

UG Undergraduate
RC **Research**
Conference

Proceedings

April 19-20, 2016

Hunter College Undergraduate Research Conference

Proceedings

April 19-20, 2016

Oral Presenter Index p. 3-5

Poster Presenter Index p. 6-9

Oral Presentations

Session 1 p. 10

Session 2 p. 15

Session 3 p. 19

Session 4 p. 23

Session 5 p. 28

Poster Presentations

Session 1 p. 34

Session 2 p. 43

Session 3 p. 50

Session 4 p. 59

Oral Presenter Index

Oral Presentation Session 1: Tuesday, 9:00am - 11:30am 3rd Floor Glass Cafeteria			
#	Presenter(s)	Title	Pg
1	Brian Richford	Asthma in the South Bronx: An Environmental Analysis	10
2	Claudine Avalos	Afro-Peruvian Jazz: A Case Study of the Fusion of Two Genres	10
3	Daniel Cisneros	A Closer Look at Discrimination: Field Experiments on Productivity Perception and Same-Race and Bender Bias.	10
4	Krishna Mehta	Investigating the Role of Y-Family Polymerases in Stress Induced Mutagenesis and Drug Resistance	11
5	Rubaya Yeahia	National Guidelines for Surveillance Testing in Patients with Solid Tumors: Variation and Specificity	11
6	Valentyna Kostiuk	Characterization of the Insulator Activity in the T Cell Receptor-Alpha Locus Control Region (TCR α LCR)	12
7	Eric Nava-Pérez	Neoliberal Textile Production of Puebla, Mexico	12
8	Gianna Torre	The Healing Power of Art	13
9	Lauren Christopher	Daily Energy Requirements for Human Populations	13
10	Olha Oliynyk	The Influence of Don Quixote on Dostoevsky's Idiot: The Quixotesque Character as a Result of Societal Tensions	13
11	Omari-Khalid Rahman	A Multilevel Analysis of NYPD Precinct Disparities in the Use of Force	14
12	Sarah Chebli	Freedom as a State for the Slave	14
Oral Presentation Session 2: Tuesday, 2:00pm - 4:00pm 3rd Floor Glass Cafeteria			
13	Alfredo Vidal Ceballos	Identification of Rahnella Aquatilis' lipid A and its Relation with the Human Immune System	15
14	Caresse Jackson	Neo-Orientalism in Jean Rhys's Wide Sargasso Sea	15
15	Christine Hirt	Comparing Historical Radar Storm Data with Electric Utility Power Outages in Order to Develop Statistical Models	15
16	David Kanbergs	Perceptions of Change: Narratives of Loss in Amman, Jordan	16
17	Jannatun Ferdowsi	The Cognitive Mediators of Binge Drinking on GPA and Academic Performance	16
18	Craig Brooks	Surface Brightness Mapping Using the BELR Flow Model	17
19	Kathleen Emerson	Urban Food Policy and the Potential for Urban Agriculture in New York City	17
20	Morgan Haywood-Joy	No Longer a Slave to the System: How Anne Bradstreet and Frederick Douglass used their Voices to Combat Systematic Oppression and Regain Power	17
21	Sarafina Gordon	LGBT Afro-Caribbean Activism, Experiences and Gatherings	18
22	Shihab Dider	Toward Repurposing Metformin as a Precision Anti-Cancer Therapy Using Structural Systems Pharmacology	18

Oral Presentation Session 3: Tuesday, 4:15pm - 6:15pm 3rd Floor Glass Cafeteria			
23	Brenda Abdelmesih	Understanding Rab7 Endosomal Trafficking in Schwann Cell Development and Myelination	19
24	Esra Padgett	Self as Commodity, Social Media as Market: The Branding of a Porn Star	19
25	Jaquelin Erazo	Mapping the Full-Extent of Dust in Molecular Clouds	19
26	Prima Manandhar-Sasaki	Does 8-Amino-Adenosine Activate a cep-1-independent Cell Death Pathway in Tumorous <i>C. elegans</i> and Inhibit Tumor Development?	20
27	Ryan C. Zurich	On Art: Translating the Creative Act	20
28	Farangis Tolibzoda	Effects of Curcumin on Fear Learning and the Anxiety-Related Threat Bias	21
29	Neriel David Ponce	Here and There: Home for Undocumented Immigrants	21
30	Rakia Khalid	Migration in Diasporic Communities	22
31	Roy Emmanuel Nuñez	Uncovering the Genomic Basis of <i>Treponema</i> Diversity	22
32	Syedah Meriam Haider	Islam, and Fair and Lovely	23
Oral Presentation Session 4: Wednesday, 9:00am - 11:30am 3rd Floor Glass Cafeteria			
33	Abtsam Saleh	Classical Islamic Perspective on the Relationship between the Individual and the Society	23
34	Betsy Hernandez	Identifying Sources of Inclination Biases of Inferred Galaxy Star Formation Rates	23
35	Martha Ordonez	Characterization of Tau Protein in Cancer Cells	24
36	Paul Melas	Cosmogony and Sacrifice in the Greek Orthodox Paschal Ritual	24
37	Sham Rampersaud	Iron Oxide Nanocages for Medical Applications	24
38	Steven Hall	Analysis of the Binding Abilities of Benzophenone-like Drugs to GLO1	25
39	Abraham Gutman	Analysis of Racial Bias in the Application of Physical Force by Police Officers in the New York City Stop and Frisk Program	25
40	Fernando Villafuerte	Investigating Ion Transport in Solid State, Ionically Conducting Materials: Insight into the Future of Energy Storage	26
41	Promie Faruque	Patient Outcomes and Characteristics in Peripheral T-Cell Lymphomas Treated with Histone Deacetylase Inhibitors	26
42	Rani Allan	The Plight of Palestinian Refugees in Lebanon	27
43	Ridwan Carim-Sanni	Visual Evoked Potential Measures of Sex Differences in Lateral Inhibitory Mechanisms	27
44	Tenzing Doma	Farmers' Markets and Population Health in the U.S.	28

Oral Presentation Session 5: Wednesday, 2:00pm - 4:30pm 3 rd Floor Glass Cafeteria			
45	Brigid Maloney	Preliminary Observations on the Effects of Unmanned Aerial Systems (UAS) on Bottlenose Dolphin Behavior	28
46	Carina Sirochinsky	Amplification and Mechanical Property Manipulation of Breast Cancer Cell Exosomes	29
47	Elizabeth Gorodetsky	Exogenous Fatty Acids Stimulate mTOR via the LPAAT Pathway in Mammalian G1 Cell Cycle	29
48	Nadha Fathima Yakoob	Iron-Oxide Nanoparticles and Exosomes for Targeted Therapy	30
49	Norine Wendlyn Chan	An Electrophysiological Analysis of Spatial Vision in Males and Females	30
50	Saipriya Iyer	Neutrophil to Lymphocyte Ratio in Patients with Primary Uveal Melanoma	30
51	Evelyn Mau	The Effect of English Language on Hong Kong Cantonese	31
52	Jose Ramirez	Judicial Obstructionism in Chilean History Post-Pinochet's Dictatorship (1973-1990)	31
53	Kathleen Jedruszczuk	Reducing Error and Increasing Consistency in the Segmentation of Anatomical Structures for Radiotherapy Planning	32
54	Mame Diop	Construction of a Transgenic C. Elegans Strain to Study Human Gain of Function Mutant p53	32
55	Nadera Rahman	Mouse Model of Multiple Traumatic Brain Injury Shows Decrease in Motoric Aspects of Nervous System Arousal	33
56	Rosaury Hernandez	Does Bilingualism Affect Working Memory?	33

Poster Presenter Index

Poster Presentation Session 1: Tuesday, 9:45am - 11:45am 3 rd Floor Main Cafeteria			
#	Presenter(s)	Title	Pg
1	Alketa Plaku & Alma Plaku	Tax Avoidance by Financial Companies	34
2	Andrea Cumpelik	Selective Potentiation of Hippocampal-Accumbal Synapses in Cocaine Conditioned Place Preference	34
3	Andrew Villier	The Influence of Muscle Tension and Gastrointestinal Distress on Psychological Symptoms within Generalized Anxiety Disorder	34
4	Anjelica Gangaram	Binding of Protein RBM22 to the Human Spliceosomal U2-U6 snRNA Complex	35
5	Da Eun Chung	Mental Number Representations in Adults: Relations Between Spatial Cognition and the Mental Number Line	35
6	Desiree Gordian	Behavioral Differences in Methamphetamine-Induced Conditioned Place Preference Between C57Bl/6 and 129/SvEv Adolescent Female Mice	36
7	Eloise McAviney	Subject-Permitted Teasing: Agency and Support in High-Risk Humor	36
8	Elyce Williams	Nonverbal Joint Attention Behaviors in Children with Autism Spectrum Disorder: Investigating Continuity and Change	37
9	Gil Dekel	Identification of Topological Structures in 2-D Spatial Models	37
10	Giuseppe Yanez	Drongo, the Fruit Fly Homolog of AGFG1, Participates in Vesicular Trafficking During Oogenesis	37
11	Gunjan Desai	Pain Experience in Pediatric Obstructive Sleep Apnea: Relationship with Subjective and Objective Measures of Sleep	38
12	Helen Shin	Characterization of Terebrid Venom Peptides Using a Polychaete Bioactivity Assay	38
13	Ilana V. Deyneko	Effects of Microtubule Stabilizing Drugs in CNS Myelination	39
14	Ina Shehu	Physiological and Behavioral System for Hearing Restoration with Cochlear Implants	39
15	Jacob Hamer	Using Dense Hydrogen Clouds to Improve Galaxy Formation Models	40
16	Jessica Johnson	Electron Paramagnetic Resonance and the Effects of Radiation in Kapton	40
17	Kevin Park	Asian American Roots: The Current and Historical Role of Youth and Undergraduate Organizing in Asian American Studies	40
18	Miranda Trapani	Volatility of Host Mark Pheromone in Tamarixia Radiata	41
19	Nataliya Rubinchik	Risk Aversion Effects on Health and Financial Investments in Middle Adulthood	41
20	Ying Xie	Lethal Effects of Imidacloprid on Asian Citrus Psyllid, Diaphorina Citri	41
21	Seonghee (Joy) Park	Generation of a novel mouse model for the study of cisplatin resistant bladder cancer	42
22	Victoria DiTomasso	A Million Years Young: Determining the Age of 11 Young Brown Dwarfs	43
23	Ying Xie	Intergroup Threat Alters the Underlying Dimensions of Face-Trait Evaluation	43

Poster Presentation Session 2: Tuesday, 1:45pm – 3:45pm 3 rd Floor Main Cafeteria			
24	Alexa D'Angelo	Analyzing the Relationship Between Student Debt and Physical Health	43
25	Alkaya Massaly	Synthesis of Tetrahydroisoquinoline/D3 Antagonist Hybrids as Potential Anti-Cocaine Agents	44
26	Angelina Usherenko	Understanding the Relationship Between Urban Infrastructure and Asthma in the South Bronx	44
27	Betty Y. Lung	The Untold Story: Post-Traumatic Stress Among Parents of Adolescents and Young Adults with Cancer	45
28	David Iskhakov	Synthesis and Characterization of ⁹⁹ Tc Complexes Containing Phosphonic Acid Ligands	45
29	Eden Volkov	Evaluating the Causal Effect of Health Insurance Coverage on the Labor Supply of Young Adults	45
30	Emily Lau	Characterizing Bioluminescent Proteins from Polychaete Worms Using Top- Down Proteomics	46
31	Frank Yeh	Effect of Cortisol on Goldfish Startle, Sensory Gating and Open Field Behavior	46
32	Giovanna Romero	The Communication Between Phytobacteria	47
33	Hector Moran	Effects of microtubule stabilizing drugs in PNS myelination	47
34	Jean-paul Ventura	Characterizing Brown Dwarf and Exoplanet Atmospheres	47
35	Mauricio Vallejo	Localization of Active DNA Sub-regions of the JaCa in the TCRa Locus	48
36	Sofia Chelpon	Westhampton, NY Coastal Morphology Assessment: Pre and Post Hurricane Sandy	48
37	Steven Behm	Biochemical and Behavioral Sex Differences in Response to the Cannabinoid Agonist CP55,940	48
38	Victor R. Cabrera	Human and Robotic Navigation in Virtual Indoor Space	49
39	Ximena M. Peralta	Investigating Bacterial Contribution in Immunostimulatory Activity of Coriolus Versicolor	49
40	Yuleisy Ruiz	Metabotropic Glutamate Receptors Activate Autocrine Growth Signaling Pathways in LM7 Cells	49
40.5	Zachary Gershon	The Nose Knows – Understanding the Expression of Human Odorant Receptors	50
Poster Presentation Session 3: Wednesday, 9:45am – 11:45am 1 st Floor Lobby			
41	Alisa Sponton	Providing Care to Women with Disabilities During the Perinatal Period	50
42	Annelie Aguessy	The Role Of Protein Kinase C and Phospholipase D in Morphogenesis in Dictyostelium Discoideum	50
43	Anzhela Tsomyk	Mold Exposure Increases Sensitivity to Pain	51
44	Christina Helmi	REG1 Promotes the Development of Chemoresistance in Pancreatic Cancer Cells Through Activation of AKT	51
45	Christopher Mallia	An Exploration of Polycarbonate-Diluent Systems via FFCNMR	52
46	Daniela Mikhaylov	Further Analyzing Translational Control in Acute Myeloid Leukemia (AML)	52

47	Dina Buitrago	Engineering a Novel Chimeric Locus Control Region with Insulator Activity for Gene Therapy	53
48	Elena Byrne	The Neural Benefits of Enrichment on Stress Response	53
49	Jyothisraj Johnson	Characterizing the zone of influence of dark matter clumps on image positions and flux ratios in gravitational lensing systems	53
50	Kathleen Jedruszczuk	Stress Dynamically Regulates Behavior and Glutamatergic Gene Expression in Hippocampus by Opening a Window of Epigenetic Plasticity	54
51	Kelsey Matta	Ankle Distraction Arthroplasty	54
52	Linda Wong	Higher Body Weight and Brain IL-1B Associated with Increased Fear in Mold-Exposed Mice	55
53	Michael Lyudmer	Biological Characterization of Tv1 Venom Peptide for Hepatocellular Carcinoma Therapy	55
54	Munazza Alam	Understanding the Intrinsic Properties of Galaxies: Relating Viewing Angle and Intrinsic Luminosity	55
55	Naxhije Berisha	Analysis of Porphyrin-Conjugates for Applications in Photodynamic Therapy	56
56	Nicolette Somogyi & Henry Yelkin	Discovery of Novel Bioactive Peptides from Venomous Marine Snails	56
57	Roseann Weick	Effect of Post-transcriptional Nucleotide Modification on Thermal Stability of E. coli tRNA(lys)	56
58	Sara Camnasio	Quantitative Spectral Morphology Analysis of Unusually Red and Blue L Dwarfs	57
59	Sarah Chebli	The Binding of Protein RBM22 to the Human Spliceosomal U2-U6 snRNA Complex	57
60	Sharon Pang	Knockdown of RHAMMB on Liver Metastasis of Pancreatic Tumors	58
61	Sujoy Manir	Developing a Dissociative Nanocontainer for Peptide Drug Delivery	58
62	Tamara Yakubova	HuR Ubiquitination and its Role in mRNA Processing During DNA Damage	59
63	Victoria Mroz	Mapping the Lipid Mediated Cell Growth Checkpoint in the G1 Phase of the Cell Cycle	59
Poster Presentation Session 4: Wednesday, 1:45pm – 3:45pm 1st Floor Lobby			
64	Alison Klein	Tau-related Deficits in Fast Axonal Transport in Alzheimer's Disease	60
65	Amanda Ramdular	Small Molecule Agents for Tumor Targeting	60
66	Carolina Santamaria	Developing a High Throughput In-Vitro Screen to Assess Novel Terebrid Peptide Neurotoxicity	61
67	Dayanni Bhagwandin	Synthetic Studies on Immunostimulatory Glycolipids	61
68	Dean Gailey	Alternatives to the “Other Box:” Supporting Non-Binary Gender Identities via Medical Documentation	61
69	Dennis Melendez	Behavioral Plasticity as a Predictor of Vocal Plasticity	62
70	Gisela Lopez & Hana Lee	The Effect of Flavor on Human Swallowing Behavior	62
71	Hala Haddad	Effects of Environment Induce Neurogenesis that Increases Memory on the Radial Arm Maze	62
72	Heeyewon Jeong	Cultivating Mindfulness for Psychological Well-being: Mindfulness Meditation as a Stress and Anxiety Reducer among College Students	63

73	Karen Ebenezer	Assessing the Structure and Function of TLF3, a Good Cholesterol Found in Lupus Patients	63
74	Katherine Lopez	The Effects of Curcumin on Morphological Changes in the Infralimbic Cortex and Lateral Amygdala Following Chronic Restraint Stress in Rats	64
75	Keith Anne Ilagan	Do Social Constraints Affect Psychological Adjustment? Steps to Conducting a Systematic Literature Review	64
76	Kirran Tiwari	The Effect of Temperature on the Blue-Green Chroma of the Eggshells of Selected Avian Species	64
77	Medea Asatiani	The Georgian Orthodox Church and Georgian Women	65
78	Michelle Naidoo	The protein FRY-like (FRYL) and androgen receptor (AR) signaling in prostate cancer	65
79	Muyu Situ	Environmental Enrichment Increases Neurogenesis Leading to Improved Working Memory	66
80	Nayab Khan	2-Methyl-1, 3, 6-Trihydroxy-9, 10-Anthraquinone Isolated from <i>Rubia Cordifolia</i> L Inhibits IgE Production	66
81	Ria Kalyan	Looking at You, Looking At Me: Positive and Negative Biases of Individuals With Social Anxiety Disorder	66
82	Shamima Khan	Psychiatric vs. Physical Disabilities: A Comparison of Barriers and Facilitators to Employment	67
83	Tamara Gillot	A novel synthetic biotinylated microRNA-1207-3p duplex inhibits migration and induces apoptosis of prostate cancer cells	67
84	Veronica Bueno	Conjugating a Chlorine Derivative with Lysozyme and Bovine Serum Albumin	68
85	Wendy Li & Kenel Zhao	Role of Spliceosomal RBM22 in Folding of Human U2-U6 snRNA Complex Analyzed by Fluorescence Resonance Energy Transfer Techniques	68

Oral Presentation Abstracts

Tuesday, April 19th, 2016
Oral Presentation Session #1
9:00am-11:30am

1	<p>Presenter: Brian Richford, <i>Urban Studies</i> Faculty Mentor: Charles Starks</p> <p>Asthma in the South Bronx: An Environmental Analysis</p> <p>Our project - An Analysis of Asthma in the South Bronx - will look at environmental factors shaping the high rates of asthma in the South Bronx. Traditional discussions of asthma in the region tend to focus heavily on the effects of air pollution. In an effort to make our analysis more expansive we will also be looking at the effects of less discussed factors- such as second hand smoking, pests and household toxins. By assessing the importance of these factors we will then propose policy and community solutions to reduce asthma prevalence in the region. Proposed solutions will also arise from interviews conducted with local leaders/community activists as well as through an analysis steps taken by existing community organizations.</p>
2	<p>Presenter: Claudine Avalos, <i>Music Education</i> Faculty Mentor: Stephanie Jensen-Moulton</p> <p>Afro-Peruvian Jazz: A Case Study of the Fusion of Two Genres</p> <p>The Afro-Peruvian music revival of the 1950s-1970s strove to provide a history for Afro-descendants of Peru by salvaging the remains of a culture that was nearly forgotten (Feldman 2006). To accomplish this, Afro-Peruvians turned to established Afro-Latin musical traditions, such as Afro-Cuban and Afro-Brazilian, which had long-standing histories of creolized music. As new instrumentations and techniques were adopted from these neighboring traditions, Afro-Peruvian music was redefined with new standards, engendering polarized reactions from Peruvian audiences particularly on issues of authenticity of international performance (Tucker 2013). As this genre continued to evolve post-revival, musicians began fusing Afro-Peruvian music with other genres like jazz and rock, bringing Afro-Peruvian music to new audiences. This act of repackaging Afro-Peruvian music for the world has once again led to differing opinions from Peruvian audiences who experience this music in varying ways and have come to question its authenticity. This project examines issues of cultural identity and transnational audience reception in the the Gabriel Alegria Afro-Peruvian Sextet and the Laura Andrea Leguía Afro Peruvian Jazz Orchestra. Based in New York City, these ensembles explore "... the music of Coastal Perú in a jazz context," producing a sound "...that is at once African, Andean and American." (Leguía 2015) Ethnographic fieldwork both in New York City and Lima, Peru will provide insight on how fusions of Afro-Peruvian music and Jazz develop and how these ensembles are being received by their intended audiences.</p>
3	<p>Presenter: Daniel Cisneros, <i>Economics and Psychology</i> Faculty Mentor: Karna Basu</p> <p>A Closer Look at Discrimination: Field Experiments on Productivity Perception and Same-Race and Bender Bias</p> <p>The purpose of this study is to examine the link between wage differentials across population sub-groups and their underlying causes. This is accomplished by conducting two field experiments on Hunter College students. In experiment I students were asked to predict the productivity of an applicant based on the applicant's resume. In experiment II, students were asked to assign wages to</p>

	<p>a list of employees based on the amount of money they would make for the respondent and their chances of coming to work. To manipulate the perceived race and gender, resume and employee names varied between black and white sounding names and between male and female sounding names. I find that whites are perceived as being 10.88% more productive than blacks, and males as being 12.96% more productive than females. I also find that raters assigned higher wages to employees of the same race; however, there is no effect when looking at same-gender preferences.</p>
4	<p>Presenter: Krishna Mehta, <i>Biology with Neuroscience concentration and Studio Art</i> Muse Scholar, Tukman Award Recipient, Helene Kadish Barnett Fellowship Co-Author: Kelsey Temprine Faculty Mentor: Richard White</p> <p>Investigating the Role of Y-Family Polymerases in Stress Induced Mutagenesis and Drug Resistance</p> <p>Melanoma is often associated with mutations of the protein BRAF. Despite profound effects by targeted BRAF inhibitors, resistance resulting from mutations by stress causes relapse of the disease. In bacteria, a pathway called stress-induced mutagenesis (SIM) creates new selectable mutations in response to starvation stress. In prior studies using the human melanoma cell line A375, polη, a Y-family polymerase, are upregulated at the RNA level after addition of BRAF inhibitor PLX4032, suggesting that SIM may play a role in development of drug resistance. Three human melanoma cell lines (A375, Malme-3M, and SKMEL28) were treated with 1 and 5 μM PLX4032, using dimethyl sulfoxide as a negative control in order to determine the role of this pathway in drug resistance. Treatment of the human melanoma cell lines with 5 μM PLX4032 caused a substantial increase and 1 μM PLX4032 caused a smaller increase in polη RNA in all cell lines. Despite significant increases in RNA levels, Western blots revealed no similar increase in protein levels of polη. Immunofluorescence indicated a shift of polη from the cytoplasm to the nucleus upon addition of drug treatments. BRAF inhibition with PLX4032 led to upregulation of polη and other Y-family DNA polymerases at the RNA level, suggesting a potential connection between cellular stress and the development of new mutations. The shift in protein localization seems to play a role in this connection as well. These studies will elucidate how drug inhibition can upregulate error-prone polymerases and generate mutations that lead to drug resistance.</p>
5	<p>Presenter: Rubaya Yeahia, <i>Chemistry</i> This project was done through the SCORE program Co-Authors: Deborah Korenstein, Shrujal Baxi Faculty Mentors: Deborah Korenstein, Shrujal Baxi</p> <p>National Guidelines for Surveillance Testing in Patients with Solid Tumors: Variation and Specificity</p> <p><u>Background:</u> Clinical guidelines are recommendations for clinicians about the care of patients with particular conditions and are developed by various organizations. Cancer guidelines address issues including screening, active therapy (e.g. chemotherapy), and care during the “surveillance” period: the period after successful treatment with curative intent during which the patient is still followed by cancer specialists for recurrence. Primary care physicians care for cancer survivors and rely on guideline recommendations. Despite an increasing number of cancer survivors, recommendations for surveillance testing are often underemphasized in guidelines. Guidelines can even vary in terms of content, which leads to variations in care and possibly to unnecessary testing and decreased efficiency. This study explores variations and specificity in recommendations among current national guidelines for the most common cancers in America – breast, colorectal, lung, and prostate.</p> <p><u>Methods:</u> We included guidelines created by professional societies and government-based organizations in North America and Europe. We used online search engines (PubMed, Google, National Guideline Clearinghouse) and organization websites to identify guidelines. Guidelines aimed at patients and those developed by local organizations were excluded. Surveillance recommendations were categorized by modality (imaging studies, blood testing, etc.) and classified by their nature (recommend for/against, no clear recommendation, not addressed).</p>

