’s administration. Popular narratives suggest that an increase in chain stores (or “chainification”) is directly linked to an influx of wealthier residents (or “gentrification”). Our findings challenge these assumptions. Using GIS analysis, field visits, and literature reviews we concluded that – contrary to these narratives – government intervention has truly stimulated chainification in Brooklyn. Specifically, rezoning projects and Business Improvement Districts (BIDs) cause chainification. The former, which Mayor Bloomberg favored, is a top-down approach that often displaces current mom-and-pop stores. The latter is far more bottom-up and causes chainification when a local group of existent stores (often mom-and-pop stores) build a coalition to attract chain stores and, ultimately, increase traffic to the shopping district. We found that “gentrification” and “chainification” are not inexorably linked. Gentrifiers often desire unique, quality products found in mom-and-pop stores; chain stores do not necessarily cater to wealthier clientele. Thus, an increase in chain stores is not necessarily due to a shift in consumer demographics. Chainification is not about the invisible hand of the market, but the very visible hand of local government.</p>
49	<p>Presenter: Ruka Aderogba, <i>Biological Sciences</i> BP-ENDURE (Blueprint Program for Enhancing Neuroscience Diversity through Undergraduate Education) Faculty Mentor: Vanya Quinones-Jenab</p> <p>Effects of Social Isolation during Adolescence on Apical Dendritic Spine Density of CA1 Pyramidal Cells in Dorsal and Ventral Hippocampus</p> <p>Adolescence is a stage of development that is monumental in the development of the brain. Stress during the onset of puberty has been shown to alter the behavioral, physical, and biochemical processes of the brain because of the introduction of gonadal hormones. Previous studies have shown that stress during critical periods of development is linked to many pathological disorders, such as schizophrenia, depression and anxiety-like behaviors. The effects of stress could be gender specific. For example, females are more susceptible to stress-increased anxiety-related behaviors. However, females have been insufficiently studied in animal models. Social Isolation is a stressor that has been shown to affect individual behaviors. Previous studies also indicate that there may be a critical period for the effects of social isolation before and during puberty. The hippocampus is a component in the limbic system that plays a role in spatial learning, memory, anxiety and the regulation of stress. An introduction to stress before or around puberty can cause changes in the dendritic remodeling of the apical CA1 pyramidal</p>

	<p>neurons in the dorsal and ventral hippocampus. Interestingly, previous studies indicate the differential response of hippocampal subregions to stress. For example, ventral region of the hippocampus is more susceptible than the dorsal region to changes in response to stress hormones. The goal of this study was to understand if social isolation alone during puberty in females could cause changes in the dendritic remodeling of the pyramidal neurons in the CA1 of ventral hippocampus. We also tested whether social isolation had a different effect on dendritic branching of the pyramidal neurons in the dorsal compared to the ventral hippocampal CA1. Sixteen Sprague-Dawley female rats were delivered at P28, and assigned to 2 experimental groups (socially isolated and paired housed) from P36 to P44, where animals were euthanized. We traced and measured the dendritic arborization of the pyramidal neurons by Sholl analysis after the Golgi procedure in the CA1 region of the dorsal and ventral hippocampus, then calculated the difference in the dendritic characteristics between socially isolated animals and paired-housed controls. Our preliminary data indicated that in the ventral hippocampus, which preferentially regulates anxiety, social isolation evoked an increase in dendritic branching in the CA1 pyramidal neurons. On the other hand, in the dorsal hippocampus, which preferentially mediates spatial learning and memory, cells of animals under social isolation had fewer dendritic branches in stratum radiatum than in paired controls. Taken these results together, our data indicate that social isolation of adolescent females elicits pathway-specific changes in the hippocampus that may cause an increase in anxiety and a reduction in spatial memory performance. Next we will like to see if there are changes in spine density across the hippocampal regions.</p>
50	<p>Presenter: Abdel-Minem Mustafa, <i>Semitic Philology</i> Faculty Mentor: Angela Reyes</p> <p>The Role of Ethnicity in the Language of the Noble Quraan</p> <p>With the use of certain words, a speaker can quickly grab the attention of a specific group in the audience, affecting them with an intended understanding of what's being said, without taking anything away from the meaning understood by the rest of the audience at large. Allah does exactly this in the Quraan with the usage of the words "asfaara" and "yamm" (meaning "books" and "sea"), and with Him lies the ultimate example of excellence and eloquence. Using contemporary and modern sources of semitic philology and Quraanic exegesis, we see that by using an Arabic word existent in Hebrew and rooted in Aramaic, all having been understood by the Jews at the time of the Prophet Muhammad (peace and blessings be upon him), Allah not only teaches the newly Muslim Arabs to adhere to and live by the message of what is being revealed to them, but He reminds and chastises the Jews for their failure to do exactly that.</p>
51	<p>Presenter: Jeffrey Garzon, <i>Behavioral Neuroscience</i> Faculty Mentor: Hiltrud Otto</p> <p>The Neuroscience of Attachment</p> <p>Attachment theory and the mechanisms of development at play in interpersonal relationships possess an unmistakable similarity with the evolution of evaluative, behavioral, identificational, normative and explanatory beliefs or ideologies. The work of John Bowlby and Mary Ainsworth can be used as a template to explain the acquisition, benefit and attraction of these construals. Egosyntonic and egodystonic etiologies can be further assessed by means of Cognitive Neuroscience. Modern biofeedback equipment, experimental techniques and investigative</p>

	<p>procedures are beginning to tease mental processes into the realm of empirical investigation. A intrapsychic hierarchy of dependency exists as a transactional paradigm that extinguishes sapient distortions, discontinuities and insufficiencies under a top-heavy monotropic system of belief. The motivations and emotions that cause the attachment of this crucial idea ensue evolutionarily to provide comfort, safety and resolve. Human beings will always function under this principle philosophy or religion that must be formed to operate as a ‘primary caregiver’ or primary attachment figure. This principle ideological entity removes discomfort or threats from the world while managing and repairing ruptures in the attachment bond. This bond typically arises by means of filial imprinting or can form as an adaptation that occurs during critical periods in the atricial human animal. The classification of secure, avoidant, ambivalent and disorganized attachment is capable of identifying the health of this ideological relationship and others. Attachment theory is already becoming substantiated by Interpersonal Neurobiology and it will continue to become ever clearer that our thoughts, emotions and feeling are nothing more than physical manifestations created by concrete biological processes.</p>
52	<p>Presenter: Larisa Shagabayeva, <i>Biochemistry</i> Thomas Hunter Honors Program Co-authors: Elena Pentsova, Martin Fleisher Faculty Mentor: Karen Phillips</p> <p>Detection of Melanoma Cells in Cerebral Spinal Fluid for the Diagnosis of Leptomeningeal Metastasis in Patients with Melanoma</p> <p>Background: Early diagnosis of Leptomeningeal Metastasis (LM) is important in solid tumors and melanoma. Use of Rare Cell Capture Technology to detect circulating melanoma cells in cerebral spinal fluid (CSF CMC) may be sensitive in diagnosing melanoma LM as oppose to CSF cytology and MRI. Methods: We identified 10 patients with metastatic melanoma and clinical suspicion of LM who were evaluated at MSKCC by neurologists. CSF CMC analysis was performed using immunomagnetic enrichment of cells expressing CD146. Evaluation and enumeration of cells were followed by nuclear staining using 4, 6-diamidino-2- phenylindole, and immunofluorescence detection of high-molecular weight melanoma-associated antigen, CD45 and CD34. Enumeration of melanoma cells in CSF was correlated with CSF cytopathology from the same sample, as well as MRI results done within a week prior to CSF collection. Positive CSF CMC was defined as ≥ 1 CMC/3 mL. Results: Eleven CSF samples from 10 patients were analyzed. Neuro-images were performed on all patients; 9 had no evidence of LM but brain metastases on MRI. Five (46%) of 11 CSF samples demonstrated CMC $\geq 1/3$ mL (median 5 CMCs/3 mL, range 1-200) despite negative CSF cytology. One (9%) CSF sample with no CSF CMC had positive CSF cytology and MRI findings of LM. Five (46%) CSF samples had no CSF CMC and negative CSF cytology. Conclusion: In our study, enumeration of melanoma cells in CSF does not correlate with cytology or brain metastases. Thus, further study of CSF CMC is needed to assess its sensitivity, specificity and clinical relevance.</p>
53	<p>Presenter: Genevieve McNamara, <i>History and Special Honors</i> Faculty Mentor: Donna Haverty-Stacke</p> <p>Changing the Definition of “Americanism”: From Anti-Labor Terrorism to New Deal Legislation</p> <p>The Citizens Alliance and the Black Legion were violent anti-labor organizations active in the Midwest in the early twentieth century. The Citizens Alliance was a public group of “deputies,”</p>

often utilized in addition to or in place of the police during strikes and labor demonstrations. They lost public support after the Minneapolis Teamsters' Strike of 1934. The Black Legion was a secret organization that targeted union leaders or sympathizers, often at night. They were a ubiquitous presence, yet their violent actions went unprosecuted for years. They lost political support after the 1936 murder of Charles Poole, who was not involved in organized labor. However, although members of both groups were prosecuted for their actions, they were also incorporated into other anti-labor organizations after the public demise of the Citizens Alliance and the Black Legion. / For many years, violent anti-labor associations, like the Citizens Alliance and the Black Legion, avoided prosecution for their actions because of their ties to politics, industry, and law enforcement. Both groups also utilized the cultural concept of "Americanism" to support their illicit actions. However, the 1930s served as a turning point. Although both groups entered this decade strongly, the passage of pro-labor legislation by the Roosevelt administration encouraged a public sentiment that would no longer support blatant acts of violence by anti-labor organizations. This new legislation provided legal support for labor unions and thus, delegitimized anti-labor organizations' argument that organized labor was an affront to "Americanism".

Poster Presentation Abstracts

Wednesday, March 25th, 2015

Poster Session #1

9:00am–11:00 am

1	<p>Presenter: Brenda Abdelmesih, <i>Biological Sciences</i> HHMI (Howard Hughes Medical Institute) Co-presenter: Justina Assaad, <i>Biological Sciences</i> Undergraduate Research Initiative Fellow Co-author: Chris Eyermann Faculty Mentor: Carmen Melendez-Vasquez</p> <p>Understanding Rab 7 Endosomal Trafficking in Schwann Cell Development and Myelination</p> <p>Myelination in the peripheral nervous system is carried out by Schwann cells (SC), which surround and insulate all axons, expediting transmission of nerve impulses. Non-muscle myosin II (NMII), an actin-binding motor protein, is a key regulator of cytoskeleton dynamics necessary for interactions between SC and axons and normal myelin formation. NMII activity is regulated by the phosphorylation of its regulatory myosin light chain (MLC). Previous data suggests that one of the kinases that phosphorylates MLC, myosin light chain kinase (MLCK) may be involved in pathways activated in SC by axonal signals at the onset of myelination. Previous data also suggests that Rab7 transport, a regulator of endocytic membrane transport, late endosomes to Golgi transport, and lysosome biogenesis, may be mediated by myosin II. By conducting immunofluorescence, immunoprecipitation, and biochemical experiments, we attempt to characterize the localization of rab7 during schwann cell development and myelination to demonstrate if myosin II activity is required for rab7 localization and/or function, and show if rab7 is required for proper cytoskeleton function and proper myelin formation.</p>
2	<p>Presenter: Annelie Aguessy, <i>Biological Sciences</i> MBRS-RISE (Minority Biomedical Research Support—Research Initiative for Scientific Enhancement) Faculty Mentor: Derrick Brazill</p> <p>The Role of TkIA and PldB in Morphogenesis and Differentiation in Dictyostelium discoideum</p> <p>Morphogenesis and cell differentiation play a crucial role in numerous biological processes, such as metastasis of cancer cells, cell sorting during pattern formation, and migration of neural crest cells during development. The unicellular eukaryote Dictyostelium discoideum is ideal for unraveling the pathways that control cell movement, morphogenesis and differentiation due to its simplicity and conservation of mammalian genes. When starved, D. discoideum cells form a multicellular fruiting body consisting of two cell types, stalk and spore cells. Here we use a double mutant to gain insight into how two proteins with mammalian homologs, PldB and TkIA, work together to control morphogenesis and differentiation during fruiting body formation. Cells lacking TkIA, but overproducing PldB (tkIA-/pldBOE) fail to develop, but can develop normally when mixed with a small amount of wild type cells to form chimeric fruiting bodies. This suggests that tkIA-/pldBOE cells are able to respond to developmental signals (produced by wild-type cells) but are unable to produce these signals</p>

	<p>themselves. By varying the ratio of wild-type cells added to the double mutant, we determined that the developmental signal is most likely diffusible. Even distribution of wild type cells (labelled with β-galactosidase) throughout chimeric fruiting bodies suggests that the double mutant doesn't have a preferential location, and is therefore able to differentiate into both stalk and spore cells and to sort to the proper location in the fruiting body. These studies provide new insights into the regulatory pathways controlling these processes and may be applicable to other organisms.</p>
3	<p>Presenter: Stephanie Almanzar, <i>Urban Affairs</i> Co-authors: Melanie Dieg, Abraham Cordova, Carl Chrispin Faculty Mentor: Charles Starks</p> <p>Sports Facility Impact On Flushing Meadows Corona Park</p> <p>The purpose of this project was to evaluate the impact the development of sports facilities has on Flushing Meadows Corona Park. Flushing Meadows Corona Park is one of New York City's largest parks, set in Queensborough. The park has been greatly neglected despite the many sports facilities that are on or near parkland. These include the United States Tennis Association (USTA) facilities and Citi Field. We also examined the denied proposal for a major league soccer stadium and how the public and public officials reacted to this proposal. These sports facilities often promise jobs and stability to the surrounding neighborhoods, but often overlook the economic needs of Flushing Meadows Corona Park itself. Although the construction, expansion, and maintenance of these sports facilities may bring jobs, many have argued that these positions do not extend past the construction phase and that the facilities do not serve the greater neighborhood, extending into the park. The surrounding community has voiced their opinions on the lack of economic support the sports facilities have provided the park. In our research we have found that the park is not receiving sufficient funds to maintain its deteriorating structures and infrastructure. Many of the park's fountains and art installations have been in place since the World's Fair exhibition present from 1939-40 and again from 1964-65. Since the World's Fair there have been little to no renovations and maintenance done on the park and this may be directly due to its lack of economic resources.</p>
4	<p>Presenter: Nicole Avento, <i>Environmental Studies and Women & Gender Studies</i> Macaulay Honors College Faculty Mentor: Jennifer Gaboury</p> <p>The Disappearing Egg and Sperm</p> <p>The limited studies available on reproductive health and water pollution are disgustingly inadequate. Water pollution is affecting reproductive health for both males and females through exposure and consumption to endocrine disrupting chemicals that reach potable water supplies. Of the information available there is more research on male reproductive health than there is for its female counterpart. The research found on female reproductive health and pollution focuses heavily on socioeconomic issues through air pollution, while male reproductive health research is more physical research and encompasses both air and water pollution. The effects water pollution has on fertility and reproductive health is most clearly seen through hydro-fracking and agricultural pollution. Water pollution is not going to stop anytime soon. To properly combat its effects, we need further, more equitable research between the sexes on this issue.</p>

5	<p>Presenter: Stephen Braren, <i>Psychology</i> BP-ENDURE (Blueprint Program for Enhancing Neuroscience Diversity through Undergraduate Education) Co-authors: Damian Drapala, Ingrid Tulloch, Peter Serrano Faculty Mentor: Peter Serrano</p> <p>Methamphetamine-induced Short-term Increase and Long-term Decrease in Spatial Working Memory Affects Protein Kinase M zeta (PKMζ), Dopamine, and Glutamate Receptors</p> <p>Methamphetamine (MA) is a toxic, addictive drug shown to modulate learning and memory, yet the neural mechanisms are not fully understood. We investigated the effects of 2 weekly injections of MA (30 mg/kg) on working memory using the radial 8-arm maze (RAM) across 5 weeks in adolescent-age mice. MA-treated mice show a significant improvement in working memory performance 1 week following the first MA injection compared to saline-injected controls. Following 5 weeks of MA abstinence mice were re-trained on a reference and working memory version of the RAM to assess cognitive flexibility. MA-treated mice show significantly more working memory errors without effects on reference memory performance. The hippocampus and dorsal striatum were assessed for expression of glutamate receptors subunits, GluA2 and GluN2B; dopamine markers, dopamine 1 receptor (D1), dopamine transporter (DAT) and tyrosine hydroxylase (TH); and memory markers, protein kinase M zeta (PKMζ) and protein kinase C zeta (PKCζ). Within the hippocampus, PKMζ and GluA2 are both significantly reduced after MA supporting the poor memory performance. Additionally, a significant increase in GluN2B and decrease in D1 identifies dysregulated synaptic function. In the striatum, MA treatment increased cytosolic DAT and TH levels associated with dopamine hyperfunction. MA treatment significantly reduced GluN2B while increasing both PKMζ and PKCζ within the striatum. We discuss the potential role of PKMζ/PKCζ in modulating dopamine and glutamate receptors after MA treatment. These results identify potential underlying mechanisms for working memory deficits induced by MA.</p>
6	<p>Presenter: Sara Camnasio, <i>Physics and Astronomy</i> Macaulay Honors College Co-authors: Munazza Alam, Emily Rice, Kelle Cruz, Jacqueline K. Faherty, Gregory M. Mace, Emily C. Martin, Sara Logsdon Faculty Mentor: Kelle Cruz</p> <p>Medium-Resolution Photometric and Spectroscopic Analysis of Unusually Red and Blue Brown Dwarfs</p> <p>Brown dwarfs are celestial bodies that form like stars, but are too small in mass to sustain hydrogen fusion. Because they are cooler in temperature, they fall within the latter end of the traditional MK stellar classification scheme O, B, A, F, G, K, M, L, T and Y. Our project focused on spectral type "L" brown dwarfs with extreme "red" and "blue" colors that contradict existing models. The "red" and "blue" colors are simply an indication that the spectrum of the star peaks – respectively – at longer and shorter wavelengths. Some red L dwarfs are low surface gravity, young objects whose spectra present weak Na I doublets and FeH absorption bands, but strong VO features. Some blue L dwarfs are subdwarfs with low metallicity spectral features such as greater H2 absorption, stronger metal hydride bands, and enhanced TiO absorption. Our sample is composed of L dwarfs that present extreme colors but lack the spectral features usually accompanying them, thus contradicting models. Analysis of the</p>

	<p>sample was executed using medium-resolution data in the range of wavelength defined as "J band" (0.8μm - 1.4μm). To analyze the cause of the unusual color and compare them, we fit medium-resolution spectra with 3rd order polynomials. The coefficients from these fits were then compared across near-infrared colors and across spectral types, resulting in significant correlations. These correlations will serve in probing the differences between standard L dwarf subtypes and unusually red and blue L dwarfs, as well as probing the underlying physical properties that cause the extreme colors that we have been exploring.</p>
7	<p>Presenter: Ai Ying Chen, <i>Psychology</i> Co-authors: Camille Toni Tobias, Juana Gonzalez, Camille McIntyre, William Gallagher, Heke Neumeister, Thomas Preuss Faculty Mentor: Thomas Preuss</p> <p>Social Effects of Sensory Filtering and Anxiety-related Behavior in Female African Cichlid <i>Astatotilapia burtoni</i></p> <p>The African cichlid fish <i>Astatotilapia burtoni</i> is an important model system for studying the effects of social status on brain and behavior. Our lab has previously found that subordinate (SUB) males show reduced sensory filtering abilities when compared to dominant (DOM) males. Experimentally this is indicated by lower rates in prepulse inhibition (PPI) in SUBs. The latter also demonstrated reduced exploratory behavior in an open field environment, suggesting increased anxiety in SUBs. Interestingly, social hierarchies also develop in communities consisting only of females. In such a male-free condition, females exhibit male typical dominant and submissive behaviors. Therefore, we asked if females show comparable socially induced changes in PPI and anxiety-related behavior as their male counter parts. Indeed, our results revealed an increased exploratory activity in dominant females when compared to subordinate and to female controls living in female/male communities. However, as compared to males females were less explorative. On the other hand, we did not find significant differences in PPI rates within in the female, yet all females have PPI rates comparable to dominant males. Taken together, results imply that social dominance reduces anxiety in females whereas high PPI rates might be the 'default' state in <i>A. burtoni</i>.</p>
8	<p>Presenter: Ahmed El-Razi, <i>Psychology</i> Faculty Mentor: Cheryl Harding</p> <p>Nonparametric and Variance Stabilizing Methods of Correcting Heterogeneity of Variance</p> <p>It is a common occurrence in psychological research to have data which do not conform to the assumptions required for parametric hypothesis testing. Animal models are particularly susceptible to violating the assumption of homogeneous variances. This study investigated an instance of heterogeneous group variances and identified ways to rectify the violation. Previous researchers found that outlier removal, data transformation, and running nonparametric hypothesis tests were some of the most effective ways in correcting violations of this type. Data were collected from mice performing an elevated plus maze (n = 24) task as part of a study at Hunter College. The data were run through an ANOVA before and after having outliers removed and being subject to a transformation. The results showed that outlier removal when paired with a log transformation not only mitigated the impact of differing group variances, but also restored normality select cases.</p>

9	<p>Presenter: Jaquelin Erazo, <i>Physics</i> AstroCOM NYC Co-author: Timothy Paglione Faculty Mentor: Kelle Cruz</p> <p>Detecting and Mapping Extinction Clouds</p> <p>Massive and dense clouds of gas and dust support the birth of stars and solar systems. An outstanding difficulty is accurately and sensitively quantifying the mass and structure of the cloud. A dust cloud between an observer and a star not only scatters the light of the starlight and makes it fainter, but it also reddens the starlight. This effect is known as extinction. Extinction is wavelength dependent; shorter wavelengths are more preferentially scattered. Therefore, infrared bands (long wavelength colors) are used because we are able to “look through” the dense areas of dust clouds and detect stars despite the extinction. However, infrared studies are only able to probe relatively high extinctions. To measure very low extinction regions, shorter wavelengths are preferred. We compare both a test field and a control field via stellar infrared and optical colors in order to find an optimal method that combines all available bands in detecting and quantifying extinction.</p>
10	<p>Presenter: Erick Fedorenko, <i>Psychology</i> Undergraduate Research Initiative Fellow Co-author: Amber Alliger Faculty Mentor: Amber Alliger</p> <p>Antidepressant-Like Behaviors Related to Enrichment Aided Neurogenesis</p> <p>Environmental enrichment involves providing laboratory animals with various objects that they are able to manipulate freely. The purpose of this study is to examine the correlation between performance on the Porsolt forced swim test and the neurophysiological make up of the rat hippocampus of enriched animals. The Porsolt forced swim test involves measuring the amount of time an animal will spend immobile (as opposed to swimming) when placed in a container of water. Higher immobility times are commonly associated with depressive behaviors. Previous research in our lab has found that enriched animals performed significantly better on working memory tasks than non-enriched animals, $t(22) = 2.82, p = .010$. These behavioral differences were correlated with neurophysiological differences between the two cohorts. Likewise, previous research in our lab has also demonstrated that immobility time in the Porsolt test was significantly less for the enriched animals than the non-enriched animals, $t(22) = -3.94, p = .001$. We hypothesize that the behavioral differences in the Porsolt test are also correlated with neurophysiological differences between the cohorts. Environmental enrichment may support neurogenesis, which may aide, the enriched animals in dealing with the stress of the Porsolt test, thus leading to the lower immobility time of the enriched cohort. This may indicate the possible antidepressant-like quality of environmental enrichment.</p>

11	<p>Presenter: Grace Frutos, <i>Psychology</i> Psychology Honors Program Co-author: Joseph Lao Faculty Mentor: Joseph Lao</p> <p>Correlations Between Parental Warmth and Academic Achievement, and its Association with Self-esteem, Resilience, and Self-efficacy</p> <p>This study investigates relationships between parental warmth and GPA and academic attainment, as well as any associations between parental warmth, self-esteem, resilience and self-efficacy. There are 101 participants, 64 were females and 37 were males, ages ranged from 20-69 years old. The Parental Acceptance Rejection Questionnaire (PARQ) was used to obtain parental warmth scores. The Self-esteem Scale, The Brief Resilience Scale and The General Self Efficacy Scale were used to test association with parental warmth scores. Surprisingly, a Pearson's Correlation test found no significant relationship between maternal warmth ($r(100) = .561, p = .237$), or paternal warmth ($r(100) = .561, p = .218$) and GPA scores. A spearman's correlation test found maternal ($r_s(99) = .296, p = .006$) and paternal ($r_s(99) = .216, p = .030$) warmth scores positively correlated with academic attainment. An independent samples t-test found maternal warmth to be associated with self-esteem ($t(99) = 2.443, p < .05$), but not with self-efficacy ($t(99) = .890, p = .376$) or resilience ($t(99) = .294, p = .769$). An independent samples t-test found parental warmth to be associated with self-esteem ($t(99) = 2.054, p = .043$), but not with self-efficacy ($t(99) = .800, p = .425$) or resilience ($t(99) = .376, p = .668$). Finding implicate that parental warmth may be associated with other personal characteristics, and that it's these characteristics that aid higher academic achievement.</p>
12	<p>Presenter: Joshua Halpenny-nguyen, <i>Urban Studies</i> Co-authors: Victoria Thornton, Adriyana Yakymyshyn Faculty Mentor: Charles Starks</p> <p>Adult Day Care in Flushing, Queens</p> <p>As the treatment and care needed for aging populations increases, their families and caregivers often rely on adult day care facilities to provide the care they are unable to provide. In the last two years, New York City has experienced a drastic increase in the number of adult day care centers that have opened. We conducted a community profile of Flushing, Queens, which demonstrated that centers catering to the Asian community are highly concentrated in this neighborhood. We then conducted a demographic analysis of the neighborhood which concluded that the Asian population is highly concentrated in the Flushing area and this concentration is even more apparent when the Asian population 55 and over is considered. Posing as family members of potential clients, we conducted detailed observations of the adult day care centers in the Flushing community and concluded that although these demographics warrant adult day care services, many of these recently opened centers do not provide adequate services and are chiefly in operation to collect Medicaid payments for profit. We found that adult day care is effective when all services/treatments are being provided, not all adult day care centers are providing adequate services to their clients, some centers have opened only to collect the Medicaid financial rewards, and New York State's recent revision of the Managed Long Term Care (MLTC) Policy is largely to blame for the problems with these facilities. Therefore this report recommends that the MLTC policy be changed to re-establish</p>

	<p>regulations for these facilities such as by specifying the quality of services. These specifications need to detail the purpose of programs, and their expected outcomes. Policymakers should also consider redistribution of Medicaid payments to nonprofit senior centers and conduct follow-up investigations to assure the Adult Day Care facilities maintain basic building standards and quality services. These policy adjustments will help weed out corruption and improve conditions for independent seniors.</p>
13	<p>Presenter: Saipriya Iyer, <i>Psychology with concentration in Behavioral Neuroscience</i> Yalow Scholar and Thomas Hunter Honors Program Co-author: Dilip Giri Faculty Mentor: Karen Phillips</p> <p>Surgical Pathology of Microinvasive Breast Cancer (MIBC)</p> <p>Background: Minimally invasive breast cancer (MIBC), an invasive cancer of the breast with no invasive focus measuring more than 1 mm, accounts for less than 2% of breast cancers. Most MIBC is found in association with ductal carcinoma in situ (DCIS), and hence has also been called DCIS with microinvasion. The aim of this study thus was to examine the histopathology of MIBC. Methods: With IRB approval, retrospective review of surgical pathology files at Memorial Sloan Kettering Cancer Center (MSK) from 1997 to 2009 revealed 263 cases diagnosed as MIBC. In addition to diagnosis confirmation, pathologic features were studied. Results: Grade of DCIS (n=239) was I in 8 (3%), II in 76 (32%), and III in 155 (65%). Morphologic form of MIBC (n=223) was single cells and clusters in 165 (74%) cases, clusters in 51 (23%) and glands in 7 (3%). 1, 2, 3, 4, and 5 invasive foci were identified in 121 (51%), 48 (23%), 16 (8%), 7 (3%) and 13 (6%) of 205 MIBC cases, respectively. LVI was present in 6/239 (2%) cases. Hormonal status was ER (+) in 80/143 (56%) cases and HER2 (+) in 50/118 (42%). Conclusions: Most (>95%) MIBC had high-grade (grade 2 or 3) DCIS, occurred in the form of single cells and/or clusters. More than half (51%) of patients with MIBC had only a single focus of invasion and VI was uncommon (2%). Further study is necessary to identify MIBC features predictive of outcomes to optimize treatment for women with MIBC.</p>
14	<p>Presenter: Saveliy Kelebeyev, <i>Biochemistry</i> Macaulay Honors College Co-authors: Nirav Kapadia, Sudharshan Madapa, Wayne Harding Faculty Mentor: Wayne Harding</p> <p>Synthesis of (+)-Boldine Derivatives and their Relationship to CNS Receptors</p> <p>Aporphines are natural and synthetic alkaloids that possess a tetracyclic framework. Chemically aporphines belong to the isoquinoline group of alkaloids. At the Central Nervous System (CNS), aporphines have been explored as ligands at the adrenergic, serotonin and dopamine receptors. Ligands at these receptors are valuable for the treatment of a myriad of disorders including schizophrenia, depression, anxiety and Parkinson's disease. Our research group is specifically involved in the exploration of the aporphine alkaloid "nantenine" as a 5-HT_{2A} antagonist. Selective 5-HT_{2A} antagonists have been shown beneficial for the treatment of symptoms caused due to drug abuse. Currently there are no clinically approved selective 5-HT_{2A} antagonists available. The routine route for the generation of nantenine analogues involves multiple steps, which leads to a delay in throughput. Moreover, the analogues generated through this approach are racemic and hence, do not necessarily provide a</p>

	<p>conclusive Structural Activity Relationship (SAR) correlation. In order to overcome this limitation, we have developed a “one step synthetic protocol” for the rapid generation of tetraoxygenated aporphine analogues. This approach involves a Mitsunobu Reaction between commercially available aporphine alkaloid (+) – boldine and various alcohols to produce a library of dialkylated aporphine analogues in moderate yields (30-40%). All analogues were purified using standard purification techniques. Our approach offers the advantage of generating chirally pure analogues in a single step. Detailed synthetic work and future applications will be presented.</p>
15	<p>Presenter: Martha Ordonez, <i>Psychology</i> MBRS-RISE (Minority Biomedical Research Support—Research Initiative for Scientific Enhancement) Co-authors: Jorge Baquero, Frieda Kleiman Faculty Mentor: Frieda Kleiman</p> <p>Characterization of Tau protein in Cancer Cells</p> <p>Tau is a microtubule-associated protein involved in a number of neurodegenerative disorders, including Alzheimer’s disease (AD). In normal individuals, Tau is a highly soluble, non-phosphorylated protein that stabilizes microtubules in the cytoplasm of neurons. However, neurons in AD’s contain insoluble hyperphosphorylated-tau aggregates known as paired helical filaments. Previous studies have shown that Pin1, a prolyl-isomerase initially identified as a mitotic regulator, is involved in the regulation of Tau phosphorylation under different conditions. Furthermore, Tau has been linked to another Pin1 substrate, the tumor suppressor p53, and some of its isomers. Interestingly, Dr. Kleiman’s lab identified p53 as an activator of PARN-dependent mRNA deadenylation in the nucleus during the DNA damage response (DDR), resulting in changes in mRNA stability. / As Pin1, p53 and PARN possess nuclear functions, we hypothesize that Tau might also localize in the nucleus of non-neuronal cells and functionally overlap with these factors. To show that tau isoforms are present in the cell nucleus we use cellular fractionation assays with samples of HCT116 human colon carcinoma cell line. Interestingly, nuclear isoform patterns of Tau changed upon Pin1 inactivation, UV irradiation, p53 expression and/or phosphatase treatment. Furthermore, we show that some Tau isoforms can form (a) complex(es) with p53, Pin1 and PARN using co-immunoprecipitation assays, and these interactions change under different cellular conditions. Although more studies are necessary, these preliminary results reveal a new potential role for Tau in some nuclear processes, such as DDR, control of mRNA stability and gene expression.</p>
16	<p>Presenter: Aleksandr Uvaydov, <i>Chemistry II</i> Co-authors: Patrick Kelly, Mandë Holford Faculty Mentor: Mandë Holford</p> <p>Developing a Triggerable Nanocontainer for Peptide Drug Delivery</p> <p>Small-peptides, because of their potency, selectivity, and general lack of side effects, represent one of the current frontiers of pharmacological research. Unfortunately, these agents can be rapidly degraded by gastrointestinal enzymes and generally cannot cross the blood-brain barrier (BBB). The lack of an effective system for the transport and delivery of small peptides in vivo is a primary obstacle to their therapeutic application. This project modifies the viral capsid of P22 bacteriophage to serve as a tunable nanocontainer for the</p>

	<p>packaging and controlled release of neuropeptides derived from the venom of marine snails. Recent results in the Holford group has demonstrated the venom peptides can be effectively expressed in the interior of the P22 capsid and translocated across a BBB model using cell-penetrating peptide, HIV-Tat, conjugated to the capsid exterior. Releasing the cargo peptide at the target site remains a challenge, as disassembly must proceed under physiological conditions, i.e., at moderate pH in an aqueous environment. In this work a Ring Opening Metathesis Polymerization (ROMP) is applied to trigger the release of cargo peptide. ROMP is a polymerization reaction driven by the release of ring strain in an olefin substrate (norbornene) in the presence of a ruthenium catalyst. Our hypothesis is that ROMP will disrupt the capsid architecture by linking together norbornene moieties conjugated to the capsid exterior. Preliminary findings are presented to characterize the triggered release of cargo peptides from P22 capsid using a catalyst driven ROMP reaction.</p>
17	<p>Presenter: Alexis Vigo, <i>Philosophy</i> Undergraduate Research Initiative Fellow Faculty Mentor: Daniel W. Harris</p> <p>Internal Language, External Implications</p> <p>Over the last fifty years, Noam Chomsky has been incredibly influential in the study of linguistics. His conception of the study of language is as the study of a cognitive capacity that is wholly internal to each speaker's mind. This conception is responsible for major advances in syntax and psycholinguistics, the study of the psychological mechanisms that make language acquisition and processing possible. This conception has also been used as a primary model for research in cognitive science, but it has not been systematically applied to the study of the meaning of sentences. The void left by the lack of theorizing about linguistic meaning from an internalist conception of language has been, in practice, filled by referential semantics, which assumes that words and sentences are meaningful due to the relations they bear to the physical things they're about. Any adequate theory of linguistic meaning must recognize and explain how 'tree' (the word) refers to a tree (the physical entity). There is an apparent tension between these two approaches in that one tells us that the study of language is the study of something completely inside our mind, while the other tells us that it must explain the connection between words and all sorts of extra-mental things. Some philosophers and linguists have argued that both approaches can be reconciled. I will argue that these attempts ultimately fail by analyzing their arguments in light of Chomsky's and other internalists' criticisms of referential semantics and its inconsistencies.</p>
18	<p>Presenter: Shu Shu Wu, <i>Psychology with concentration in Behavioral Neuroscience</i> Macaulay Honors College Faculty Mentor: Cheryl Harding</p> <p>The Effects of Doxycycline on Spatial Memory and Learning in Spore-Treated Mice</p> <p>Mold is found in 40% of American buildings, and is known to cause a number of physical and neurobehavioral deficits. Prior research from our laboratory showed that intact mold spores could also cause deficits in spatial memory. A number of studies conducted show that tetracycline antibiotics are able to attenuate loss of memory in mice peripherally injected with lipopolysaccharide. In this current study, vehicle or spore treated mice were given either a control diet or doxycycline diet, and the spatial memory of the mice were assessed using the</p>

	<p>Morris Water Maze. As expected, we found that the more doxycycline diet spore-treated mice consumed, the better they performed on the MWM. Additionally, the more doxycycline the vehicle animals consumed, the more direct their routes on the last visible learning trial of the MWM. Analysis was also run to understand whether weight correlated with MWM performance. It was found that the more a vehicle mouse on the doxycycline diet weighed, the longer the route it took to the platform during the last visible learning trial. The amount of diet consumed influenced the weight of the mouse. The more a mouse consumed, the more it weighed - however, this pattern only holds true for vehicle mice on the control diet, spore-treated mice on the control diet, and spore-treated mice on the doxycycline diet. This trend was not seen in vehicle animals on the doxycycline diet.</p>
19	<p>Presenter: Masai Young, <i>Biochemistry</i> Undergraduate Research Initiative Fellow Co-author: David Mootoo Faculty Mentor: David Mootoo</p> <p>Glycomimetics via the [2 + 3] Dipolar Cycloaddition of Nitrones and Alkenes</p> <p>Carbohydrates are involved in many vital biological functions and disease states. Elucidation of these mechanisms will provide insight for new diagnostics and therapies against disease. As carbohydrate-mediated processes become clearer and new pathways emerge, there is an increasing demand for glycomimetic molecules for use in glycobiology research. To meet this need, the overarching objective of this research project is the development of robust synthetic technologies for glycomimetics. In this context, we are interested in strategies that center on the 2 + 3 dipolar cycloaddition of nitrones and alkenes. In this presentation, synthetic studies on the application of this approach to mimetics of the immunostimulatory glycolipid α-galactosylceramide (α-GalCer) will be presented. Important attributes of this method are the rapid build-up of structural complexity from relatively simple precursors in the key cycloaddition reaction, and the synthetic versatility of the cycloadduct. The alkene component for the cycloaddition reaction is a known exo-gycal that is available in seven straightforward steps from galactose and the nitrone partner can be derived in one step from a simple lipid alkene. The cycloadduct can be easily transformed via short reaction sequences to a variety of glycolipid structures. The method promises new molecules for use in research in glycolipid immunology.</p>

Wednesday March 25th, 2015

Poster Session #2

11:30am–1:30pm

20	<p>Presenter: Zeina Alturk, <i>Psychology</i> Faculty Mentor: Dawn Dugan</p> <p>Social Support among Muslim Women</p> <p>Muslims are one of the fastest growing groups in the United States but Muslim American health has not been a widely researched topic in psychology or public health. MARHABA (Muslim Americans Reaching for Health and Building Alliances) is a research study that was conducted to understand the barriers and facilitators to breast and cervical cancer screening</p>
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	<p>among Muslim Women. Interviews were done with Muslim women on their health and practices as well as focus groups and surveys. In order to understand the effects of social support on breast and cervical cancer screenings in a group of Middle Eastern and South Asian women, a literature review was done on the influence of support and a subset of the MARHABA study was looked at. Qualitative results showed among the sample of women, all cited some form of social support and 85% of Middle Eastern women and only 20% of South Asian women said they were comfortable talking about cervical cancer. These findings support the hypothesis that Muslim women who seek cancer screenings also have some form of social support.</p>
21	<p>Presenter: Tobey Ben-Aderet, <i>Psychology</i> Co-authors: Mark Hauber, Valerie Nunez Faculty Mentor: Mark Hauber</p> <p>The Diversity of Avian Eggshell Shapes: A Mathematical Approach</p> <p>Avian eggshells are diverse natural products that vary in coloration, size, and shape. Our main aim is to understand what factors generate and constrain the evolutionary diversity of eggs. We tested the hypothesis that measuring three easily accessible aspects (total length, width, and length at widest point) of different bird eggs will allow for the full mathematical characterization of their shapes. We compiled measurements of eggs for n=1869 species from life-size guidebooks for taxa across different continents and phylogenetic groups. We then assessed whether and how closely natural bird eggs' shape matches theoretical predictions of different mathematical models of eggshape geometry. Our conclusions suggest that measuring just three metrics is sufficient to characterize egg shape diversity within and between species.</p>
22	<p>Presenter: Emma Briggs, <i>Psychology</i> Psychology Honors Program Co-author: Sandeep Prasada Faculty Mentor: Sandeep Prasada</p> <p>Non-obvious Conceptual Structure: Evidence from Weak Definites</p> <p>It would appear that the concepts NEWSPAPER, DOCTOR, BUS, and BANK have nothing in common that distinguish them from concepts like MAGAZINE, SURGEON, CAR, and HOTEL. Nevertheless, definite noun phrases containing words corresponding to the two sets of concepts are interpreted differently. For example, "John went to the surgeon and Bill did too" is interpreted as involving a specific surgeon who is seen by both John and Bill. In contrast, "John went to the doctor and Bill did too" allows for the possibility that John and Bill saw different doctors (weak definite interpretation). We propose that weak definite interpretations are possible for nouns that name kinds that are simultaneously conceived of in concrete and abstract terms and provide principles of individuation and non-individuation. Three experiments provide support for this non-obvious characteristic of conceptual structure which distinguishes the two sets of concepts and underlies the possibility of weak definite interpretations.</p>

23	<p>Presenter: Dina Buitrago, <i>Biological Sciences</i> MBRS-RISE (Minority Biomedical Research Support—Research Initiative for Scientific Enhancement) Faculty Mentor: Victoria Luine</p> <p>Effects of Gonadal Hormones on Recognition Memory and its Neural Correlates in the Hippocampus in Castrated Male Rats</p> <p>Previous studies using chronic estrogen and testosterone treatment to castrated male rats showed enhancements in male memory, but the effects of acute hormones have not been investigated in males. Our goal is to understand how gonadal hormones affect learning and memory. Both chronic and acute estradiol treatment to ovariectomized female rats enhances memory. We therefore hypothesize that acute treatments with estradiol or testosterone will enhance memory in male rats. This current project investigates the effects of acute estrogen and testosterone on recognition memory by using object recognition and object placement tests in castrated male rats two hours after hormone treatments with the same dose of hormones as in females. The estradiol treated groups spent more time exploring the new object or the object in the new location whereas the oil treated controls spent the same amount of time exploring the new object/location and the old. This pattern shows that estradiol enhances memory. Treatment with testosterone also enhanced object placement. This preliminary result suggests that acute gonadal hormones can improve spatial recognition memory in castrated male rats. Whether these acute hormone treatments increase dendritic spine density in the prefrontal cortex and hippocampus, two areas that regulate memory, is currently under investigation. These current findings have implications in treating neurodegenerative diseases and aging that affect memory. In the future we would like to explore whether estrogen receptors and their downstream signaling molecules (ex: Raf-1 proto-oncogene) are altered to enhance in memory and learning.</p>
24	<p>Presenter: Cody Chan, <i>Psychology with concentration in Behavioral Neuroscience</i> Psychology Honors Program Faculty Mentor: Shirzad Jenab</p> <p>Sex Differences in Anxiety-like Behavior & the Biochemical Effects of Cannabinoids on the Nucleus Accumbens</p> <p>Women are more susceptible to developing cannabinoid dependence and/or an anxiety disorder than are men. Cannabinoids can produce strong anxiety-inducing and anxiety-relieving responses in human and animal tests of anxiety depending upon dose and sex. Low acute doses of cannabinoids are anxiolytic while high and/or chronic doses are anxiogenic. In this study we examined if the biphasic behavioral effects of cannabinoids that have been demonstrated in males are also present in females.</p>
25	<p>Presenter: Deena Chanowitz, <i>Biological Sciences</i> HHMI (Howard Hughes Medical Institute) Co-authors: Matthew Utter, David Foster Faculty Mentor: David Foster</p> <p>Absence of Rb Confers Rapamycin Resistance to Cancer Cells</p>