	<p>Recommendations were analyzed by one investigator (RY) and checked by two others (SB and DK). Results: We identified 31 guidelines – 8 each for breast and colorectal and 5 each for lung and prostate. 35% were based on systematic review; origins were US (45%), UK (26%), Canada (10%), and Europe (23%). Guidelines recommended mammography in breast cancer (100%), colonoscopy (100%) and CEA (87.5%) in colon cancer, CT (80%) in lung cancer, and PSA (100%) in prostate cancer. The proportion of guidelines recommending how often one should be tested were 62.5% for mammography, 100% for colonoscopy, 40% for CEA, 70% for chest CT, and 25% for PSA. Contradictory recommendations were seen for breast MRI and ultrasound (12.5% recommended for and 37.5% recommended against each). Of the 81 total recommendations, only 33% gave specific frequencies and 12% specified when to stop testing. Conclusion: Most organizations recommended 1 or 2 main tests for each cancer, despite the presence of numerous surveillance tests; recommendations on some secondary tests were contradictory. Few organizations recommended against specific tests or gave specific testing frequencies. The lack of guideline specificity may confuse clinicians and does not serve the needs of patients. Our findings highlight the need for more specific and comprehensive surveillance guidelines in North America and Europe.</p>
6	<p>Presenter: Valentyna Kostyuk, <i>Biological Sciences</i> HunterHHMI, Ronald E. McNair Co-Authors: Gayathri Devi Raghupathy, Armin Lahiji, Benjamin D. Ortiz Faculty Mentor: Benjamin D. Ortiz</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>
7	<p>Presenter: Eric Nava-Pérez, <i>Political Science</i> Pipeline Pre-Doctoral Fellowship Program Faculty Mentor: Jeannette Graulau</p> <p>Neoliberal Textile Production of Puebla, Mexico</p> <p>There has been much work done on neoliberal free-trade agreements, such as the North American Free Trade Agreement (NAFTA). This paper discusses NAFTA, with a focus on its effects on Puebla, Mexico's textile industry in particular, using theories of combined and uneven development. I am specifically interested in the dialectical relationship between factors of production (land, labor, and capital) and their globalized distribution or trade. Analyzing geospatially and structurally both the international division of labor and political economy I ask, how has the textile industry in the State of Puebla, since 1982, been affected by emerging economies of the global south? Moreover, is there a</p>

	causal and/or spatial relationship between the devaluation of that industry and migration patterns from Puebla, Mexico to New York City? This investigation contributes to scholarly conversations on economic geography, emerging economies, regionalism, global migration flows, and state sovereignty.
8	<p>Presenter: Gianna Torre, <i>Art History</i> Yalow Scholar Program, Thomas Hunter Honors Program Faculty Mentor: Lynda Klich</p> <p>The Healing Power of Art</p> <p>It is largely accepted that displaying works of art within the children's department in a medical setting is essential to the wellbeing of a sick child. Jan Mittan, executive director of the Children's Hospital Foundation says, "Art is such a vital piece of the treatment program. We're touching the lives of these really sick kids and their families at the heights and depths of their emotions." While displaying art within the children's wing is a widely-accepted practice, presenting art within adult medicine is not well established. There is a gap in the research regarding the effect of art within adult medical settings and I argue that art has a powerful potential to heal, a potential yet to be unlocked. There are a select few hospitals within New York City that have already realized the importance of displaying art as a way to promote healing. Memorial Sloan Kettering Cancer Center is a premier example of a hospital that emphasizes the arts. Alice Momm, an artist and curator, has the unique opportunity to curate the works that are displayed within the hospital. Momm's unique philosophy on the healing power of art has created an uplifting atmosphere in which patients feel comfortable. Through this research, I plan to further study the connection between art and medicine in hopes of convincing others of its importance.</p>
9	<p>Presenter: Lauren Christopher, <i>Psychology and Anthropology</i> The Research Initiative for Scientific Enhancement (NIGMS/RISE) Program Co-Author: Herman Pontzer Faculty Mentor: Herman Pontzer</p> <p>Daily Energy Requirements for Human Populations</p> <p>What factors determine daily energy requirements for adult humans? Previous studies indicate that body size (particularly fat free mass) and age affect total energy expenditure, TEE (kcal/d), but the effects of habitual physical activity and climate are not well understood. Physical activity is considered a primary factor affecting TEE, but comparisons among populations often reveal no correlation with activity level. Climate has been shown to affect basal metabolic rates, BMR (kcal/d), but the effects of latitude and elevation on TEE are unstudied. Here, we assembled a global dataset of TEE for 255 cohorts, using data from 188 doubly labeled water studies from 1986 ? 2015. We used multiple regression to test for effects of habitual physical activity (assessed via human development index (HDI)) and climate (latitude and elevation), controlling for anthropometric variables (including body mass, sex, and age). None of our models indicated a significant effect of habitual activity or lifestyle on TEE. However, several models did indicate a significant effect ($p < 0.05$) of latitude and elevation, as well as a latitude*elevation interaction. Results are consistent with previous work showing no effect of habitual physical activity on size-controlled measures of TEE. The effect of climate warrants further investigation, and should be considered in future estimates of TEE in human populations.</p>
10	<p>Presenter: Olha Oliynyk, <i>English and Adolescent Education Concentration</i> Faculty Mentor: Diana Conchado</p> <p>The Influence of Don Quixote on Dostoevsky's Idiot: The Quixotesque Character as a Result of Societal Tensions</p>

	<p>Many critics have discussed Dostoevsky's representation of social corruption in <i>Idiot</i>, however, his literary character is traceable to the 17th century inspirational model Don Quixote. Originally composed in Spanish, this research paper explores Cervantes's witty creation of Don Quixote as a reflection of social changes and issues of Baroque Spain, arguing that Dostoevsky copied and recreated Don Quixote in a Russian Soviet 19th century setting to illustrate the tensions of that society. Don Quixote lives immersed in the romantic and innocent chivalric novels; Prince Mishkin grows up in Switzerland isolated from Soviet Russian city life. Both do not know how to operate in their current society and their innocent hearts and goodness backfire when they encounter the cruelty of those they meet. Both Cervantes and Dostoevsky represent the modern urban world as a place of corruption and changing patterns of society with no space for the idealistic, pure, and imaginative freedom represented by the characters' fantasies. The tragic ending of the characters: Don Quixote's sickness and death because of despair and loneliness and Prince Mishkin's descent into complete insanity are results of a society that crucifies those who do not play by its rules. The discovery of the extent of the influence Don Quixote had on <i>Idiot</i> shines a light on the grand literary impact of Don Quixote on the modern novel.</p>
<p>11</p>	<p>Presenter: Omari-Khalid Rahman, <i>Economics</i> Faculty Mentor: Partha Deb</p> <p>A Multilevel Analysis of NYPD Precinct Disparities in the Use of Force</p> <p>Stop-and-frisk has been a fundamental part of New York City policing strategy for the past two decades. This long-standing practice has faced numerous political and legal challenges, culminating in a ruling by a federal district court against the City of New York deeming the manner in which stops and searches are conducted to be racially discriminatory. While the sheer magnitude of the number of stops and its disproportionate racial and ethnic composition have received much scrutiny, an equally important issue that has received less attention has been the disproportionate use of force by the police after a stop has been initiated. This paper attempts to answer the question of racial/ethnic disparities in the use of force by reconciling academic theories of policing with explanations given by the police to justify their decision-making; whereas academics posit that demographic variables (race/ethnicity, age, neighborhood, etc.) have a significant influence on the decision to use force, officers have maintained that force is used to "compel compliance by an [otherwise] unwilling subject." To test these claims, I disaggregated stops into compliant and noncompliant pedestrians and estimated the effects of race, ethnicity, and age on the probability that force will be used. I then made cross-precinct comparisons to understand the role of neighborhood effects in shaping police behavior. The results illuminate irregularities in the decision to use force, with racial/ethnic minorities being substantially more likely to have force used on them regardless of compliance or noncompliance. The pattern also holds at the neighborhood level, where minorities in an affluent neighborhood are less likely to have force used on them in comparison to someone of a similar age and/or race/ethnicity in a less affluent neighborhood.</p>
<p>12</p>	<p>Presenter: Sarah Chebli, <i>English Literature</i> Undergraduate Research Initiative Fellowship Faculty Mentor: Janet Neary</p> <p>Freedom as a State for the Slave</p> <p>Many critics have interpreted the slave's freedom in relation to physicality and mobility. However, Douglass's Narrative provides contrary evidence which emphasizes freedom as a direct result of one's mental state. The objective of this presentation will be to explore how Douglass uses language in his Narrative to capture his "state" as a fugitive slave and to examine the contradiction in the phrase "Land of the Free". One of the primary focuses here will be on Douglass's repetition on the words "free" and "state" in relation to the slave. I make the claim that Douglass is implying that being on and living in a free "state" does not automatically or naturally result in mental freedom for the slave from the enforced ignorance that has kept them chained in slavery. I further push this</p>

	claim by analyzing how Douglass plays on the word “state” which becomes not representative of land on which slavery is abolished, but rather a condition in which the slave has the power and agency to make his own decisions and live by his own free will. Mental and physical freedom for the slave thus becomes a direct result of his “state”. Redefining the definitions and notions of “free” and “state” adds a new complexity to the reading Douglass’s Narrative by blurring the lines between the slave’s physicality in relation to his mentality.
--	---

Tuesday, April 19th, 2016
Oral Presentation Session #2
2:00pm-4:00pm

13	<p>Presenter: Alfredo Vidal Ceballos, <i>Biochemistry</i> MARC program Faculty Mentor: Akira Kawamura</p> <p>Identification of <i>Rahnella Aquatilis</i>' Lipid A and its Relation with the Human Immune System</p> <p>Humans are constantly exposed to plant-associated bacteria (phytobacteria) through the consumption of vegetables, fruits and other plant based products. However little is known about the effects of Phytobacterium in humans. It is possible that phytobacteria modulate human immune cells, because many bacterial metabolites, such as Lipid A, are known as potent immunostimulants. Our recent study indicated Lipid A produced by a phytobacterial strain <i>Rahnella aquatilis</i>, living inside the herb <i>Angelica Sinensis</i>, may safely stimulate human immune cells. Our lab aims to identify the structure of Lipid A. In order to do so we hydrolyze the outer membrane glycolipid called lipopolysaccharise (LPS). Different protocols have been used in the literature to hydrolyze LPS to obtain Lipid A, and we intend to reproduce and maximize their efficiency. We perform organic extraction using Trizol (Guanidinium Thyocyanate/Phenol) reagent and chloroform followed by mild acid hydrolysis with 2% acetic acid solution. We measured the success of the hydrolysis by Thin Layer Chromatography (TLC), and proved this as the most efficient method to obtain Lipid A from our bacteria. Currently we are scaling up the extraction and purifying our product. After purification we will perform nuclear magnetic resonance spectroscopy (NMR) and mass spectrometry to identify its structure. Once the structure is identified, the future direction of the lab is to test the <i>R. aquatilis</i> in combination with the <i>Angelica Sinensis</i> natural products and observe if structural changes occur in Lipid A that could explain the reduction in endotoxicity of the bacteria living inside this herb.</p>
14	<p>Presenter: Caresse Jackson, <i>English</i> Mellon-Mays Undergraduate Fellow Faculty Mentor: Justin Garson</p> <p>Neo-Orientalism in Jean Rhys's <i>Wide Sargasso Sea</i></p> <p>I will present a restructured version of Said's concept of Orientalism and apply it to the dichotomous relationship between Europe and the postcolonial Caribbean, as presented in the text <i>Wide Sargasso Sea</i> by Jean Rhys. Nietzsche's Apollonian and Dionysian are the modes of presentation for this "new Orientalism," and I will examine how his concepts were used to develop a microcosm of Europe's relationship to and understanding of the Caribbean and the implications of this paradigm.</p>
15	<p>Presenter: Christine Hirt, <i>Earth Science, Religion and Public Policy</i> Macaulay Honors College Faculty Mentor: Allan Frei</p> <p>Comparing Historical Radar Storm Data with Electric Utility Power Outages in Order to Develop Statistical Models</p>

	<p>Storm response and restoration are extremely costly for electric utilities due to the damage storms can cause to the power system and the cost of restoration. The objective of this project is to demonstrate that radar storm data related to a geospatially-referenced model can be used to enhance real-time storm detection, outage prediction, and storm utility management. I used Interactive Data Language to develop software for the analysis of spatial and temporal characteristics of radar observed storm characteristics and related them to utility outage data. Through a number of radar storm data case studies in the Central Hudson Gas and Electric service areas, we defined periods of relevant storm activity, categorized storm characteristics, including storm intensity (based on the magnitude of radar reflectivity), and observed areal coverage. We used these radar observations to relate storm intensity and storm data directly to utility outage info in order to develop statistical models that can be used to characterize vulnerabilities and predict outages.</p>
16	<p>Presenter: David Kanbergs, <i>Anthropology and Middle Eastern Studies</i> Thomas Hunter Honors Program Faculty Mentor: Christopher Stone</p> <p>Perceptions of Change: Narratives of Loss in Amman, Jordan</p> <p>The country of Jordan is currently experiencing an important moment of change. Recent decades have brought both increased urbanization and rapid economic and urban redevelopment, fueling intense political debate on a number of social and economic issues. Crucial to understanding both the present situation in Jordan, and how Jordan's citizens envision their country's future, is an exploration of how Jordanians understand themselves and their nation. To this end, I examine three fields of discourse that are present in Jordan, which respectively center on cultural heritage and the image of the Bedouin; the role of women in society; and a perceived loss of social, cultural and moral values. I discuss how these discourses enter into dialogue with each other, and with an official, state-sponsored discourse. I argue that Jordanians employ these overlapping fields of discourse as a form of social and political critique, and as a forum in which they attempt to actively shape their country's future.</p>
17	<p>Presenter: Jannatun Ferdowsi, <i>Psychology</i> Psychology Honors Program Faculty Mentor: Kimberly Robinson</p> <p>The Cognitive Mediators of Binge Drinking on GPA and Academic Performance</p> <p>High rates of alcohol consumption have been reported on many college campuses, and are often believed to contribute to a social atmosphere. However, alcohol consumption has been negatively associated with academic performance, and may affect cognitive function as well. The aim of this study is to investigate the cognitive effect of alcohol consumption and its relationship to academic performance on college students. The hypotheses for this study are: a) as alcohol consumption increases, academic performance decreases; and b) we hypothesize a mediation model in which the relationship between alcohol consumption and poor academic performance is mediated through negative cognitive effects. This study was conducted by distributing surveys about alcohol consumption and academic performance, as well as a memory task containing images, words and numbers to Hunter College students. It is anticipated that the results will show that there is a negative correlation between alcohol consumption and academic performance. It is also anticipated that the results will illustrate that binge and heavy drinkers have poor memory skills and cognitive functioning. The implications of this study are that when college students binge drink alcohol, they are relieving stress and engaging in many activities, but their academic performance and cognitive functioning may suffer in the process.</p>

18	<p>Presenter: Craig Brooks, <i>Physics and Mathematics</i> AstroComNYC Scholar Faculty Mentor: Matthew O'Dowd</p> <p>Surface Brightness Mapping Using the BELR Flow Model</p> <p>Quasars are some of the brightest and most distant objects in the universe. Consequently, it is difficult to resolve the structure of quasars using telescopes. We do know that the central engine of a quasar is a supermassive black hole, and close to this central region, we observe broad spectral emission features. It is observed, however, that approximately 15% of quasars have blue shifted, broad absorption features which are accompanied by outflows near this region. It is believed that the same outflowing “winds” are responsible for broad emission features as well. Despite the technical problems resolving quasars, they do have features that change on scales, which, if they strongly gravitationally lensed, can be mapped out in the broad emission line region (henceforth BELR). In order to do this, we must determine the wavelength-dependent surface brightness distribution in the BELR wind, which is accomplished using a mathematical model (called BELR Flow model) and, given specific parameters, model the kinematic properties and density at each point in the wind. This technique, called surface brightness mapping, allows us to construct a 3D computer simulation with the goal of generating 2D maps representing possible surface brightness distributions for a particular wavelength of light, which can then undergo gravitational lensing simulation to distinguish different BELR models.</p>
19	<p>Presenter: Kathleen Emerson, <i>Environmental Studies</i> Co-Authors: Brennan Ortiz Faculty Mentor: Sigmund Shipp</p> <p>Urban Food Policy and the Potential for Urban Agriculture in New York City</p> <p>According to the New York City Department of City Planning, New York is projected to reach over 9 million residents by 2040. This poses greater challenges and questions about the city and its livability. Among them, none other is as pressing as the question of food production, availability and distribution. Despite the many advances that New York has and continues to make to increase the quality of life for its residents, access to local health foods and its production remain an area with little oversight. As a result, many of New York City’s neighborhoods continue to grapple with effects of poor access to fresh, healthy foods. This is an issue that could be best solved through the expansion of urban agriculture and the introduction and strengthening of supportive policies.</p>
20	<p>Presenter: Morgan Haywood-Joy, <i>English</i> Faculty Mentor: Janet Neary</p> <p>No Longer a Slave to the System: How Anne Bradstreet and Frederick Douglass used their Voices to Combat Systematic Oppression and Regain Power</p> <p>Anne Bradstreet and Frederick Douglass used literature to challenge the system of oppression that they each faced on a daily basis within their respective time period. As the issue of superiority on a racial and gender spectrum firmly grasped the country as an epidemic, both Bradstreet and Douglass used their supposed "inferiority" as means of developing a voice to represent those oppressed. While Bradstreet spoke for the female generation of the mid-1600s, Douglass used his experience as a slave to express the desires of enslaved African Americans to be free from the persecution of an Antebellum South during the 1800s. Between the two, Frederick Douglass's work in the Narrative of the Life of Frederick Douglass, an American Slave, Written By Himself, and Bradstreet’s work of poetry, most noticeably The Prologue, allowed the authors to present the critical</p>

	<p>dynamic that was at work. For the two, their works of literature expressed the binary between oppressed and oppressors not being as thick as societal ranking had placed it. To further demonstrate this, the use of irony and sarcasm is placed subtly throughout their works so much so that if not read closely, one may take it as a compliment, opposed to as criticism. It is with this technique and literary aesthetic, that both authors have become pioneers in their own right. While the comparison between the two may seem far-fetched, I've examined that they are two people, respectively, fighting for the same cause: equality.</p>
21	<p>Presenter: Sarafina Gordon, <i>Anthropology and Public Policy Certificate</i> CUNY Pipeline Program, CUNY Guttman Scholarship Faculty Mentor: Jacqueline Brown</p> <p>LGBT Afro-Caribbean Activism, Experiences and Gatherings</p> <p>This paper is a comparative analysis of the intersectional experiences of gay, defined as having abnormal gender and sexual behavior, Afro-people in Caribbean countries, specifically Jamaica, Trinidad, and Haiti. This research focuses on gay individuals as political actors who challenge the various anti-gay rhetorics of their society, which are presented as part of nationalism, blackness, and a fight against the invasive ideologies of relative imperial nations. These anti-gay rhetorics deem their bodies as illegal and/or illegitimate in their own nation-states, and ultimately attempts to exclude them from a social, economic, and political realm. By looking at the anthology <i>Our Caribbean</i> by Thomas Glave, we can see gay Afro-Caribbean people reclaim their current and past existences, and as importantly, their future existences. This anthology symbolizes a “gathering” that many Caribbean gay people have longed for and which has been occurring online. Both the production of organic literature on gay experiences and the gatherings for social, especially romantic and sexual, connections online represent a growingly less violent and integrated visibility. These actors construct this visibility in their localities and in a transnational Caribbean via grassroots activism with help from LGBT organizations. Simultaneously, these actors declare their existence via ritual expressions and myths and thus are necessary for the societies’ structure. I hope to find the connections, or lack of, between LGBT rights activism in the Caribbean and the flow of intellectual traditions between historical core-periphery states and to tell a story that shows the power of organic ideas and grassroots activism.</p>
22	<p>Presenter: Shihab Dider, <i>Chemistry (Bioinformatics)</i> Sage Scholar, Yalow Scholar Faculty Mentor: Lei Xie</p> <p>Toward Repurposing Metformin as a Precision Anti-Cancer Therapy Using Structural Systems Pharmacology</p> <p>Metformin, a drug prescribed to treat type-2 diabetes, exhibits anti-cancer effects in a portion of patients, but the direct molecular and genetic interactions leading to this pleiotropic effect have not yet been fully explored. To repurpose metformin as a precision anti-cancer therapy, we have developed a novel structural systems pharmacology approach to elucidate metformin’s molecular basis and genetic biomarkers of action. We integrated structural proteome-scale drug target identification with network biology analysis by combining structural genomic, functional genomic, and interactomic data. Through searching the human structural proteome, we identified twenty putative metformin binding targets and their interaction models. We experimentally verified the interactions between metformin and our top-ranked kinase targets. Notably, kinases, particularly SGK1 and EGFR were identified as key molecular targets of metformin. Subsequently, we linked these putative binding targets to genes that do not directly bind to metformin but whose expressions are altered by metformin through protein-protein interactions, and identified network biomarkers of phenotypic response of metformin. The molecular targets and the key nodes in genetic networks are largely consistent with the existing experimental evidence. Their interactions can be affected by the observed cancer mutations. This study will shed new light into repurposing metformin for safe,</p>

	effective, personalized therapies.
--	------------------------------------

Tuesday, April 19th, 2016
Oral Presentation Session #3
4:15pm-6:15pm

23	<p>Presenter: Brenda Abdelmesih, <i>Biology</i> HHMI Co-Authors: Carmen Melendez, Chris Eyermann Faculty Mentor: Carmen Melendez-Vasquez</p> <p>Understanding Rab7 Endosomal Trafficking in Schwann Cell Development and Myelination</p> <p>Myelination in the peripheral nervous system is carried out by Schwann cells (SC), which envelop and insulate axons facilitating rapid 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 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. Using shRNA directed against MLCK, experiments displayed accumulation of large vesicles and increased autophagic and lysosomal protein expression suggesting that MLCK activity is necessary for proper protein trafficking. Previous data also suggests that Rab7, a GTPase that regulates late endosomal trafficking including late endosomes to the Golgi apparatus and lysosomal biogenesis, may require MLCK activity through a novel pathway. By conducting immunofluorescence and biochemical experiments, we attempt to characterize whether or not MLCK activity is necessary for proper Rab7 trafficking which in turn may be required for normal myelination.</p>
24	<p>Presenter: Esra Padgett, <i>CUNY BACCALAUREATE</i> Faculty Mentor: Angela Reyes</p> <p>Self as Commodity, Social Media as Market: The Branding of a Porn Star</p> <p>The study looks at the ways in which porn performers consider themselves a “brand,” how the process of “branding” interacts with other identity processes, as well as how branding is implemented through social media platforms. The study investigates how porn performers present multi-faceted identities in discourse, and how that discursive mitigation is complicated by the commodification of one (or more) of those identities. Through a series of ethnographic interviews with porn stars contacted via Twitter, a closer look is taken at the linguistic construction of both personal and public personas, with particular attention given to the placement of these identities on social media. The study also serves as an initiatory ethnographic survey of the community of adult performers promoting their careers on the Internet, while at the same time questioning the very nature of ethnography in contemporary research, as cultural spaces shift towards the digital, and identity is constructed on the public platform of the internet and its wealth of social media networks.</p>
25	<p>Presenter: Jaquelin Erazo, <i>Physics</i> AstroCom NYC Faculty Mentor: Timothy Paglione</p> <p>Mapping the Full-Extent of Dust in Molecular 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</p>