	<p>High doses of rapamycin (20 μM) have been found to be effective in killing cancer cells in the absence of serum in vitro. This apoptotic effect is believed to be cell cycle specific. The cells tend to die when they are treated with rapamycin during S-phase. Our lab has found in previous research that there appears to be a trend where rapamycin resistance may correlate with the Rb null mutation. Recent data has shown that high dose rapamycin leads to inhibition of Rb phosphorylation. Unphosphorylated Rb binds to the transcription factor E2F and prevents it from binding to DNA. When Rb is phosphorylated, it dissociates from E2F and allows E2F to transcribe genes necessary to progress through S-phase. Therefore, unphosphorylated Rb will bind to E2F and the cells will halt in S-phase and undergo apoptosis. We hypothesize that high dose rapamycin's cytotoxic effect occurs when it targets cells that are unable to progress through S-phase, and that cells that lack Rb are unable to sequester E2F and will progress through S-phase evading apoptosis. Rb's role in the apoptotic effects of high dose rapamycin will be evaluated through drugs inhibiting E2F activity in Rb-null cells, plasmids inserting Rb in Rb-null cells, and siRNA knocking down Rb in Rb-wild type cells.</p>
26	<p>Presenter: Anahi Garnelo, <i>Computer Science</i> Faculty Mentor: Lei Xie</p> <p>Exploring a Cost Effective Strategy for Drug Discovery by Mining Big Data of Adverse Drug-Side Effects</p> <p>Developing new drugs to treat or prevent diseases requires a lot of time and effort with a small success rate and a high capital cost. One of the fundamental problems in the conventional drug discovery paradigm is that the drug is mainly tested in test tubes, cells, or on animals before it progresses to clinical trials. Actual drug response in human, both therapeutic effects and side effects, cannot be determined in advance. To address this grand challenge, we propose a new solution that may allow researchers to make informed decisions when developing new drugs or repurposing existing drugs to treat new diseases. The approach we suggest is mining already existing data via the OpenFDA database to determine the relationships between drugs based on the adverse side effects they cause patients taking the medication. The OpenFDA database contains 3,814,223 records which translate to over 75 GB of data. We have developed methods to transfer and process this extremely large data set. We are developing new algorithms to recognize hidden pattern and extract useful information from this data. It is expected that this alternative way of looking at the drug discovery and development process could potentially prove to be not only effective but cost efficient as researchers would have prior knowledge of drug response in human.</p>
27	<p>Presenter: Natalia Grube, <i>Anthropology</i> Undergraduate Research Initiative Fellow Co-authors: Emma Cancelliere, Jessica Rothman Faculty Mentor: Jessica Rothman</p> <p>How Does Infant Care Affect Maternal Activity Budgets? A Test with Arboreal Monkeys</p> <p>The energetic costs of parenting can limit the mobility and behavior of primates, as they must compensate for the added weight and restriction of infant carrying. In this study we explored whether infant carrying is related to activity budgets in arboreal guenons, <i>Cercopithecus ascanius</i>. We observed the behavior between infant and mother to explore potential energetic costs to feeding, traveling and foraging. We hypothesized that when the mother is</p>

	<p>independent from the infant she will spend more time feeding, foraging and resting, and less time traveling. We also assumed that the mother would travel more while the infant was attached to her. With over 70 focals recorded we pooled activities into two categories: “active” (scored as all activities besides resting) and “inactive” (resting). On average mothers carried their infants more often while traveling (64% of the time) than other activities. We examined the activity budgets of mothers while carrying infants and when alone, and found that they were significantly different ($\chi^2=103.95$, $df=1$, $p<0.0001$). Our results suggest that mothers carry infants most often when they were traveling than other activities.</p>
28	<p>Presenter: Rochelle Langman, <i>Psychology</i> Undergraduate Research Initiative Fellow Faculty Mentor: Dawn Dugan</p> <p>The Relationship between Attachment Style, Life Satisfaction, and the Need to Belong</p> <p>Past research has found evidence to show that human beings are fundamentally motivated to satisfy their need to belong. Satisfying this need involves forming and maintaining positive, fulfilling relationships with individuals who mutually care about each other’s wellbeing. When satisfied, the need to belong can have benefits on one’s health and contribute to having a positive affect; whereas the lack of belongingness has been linked to having a negative affect and feelings of loneliness. Similarly, attachment theory also explains the importance of forming positive bonds. While there is currently strong evidence to show how important healthy attachments and relationships can influence one’s overall life satisfaction and wellbeing, what is required is further research to see how these variables correlate and affect one another. In our study, researchers administered a scale to measure each participants' need to belong, a scale to measure life satisfaction, and lastly one to identify their attachment style within the context of their closest relationships. We predict preliminary findings will show participants with an anxious/ambivalent attachment as demonstrating a higher need to belong and a lower sense of life satisfaction. In addition to this, we predict participants with an avoidant attachment style will demonstrate a lower need to belong and a higher sense of life satisfaction. By identifying to what degree the role of attachment style and the need to belong affects one’s life satisfaction, researchers will be able to better predict populations who would benefit from early-intervention practices in an effort to help improve life satisfaction.</p>
29	<p>Presenter: Patrick Moy, <i>Chemistry</i> Macaulay Honors College Co-author: Emaad Kwaja Faculty Mentor: Charles Drain</p> <p>Synthesis of Phthalocyanine Derivatives with near IR absorption for Materials and Biomedical Applications</p> <p>Photosensitive dye molecules are becoming increasingly renowned for their potential use in a variety of fields. In particular, adducts derived from phthalocyanines (Pc), which are aromatic macrocycles commonly used as dyes, could prove to have great materials and biomedical applications. The overall goal of our research is to develop facile synthetic methods for generating Pc derivatives with expanded π-systems. Increasing the spatial delocalization of the molecular orbitals stabilizes them and decreases the HOMO-LUMO gap. This leads to a red-shifted absorbance that should be ideal for various biomedical and materials applications.</p>

	<p>Click-type substitution chemistry is performed on zinc hexadecafluoro phthalocyanine (ZnF₁₆Pc). An unexpected discovery showed that addition of a 7-membered ring on the outside of ZnF₁₆Pc induces sterics causing the planar Pc macrocycle to twist and distort. This distortion results in a huge shift in the UV-visible spectroscopy peak. The resulting peak is also much broader because of flexibility in the macrocycle. A facile microwave assisted substitution of the fluorines on ZnF₁₆Pc with an alkyl substituted polyamine, Isodecyloxypropyl-1,3-diaminopropane, yields a product with near IR absorption. The resulting compound is highly soluble in organic and aqueous solvents and is expected to have great biomedical applications and can potentially prove to be an effective Photodynamic Therapy (PDT) agent and be a viable dye for surface enhanced Raman Spectroscopy (SERS).</p>
30	<p>Presenter: Roy Nunez, <i>Biological Sciences</i> MARC (Maximizing Access to Research Careers) Faculty Mentor: Weigang Qiu</p> <p>Evolution of Flagella Operon in Spirochetes</p> <p>Spirochetes are a family of gram-negative, spiral bacteria and are unique in having periplasmic flagella whose filaments reside between the outer and cytoplasmic membranes. Their flagella are used for motility and are a major virulence factor. Spirochetes are able to swim in highly viscous, gel-like medium, such found in connective tissues, which normally inhibits other bacteria [cite?]. Some spirochete bacterium such as <i>Borrelia burgdorferi</i> and <i>Treponema pallidum</i> are causal agents in Lyme disease and syphilis, respectively. The flagella operon encodes a group of genes encoding the structure components as well as the regulatory proteins of the bacteria's flagella. Although the basic structure of the flagellum is fairly well conserved across bacteria, preliminary genome analysis suggests that the flagella operon varies among spirochete species especially among <i>Treponema</i> species. BLAST searches of individual flagellar genes in the operon across available <i>Treponema</i> genomes will be employed to quantify the gene shuffling and rearrangements of the flagella operon during the evolution of spirochete. Comparative and phylogenetic analyses will be used to identify the ancestral gene orders so that evolutionary history of gene arrangement of this important bacterial operon can be reconstructed. The result of the phylogenetic analysis will be used to test the hypothesis that genetic variations of the flagella operon among <i>Treponema</i> species contribute to their functional and ecological differences.</p>
31	<p>Presenter: Aminoor Rashid, <i>Chemistry II: Biochemistry</i> Co-authors: Marlon Jansen, Jessemae Nethercott Faculty Mentor: Thomas Schmidt-Glenewinkel</p> <p>Age Associated Decline of Proteasome Function and its Effects on Protein Aggregation in <i>Drosophila Melanogaster</i></p> <p>Aging is a significant but poorly understood factor that contributes to the pathology of neurodegenerative diseases. Alzheimer Disease (AD), one of the most common neurodegenerative diseases is characterized by the accumulation of intracellular neurofibrillary tangles and amyloid multimers as well as extracellular amyloid plaques. Since the ubiquitin proteasome pathway (UPP) is responsible for the breakdown and removal of proteins, a malfunction in this pathway may be an important factor in the etiology of AD. To further elucidate the cellular mechanisms of AD, we will overexpress the genes for amyloid</p>

	<p>precursor protein (APP), beta- secretase (BACE), and Tau in <i>Drosophila melanogaster</i>. Our studies will focus on the relationship between beta amyloid and tau protein accumulation and proteasome function. We hypothesize that in these experiments we will observe a relationship between AD and proteasome activity resulting in a build-up of protein aggregates.</p>
<p>32</p>	<p>Presenter: Nunny Reyes, <i>Environmental Studies</i> Faculty Mentor: Allan Frei</p> <p>Carbon Dynamics of Surface and Down Core Sediments of Piermont Marsh, Hudson River Estuary</p> <p>Tidal wetlands play a major role in the carbon cycle because they store high levels of carbon within their sediment. We explored the percent carbon, depth of marsh sediments, and concentration of heavy metals on a total of six transects throughout the Piermont Marsh in the Hudson River Estuary. Through Loss-On-Ignition (LOI), probing via fiberglass rods, and portable X-ray Fluorescence (pXRF), a total of thirty surface sediment samples and a core sample from the southernmost point of Piermont Marsh, Eel Creek, were collected and analyzed. Using the information from our surface sediment data from current and past years, a contour graph of the estimated distribution of percent carbon throughout the marsh was made. Further, compiled data of the minimum depth at different areas in the marsh were mapped, and using LOI results from the Eel Creek Core, the depth values were used to calculate a minimum estimate of the amount of carbon in the marsh. In addition, our down core sample was tested for heavy metals using pXRF. Results indicate rising levels of lead concentrations in the upper portion of the core, demonstrating the impact of humans on the environment. Ultimately, this study emphasizes the importance of preserving wetlands due to their role as a major carbon sink and impact on the global carbon system.</p>
<p>33</p>	<p>Presenter: Rehma Saleem, <i>Undeclared</i> Faculty Mentor: Sean Molloy</p> <p>How does the Rhetoric of the New York Times Encourage Anti-Muslim/Islamic Sentiment?</p> <p>According to the University of California, Berkeley, Islamophobia, in its most general form is "unfounded hostility towards Muslims, and therefore fear or dislike of all or most Muslims."(Center for Race and Gender, Berkeley) The phenomenon dates back centuries, however the word starting getting used in the 1990s in Europe. In his book, (Mis)Representing Islam: The Racism and Rhetoric of British Broadsheet, John E. Richardson argues that journalism and mass-communicated media represents Muslims and Islam in a negative light. He defines the Orientalist approach to Islam as “essentialist, empiricist, and historicist” and that it “impoverishes the rich diversity of Islam” (pg 5). For my research, I analyzed different headlines and articles in the New York Times to see how they used their rhetoric to influence their audience on Islam, and perpetuate the belief that Richardson argues. I wanted to find out how, and if at all, the NY Times associates certain words that have negative connotations, with Islam. I did so by analyzing headlines, frequency of negative words, and their proximity to words like Islam and Muslim.</p>

<p>34</p>	<p>Presenter: Demelio Urbano, <i>Biological Sciences and Psychology</i> Macaulay Honors College and Thomas Hunter Honors Program Faculty Mentor: Cheryl Harding</p> <p>The Relationship between Body Weight and Pain Perception after Mold Exposure</p> <p>People chronically exposed to moldy buildings exhibit respiratory symptoms, chronic fatigue, headaches, joint and muscle pain, cognitive problems, and a variety of other health issues. To our knowledge, no research has been published examining how mold exposure causes these health problems. We examined the effect of the heavily studied common household mold, <i>Stachybotrys charatum</i>, on cognition and physiology. In our initial research, we found strong relationships between body weight and behavioral responses. We decided to examine whether there was a relationship between weight and pain perception. Specifically, we correlated pain thresholds with the animal's weight on the day of testing. Male C57BL/6 mice were instilled three times a week with (1) intact <i>Stachybotrys</i> spores, (2) extracted <i>Stachybotrys</i> spores that had their proteins denatured and toxins removed, or (3) saline vehicle. Mice's pain thresholds were tested three times across the span of six weeks as they were instilled with either spores or saline. Spore-treated males had significantly lower pain thresholds at the first test. Weight did not differ across groups at any point in this experiment. However the more the vehicle- and intact-spore-treated animals weighed, the more likely they were to display increased sensitivity to pain. Weight, even among animals in the normal weight range, is related to their inflammatory and pain responses to both control treatment and intact spore exposure.</p>
<p>35</p>	<p>Presenter: Shaneka Whittick, <i>Psychology</i> MARC (Maximizing Access to Research Careers) Faculty Mentor: James Gordon</p> <p>A Comparative Electrophysiological Analysis of Visual Acuity in Males and Females</p> <p>The objective of this research is to test whether there are differences in visuospatial processing between male and female brains. Previous research has shown that there are marked sex differences in other sensory functions such as the audition and olfaction. Sex hormones, specifically androgens, have been identified as a significant component in these marked differences. The visual cortex has the highest density of androgen receptors in the brain but visual cortical neurophysiology has been the least studied of the senses. In order to assess these potential differences visual evoked potentials were used. The stimuli were square-wave contrast reversed at 7Hz and presented in a sweep at 6 different spatial frequencies, 1.6, 3.2, 6.4, 12.8, 25.6 and 51.2 cycles/degree. Relevant temporal frequency responses were extracted using Fourier analysis, and the acuity was generated by computing the spatial frequency at which the signal/noise ratio became less than 1. Mean acuities were then computed for males and females as well as spatial frequency of maximum amplitude response. Males showed significantly higher acuity responses. Mean acuity for males= 42.9 cycles/degree and females= 39.0 cycles/degree ($t(49)=2.148, P<.05$). Also, males showed maximum amplitude response at higher spatial frequencies than females. In conclusion, there are marked sex differences in the neural responses in primary visual cortex between males and females. This suggest that behaviorally measured acuity differences may be due to androgen receptors, which likely play a significant role in visual processing.</p>

36	<p>Presenter: Julia Williams, <i>German and Political Science</i> Faculty Mentor: Lisa Marie Anderson</p> <p>Der blonde Eckbert: das simultane Verleugnen und Aufgreifen des Märchens in der frühromantischen Novelle</p> <p>In his 1797 novella, er blonde Eckbert, Ludwig Tieck embraces common fairytale motifs, while simultaneously and expressly denying that his novella is a fairytale. This essay seeks to understand Tieck’s motives for both taking up and repudiating the fairytale while considering late 18th century thought in general and early Romantic ideas in particular, specifically with regard to individuality and love, as well as his contributions to the Germanic fairytale tradition. An examination of the formal eclecticism of the novella and the ambivalence of both its characters and the readership is followed by a study of Tieck’s use of the fairytale as an expression of contemporary thought vis-à-vis individuality and love. The distinction between punishment and consequence, subtly implied by Tieck in the text, is used to explore the key differences between er blonde Eckbert and standard fairytales. Throughout, my inquiry draws upon research by Frederick C. Beiser and Azade Seyhan. I conclude that Tieck cleverly uses the guise of the standard fairytale to convey modern ideas, thus allowing one to read er blonde Eckbert as a unique “fairytale” fit for the late 18th century.</p>
37	<p>Presenter: Naima Zahid, <i>Undeclared</i> Roosevelt Scholar Faculty Mentor: Sean Molloy</p> <p>Does Rolling Stone Sexually Objectify and Under-represent Women on its Cover?</p> <p>The sexual objectification of women is a major issue in today’s society. Women are constantly objectified in television, advertisements and even on covers of well-known magazines. This continuous objectification sends across the wrong message about women in our society. Along with being objectified women are also under represented in many forms of media. Rolling Stone magazine seems to follow this trend of sexually objectifying and under representing more women as opposed to men. In this work, I follow the methods created by Mary Nell Trautner and Erin Hatton (assistant professors of sociology at SUNY Buffalo) who previously conducted a study to test the levels of sexualization on the cover of Rolling Stone. I extend their original study (from 1967-2009) to examine if Rolling Stone has continued this trend of sexually objectifying and under-representing women in the past 5 years. This paper examines the different levels of sexualization (non-sexualization, sexualization, and hyper-sexualization) and the gap of representation between men and women on the cover of Rolling Stone.</p>
38	<p>Presenter: Habib Zahir, <i>Biological Sciences</i> MBRS-RISE (Minority Biomedical Research Support—Research Initiative for Scientific Enhancement) Co-authors: Jyoti Panta, Joseph Verdi, Jayne Raper Faculty Mentor: Jayne Raper</p> <p>Antimicrobial Action of Primate Innate Immunity Against Kinetoplastida Parasites</p> <p>Human high-density lipoprotein (HDL) provides innate immunity against <i>Trypanosoma brucei</i> ssp. and <i>Leishmania</i> sp. This immunity is due to the presence of a complex called</p>

Trypanosome Lytic factor-1 (TLF-1), which constitutes 1% of total HDL. TLF-1 enters the African trypanosome via receptor-mediated endocytosis, and traffics to the lysosome thus initiating parasite death. For the intracellular pathogen Leishmania, TLF-1 and Leishmania are phagocytosed by host macrophages, where together they localize in the acidic phagolysosome. Therein, TLF-1 activation leads to pore formation in the microbe. The key components of TLF-1 are apolipoprotein L-1 (APOL-1) and haptoglobin-related protein (HPR). In the human population, there are variant genes coding for APOL-1, the lytic component. Certain variants show geographic specificity and may have been selected for by trypanosomes, which are endemic in Africa. We hypothesize that Leishmania may have selected some of the APOL-1 gene variants. We propose to test this hypothesis by screening the protein's ability to kill African trypanosomes and Leishmania in vitro and in vivo using a transient transgenic mouse model. To this end, we have expressed human APOL-1 and HPR in our mouse model via hydrodynamic gene delivery. Next, techniques such as, density gradient centrifugation, size fractionation and western blotting, were used to confirm the expression of TLF-1. Using these approaches, we also aim to understand if APOL-1 and HPR can reconstitute into the same HDL particle, using two independent plasmids, one expressing HPR and the other APOL1. The result of this experiment will shed light on TLF-1 assembly in vivo.

Wednesday, March 25th, 2015

Poster Session #3

2:00pm–4:00pm

39	<p>Presenter: Rena Abramova, <i>Mathematics</i> John P. McNulty Scholar Faculty Mentor: Robert Thompson</p> <p>Stochastic Differential Equations</p> <p>A Stochastic Differential Equation (SDE) is a differential equation with at least one term being a stochastic process. In probability theory, a stochastic process is a collection of random variables depending upon time. The solution of a stochastic differential equation is a stochastic process. Stochastic differential equations are used to model diverse phenomena and therefore have numerous applications in engineering, physics, finance and economics. One application of stochastic differential equations to mathematical finance is options pricing models, which use stochastic differential equations to model fluctuating stock prices. Another application of stochastic differential equations is thermal noise in physics. Thermal noise is the electronic noise generated by the random thermal motion of the charge carriers inside an electrical conductor at equilibrium. In this poster presentation I will summarize some of the key features of this topic.</p>
40	<p>Presenter: Naxhije Berisha, <i>Biochemistry</i> John P. McNulty Scholar Co-authors: Chris Farley, Charles Drain Faculty Mentor: Charles Drain</p> <p>Photophysics of GO Conjugates</p> <p>The unique properties of graphene oxide (GO) makes it an excellent platform for functional</p>

	<p>materials for diverse applications such as for solar energy and for therapeutics. Because it has the ability to solublize drugs and stabilize enzymes, GO show great promise as a component of therapeutics, but may also serve as the active agent in and of itself. The non-homogenous structure of GO is described as a surface composed of a substituted network carbon with alcohol and epoxide functionalities on the planes, and carboxylic groups along the edges and large defects. This makes it possible to covalently functionalize GO in various ways. The goal of this project is to make small flakes of GO and attach dyes with known therapeutic value. I will use spectrometric techniques both to confirm attachment of the dye and to analyze the photophysics and other properties of the conjugates. Future work will include in vitro analysis.</p>
41	<p>Presenter: Janet Borrero, <i>Computer Science</i> John P. McNulty Scholar Faculty Mentor: Saad Mneimneh</p> <p>Classification of Cone Snail Toxins using Profile Hidden Markov Models</p> <p>Cone snail species (<i>Conus</i>) use venomous toxins to defend themselves from predators and capture their prey. These peptide toxins, collectively known as conopeptides, are pharmacologically valuable since they have been shown to affect the human nervous system and may lead to potential drug therapies. These conopeptide sequences, available on the ConoServer (http://www.conoserver.org) database, contain various cystine frameworks that help control protein folding structure. We propose using profile hidden markov models to assist in the classification of the conopeptides' cystine framework.</p>
42	<p>Presenter: Daniel Hart, <i>Biochemistry</i> Macaulay Honors Program and Undergraduate Research Initiative Fellow Co-authors: Travis Shaffer, Charles Drain Faculty Mentor: Charles Drain</p> <p>Efficient Synthesis of Fluorodeoxyglucose as Probes for PET Imaging of Cancerous Tissues</p> <p>In comparison to normal tissue, malignant tissue grows rapidly and has a much higher rate of metabolism. Glucose is the typical source of energy for cells and accumulates over two hundred times faster in cancerous cells. Taking advantage of this fact, a glucose analog known as fluorodeoxyglucose, [18F]-FDG, has been developed for use in positron emission tomography, commonly known as the PET scan. The positron-emitting radioactive isotope fluorine-18 replaces hydroxyl group at the 2' position in the glucose. A wide range of malignancies take up [18F]FDG, however, as a close analogue to glucose, [18F]FDG also accumulates in some normal tissues, which can lead to false-negative PET scan results. Our goal is to modify [18F]FDG to significantly increase specificity by taking advantage of the slightly acidic microenvironment due to the high rate of metabolism in cancerous tissues. Cold [19F]-FDG derivatives will be used as a model before moving on to radioactive [18F]-FDG. Therefore, the goals of this project are to: (1) develop an efficient, large scale synthesis of [19F]-FDG; (2) characterize the FDG; (3) develop methods to modify FDG, (4) characterize the derivatives.</p>