	<p>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>
26	<p>Presenter: Prima Manandhar-Sasaki, <i>Biology</i> Howard Hughes Medical Institute Undergraduate Research Program, Macaulay Honors College Co-Authors: Nabanita Hossain, Phu Tang, Jill Bargonetti Faculty Mentor: Jill Bargonetti</p> <p>Does 8-Amino-Adenosine activate a cep-1-independent cell death pathway in tumorous C. elegans and inhibit tumor development?</p> <p>p53 is a tumor suppressor protein that plays an invaluable role in the body’s safeguard against the development of unregulated cell division which could lead to cancer. Over 50% of all cancers have a mutated form of p53. The crucial role of the P53 protein underscores the importance of finding p53-independent cell death pathways to target in cancer cells. cep-1 is the C. elegans ortholog to the p53 gene, and plays a parallel role in the apoptotic pathway in the worm. Additionally, the germline contains the only dividing cells in the adult body, serving as a useful model of cancer cells. 8AA is a therapeutic agent shown to induce p53-independent cell death in metastatic breast cancer cells. Using this tumor model, worms with and without cep-1 were treated with 8-Amino-Adenosine (8AA), to test for comparable levels of cell death in the germline. This would be the first time the drug had been tested on a whole animal model. In addition to the comparison of germline engulfment levels, tumor development was compared to see if 8AA could inhibit the constitutive induction of mitosis in a glp-1(ar202) background and yield more non-tumorous germlines. Results are in progress and preliminary data will be presented, suggesting the extent of the cep-1-independent activity of 8AA.</p>
27	<p>Presenter: Ryan C. Zurich, <i>Psychology, Art and Religion</i> Honors Seminar in Religion & Psychology Faculty Mentor: Barbara Sproul</p> <p>On Art: Translating the Creative Act</p> <p>There is a dearth of art-writing from artists that describes the process of creative work in the moment. There have been accounts throughout history that speak of the inspiration, subject matter, or concept that motivated the work, as well as formal writing on the product itself (quality of material, form, line, color, etc.). Yet there seems to be little, if any, writing from within the moment of creation. Recognizing this major absence, I set out to describe my experience as a painter and potter by creating narrative descriptions of what it is like to make art. The product of this exploration has been two pieces of writing that account my experience making a single painting and a single vessel on the potter’s wheel. Each piece was written just after completion of a day’s work in the studio, and attempted to recount the details of the actual doing involved in the creative process. They describe, from inspiration through completion of the work, a phenomenological perspective of the creative act that moves from detailed narrative into poetry. In no way claiming to speak for all creators of things, I hope to begin a discussion of the psychological and spiritual dimensions of creative work among artists; to put words to what seems to transcend traditional articulation.</p>

<p>28</p>	<p>Presenter: Farangis Tolibzoda, <i>Psychology</i> Thomas Hunter Honors Program, BP ENDURE Co-Author: Tracy Dennis Faculty Mentor: Tracy Dennis</p> <p>Effects of Curcumin on Fear Learning and the Anxiety-related Threat Bias</p> <p>Anxiety disorders are one of the most often diagnosed disorders in the U.S., their prevalence over lifetime being reported to be 7.3% (Baxter et al., 2013). Some commonly used pharmacological treatments for anxiety disorders can have serious negative side effects on patient's health (Wilson et al., 2015). Curcumin, an active ingredient of <i>Curcuma Longa</i>, is a major constituent of Chinese herbal medicine, and has been reported to be successfully used to manage symptoms of stress and depressive disorders in people (Xia et al., 2007). An adaptogenic and therapeutic effect in PTSD rat model has been reported. Adult male rats, which were fed a curcumin containing diet, failed to form auditory Pavlovian fear memory. Moreover, rats that were on curcumin diet had impaired reconsolidation of older, well-consolidated memory (Schafe, G., 2015). Here we will describe methodological innovations and early findings from a translation of this animal model to a study with humans on the effects of curcumin on Pavlovian fear learning and anxiety-related threat processing. In this ongoing study, moderately anxious adults were randomly assigned to either curcumin or placebo group, and were asked to take the supplements orally every day for 4 weeks. Skin conductance was recorded and analyzed to examine whether participants have consolidated a Pavlovian fear memory. Scalp-recorded event-related potentials (ERPs) were used to measure neurocognitive responses to emotional context before and after curcumin treatment to assess the effect of curcumin on threat bias, as well as self-reported anxiety levels were compared between groups. Our study is the first to investigate curcumin's efficacy to impair the consolidation of Pavlovian fear memory in people, as well as to reduce trait anxiety and attention bias to threatening stimuli.</p>
<p>29</p>	<p>Presenter: Neriel David Ponce, <i>Anthropology</i> Faculty Mentor: Jacqueline N. Brown</p> <p>Here and There: Home for Undocumented Immigrants</p> <p>The concept of home is a difficult one to pinpoint; it is a constantly moving target shifting over space and time. With the rapid rise of globalization in the last few decades, people are migrating in larger groups and at faster paces than ever before. For undocumented immigrants, home is more than their physical place of residence. They maintain transnational ties to their countries of origin and recreate spaces as home through people, communities, and geographical areas. Home carries complex and heavy baggage as it can be a site of affirmation and safety, and struggle and violence. With the recent executive action by President Barack Obama's Deferred Action for Childhood arrivals (DACA) in 2012, undocumented youth (formerly known as DREAMers) now have the opportunity to travel abroad and visit their countries of origin. This research aims to explore how undocumented immigrants (re)define meanings of home, how they maintain transnational ties back to their country of origin, how families are (re)structured after migrating, and how they see themselves in relation to the US. Using DACA as a turning point in the immigrant rights movement, the efforts of undocumented youth organizing are explored to highlight the overall impacts of the action, and how undocumented immigrants who have traveled back to their countries of origin experienced "going back home." How much of "home" is romanticized and nostalgic? How do shifting definitions of home for migrants contribute to the creation of communities? For undocumented migrants displaced around the world through structural forces larger than them, home provides a sense of belonging and purpose with possibilities for larger political implications and action.</p>

30	<p>Presenter: Rakia Khalid, <i>English Literature</i> CUNY Pipeline Program, Hunter College Mentoring Program Faculty Mentor: Sonali Perera</p> <p>Narratives in the Diaspora: A Look into Migration and its Effects</p> <p>Using Vivek Bald's, critical ethnography titled Bengali Harlem and the Lost Histories of South Asian America, Saadat Hasan Manto's "Toba Tek Singh," Chimamanda Ngozi Adichie's Americanah, Sam Selvon's The Lonely Londoners, and Jamaica Kincaid's Lucy, this research will focus on diverse genres of the literature and the history of migration to consider how displacement affects characters' bodies, family relations, and identity. This research will take a closer look at how movement enables resistance and authentic voiced expression and yet, at the same time, reveals the violent experiences characters endure. Using an intersectional framework that draws on human rights, labor, and migration studies approaches, I'll consider a range of questions: What is the paradoxical relationship between nation, citizen, and immigrant and how are these terms fluid, ever-changing, and constructed? What are the political and historical contexts that enable migration and how does displacement frame identities for characters who are marginalized? Further, how do characters muster resistance and (re)-claim their agency following loss and displacement? Finally, what are the gender distinctions of migration and how do those contribute to a character's family relations, agency, and identity?</p>
31	<p>Presenter: Roy Emmanuel Nuñez, <i>Biology</i> MARC Fellowship Faculty Mentor: Weigang Qiu</p> <p>Uncovering the Genomic Basis of Treponema Diversity</p> <p>Members of the bacterial spirochetal genus Treponema exhibit extensive phenotypic diversity in parasitism, host range, and virulence. For example, Treponema pallidum Nichols is a causal agent of syphilis and prevails in primate urogenital tissue. T. pallidum pertenue is the causal agent of yaws, a human skin infection. T. succinifaciens is a non-pathogenic species found in pig intestines while T. caldaria is the only free-living species known so far. To identify the genetic basis of Treponema phenotypic diversity, we performed a phylogenetic analysis of spirochetes, which confirmed that Treponema is a genetically diverse genus as well. We then downloaded whole-genome sequences of eleven Treponema isolates from NCBI and identified 239 core orthologs shared by all isolates. We inferred a phylogenetic tree based on the core orthologs, and reconstructed gene gains and losses. Highly variable genomic locations of these core orthologs indicate extensive genome rearrangements during Treponema diversification. After identifying presence and absence of gene families in individual genes, we used maximum parsimony to reconstruct evolutionary gains and losses of genes at each level of the Treponema phylogenetic history. Evolutionary reconstruction revealed a massive amount of gene losses and pseudogenization as a result of evolutionary transition from free-living to parasitic life styles. We developed a bioinformatics pipeline for automated identification of gains or losses as well as for confirmation of such gene gains and losses through visualization of genome synteny for subsequent analysis of their respective phenotypic roles in host-pathogen interactions. Most interestingly, we saw four clonal groups with less than 15 gains and losses in total between them that exhibit very diverse phenotypes. Diseases caused by the four strains in this clade range from skin disease in cows to syphilis in humans. Nonsynonymous/synonymous substitution rates (dN/dS) were plotted for the most variable genes N=248 (average seq identity <= 99.5%) during diversification of these four recently diverged T. pallidum strains. Multiple sequence alignment allowed visualization of sequence hypervariability in orthologous genes across four genomes. Future work will include the development of statistical tests inferring phenotype-function association as well as gene and operon gain/loss identification in each clade.</p>

32	<p>Presenter: Syedah Meriam Haider, <i>Religion</i> Faculty Mentor: Bert Breiner</p> <p>Suffering: An Analysis of the Rituals of Ashura in Shi'a Culture</p> <p>Shi'a Muslims are perhaps most recognized by their rituals of mourning for the martyrdom of the Imam Hussain, the grandson of the Prophet Mohammed. The day of his martyrdom is known as Ashura, and while rituals for this commemoration vary from region to region, common scenes on Ashura are lamentation, reenactments of the killing, and self-flagellation. Some might suggest that there is a culture of death embedded in the rituals surrounding Hussain, and that they are idolatrous. This research aims to look at the rituals of Ashura through the perspective of the Shi'a and how Ashura helps to create the Shi'a identity.. Additionally, we will look at how the Ashura rituals have been used to create a platform for socioeconomic and political change.</p>
----	---

Wednesday, April 20th, 2016

Oral Presentation Session #4

9:00am-11:30am

33	<p>Presenter: Abtsam Saleh, <i>English Literature and Religious Studies</i> Faculty Mentor: Bert Breiner</p> <p>Classical Islamic Perspective on the Relationship between the Individual and the Society</p> <p>The revelation of Islam brought upon many social reforms for 7th century civilization. These reforms included the security of women and children, restriction of ill practices, social security, slavery, moral, sociological, economic and civil changes. This socioeconomic reform emphasized the importance of the society as a whole, and one's obligation to the society. Alongside societal changes, the revelation of Islam revealed the importance of the individual and their actions. Today, Islam is perceived as a religion of inequality, social injustice and radical fundamentalism. Yet the ideal claim is that, essentially, the revelation of Islam has harmonized the relationship between man and society, thus creating an equilibrium between individualization and collectivism. What this study does is analyze classical text, such as the Quran and Hadith, to develop a conclusion as to whether the revelation of Islam attempted to reform classical 7th century society, and how it did so.</p>
34	<p>Presenter: Betsy Hernandez, <i>Physics and Mathematics</i> LSAMP and AstroCom NYC Faculty Mentor: Ariyeh Maller</p> <p>Identifying Sources of Inclination Biases of Inferred Galaxy Star Formation Rates</p> <p>Galaxies are composed of stars, gas and dust. Astronomers estimate the rate of star formation in galaxies using light detected from those galaxies, which can be hindered by dust. An ideal star formation rate model would correct for errors due to dust so there was no relationship between the inclination of a galaxy with respect to the Earth and the rate of stars the galaxy produces. We examined inclination dependence of inferred star formation rates in the Sloan Digital Sky Survey by combining calculated inclination angles in the Simard et al. 2011 catalog with the star formation rates using the analysis of Brinchmann et al. 2004 by the Max Planck Institute for Astrophysics and John Hopkins University in addition to mass estimates from the Mendel et al. 2014 catalog. We tested these factors and found the chosen model displayed a relationship between the apparent inclination of the galaxies and their star formation rates. We suspect the difference is linked to dust correction and therefore examined secondary galaxy characteristics, such as distance and mass, to identify which samples contributed to the calculated inclination dependence of star formation rates.</p>

35	<p>Presenter: Martha Ordonez, <i>Psychology</i> NIGMS-RISE Co-Authors: Jorge Baquero, Frida E. Kleiman Faculty Mentor: Frida E. 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). While highly soluble in normal individuals, neurons in AD's contain insoluble hyperphosphorylated-tau aggregates. Previous studies have shown that Pin1, a prolyl-isomerase initially identified as a mitotic regulator, is involved in the regulation of Tau phosphorylation. Furthermore, Tau has been linked to another Pin1 substrate, the tumor suppressor p53. 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 and, therefore, gene expression. As Pin1, p53 and PARN possess nuclear functions, and having shown that some Tau isoforms are present in the nucleus of non-neuronal cells, we hypothesize that Tau might functionally overlap with these factors. Using samples from HCT116 human colon carcinoma cells, we show that some Tau isoforms can form (a) complex(es) with p53, Pin1 and PARN. Strikingly, overexpression of Tau, but not of its phosphomimic mutants, induces nuclear deadenylase activity in CHO cells. Finally, siRNA-mediated knockdown of Tau decreases nuclear deadenylation in samples from HCT116 cells under non damaging conditions. Moreover, Tau knockdown further increases the previously described UV-induced deadenylation. These preliminary results reveal a new potential role for Tau in the regulation of mRNA 3' processing. These findings also support the idea that factors involved in cancer and AD might play a role in regulating gene expression by a functional interaction with the mRNA 3' processing machinery, resulting in specific gene expression patterns.</p>
36	<p>Presenter: Paul Melas, <i>Religion and Sociology</i> Departmental Honors for both the Program in Religion and Sociology Department Faculty Mentor: Ronald Long</p> <p>Cosmogony and Sacrifice in the Greek Orthodox Paschal Ritual</p> <p>The purpose of this research is to highlight the ways in which cosmogony is replicated and represented within the Greek Orthodox Paschal ritual. This will be done by examining both prescribed liturgical practices as well as practices and customs of a more folkloristic nature. Moreover, an attempt will be made to exhibit the ways through which these two sets of practices intertwine, in order to create a cogent cosmogonic narrative. The research focuses most on topics including the use and consequences of light and fire in the Orthodox Paschal ritual, and the use of human sacrifice, especially as it pertains to creation. This research proves to be consequential, as it reveals one way in which cosmogony may act as an archetype for Christian ritual, whilst examining the consequences that such a phenomenon has for the Christian worldview.</p>
37	<p>Presenter: Sham Rampersaud, <i>Biochemistry</i> Co-Authors: Justin Fang, Shahana Mahajan, Stefan Silver, Yuleisy Ruiz, Trisha Jaikaran Faculty Mentor: Hiroshi Matsui</p> <p>Iron Oxide Nanocages for Medical Applications</p> <p>Cancer has been one of the most multifaceted and problematic ailments and there has been a need to engineer new ways to combat the disease. Establishing new drug delivery approaches is important and one way to make such a delivery system is to utilize nanoparticles as carriers by conjugating drugs and/or anti bodies to these nanoparticles. There has been some success and failure with this method, and our research is grounded in releasing drugs more effectively because it will allow minimizing the usage of drugs while maintaining a large degree of anti-cancer activity. Many nano-</p>

	<p>drug delivery systems have taken advantage of the nontoxic iron-oxide nanoparticle, and there have been significant progress in their effectiveness. Here we are interested in whether the shape of these particles is important for drug delivery efficiency. Recently we developed the methodology to fabricate inorganic Palladium nanocages whose size was 15 nm or less. We applied this novel cage approach to the iron oxide drug delivery system, utilizing 15 nm diameter particles capped by stable catechol-dopamine ligands. The anti-cancer drug of Riluzole Hydrochloride in conjunction with Iron Oxide cages showed twice the efficiency to kill osteosarcoma cells as compared to the free drug injection. Due to the stability of the dextran-dopamine capping agent and the unique cage shape of iron oxide in vitro, there is an implication of the similar anticancer activity by this hybrid system in circulation in vivo.</p>
<p>38</p>	<p>Presenter: Steven Hall, <i>Chemistry</i> NIGMS RISE Faculty Mentor: Akira Kawamura</p> <p>Analysis of the Binding Abilities of Benzophenone-like Drugs to GLO1</p> <p>Benzophenone is a photoactive organic molecule that is also the structural framework for some clinical drugs. Previously, we found that glyoxalase 1 (GLO1), an enzyme that neutralizes toxic byproducts of glycolysis, had a binding pocket for benzophenone. As such GLO1 could be readily photo-crosslinked by benzophenone. GLO1 is present in most cells but is overexpressed in cancer cells because of their increased dependence on glycolysis. It was unknown if other benzophenone-like molecules could bind to GLO1. This is important because some clinical drugs have chemical structures similar to benzophenone. Another important consideration is the reduced efficacy of clinical drugs that bind to GLO1. Ketoprofen, fenofibrate, and doxorubicin are some well-known examples of benzophenone-like clinical drugs with different intended targets. We hypothesized that these drugs can bind to GLO1 in a similar manner to benzophenone. We tested our hypothesis by a blocking experiment, in which GLO1 is photo-crosslinked with a biotinylated benzophenone photoprobe in the presence of drug. If the drug competes for the binding pocket, the photochemical biotinylation is inhibited. We also considered that other benzophenone-like molecules, such as phytochemicals, could possibly bind to GLO1. The molecules tested were ketoprofen, resveratrol, fenofibrate, carmine, and doxorubicin. We found that GLO1 bound to all except for carmine. In conclusion, we confirmed that molecules with a benzophenone-like framework have the ability to bind to GLO1 instead of their intended targets, leading to a possible reduction in their efficacy. This could also play a role in drug resistance of certain cancer cells overexpressing GLO1.</p>
<p>39</p>	<p>Presenter: Abraham Gutman, <i>Economics</i> Faculty Mentor: Partha Deb</p> <p>Analysis of Racial Bias in the Application of Physical Force by Police Officers in the New York City Stop and Frisk Program</p> <p>Concerns have been raised over potential racial bias in the New York City Police Department's Stop, Question, and Frisk Program. I examined whether non-white pedestrians are more likely to be subjected to force by the stopping police officers compared to white pedestrians. Productive stops were distinguished from stops that did not result in an arrest or summons. Using data collected by the NYPD of stops between 2006 and 2012 and a multinomial logit regression model, I estimated the effect of race on the probability of having force applied. While there is no difference in likelihood of being subjected to force during a productive stop, black and Hispanic pedestrians are more likely than white pedestrians to have force applied to them during a non-productive stop. This difference is both statistically and economically significant, thus providing support for racial bias concerns of the Stop and Frisk Program.</p>

40	<p>Presenter: Fernando Villafuerte, <i>Physics</i> MBRS-RISE Co-Authors: Steven Greenbaum, Mallory Gobet, Stephen Munoz Faculty Mentor: Steven Greenbaum</p> <p>Investigating Ion Transport in Solid State, Ionically Conducting Materials: Insight into the Future of Energy Storage</p> <p>The development of technologies to harness energy from renewable sources such as sunlight and wind is crucial to humanity's energy future. The adoption of such technologies hinges upon the development of batteries that can store and discharge energy from intermittent, renewable sources for extended periods of time. Of particular interest in designing more efficient batteries is the investigation of solid state electrolytes. Batteries constructed with solid electrolytes offer many advantages over the liquid-electrolyte-based batteries currently in the market: they are non-flammable, allow for much greater charge density, and could potentially last for thousands of charge-discharge cycles. The adoption of solid state batteries has been hindered, however, by the relatively low ionic conductivity of solid electrolytes. There is much interest in developing solid state electrolytes with high enough conductivity to make solid state batteries viable. Our lab, in partnership with Ionic Materials, Inc. in Boston, is using pulsed field gradient nuclear magnetic resonance (PFG NMR) spectroscopy to investigate ion transport in a proprietary solid state electrolyte they developed. We use PFG NMR to observe the diffusion of lithium ions and their counter-ions, which contain fluorine, in each sample sent to us by Ionic Materials, and ascertain the ionic diffusion coefficient in each sample at different temperatures. Diffusion is directly related to the ionic conductivity of a material by the Nernst-Einstein relation. Experimentally observed departures from this predicted behavior give valuable information on cation-anion association. This poster/presentation presents the diffusion data for various samples, and assesses their promise as potential battery electrolytes.</p>
41	<p>Presenter: Promie Faruque, <i>Biology</i> Thomas Hunter Honors Program, Yalow Honors Scholar Co-Authors: Neha Mehta-Shah, Steven M. Horwitz Faculty Mentor: Karen E. Phillips</p> <p>Patient Outcomes and Characteristics in Peripheral T-Cell Lymphomas Treated with Histone Deacetylase Inhibitors</p> <p><u>Background:</u> T-cell lymphomas (TCLs) account for approximately 10% of Non-Hodgkin's lymphomas diagnosed in the US. Five-year overall survival in patients (pts) with relapsed/refractory TCL is 20%. Belinostat (B) and romidepsin (R) are histone deacetylase (HDAC) inhibitors that are FDA approved for treatment of TCLs. We describe our large single institution experience treating TCL pts with belinostat and romidepsin to evaluate their efficacy. <u>Method:</u> With IRB approval, we reviewed medical records of all TCL patients (pts) treated with B or R at Memorial Sloan Kettering Cancer Center from 2010-2015. Data collected included demographics, histology, stage, treatment, and outcomes. International Prognostic Index (IPI) risk score was reported as 0-1 (low), 2-3 (intermediate), or 4-5 (high). We assessed overall response rate (ORR), frequency of partial response (PR) or complete response (CR), and duration of response. <u>Results:</u> 66 TCL pts (38 male, 28 female) treated with B or R were identified. Median age was 58.5 (range 26 – 85) years. Pts had peripheral T-cell lymphoma, NOS (PTCL-NOS) (16), angioimmunoblastic T-cell lymphoma (AITL) (10), anaplastic large-cell lymphoma ALK+ (ALCL ALK+) (1), anaplastic large-cell lymphoma ALK- (ALCL ALK-) (1), subcutaneous panniculitis-like T-cell lymphoma (SPTCL) (1), hepatosplenic T-cell lymphoma (HTCL) (2), adult T-cell leukemia/lymphoma (ATLL) (4), natural killer T-cell lymphoma (NK/TCL) (1), mycosis fungoides (MF) (18), Sezary syndrome (SS) (8), primary cutaneous ALCL with MF (ALCL+MF) (2) and prolymphocytic T-cell leukemia (T-PLL) (2). 58 patients had stage IV disease (13 skin only).</p>