43	<p>Presenter: Gretchen Iverson, <i>Undeclared</i> Roosevelt Scholar Faculty Mentor: Sean Molloy</p> <p>Liberating and Transformative Messages in Rap Music: A Study Using the Lens of Paulo Freire</p> <p>Originating in the 1960s as an accepted form of music through the hip-hop culture, Africans, African Americans, and other ethnic groups have used the beats of rap music to express overarching race, sex, and class themes of oppression. Yet this genre has also been described as misogynistic, vulgar, and offensive. While these two deeply conflicting interpretations are most widely known, another understanding may also be found by examining popular rap song lyrics through the lens of Paulo Freire. In Freire's "Pedagogy of the Oppressed," Freire examines the relationship between the oppressed and the oppressor, as well as the importance of the oppressed transcending their persecution rather than reciprocating. This study explores the idea that popular rap music may or may not align with Freirean ideals, which would be using language with the objective of freeing not only the oppressed, but also the oppressors. The goal is to create a systematic test based on this view, including close-reading the lyrics of Grammy winners for Best Rap Song and identifying triggers words or phrases to understand if it can be determined whether or not award-winning rap music is effective or ineffective in sending liberating and transformative messages to an audience, the industry, and society that would meet Freire's standards.</p>
44	<p>Presenter: Ji Won Kang, <i>Biochemistry</i> Thomas Hunter Honors Program Faculty Mentor: Derrick Brazill</p> <p>Attraction of <i>Diaphorina citri</i> to Visual Stimuli</p> <p><i>Diaphorina citri</i>, also known as the Asian citrus psyllids, are the leading cause of the huanglongbig disease. Their attraction to visual stimuli appears to have an impact on their host plant search. In this study, the effects of four different colored sticky traps as well as five different LED lights in the visible spectrum on the behavior of Asian citrus psyllids were observed. Trap catches of <i>D. citri</i> were examined on blue, green, red, yellow and black sticky cards placed in an isolated arena. Their attraction to visual cues was observed from 11:00 to 16:00 hr. The analysis of the trap catches revealed that yellow traps caught significantly more psyllids than the other five traps; black and green traps caught more psyllids than blue and traps. The strongest attraction in the LED group was the green light followed by yellow. The findings from this study has further exemplified psyllids' tendency to be drawn toward yellow sticky traps and a specific range in the visible light spectrum; thus helping to develop more efficient traps for psyllids and to enhance our understanding of the behavior of <i>D. citri</i>.</p>
45	<p>Presenter: Diane Kogan, <i>Biochemistry</i> John P. McNulty Scholar Co-authors: Suman Mukhopadhyay, David Foster Faculty Mentor: David Foster</p> <p>Dual Inhibition of mTOR C1/2 by AICAR and Rapamycin is Synthetically Lethal</p> <p>The Mammalian Target of Rapamycin (mTOR), a major player in cell growth and survival,</p>

	<p>requires Phosphatidic Acid (PA) for signaling activity. PA, a metabolic product of Phospholipase D (PLD), positively regulates mTOR and is involved in reciprocal regulation of AMPK. The energy sensor AMPK is also a critical negative regulator of mTOR signaling. Our recent report suggests that the pharmacological activator of AMPK, AICAR, inhibits PLD activity, suppressing the role of PLD in mTOR signaling cascade. In addition rapamycin, an allosteric inhibitor of mTOR, has been used to target mTOR dependent survival signals in cancer with little success. Less is known about effects of combined treatment with AICAR and rapamycin on mTOR signaling. We report that AICAR treatment causes S-phase cell cycle arrest leading to inhibition of cell proliferation. Most importantly, treatment via AICAR and rapamycin results in synthetic lethal phenotype. Our data shows that AICAR treatment suppresses mTORC1, while inducing phosphorylation of the survival kinase AKT at Ser473, a downstream effector of mTORC2. By repressing PA production, AICAR substantially increases sensitivity of mTOR C2 to rapamycin. Furthermore, we also show that exogenously supplied PA abolished the combined effect of AICAR and rapamycin on mTOR signaling. The dissociation of rictor from mTOR is evidently complex in response to AICAR and rapamycin treatment. Consistent with this observation, ablation of rictor along with AICAR treatment results in apoptosis. Conclusively, these data suggest that AICAR together with rapamycin could be a potential strategy for therapeutic intervention.</p>
46	<p>Presenter: Nicola Kriefall, <i>Biological Sciences with concentration in Neuroscience</i> John P. McNulty Scholar and Yalow Scholar Co-author: Sean Low Faculty Mentor: Paul Feinstein</p> <p>Investigating the Mechanosensory Role of Piezo Ion Channels</p> <p>Mechanosensation converts mechanical stimuli into biological signals within excitable cells, a process essential for hearing, touch, proprioception, and pain. Recently, a family of mechanically-activated ion channels named piezos were found to mediate mechanosensation in mammals, specifically touch sensed by Merkel cells. To investigate the properties of piezos further, we utilized the three piezo homologs in <i>Danio rerio</i> (zebrafish): piezo1, piezo2a, and piezo2b. Thus far, we know that piezo2a is responsible for sensing light touch in zebrafish, and piezo1 is involved in processes such as cell extrusion and erythrocyte volume homeostasis. There is still much to uncover about these proteins. We hypothesized that the three piezos would be expressed in mechanically sensitive cells and contribute to forms of mechanosensation within zebrafish beyond the light touch response (e.g. mechanical nociception or mechanical transduction in hair cells). Preliminary results indicate a spread of differential piezo expression within Rohon-Beard sensory neurons, trigeminal ganglia, and neuromasts. Zebrafish with targeted mutagenesis of the piezos all seem to retain auditory-vestibular function, chemical and mechanical nociception, and hair cell function. Future efforts will continue to refine the distribution of piezos within zebrafish and specifically characterize the channels' mechanical sensitivity.</p>
47	<p>Presenter: Kathrynne Li, <i>Psychology</i> Faculty Mentor: Jennifer Samson</p> <p>The Need for Paraprofessionals as Effective Reading Tutors</p> <p>Students at-risk for reading failure due to minority status, poverty, disability, and limited</p>

	<p>English need intervention support at school. However, limited finances and staff lead schools to depend on paraprofessionals versus teachers to provide reading interventions. While previous research indicates that paraprofessionals can be effective tutors, it is unclear whether they can be effective with disadvantaged students who need it the most. This descriptive study analyzes existing empirical studies effective reading interventions provided by paraprofessionals with a specific focus on whether at-risk students were included in the studies. Research questions included: 1) How many empirical studies on reading interventions provided by paraprofessionals included students from diverse backgrounds (minority, disability, poverty, and ELLs); 2) Among these empirical studies, how many from each subcategory were included and in what grades? / Research methods for this study included conducting online database searches of EBSCO, PsychInfo, Google Scholar, and Web of Science and drawing data from articles that met specific criteria. Empirical studies from 1978-2013 that included the terms paraeducator, paraprofessional, tutoring, reading intervention, and literacy were data sources. This search yielded only 15 empirical studies that were included in our analysis. Findings show that there 570 participants from grades K-9. Among these studies, most were focused on early grades (K-3) with minority and low-income students. Very few were focused on ELLs and students with disabilities. This suggests the need for more studies of paraprofessionals as reading tutors for ELLs and students with disabilities who are often the most at risk for reading failure.</p>
48	<p>Presenter: Jing Liang, <i>Psychology</i> BP-ENDURE (Blueprint Program for Enhancing Neuroscience Diversity through Undergraduate Education) Co-authors: Nawshin Kutub, Jesus Angulo Faculty Mentor: Jesus Angulo</p> <p>Leptin Signaling is Mediated by NMDA-Induced Toxicity in the Mouse Striatum</p> <p>Methamphetamine (METH) is an illicit drug that causes degeneration in the striatum, a brain area that modulates motivation. This degeneration is characterized by increased cell death (apoptosis), increased production of reactive oxygen species (ROS), increased free radical formation, and decreased dopamine and serotonin levels. Moreover, METH exacerbates glutamate excitotoxicity, which triggers Ca²⁺-influxes leading to apoptosis and the release of ROS; this further contributes to neurodegeneration in METH users. Prevention of this toxicity can be beneficial to chronic and heavy users, but currently, there are no pharmaceutical agents prescribed to prevent METH-induced toxicity. Previous research in our lab has demonstrated that leptin, a hormone produced by adipocytes, decreases METH-induced apoptosis and ROS production in the striatum. As of now, we know little about how leptin affects glutamate toxicity. Therefore, the goal of this project is to determine whether leptin alters striatal glutamate receptor subunits. We hypothesize that, like other neuropeptides (e.g. Neuropeptide Y), leptin will decrease signaling on striatal neurons through the ionotropic NMDA and AMPA glutamate receptors. Preliminary results suggest that NMDA-induced apoptosis and oxidative stress are attenuated by leptin. For the current study, we plan to measure the NR2A and NR2B receptors subunits (NMDA) and the GluR1 and GluR2 receptors subunits (AMPA) by western blot analysis 24 hours after stereotaxic NMDA microinjection and leptin or saline administration to ICR mice.</p>

49	<p>Presenter: Kadee Medrano, <i>Psychology</i> Thomas Hunter Honors Program Faculty Mentor: Dawn Dugan</p> <p>Adult Attachment to Primary Caregiver and Adjustment to the College Experience</p> <p>I, Kadee Medrano, am conducting a study about how students' attachment styles differ among those who live at home with parents, from those who do not live with primary caregivers. I will be asking students to participate in a study which explores how student experiences vary among different activities and behaviors. I have identified Hunter College students as possible participants because they are currently enrolled at the college. It is anticipated that 300 individuals will participate in my study. The present research aims to better understand the role of parental attachment in regards to shaping the college experience. Previous research (John and Srivastava 1999) has found that according to the Big Five, self ratings are higher for positive traits but lower for negatives such as neuroticism. Personality is shaped by those with which we surround ourselves. According to the Big Five personality traits, I anticipate elevated levels of openness, extraversion and agreeableness in younger students and higher levels of neuroticism in graduating students. With regard to attachment, students with secure attachment styles will be more open and extraverted. Attachment styles in children are shown to predict relationship styles in adulthood (Hazan and Shaver 1987). The adult relationship mirrors those established earlier in life between infants and parents and our primary caregivers impact our personalities and help shape the kind of adults we become. Attachment may also impact one's adjustment to college. It is also important to establish relationships with peers and to have continued parental involvement as these are both predictors of college satisfaction (Lampert 2009). Therefore, studying attachment styles in college students may help us better predict which populations will succeed in a college environment and may help us identify at risk students.</p>
50	<p>Presenter: Elena Pires, <i>Biochemistry and Studio Art</i> MBRS-RISE (Minority Biomedical Research Support—Research Initiative for Scientific Enhancement) Co-author: John Moon Faculty Mentor: Mandë Holford</p> <p>Developing a Reliable Recombinant Strategy for Synthesizing Disulfide Rich Peptides from Venomous Marine Snails</p> <p>Peptidic neurotoxins derived from venomous marine snails (turrids, terebrids, and cone snails) are effective tools for investigating ion channel function and structure. They are also highly efficient and effective tools for novel therapeutic drug development. The Holford lab is focused on the discovery, characterization and delivery of terebrid peptide toxins, teretoxins, as potential therapeutic agents. Novel peptides Tg77 from <i>Terebra guttata</i>, Tan10.1 and Tan 6.5 from <i>Triplostephanus anilis</i>, were synthesized using a recombinant expression strategy. Recombinant synthesis is an effective way to produce peptides longer than 30 amino acids and aids. A reliable recombinant strategy will also aid in the conservation of terebrid snails as extraction of natural products from live specimens yields insufficient amounts and involves the sacrifice of many specimens. Teretoxins were recombinantly expressed in an <i>E. coli</i> bacterial host via Ligation-Independent Cloning and transformation. After purification of the fusion protein by Histidine-tag affinity chromatography, enterokinase enzymatic cleavage</p>

	<p>yielded the desired folded Tg77 teretoxin, which was purified and characterized using Reverse-Phase High Performance Liquid Chromatography and mass spectrometry. Preliminary bioactivity of Tg77 was confirmed by way of a phenotypic worm assay, using <i>N. virens</i> polychaetes. Bioactivity of Tg77 suggests the recombinant strategy is possible to produce structurally active teretoxins. Tan10.1 and Tan6.54 were also successfully expressed and are currently being characterized. These efforts will devise a reproducible protocol for the recombinant synthesis of teretoxins to generate sufficient amounts of peptide for structural and biological characterization.</p>
51	<p>Presenter: Amanda Ramdular, <i>Chemistry</i> MARC (Maximizing Access to Research Careers) Co-authors: Patricia Gonzalez, Stewart Bachan, David Mootoo Faculty Mentor: David Mootoo</p> <p>Synthesis of Tetrahydrofuran Containing Annonaceous Acetogenin Prodrug Using a Carbamoylated Mannose Vector</p> <p>Many cancer chemotherapies do not specifically target cancer cells and often result in systemic toxicities that lead to serious side effects. The tetrahydrofuran containing annonaceous acetogenins (THF-AGE's) are an extremely potent class of cytotoxic agents that are active against a broad spectrum of cancer cell lines. However, because of their ubiquitous cytotoxicity, THF-AGE's are not clinically useful. The overall aim of this project is to develop analogues of THF-AGE's that specifically target cancer cells. Our strategy is a pro-drug approach in which a THF-AGE is linked to a tumor-specific vector that is cleaved to release the THF-AGE after the drug is delivered to the tumor. The THF-AGE that will be used is 4-deoxyannonetocuin (DAN), which will be conjugated via a traceless disulfide linker to the vector, a 3-O-carbamoyl-mannose derivative. The latter comprises the structure of the bleomycin family of antitumor agents and is believed to be primarily responsible for the tumor specificity shown by the bleomycins. We hypothesize that the carbamoyl-mannose vector will enhance tumor specificity of this pro-drug of DAN. We further hypothesize that, after internalization, attack of the disulfide moiety in the pro-drug by intracellular glutathione will liberate DAN, which will exert its cytotoxic effect. This presentation will focus on the synthesis of the active drug, DAN, the tumor vector, a 3-O-carbamoyl mannose, and the conjugation of drug and vector. Future studies will involve cell studies on cytotoxicity and specificity using fluorescent derivatives.</p>
52	<p>Presenter: Yuleisy Ruiz, <i>Medical Laboratory Sciences</i> Co-authors: Yruiy Shvarts, Kristina Kozlitina Faculty Mentor: Shahana Mahajan</p> <p>Riluzole Prevents Activation of Metabotropic Glutamate Receptors and Downstream Signaling Pathways in Osteosarcoma Cells</p> <p>Human metastatic osteosarcoma cell line, LM7 shows aggressive and invasive growth behavior. Altered surface adhesion molecules play a major role in metastatic nature of the tumor. However, signaling molecules that stimulate the growth of the cells were not known. Especially the effect of glutamate on cell growth was not investigated. Our studies with LM7 cells show that these cells not only secreted glutamate but also use glutamate for autocrine</p>

	<p>signaling for stimulating growth. Riluzole, a glutamate release blocker, inhibits proliferation, induces apoptosis and prevents migration of LM7 cells. Interestingly, specific inhibitors of mGluR1 and mGluR5 also inhibit proliferation and survival of LM7 cells confirming that glutamate signaling is occurring via their activation. Furthermore, Riluzole prevents downstream signaling, by mGluR1 and mGluR5, by preventing the activation of AKT, ERK1/2 and Yap-1. Our results support that drugs such as Riluzole have therapeutic potential for treating glutamate-secreting cancers.</p>
53	<p>Presenter: Chhime Sherpa, <i>Biochemistry</i> John P. McNulty Scholar Co-authors: Dmitry Cherevatsky, Stephen Jannetti, Mandë Holford Faculty Mentor: Mandë Holford</p> <p>Developing Novel Imaging Agents Using Fluorescently Labeled Peptides From Venomous Terebrid Marine Snails</p> <p>The disulfide rich peptides found in the venom of predatory marine snails, such as the Terebridae (terebrid), are promising candidates for drug discovery. This poster describes the synthesis and initial characterization of two novel terebrid venom peptides (teretoxins), Ta5, from <i>T. argosyia</i>, and Tv1 from <i>T. variegata</i> using Fluorenylmethyloxycarbonyl (Fmoc) Solid phase peptide synthesis (SPPS). Ta5 and Tv1 were synthesized on a solid support using pre-loaded Wang resin. An orthogonal protection strategy was used to induce the addition of fluorophore 5(6)-carboxyfluorescein (FAM). Specifically, Lysine (Lys) residues protected by tert-butyloxycarbonyl (Boc) protecting group were deprotected after synthesis and activated FAM was conjugated to the Lys free amine. After deprotection of side chain protecting groups and cleavage from pre-loaded Wang resin solid support, the purity of FAM labeled Ta5 and Tv1 was determined using High Performance Liquid Chromatography (HPLC) and Liquid Chromatography/Mass Spectrometry (LC/MS). The FAM labeled peptides were then folded using thiol assisted air oxidation to obtain their active conformation. The successful synthesis of fluorescently labeled Ta5 and Tv1 will enable these peptides to be used as imaging agents to determine their molecular targets in vivo.</p>
54	<p>Presenter: Esraa Soliman, <i>Biochemistry</i> John P. McNulty Scholar and Thomas Hunter Honors Program Co-authors: Gamage Aruggoda, Frida E. Kleiman Faculty Mentor: Frida E. Kleiman</p> <p>Role of Ubiquitinated HuR in mRNA 3' Processing during DNA Damage Response</p> <p>During DNA damage response (DDR), control of mRNA stability is essential for regulation of gene expression and DNA repair. HuR is an RNA binding protein that plays important roles in regulating the stability of mRNA targets involved in DDR. HuR can be ubiquitinated resulting in its release from the target mRNAs. Our aim is to identify the E3 Ub ligase involved in HuR ubiquitination and elucidate how ubiquitination of HuR plays a role regulating the stability of one of its targets, the p53 transcript. Our results indicate that the E3 Ub ligase BRCA1/BARD1 can modify HuR using in vitro ubiquitination reactions. siRNA-mediated knockdown of BRCA1/BARD1 decreased HuR ubiquitination in HCT116 cells. Previous studies indicate that both the mRNA processing factor CstF-50 and the escort factor p97 play a role in BRCA1/BARD1 substrates ubiquitination. Our co-immunoprecipitation assays showed that</p>

	<p>p97, CstF-50, HuR, and BRCA1/BARD1 can form (a) complex(es) in HCT116 cells. Both GST-CstF-50 and His-p97 inhibited in vitro HuR ubiquitination by BRCA1/BARD1. Interestingly, HuR ubiquitination decreased binding of HuR to p53 mRNA, allowing the binding of mRNA destabilizing factors, such as PARN deadenylase and Argonaute, to p53 transcript. Based on these results, we propose a model where under non-stress conditions BRCA1/BARD1 ubiquitinates HuR, inducing HuR release and PARN/Ago2 binding to target mRNAs and resulting in destabilization of mRNAs involved in DDR. After UV treatment, HuR ubiquitination by BRCA1/BARD1 is inhibited by CstF-50/p97, resulting in HuR binding to target mRNAs and the stabilization of mRNAs involved in DDR.</p>
55	<p>Presenter: Harika Thambireddy, <i>Biological Sciences and Neurobiology</i> Faculty Mentor: Maria Pereira</p> <p>Analysis of Lysosomal Function in Motor Neuron-like Cells Expressing ALS-linked Mutant SOD1</p> <p>Amyotrophic lateral sclerosis (ALS) is a progressive neurodegenerative disease characterized by motor neuron degeneration. Familial ALS occurs in 10% of all ALS cases, and 20% of familial cases are caused by mutations in the superoxide dismutase (SOD1) gene. While normal SOD1 protect cells against oxidative stress, mutant SOD1 has been implicated in harmful cellular processes, such as gain of toxic function, endoplasmic reticulum stress, and mitochondrial dysfunction. Although primarily a cytosolic enzyme, SOD1 also localizes in mitochondria, key organelles in cellular energy production and metabolic homeostasis. The maintenance of a pool of healthy mitochondria is achieved through mitochondria quality control mechanisms (MQC), which require active lysosomal degradation of cargoes. / Previous studies showed the accumulation of damaged and dysfunctional mitochondria in ALS neurons Thus, we aimed to investigate the role of MQC by expressing G93A (mutant) and wilt-type SOD1 in motor neuron-like NSC34 cells and inducing oxidative stress to mimic ALS conditions in these cells, Following immunodetection of LAMP1 protein, quantification of lysosomal density in cell bodies and neurites revealed a marked decrease in neurons expressing mutant SOD1, compared to control cells. In vivo confocal microscopy experiments using the probe LysoTracker Red showed reduced number of lysosomes in mutant cells. Starving response involving nuclear translocation of transcription factor EB (TFEB), the master controller of lysosomal biogenesis, is currently under study. Implications of defective lysosomal network on MQC processes might represent a new pathway of degeneration in ALS and can be potentially modulated to stimulate efficient mitochondria recycling in neurons.</p>
56	<p>Presenter: Alla Uts, <i>Biological Sciences</i> Macaulay Honors College and John P. McNulty Scholar Co-authors: Michael Urbanski, Mitchell Goldfarb Faculty Mentor: Mitchell Goldfarb</p> <p>Involvement of Islet Brain-2 in Olfactory Perception in Mice</p> <p>Phelan-McDermid Syndrome (PMS) is a neurodevelopmental disorder and a known cause of autism spectrum disorder (ASD). PMS is characterized by autistic features, including decreased social interaction, hypotonia, and delayed or absent speech. Its symptoms are associated with the hemizygous deletion of genes at the terminal part of chromosome 22, with one of the deleted genes being Islet Brain-2 (IB2). Previous studies have shown that IB2 knockout (IB2KO) mice show social interaction deficiencies compared to the wild-type (WT)</p>

	<p>mice, as well as an inability to mate. Given this established deficit in the IB2 knockout mice, we decided to test if changes that occur are due to the olfactory perception of pheromones. Pheromones are heavily involved in mating behavior and gender identification. Two key olfactory sensory organs that are involved in detecting pheromones in mice are the main olfactory epithelium (MOE) and the vomeronasal organ (VNO). Using a neuronal activity marker c-Fos, we observe the changes in neuronal activation in the MOE and VNO between WT and IB2KO mice upon pheromone stimulus. Findings will show if the IB2 gene is involved in courtship and mating behavior. Comparing innervation patterns in MOE and VNO between the WT and IB2KO will reveal any deficiencies in the olfactory sensory organs.</p>
57	<p>Presenter: Roseann Weick, <i>Biochemistry</i> John P. McNulty Scholar and Macaulay Honors College Co-authors: Anna Katkovskaya, He Huang, Nancy Greenbaum Faculty Mentor: Nancy Greenbaum</p> <p>Biochemical Structure Probing of the SAM1 Riboswitch</p> <p>Riboswitches are gene regulatory elements in noncoding regions of mRNA that, when bound to a specific metabolite, undergo a structural change that results in altered expression of the protein encoded by the mRNA in question. The goal is to utilize the selective 2'-hydroxyl acylation analyzed by primer extension (SHAPE) technique to probe the solution structure of the SAM1 riboswitch. SHAPE is a form of biochemical structural probing that identifies nucleotides not constrained by stacking or pairing, i.e. the most flexible regions, by derivatizing the ribose sugar under a wide range of solution conditions. Assay of the pattern of reactive nucleotides of the SAM1 riboswitch by capillary electrophoresis will then provide information on the secondary and tertiary structure of the RNA molecule. Two SHAPE reagents, NMIA and 1M6, will be used to identify flexible regions of the RNA. NMIA preferentially reacts with riboses that exhibit slow immobilization by base pairing, whereas 1M6 prefers to react with riboses unconstrained by stacking interactions (1). Since these reagents tend to favor reactions at different flexible regions of the RNA, subtle differences in conformational change can be detected. A comparison of the reactivity and folding of the SAM1 riboswitch with the two SHAPE reagents will help to distinguish regions structured by base stacking versus base pairing, and therefore assist us in understanding the noncanonical and tertiary structure of this riboswitch. (1) Steen, K.A., Rice, G.M., Weeks, K.M. (2012) "Fingerprinting Noncanonical and Tertiary RNA Structures by Differential SHAPE Reactivity". <i>J. Am. Chem. Soc.</i> 134, 13160-13163</p>
58	<p>Presenter: Linda Wong, <i>Psychology</i> John P. McNulty Scholar Faculty Mentor: Cheryl Harding</p> <p>The Effect of Body Weight Following Mold Exposure</p> <p>People who live or work in moldy buildings often complain of mood/emotional problems. We administered precise amounts of mold to mice to determine if mold could cause such problems in an animal model. We investigated the effect of mold on auditory-cued memory in mice. Three groups of mice were used: mice exposed to saline vehicle (VEH), mice exposed to intact <i>Stachybotrys chartarum</i> spores (IN) that contained toxins, and mice exposed to extracted <i>Stachybotrys chartarum</i> spores (EX) that had their contents removed. When tested</p>

	<p>25 hours after training, the mice in the intact spore group moved significantly less than the mice in the saline vehicle group, showing that the mice exposed to the intact spores were more fearful of the auditory cue. Since we found that body weight was related to the animals' responses to mold on other behavior tests, we examined the relationship between weight and auditory-cued fear. Body weight at several points in the experiment was highly correlated with fear of the auditory cue for IN, and to a lesser extent VEH, but not EX mice. Thus, the toxin-laden IN spores had very different effects than the EX spore skeletons. While it was known that obesity could cause such adverse changes in behavior, our lab is the first to report such effects in normal-weight animals. Our data suggest that increased body weight increases the risk of adverse effects following mold exposure.</p>
<p>59</p>	<p>Presenter: Nadha Fathima Yakoob, <i>Biochemistry</i> John P. McNulty Scholar Faculty Mentor: Cheryl Harding</p> <p>The Effect of Mold Exposure on Body Weight, Antibiotic Treatment Counters this Effect</p> <p>Over one third of American buildings are moldy and existing evidence shows that mold exposure in water-damaged buildings increased anxiety, depression, chronic fatigue, pain, and cognitive problems. Previously, our lab found that exposure to mold causes memory deficits in mice, which are highly correlated with increases in a number of markers of innate immune function in the hippocampus. In this study, we examined whether treatment with doxycycline, a tetracycline antibiotic, can ameliorate the effects of mold exposure. Previously, we found that body weight is more strongly correlated with brain inflammation and negative cognitive changes than spore dose. Due to this, we examined whether treatment with doxycycline affects body weight. This was done by studying the correlation between the body weights of adult male C57Bl/6 mice and the amount of diet consumed. Our current study used four groups of mice 1) Intact spores/control diet, 2) Intact spores/doxycycline diet, 3) Vehicle/control diet, or 4) Vehicle/doxycycline diet. We found that prior to instillation of <i>Stachybotrys</i> spores, all groups showed a significant positive correlation between body weight and the amount of diet consumed. This correlation broke down in all but the vehicle/control diet group when instillations began. The relationship even reversed in the intact spore/doxycycline group when instillations began. As predicted, the doxycycline treatment ameliorated the effects of spore treatment. We are examining these variables to further understand consequences of mold exposure and determine how to counteract its effects.</p>
<p>60</p>	<p>Presenter: Leslie Zhen, <i>Psychology with concentration in Behavioral Neuroscience</i> Macaulay Honors College Co-author: Arnella Mikhaylova Faculty Mentor: Peter Moller</p> <p>The Effects of 17α-methyltestosterone on Sexual Traits and Spatial Memory in Mormyrids</p> <p>Hormones such as those found in many pollutants and medications may influence learning and memory acquisition and contribute to physiological changes, so it is vital to understand their effects on living organisms. Previous research (Herfeld & Moller, 1998; Dowling thesis 2008; Herfeld thesis 2006) has shown that exposure to water-soluble 17α-methyl-dihydrotestosterone (MDHT) affects the expression of primary and secondary sexual traits in mormyrid fish. Among these changes are those in the waveform of the electric organ</p>

	<p>discharge (EOD), gonadal development, and changes in anal fin ray expansion. Until now, research has not been carried out in <i>Gnathonemus petersii</i>, the subject of our study. We aim to identify changes in physiology and spatial memory capacity in <i>G. petersii</i>. Over the course of six weeks, EODs were fed into an oscilloscope to read amplitude and phase duration of individual EODs for control and androgenized fish, respectively. Experimental fish received small doses of 17α-MDHT during the six weeks of treatment. At the end of the seventh week, control and experimental fish completed a maze-learning task after which they were sacrificed and their brains subjected to western blotting to measure changes in the expression of PKMζ. Postmortem examinations allowed us to assess any changes to the anal fin ray morphology and gonadal maturations. From this study, we conclude 17α-MDHT does have significant hormonal effects on Mormyrids' morphological structure, behavior, spatial memory, and communication signals. Given our findings that 17α-MDHT acts as learning and memory agonist and functions in conjunction to modify the morphology of mormyrids, we hope to extend our results to other vertebrates. / Keywords: Hormones, androgen, 17α-methylidihydrotestosterone, Mormyridae, Electric Organ Discharge, <i>Gnathonemus petersii</i>, PKMζ.</p>
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Thursday, March 26th, 2015
Poster Session #4
9:00am–11:00am

61	<p>Presenter: Ihsane Boualaoui, <i>Nursing</i> Golden Key Honour Society Faculty Mentor: Lorie Goshin</p> <p>Sourdough and Coeliac Inflammatory Disease</p> <p>Many researches and studies suggest that sourdough products have many advantages over the one raises with the chemical brewer's yeast, especially for those who suffer from intestinal inflammatory diseases such as Coeliac disease. The article" the sourdough fermentation may enhance the recovery from intestinal inflammation of coeliac patients at the early stage of the gluten free diet" emphasizes the role of sourdough gluten free (GF) products in interfering with the production of nitrate oxide and pro Inflammatory cytokines, the two markers of the disease process. Unlike the GF products that are started with chemical brewer's yeast, only those that are fermented with sourdough showed a remarkable decrease in the Inflammatory process. This quantitative study suggests that sourdough can play a big role in improving the recovery trajectory of coeliac disease.</p>
62	<p>Presenter: Aida Davila, <i>Psychology</i> MARC (Maximizing Access to Research Careers) Faculty Mentor: Chris Braun</p> <p>ACTH Challenge: A Measurement of Cortisol in Fish-holding Water</p> <p>The pulse-type weakly electric gymnotiforms utilize their electro-sensory systems for social communication and object detection. They emit electric organ discharges (EOD) that are detectable by a neighboring fish and sense distortions in their own field to detect objects. The EOD waveform and discharge rate contain information on an individual's status, gender, and</p>

	<p>size. If nearby fish have similar discharge rates the two fish create electric sensory interference known as “Jamming” that could interfere with object location using the electric sense. We are interested in whether or not jamming is a stress-induced behavior and if the interference is equally detrimental to both fish or if a dominant individual can control the pattern of interference to its own benefit. To further analyze this we propose to collect cortisol samples before, during and after jamming experiments. The ACTH challenge is a validation that an individual’s cortisol levels could be measured directly from the water that they inhabit. We collected water samples from fish immediately after injection with different concentrations of ACTH (.025 IU/g, .05 IU/ g, and .25 IU/ g) over the next 6 hours. We measured the amount of cortisol in the water samples using a Cortisol EIA Kit (Caymen Chemicals). Preliminary results indicate that the cortisol released by the subjects is dose dependent; the highest dose of ACTH injection results in the greatest amount of cortisol release and vice-versa. Moreover, the cortisol concentration was observed to be time dependent, showing a peak 4 hours after the injection. Further research will incorporate the methodology used to measure cortisol to jamming experiments to assess the stress-inducing potential of specific patterns of jamming interference.</p>
63	<p>Presenter: Sharrone Francis, <i>Psychology</i> Ronald E. McNair Scholar Co-author: Kitty Huang Faculty Mentor: Roseanne Flores</p> <p>A National Look at Children with Special Health Care Needs and Parental Access to Health Insurance: A Secondary Data Analysis</p> <p>Objective: Previous research has demonstrated that access to healthcare has an effect on children’s later developmental outcomes. For example, it has been shown that access to quality healthcare influences many areas of a child’s life such as lower rates of chronic illness and greater productivity as an adult. Moreover, parental health insurance coverage is critical in preventing and treating developmental problems during early childhood. Children living with special healthcare needs such as behavioral, developmental or socio-emotional conditions require healthcare coverage in order to obtain adequate treatment, which is often costly. The purpose of the current poster will be to examine parental access to health insurance and the pervasiveness of treatment of special healthcare needs within young children. Methods: Using the data extracted from the National Survey of Children with Special Health Care Needs, national and state comparisons will be made across children with and without special needs. Analysis: All numbers and prevalence estimates will be calculated using the data from the National Survey of Children with Special Health Care Needs for 2009-2010. Conclusions: The results have the potential to influence policies that effect parental access to health insurance, which can influence the developmental outcomes of young children with special needs. Keywords: Early childhood development, insurance, health care needs, coverage.</p>
64	<p>Presenter: Jacob Hamer, <i>Physics and Mathematics</i> Undergraduate Research Initiative Fellow Co-author: Ari Maller Faculty Mentor: Kelle Cruz</p> <p>Addressing Discrepancies in Galaxy Formation Modeling: Dense Hydrogen Clouds in the Early Universe</p>

	<p>The densest clouds of neutral hydrogen are called Damped Lyman-Alpha Systems (DLAs). We know how many of these objects have been present over the history of universe from observations. However, when modeling galaxy formation in cosmological simulations or semi-analytic models, an insufficient number of these objects are produced at early stages of the universe. Working with the outputs of semi-analytic models, we attempt to find a way to create the observed numbers of these objects at all redshifts. We explore the results of using different models for the surface density of gas in the galaxy, then calculating the line density. After choosing the gas profile that produces the line densities closest to those observed at high redshift, we explore if increasing the amount of gas in the gas disks by any reasonable amount can match observations.</p>
65	<p>Presenter: Betsy Hernandez, <i>Physics and Mathematics</i> AstroCOM NYC Co-author: Ari Maller Faculty Mentor: Kelle Cruz</p> <p>Masses of Galaxies and Inclination</p> <p>Galaxies are collections of billions of stars held together by gravity and include gas and dust. Disk galaxies are shaped like pancakes and are oriented at a variety of angles, called “inclinations”, relative to the Earth. When the galaxy is oriented sideways to us, we call it “edge-on”. At the other extreme, when the galaxy is oriented with its disk facing us, we call it “face-on”. Dust in the disk affects the light emitted from the galaxies and causes edge-on galaxies to appear redder, while face-on galaxies appear bluer. Computer simulations called “models” have been created to determine the masses of galaxies based on their colors. In order to test the accuracy of a model, we investigated whether it caused any relationship between the inclination angle and the mass of the galaxy. A perfect model would find no correlation. Interestingly, we found that the galaxy masses predicted by the model for the edge-on galaxies were smaller than average and the masses for the face-on galaxies were larger than average. The differences in the mean masses of the edge-on, face-on and entire galaxy sample were small, which showed the model was very good, but has room to improve. The weakness of the model is likely linked to the manner in which the effects of dust were treated. By improving the correction for dust, we may get rid of the differences in mass between the edge-on and face-on galaxies and end up with an even better galaxy model.</p>
66	<p>Presenter: Arno Hovhannisyan, <i>Chemistry</i> Chemistry Honors Program Faculty Mentor: Dixie Goss</p> <p>A Mechanistic Study of Olefin Hydrogenation by Rhodium(III) Hydride Complex</p> <p>Organometallic-hydride complexes have played a major role in catalysis, energy storage, and within the field of electrochemical applications. The importance and diversity of such molecules relies in mechanistic studies at an interface between organic and inorganic chemistry. The thermodynamic and kinetics properties of transfer of H⁻, H⁺ and H[•] for the Rh(III) hydride complex, Cp[*]Rh(2-(2-pyridyl)-phenyl)-H, have been studied. The results show remarkably fast H⁻ transfer (KH=3.5E5 M/S) in the catalytic ionic hydrogenation of iminium cations as well as fast H[•] transfer but poor H⁺ donor properties. While rhodium based</p>

	<p>catalysts for hydrogenation of alkenes exist, they mainly proceed through the process of insertion. The hydrogenation of alkenes through a radical process often does not occur or is extremely slow because of steric effects and instability of the resulting radical. Even for single substituted alkenes, radical hydrogenation does not occur. Rh-H (III) allows for the hydrogenation through a seemingly radical process to occur at high rates for highly substituted alkenes. Furthermore, the complex has shown to exchange with alkane substrates, signifying an important property of the hydride to activate C-H bonds. This characteristic is prominent in the use of organometallics in alkane metathesis to form shorter and longer products with applications in petrochemicals and fuels.</p>
67	<p>Presenter: Michelle Li, <i>ACS Chemistry</i> Chemistry Honors Program Faculty Mentor: Dixie Goss</p> <p>Metallo Complex Mediated Synthesis of Pyrrolindolines via Cycloaddition</p> <p>More than 70% of modern pharmaceutical drugs are heterocyclic compounds. While many of these substances may be found in nature, most drugs are synthesized from readily available fine chemicals. Because of their biological roles, the synthesis of these drugs must be very specific. Furthermore, the mechanisms by which the reactants interact can have a surprisingly significant effect on how the reaction can be used. Even if a reaction leads to the same product, its specific mechanism is indicative of the conditions and the scope of reactants that can be used. Pyrrolindolines are nitrogen containing heterocyclic structures that show potential in their biological properties such as anticholinesterase, anti-inflammatory and anticancer activities. These molecules are composed of three N-hetero rings and are synthesized via cycloaddition, usually with a variety of chiral metal complex catalysts. The synthesis was attempted by reacting methyl azidoacrylate compound with methylindole in the presence of an array of catalysts. Various conditions were applied through a screening experiment to yield the desired compounds. Similarly, phenylazidoacrylate was reacted with indole and methylindole. Reactions were monitored through the use of GC and HNMR spectroscopy.</p>
68	<p>Presenter: Wendy Li, <i>Biochemistry</i> Macaulay Honors College and SCORE (Summer Clinical Oncology Research Experience) Co-author: Lisa Ruppert Faculty Mentor: Karen Phillips</p> <p>The Natural History of Spinal Metastases in Prostate Cancer</p> <p>Purpose: The natural history of spinal metastases, most often caused by metastatic prostate cancer (MPC), is not well defined. Our aim is to review literature to determine natural history of spinal metastases, and to compare findings to a series of 38 patients treated at a cancer center. Methods: A PubMed database search from 2000 to present was conducted. Titles and abstracts of 3,061 articles were screened to identify 46 articles pertaining to MPC or spinal metastases. Medical records of 38 men with MPC were also reviewed. Results: In 46 articles reviewed, main topics about spinal metastases addressed were: pathophysiology, location, SCC, risk of metastases, characterization, and timing to metastases. Most spinal metastases occur in the thoracic spine (78%) followed by lumbar (76%), sacral (55%), and cervical (35%) spine. The literature suggests development of bone metastases after radical prostatectomy</p>

	<p>(RP) or radiation therapy (RT) with adjuvant therapy is rare. Of 38 patients in our series, 24 had spinal metastases, and 54% received RP or RT before developing spinal metastases. Metastases were most common in the lumbar spine (100%) followed by thoracic (79%), sacral (57%), and cervical (43%) spine. Conclusion: There is a paucity of literature about natural history of spinal metastases. Compared to published findings, our series showed similar patterns of metastatic distribution in the spine. Most patients treated with RP or RT in our study developed spinal metastases, an event the literature reports as rare. Further study is needed to develop treatment guidelines for patients with spinal metastases.</p>
69	<p>Presenter: Prima Manandhar-Sasaki, <i>Biological Sciences</i> HHMI (Howard Hughes Medical Institute) Co-authors: Jake Kresge, Jill Bargonetti Faculty Mentor: Jill Bargonetti</p> <p>The Initiation of p53-Independent Cell Death in <i>C. elegans</i> Germline Tumors has Implications for Cancer Therapeutics</p> <p><i>C. elegans</i> p53 (CEP-1), ortholog to the human tumor suppressor p53, is a critical transcription factor for initiating growth arrest and cell death (apoptosis). Over 50% of all human cancers contain mutant p53. The crucial role of cep-1 has been underscored by studies showing that UVC treatment can induce cep-1-dependent germline cell death. To investigate alternate routes to cell death in tumors, the JBC7 strain was constructed to allow for visualization and quantification of germline cell death in cep-1-null tumorous <i>C. elegans</i>. The strain is tumor-inducible and utilizes the fusion reporter gene ced-1::GFP to localize cell death. Comparison of germline cell death in the JBC7 strain and in the JBC6 strain (containing cep-1) following UVC treatment supported previous findings. We are comparing the outcome of chemotherapeutics on <i>C. elegans</i> germline tumors, as compared to the normal germline, to develop best practices for treating cancers with mutant p53. In culture, breast cancer cells with mtp53 are efficiently killed by 8-Amino-adenosine (8AA), which activates p53-independent cell death. Our model will be useful for the first examination of chemotherapeutic induced cep-1-dependent and cep-1-independent cell death induced in a whole animal model. Quantification of germline tumors in 8AA-treated cep-1-null worms suggested that 8AA did in fact reduce tumor size. Using JBC7 and JBC6 worms, we will determine if this is attributable to cep-1-independent cell death, and if so, it will set the stage for developments in using 8AA as a chemotherapeutic drug for cancers with mutant p53.</p>
70	<p>Presenter: Hannah Moon, <i>Biochemistry</i> Undergraduate Research Initiative Fellow Co-authors: David Mootoo, Stewart Bachan Faculty Mentor: David Mootoo</p> <p>Glycosyl Nitrones For the Synthesis of Immunologically Active Glycolipid Libraries</p> <p>The binding of certain glycolipids to invariant natural killer T (iNKT) cells leads to the production of cytokines, which triggers the immune system to release helper T- cells. In turn, these helper T-cells act against different disorders, including cancer, autoimmune and infectious diseases. Cytokines may be broadly divided into two groups, Th1 and Th2, which have immunostimulatory and immunomodulatory effects respectively. α-Galactosylceramide (α-GalCer) is a prototype glycolipid that has been widely used as a tool in immunology research</p>

	<p>and evaluated as a potential clinical agent. However, α-GalCer does not show a pronounced Th-1 or Th-2 bias, which is a desirable property for therapeutic applications. The objective of this research project is to identify glycolipids with clinical potential, in terms of their potency and cytokine profile. To this end, we are interested in synthetic methods that can efficiently deliver diverse libraries of new analogues of α-GalCer. In this context our specific goal is to evaluate the cycloaddition reactions of galactosyl nitrones and lipid alkenes. This strategy is well suited to high throughput synthesis because the starting materials are easily accessible, and the cycloadducts can be easily transformed to the final glycolipid targets. Our synthetic studies in this area will be presented.</p>
71	<p>Presenter: Ximena Peralta, <i>Chemistry</i> Co-author: Akira Kawamura Faculty Mentor: Akira Kawamura</p> <p>Who lives in JTT?</p> <p>Juzen-taiho-to (JTT) is an immune-boosting herbal formulation consisting of ten crude drugs. JTT can be used for the improvement of a wide range of diseases or conditions; it is commonly used for patients with cancer, anemia, anorexia, and fatigue. JTT is composed of Astragalus root, Cinnamon bark, Rehmannia root, Peony root, Cnidium rhizome, Atractylodes root, Japanese Angelica root, Ginseng, Poria, and Glycyrrhizae Radix. But then, what component of JTT is causing the immunostimulatory effects? The purpose of my research is to identify how JTT and its components stimulate the human immune system. Our previous study found that the glycolipid extract of JTT is enriched with the activity. Further structural study of this extract identified lipid A, which is an immunostimulatory glycolipid of gram-negative bacteria. Thus, it stands to reason that there is some form of gram-negative bacteria in JTT. This finding raised a possibility that the immunostimulatory activity of JTT arises from symbiotic plant bacteria, which we call plant probiotics. To examine this possibility, DNA was extracted from Angelica root, which shows the most potent activity among the ten herbs. DNA was subjected to polymerase chain reaction (PCR) to amplify a bacterial gene called 16S ribosomal RNA. The PCR amplicon was examined by next generation sequencing (Illumina sequencing), which found a diverse community of bacteria. Implications of this finding will be discussed.</p>
72	<p>Presenter: Tina Roa, <i>Biological Sciences</i> SCORE (Summer Clinical Oncology Research Experience) Co-authors: Ying-Bei Chen, Ann Bialik, Victor Reuter Faculty Mentor: Karen Phillips</p> <p>Using Fumarate Hydratase Protein Expression as a Marker in the Identification of a Rare Form of Familial Renal Cell Carcinomas</p> <p>Hereditary leiomyomatosis and renal cell carcinoma (HLRCC) syndrome is a rare, aggressive form of familial renal cancer that is difficult to diagnose. Genetic analyses have correlated this autosomal dominant disorder to germline mutations of the fumarate hydratase (FH) gene. In this study, we sought to evaluate whether protein levels of FH can be used as a marker for pathologic diagnosis of this disease. We performed immunohistochemistry using mouse monoclonal antibody against FH (clone J-13, Santa Cruz Biotech) in representative tissue sections and/or tissue microarrays constructed from 350 RCC cases. Of these, 14 were confirmed HLRCCs and 190 were high-grade sporadic tumors histologically mimicking HLRCC.</p>