	<p>Half (33) of 66 patients had IPI ≥ 3. 6 pts were treated with B only, 59 with R only, and 1 with both sequentially. Of those treated with B (PTCL-NOS=3, AITL=2, ALCL ALK- =1, ALCL ALK+ =1), median age was 58 (range 44 – 85) years; all had relapsed disease. None of these 7 pts treated with B alone (6) or sequentially (1) responded. Of pts treated with R (5 initial therapy, 55 subsequent therapy) (PTCL-NOS=13, AITL=8, ALCL ALK- =1, MF=18, SS=8, T-PLL=2, SPTCL=1, HTCL=2, ATLL=4, NK/TCL=1, ALCL+MF=2), median age was 58.5 (range 26 – 82) years. ORR to R was 43% (26/60). 3 had CR (5%) while 23 had PR (38%). Median response duration was 2.4 (range, 0.2 – 48.8) months. ORR in pts with AITL and SS were 62.5% (5/8) and 75% (6/8). Both T-PLL pts had PR. <u>Conclusion:</u> In our single institution experience, romidepsin (R) yielded an ORR 43% across TCL histologies. Responses to belinostat (B) were not observed. Pts with AITL, T-PLL and SS appeared to have a higher response to romidepsin although sample sizes are small. Further studies in these specific diseases to evaluate response mechanisms are warranted. We plan to perform mutational analysis of patients treated with these agents to determine predictors of response or resistance to HDAC therapies.</p>
42	<p>Presenter: Rani Allan, <i>Political Science</i> Human Rights Certificate Faculty Mentor: Faraz Sanei</p> <p>The Plight of Palestinian Refugees in Lebanon</p> <p>Last summer I was accepted into the LEAP (Learning for the Empowerment and Advancement of Palestinians) Program, where I was chosen to teach English and Theatre at an UNRWA (United Nations Relief and Works Agency for Palestinian Refugees) school in the Bourj al-Shemali camp in Southern Lebanon, the 2nd largest Palestinian refugee camp in Lebanon. I spent a month there with the students, NGO workers, and the camp community. What I witnessed during this month was a remarkable learning experience for me. As a descendant of Palestinian refugees myself, it give me a larger insight into the plight of Palestinian refugees that has been ongoing for 67 years. But most noteworthy, it is in Lebanon where Palestinian refugees are in urgent conditions the most, and where they are in the need of the most support. Since 1948, hundreds of thousands of Palestinians remain as refugees in Lebanon ever since they were ethnically cleansed out of their homes in Palestine. They compose one of the largest and oldest refugee issue in modern history. Subsequently, from 1950 and onwards, UNRWA has been the primary UN organ holding the responsibility to “to carry out direct relief and works and to plan for the time when relief was no longer needed.” As of 2015, UNRWA works for 6 missions, which are: emergency relief, education, health, relief and social services, microfinance, and infrastructure and camp improvement. Recently, the agency has been experiencing funding constraints, which has been making it be unable to fulfill its obligations. The purpose of this presentation is to discuss how Palestinian refugees in Lebanon lack political agency and socio-economic mobility and what UNRWA does in regards to this issue. To achieve this purpose, I will first discuss how they are not allowed to own property, subjected to significant socio-economic marginalization, living under substandard health circumstances, and living under impoverished conditions.</p>
43	<p>Presenter: Ridwan Carim-Sanni, <i>Biochemistry</i> MARC Co-Author: James Gordon Faculty Mentor: James Gordon</p> <p>Visual Evoked Potential Measures of Sex Differences in Lateral Inhibitory Mechanisms</p> <p>There are anatomical differences in visual cortex between males and females that may reflect well known differences in visual processing and perception. For example, the presence of more testosterone during development causes males to have more cortical neurons than females. To study these cortical cells, we used visual evoked potentials (VEPs) elicited by patterns designed specifically to examine non-linear inhibitory interactions in primary visual cortex. Previous research</p>

	<p>suggests that pre-cortical visual pathways show only linear interactions. Therefore, any non-linear interactions must be cortical and are likely mediated by GABA. We hypothesize that there are sex differences in the non-linear cortical interactions. The patterns used consisted of windmill-dartboards (WD) or partial windmills (PW) modulated at 4 Hz, presented for 2 seconds and repeated 10 times. The electrical activity of the brain was recorded and signal averaged to yield VEPs. We examined the fundamental and second harmonic components extracted by Fourier analysis of the recording. The VEP responses elicited by PW reveal a second harmonic which is greatly attenuated in response to WD (long range lateral interaction). WD elicited a prominent fundamental component not present in the PW (short range lateral interaction). This evidence for short and long range non-linear inhibitory mechanisms is consistent with previous findings. We found that females have overall larger amplitudes in all components of the VEP. However, there are no significant sex differences in the relative sizes of the amplitudes. Hence, males and females have very similar long and short range lateral inhibitory mechanisms.</p>
44	<p>Presenter: Tenzing Doma, BA/MA Economics Faculty Mentor: Partha Deb</p> <p>Farmers' Markets and Population Health in the U.S.</p> <p>Overweight and obesity are major public health problems in the U.S. More than one-third of U.S adults and about 17% (or 12.7 million) children and adolescents were classified as obese in 2015. In adults' age 20 years and over who are overweight, also obese is about 69.01%; where as children and adolescents age 12-19 years is about 14.9% overweight. Through the following years the government has taken multiple actions with new policy laws like the mandatory calorie labeling law to banning commercial large sizes of soft drinks, etc. These laws usually target low-income neighborhoods and certain individuals who might be ill informed about nutrition. There is also considerable discussion, especially in the popular press, about the impact of food deserts and the lack of healthy choices. At the same time, the prevalence of farmers markets has increased over time. These markets provide a source of healthy food choices for individuals in the neighborhoods in which they operate. In this research, I investigate the effects of the existence and number of nearby farmers' markets on BMI, food choices and other healthy lifestyle choices. I use the Behavioral Risk Factor Surveillance System (2009-2012) data, a survey of approximately 200,000 individuals each year conducted by the CDC, combined with data from a farmer's market directory compiled by the USDA to estimate the effects of farmers' markets using a variety of regression analyses.</p>

Wednesday, April 20th, 2016
Oral Presentation Session #5
2:00pm-4:30pm

45	<p>Presenter: Brigid Maloney, Psychology RAISE-W, Macaulay Honors College, McNulty Scholars, Goldsmith Scholar Faculty Mentor: Diana Reiss</p> <p>Preliminary Observations on the Effects of Unmanned Aerial Systems (UAS) on Bottlenose Dolphin Behavior</p> <p>Traditionally, behavioral observations of wild bottlenose dolphins (<i>Tursiops spp.</i>) have been conducted from vessel and land-based platforms. While observations gathered from these platforms are the basis of most of our current knowledge of these species, vessel activity has been shown to disrupt the behavior of wild dolphins, potentially introducing bias and disturbing animals. Observations from small Unmanned Aerial Systems (UAS) equipped with high-resolution cameras provide many advantages over vessel-based observations, allowing for fine-grained continuous observations of dolphin behavior in shallow waters with good visibility while allowing the research vessel to remain far from focal animals. However, before we can effectively apply these systems in field studies, their potential impact on dolphin behavior needs to be assessed. This study sought to</p>
----	---

	<p>document and compare the behavioral responses of dolphins to the presence of a UAS and a research vessel. We analyzed video footage of focal group and focal animal follows conducted on coastal bottlenose dolphins (<i>Tursiops truncatus</i>) at Turneffe Atoll Marine Reserve in Belize using a remote-controlled multi-rotor UAS. The data was collected from 2014 to 2015 and included An ethogram was created and used to describe and quantify the dolphins' behavioral responses to both platforms. The results indicate that the overall behavioral impact of the UAS on wild dolphins is low, with juvenile males in small groups being most likely to react. Our preliminary findings suggest that the use of UAS is a promising means of collecting high quality behavioral data while minimizing the impacts of research activities.</p>
46	<p>Presenter: Carina Sirochinsky, <i>Chemistry</i> Macaulay, McNulty Scholars Faculty Mentor: Hiroshi Matsui</p> <p>Amplification and Mechanical Property Manipulation of Breast Cancer Cell Exosomes</p> <p>Exosomes were previously thought to be utilized by cells as a method of waste disposal; in recent years these vesicles have been implicated in the development and propagation of Alzheimer's disease, cardiovascular disease, and various cancers, among other illnesses. Studies on the properties of exosomes are nowhere near complete, but their inherent site targeting capabilities and non-toxicity make exosomes an innovative option for drug delivery systems. We use a short peptide sequence, NapFFKYp, which self-assembles in the intracellular environment due to the presence of the alkaline phosphatase and tyrosine phosphatase enzymes, to form nanofibers within the cell, changing the stiffness, as well as other properties of the cell. We have found that incubating the cells for varying lengths of time with the peptide monomer caused the production of exosomes to be amplified to varying degrees. Our current study involves relating the incubation time to cell death and quantifying the degree of exosome amplification. In addition, the stiffness of the resulting exosomes is studied using atomic force microscopy. The experiment is being conducted on two different breast tissue cell lines: the parental metastatic mammary gland cells, MDA-MB-231, and a daughter strain, 4175, a highly aggressive cell line whose metastasis is specific to the lung. Our results will provide insight into exosome production pathways in cancerous cells, and how the change of exosome production and exosome properties can aid in the design of drug delivery systems.</p>
47	<p>Presenter: Elizabeth Gorodetsky, <i>Biological Sciences</i> Sage, NIGMS-RISE, RAISE-W, McNulty Scholar Co-Authors: Deepak Menon, David A. Foster Faculty Mentor: David A. Foster</p> <p>Exogenous Fatty Acids Stimulate mTOR via the LPAAT Pathway in Mammalian G1 Cell Cycle</p> <p>Mammalian target of rapamycin (mTOR) has been widely implicated as a critical sensor of nutrient sufficiency in dividing cells, and is dysregulated in 70% of all cancers. Emerging evidence suggests the significance of phosphatidic acid (PA), a central metabolite in the synthesis of membrane phospholipids, in the stability and activity of the mTOR in dividing cells. This suggests that PA is critical for sensing the presence of sufficient lipids for membrane biosynthesis in proliferating cells. A major metabolic pathway that generates de novo PA is lysophosphatidic acid acyltransferase (LPAAT), and has been shown to play an integral role in de novo membrane phospholipid biosynthesis. This study had three specific aims: 1) To study the effect of exogenous lipids on the mTOR complex, 2) examine the role LPAAT-β plays in oleic acid - induced mTOR activation, and 3) ascertain the significance of lipid-sensing by mTOR in KRAS-driven cancer cells. / Emerging evidence suggests LPAAT's significance in mTOR regulation. We showed compensatory production of alternate PA under stressful conditions, where one alternative pathway increases production when another source of PA is compromised. We have uncovered mTOR's role in lipid sensing by proving exogenous fatty acids stimulate mTOR activity. Furthermore, decreases in mTOR activity were evident with LPAAT knockdown after addition of exogenous fatty acids. Lastly, levels of the ACSL5 protein,</p>

	located upstream of LPAAT in the same pathway, are present in significantly higher amounts in KRAS-driven cancer cells. These findings suggest possible targets for further clarifying mTOR's role in sensing lipids during cellular division.
48	<p>Presenter: Nadha Fathima Yakoob, <i>Biochemistry</i> John P. McNulty Co-Authors: Hiroshi Matsui Faculty Mentor: Hiroshi Matsui</p> <p>Iron-Oxide Nanoparticles and Exosomes for Targeted Therapy</p> <p>Shape-controlled metal nanoparticles hold potential for quantity-enhanced targeted therapy systems. However, cell-specific targeting is a property mostly found in biological micro-vesicles. Exosomes, with their unique composition, have been found to play a crucial role in tumor spread. Due to their targeting properties they hold great promise in therapeutics as highly cell-specific carriers of proteins and drugs. In this study we introduce a novel system for targeted therapy, via combining ~100-200nm exosomes with ~20nm hollow Iron-Oxide nanoparticles. The combination of these nanocages into exosomes ex vivo yielded positive results. The low toxic nature and small size of the cages, with potential to hold several types of anti-tumor drugs serves as an efficient carrier system, with enhanced delivery properties when associated with the cancer niche-targeting exosomes.</p>
49	<p>Presenter: Norine Wendlyn Chan, <i>Psychology</i> Macaulay Honors College, McNulty Scholar Faculty Mentor: James Gordon</p> <p>An Electrophysiological Analysis of Spatial Vision in Males and Females</p> <p>Sexual dimorphisms in spatial vision are present on psychophysical and electrophysiological levels. These sex differences in spatial ability are attributed to the organizing effects of gonadal sex steroids during early development. Androgens protect against apoptosis in the neonatal male brain, contributing to gender-specific asymmetries in the primary visual cortex—in particular, greater neuronal density in males. Sex differences in visuospatial processing were assessed in this experiment using electroencephalogram (EEG) recordings. Horizontal striped patterns were presented at a contrast reversal rate of 7.50 Hz, becoming more closely-packed as they increased in number and fineness. During a single swept-parameter run, spatial frequency of the gratings was varied in six discrete steps, ranging from 0.8 to 24 cycles/degree at a 114 cm viewing distance and 1.6 to 48 cycles/degree at a 228 cm viewing distance. Using a Fourier analysis, visual evoked potentials (VEPs) were extracted and analyzed using the dominant (second harmonic) component of the response. In accordance with previous research, females exhibited significantly higher response amplitudes at each spatial frequency and higher maximum amplitudes than males. Females also demonstrated larger signal-to-noise ratios at lower spatial frequencies, while males showed larger ratios at higher frequencies. The results are consistent with research showing increased visual acuity and sensitivity to high-frequency patterns in males. These data further show that, while females demonstrate stronger VEP responses, their visual cortex also exhibits a greater amount of noise when interpreting spatial frequency patterns—suggesting underlying anatomical effects on electrophysiological response.</p>
50	<p>Presenter: Saipriya Iyer, <i>Behavioral Neuroscience</i> Yalow Scholar, Thomas Hunter Scholar, McNulty Scholar Co-Authors: Christopher Barker, David Abramson, Brian Marr, Jasmine Francis Faculty Mentor: Vanya Quinones-Jenab</p> <p>Neutrophil to Lymphocyte Ratio in Patients with Primary Uveal Melanoma</p> <p>Although only 2-3% of uveal melanoma patients have clinically evident metastatic disease at the</p>

	<p>time of their primary diagnosis, 50% of patients ultimately develop metastatic disease. As a result, prognostication is particularly pertinent for this disease. The use of the neutrophil to lymphocyte ratio (NLR) metric is understudied in patients with primary uveal melanoma. The aim of this study was to determine if NLR correlated with overall survival as well as metastasis free survival. A retrospective review was conducted from April 2004 to June 2015. A total 372 primary uveal melanoma cases had available laboratory values and were included in the study: 89 patients had primary enucleation and 283 received plaque brachytherapy. NLR was obtained at the time of presurgical testing for enucleation or brachytherapy surgery. All-cause mortality was deemed an event for overall survival. Kaplan-Meier (KM) estimates were generated for overall survival and metastasis-free survival and the Log rank test used for curve comparison. The mean calculated NLR was 2.8, and the mean follow-up was 40.6 months. The 4-year KM estimate for overall survival was significantly worse ($p=0.003$) for patients with $NLR > 2.8$ (75.5% 95%CI 66-82.7) compared with patients with $NLR < 2.8$ (90.3% 95%CI 81.3-95.1). The 4-year KM estimate for metastasis-free survival was not significantly different between patients with $NLR > 2.8$ (86.1% 95%CI 79.4-90.8) or $NLR < 2.8$ (82.8 95%CI 73.9-88.9). NLR may have an association with prognosis in patients with uveal melanoma.</p>
<p>51</p>	<p>Presenter: Evelyn Mau, <i>Linguistics and Rhetoric</i> Chinese Flagship and Thomas Hunter Honors Faculty Mentor: Angela Reyes</p> <p>The Effect of English Language on Hong Kong Cantonese</p> <p>Hong Kong, being a former British colony, as well as having a government separate from mainland China, also has a different sort of language. Hong Kong natives are usually fluent in both Cantonese and English, but sometimes, they would speak both Cantonese and English at the same time. They would mix the two languages, making it confusing to monolingual speakers. The result is Hong Kong English. However, why would Hong Kong natives decide to speak this way? How did Cantonese evolve from just Cantonese to a Cantonese-English mixture? Drawing evidence from a Hong Kong drama, it can be seen that Hong Kong natives mix Cantonese and Chinese sometimes due to linguistic convenience as well as clarity. Additionally, it can also be seen that although the Hong Kong natives participate in mixing, they do not encourage the mixing and differentiates what is “High Cantonese,” and what is “Low Cantonese,” where the Cantonese-English mix is preferred less.</p>
<p>52</p>	<p>Presenter: Jose Ramirez, <i>History</i> CCNY Undergraduate Fellow, S Jay Levy Fellow, CUNY Pipeline Fellow Faculty Mentor: Adrienne Petty</p> <p>Judicial Obstructionism in Chilean History Post-Pinochet’s Dictatorship (1973-1990)</p> <p>There are no winners in revolution only survivors. Augusto Pinochet’s dictatorial regime lasted from 1973 to 1990 and affected the lives of all Chileans, rich and poor alike. Pinochet strategically implemented constitutional changes that severely crippled the judicial and legislative branches of the democratic system of governing that Chileans had enjoyed since 1925. This paper focuses on the judicial system throughout the dictatorship and the failure of the subsequent post-dictatorship democratic governments to indemnify those who were most personally affected by the atrocities committed against them and their families throughout the dictatorial period. Augusto Pinochet placed constitutional and judicial control at the discretion of the presidency by rewriting the constitution in 1980 in order to carry out systematic atrocities against those opposed to the regime. Following Javier Auyero’s methodological approach in <i>Contentious Lives: Two Argentine Women, Two Protests, and the Quest for Recognition</i>, he analyzes and makes connections between the lives of two women and contentious events throughout their country’s history; I will examine and narrate how supreme court judge Juan Guzman and human rights activist Gabriela Zuñiga experienced the effects of judicial justice (or lack thereof), in unique and dynamic ways that led them to taking a stand against the dictator and the post-dictatorship democratic governments that became indifferent to their suffering. By examining their lives, this paper asserts the complex and controversial decision</p>

	<p>making process of overcoming repression. First, I will review the political climate that lead to the Chilean Golpe de Estado" or destruction of Chilean democracy in 1973. Second, I will introduce Judge Guzman and Gabriela Zuñiga and their lives pre-dictatorship. Third, I will present how their lives drastically changed because of the dictatorship. Fourth, I will present their process of overcoming repression throughout the dictatorship and following the injustices of the democratic governments post-dictatorship. Their accomplishments or lack thereof are important in their country's socio-political history and I end this paper with their finished or unfinished condition as people who feel both accomplished and failed. Most importantly, their legacy continues to be contentiously debated and written about because both have become admirable judicial justice figures in Chile, and the shaping of its judicial future.</p>
53	<p>Presenter: Kathleen Jedruszczuk, <i>Biochemistry</i> Thomas Hunter Honors, Yalow Scholar Faculty Mentor: Sean Berry</p> <p>Reducing Error and Increasing Consistency in the Segmentation of Anatomical Structures for Radiotherapy Planning</p> <p>Correct and consistent segmentation of organs at risk (OARs) is imperative for the safe delivery of radiotherapy. Manual segmentation by radiation oncologists is time-consuming and prone to human error and variability. It is hypothesized that automating the review process of OAR contours with auto-segmentation algorithms will reduce the time it takes for evaluation, produce more consistent contours, and decrease the occurrence of segmentation errors. The goal of the project is to acquire baseline data about how well the manually and auto-segmented contours of critical organs match each other. 82 head-neck cancer patients that had manually delineated OARs on CT images were retrospectively identified. Five representative patients were selected as models for atlas-based segmentation. These 5 atlas-based models were applied to the patient cohort, resulting in 5 auto-segmentations per patient. The produced segmentations were ranked on their similarity to the expert case from which they were derived from. Using statistical validation from dice similarity coefficient and hausdorff distance, it is very likely that this method can be used for auto-segmentation assurance review of physician-defined contours, except for the brachial plexis. This method would be most accurate if the atlas is rated at a high similarity to the patient of interest. Clinical validation studies are necessary before implementation in radiation therapy planning.</p>
54	<p>Presenter: Mame Diop, <i>Biology</i> Co-Authors: Jill Bargonetti Faculty Mentor: Jill Bargonetti</p> <p>Construction of a Transgenic C. Elegans Strain to Study Human Gain of Function Mutant p53</p> <p>The tumor suppressor p53 gene (TP53) is one of the most mutated genes in cancers. Mutations in TP53 occur in over 50% of all human cancers. The most frequent mutations in TP53 are clustered in its highly conserved DNA binding domain. Mutant p53 proteins have been shown to lose the tumor suppressive functions of wild-type p53 due to their inability to specifically bind to the wild-type p53 responsive elements on DNA. There is also increasing evidence that many mutant p53 proteins possess new gain of functions (GOFs) that up regulate oncogenic signal transduction pathways. Most mutant p53 proteins are expressed at very high levels in cancer cells, making these proteins ideal therapeutic targets. However, the pathways through which mutant p53 proteins exert their effect remain unclear. The roundworm <i>C. elegans</i> can serve as a powerful in vivo model to study cancer. The <i>C. elegans</i> germline contains the only cells capable of continuously dividing in the adult animal. Tumors can be caused by germline hyperproliferation. Furthermore, it is estimated that 60-80% of <i>C. elegans</i> genes are orthologous to human genes. <i>cep-1</i>, the <i>C. elegans</i> the p53 gene, which plays a role in the apoptotic pathway in the worm, has been shown to have similar DNA binding specificities to human p53. This project aims to establish the first humanized <i>C. elegans</i> strain in a <i>cep-1</i> null animal that has been engineered to express human GOF mutant p53. This unique strain would allow</p>

	us to discover and study novel mutant p53 pathways.
55	<p>Presenter: Nadera Rahman, <i>Psychology</i> Macaulay Honors College Co-Authors: Inna Tabansky, Donald W. Pfaff Faculty Mentor: Harris Zeigler, Donald W. Pfaff</p> <p>Mouse Model of Multiple Traumatic Brain Injury Shows Decrease in Motoric Aspects of Nervous System Arousal</p> <p>Traumatic brain injury (TBI) occurs from head injury that results in sustained internal brain damage. Depending on severity, TBI produces a range of cognitive deficits and behavioral issues. In light of both prevalence and impact, it is important to better understand the consequences of TBI on the brain, to address long-term functional impairment. As brain injury affects brain arousal, we operationalized voluntary motor activity as one component of arousal, to study the effects of TBI. We optimized a closed-headed mouse model of multiple TBI to investigate the motoric aspects of arousal, measured by quantitative, behavioral assays. Using a 3D home cage monitoring system, two measures of movement were recorded: horizontal activity and total distance, before and after injury. Experiments used 26 C57BL/6J mice, 6-9 weeks of age. We hypothesized that this model of TBI would generate deficits in the motoric aspect of arousal and injured mice would recover functionality at an observable rate. Multiple-factor ANOVA tests, t-tests, and Friedman and Kruskal Wallis tests found significant deficits in both horizontal activity and total distance after injury and significant differences between deficits from day 1 and day 12 after surgery, which indicated a timeline for recovery. Additional behavior assays showed no significant differences in social recognition, spatial learning, or parental care. In the elevated plus maze assay to measure anxiety, a significant difference was observed between control (n=12) and TBI (n=14) animals. Our findings show that this model of TBI does generate deficits in arousal, with most significant deficits in motoric arousal.</p>
56	<p>Presenter: Rosaury Hernandez, <i>Psychology</i> CUNY Pipeline Fellow Co-Authors: Yasmine Ouchikh, Vivien Tartter, Sophia Barrett, Robert Melara Faculty Mentor: Robert Melara</p> <p>Does Bilingualism Affect Working Memory?</p> <p>Numerous studies have investigated the role of bilingualism on performance of executive control tasks. Bilinguals outperform monolinguals on both visual executive control tasks and mental flexibility tasks (Costa, Hernandez, Sebastián-Gallés 2009; Bialystok, 2009). On one account, when bilinguals employ Language one L1 they must simultaneously inhibit Language two L2 (Bialystok, 2009; Martin-Rhee & Bialystok 2008), and vice-versa, leading to an advantage relative to monolinguals in both switching and inhibitory control. The preponderance of research on the bilingual advantage has focused on the visual modality. Yet research with speech-in-noise tasks suggests a bilingual disadvantage. In the current study we investigated the role of bilingualism on auditory executive control. Participants completed auditory versions of the Simon task, the Eriksen flanker task (target tone preceded and followed by irrelevant flanker tones), the speech-in-noise task and a visual and verbal working memory task. To equate language demands in working memory, bilingual participants were administered the digit span in both L1 and L2; to diminish the lexical disadvantage responses in digit span were written. We found that (1) bilinguals outperformed monolinguals on the visual but not the verbal working memory task, (2) bilinguals edged monolinguals on the Simon task but performed worse than monolinguals on the flanker task, (3) bilinguals performed worse than monolinguals on the speech-in-noise task. The results indicate that the bilingual advantage does not extend to executive control tasks that require the inhibition of sequential auditory information held in working memory, such as the auditory flanker task or the speech-in-noise task. One implication is that bilinguals have relatively good visual working memory but poor executive control over verbal working memory.</p>