	<p>Unstained 5µm-tissue slides were incubated with primary antibody (1: 200 dilution) for 32 minutes, visualized using OmniMap anti-mouse DAB detection system (Ventana), and counterstained by Hematoxylin II/ Bluing Reagent. The FH staining was visually scored as negative or positive. The 95% confidence intervals (CI) were calculated using Geigy Scientific Tables. We found that FH was ubiquitously expressed in normal kidney tissue and common types of RCC. Loss of FH protein in renal tumors was observed in 12 (86%; 95% CI, 57-98%) of 14 patients with genetically confirmed FH germline mutations. Therefore, our study suggests that the FH immunohistochemical stain is a highly specific marker for detecting renal cancer associated with HL RCC syndrome. While its effectiveness and sensitivity await further validation, the FH stain may provide us with a useful diagnostic tool to help improve the detection of this aggressive hereditary condition.</p>
73	<p>Presenter: Julia Rozenberg, <i>Biochemistry</i> Thomas Hunter Honors Program Co-authors: Huong Chu, Junior Gonzalez, Charles Drain, Nancy Greenbaum Faculty Mentor: Nancy Greenbaum</p> <p>Linkage of Chlorins to Nucleic Acids</p> <p>Photosensitive compounds, including certain porphyrin molecules, are valuable in many aspects of basic and biomedical science, such as bioimaging and photodynamic therapy (PDT). In order to take optimal advantage of these different techniques, it is desirable to attach a porphyrin molecule to biomolecules, including DNA and RNA, to assist with localization. We are using a chlorin, a porphyrin with one less double bond, that is derivatized with linker group. We are attempting to attach the chlorin to a DNA oligomer through an amino linker group on the DNA, which performs a nucleophilic attack on the carboxyl group of the chlorin, resulting in leaving of the protecting group of the chlorin. Preliminary data are promising, and we are now extending this approach to attach a chlorin derivatized with functional groups to enhance solubility. Once we have achieved good yields for the reaction of DNA and chlorin, we will apply similar conditions to attach chlorin to RNA aptamers, RNA oligonucleotide sequences that adopt unique three-dimensional structures and bind biomolecular targets tightly and specifically, that are engineered to bind specific extracellular biomarkers. The resulting bioconjugates will then be tested as bioimaging tools for specific cancers.</p>
74	<p>Presenter: Ryan Sirlin, <i>Psychology and Art History</i> Faculty Mentor: Kimberly Robinson</p> <p>The Effect of Parental Behaviors During High School on Binge Drinking of College Undergraduates</p> <p>For this study 386 undergraduate students of ages 18 to 23 were involved in an online self-report questionnaire during the Fall of 2012. The purpose of this study was to see if parents behaviors towards their children during high school had an effect on the binge drinking patterns of those children once they become undergraduates in college. The sample of 386 undergraduates consisted evenly of males and females. The sample was significantly Caucasian. The data was not collected in a longitudinal manner, but in a single questionnaire completed on a single occasion by the subject. In order to collect data regarding the subjects parents behavior during high school retrospective reporting was utilized. In order to properly</p>

	<p>collect data for the Independent Variable of Parental Behavior, the variable had to be divided into two classifications along with five sub-classifications. The two main classifications included: General Parental Behavior and Alcohol Related Parental Behavior. Within General Parental Behavior there are two sub-classifications including social support and parental monitoring. Parental monitoring refers to how many elements of the students life back in high school that the parent monitored. Within Alcohol Related Parental Behavior there are three sub-classifications including Parental Communication regarding alcohol consumption, rules that the parent set in regards to alcohol, and the parents personal drinking habits. None of the general Parental Behaviors were found to have an effect upon binge drinking habits in college. Significant effects were found for all three sub-classifications of alcohol-related parental behavior.</p>
75	<p>Presenter: Toni Tobias, <i>Psychology with concentration in Behavioral Neuroscience</i> Co-authors: Camille McIntyre, Thomas Preuss Faculty Mentor: Thomas Preuss</p> <p>Seasonal Effects on Startle Escape Behavior and Sensory Motor Gating in Goldfish <i>Carassius auratus</i></p> <p>This meta-analysis examines the seasonal effects on goldfish startle escape behavior and the sensory gating phenomena, prepulse inhibition (PPI.) A modification of startle, PPI is described as an inhibition of the startle escape response in organisms by precluding a startling stimulus (pulse) with a relatively weaker stimulus (prepulse.) Deficits in PPI are found in many neurological disorders such as schizophrenia, attention-deficit disorder and obsessive compulsive disorder and therefore, it is studied extensively in various animal models including fish. As goldfish are seasonal spawners, combined data sets on acoustically evoked startle and PPI collected from 2009-2013 were compared by season. It is hypothesized that a significant difference in startle probability and PPI effect exists between seasons. The seasonal categories are defined as pre-spawning (November-February), spawning (March-July), and post-spawning (August-October); data sets were sorted according to the corresponding date on which the behavioral experiment was conducted. A one-way ANOVA was conducted for data in each of the three experimental conditions: pulse only (no PPI), PPI at interstimulus interval (ISI) 50 and PPI at ISI 500. Results revealed a significantly increased startle escape rate during the pre-spawning season relative to the spawning and post-spawning season across all experimental conditions. PPI effect was found to be significantly increased during spawning season relative to pre- and post-spawning season across all experimental conditions. These results indicate seasonal fluctuations may affect goldfish startle escape behavior and PPI in different ways, possibly related to season-dependent hormonal fluctuations.</p>
76	<p>Presenter: Eden Volkov, <i>Economics</i> BA/MA Program in Economics Co-authors: Andrew Bean, Evan Bollens-Lund Faculty Mentor: Partha Deb</p> <p>The Effects of the Young Adult Coverage Expansion under the Patient Protection and Affordable Care Act</p> <p>The Patient Protection and Affordable Care was signed into law on March 10, 2010. An</p>

	<p>important goal of the ACA was to increase the affordability of healthcare by expanding insurance access for all Americans. One of the first provisions enacted was the Young Adult Coverage Expansion, which took effect on September 23, 2010. Under this provision, individuals up to age 26, would be allowed to remain on their parents' health insurance plan, provided that their parents were receiving insurance through their employer. Since enactment, a number of studies have found evidence of increased insurance rates due to this provision. In this research, we estimate the effect of the Young Adult Coverage Expansion on healthcare utilization. We use data from the Medical Expenditure Panel Survey (MEPS) from 2008-2012 and a difference-in-difference study design for our analysis. Specifically, we define our treatment groups as individuals aged 19-25 and our control group as those aged 16-18 and 27-29. We choose this specification since there is evidence that the insurance access and healthcare utilization trends are quite similar for these two groups in the pre- enactment years. We find evidence of increased preventative care utilization, like checkups, since the laws enacted in 2010, for our treatment relative to our control group. We further investigate the heterogeneity of effects among our treatment group by socioeconomic, racial, and gender status.</p>
77	<p>Presenter: Elyce Williams, Psychology BP-ENDURE (Blueprint Program for Enhancing Neuroscience Diversity through Undergraduate Education) Co-authors: Katherine Swett, Bennet Landman, Laurie Cutting, Hakmook Kang Faculty Mentor: Michael Siller</p> <p>A Cross-Sectional MRI Study Exploring the Effects of Socioeconomic Status on Gray Matter Brain Volume Throughout the Lifespan</p> <p>Socioeconomic status (SES) has been found to predict memory retention, learning ability and aptitude for reasoning/perception, along with additional health outcomes. Studies examining brain structure have explored correlations between gray matter volume and SES, in regions such as the hippocampus and prefrontal cortex. Some findings indicate that individuals with higher SES show increased brain volume, and others suggest high SES correlates with greater preservation of behavioral and cognitive function with age. Few studies however, examine these implications throughout the lifespan, instead focusing on children/adolescents and older adults. Using data gathered from 58 contributors (n=6142), the present study explores the effects of SES on gray matter brain volume across the lifespan (0-98 years) using a cross-sectional whole-brain analysis. SES was measured using education level as an indicator, which narrowed the sample (n=2296). Results for this comparatively large and comprehensive study are in progress. Data are being analyzed on Vanderbilt ACCRE cluster for structural analysis using volumetric assessment methods. The primary method of analysis is a multivariate model with 15 identified networks of interest. A secondary analysis is also being conducted, consisting of univariate models for education, age, sex, and handedness on 133 identified regions of interests.</p>

Thursday, March 26th, 2015

Poster Session #5

11:30am–1:30pm

78	<p>Presenter: Shahreaz Ahmed, <i>Chemistry</i> Co-authors: Nirav Kapadia, Wayne Harding Faculty Mentor: Wayne Harding</p> <p>Synthesis of Tris-(phenylalkyl)amines as Selective h5-HT2B Receptor Antagonists</p> <p>Antagonism of the 5-HT2B receptor appears to be a promising avenue for the development of novel therapeutics to treat migraines, irritable bowel syndrome, and cardiovascular diseases such as chronic heart failure. However, there are no selective 5-HT2B antagonists clinically approved and exploiting this target therapeutically remains to be realized. Our lab has recently identified a series of novel high affinity ligands for the 5-HT2B receptor that bear a tris-(phenylalkyl)amine scaffold. Further pharmacological characterization revealed that the compounds were 5-HT2B receptor antagonists and that they were selective versus the structurally similar 5-HT2A and 5-HT2C receptors. This serendipitous discovery has prompted the synthesis of further libraries of tris-(phenylalkyl)amine analogues in order to more clearly define structural determinants that control affinity and selectivity of the scaffold for the 5-HT2B receptor. To probe the steric and electronic tolerance of substituents in the aryl units of the scaffold, we have synthesized a library of substituted aryl analogs. The analogs were prepared from a readily available secondary amine precursor containing dimethoxyphenethyl and methylenedioxyphenethyl units in two steps. In the first step, the secondary amine precursor was coupled to various commercially available arylpropyl carboxylic acids using EDCI. Thereafter, reduction of the resulting amide with borane gave the target analogs with overall yields (over two steps) between 30-50%. The compounds were purified by column chromatography and characterized via NMR and mass spectroscopy. All analogues will be evaluated for affinity and activity at 5-HT2 receptors. Details of our synthetic procedures and analogue characterization will be presented.</p>
79	<p>Presenter: Munazza Alam, <i>Physics and Astronomy</i> John P. McNulty Scholar and Macaulay Honors College Co-author: Sara Camnasio Faculty Mentor: Kelle Cruz</p> <p>Understanding Unusually Red & Blue Brown Dwarfs</p> <p>Brown dwarfs are low mass astronomical objects that form like stars, but are not massive enough to sustain hydrogen fusion in their cores. As a result, they cool, fade, and shrink over billions of years to resemble gas giant planets. Near-infrared colors, the ratio of fluxes at two near-infrared wavelength ranges, allow researchers to distinguish between “normal” and unusual brown dwarfs. Brown dwarfs are known to have a wide range of near-infrared colors for objects with similar surface temperatures, thereby suggesting that parameters other than temperature influence their spectra. This project investigates the properties of two unusual subtypes of brown dwarfs classified as either “red” or “blue”. Compared to their similarly-classified counterparts, red brown dwarfs are brighter at longer wavelengths, whereas blue brown dwarfs are brighter at shorter wavelengths. Some red brown dwarfs have spectral features indicative of low surface gravity; many blue brown dwarfs have low metallicity (heavy</p>

	<p>metal content) spectral features. Red objects and blue objects that do not have these spectral features are considered color outliers because they are red or blue for unknown reasons. We compare high-resolution (R~20,000) observations of these color outliers with brown dwarf spectral standards to understand their physical and atmospheric properties. We measure the equivalent widths of neutral potassium (K I) absorption lines for our sample of brown dwarf color outliers. Equivalent width, the area of the absorption line below the continuum level, is a proxy for line strength that elucidates quantifiable differences among red, blue, and standard brown dwarfs.</p>
80	<p>Presenter: Duwa Alebdy, <i>Psychology with concentration in Behavioral Neuroscience</i> Macaulay Honors College Faculty Mentor: Cheryl Harding</p> <p>Where's the Platform? Body Weight as a Predictor of Memory Loss</p> <p>Many people who are exposed to mold develop adverse health effects such as asthma, muscle pain, chronic fatigue, and cognitive problems. Our lab is the first to use an animal model to determine what cognitive and neural dysfunctions are caused by mold, and the physiological mechanisms behind them. We have already shown that mold exposure causes decreases in spatial learning and memory, which correlates with immune activation and brain inflammation. In the current study, we looked to see if body weight would make animals more susceptible to the negative effects of mold exposure. It is known that obese animals show immune activation with resulting brain inflammation, which then causes cognitive problems. In this study, we looked into weight effects among animals of normal weight to see if even normal weight gain would adversely affect the body. Animals were randomly chosen to receive equal doses of either intact <i>Stachybotrys</i> spores containing toxins and a variety of other chemicals (IN), <i>Stachybotrys</i> spores extracted twice with ethanol to remove toxins and denature proteins (EX), or nonpyrogenic saline vehicle (VEH). In line with our predictions, body weight showed a strong negative correlation with spatial memory. After 5-6 weeks of mold exposure, both the animals' body weights and weight changes at various points of the experiment correlated negatively with ability to remember where the hidden platform was. These results suggest that heavier individuals have a higher risk of developing the cognitive and neural problems that follow mold exposure.</p>
81	<p>Presenter: Naser Dodic, <i>Biochemistry</i> Co-authors: William Perea, Junior Gonzalez, Charles Drain, Nancy Greenbaum Faculty Mentor: Nancy Greenbaum</p> <p>Bioconjugation of Porphyrin and Protein for use in Bioimaging and FRET Studies</p> <p>Development of fluorescent probes is important for bioimaging applications that enable visualization of particular biomolecules or structures in biological tissues and for FRET (Förster resonance energy transfer) techniques used in measurement of inter- and intramolecular distances. To develop a new set of fluorescent porphyrin-based probes, we are conjugating a chlorin (a porphyrin with one less double bond in its ring structure) that has desirable spectroscopic properties to protein molecules. The specific chlorin we are using is derivatized with four polyethyleneglycol (PEG) groups for added solubility in aqueous systems. We have attached this chlorin to lysozyme, a protein that is stable to changes of pH and temperature extremes, via a NHS linker to one of several amino sites on the protein. The reaction is</p>

	<p>performed in a bicarbonate buffer at pH 10.5, at which all the amino groups on the protein are deprotonated. Observation of electrophoretic mobility shifts in SDS-PAGE gels suggest that the bioconjugate is formed at high yield under these conditions. The next step will involve purification of the conjugate using reverse-phase chromatography and characterization of the compound by NMR spectroscopy. We will then test the bioconjugate for suitability in bioimaging or FRET experiments.</p>
82	<p>Presenter: Victoria Durojaiye, <i>Biological Sciences</i> LSAMP (Louis Stokes Alliance for Minority Participation) Co-authors: Adeodat Ilboudo, Fayola Levine, Joseph Osborne, Jong Y. Park, Olorunseun Ogunwobi Faculty Mentor: Olorunseun Ogunwobi</p> <p>miR-1205/FRYL as a Novel Regulatory Mechanism in Androgen-independent Prostate Cancer</p> <p>Prostate Cancer (PCa) is the second most common cause of cancer-related deaths in American men. Understanding of the molecular mechanisms underlying the development of AIPC is critical to discovering more effective therapeutic strategies for AIPC. MicroRNAs (miRNAs) are short non-coding RNAs that play an important role in post-transcriptional regulation. A recently annotated miRNA is miR-1205 encoded by the long non-coding PVT1 gene locus which is located at the prostate cancer susceptibility chromosomal region, 8q24. The role of miR-1205 in PCa is unknown. A panel of five prostate cell lines was used. RWPE1, a non-tumorigenic prostate epithelial cell line, WPE1-NA22, an indolent PCa cell line and three aggressive PCa cell lines (PC3, VCaP and MDA PCa 2b) were used. Expression of miR-1205 was determined using real-time quantitative polymerase chain reaction. Effect of loss or gain of miR-1205 on proliferation and migration was measured using MTT and wound healing assays, respectively. The miSVR computer algorithm was used to ascertain putative targets. Effect of transfection of oligonucleotide mimic on mRNA expression of the putative targets was used to confirm the miR-1205 target. Our study indicates that the expression of miR-1205 is markedly less in PCa cells (WPE1-NA22, MDA PCa 2b, PC3, and VCaP) in comparison to the RWPE1 non-tumorigenic prostate epithelial cell line. The expression of miR-1205 was significantly less in AIPC cells (PC3) compared to the other PCa cells. Loss of miR-1205 significantly increased cell proliferation in prostate epithelial cells. Exogenous miR-1205 significantly decreased cell proliferation in prostate epithelial cells. Also, loss of miR-1205 promoted migration in PCa cells by nearly 3 folds. The miSVR computer algorithm identified FRYL-like (FRYL) as a putative target of miR-1205. Transfecting miR-1205 mimic into androgen-independent PC3 cells leads to significant decrease in the expression of FRYL, suggesting that FRYL is a direct target of miR-1205. Therefore, miR-1205 regulates proliferation and migration of prostate epithelial cells, and loss of miR-1205 promotes a tumorigenic phenotype in PCa. Moreover, miR-1205 targets FRYL in AIPC. Consequently, strategies to increase miR-1205 or target FRYL may have therapeutic potential in AIPC.</p>
83	<p>Presenter: Juliel Espinosa, <i>Biochemistry</i> Macaulay Honors College and MBRS-RISE (Minority Biomedical Research Support—Research Initiative for Scientific Enhancement) Co-authors: Nirav Kapadia, Sudharshan Madapa, Wayne Harding Faculty Mentor: Wayne Harding</p> <p>(+)-Boldine as Semi-synthetic Source Towards Novel CNS Receptor Ligands</p>

	<p>There is a need to identify new molecules that have high potency and selectivity for dopamine, serotonin and adrenergic receptors. Such molecules will be useful to develop as imaging probes to better understand the role of these receptors in a variety of neuropsychiatric disorders. Furthermore, the identification of potent and selective molecules will provide a platform for the development of useful therapeutic agents. We hypothesize that the phenolic groups of (+)-boldine may be chemically modified via alkylation to form phenyl alkyl ether derivatives. We further hypothesize that these phenolic groups are not required for affinity to dopamine, adrenergic and serotonin receptors. To test our dual hypothesis, we engaged two semi-synthetic routes involving Mitsunobu alkylation of the phenolic groups of (+)-boldine to provide three sets of analogs – Group A) C2 methoxy/C9 alkyloxy, Group B) C9 methoxy/C2 alkyloxy and Group C) C2/C9 dialkyloxy. The findings also show the group A analogs have a higher affinity for the 5-HT₇ receptor than Clozapine. A C2 benzylated (+)-boldine analog (8) showed high affinity for the 5-HT_{2A} receptor comparable to the common antipsychotic drug, Clozapine. Docking studies show that hydrophobic interactions between 5-HT_{2A} binding site and substituent at C2 position are responsible for the affinity of compound 8 to the 5-HT_{2A} receptor, as is an ionic bond between 5-HT_{2A} aspartate residue with aporphine alkaloid nitrogen.</p>
84	<p>Presenter: Sara Fleszar, <i>Psychology</i> Co-authors: Katherine Roberts, Stephen Lepore, Tracey Revenson Faculty Mentor: Tracey Revenson</p> <p>Improving Comprehension in Informed Consent on Thyroidectomy</p> <p>Providing informed consent is a required and standard practice for patients in need of a thyroidectomy. Multimedia presentations have been developed in an effort to standardize informed consent for surgical procedures and to reduce the burden on health care systems and providers who deliver informed consent. The proposed study uses recent advances in cognitive science related to online learning to improve a video-based informed consent procedure. The goal of the study is to determine which of three conditions had greater knowledge and retention in informed consent after watching a patient education video on thyroidectomy. Students at a public university were recruited to participate in the study. The 20-minute patient education video was divided into four short segments of approximately 5 minutes each. Participants (n=84) were randomly assigned to three experimental conditions: (1) testing and provided with immediate feedback after each segment, (2) testing only (not provided with feedback after each segment), and (3) control condition (not tested after each segment). At the completion of all four video segments, participants completed a 22 question post-test on the information presented in the video. As hypothesized significant differences were seen (p<.01), with participants in the testing and group scoring higher on the posttest (92.4% correct) compared with those in the testing only group (78.7% correct) and compared to controls (74.8% correct). Segmenting a video and then testing and providing immediate feedback can enhance learning and short-term retention of general and risk information contained in a patient education video.</p>

<p>85</p>	<p>Presenter: Zachary Gershon, <i>Biological Sciences</i> HHMI (Howard Hughes Medical Institute) Co-authors: Paul Feinstein, Charlotte D’Hulst Faculty Mentor: Paul Feinstein</p> <p>Designing an in vitro System to Predict in vivo Success of Gene Targeted Mice</p> <p>The mammalian olfactory system is a chemosensory detector mechanism used to aid mammals in interpreting the world around them. The process of olfaction is facilitated by olfactory sensory neurons (OSNs), which are embedded in the olfactory epithelium (OE) that line the nasal cavities. At maturation, each OSN expresses only one of approximately 1,000 different, highly conserved odorant receptor (OR) genes from only one allele. Although all OR sequences have been identified, few have been functionally characterized, or “deorphaned.” ORs are extremely difficult to express in vitro and therefore ligands must be identified in an in vivo setting. However, creating an in vivo system to express a given OR is both time-consuming and expensive. Thus, creating an in vitro model predicting the success of an in vivo system for gene-targeted mice would greatly enhance our ability to deorphan ORs. Our approach examines the translation start site consensus sequence as a potential inhibitor of expression of human ORs.</p>
<p>86</p>	<p>Presenter: Klea Kulla, <i>Neurobiology</i> Thomas Hunter Honors Program Faculty Mentor: Derrick Brazill</p> <p>Dispersal Behavior of Insects with Weak and Strong Flying Potential Using Computer Automated Flight Mills</p> <p><i>Diaphorina citri</i> or the Asian citrus psyllid plays the role of a vector, which carries a bacteria causing citrus huanglongbing. This disease (also known as yellow dragon disease or citrus greening) is arguably the most serious condition affecting citrus plants. Its effects include leaf yellowing or blotchy mottling of leaves as well as lopsided and bitter fruit which remains green after maturation. <i>Diaphorina citri</i> have migrated to various locations around the world, including Florida and have infected a countless number of orange trees. In order to implement methods of containment for the Asian citrus psyllid, a computer automated flight mill can be used to study their dispersal behavior. Flight mills constructed in the lab include a photo interrupter and an LED detector pair and an arduino coded with a program named the MothHamsterWheel. This software is able to detect any interruptions of the LED beam at the exact time it was interrupted starting from the activation of the program. An insect was attached to one end of the mill and a piece of black paper to the other end. Each time the insect attempted to fly, it pushed the mill and made a 360 degree round trip. When this occurred, the black paper would glide between the photo interrupter and disrupt the beam, sending a signal to the arduino which was then recorded on a computer screen. This study allows us to keep track of the distance an insect can travel in a specific time period. First, program was tested using <i>Musca domestica</i> or house flies. This served the purpose of better understanding the flight mill program and providing comparative data. Due to the strong flying potential of <i>Musca domestica</i>, they were able to fly on the mills with ease and results were obtained quickly. <i>Diaphorina citri</i> however, are much smaller and are considered weak fliers, therefore a lighter and more suitable mill was created to facilitate <i>Diaphorina citri</i> flight.</p>

87	<p>Presenter: Katherine Lopez, <i>Psychology</i> MBRS-RISE (Minority Biomedical Research Support—Research Initiative for Scientific Enhancement) Co-authors: Lucia Hipolito-Cubedo, Blake Butler, Jose Moron-Concepcion Faculty Mentor: Glenn Schafe</p> <p>Inflammatory Pain Affects Motivated Behavior, Possible Implication of the KOR System</p> <p>Understanding how to manage pain in people with a prior drug abuse history has become a real challenge for clinicians. In turn, many times this population is still left under treated, which can lead to the illegal use of drugs. Data presented here examined the effect of pain on motivated behavior and the possible role of the kappa opioid receptor (KOR). Whereas the activation of the mu opioid receptor increases dopamine release in the nucleus accumbens (NAc), KOR activation has shown to inhibit it. This activity has been associated with depression and the negative effects associated with withdrawal from opiates. We investigated the effect of inflammatory pain on sucrose self-administration under fixed ratio (FR) and progressive ratio (PR) schedules of reinforcement. In addition, we examined the KOR expression following the self-administration procedures in the NAc, prefrontal cortex (PFC), and the ventral tegmental area (VTA), areas involved with motivated behavior and the reward pathway. The complete Freund’s adjuvant (CFA) was used to induce inflammatory pain in the rats. We found that inflammatory pain reduced PR step number from the baseline without affecting sucrose self-administration under FR schedule. Also, KOR expression was significantly increased in the NAc and PFC, but not changed in the VTA. Overall, our experiments show that inflammatory pain impacted motivated behavior, and that this effect may be involved with the KOR system. Future experiments will examine whether the activation of the KOR is directly responsible for the decrease in motivation in the presence of inflammatory pain.</p>
88	<p>Presenter: Janis Mahnure, <i>Media Studies</i> Jenny Hunter Scholar and Thomas Hunter Honors Program Faculty Mentor: Stuart Ewen</p> <p>The Influence And Social Power Of Media In Fashion, Film, And Freedom</p> <p>My research investigates media as a social mechanism for change through theories of collective consciousness, public opinion, propaganda and consumerism. Media is powerful. It is a teacher of society. It has the authoritative force for social good or manipulative malice. Visual vernacular, a term coined by Stuart Ewen, to represent the phenomenon of media, is “understandable even to immigrants unable to speak English.” All of media that is made of images, static and moving, convey a meaning, left for interpretation. But almost all conclusions are guided by the motive behind the marketer who created that image. The public is inherently malleable through media. I studied the works of sociologists like Emile Durkheim, Georg Simmel, and social psychologists like Wilfred Lewis Trotter to understand herd instinct, individualist and group membership as elements of public opinion and marketing. I outlined evidence that shows the power of media: the changing status of a country, the tearing of a social fabric, and the shift of an entire culture and generation. Lithuania used media to mold public opinion and gain its own freedom as a country; during the women’s liberation movement, Edward Bernay’s used fashion to create pool of consumers for the cigarette industry essentially extinguishing a social taboo; and silent films influence on immigrant women and the creation of “metamorphosis through consumption”.</p>

89	<p>Presenter: Alyssa M. Molloy, <i>Anthropology and Psychology</i> Co-authors: Emma Cancelliere, Caley A. Johnson, Jessica M. Rothman Faculty Mentor: Jessica Rothman</p> <p>Exploring the Energetic Costs of Infant Care in Wild Forest Baboons</p> <p>Gestation and lactation are highly costly to female primates, but less is known about the energetic and time costs associated with infant care. We conducted an experiment to explore how infant care affects foraging behavior and feeding efficiency in a population of forest-dwelling olive baboons (<i>Papio anubis</i>). We hypothesized that there is an energetic cost to infant care that would affect the mother's ability to forage. We expected to find that the female baboons would forage less often and less efficiently while carrying their infants due to the energetic costs of the added weight and lactation. The research was conducted in Kibale National Park, Uganda, from June to July of 2014 on a group of 65 forest-dwelling wild olive baboons. At the time of research there were six mother/infant pairs. Data was collected through 10 minute rotating focal samples on mothers with dependent infants. During each focal the mother's activity and infant location was recorded. Plant species, plant part, and unit count was also recorded during feeding bouts. T-tests revealed that mother's significantly spent more time feeding with the infant than without the infant ($T=2.1321$, $P=0.02232$). While the infant was on the mother, there was no significant difference whether the infant was ventral or dorsal ($T=-1.3292$, $p=0.1862$). But while the infant was away from the mother, the time spent feeding was significantly longer when the infant was two meters or less away than when the infant was 3 meters or more away ($T=7.193$, $P<0.001$). T-tests did not reveal a significant difference of feeding efficiency between infant locations ($T=-0.4833$, $P=0.6299$). In these forest dwelling olive baboons, the energetic costs of infant care do not significantly affect the mother's ability to forage, although, there may be an effect of infant distance from the mother on her likelihood to forage.</p>
90	<p>Presenter: Michelle Naidoo, <i>Biological Sciences</i> Co-authors: Nazarius Lamango, Olorunseun Ogunwobi Faculty Mentor: Olorunseun Ogunwobi</p> <p>A Novel Polyisoprenylated Cysteinyl Amide Inhibitor, NSL-BA-055, Selectively Inhibits Proliferation of Hepatocellular Carcinoma Cells</p> <p>The monomeric GTP-ase, Ras, is mutated in over 30% of cancers where it promotes uncontrolled proliferation of cancer cells. Ras signaling is one of many pathophysiological pathways implicated in hepatocellular carcinoma that results in cell survival, differentiation, proliferation, and angiogenesis. Ras is bound to the cytoplasmic face of the plasma membrane where it relays intracellular signals. Polyisoprenylated cysteinyl amide inhibitors (PCAI) effectively disrupt the functions of polyisoprenylated proteins such as Ras. Many hepatocellular carcinomas (HCCs) have dysregulated Ras signaling. However, the effects of PCAIs on hepatocellular carcinoma (HCC) are unknown. The aim of this study was to investigate the effect of a novel PCAI, NSL-BA-055, on HCC. Concentrations of NSL-BA-055 ranging from 0 to 10 μM were used for experimentation. Effects on proliferation of BNL CL.2 (non-tumorigenic mouse hepatocytes) and BNL 1ME A.7R.1 (mouse HCC cells derived from BNL CL.2 hepatocytes) were analyzed. Next, the effects of NSL-BA-055 on Akt protein expression, a downstream component of Ras signaling, were examined by western blotting. NSL-BA-055 significantly inhibited the proliferation of BNL 1ME A. 7R.1 HCC cells, but not the</p>

	<p>non-tumorigenic BNL CL.2 hepatocytes. Also, concentrations of the NSL-BA-055 compound as low as 4 μM significantly inhibited the proliferation of BNL 1ME A.7R.1 HCC cells. Western blotting revealed that NSL-BA-055 inhibited Akt protein expression at 4μM. Therefore PCAIs such as NSL-BA-055 is a novel class of agents that selectively inhibit the proliferation of HCC cells, but not normal hepatocytes. This effect may be via inhibition of Akt, a downstream intermediate of Ras signaling. Consequently, NSL-BA-055 is a novel candidate agent for HCC therapy.</p>
<p>91</p>	<p>Presenter: Grace Neumann, <i>Political Science</i> Yalow Scholar Co-author: Kim Kramer Faculty Mentor: Karen Phillips</p> <p>Using the Therapeutic Index to Measure Efficacy of Intrathecal Radioimmunotherapy</p> <p>Purpose: cRIT is important in treating Central Nervous System (CNS) malignancies such as metastatic neuroblastoma (NB) or recurrent medulloblastoma (MB). We hypothesize that a higher therapeutic index (ratio of CSF to blood dosimetry) may be associated with improved survival. Our purpose was to assess the relationship between survival and therapeutic index in recurrent CNS NB or MB treated with cRIT. Methods: cRIT therapies for these patients included ¹³¹I 3F8 or ¹³¹I 8H9. Dosimetry (cGy/mCi) was assessed by a pre-treatment 2mCi test dose of ¹³¹I-3F8 or ¹³¹I-8H9. The mean therapeutic index was calculated as the ratio of radioactivity in the CSF samples to the ratio of radioactivity in blood samples. Results: 66 patients received cRIT, with survival statistics of 15 (40%) of 38 with NB and 10 (36%) of 28 with MB. The mean age at diagnosis was 5.57 years, and the mean age of deceased patients was 6.55 years. In NB patients, the mean therapeutic index was 36.22 in survivors and 34.17 in non-survivors. Among MB patients, the mean therapeutic index was 17.20 in survivors and 42.73 in non-survivors. Conclusion: A higher therapeutic index was not associated with improved survival. Further study is needed to assess the prognostic impact of other variables such as age at diagnosis, time to relapse, disease status at the time of cRIT treatment, and total CSF dose delivered by cRIT by both ventricular sampling and serial imaging.</p>
<p>92</p>	<p>Presenter: Esra Padgett, <i>CUNY BA for Unique and Interdisciplinary Studies</i> Faculty Mentor: Trudith Smoke</p> <p>Dueling Identities: Narrative Strategy and the Construction of Complex Identities in Porn Star Memoirs</p> <p>In 2010, Jenna Jameson’s autobiography, <i>How To Make Love Like A Porn Star: A Cautionary Tale</i>, spent six weeks on the New York Times Best-Seller list. Though this book stands out for its mainstream success, it is also representative of what has, since the early 2000s, become an emerging literary genre: porn star memoirs. Though noted for their graphic and controversially candid nature, authors of these memoirs often still find themselves toying a fine line between presenting an authentic sexual identity and a self that is socially ‘acceptable’. In contrast to the notion of an increasingly sexualized culture, an analysis of narrative strategy and linguistic stance-taking methods used by the authors of these memoirs suggests the presence of ongoing societal constraints placed on female sexual identities. My project is a discourse analysis of Jameson’s and three other self-proclaimed ‘porn stars’ memoirs that aims to investigate the linguistic strategies employed in the narrative</p>

	<p>construction of identity. Included in these strategies are what have been called ‘coherence principles,’ narrative tools that allow for the creation of causality. The analysis looks into the ways in which speakers use coherence principles to create justification for identities that may be unacceptable to their audience. This study looks at the features both on a micro(morpho-syntactical) as well as macro(ordering of chapters, book covers and imagery)-linguistic scale. In addition to looking at the ways authors choose to construct their life narratives, the public format of these memoirs also allows correlations to be made between narrative decisions and the socio-cultural pressures placed on the authors.</p>
<p>93</p>	<p>Presenter: Michael Petruso, <i>Media Studies—Emerging Media</i> Muse Scholar Faculty Mentor: Jen DeGregorio</p> <p>Capoeira: Reacting, Not Acting</p> <p>In my presentation, I will discuss my experience dancing Capoeira, a Brazilian form of martial arts that serves as physical expression for its practitioners, or Capoeiristas. The musical atmosphere of Capoeira fosters a strong sense of community amongst its practitioners, as opposed to other martial arts whose primary focus is on the individual fighter. I joined the Capoeira Club at Hunter College a little over two years ago and have engaged in numerous public performances on campus to promote it to the student body. As a Capoeirista, the most important lesson I have learned is to be ready, willing, and able to adapt to any situation. Exercises in my classes have ranged from following the tempo of music, to following the contours of a person’s body with our limbs while remaining balanced, to trusting our bodies’ instinctual reactions to falling. In a world where technology is prevalent and humanity is bombarded with new information, humans have trained themselves to rely on intellect. However, Capoeiristas endeavor to abandon thinking and learn to react to their opponents’ movements at a moment’s notice. As an actor, practicing Capoeira has not only increased my marketability by enhancing my physical skill set, but has also reinforced one of acting’s most basic principles. Acting is not about acting, but reacting. As my lessons progressed, I discovered that the instinctual reactivity of Capoeira enhanced my improvisational acting. Improvisational acting is acting in its purest form: No blocking, no script, just feelings. Improvisation in acting often leads to new discoveries about both the material and the actor, resulting in a deeper, richer performance. Capoeira quells my fear of taking risks, which is the one of the primary hindrances of an actor.</p>
<p>94</p>	<p>Presenter: Giovanna Romero, <i>Chemistry</i> MARC (Maximizing Access to Research Careers) Co-author: Akira Kawamura Faculty Mentor: Akira Kawamura</p> <p>Juzen-taiho-to’s (JTT) Immune Stimulating Properties Explored in its Potentially "Safe" Bacteria</p> <p>Juzen-taiho-to (JTT) is a Japanese and Chinese medicinal herb composed of 10 different plants. It has been used for the treatment of many diseases like anemia and helps against fatigue. JTT has also been known as a safe method of stimulating the body’s immune system. Through previous research we have found that <i>Angelica sinensis</i> is one of the plants in JTT that displays the most activity. We suspect this activity is caused by lipid A, which is a portion of the lipopolysaccharides (LPS) found on the outer membrane of gram-negative bacteria.</p>

	<p>Although LPS is an endotoxin, the lipid A portion of the compound has immune stimulating properties. However, there are not many "safe" applications of lipid A. An analog of lipid A called monophosphoryllipid A (MPL) is used as an immunological adjuvant to boost the immunogenicity and effects of vaccine antigens. Here we demonstrate how <i>Rahnella</i>, which is gram-negative bacteria found in <i>A. sinensis</i>, can be a good candidate for containing lipid A. We tested <i>A. sinensis</i> for bacteria and through sequencing found that one of the main causes of its immune boosting properties is the bacterium <i>Rahnella</i>. We purified the <i>Rahnella</i> to extract lipid A. If <i>A. sinensis</i> has immunostimulatory properties without being toxic, then it is possible that the extracted lipid A may contain the same properties. We anticipate that this is a starting point for determining whether the lipid A extracted could serve as immune stimulating without having high toxicity.</p>
95	<p>Presenter: Michael Wilkinson, <i>Biological Sciences</i> Co-author: Zayd Daruwala Faculty Mentor: Benjamin Ortiz</p> <p>Engineering Hybrid Gene Regulatory Cassettes for Gene Therapy</p> <p>Inherited immunodeficiency, and many types of blood cell tumors result from the disruption of major developmental pathways during lymphocyte development. These problems have the potential to be alleviated via gene therapy. Locus Control Regions (LCR) are a group of cis-regulatory DNA elements that support high level expression of a linked transgene at any ectopic site of integration in the genome (insulation capacity). Furthermore, LCR elements confer developmental and cell type selectivity to transgene expression (spatiotemporal specificity). The study of LCRs provides a new avenue towards understanding the regulation of T-cell development, and adds to the genetic tool kit for therapeutic gene expression in engineered T cells. We mainly focus on the LCR of the mouse T cell receptor alpha (TCRa) gene. The LCR supports a specific spatiotemporal pattern of activity, as well as a strong insulation capacity that leads to integration site independent gene expression. We had found that a sub-region of the TCR-a LCR can provide a transgene with integration site independence, without the spatiotemporal activity of the rest of the LCR DNA sequences. We hypothesize that this capacity can be combined with enhancer like regions of other genes to synthetically create "hybrid" LCRs that have TCRa's strong insulation capacity and a desired spatiotemporal specificity. To test this hypothesis, we are currently constructing a DNA cassette that contains the enhancer region of the mouse CD2 gene and hypersensitive sites from the TCR-a LCR. This hybrid LCR will be linked to a human-CD2 reporter gene. We expect this construct will support a CD2-like pattern of gene expression that is as well insulated from silencing as is the TCR-a LCR.</p>
96	<p>Presenter: Laurel Yee, <i>Biochemistry</i> Co-authors: Hye Shin, Samer Khawaja, Juliette Gorson Faculty Mentor: Mandë Holford</p> <p>Characterization of Venom Peptides Using a Polychaete Bioactivity Assay</p> <p>The Conoidea superfamily is a group of predatory marine gastropods that consist of Conidae, Terebridae and Turridae. The Conoidean group is distinguished by its radular tooth, which acts like a hyperdermic needle to inject powerful neuropeptides into its prey. While peptide toxins from cone snails, named conotoxins, have been previously characterized as effective</p>

inhibitors of cell signaling, almost nothing is known about the bioactivity of terebrid snail peptide toxins, named teretoxins. This project examines the activity of two novel teretoxins from *Terebra guttata*, Tgu6.1, and *Terebra argyosia*, Tar22.1 using a polychaete bioassay. Polychaetes are the natural prey for terebrid snails, providing a viable assay for determining the bioactivity of these synthesized peptides. Twenty micromolar of Tgu6.1 and Tar22.1 was injected into the central nerve cord of *Nereis virens* (20uM/2g). An inhouse worm tracking software was used to quantitatively analyze worm activity post teretoxin injection. Results obtained from this assay indicate that Tgu6.1 is biologically active, causing sustained paralysis when injected into worms. Two negative controls, a non-injected worm and a worm injected with saline solution, show more active movement and greater speed throughout the experiment. When looking at the distribution of speed of the polychaetes, it is evident that the worm injected with Tgu6.1 has a dramatic decrease in range as well as variation in speed over time. Preliminary results for the injection of Tar22.1 show slight decreases in range as well as variation in speed, but less so than Tgu6.1. While promising, the polychaete assay only provides phenotypic information about teretoxins. To fully characterize Tgu6.1 and Tar22.1 activity additional experiments using electrophysiology must be performed to determine ion channel and receptor specificity and selectivity.

Thursday, March 26th, 2015

Poster Session #6

2:00pm–4:00pm

97 Presenter: **Danyal Alam**, *Psychology*
BP-ENDURE (Blueprint Program for Enhancing Neuroscience Diversity through Undergraduate Education)
Faculty Mentor: Regina Miranda

RNA Editing Mediated by the Immune System

Patients treated with interferon alpha (IFN- α) often report severe depressive symptoms that presumably result from the activation of numerous interferon-stimulated genes (ISGs). One such ISG is an isoform of ADAR1 (p150), an enzyme involved in the editing of numerous RNA transcripts by the site-selective conversion of adenosine-to-inosine (A-to-I). Aberrant editing of transcripts encoding the 2C-subtype of serotonin receptor (5HT2C) has been associated with depression, anxiety, and schizophrenia suggesting that interferon-mediated, p150-dependent alterations in 5HT2C function could, in part, underlie the etiology of mood and psychotic disorders. To test this hypothesis, C57BL/6J mice were injected daily with IFN- α for 14 days before the isolation of RNA from dissected brain regions and peripheral tissues. Increased expression of transcripts encoding ADAR1 (p150) were observed in numerous brain regions and peripheral tissues in response to chronic interferon treatment. Similarly, the extent of editing for 5HT2C transcripts in interferon-treated animals was selectively increased at two sites (A and B) that previously have been shown to be preferentially edited by ADAR1. These results demonstrate that chronic interferon treatment for conditions such as hepatitis C infection and multiple sclerosis could result in depressive symptoms by changes in ADAR1 expression and subsequent changes in RNA editing profiles.