Poster Presentation Abstracts

Tuesday, April 19th, 2016
Poster Session #1
9:45am–11:45am
3rd Floor Main Cafeteria

1	<p>Presenter: Alketa Plaku & Alma Plaku, <i>Economics</i> Faculty Mentor: Timothy Goodspeed</p> <p>Tax Avoidance by Financial Companies</p> <p>Recent public policy issues have been raised concerning the taxation of multinational companies. Some companies have been able to set up subsidiaries that allow them to avoid paying tax to any country. The OECD is concerned about this “base erosion and profit-shifting” (BEPS) because it could potentially open a big hole in the tax net. The OECD has initiated an attempt to get countries to agree on certain ground rules. Base erosion and profit-shifting has been studied mainly in the context of manufacturing companies. However, financial companies can also avoid taxes but since financial companies have a different sort of business than manufacturing companies, they may avoid taxes in different ways. The project will use a dataset called “Bankscope” to gather data on financial companies and analyze the income and asset allocation of their subsidiaries. It will be of interest whether subsidiaries income and assets are concentrated mainly in low-tax or high-tax places.</p>
2	<p>Presenter: Andrea Cumpelik, <i>Neuroscience</i> BP-ENDURE Co-Author: Lucas Sjulson Faculty Mentor: Lucas Sjulson, Regina Miranda, Mariann Weirich, Chiye Aoki</p> <p>Selective Potentiation of Hippocampal-Accumbal Synapses in Cocaine Conditioned Place Preference</p> <p>Addiction is a prevalent mental health disorder for which no effective treatment exists, mainly because its underlying mechanism has not been well described. Conditioned place preference (CPP) is a rodent model of addiction, commonly used to evaluate reward value of a drug. The mechanisms of CPP are not well understood, though previous research suggests that a key component is interaction between two brain regions, the hippocampus and the nucleus accumbens. The key part of this interaction is thought to be between hippocampal place cells, which encode location, which project to corresponding D1 cells in the nucleus accumbens, which encode reward. / We are testing the hypothesis that selective synaptic potentiation between the hippocampal place cell and nucleus accumbens D1 cells is a key substrate of cocaine conditioned place preference. To do this we will record activity from both areas using silicon probes and examine its correlation, as a CPP effect is acquired. Then we will induce activity in hippocampal place cells using optogenetics, and observing the effects on the NAc cells. We expect to find that during and after CPP acquisition, a subset of NAc cells will a) fire preferentially in the cocaine-paired chamber, b) respond more strongly to input from place cells than other NAc cells, and c) respond more strongly to place cells that encode the reward chamber, even when the animal is not physically in the chamber.</p>
3	<p>Presenter: Andrew Villier, <i>Psychology</i> Co-Authors: Megan E. Renna, Douglas S. Mennin, David M. Fresco, Amelia Aldao Faculty Mentor: Douglas Mennin</p> <p>The Influence of Muscle Tension and Gastrointestinal Distress on Psychological Symptoms within Generalized Anxiety Disorder</p> <p><u>Background and Study Aims:</u> The present study examined whether muscle tension or GI distress would</p>

	<p>more significantly predict psychological symptoms that are common among individuals with GAD. Additionally, we sought to establish differences in physical symptom distress in individuals with GAD versus healthy controls. <u>Methods:</u> The present study investigated university students (n=688) designated as endorsing clinically significant symptoms of GAD or as healthy controls based on their scores using the GAD-Q-IV. Participants completed an array of self-report measures to assess common symptoms associated with GAD. In addition, participants completed a physical symptoms questionnaire used to assess the presence of muscle tension and GI distress. Participants were instructed to rate the frequency of physical symptoms experienced during the previous 6 months on a 0-8 severity scale, from which the sum of individual items from each subscale created scores for muscle tension and GI distress. <u>Results:</u> Multiple Regression analyses indicated muscle tension to be a significant predictor above and beyond GI distress of emotion dysregulation ($\beta=.248$, $p=.001$), depressive symptoms ($\beta=.234$, $p=.001$), and intolerance of uncertainty ($\beta=.167$, $p=.024$), but not worry or affect intensity ($ps>.10$). Gastrointestinal symptoms were not shown to significantly predict any of the psychological symptoms (p value ranges .085- .589, β ranges .040- .124). <u>Conclusion:</u> This study demonstrates muscle tension to be a significant predictor of psychological dysfunction, and exhibits the necessity for further research concerning the muscle tension and GI distress common within GAD.</p>
4	<p>Presenter: Anjelica Gangaram, <i>Biochemistry</i> Undergraduate Research Initiative Fellow Co-Authors: Sarah Chebli, Joanna Ciavarella, William Perea, Nancy L. Greenbaum Faculty Mentor: Nancy Greenbaum</p> <p>Binding of Protein RBM22 to the Human Spliceosomal U2-U6 snRNA Complex</p> <p>The removal of introns, or noncoding intervening sequences, from precursor messenger (pre-m) RNA molecules, and the ligation of flanking coding exons, known as pre-mRNA splicing, is an important step in the maturation of mRNA prior to translation of the message into a protein. The process of splicing is catalyzed by the spliceosome, a large and dynamic complex found in a cell's nucleus comprising five small nuclear (sn)RNA and more than 100 protein components. The chemistry of splicing is catalyzed by a complex formed between two snRNAs, U2 and U6, but a number of spliceosomal proteins have key roles in the assembly and activation of the RNA catalytic core. The goal of this research is to determine how the U2-U6 snRNA complex of the human spliceosome folds to form a catalytically active conformation, a process facilitated by the protein RBM22. Previous results by others, using electrophoretic mobility shift assays (EMSA) and cross-linking techniques, identified an interaction between RBM22 and U6 snRNA (without U2 snRNA) (1). We have now expressed RBM22 and transcribed RNA strands to form the U2-U6 snRNA complex in the laboratory, and have shown by EMSA that RBM22 binds to the U2-U6 snRNA complex as well as U6 snRNA alone. It is our goal to continue to characterize the molecular basis of interaction between RBM22 and the U2-U6 complex through additional EMSA experiments and by solution NMR spectroscopy. (1) Rasche, N., Dybkov, O., Schmitzová, J., Akyildiz, B., Fabrizio, P., and Lührmann, R. (2012) EMBO J 31, 1591-1604.</p>
5	<p>Presenter: Da Eun Chung, <i>Psychology</i> Thomas Hunter Honors Program Co-Author: Amber Martin Faculty Mentor: Amber Martin</p> <p>Mental Number Representations in Adults: Relations Between Spatial Cognition and the Mental Number Line</p> <p>A well-developed number sense is a crucial skill for success in math and sciences. A mature mental number line -a rapid and accurate ability to judge the placement of a number along a line- is associated with math abilities such as understanding fractions (Jordan 2015). Spatial cognitive skills also play a role in number conceptualization and computations. Specifically, mental rotation abilities predict math achievement across development (Mix & Cheng 2013). The ability to make mental transformations of objects and use visual spatial representations aid the mental representation of numerical magnitudes</p>

	<p>(DeSemedt 2013). Less is known about the stability of these relations in adulthood. Here we examine the relation between mental rotation abilities and the spatial representation of number in a sample of college-age adults (n=24). In a mental rotation task, participants judged as quickly and accurately as possible which of two rotated mirror-imaged figures was a match to a third figure. In a second task, participants judged the position of a series of numbers (between 1 and 99) along a horizontal line (zero on the left and 100 on the right). Preliminary analyses show that adults over-estimate the position of small numbers and underestimate the position of large numbers. Analyses did not show a correlation between errors on the number line task and mental rotation on a horizontal plane ($p = .868$). However, ongoing analyses will examine the relations between number line errors and more difficult mental rotation trials (e.g. rotation on horizontal plane, and greater angular disparities between the objects being compared).</p>
<p>6</p>	<p>Presenter: Desiree Gordian, <i>Psychology</i> BPENDURE Co-Authors: Andre Toussaint, Rachael Langa, Santiago Uribe-Cano, Nesha Burghardt Faculty Mentor: Nesha S. Burghardt</p> <p>Behavioral Differences in Methamphetamine-Induced Conditioned Place Preference Between C57Bl/6 and 129/SvEv Adolescent Female Mice</p> <p>Human studies show a sex difference in the use and response to methamphetamine. Females engage in the use of this drug at an earlier age and are more dependent on methamphetamine when compared to males. While there is a sex difference in drug taking behavior, research using rodent models generally focuses on the genetic and cellular basis of drug intake in male rodents. Our research examines the neural basis of addiction in female mice by testing the rewarding effects of a low dose of methamphetamine (1 mg/kg) in a conditioned place preference paradigm during adolescence (postnatal day 41). We compared responses in two strains, C57Bl/6 and 129/SvEv, both of which are commonly used background strains of knockout mice. Mice were trained and tested during adolescence, because methamphetamine use is often initiated during adolescence and maturational changes during this stage of development have been suggested to affect drug response. Our results show a response difference in female C57Bl/6 and 129/SvEv mice. While C57Bl/6 mice exhibit conditioned place preference for the compartment paired with methamphetamine, 129/SvEv mice fail to display this preference. The neural basis of this difference is being investigated by quantifying behaviorally-induced protein expression of the immediate early gene c-Fos in the nucleus accumbens, basolateral amygdala, and medial prefrontal cortex after CPP testing, when animals are drug-free. To gain further insight into the rewarding effects of this dose of methamphetamine, c-Fos expression will be evaluated in a separate cohort of mice while they are on drug. Cell counts will be compared in methamphetamine-treated and saline-treated mice of each strain. Given that C57Bl/6 mice show higher novelty-seeking behavior than 129/SvEv mice, our results are consistent with the association between high novelty seeking behavior and an increased risk for using drugs of abuse.</p>
<p>7</p>	<p>Presenter: Eloise McAviney Faculty Mentor: Ignasi Clemente</p> <p>Subject-Permitted Teasing: Agency and Support in High-Risk Humor</p> <p>Like every kind of talk, teasing is collaborative. Research on teasing reveals that teasing has many forms and uses, but generally only one of two outcomes: increased solidarity, indicated by support for the tease, or social distancing, indicated by no support or talk that denounces the tease. There exists much research about the agency of the teaser or the response of the teased. This research asks whether the participation of the teased person in the setup of a tease—specifically, the person being teased introducing the topic about which they are teased—consistently predicts whether support for the tease will be observed. This research shows that there is evidence to suggest that a tease is supported more fully when the person teased is the one who introduces the topic they are teased about. These findings have implications in the fields of conversational power dynamics, communication research, pragmatics,</p>

	and sociolinguistics.
8	<p>Presenter: Elyce Williams, <i>Psychology</i> BP-Endure/ Honors in Psychology Faculty Mentor: Michael Siller</p> <p>Nonverbal Joint Attention Behaviors in Children with Autism Spectrum Disorder: Investigating Continuity and Change</p> <p><u>Background:</u> By 15 months of age, most typically developing children initiate triadic eye gaze shifts and pointing/showing gestures. The development of these non-verbal communicative behaviors is correlated with the development of language and can predict subsequent gains of joint attention. Children with autism show characteristic deficits in joint attention. <u>Purpose:</u> This study explores the interaction between pointing/showing gestures and triadic eye gazes as initiations for joint attention as verbal language skills develop. The purpose is to evaluate pointing, showing, and eye gaze joint attention behaviors in children with autism. <u>Methods:</u> At each time point (baseline to 1-year follow up) participants received the revised Early Social Communication Scale (ESCS) and the Mullen Scales of Early Learning used to obtain the frequency of initiations for JA as well as language age, respectively. Participants were children between the ages of 32 and 82 months (males =30), diagnosed with autism spectrum disorder (n=34). <u>Results:</u> Results show a significant negative correlation of pointing/showing gestures with eye gaze. <u>Discussion:</u> Results indicate that as one type of initiation behavior increases the other decreases as language develops.</p>
9	<p>Presenter: Gil Dekel, <i>Computer Science</i> Co-Author: Victor Cabrera Faculty Mentor: Susan L. Epstein</p> <p>Identification of Topological Structures in 2-D Spatial Models</p> <p>SemaFORR is a navigation system that learns and reasons about spatial abstraction. It is intended to support autonomous robot navigation in dynamic environments, such as busy indoor workspaces. SemaFORR builds a spatial model of its environment from incremental learning during travel, and navigates from that model without a map. These learned models describe space in ways familiar to people. The current system, while able to construct spatial models that support satisfactory travel times, is unable to recognize some important topological structures. In this work we seek to identify and capitalize on topological structures (such as doorways and hallways) the way humans would. This work refines and extends SemaFORR's spatial models. We postulate that the entry and exit points to each learned region in the model and their matching points on neighboring regions will allow SemaFORR to detect doorways and hallways for the spatial model, and ultimately improves its performance.</p>
10	<p>Presenter: Giussepe Yanez, <i>Biological Sciences</i> Co-Authors: Diana P. Bratu, Irina E. Catrina Faculty Mentor: Diana Bratu</p> <p>Drongo, the Fruit Fly Homolog of AGFG1, Participates in Vesicular Trafficking During Oogenesis</p> <p>RNA viruses exploit cellular vesicular trafficking pathways to achieve efficient RNA transport and viral replication. AGFG1, a 62KDa host protein, is essential for HIV-1 and Influenza A viruses replication, but not for cell viability. These characteristics make AGFG1 an attractive drug target, and efficient drug design requires a detailed understanding of its specific cellular role(s). AGFG1 has been shown to mediate release of viral RNAs from the perinuclear region for transport to the plasma membrane. This essential role in viral RNA transport and AGFG1's motifs suggest that it may also participate in intracellular vesicular trafficking events. However, AGFG1's precise role in cytoplasmic transport is still unknown. To address this question we use the <i>Drosophila melanogaster</i> egg chamber, an ideal multicellular model to study in detail the role of Drongo, the fruit fly homolog of AGFG1. Here we show</p>

	<p>that Drongo colocalizes with Clathrin light chain and F-actin at the oocyte cortex. This suggests that Drongo plays a role in endocytosis, much like the role of its mammalian homolog, AGFG1. We also find that Drongo colocalizes with endosome markers Rab5 and Rab11, which indicates that Drongo is associated with both early/sorting and recycling endosomes.</p>
11	<p>Presenter: Gunjan Desai, <i>Psychology</i> Co-Authors: Boris Dubrovsky Faculty Mentor: Boris Dubrovsky, Tracey Revenson</p> <p>Pain Experience in Pediatric Obstructive Sleep Apnea: Relationship with Subjective and Objective Measures of Sleep</p> <p>Obstructive sleep apnea is a life-threatening sleep disorder featuring recurrent cessations of breathing caused by the irregular relaxation of throat muscles, which prevent the normal flow of oxygen while sleeping. The prevalence of pediatric obstructive sleep apnea is 1-4% worldwide, with the highest percentage found in African American children. In addition, research has found that obstructive sleep apnea leads to oxygen desaturation (hypoxemia) and enhanced sensitivity to pain (hyperalgesia). Previous research has demonstrated that oxyhemoglobin desaturation nadir was associated with lower postsurgical requirement for morphine, in pediatric obstructive sleep apnea patients who underwent adenotonsillectomy. Likewise, in adults with chronic pain, a higher pressure pain and heat pain threshold was related to higher respiratory disturbance index (RDI). Additionally, the evaluation of subjective pain reports in The Cleveland Family Study, the world's largest database of obstructive sleep apnea patients, showed that oxyhemoglobin desaturation nadir was associated with a higher risk of several types of pain. This study was conducted on 30 children referred by a physician for an overnight polysomnography recording, as an evaluation for an obstructive sleep apnea. In order to assess pain perception and pain-related functional limitations, participants and their guardians were asked to fill out The Children's Sleep Habits Questionnaire, Pediatric Sleep Questionnaire, and Pediatric Quality of Life Inventory. The results of this study will be applicable to fully understand the underlying mechanisms relating obstructive sleep apnea and pain perception, since an inclusive and concurrent examination of the effect of several sleep and respiratory measures on pain perception in pediatric obstructive sleep apnea patients has not been examined as of yet.</p>
12	<p>Presenter: Helen Shin, <i>Biochemistry</i> Thomas Hunter Co-Authors: Samer Khawaja, Laurel Yee, John Moon, Juliette Gorson, Elizabeth Wright, Mandë Holford Faculty Mentor: Mande Holford</p> <p>Characterization of Terebrid Venom Peptides Using a Polychaete Bioactivity Assay</p> <p>Venom peptides found in marine snails expand the toolbox of active compounds that can be applied to investigate cellular physiology and can be further developed as perspective therapeutics. The Conoidea superfamily is a group of predatory marine gastropods that consist of Conidae, Terebridae and Turridae. While peptide toxins from cone snails, named conotoxins, have been previously characterized as effective inhibitors of cell signaling, the bioactivity of terebrid snail peptide toxins, teretoxin, is less understood. Here, we describe the first recombinant expression and characterization of terebrid peptide, teretoxin Tgu6.1, from <i>Terebra guttata</i>. Tgu6.1 is a novel forty-four amino acid teretoxin peptide with a VI/VII cysteine framework (C-C-CC-C-C) similar to O, M and I conotoxin superfamilies. The activity of Tgu6.1 was characterized using a <i>Nereis virens</i> polychaete bioassay. Polychaetes are the natural prey for terebrid snails, which provides a viable assay for determining the bioactivity of these synthesized peptides. Twenty micromolar of Tgu6.1 was injected into the central nerve cord of <i>Nereis virens</i> (20uM/2g). Video recordings of each polychaete injection were studied frame-by-frame using an in house custom image segmentation algorithm, which has been programmed in Python. Results obtained from this assay indicate that Tgu6.1 was biologically active, causing sustained paralysis when injected into worms. Two negative controls, a non-injected worm and a worm injected with saline solution, showed more active movement and greater speed throughout the experiment. When viewing the distribution of</p>

	<p>the polychaetes speed, it was evident that the worm injected with Tgu6.1 had a dramatic decrease in range as well as variation in speed over time. While promising, the polychaete assay only provides novel phenotypic information about teretoxins. To fully characterize Tgu6.1 activity additional experiments using electrophysiology must be performed to identify the molecular ion channel and receptor specificity and selectivity of Tgu6.1 .</p>
13	<p>Presenter: Ilana V. Deyneko, <i>Biology</i> BP-ENDURE, Sage Scholarship Co-Authors: Hector A. Moran, Mateusz M. Urbanski, Carmen V. Melendez-Vasquez Faculty Mentor: Elizabeth Wall-O'Brien</p> <p>Effects of Microtubule Stabilizing drugs in CNS Myelination</p> <p>In the central nervous system (CNS), oligodendrocytes (OL), which are glial cells, wrap axons in a membrane called myelin. Nerve impulses are propagated in myelinated axons via saltatory conduction, which increases the speed of transmission and promotes efficient information processing. Loss of myelin in diseases such as multiple sclerosis results in significant cognitive and physical impairments. Remyelination by OL has been found to reverse demyelination damage and protect axons from further degeneration. Our lab focuses on the study of the cytoskeletal proteins as a tool for promoting myelin formation and repair. Microtubules (MTs) are polymers made up of alpha and beta tubulin, which are involved in the transport of myelin proteins, and are thus important for its proper assembly. Previous studies have found that MT-modifying drugs, such as Taxol, which stabilize MTs, are beneficial for axon repair and myelin protection. We are currently examining a MT-modifying drug that inhibits detyrosination of alpha-tubulin, a modification that affects the rate of transport along MTs. We have found in preliminary studies that these drugs promote myelination of dorsal root ganglia (DRG) neuron by OL in co-cultures, and are currently investigating the mechanisms responsible for these effects.</p>
14	<p>Presenter: Ina Shehu, <i>Biology</i> Co-Authors: Julia King, Mario Svirsky, Robert Froemke Faculty Mentor: Robert C. Froemke</p> <p>Physiological and Behavioral System for Hearing Restoration with Cochlear Implants</p> <p>Cochlear implants are neuroprosthetic devices that provide hearing to deaf patients, although outcomes are highly variable even with prolonged training and use. The central auditory system must process cochlear implant signals, but it is unclear how neural circuits adapt – or fail to adapt – to such inputs. Understanding these mechanisms is required for development of next-generation neuroprosthetics that interface with existing neural circuits and enable synaptic plasticity to improve perceptual outcomes. Here we describe a new system for cochlear implant insertion, stimulation, and behavioral training in rats. Animals were first ensured to be profoundly deaf via physiological and behavioral criteria. We developed a surgical approach for multi-channel array insertion, comparable to implantation procedures and depth in humans. Peripheral and cortical responses to stimulation were used to objectively program the implant. Animals fitted with implants learned to use them for an auditory-dependent task that assesses sound detection and recognition, and ceased responding appropriately to sounds when the implant was temporarily inactivated. This physiologically-calibrated and behaviorally-validated system provides a powerful opportunity to study the neural basis of neuroprosthetic device use and plasticity.</p>

15	<p>Presenter: Jacob Hamer, <i>Physics and Mathematics</i> Macaulay Honors College, Hunter Undergraduate Research Initiative Co-Authors: Ariyeh Maller, Rachel Somerville Faculty Mentor: Kelle Cruz</p> <p>Using Dense Hydrogen Clouds to Improve Galaxy Formation Models</p> <p>When attempting to make realistic models of the universe, it is important to be able to compare the model with what is actually observed. Recent astronomical surveys have allowed astronomers to gain a better understanding of the gas content of the universe at different ages of the universe. More specifically, these observations have allowed astronomers to better understand the number of dense hydrogen clouds located in and around galaxies as the universe evolves. The number of these clouds represents a discrepancy in current galaxy formation models; in the models there are too few of these clouds, called Damped Lyman-Alpha Absorption Systems, when the universe is at a younger age. In our project, using one model (Popping et al. 2014), we attempt to distribute the gas within each galaxies in such a way that we produce numbers of these objects consistent with observations. We find that not only must the gas be distributed within the galaxy differently, but more hydrogen is needed to reproduce observed numbers. We investigate the hypothesis that gas flowing out of the galaxies represents a source for the missing gas mass.</p>
16	<p>Presenter: Jessica Johnson, <i>Physics</i> MARC Faculty Mentor: Steven Greenbaum</p> <p>Electron Paramagnetic Resonance and the Effects of Radiation in Kapton</p> <p>There is a need for lightweight and durable materials in space missions that can withstand the challenging environments in the upper atmosphere and in space. Kapton is a lightweight polymer used for structural support and insulation that is stable over a wide range of temperatures. Kapton is largely insensitive to ionizing radiation characteristic of high altitude and space environments. However, a more thorough understanding of Kapton's ability to stabilize after exposure to radiation will shed further insight on its abilities and limitations in space flight. Radiation creates free radicals (atoms or molecules with unpaired electrons) by breaking chemical bonds. Free radicals cause a material to be more reactive and electrically conductive which is undesirable for its intended missions. Our aim is to measure the concentration of these free radicals produced by radiation; the time it takes Kapton to recover from these changes; and if heating Kapton reverses its recovery. We use Electron Paramagnetic Resonance (EPR) - a technique that directly detects unpaired electron spins in a magnetic field- to measure the effects of radiation in Kapton samples over time. In collaboration with Dr. Ryan Hoffman of the U.S. Air Force Research Laboratory at Kirtland Air Force Base, NM, we conduct measurements on electron-irradiated samples of Kapton. Our results indicate that Kapton heals quickly from irradiation; however we have also observed that heating a healed sample can partially reverse recovery. These results offer a more detailed understanding of how irradiation may compromise Kapton's stability through a wide range of environmental conditions.</p>
17	<p>Presenter: Kevin Park, <i>Asian American Studies</i> Co-Authors: Jing Ney Leong Faculty Mentor: Jennifer Hayashida</p> <p>Asian American Roots: The Current and Historical Role of Youth and Undergraduate Organizing in Asian American Studies</p> <p>The presentation will be focused on the importance of Asian American Studies (AAS) at the undergraduate level as an entry point for Asian American youth advocates and scholars to pursue careers at the community level, locally and nationally. The presentation will be about reimagining the current role of AAS at the undergraduate level to better connect the community to the classroom. In addition, in light of the many new digital media platforms, how has the role of the classroom changed in</p>