<p>98</p>	<p>Presenter: Stefanie Balbuca, <i>Biological Sciences and Psychology</i> BP-ENDURE (Blueprint Program for Enhancing Neuroscience Diversity through Undergraduate Education) Co-author: Suzanne DeLaMonte Faculty Mentor: Regina Miranda</p> <p>Exposure to Ethanol and the Nitrosamine NNK Contribute to White Matter Degeneration and Impairment to the Insulin-signaling Pathway</p> <p>Background: Alcohol related neurodegeneration (ARN). ARN is implicated in the disruption of the insulin signaling pathway, white matter atrophy and the accumulation of toxic lipids in the brain. Furthermore, similar effects to the ones produced by alcohol occur with low exposures to nitrosamines. Consequently, since many alcohol abusers, also consume tobacco products, it is necessary to investigate how the Nicotine-Derived Nitrosamine (NNK) contributes to or exacerbates the effects of alcohol in ARN. Hypothesis: Low doses of NNK can have neurodegenerative effects similar to those seen in ARN. In addition, exposure to both ethanol and NNK can exacerbate these effects. Results: Ethanol was responsible for the inhibition of insulin/IGF-1 signaling pathways, by reducing the phosphorylation levels of insulin-R and IGF-1R. Ethanol was also responsible for the inhibition of Akt. NNK was responsible for the phosphorylation of the insulin receptor substrate-1 (IRS-1) on the serine residue 312, thus inactivating it. Ethanol also inhibited phosphorylation of the Glycogen Synthase Kinase 3 beta (GSK-3B), thus activating it and allowing it to inhibit the insulin-signaling pathway. Furthermore, exposure to both ethanol and NNK altered the expression of oligodendrocyte genes. NNK stimulated the expression of immature oligodendrocyte genes, while ethanol stimulated the expression of both immature and mature oligodendrocyte genes. Conclusion: Alcohol abuse and exposure to NNK promote ARN. Alcohol inhibits the insulin-signaling pathway and NNK alters the normal expression glial genes, thus dys-regulating the proper synthesis of myelinating oligodendrocytes.</p>
<p>99</p>	<p>Presenter: Chana Ben-Zacharia, <i>Theatre and Psychology</i> Macaulay Honors College Faculty Mentor: Deepshikha Chatterjee</p> <p>Design and Production of Costume Representations of Tarot Cards</p> <p>Theatrical story telling has been based around inspiration from myths, rituals, and human betterment. In my project, I am creating Tarot card costume representations based on modern haute couture fashion. The project entails designing and building four realized costumes. These costumes are inspired by the Tarot deck painted by Bonifacio Bembo for Bianca Maria Visconti and Francesco Sforza. The Visconti-Sforza deck's gold wall background and color palette has inspired the world of metallics, creams, and cool earth tones. The design is based on the Pentacles suit, which advises individuals on the material and secular world. The sources of research include historical Tarot deck research and modern haute couture. These designs, in addition to the array of fabrics, trims, notions, and silhouette of each model, have collectively informed the final realizations of these costumes. The costumes will be exhibited in Hunter North 537 on May 7-9, 2015.</p>

100	<p>Presenter: Emilie Canino, <i>Psychology</i> Faculty Mentor: Kimberly Robinson</p> <p>Perfectionism and Illicit Stimulant Use in College Students</p> <p>With the increase in diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) stimulant medication has become easily accessible on college campuses, resulting in higher rates of illicit use. Previous research has indicated that a primary motive for illicit stimulant use is a desire to improve academic performance, a motive that may be associated with perfectionism. Research has found mixed results regarding the effects of perfectionism on illicit stimulant use. 326 participants at a liberal arts college in the Northeast completed self-report questionnaires on personality, cognitive, and drug-related variables. Results revealed that only one type of perfectionism, self-oriented, was significantly related to illicit stimulant use. Individuals who were higher in self-oriented perfectionism were 1.52 times more likely to use stimulants than those who were lower in perfectionism ($p < .01$). In addition, results revealed that this significant, negative relationship was partially mediated by increased outcome expectancy of guilt around stimulant use.</p>
101	<p>Presenter: Raymond Fan, <i>Chemistry II</i> Yalow Scholar Co-authors: Zheng Zhao, Che Martin, Philip Bourne, Lei Xie Faculty Mentor: Lei Xie</p> <p>Drug Repurposing to Target Ebola Virus Replication and Virulence Using Structural Systems Pharmacology</p> <p>The recent outbreak of Ebola has been cited as the largest in history. Despite this global health crisis, few drugs are available to efficiently treat Ebola infections. Moreover, the time required to bring new drugs to market using conventional drug discovery and development approaches is too long to address this urgent situation. Under these circumstances, drug repurposing provides a potentially efficient solution. The identification and reuse of validated safe medicines would decrease the time required to pinpoint effective candidates, and accelerate the development of therapeutic approaches in response to Ebola and other pathogenic diseases. To identify such candidates, we used an integrated structural systems pharmacology pipeline which combines proteome-scale ligand binding site comparison, protein-ligand docking, and Molecular Dynamics (MD) simulation. Here, 1,766 FDA-approved drugs and 259 experimental drugs were screened to identify those with the potential to inhibit the replication and virulence of Ebola, and to determine the binding modes with their respective targets. Initial screening has identified a number of promising hits. Notably, Indinavir; an HIV protease inhibitor, may be effective in reducing the virulence of Ebola. Additionally, an antifungal (Sinefungin) and several anti-viral drugs (Maraviroc, Abacavir, Telbivudine, and Cidofovir) may inhibit Ebola RNA-directed RNA polymerase through targeting the MTase domain. Further in vitro and in vivo testing to evaluate the anti-Ebola activity of these drugs is warranted.</p>

102	<p>Presenter: Stephen Formel, <i>Biological Sciences</i> Undergraduate Research Initiative Fellow Co-authors: Livia Johnson, Diana Bratu Faculty Mentor: Diana Bratu</p> <p>Visualizing the Dynamic Composition of Oskar mRNP during <i>Drosophila melanogaster</i> Oogenesis</p> <p>Post-transcriptional control of gene expression plays a major role in normal cellular function. Protein expression can be spatially and temporally regulated via the asymmetric distribution of mRNA transcripts. During <i>Drosophila melanogaster</i> oogenesis, mRNAs encoding maternal factors, that control early embryonic development, localize in the oocyte by active transport via microtubules. oskar mRNA localizes to the posterior cortex of the oocyte and encodes the germline determinant while also indirectly specifying the anterior-posterior embryonic axis. During transport the mRNA remains translationally repressed, which is critical for proper axis development in the embryo, as premature Oskar protein expression causes a duplicated posterior phenotype. The transport and translational repression of oskar mRNA is a dynamic process mediated by multiple factors that form a messenger-ribonucleoprotein (mRNP) complex. Two members of the mRNP complex, Cup and Bruno, have been shown to play a role in the translational repression of oskar mRNA; however, the spatial and temporal requirements for these proteins to join the mRNP complex have not been investigated. In order to decipher when and where Cup and Bruno join the mRNP complex, and to determine if their mutual interactions is required for recruitment to oskar mRNA, we examined the localization of each factor following reciprocal depletion of the other protein. Future work will focus on examining the spatial and temporal requirements for the formation of the oskar mRNP and the roles of Cup and Bruno in the regulation of oskar mRNA transport, stability and translational repression.</p>
103	<p>Presenter: Kelly Huang, <i>Biochemistry</i> Co-authors: Prachi Anand, Marouf Hossain Faculty Mentor: Mandë Holford</p> <p>Characterization of Venom Snail Peptide Tv1 Activity to Selectively Inhibit Liver Cancer</p> <p>The most common treatment for patients with liver cancer, hepatocellular carcinoma (HCC), is chemotherapy with doxorubicin, 5-fluorouracil or cisplatin, or targeted therapy with sorafenib. Unfortunately, these therapies are not selective for HCC cancer cells and have significant side effects to normal cells that could lead to patient death. There is, therefore, an urgent need to find novel therapies for HCC that are selective to liver and lead to better clinical outcomes. This project will investigate anti-cancer properties of bioactive snail peptides that can be exploited to contribute to selective HCC therapy. Venomous peptides are an innovative arena for investigation of novel cancer therapies. Most venomous snail peptides are antagonists that inhibit the function of their target ion channel. Membrane ion channels play an important role in cell proliferation and the development of cancer. Cone snail peptide k-PVIIA has been shown to bind to hERG, a potassium (K⁺) ion channel protein that increases in concentration on the cell surface of cancer cells. Blocking of hERG inhibits tumor cell proliferation. Additionally, the analgesic effect of venomous snail peptides is well documented, as evidenced by the commercially available snail peptide drug, ziconotide (Prialt®), which is used to treat chronic pain in HIV and cancer patients. The Holford and Ogunwobi research</p>

	<p>group has recently discovered that terebrid snail peptide, teretoxin, Tv1, from <i>Terebra variegata</i> has specific anti-cancer activities against HCC, but not normal hepatocytes. The anticancer activity of Tv1 was characterized in liver cancer (BNL1MEA.7R.1) and normal liver cell line (BNL.CL.2) using cell death and proliferation assays, MTT colorimetric, Hoescht staining, and migration assays, in comparison to sorafenib and doxorubicin. Preliminary results indicate that Tv1 is highly specific against liver cancer cell lines in preventing tumor cell migration using an apoptotic cell death pathway.</p>
104	<p>Presenter: Anna Katkovskaya, <i>History</i> Macaulay Honors College Co-authors: Roseann Weick, He Huang, Nancy Greenbaum Faculty Mentor: Nancy Greenbaum</p> <p>Structural Change in the SAM1 Riboswitch Induced by Ligand Binding</p> <p>Selective 2'-hydroxyl acylation analyzed by primer extension (SHAPE) is a form of biochemical structure probing that is useful in providing information about the secondary and tertiary structure, as well as non-canonical base pairing, of RNA molecules. The principle of the method is that a certain class of chemical reagents reacts covalently with the 2' hydroxyl group of a nucleotide's ribose sugar according to its flexibility, thereby providing data about the flexible vs. structurally constrained regions of a folded RNA molecule. The target of our investigation will be riboswitches, regulatory RNA sequences in the 5' untranslated region of certain bacterial mRNA molecules that, when bound to a specific metabolite, undergo a structural change that alters the expression of the protein encoded by the mRNA in question. The specific focus of this investigation will be the SAM1 riboswitch, which regulates the expression of multiple genes in the bacterial S-adenosylmethionine synthesis/metabolic pathway (1). We will use BzCN to probe the conformation of the SAM1 riboswitch in the absence and presence of the SAM1 ligand in order to determine how the binding of the ligand affects the secondary and tertiary structure of the RNA. Preliminary data suggest that the folding pattern of SAM1 without a bound ligand is consistent with what found by x-ray crystallography. (1) Winkler WC, Nahvi A, Sudarsan N, Barrick JE, Breaker RR (2003). "An mRNA structure that controls gene expression by binding S-adenosylmethionine". <i>Nat. Struct. Biol.</i> 10: 701-707.</p>
105	<p>Presenter: Franklin Lema, <i>Psychology</i> MBRS-RISE (Minority Biomedical Research Support—Research Initiative for Scientific Enhancement) Co-authors: Kai Monde, Leandro Salina, Daphne Simeon, Victoria Luine Faculty Mentor: Victoria Luine</p> <p>The Effects of a Native American Ceremony for Trauma on Individuals with Characteristics of Depersonalization Disorder</p> <p>Stress-trauma disorders, including Depersonalization Disorder (DPD), are often medication-resistant, but studies suggest mindfulness-interventions reduce symptoms. DPD is a psychiatric disorder characterized by dissociation from the body or mental processes, comorbid with depression and anxiety, and associated with trauma. Thus, we investigated the effects of a traditional Native American Ceremony, involving meditation, visualization and emotional disclosure, on individuals with DPD-like symptoms. Participants (n = 15) were</p>

	<p>prescreened for levels of dissociation, depression, anxiety and a history of trauma similar to DPD patients and administered the ceremony or a written disclosure task. Participants received the Positive and Negative Affect Schedule to assess mood, the Profile of Mood States- depression subscale, the State-Trait Anxiety Inventory (STAI-YI) and the Peritraumatic Dissociative Experiences Questionnaire (PDEQ) before and after participation. Saliva samples were also taken and Cortisol measured by ELISA. Ceremony participants showed significant decreases, in anxiety, stress, negative affect and tension. Additionally, at 40 min post ceremony, depression decreased compared to baseline. Interestingly, immediately following the ceremony, dissociation slightly increased and then significantly decreased 20-mins later. No significant changes, except for a decrease in positive affect, were observed for written disclosure group. No changes in cortisol were found in either group. Our preliminary findings suggest that the ceremony may be a cost and time efficient intervention for symptoms of depression, anxiety and dissociation associated with trauma-stress disorders, such as DPD. Future research should investigate the ceremony on clinically diagnosed DPD patients and if repeated exposure to the ceremony results in permanent reductions of symptoms.</p>
106	<p>Presenter: Mario Martin, <i>Psychology</i> AstroCOM NYC Co-author: Viviana Acquaviva Faculty Mentor: Kelle Cruz</p> <p>Classification of Low/High Redshift Galaxies Using Machine Learning</p> <p>We can learn about how the universe has evolved through cosmic time by observing galaxies at different redshifts. Using the Hobby-Eberly Telescope Dark Energy eXperiment (HETDEX) survey as our proving grounds, we look to separate high-redshift Lyman Alpha Emitting (LAE) galaxies from low-redshift OII emitting galaxies, in order to use LAEs for investigating the behavior of Dark Energy at high redshift. Previously employed techniques relied on our understanding of the properties of LAE galaxies to separate them from OII emitting galaxies. We take a novel approach and explore classification using a popular computer science toolkit called machine learning. We are optimizing the performance of our support vector machine algorithm in identifying LAEs within our simulated dataset. Our objective is to recover more LAEs, thereby reducing incompleteness, and to minimize the contamination from OIIs.</p>
107	<p>Presenter: Gina Pellicci, <i>Psychology</i> Co-author: Melissa Katkin Faculty Mentor: Dawn Dugan</p> <p>The Effect of a Brief Mindfulness Intervention on College Stress</p> <p>The amount of stress and pressure college students face is rapidly rising (American College Health Association, 2004; American Freshman National Norms, 2000). This fact shows the necessity for better college stress reduction programs. Mindfulness is an increasingly prevalent skill that can be used as a coping method for handling stress (Baer, Carmody, & Hunsinger, 2012). This study examines the impact of a brief mindfulness intervention on college stress. Participants will include 30 Hunter College students, both male and female, who have been at Hunter for at least 1 previous semester. Participants will be asked to first complete 3 surveys, which talk about demographics, stress levels and mindful awareness. Participants will then listen to, and practice a daily mindfulness skill for 7 days. Three weeks</p>

	<p>later, participants will complete the mindfulness and stress surveys again. The hypotheses include that a week of mindfulness practice will increase mindful awareness and decrease college stress. Data collection is expected to begin as soon as the semester starts. Some parts of the data analysis will be done in time for the research conference. We expect to see that this intervention will attract more students because it is easily accessible and only requires a 1 week commitment. This is predicted to encourage more busy students to take advantage of a college stress reduction program.</p>
108	<p>Presenter: Andre Perez, <i>Rhetoric and Linguistics</i> Faculty Mentor: Kate Parry</p> <p>Emergent Cultures of the Harlem Renaissance</p> <p>My research was on the emerging sense of identity during the Harlem Renaissance and how African American Vernacular English (AAVE) played a crucial part in the development. The Harlem Renaissance was a mass movement physically, economically and culturally. The artists during this movement, who emerged out of the Reconstruction Era of the U.S., provided a public voice and identity to African Americans which had profound effects on both American and world cultures. Using various art forms, African American artists developed a strong sense of uniformity and pride. This movement was led by scholars such as Langston Hughes and W.E.B. DuBois, writers such as Zora Neale Hurston, Richard Wright and James Baldwin, composers like Duke Ellington and painters like Archibald Motley and Palmer Hayden. These people, among many others, gave a new depiction of what it meant to be an American Negro, a depiction not rooted in racist idealism like what was imposed during slavery and Reconstruction. My research presents the different causes and effects of the Harlem Renaissance movement as depicted through several art forms and demonstrates the new views of African American and urban identities which developed as direct results of the Harlem Renaissance.</p>
109	<p>Presenter: Hugo Roussel, <i>Political Science, Special Honors</i> Thomas Hunter Honors Program Faculty Mentor: Cynthia Roberts</p> <p>Explaining Why European Defense Integration Never Succeeds</p> <p>Europe created a common market, a single currency, and ranks as one of the world's largest and richest regions. Yet Europe has failed to become an integrated, global military power. Instead, national capabilities have been steadily cut as reliance on the US through NATO increased. But freeriding may not prove a viable long-term strategy as the US pivots to Asia. Using case studies, this project examines why meaningful European defense cooperation has been attempted but never succeeds. The most revealing case – Anglo-French cooperation through the Lancaster House treaties (2010) – should have been an easy success story, but failed to deliver. Its flagship project was an integrated UK-French carrier strike group in which new British carriers were to be updated to technological standards allowing for French jet fighters to operate from them. Both countries would benefit operationally and reduce costs. But in 2012, the UK reverted to an older design standard making interoperability impossible. This research identified three levels of explanations for the failure of the joint aircraft carrier project and cooperation in general: the dysfunctional defense acquisition process the United Kingdom, the dynamics of alliance relationship among the United Kingdom, the United States</p>

	and European NATO partners, and conflicts of interests among defense industry stakeholders.
110	<p>Presenter: Andres F. Salazar, <i>Psychology</i> Undergraduate Research Initiative Fellow Co-authors: Geneva Berra, Ruth Mizrahi, Guadalupe Morales, Amanda Marin-Chollom, Tracey A. Revenson Faculty Mentor: Tracey A. Revenson</p> <p>What I Wish I Had Known: Advice from Young Adult Blood Cancer Patients</p> <p>Young adults with cancer are understudied in behavioral medicine and likely to have unmet psychosocial needs. Cancer during this developmental stage is “off-time” in the normative life cycle, bringing unique stresses and challenges as young adults work to create identities, launch careers, become independent, and develop intimate relationships. We collected mixed methods data (interviews and self-report scales) from 60 individuals aged 20-49 (65% women and 35% men) diagnosed a hematological malignancy an average of 2.5 years ago. Responses to the prompt, “What advice would you give to someone of your age who has just found out that they have cancer?” were transcribed verbatim and coded using an eight-category schema developed by the investigators. In all, 123 unique excerpts were created and coded to create a total of 200 excerpts. The most cited advice (31.1%) was to work at maintaining relationships with family and friends despite the stresses cancer brings. The next largest category is (28.9%) concerned obtaining adequate information from medical professionals about pain management, treatment side effects, and fertility. Patients are also encouraged to make new social connections with other young people with cancer to garner emotional support from others in their situation (16.6%). Another frequent piece of advice was to maintain hope and optimism (23.6%); few participants suggested maintaining a realistic attitude.</p>
111	<p>Presenter: Camille Stewart, <i>Anthropology and Geography</i> Faculty Mentor: Jessica Rothman</p> <p>Diet Diversity in Red Colobus and Black & White Colobus Monkeys in a Shared Rainforest Habitat</p> <p>An important goal of primatology is to understand how primates living in the same habitats partition their resources and coexist in the same habitat. As part of a winter study abroad course, I conducted a short research project on the differences in feeding ecologies of two sympatric leaf-eating monkeys: the red colobus (<i>Procolobus rufomitatus</i>) and black and white colobus (<i>Colobus guereza</i>) living in Kibale National Park, Uganda. Through 5-6 focal samples each day for three days, we characterized the diets of these two species in relation to their amount of daily activity. Eight focal samples of adult monkeys per species were taken for twenty minutes each over a three day period, documenting identification (age, group, sex), actual time, and focal time of every activity performed. The data showed that in the red colobus, three different species of food were consumed during a twenty minute period, while in black and white colobus an average of one species of trees were consumed during a twenty minute period. More activity was demonstrated by the Red Colobus, which fed, groomed, and moved about more than the Black and White Colobus, which mainly rested. The Red Colobus consumed a wider variety of foods on average compared to the Black and Whites. These results highlight important differences between the two species and lend preliminary insight</p>

	into how these primates live together. Future research should include a longer data collection period and an assessment of the nutrients obtained through these foods.
112	<p>Presenter: Igor Teslya, <i>Psychology</i> Macaulay Honors College Faculty Mentor: Cheryl Harding</p> <p>The Relationship between Body Weight and Latency to Desired Level of Anesthesia Effect in the Mouse</p> <p>Gaseous anesthesia use is necessary to insure success in various surgical and experimental procedures. In order to study the effects of mold exposure on neural functioning, we used gaseous isoflurane to anesthetize mice before intranasal treatment with mold spores. However, there was a noticeable variability in latency to desired anesthetic effect among the subjects. From prior research, we were aware that that the animal's body weight is related to the effects of mold exposure. There is also strong evidence that the effects of anesthesia are related to body weight. An experiment was proposed to investigate whether animal body weight, change in an animal's body weight, or food consumption are related to latency to desired anesthesia effect in the mouse. Preliminary data analysis showed a significant positive correlation between the change in an animal's body weight (from the day before treatment to the day of treatment) and the latency to desired level of anesthesia. However, no correlation was present between latency to anesthesia effect and animal food consumption or change in body weight post-anesthetization.</p>
113	<p>Presenter: Crismeldy Veloz, <i>Psychology</i> BP-ENDURE (Blueprint Program for Enhancing Neuroscience Diversity through Undergraduate Education) Co-authors: James Gordon, Vance Zemon Faculty Mentor: James Gordon</p> <p>Sex Differences in Cortical Lateral Interactions Assessed Using Visual Evoked Potentials</p> <p>The human visual system undergoes major early developmental changes that lead to differences between males and females in cortical brain structure. Behavioral tests show that females tend to have better color vision while males tend to have better spatial vision. This study was designed to investigate neural mechanisms underlying the visual spatial differences. In particular it looked at long and short-range lateral interactions in males and females. It is hypothesized that sex differences exist in these long and short-range lateral interactions in the brain. Our lab tested this hypothesis using the visual evoked potential (VEP) with visual patterns that enable the examination of long and short lateral range inhibitory processes. We observed 60 participants, 40 males and 20 females, within the ages of 18-50. The stimuli consisted of windmill dartboard or partial windmill patterns presented at 4.29 Hz, 10 times each for 2-second periods. The electrical activity of the brain was recorded and signal averaged to yield VEPs. A discrete Fourier transform was used to extract first and second harmonic frequency components of the response. The significance was measured with amplitude and variability from 10 repeated measures, for individual harmonics and combinations of harmonics. A Fourier analysis was done for each response, and the significance measured with magnitude-squared coherence (MSC). Previous research studies showed that, for both males and females, responses to windmill dartboards compared with</p>

	<p>responses to partial windmills yield 2nd harmonic response suppression (long range lateral interactions) and an increase in fundamental response (short range lateral interactions). Our current data supported the previous studies. However, although our results show trends that sex differences may exist in these long and short-range lateral interactions in the brain, we have not yet found statistically significant differences.</p>
<p>114</p>	<p>Presenter: Tamar Winer, <i>Psychology</i> BP-ENDURE (Blueprint Program for Enhancing Neuroscience Diversity through Undergraduate Education) Co-authors: Hamed Khandaker, Miguel Briones, Ma'ayan Seligsohn, Glenn Schafe Faculty Mentor: Glenn Schafe</p> <p>Sex Differences Within an Administered Dietary Source of CORT and Curcumin on Morphological Changes within the CA3 and Amygdala</p> <p>Exposure to chronic stress has been strongly implicated in the development of a number of psychiatric disorders such as post-traumatic stress disorder (PTSD). Previous findings in our lab have shown that chronic exposure to corticosterone (CORT), a stress-associated adrenal steroid, enhances the expression of intracellular signaling pathways, memory-related immediate early genes (IEGs), and synaptically localized proteins within the lateral nucleus of the amygdala (LA). In contrast, western blot analysis of the CA3 region of the hippocampus has found significant down regulation of GluR1, snaptophysin, and BDNF. Based on these findings, we are currently examining whether chronic exposure to CORT alters spine morphology in the CA3 region of the hippocampus and within the amygdala in both male and female rats. We are also exploring whether a dietary source of curcumin, a naturally occurring compound found to have numerous pharmacological properties, is capable of reversing the effects of chronic CORT exposure on spine density. Male and female rats were exposed to CORT in their drinking water (50 µg/ml) for 14-days and simultaneously fed a diet enriched with curcumin (1.5%). Brains then underwent Golgi development and spine counts are being analyzed. We expect to find a sex difference in response to chronic CORT exposure, hypothesizing males will be more vulnerable to impairment (spine increase in amygdala and spine decrease in CA3) than females. We also hypothesize that a diet enriched with curcumin will be capable of reversing the effects of chronic CORT exposure on spine morphology in both regions.</p>