	<p>relation to AAS? We will present how we each arrived at Asian American Studies and how undergraduate AAS has informed our academic research, advocacy work, and professional goals. The panel will also discuss the significance of new ways youth are becoming engaged in Critical Ethnic Studies and how community-based professional advocacy work is informed by advances in the field of AAS. The diversity of the presenters reflects not only the broad spectrum of activities and interests of the participants but also the inherent way in which AAS allows intersectional and interdisciplinary work.</p>
18	<p>Presenter: Miranda Trapani, <i>Psychology</i> Sage Scholar Faculty Mentor: Xulin Chen</p> <p>Volatility of Host Mark Pheromone in <i>Tamarixia radiata</i></p> <p><i>Tamarixia radiata</i> is a parasitoid of Asian Citrus Psyllid (ACP), vector of Citrus Greening disease. It has been used to control the ACP population due to its quick colonization and high fecundity rate. It has been reported that female <i>T. radiata</i> release a mark when parasitizing psyllid nymphs, however its volatility is unknown. Our research used an olfactometer to determine the female <i>T. radiata</i> preference over 4th instar ACP nymphs (both parasitized and nonparasitized) and clean air. Observed adult female <i>T. radiata</i> preference to determine the volatility of this host mark pheromone. Female <i>T. radiata</i> showed no significant preference between parasitized and nonparasitized hosts which indicates that this pheromone is nonvolatile. Significant preference for hosts regardless of parasitization over clean air supports previous claims that female <i>T. radiata</i> attracted to volatiles emitted by nymphs themselves. These results further explored mechanisms of use of <i>T. radiata</i> as biological control for Asian Citrus Psyllid.</p>
19	<p>Presenter: Nataliya Rubinchik, <i>Psychology and Economics</i> Faculty Mentor: Karna Basu</p> <p>Risk Aversion Effects on Health and Financial Investments in Middle Adulthood</p> <p>According to the Census Bureau, the median asset value of people over 65 is over \$170,000, and decisions about investments that led up to possessing these assets would have been made between 35 and 65. We know that risk aversion plays a role in stochastic decision-making. However, I expand on that knowledge by analyzing how risk aversion may affect decision-making over time, and whether one's level of risk aversion varies over the lifetime. I use the Health and Retirement Study dataset to analyze how risk aversion affects risky behaviors and financial investments in people aged 40 - 65. I find that risk averse makes one less likely to be in very good or excellent health. Risk aversion also makes one more willing to invest into a greater number of insurances. Moderate levels of risk aversion in men affect their likelihood of checking their prostate for cancer. I also find that moderate levels of risk aversion makes everyone more likely to get a flu shot, and less likely to indulge in risky behaviors, such as smoking and drinking alcohol. Finally, high levels of risk aversion make one invest less into total assets and primary residence housing. Furthermore, I find that age, gender, ethnicity, marital status, and health are factors that correlate with more stable risk preferences, while veteran status, education, and total financial assets correlate with more variable risk preferences.</p>
20	<p>Presenter: Ying Xie, <i>Psychology-Behavioral Neuroscience</i> Thomas Hunter Honors Program Co-Authors: Xulin Chen, Phil Stansly Faculty Mentor: Phil Stansly</p> <p>Lethal Effects of Imidacloprid on Asian Citrus Psyllid, <i>Diaphorina citri</i></p> <p>Citrus greening disease or huanglongbing (HLB) is a devastating disease that debilitates citrus trees throughout various states in the United States. Asian citrus psyllids (ACP) not only account for the spread of HLB, but also damage the trees through their feeding of the leaves and stems. Insecticides have been</p>

	<p>used to combat the ACP population. However, with prolong use or lack of rotation among insecticides, ACP populations might have developed tolerance to certain insecticides. In the present study, Imidacloprid, a neonicotinoid insecticide, was tested. The LD80, lethal dose 80, of foliar residues of Imidacloprid for adult and nymph ACP from the colony held at Southwest Florida Research and Education Center was determined. Using the LD80 concentration, the mortality rate between the adult psyllids from the colony and a commercial field were compared. The LD80 concentration was determined to be 21.9 ppm for adult colony ACP and 3.42 ppm for colony nymph ACP. The LD80 concentration of colony adults resulted in the mean mortality of 2.25 for field psyllid adults. This suggests that the field population of ACP has increased tolerance to Imidacloprid.</p>
21	<p>Presenter: Seonghee (Joy) Park, <i>Chemistry</i> Co-Authors: Guilhem Roubaud, Geoffrey Bryant, Ying Zhou, John Sfakianos, David Mulholland Faculty Mentor: David Mulholland</p> <p>Generation of a Novel Mouse Model for the Study of Cisplatin Resistant Bladder Cancer</p> <p><u>Background:</u> Bladder cancer is the second leading cause of death for urological cancers. Despite the benefits of standard of care chemotherapy, such as cisplatin, the median overall survival for patients with metastasis is only 15 months. One of the main reasons for poor survival is the onset of chemoresistance and associated patient toxicity. Thus, there is a clinical need to understand why resistance occurs and how to sensitize bladder tumors to acceptable levels of chemotherapy. One roadblock is adapting the appropriate preclinical model. While multiple human bladder cancer cell lines exist, most have undergone significant adaptation and divergent evolution as a result of long term in vitro culture. As a result, such 2D systems may not accurately reflect the complexity of how human bladder tumors respond and adapt to treatments. To overcome this challenge we have developed a novel mouse model of cisplatin resistant bladder cancer capable of in vivo tumorigenesis, ex vivo 3-D organoid culture and having pathology similar to advanced human bladder cancers. <u>Methods:</u> CD1 mice were treated with the chemical carcinogen OH-BBN (0.1%, N-Butyl-N-4-hydroxybutyl nitrosamine) for 20-24 weeks. Following this, muscle invasive cancers were resected and subject to mechanical and enzymatic dissociation. Dissociated donor bladder cancer tissues were then injected subcutaneously to immune incompetent nude/nude mice and allowed to propagate for 2-4 months. Successful transplantable tumors (CD1-BBN allografts) were then assayed for pathological and signaling markers with known importance to human bladder cancer progression using immunohistochemistry. Allografts were maintained as chunks and implanted for 4-6 weeks before being passed again. Determination of cisplatin response was achieved by two approaches. In vivo, mice with CD1-BBN tumors were treated with cisplatin (3 mg/kg, intraperitoneal) over 3-4 wks. and evaluated by measurement of tumor dimensions ((Length x Width²) / 2) with respect to control treated tumors. Ex vivo cisplatin sensitivity was assayed using escalating dosages of cisplatin and a novel 3-D bladder cancer culture system consisting of tumor chunks or single cells embedded in Matrigel. To determine the importance of histone deacetylase (HDAC) activity for the maintenance of chemoresistance, we conducted co-treatment of CD1-BBN organoid 3-D cultures using cisplatin (0-10 μM) alone or in concert with the HDAC inhibitor, vorinostat (0-50 μM). Alterations in viability were determined using AlamarBlue, a resazurin dye allowing colorimetric detection. <u>Results and Conclusions:</u> We have derived novel OH-BBN induced bladder cancer models that are amenable to studying cisplatin resistance. Using transplantable tumors and ex vivo organoid cultures, we determined that: (1) CD1-BBN tumors maintain high grade pathology and high expression of markers common to human disease including p63, cytokeratin 5 (CK5), androgen receptor (AR), glucocorticoid receptor (GR) and the proliferative marker (Ki67). (2) tumors are poorly responsive to cisplatin but (3) may be sensitized to cisplatin treatment using the HDAC inhibitor, vorinostat.</p>

22	<p>Presenter: Victoria DiTomasso, <i>Physics</i> Macaulay Honors College, AstroCom NYC Co-Authors: Ellie Schwab, Emily Rice, Adric Riedel Faculty Mentor: Emily Rice</p> <p>A Million Years Young: Determining the Age of 11 Young Brown Dwarfs</p> <p>Brown dwarfs are substellar astronomical objects that form like stars, but are not massive enough to fuse hydrogen the way stars do. Brown dwarfs continuously cool, fade, and shrink over billions of years, but maintain the same mass. Changes in radius and temperature affect the brown dwarf's spectrum, which we can then analyze to determine its age. We reduced high-resolution near-infrared (1.1-1.4 μm) spectra for 11 potentially young brown dwarfs, collected using the Keck II telescope in Hawaii. We compared spectra from our 11 brown dwarfs to spectra of established young (<500 million years old) and field (1-5 billion years old) brown dwarfs, focusing specifically on the potassium (K I) absorption lines, because their shape changes noticeably with age. We found that most of our brown dwarfs have narrow absorption lines, further indicating their youth.</p>
23	<p>Presenter: Ying Xie, <i>Psychology-Behavioral Neuroscience</i> Thomas Hunter Honors Program Co-Authors: Ryan Stolier, Eric Hehman, Jonathan Freeman Faculty Mentor: Jonathan Freeman</p> <p>Intergroup Threat Alters the Underlying Dimensions of Face-Trait Evaluation</p> <p>Trait evaluation of faces has been found to occur on two fundamental dimensions: trustworthiness and dominance. Though typically assumed orthogonal, the threat conveyed by these judgments may vary with target group membership, altering their interdependence. In the present study, White participants evaluated the trustworthiness of both own (White) and other-race faces (Asian, Black). While trustworthiness related negatively to dominance judgments on average, this negative relationship was exacerbated towards out-group members. Furthermore, this effect was mitigated as the participant's need-to-belong increased. Future research will examine the role of out-group threat and in-group affiliation in this process. These findings provide implications for intergroup perception and its behavioral consequences, as well as the nature of fundamental dimensions underlying face-trait evaluations.</p>

Tuesday, April 19th, 2016
Poster Session #2
1:45pm-3:45pm
3rd Floor Main Cafeteria

24	<p>Presenter: Alexa D'Angelo, <i>Psychology</i> UGRI Fellowship Faculty Mentor: Dawn Dugan</p> <p>Analyzing the Relationship Between Student Debt and Physical Health</p> <p>In response to the current student debt crisis, this study has analyzed the relationship between student debt and physical health. Participants completed an online survey in which they offered health and debt information. Participants included 92 individuals who completed an anonymous online survey, powered by Qualtrics.com. The survey consisted of 59 questions, which covered topics including: physical health, psychological well-being, financial circumstances, and general demographics. The SF-36 was used as our measure of health, with a focus on the General health, and energy/fatigue sub-scales. Statistical analysis revealed significant relationships between several variables relating to financial circumstance, debt and finance perception, and health. While no correlation could be found in regards to debt level and health, a significant correlation was found when analyzing the relationship between debt-related stress and health</p>
----	--

	<p>scores. This result supports our second hypothesis. Specifically, debt-related stress was found to be inversely associated with both general health scores, as well as energy and fatigue scores, with the latter being even more negatively correlated. Additional findings included a negative relationship between household income (parental net worth) and debt stress, however, independent income was not related to debt stress or health scores. This study adds to the current body of research regarding student debt and health, by focusing on the relationship between debt-related stress and physical health. Previous research has been limited to looking at the relationship between student debt and psychological health.</p>
25	<p>Presenter: Alkaya Massaly, <i>Chemistry</i> NIGMS-RISE, Community Scholar Co-Authors: Wayne Harding, Satish Gadhiya Faculty Mentor: Wayne Harding</p> <p>Synthesis of Tetrahydroisoquinoline/D3 Antagonist Hybrids as Potential Anti-Cocaine Agents</p> <p>Dopamine (DA) D3 receptor antagonists have been shown to reduce cocaine seeking behavior and the self-administration of cocaine in preclinical studies and are promising as therapeutics to treat cocaine use disorders. Although a number of potent and selective D3 antagonists are known, there are no D3 antagonists clinically available at this time. Pharmacokinetic issues with such compounds have been a major obstacle in that regard. The identification of new D3 antagonist scaffolds is of topical interest as this could lead to the generation of novel, needed therapeutics to treat cocaine addiction behaviors. Towards that ultimate goal, we have embarked on a project to synthesize and evaluate a series of novel tetrahydroisoquinoline-bearing compounds as potential D3 antagonists. Our ligand design is predicated on the hypothesis that “the chemical linkage of a tetrahydroisoquinoline motif with pharmacophoric groups from known D3 receptor antagonists, will provide novel ligands with high affinity and selectivity for the D3 receptor”. We have prepared four compounds starting from commercially available 6,7-dimethoxytetrahydroisoquinoline in three linear steps. The steps in our reaction sequence include reductive amination, nitrile reduction, and amide formation. Compounds were purified by flash column chromatography and were characterized by ¹H NMR, ¹³C NMR and mass spectroscopy. The novel ligands will be evaluated for affinity to DA D1, D2 and D3 receptors. Our work will provide insights into structural features of the scaffold that impact D3 receptor affinity and selectivity and pave the way for the identification of biological tools and drug leads of relevance to cocaine addiction.</p>
26	<p>Presenter: Angelina Usherenko, <i>Community Health</i> Faculty Mentor: Meredith Manze</p> <p>Understanding the Relationship Between Urban Infrastructure and Asthma in the South Bronx</p> <p><u>Background:</u> Little is known about the source of deteriorating air quality and higher asthma rates in the South Bronx. Identifying the cause can inform residents of the health risks associated with living in specific neighborhoods. <u>Methods:</u> The Mount Sinai Adolescent Health Center and the University of Chicago collaborated in creating the MAPSCorps program. Using an asset-based research approach, MAPSCorps paired high school students with university students to map neighborhoods lacking reliable information about their businesses. While walking an assigned zip code, the pairs collected data from each business and non-profit organization. This data was loaded into an iPhone app called the Map © App, which sorted the name, type, address, and status of each business. The pairs analyzed the data using a specific taxonomy. After analysis, the business category with the highest frequency and the location of the South Bronx neighborhood where it was located was determined. <u>Results:</u> Preliminary analyses suggest that the Wholesale, Storage, Transit, and Industrial Factory business category was the highest in frequency in the South Bronx. The Maps © App showed a total of 46 industrial factories, 31 wholesale factories, and 23 transit part factories were present in Hunts Point, zip code 10474. <u>Conclusions:</u> According to a New York State asthma report, the urban infrastructure in Hunts Point contributed to it having the worst air quality and highest asthma prevalence rate in the South Bronx. A large amount of factories in the South Bronx are the cause of deteriorating air quality and increasing prevalence of asthma.</p>

27	<p>Presenter: Betty Y. Lung, <i>Medicine and the Social Sciences</i> Coping and Health in Context (CHiC) Lab, Thomas Hunter Honors Program (THHP), Rosalyn Yalow Scholars Program Co-Authors: Emilia Mikrut, Aliza A. Panjwani, Rebecca Cipollina, Tracey A. Revenson Faculty Mentor: Tracey A. Revenson</p> <p>The Untold Story: Post-Traumatic Stress Among Parents of Adolescents and Young Adults with Cancer</p> <p>Little is known about the psychological well-being of parents of adolescents and young adults (AYA) with cancer. Research suggests differences in children's levels of distress depend on the match between the parent and child's gender, with adolescent daughters of mothers with cancer reporting higher levels of distress compared to other parent-child dyads (Compas et al., 1994). The current study examined parents' level of distress and tested whether it was greater among same- or mixed-sex parent-child dyads. Data were collected with an Internet survey of 38 parents (90% mothers) of AYA cancer patients, aged 14 to 39. Distress was assessed by a validated measure of post-traumatic stress (PTS). High levels of PTS were found. Contrary to Compas' findings, parents in opposite sex dyads (primarily mother-son) reported higher levels of distress ($p < .05$) compared to parents in same-sex dyads on the summed scale and all three subscales of the PTS measure.</p>
28	<p>Presenter: David Iskhakov, <i>Biochemistry</i> Faculty Mentor: Lynn Francesconi</p> <p>Synthesis and Characterization of ⁹⁹Tc Complexes Containing Phosphonic Acid Ligands</p> <p>Technetium, the lightest radionuclide discovered, has significance due to its diverse coordination chemistry with various ligands. Specifically, ^{99m}Tc is of extreme importance due to its use in the medical industry. Its convenient half-life of 6 hours and low gamma decay energy of 140 keV enables it to be the major imaging agent in radiodiagnostic medicine. Due to the short half-life of ^{99m}Tc, chemistry involving ⁹⁹Tc can be undertaken to provide more information for medical researchers regarding the proper conditions to synthesize various ^{99m}Tc complexes for quick and efficient patient injection. Frequently, the ligand that coordinates with technetium gives it its biological function and destination. (S)-[1,1'-binaphthalen-2-yl]phosphonic acid, the phosphonic acid ligand being used in this study to coordinate to technetium, contains a phosphate group, which regularly coordinates to the calcium ions on bones. In this paper, I present the synthesis of different ⁹⁹Tc precursors, and its reaction with (S)-[1,1'-binaphthalen-2-yl]phosphonic acid, in various conditions. The progress of each reaction was then tracked by UV/visible spectroscopy. The resulting UV data of the newly formed complex in solutions were compared to the UV spectra obtained from the unreacted ligand and the unreacted ⁹⁹Tc precursors. The appearance of new peaks signified the formation of new products. Significant changes in color and the absorbance in the UV/visible spectra were observed. However, attempts to isolate the new products resulted in an oily product. More research has to be done to optimize the reaction conditions to isolate the compounds in pure form and subsequent characterizations.</p>
29	<p>Presenter: Eden Volkov, <i>Economics and Mathematics</i> Faculty Mentor: Partha Deb</p> <p>Evaluating the Causal Effect of Health Insurance Coverage on the Labor Supply of Young Adults</p> <p>The Young Adult Coverage Expansion provision under the Affordable Care Act took effect in September 2010. Under this provision, individuals up to age 26, can remain on their parent's employer provided health insurance plan. Relatively little is known about the effect of insurance coverage on the labor supply of young adults. In this paper, I exploit the exogenous expansion of health insurance coverage among a segment of young adults to estimate labor market effects of private insurance coverage. I leverage a difference-in-difference design in the first stage of a two-stage control function to estimate the effect of the law on the probability of insurance coverage and use the predicted residual from this stage as my instrument in the second stage regression. The main structural equation estimates the causal</p>

	<p>effect of insurance coverage on the likelihoods of working part time, full time, not working and being self-employed among 22-29 year olds. Using data from the 2006 to 2015 March Current Population Survey (CPS) I find that eligibility for the mandate is associated with a 6.3 percentage point increase in private insurance rates among young adults. As a result of gaining access to private insurance, 22-29 year olds are more likely to be self-employed, to not work, and to work part time. They are less likely to work full time. These results are consistent with the classical economics theory behind the role of social welfare provision and work incentives.</p>
30	<p>Presenter: Emily Lau, <i>Biochemistry</i> Undergraduate Research Initiative Faculty Mentor: Mandë Holford</p> <p>Characterizing Bioluminescent Proteins from Polychaete Worms Using Top- Down Proteomics</p> <p>Marine annelid worms, referred to as polychaetes, exhibit bioluminescence to facilitate seasonal mating or to distract and escape from predators. Their bioluminescence, generated by a biochemical reaction within the body and in a mucus secretion, is brilliantly luminous, and contains extremely promising natural compounds that can be used as bio- imaging tools. A preliminary database of putative bioluminescent proteins was generated using RNA sequencing and transcriptome reconstruction of polychaete tissues. These putative proteins have to be confirmed by mass spectrometry (MS) and proteomic analyses to determine their validity. Here we utilize Top- Down proteomic MS methods, which includes native protein extractions, separation of extracted compounds by Ultra High Performance Liquid Chromatography (UHPLC), and tandem mass spectrometry (MS/MS), to identify and characterize intact polychaete proteins. Following this approach, we have identified several large proteins and a number of different peptides and small molecules. Our results exemplify how Top- Down proteomic methods can be used to characterize novel proteins with potential biomedical applications. The methods employed in this project pave a route for future proteogenomics analyses targeted towards natural compound discovery in other promising marine organisms.</p>
31	<p>Presenter: Frank Yeh Faculty Mentor: Thomas Preuss</p> <p>Effect of Cortisol on Goldfish Startle, Sensory Gating and Open Field Behavior</p> <p>The stress hormone cortisol (CORT) is released in response to stressors as part of the fight-or-flight response, which presumably will also affect information processing of threatening stimuli. To test this notion, we injected goldfish (N=12) with either CORT (500 mg/kg; IP) or saline, and measured the effects on auditory-evoked startle escape behavior and prepulse inhibition (PPI). PPI is a common measure of sensory filtering in the CNS. CORT-treated fish showed a small, but non-significant, decrease in startle rates (drug: 38.06% ±17.33 [SD]; control: 55.56% ±24.53 [SD]; p=0.1873). Similarly, CORT reduced PPI slightly, but not significantly (drug: 8.33% ±13.94 [SD]; control: 19.44% ±16.39 [SD]; p=0.2353). Another measure of information processing during startle responses in fish is the appropriate directionality of the startle responses, i.e. away from a threatening stimulus. Control fish showed a higher number of 'away' turns (72.97%; p=0.0038, exact binomial test) when compared to chance level. In contrast, CORT-injected fish showed no difference between 'away' and 'towards' responses (68.00%; p=0.0539). CORT injections also increased the anxiety-related open-field swimming behavior, thigmotaxis (i.e., wall hugging and center phobia). This was indicated by a 32.14% reduction of wall distance (drug: 1.33bl ±0.501 [SD]; control: 1.96bl ±0.503 [SD], p=0.0278). Taken together, the results imply that CORT may provide a mechanistic link between information processing deficits and anxiety.</p>

32	<p>Presenter: Giovanna Romero, <i>Chemistry</i> MARC Program Co-Authors: Diego Montenegro, Kriti Kalpana Faculty Mentor: Akira Kawamura</p> <p>The Communication Between Phytobacteria</p> <p>Phytobacteria have a positive influence on human health and immune stimulation. This benefit to human health may be caused by the phytobacteria ingested from certain plants and roots. There are numerous uncharacterized phytobacteria and it is often not known how they may work together to cause immune stimulation or prevent toxicity. <i>Angelica sinensis</i> is an herb that contributes to immune stimulation and it was recently discovered that this might be due to its phytobacteria. We are working to characterize bacteria in <i>Angelica sinensis</i> to determine how they may influence each other and their activity. In order to understand their properties, we first culture the bacteria and then extract their DNA, which we then use to characterize them through sequencing. In order to examine their behavior towards one another we co-culture the bacteria and observe how they influence each other by analyzing changes in their shape, color, and appearance. Currently we know that some phytobacteria in <i>A. sinensis</i> do stimulate human immune cells and we will continue to determine how these bacteria may influence each other's physical characteristics and how that might impact their activity. We hypothesize that by understanding how bacteria influence each other we will be able to see how they may work together in the human body to improve health without toxicity.</p>
33	<p>Presenter: Hector Moran, <i>Behavioral Neurobiology</i> Co-Authors: Ilana V. Deyneko , Mateusz M. Urbanski, Carmen Melendez-Vasquez Faculty Mentor: Carmen Melendez-Vasquez</p> <p>Effects of Microtubule Stabilizing Drugs in PNS Myelination</p> <p>Myelin sheath is a membrane that surrounds the axons in neurons, facilitating the transmission of nerve impulses. In the peripheral nervous system (PNS), the specialized type of glial cell that insulates nerve fibers are known as Schwann cells (SC). It is known that cytoskeletal components play a role in myelination. Microtubules are a type of cytoskeleton composed of beta (β) and alpha (α) tubulin polymers, which play a role in myelin protein transport in SC. Previous work has shown that mutations on microtubule α-tubulin encoding sequences results in myelination defects in developing SC. We are currently testing drugs that inhibits detyrosination of α-tubulin post-translational modification that affects transport along microtubules. We have found that in dorsal root ganglion (DRG) neurons-SC cocultures treated with this drug, there is an increase in myelin sheath production. We are currently working to understand the mechanisms behind these effects.</p>
34	<p>Presenter: Jean-paul Ventura, <i>Earth Science and Physics</i> AstroCom NYC Faculty Mentor: Kelle Cruz</p> <p>Characterizing Brown Dwarf and Exoplanet Atmospheres</p> <p>Brown dwarfs are astronomical objects that have masses between stars and planets. They are thought to form in a similar manner to stars. However, they do not have enough mass to sustain nuclear fusion at their centers (the physical hallmark of a star). Lacking a central energy source, brown dwarfs cool and fade. As a result, brown dwarfs and giant exoplanets occupy similar temperature ranges. Because of this result, the observed characteristics of brown dwarfs can provide insight into the properties of gas giant planets and their atmospheres. Observations and models of brown dwarf spectra reveal hydrogen dominated atmospheres with a variety of molecular species and condensates. Both brown dwarfs and giant exoplanets have complex spectral features and so the investigation of these features in brown dwarfs offer insight into the dynamics of giant exoplanet atmospheres. We will examine brown dwarf and large planet categories and their complex atmospheric spectral evolution.</p>

35	<p>Presenter: Mauricio Vallejo, <i>Biology</i> MARC Faculty Mentor: Benjamin Ortiz</p> <p>Localization of Active DNA Sub-regions of the JaCa in the TCRa Locus</p> <p>Treatment for chronic illnesses such as cancer have been shifting towards personalized methods. Exploiting the ability to produce targeted therapeutic gene expression in T cells is a promising avenue for novel treatments against chronic diseases. In order to maximize the therapy's efficiency there is a need to identify and characterize gene regulatory DNA elements that can support high levels of therapeutic gene expression in the mature T cells that circulate throughout the body, which are called "peripheral" T cells. A region of DNA known as the JaCa which spans 3.9 kb in the T cell receptor alpha (TCRa) gene locus has been shown to maintain expression of a linked gene in both thymic (developing) and peripheral (mature) T cells. The purpose of this study is to localize the active DNA sub-regions within the 3.9-kb. Two different fragments (1.3kb and 2.57 kb) of the JaCa region have been isolated. These will be separately linked to a reporter gene and transfected into T cells to assay them for the gene regulatory activity. These experiments could reveal the minimal functional unit of the JaCa region required for its ability to increase levels of gene expression. Once identified, these gene regulatory elements could be used in conjunction with other identified TCRa gene regulatory elements to enhance therapeutic gene expression across thymic and peripheral T Cells.</p>
36	<p>Presenter: Sofia Chelpon, <i>Environmental Studies</i> MUSE Scholar Program Co-Authors: Victoria Baamonde, Giedre Kazragte Faculty Mentor: Frank Buonaiuto</p> <p>Westhampton, NY Coastal Morphology Assessment: Pre and Post Hurricane Sandy</p> <p>The devastation that Hurricane Sandy caused along the Atlantic coast of Long Island, New York on October 29, 2012 has been well documented in respect to damages inflicted on the properties and businesses of the area's coastal communities. However, lesser known is the impact that the storm caused on the coastal morphology of the area. As part of this research effort data collected by the U.S. Geological Survey (USGS), the U.S. Army Corps of Engineers (USACE), and the National Oceanic and Atmospheric Administration (NOAA) will be analyzed to assess changes in beach and barrier island topography along a 15 mile (25 km) section of Dune Road in Westhampton, NY. Data to be reviewed includes pre and post storm subaerial beach profiles, geo-rectified and oblique aerial imagery, and pre and post storm LiDAR surveys. Despite the rapid response to the storm, which did include emergency fill placement and repair, a complete quantitative morphological assessment was not conducted. We will use the available data to develop a much more robust understanding of the effects of large storms on the Westhampton barrier beaches. Similar to the analysis conducted by the USGS and the U.S. Department of the Interior along Fire Island in 2013, our focus will be on: changes to the primary dune and berm system, alteration to the shoreline position and overwash transport processes to the barrier interior.</p>
37	<p>Presenter: Steven Behm, <i>Post-Baccalaureate</i> Faculty Mentor: Helen French</p> <p>Biochemical and Behavioral Sex Differences in Response to the Cannabinoid Agonist CP55,940</p> <p>Over 40 million American adults suffer from anxiety disorders, and women express anxiety disorders twice as often as men. Anxiety sufferers are also more likely to abuse illicit drugs, and cannabinoids have a biphasic effect on anxiety. Low acute doses of cannabinoids are anxiolytic while high and/or chronic doses are anxiogenic. However, the mechanisms and relationship between anxiety, addiction, and biological sex is still not well characterized, even at the preclinical level. Female and male rodents received a single exposure to a different doses (0, 0.001, 0.01, 0.075 or 0.125 mg/kg) of CP 55,940 (a</p>

	<p>cannabinoid analog) and were tested on an anxiety test, the elevated plus-maze. Animals were then sacrificed and changes to p-CREB, a protein in the PKA cascade, was also examined to assess the underlying mechanisms responsible for the behavioral changes observed. It is important to understand the effects of cannabinoids on anxiety in females, as women most often suffer from anxiety, those suffering from affective disorders often self-medicate with cannabinoids, and cannabinoid use in women is on the rise.</p>
38	<p>Presenter: Victor R. Cabrera, <i>Computer Science</i> Thomas Hunter Honors Program Faculty Mentor: Susan L. Epstein</p> <p>Human and Robotic Navigation in Virtual Indoor Space</p> <p>Optimal navigation for a simulated robot relies on a detailed map and explicit path planning. This approach is problematic for real-world robots, whose sensors and actuators are subject to noise and error, and whose environment may be dynamic. Robots' sensor range and inaccurate movements are in sharp contrast to humans' peripheral vision and better movement control. SemaFORR is a navigation system that learns and reasons about spatial abstractions, which remove perceived but irrelevant details from spatial information. SemaFORR describes space similarly to the ways people do. The system uses heuristics that work together to make a decision. SemaFORR learns the model during navigation through experience, when it searches for a target and records the information it learns during each task. SemaFORR has not yet been compared to human results in our environments. My project is to support a comparison between humans and robots as they navigate. The expectation is that new human heuristics can be observed and ultimately incorporated into SemaFORR to improve its performance. I have developed virtual models of the indoor spaces on which we test SemaFORR. We will collect and analyze data while humans travel through these virtual worlds. The data we collect will be compared to SemaFORR, and support its future development.</p>
39	<p>Presenter: Ximena M. Peralta, <i>Chemistry</i> Co-Authors: Akira Kawamura, Diego Montenegro, Kriti Kalpana Faculty Mentor: Akira Kawamura</p> <p>Investigating Bacterial Contribution in Immunostimulatory Activity of Coriolus Versicolor</p> <p>Herbal medicine has been a trusted remedy among many individuals for over two millennia. Coriolus versicolor, a medicinal fungus, and its extracts are known to promote immunostimulatory activities and longevity. Polysaccharopeptide (PSP) is a protein-bound polysaccharide extracted from the mycelia of C.versicolor. Evidence indicates that the bioactive agent in C. versicolor is PSP. The immune activity of PSP has been well established yet, the exact mechanism to prove the immunomodulatory activities is still unclear. Recent studies indicate Gram-negative bacterial contribution, more importantly the presence of lipopolysaccharide (LPS), to the immunostimulatory activity in some immune boosting remedies, such as Echinacea and Juzen-taiho-to. We hypothesize a similar immunostimulatory activity from bacterial contribution of the mushroom C. versicolor. Our approach to decipher the enigmatic immune boosting component of PSP is using the endotoxin removal experiment using Polymyxin B. Polymyxin B, an antibiotic, is used to treat bacterial infections. If any LPS is present in C. versicolor, Polymyxin B would reduce the endotoxin levels in the sample. Ultimately, this outcome is expected to provide new insights into the roles of bacterial LPS in the immunostimulatory activity of C. versicolor.</p>
40	<p>Presenter: Yuleisy Ruiz, <i>Medical Laboratory Science</i> Undergraduate Research Fellowship Co-Authors: Trisha Jaikaran, Stefan Silver, Murielle Hossou Faculty Mentor: Shahana Mahajan</p> <p>Metabotropic Glutamate Receptors Activate Autocrine Growth Signaling Pathways in LM7 Cells</p>

	<p>Osteosarcoma is one of the most common primary bone cancers. About 40% of osteosarcoma patients develop metastasis. The prognosis of patients with metastatic osteosarcoma is very poor and less than 30% of these patients have a / 5-year survival rate post treatment. Mechanisms of metastasis are not completely understood. However, new drugs for better treatment outcome for metastatic osteosarcoma are urgently needed. Several cancers secrete and use glutamate to sustain their growth. Riluzole, a drug that inhibits glutamate secretion, has been used in cancers such as breast, prostate and melanoma to inhibit their growth. The effect of Riluzole on osteosarcoma was not known. We have utilized LM7 cells, a metastatic osteosarcoma cell line, to study the effect of Riluzole on growth. We have investigated the molecular mechanism by which Riluzole prevents invasive growth of LM7 cells. In addition, we have utilized different inhibitors targeting mGluR1 and mGluR5 receptors to investigate their involvement in the aggressive growth behavior of LM7 cells. We have also knocked down the expression of mGluR1 or mGluR5 in LM7 cells to study their effect on LM7 growth. Using specific inhibitors and knock down of expression, we have demonstrated that mGluR1 and mGluR5 are activated in an autocrine manner to stimulate the growth of LM7 cells.</p>
40.5	<p>Presenter: Zachary Gershon, <i>Biological Sciences</i> Macaulay, Howard Hughes Medical Institute Scholars Faculty Mentor: Paul Feinstein</p> <p>The Nose Knows – Understanding the Expression of Human Odorant Receptors</p> <p>The olfactory system is a broad chemosensory detector system, vital to the survival of the vast multitude of organisms. In mammals, olfaction is mediated by seven-transmembrane domain G-protein coupled odorant receptors (ORs). Each olfactory sensory neuron expresses only one isotype of OR protein, choosing from a repertoire of hundreds to thousands of OR-coding genes, depending on the species. Despite our knowledge of all mouse and human OR gene sequences, few receptors have been functionally characterized. Further, up to this point in time, the human olfactory system has mostly been evaluated through subjective reports of odor quality and strength. To better understand the human olfactory experience, a quantitative method of study is required. One promising avenue is the use of transgenic mice expressing human ORs. We are developing an experimental model to maximize the amount of human OR protein expressed in transgenic mice. To do so, we are investigating the nucleotide context surrounding the translational start site of the OR coding sequence. Our analysis could provide novel insight into the translational properties governing odorant receptor expression and will further the study of the human sensory experience.</p>

Wednesday, April 20th, 2016

Poster Session #3

9:45am–11:45am

1st Floor Lobby

41	<p>Presenter: Alisa Sponton, <i>Nursing</i> Undergraduate Research Fellow Faculty Mentor: Lorraine Byrnes</p> <p>Providing Care to Women with Disabilities during the Perinatal Period</p> <p>It is estimated that 12% of women of childbearing age in the US are disabled. Women with disabilities are desirous of having biological children and little is known about their experience before, during, and after pregnancy. According to the Americans with Disabilities Act a disability is a physical or mental impairment that substantially limits one or more major life activities. This presentation will present what is known about the perinatal experience of women with disabilities and how healthcare professionals can meet this growing need. Recommendations for education and further research will also be made.</p>
42	<p>Presenter: Annelie Aguessy, <i>Biology</i> NIGMS-RISE</p>

	<p>Faculty Mentor: Derrick Brazill</p> <p>The Role Of Protein Kinase C and Phospholipase D in Morphogenesis in Dictyostelium discoideum</p> <p>Stem cells of a developing organism are capable of differentiating into multiple cell types however how this process occurs is not fully understood. Dictyostelium discoideum was chosen as model organism to understand cell differentiation, as it is a simpler organism with many conserved signaling pathways. Two of the genes that are known to be involved in the developmental process of higher organisms are Protein Kinase C(PKC) and Phospholipase D (PLD). Dictyostelium has orthologues of both of these proteins, PkcA and PldB, respectively. pkcA-(deletion) cells and pldBOE (overexpressing) arrest at different stage of development. To test whether these developmental defects are due to an inability to produce a proper signal (non-cell autonomous) or to sense the signal (cell autonomous), we mixed various ratios of wild-type cells with mutant cells, and measured developmental rescue as determined by spore production. We found that wild type cells provided partial rescue to pkcA- mutant cells suggesting that the defect in the pkcA- cells is non-cell autonomous. Wild type cells did not provide rescue to pldBOE mutant cells. Thus, this defect is cell autonomous. To deduce the order of action of pkcA and pldB in D.discoideum, epistasis analysis was used. Chimera of pkcA-/pldBOE (double mutant) and wild-type cells showed that the defect in pkcA-/pldBOE cells is cell autonomous; therefore, pldB likely acts downstream of pkcA. These experiments provide insight into the interaction of PkcA and PldB in D.discoideum development, and may be extended to other organisms in which these protein interactions are still unknown.</p>
43	<p>Presenter: Anzhela Tsomyk, <i>Psychology with a Concentration in Behavioral Neuroscience</i> McNulty Scholar Co-Authors: Iuliia Voronina, Ryan Pang, Cheryl Harding Faculty Mentor: Cheryl Harding</p> <p>Mold Exposure Increases Sensitivity to Pain</p> <p>People working or living in moldy buildings often report chronic pain. We sought to determine whether specific mold stimuli could change pain sensitivity. Exposure to other pathogens is known to activate the immune system and cause inflammation. Immune activation leads to increased sensitivity to pain. While it was known that mold is linked to inflammation in the respiratory system, we are the first lab to determine whether specific mold stimuli can cause other health complications. There were three groups: 1)mice treated with saline vehicle (VEH), 2)mice given non-toxic, extracted Stachybotrys chartarum spore skeletons (EX), and 3)mice given intact toxic Stachybotrys chartarum spores (IN). The mice took part in standard tail flick tests, measuring their pain sensitivity when their tails were exposed to a heat lamp. The subjects were tested several times over treatment, and each test contained three trials. One experiment tested all three groups and showed that EX and IN mice reacted more quickly to the heat, indicating a heightened sensitivity to pain compared to VEH mice. The second experiment tested only VEH and EX groups. Once again EX mice showed heightened sensitivity to heat. The results were dependent on the time of testing, relative to the days between mold exposure and testing, and the total number of mold exposures. As we predicted, exposure to both toxic IN mold spores and non-toxic EX spore skeletons increased the mice's sensitivity to pain.</p>
44	<p>Presenter: Christina Helmi, <i>Biology</i> McNulty Foundation Co-Authors: Andre Valentin, Ramy Abdel-Naby, Albert Stanek, Yashoda Persaud, Christina Helmi, Zuzanna Niewiadomska, Cathy M Mueller, Peiqi Ou, Antonio E Alfonso, Chongmin Huan Faculty Mentor: Chongmin Huan</p> <p>REG1 Promotes the Development of Chemoresistance in Pancreatic Cancer Cells Through Activation of AKT</p> <p>AKT is a major cell survival mediator in pancreatic cancer. Clarifying the mechanism of its activation in response to chemotherapy is desirable for designing strategies to overcome pancreatic cancer chemoresistance. REG proteins have been reported to activate AKT in other cancer cells, implying that</p>

	<p>REG1 that is abundantly secreted by pancreatic acinar cells could activate AKT and enhance chemoresistance in pancreatic cancer cells. To further support the hypothesis that acinar cell-derived REG1 promotes the development of chemoresistance in pancreatic cancers, I studied the expressions of REG1 receptor, EXTL3, in Panc-1 and MIA-paca-2 cells by Western blot.</p>
45	<p>Presenter: Christopher Mallia, <i>Physics</i> Macaulay Honors at Hunter College Faculty Mentor: Steven Greenbaum</p> <p>An Exploration of Polycarbonate-Diluent Systems via FFCNMR</p> <p>Over the past century, advances in electronics and electrical components have led the way to some of the most advanced technology present today. With an ever increasing demand for advanced electrical components to match the needs of industrial and public interests, research on materials fit for such purposes is at the forefront of material science. Advances in dielectric materials are one example of highly sought research in this field, and methods of research vary in power and utility. Common techniques are dielectric relaxation measurements and NMR (Nuclear Magnetic Resonance) spectroscopy. A proposed method of study is the use of an NMR technique, in which the magnetic field is varied through the experiment, called fast field cycling (FFCNMR). Through this technique, the reaction of materials to external magnetic fields can be probed at a wide range of both field strengths and temperatures. This grants insight into the molecular activities of materials, which further allows for empirical prediction of their behaviour under varying environmental conditions. Polycarbonate is a well received and widely used polymer in industrial and manufacturing applications. It is also of potential interest as a high energy and power density dielectric for thin film capacitors. The effect of additives on polycarbonate can thoroughly be studied via FFCNMR. In this particular research, the addition of the diluents 2-Adamantanone and 1-Adamantanecarbonitrile to pure Polycarbonate are studied in field strengths varying from 0.8MHz (relative to protons) to 35MHz, from temperatures of -100 to 155°C. It is surmised that the diluents facilitate polymer structural mobility in such a way as to enhance the dielectric properties. FFCNMR provides a powerful means to investigate the extent and nature of the polymer chain dynamics.</p>
46	<p>Presenter: Daniela Mikhaylov, <i>Biology and Music</i> Macaulay Honors Program and McNulty Scholars Program Faculty Mentor: Greg Phillips</p> <p>Further Analyzing Translational Control in Acute Myeloid Leukemia (AML)</p> <p><u>Purpose:</u> Acute myeloid leukemia (AML) is characterized by numerous somatic mutations and altered gene expression. There is a gap in our understanding of the molecular pathways required for AML. Therefore, it is important to look at translation of RNA within AML patients to see similarities and differences that can be characteristic of AML. This summer, we further investigated translation of RNAs within 3 AML cell lines by doing sucrose gradients and RNA sequencing. This information allows us to find new RNAs that are similar and different in AML patients. <u>Methods:</u> Three AML patient cell lines (MOLM-13, KU812, and HL60) were cultured under standard conditions. Translation profiles were generated using sucrose gradients, which separates monosomes from polysomes based on their different densities. RNA was isolated from each fraction and concentrations were analyzed. RNA percentages in each fraction were then plotted to show the distribution of monosomes and polysomes. RNA from each fraction was sent out for RNA sequencing in order to analyze new RNAs. <u>Results:</u> Last summer, we found that the RNAs from the mutant SRSF2 were associated more with the monosomes compared to the wild-type. This summer we looked further into other potential candidates. We found a difference in the distribution of RNAs in 2 cell lines, MOLM-13 and KU812. In MOLM-13, there are more RNAs associated with the monosomes than the polysomes while in KU812 cells, we saw more RNAs associated with the polysomes. <u>Conclusion:</u> We found that overall translation and RNA distribution vary in MOLM-13 and Ku-812 cell lines. We have sent RNAs from each of the fractions analyzed for RNA sequencing and once completed, we can compare RNA sequences and determine which RNAs code for proteins important for</p>

	AML progression. This can help us characterize new potential RNA targets for AML therapy.
47	<p>Presenter: Dina Buitrago, <i>Biology</i> NIGMS-RISE Co-Authors: Benjamin Ortiz , Zayd Daruwala Faculty Mentor: Benjamin Ortiz</p> <p>Engineering a Novel Chimeric Locus Control Region with Insulator Activity for Gene Therapy</p> <p>The T-cell receptor-alpha (TCR-α) gene locus consists of the TCR-α gene at the 5' end and the anti-apoptotic DAD1 gene at the 3' end. The TCR-α locus control region (LCR), situated between these two genes, is composed of a set of cis-acting gene regulatory elements, including an enhancer (that directs TCR-α gene-like spatiotemporal specificity) and other elements that provide insulator-like activity. The latter help provide integration site-independent expression to a linked transgene. We hypothesize that linking the insulator-like elements of the TCR-α LCR with the enhancer regions of a different gene can direct integration site-independent transgene expression with a spatiotemporal pattern distinct from that of the TCR-α gene. To test this hypothesis, we will synthetically combine the enhancer region of the human CD2 (hCD2) gene LCR to the insulator elements of the TCR-α LCR and thus create a "chimeric" LCR. The novel hybrid LCR will be linked to a reporter gene and transfected into embryonic stem cells. In vitro differentiation of those stem cells into T cells should produce transgene expression with an hCD2 gene-like pattern. Analyzing the reporter gene expression levels and cell type-distribution will assess both enhancer and insulator activities of the chimeric LCR. Because the hCD2 gene is expressed beginning at the earliest stages of T cell development, the activity of this novel chimeric LCR can be applied to treatment of T cell immunodeficiency diseases.</p>
48	<p>Presenter: Elena Byrne, <i>Psychology</i> RAISE-W, UGRI, Community Scholar Faculty Mentor: Amber Alliger</p> <p>The Neural Benefits of Enrichment on Stress Response</p> <p>Enriched environments (EE) allow for social relations between animals, as well as interactions with non-social stimuli, which have shown to lead to behavioral and neural modifications. Short-term exposure to environmental enrichment (EE) has been shown to increase spines and decrease stress response. This may be due to markers PSD-95 and GluA2, which are known to aid in spine growth. It is hypothesized that EE rats will have increased levels of PSD-95 and GluA2 for mature spines in the hippocampus over control animals. Sprague Dawley rats (N=12 in EE condition and N=12 for single housing condition) were placed in the Porsolt swim test (N=6 in swim test, N=6 no swim) for 10 minutes. Immobility time was measured for those subjects where we found that EE subjects swam significantly longer than control subjects ($t(22) = -3.938, p = .001$). After behavioral work, Golgi-Cox staining will be used to reveal count of PSD-95 and GluA2 on both CA1 and CA3 spines in the hippocampus of rats raised in EE and compared to controls. Understanding the molecular profile that is involved in stressful events could lead to finding potential mechanisms of non-medicinal post-traumatic stress disorder therapies.</p>
49	<p>Presenter: Jyothisraj Johnson, <i>Physics and Mathematics</i> Macaulay Honors College Co-Authors: Charles Keeton, Sean Brennan Faculty Mentor: Charles Keeton</p> <p>Characterizing the Zone of Influence of Dark Matter Clumps on Image Positions and Flux Ratios in Gravitational Lensing Systems</p> <p>The Cold Dark Matter (CDM) model of the universe predicts that there should be hundreds to thousands of clumps surrounding a massive galaxy. However, observations have shown that we only see dozens of dwarf galaxies and not the hundreds to thousands that are predicted. This means that either the CDM</p>

	<p>model prediction is wrong, or most of the substructure consists of dark matter that cannot be observed directly. Massive galaxies serve as natural gravitational lenses throughout the universe that allow us to indirectly observe these dark matter perturbations. Strong gravitational lensing occurs when these massive elliptical galaxies have the critical density required to bend light from a source located behind it and produce multiple images of that same source. Dark matter clumps located near these multiple images affect their positions and flux ratios. We used lensing simulations to quantify how dark matter clumps affect image properties and to characterize this zone of influence through color maps of chi-squared values. Our results showed regions around each of the image positions that display significant perturbations for low mass clumps. For higher mass clumps, however, these distinct regions bleed together. We found that there is a correlation between the mass of the dark matter clump and the area it perturbs. This research has been supported by NSF grant PHY-1263280.</p>
<p>50</p>	<p>Presenter: Kathleen Jedruszczuk, <i>Biochemistry</i> Yalow Scholar, Thomas Hunter Honors Co-Authors: Carla Nasca Faculty Mentor: Karen Phillips</p> <p>Stress Dynamically Regulates Behavior and Glutamatergic Gene Expression in Hippocampus by Opening a Window of Epigenetic Plasticity</p> <p>Chronic stress plays a key role in many depressive disorders linked to the dysfunction of glutamatergic neurotransmission in the brain and directly impacts epigenetic mechanisms in the hippocampus. Epigenetic mechanisms, such as histone acetylation (H3K27ac), regulate gene expression. The aim was to study how a history of chronic stress and familiar and novel acute stressors alter the expression of mood-related biomarkers, such as presynaptic type 2 metabotropic glutamate (mGlu2) and postsynaptic NR1/NMDA receptors, through mechanisms of epigenetic plasticity. Wild type mice with a history of chronic stress (CRS) and unstressed mice with BDNF loss-of-function allele (BDNF Val66Met) were subjected to acute restraint and acute forced swim stressors. This revealed a window of plasticity where there is epigenetic up- and down-regulation of mGlu2 receptors and NR1/NMDA receptors in the hippocampus, specifically in the dentate gyrus (DG). Habituation to the same acute restraint stressor and sensitization to a novel forced-swim stressor were found not only on the above mentioned gene expression changes, but were also reflected in DG long-term potentiation (LTP). Mechanistically, P300, an epigenetic activator of histone acetylation, appeared to play a critical role in the regulation of mGlu2 via histone-3-lysine-27-acetylation (H3K27Ac). This data exemplifies that there is a window of epigenetic plasticity in the hippocampus that could be useful for treatment of stress-related disorders, which involve dysregulated glutamate transmission.</p>
<p>51</p>	<p>Presenter: Kelsey Matta, <i>Anthropology</i> Yalow Scholar Co-Authors: Stephen Greenfield, Eugene W. Borst, Ettore Vulcano, S. Robert Rozbruch, Austin T. Fragomen Faculty Mentor: Karen Philips</p> <p>Ankle Distraction Arthroplasty</p> <p>Ankle distraction arthroplasty is a surgery that treats ankle arthrosis, more commonly known as osteoarthritis (OA). Currently, OA is the number one debilitating disease in the developed world. This surgery is an emerging procedure that is aimed to prolong ankle survival for OA sufferers before the inevitable need for ankle arthrodesis (fusion) or total ankle replacement (TAR). Ankle fusion eliminates the joint by fusing the bones together. This alleviates pain, but also causes loss of ankle range of motion. TAR also alleviates pain, but runs the risk of failure due to infection and collapse in active individuals. Ankle distraction is an alternative treatment that maintains the natural ankle, while improving both pain and function. The procedure uses an external fixation apparatus to separate the bones above and below the ankle joint to re-establish the joint space. This acts to alleviate pain brought on by friction between the bones that comprise the arthritic joint. It is proposed that by separating the joint space the body can</p>

	<p>work to regenerate lost cartilage and reduce inflammation. This is a retrospective level IV clinical study with follow up. The knowledge gained from this study will help to further elucidate the long-term survival of this procedure. We obtained our data from operative notes, radio-graphs, phone call follow up, and patient-reported-outcome questionnaires distributed by mail and email. We are reviewing 250 patients, of which, 60 have completed data. We will continue our follow up before conducting a preliminary statistical analysis in March.</p>
52	<p>Presenter: Linda Wong, <i>Psychology</i> McNulty and Macaulay Honors College Faculty Mentor: Cheryl Harding</p> <p>Higher Body Weight and Brain IL-1B Associated with Increased Fear in Mold-Exposed Mice</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 learning to associate a tone with a mild footshock in three groups: mice exposed to 1)toxic mold spores (IN), 2)non-toxic mold spore skeletons (EX), or 3)vehicle (VEH). When tested 25 hours after training, IN mice moved significantly less than VEH mice, showing that IN mice were more fearful of the tone. We found that weight and IL-1B were highly correlated with fear. The more the mice weighed, the more they feared the tone. Additionally, the more brain cells labeled with IL-1B, an inflammatory cytokine released once the body recognizes pathogens, the more they feared the tone. Since weight and IL-1B were both related to fear, this suggested that these two variables might be related. However, they were not correlated with each other and affected different aspects of behavior. IL-1B was correlated with change in fear over time, while weight was correlated specifically with fear 25 hours after training. In addition, while IN mice showed strong correlations between weight, IL-1B and fear, that was not the case for EX and VEH mice. IL-1B, but not weight, was correlated with fear in EX mice while weight, but not IL-1B, was correlated with fear in VEH mice. This suggests that weight and IL-1B work through different mechanisms to affect fear and learning.</p>
53	<p>Presenter: Michael Lyudmer, <i>Biochemistry</i> Undergraduate Research Fellowship Co-Authors: Michael Lyudmer, Marouf Hossain, Prachi Anand, Olorunseun O. Ogunwobi, Mandë Holford Faculty Mentor: Mande Holford</p> <p>Biological Characterization of Tv1 Venom Peptide for Hepatocellular Carcinoma Therapy</p> <p>Compelling experimental evidence supports the assumption that pharmacological inhibition of ion channels or their regulators is an effective method to counteract tumor growth, prevent metastasis and overcome therapy resistance of tumor cells. Compared to traditional cancer treatments, such as chemotherapy or radioactive treatment, peptidic compounds with high specificity for cancer cells are an efficient means of preventing metastasis while protecting normal cells. Venomous peptides are generally antagonists that can selectively inhibit the function of cell membrane channels and receptors. Here, we examined the cytotoxic and antiproliferative properties of a small disulfide rich peptide, Tv1, from venomous terebrid snail, <i>Terebra variegata</i>. Cytotoxicity assays on mouse liver normal and cancer cell lines indicated Tv1 is lethal to tumor cells. In cell westerns performed on normal and tumor mouse and human liver cell lines identified subtypes of TRPC and TRPV, which are part of the family of Transient Receptor Potential (TRP) channels, as the potential molecular targets of Tv1. Compared to standard liver cancer therapies doxorubicin and sorafenib, Tv1 is much more specific for liver tumors and resulted in fewer normal cell death. Taken together, our findings illustrate the potential of using venom snail peptides to target ion channels in cancer treatment.</p>
54	<p>Presenter: Munazza Alam, <i>Physics and Astronomy</i> Macaulay Honors College, McNulty Scholars Program Co-Authors: Ariyeh Maller Faculty Mentor: Kelle Cruz</p>

	<p>Understanding the Intrinsic Properties of Galaxies: Relating Viewing Angle and Intrinsic Luminosity</p> <p>Galaxies are collections of millions of stars, gas, and dust held together by gravity. The study of galaxy properties is complicated by the fact that luminosity depends on inclination, the angle at which we view a galaxy from our vantage point here on Earth. Thus, the observed properties of galaxies are often inconsistent with intrinsic (inclination-independent) properties. In particular, there is a discrepancy between a galaxy's observed luminosity and its intrinsic luminosity since galaxies become fainter and emit more light at longer wavelengths as they are inclined. Using a sample of ~1 million galaxies from the Sloan Digital Sky Survey (SDSS), we apply luminosity corrections based on their measured inclination. We identify inclination dependence for various parameters to correct luminosities in order to create our intrinsic sample. We will employ the methods implemented in creating this catalog to assemble the first complete sample of galaxies corrected for inclination in order to investigate a host of unsolved problems regarding the study of galaxy properties. These methods will enable us to explore the distribution of galaxy properties and the relationships among these properties to further understand galaxy formation and evolution.</p>
55	<p>Presenter: Naxhije Berisha, <i>Biochemistry</i> McNulty, Jenny Hunter Co-Authors: Bibi Begum, N.V.S.Dinesh Kumar Bhupathiraju Faculty Mentor: Charles Michael Drain</p> <p>Analysis of Porphyrin-Conjugates for Applications in Photodynamic Therapy</p> <p>Porphyrins are aromatic heterocyclic organic compounds with unique photo-physical properties. Due to aromaticity of the macrocycle, these compounds tend to absorb intensely in the visible light region. This makes them practical for applications in diagnostic tracking and alternative therapies such as photodynamic therapy (PDT). The goal of this project was to characterize and test the efficiency of an array of porphyrin-conjugates, utilizing either tannic acid or hyaluronic acid as targeting vectors, as PDT agents against cancer lines.</p>
56	<p>Presenter: Nicolette Somogyi & Henry Yelkin, <i>Biology</i> McNulty Co-Authors: Nicolette Somogyi, Henry Yelkin, Henry Yelkin, Stephen Jannetti Faculty Mentor: Stephen Jannetti, Mande Holford</p> <p>Discovery of Novel Bioactive Peptides from Venomous Marine Snails</p> <p>The Holford Lab investigates venom from predatory marine snails to discover novel bioactive peptides. Marine snails are an untapped natural resource of compounds with potential application in human health. One example of the promise of snail venom peptides is Ziconotide (Prialt®), a non-addictive analgesic used to treat chronic pain in HIV and cancer patients. This project highlights the synthesis and folding Tsu-1.1, a novel terebrid peptide (teretoxin), for characterization on expected ion channel molecular targets. Tsu-1.1 was synthesized using Fluorenylmethyloxycarbonyl (Fmoc) solid phase peptide synthesis (SPPS) utilizing orthogonal protection of amino acid side chains. Synthesis was performed using an automated microwave-assisted peptide synthesizer. The synthesized Tsu-1.1 linear product was purified by high performance liquid chromatography (HPLC) and the expected mass of 2195.47 g/mol was confirmed using liquid chromatography mass spectrometry (LC-MS). Tsu-1.1 was subsequently folded using thiol-assisted air oxidation in a glutathione-salt buffer, and the folded mass of 2191.44 g/mol was confirmed by LC-MS. The results shown highlight the successful synthesis and folding of Tsu-1.1.</p>
57	<p>Presenter: Roseann Weick, <i>Biochemistry</i> John P. McNulty Scholarship, Undergraduate Research Fellowship Co-Authors: He Huang, Nancy L. Greenbaum Faculty Mentor: Nancy L. Greenbaum</p>

	<p>Effect of Post-Transcriptional Nucleotide Modification on Thermal Stability of E. coli tRNA(lys)</p> <p>Transfer ribonucleic acid (tRNA) plays an important role in protein synthesis by ferrying specific amino acids to the ribosome to be added to a growing polypeptide chain. All tRNA molecules have a distinctive three-hairpin loop structure and are stabilized by both local and long-range interactions. Many of the nucleotides in tRNA sequences have undergone post-transcriptional modifications, such as base or ribose methylation, base deamination, base isomerization, or other functional group additions; these modifications do not have a significant impact on the global structure or activity, but they appear to contribute to tRNA folding into tertiary structures, thermal stabilization, and/or molecular recognition processes. The goal of these experiments is to test the hypothesis that the 10 naturally occurring nucleotide modifications in the 76-nucleotide long, lysine-specific E. coli tRNA enhance its thermal stability. Toward this goal, we are using a technique called Selective 2'-Hydroxyl Acylation Analyzed by Primer Extension (SHAPE), a form of biochemical structural probing that identifies nucleotides not constrained by stacking or pairing, i.e. the most flexible regions, by chemical derivatization of the ribose sugar. SHAPE assays are conducted at temperatures ranging from 37 - 75C on both native (naturally modified) tRNA and equivalent tRNA sequences without modifications (prepared by in vitro transcription), to identify structural transitions of lysine-tRNA on the melting temperatures of structural elements. We anticipate that we will observe differences between the secondary and/or tertiary structures of modified and non-modified lysine-tRNA at higher temperatures, and that the naturally modified tRNA will be more thermally stable.</p>
58	<p>Presenter: Sara Camnasio, <i>Physics</i> Macaulay Honors, McNulty Scholars Program, Lisa Goldberg/Revson Scholars, Tukman Fellow Co-Authors: Sara Camnasio, Munazza K. Alam, Emily L. Rice, Kelle L. Cruz Faculty Mentor: Kelle Cruz</p> <p>Quantitative Spectral Morphology Analysis of Unusually Red and Blue L Dwarfs</p> <p>Brown dwarfs are celestial bodies that form like stars, but are too small in mass to sustain hydrogen fusion, so they cool and fade to resemble gas giant planets. In an effort to constrain the properties of their spectra – or their light-emission curve at different wavelengths – we present a quantitative analysis of unusually red and blue objects with medium-resolution data. Red and blue colors are defined based on the amount of light they emit and longer and shorter wavelengths, respectively. “Red” and “blue” are therefore not physical colors. Generally, red brown dwarfs have low surface gravity and are young objects whose spectra present weak Na I doublets and FeH absorption bands, but strong VO features (Cruz et al. 2009). Generally, blue L dwarfs are defined as subdwarfs because of their low metallicity spectral features such as greater H2 absorption, stronger metal hydride bands, and enhanced TiO absorption (Burgasser et al 2008c). The objects in our sample present the characteristic red and blue colors, but they lack the chemical signatures usually associated with these colors. We fit 4rd order polynomials to define the overall shape of these objects’ spectra and in order to provide a quantitative comparison of with other peculiar objects, field standards, young brown dwarfs, and subdwarfs. The results indicate that the coefficients of the fit correlate with spectral type, but are independent of color variations. This newly found trend provides a parameter which can be utilized as an additional tool in characterizing quantifiable differences in the spectra of brown dwarfs. Furthermore, this method can be used in the long-run in studying the atmospheric properties of exoplanets, given their similarities with brown dwarfs in mass and photospheric properties.</p>
59	<p>Presenter: Sarah Chebli, <i>English Literature</i> Undergraduate Research Initiative Fellowship Co-Authors: Anjelica Gangaram Faculty Mentor: Nancy L. Greenbaum</p> <p>The Binding of Protein RBM22 to the Human Spliceosomal U2-U6 snRNA Complex</p> <p>The removal of introns, or noncoding intervening sequences, from precursor messenger (pre-m) RNA</p>

	<p>molecules, and the ligation of flanking coding exons, is known as RNA splicing. The splicing of pre-mRNA is an important step in the maturation of mRNA prior to translation of the message into a protein. The process of splicing is catalyzed by the spliceosome, a large and dynamic complex found in a cell's nucleus comprising five small nuclear (sn)RNA and more than 100 protein components. The chemistry of splicing is catalyzed by a complex formed between two snRNAs, U2 and U6. The goal of this research is to determine how the U2-U6 snRNA complex of the human spliceosome folds to form its catalytically active conformation. Folding of the U2-U6 snRNA complex is facilitated by the protein RBM22. Previous results by others, using electrophoretic mobility shift assays (EMSA) and cross-linking techniques, identified an interaction between RBM22 and U6 snRNA (without U2 snRNA) (1). We have now expressed RBM22 and transcribed RNA strands to form the U2-U6 snRNA complex in the laboratory, and have shown by EMSA that RBM22 binds to the U2-U6 snRNA complex as well as U6 snRNA alone. It is our goal to continue to characterize the molecular basis of interaction between RBM22 and the U2-U6 complex through additional EMSA experiments and by solution NMR spectroscopy.</p>
60	<p>Presenter: Sharon Pang, <i>Biochemistry and Religion</i> Co-Authors: Yi-Chieh Nancy Du, Soyoun Choi Faculty Mentor: Nancy Du</p> <p>Knockdown of RHAMMB on Liver Metastasis of Pancreatic Tumors</p> <p>The gene expressing Receptor for Hyaluron-Mediated Motility (RHAMM) protein is highly expressed in various cancers. Our lab has previously shown that RHAMM isoform B (RHAMMB) promotes liver metastasis of pancreatic neuroendocrine tumors (panNETs). In this study, we explored the effect of knockdown of RHAMMB in panNET metastasis. panNET cells, which express luciferase reporters, were infected with small hairpin RNA for RHAMM (shRHAMM) to knockdown the expression of RHAMMB. These cells were then injected into the spleen of the experimental immunodeficient mice to test the efficiency of establishing liver metastasis. Control immunodeficient mice were injected with tumor cells without RHAMMB-knockdown instead. Splenectomies were performed to prevent high tumor signals at the site of injection. The mice were in vivo bioluminescent (IVIS) imaged at 0, 1, 4, 7, 14, and 21 days after injection to follow the development of metastasis. Since the cells express luciferase reporters, they could be tracked by IVIS imaging. The IVIS signals of the experimental and control mice showed that levels of metastasis to the liver was lower in mice with RHAMMB-knockdown tumor cells. Histological and analysis of the liver metastases also supported that the mice with RHAMMB-knockdown tumor cells had less panNET metastasis. These results suggest that RHAMMB is a target for drug development to decrease tumor spread.</p>
61	<p>Presenter: Sujoy Manir, <i>Biochemistry</i> Undergraduate Research Fellowship Co-Authors: Patrick Kelly Faculty Mentor: Mande Holford</p> <p>Developing a Dissociative Nanocontainer for Peptide Drug Delivery</p> <p>This project examines a mechanism for inducing the in vivo disassembly of protein nanocontainers derived from the viral capsid of the P22 bacteriophage. Recent studies have demonstrated that arbitrary gene products, including bioactive peptides, can be effectively packaged in the interior of the P22 capsid and translocated across in vitro models of the blood-brain barrier. However, controlled disassembly of a peptide delivery vector under physiological conditions, such as moderate temperature, neutral pH, and aqueous environment, remains a challenge. Two bioorthogonal reactions for inducing disassembly: Ring Opening Metathesis Polymerization (ROMP), and the inverse electron-demand Diels-Alder (IEDDA) cycloaddition are attempted to trigger P22 disassembly. In the ROMP-based approach, the ring strain released by the polymerization reaction is used to pry apart the P22 capsid monomers. In the IEDDA-based approach, click chemistry is used to mimic an insertion mutation associated with P22 capsid instability. P22 capsids were manufactured via heterologous expression in <i>E. coli</i> and modified through chemical conjugation, site-specific mutagenesis, and unnatural amino acid mutagenesis.</p>

	<p>Characterization of the disassembly reaction was monitored through mass spectrometry (MS), gel electrophoresis, transmission electron microscopy (TEM), dynamic light scattering (DLS), and Ultra High-Performance Liquid Chromatography (UHPLC). Preliminary results indicate that the ROMP reaction caused conformational changes in the structure of P22 capsids that may lead to disassembly.</p>
62	<p>Presenter: Tamara Yakubova, <i>Biochemistry and Sociology</i> Co-Authors: Gamage Aruggoda Faculty Mentor: Frida Kleiman</p> <p>HuR Ubiquitination and Its Role in mRNA Processing During DNA Damage</p> <p>During DNA damage response (DDR), control of mRNA stability is essential for regulation of gene expression and DNA repair. RNA binding protein, HuR, plays important roles in regulating the stability of mRNA targets involved in DDR, usually increasing stability. HuR has shown to be ubiquitinated in non-stress conditions, resulting in its release from target mRNAs. Our results indicate that E3 Ub ligase BRCA1/BARD1 can modify HuR using in vitro ubiquitination reactions. Supporting these results, siRNA-mediated knockdown of BRCA1/BARD1 decreased HuR ubiquitination in HCT116 cells. Similarly decreased HuR ubiquitination after UV t is seen. Previous studies indicate that mRNA processing factor CstF-50 and escort factor p97 play a role in BRCA1/BARD1 substrates ubiquitination. Co-immunoprecipitation assays showed that 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. Accordingly, siRNA mediated depletion of CstF-50 increased HuR ubiquitination in HCT116 cells. Interestingly, HuR ubiquitination decreased binding of HuR to p53 mRNA, probably allowing the binding of mRNA destabilizing factors, PARN deadenylase and Argonaute, to the p53 transcript. Based on these results, we propose a model where under non-stress conditions BRCA1/BARD1 ubiquitinates HuR, inducing release of HuR 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>
63	<p>Presenter: Victoria Mroz, <i>Biology</i> McNulty Scholar Fellowship Co-Authors: Deven S. Patel, David A. Foster Faculty Mentor: David Foster</p> <p>Mapping the Lipid Mediated Cell Growth Checkpoint in the G1 Phase of the Cell Cycle</p> <p>The cell cycle is a series of events that takes place in order to divide a cell into two daughter cells. One of the hallmarks for a non-cancerous cell on its path toward becoming cancerous is the deregulation of nutrient and growth factor sensing checkpoints. Under standard conditions, cells monitor the cellular materials in the G1 phase and decide whether to divide, arrest into a quiescent state or undergo apoptosis. The specific point where the cell commits to either undergo replication and division or quiescence is the Restriction Point (R) in the G1 phase. However, to ensure proper cell division and continue to progress from G1 to S phase of the cell cycle, there are other cell growth checkpoints downstream and independent of (R) including the Essential Amino Acid (EAA), Glutamine (Q) and mTOR checkpoints. The mechanistic or mammalian target of Rapamycin (mTOR) is a serine threonine kinase involved in protein synthesis, regulating cell growth and proliferation by sensing nutrients. Non-cancerous cells arrest in the G1 phase upon lipid deprivation, and we postulated that there is an additional late-G1 phase checkpoint for for sensing lipids, another nutrient necessary for cellular proliferation and for the building of structural components of cell membranes. In this study, we explored the cellular requirement of lipids and how it is correlated with cell cycle progression. Additional studies will be conducted to see if there is any deregulation of this “putative” lipid sensing checkpoint which could open doors for any therapeutic implications.</p>

Wednesday, April 20th, 2016

Poster Session #4

1:45pm-3:45pm

1st Floor Lobby

64	<p>Presenter: Alison Klein Jenny Hunter Co-Authors: Gerardo Morfini, Scott Brady Faculty Mentor: Thomas Schmidt-Glenewinkel</p> <p>Tau-related Deficits in Fast Axonal Transport in Alzheimer's Disease</p> <p>One hallmark of Alzheimer's disease shared with some other AONDs are aggregates of hyperphosphorylated tau. Pathogenic forms of tau have been shown to inhibit anterograde fast axonal transport (FAT) by activating axonal protein phosphatase 1 (PP1) and glycogen synthase kinase 3 (GSK3). When FAT is disturbed, synaptic function is also compromised. Recently, it was shown amino acids 2-18 of tau, which comprise the phosphatase-activating domain (PAD), are necessary and sufficient for the activation of PP1. In normal nontoxic forms of tau, the N-terminal PAD is sequestered through its interaction with the C-terminus in what is known as the paperclip conformation. Hyperphosphorylation and aggregation are two likely mechanisms for disrupting the normal conformation of tau, exposing PAD, and disrupting FAT in disease. There are six naturally occurring tau isoforms, that can be classified into two subtypes, those with four microtubule-binding repeat regions (MTBRs), or 4R isoforms, and those with three MTBRs (3R). In a normal brain, the ratio of 3R to 4R isoforms is 1:1. However, many tauopathies are characterized by altered isoform splicing or preferential aggregation of 3R or 4R isoforms which may alter PAD exposure. Our data suggests that aggregated forms of both 4R and 3R tau cause reductions in overall anterograde FAT. Additionally, we found that insoluble protein from an AD brain inhibits both anterograde and retrograde FAT compared to an age-matched control brain. These results provide further evidence that inhibition of FAT by pathogenic forms of tau is a toxic mechanism associated with AD and other tauopathies.</p>
65	<p>Presenter: Amanda Ramdular, <i>Chemistry</i> Maximizing Access to Research Program Co-Authors: Patricia Gonzalez, Steven Truong Faculty Mentor: David R. Mootoo</p> <p>Small Molecule Agents for Tumor Targeting</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, their indiscriminate cytotoxicity limits their use as clinical agents. Consequently, the long-term goal 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-deoxyannonomontacin (DAN), which will be conjugated via a traceless linker to a tumor vector, a 3-O-carbamoyl-mannose derivative. The latter is a subunit of the bleomycin family of antitumor agents, and is believed to be primarily responsible for the tumor specificity demonstrated by the bleomycins. This presentation will describe the synthesis of DAN, the drug moiety required for this pro-drug construct. We hypothesized that DAN could be synthesized using an alkene cross metathesis reaction for the union of two prefabricated components of DAN. The advantages of this strategy are its modularity and experimental simplicity. The cross metathesis product required for DAN was obtained, albeit in modest yield. This result validates our synthetic strategy, but remains to be optimized. These data provide the groundwork to complete the synthesis of the final prodrug and evaluate its cytotoxicity against cancerous versus healthy cells.</p>

66	<p>Presenter: Carolina Santamaria, <i>Biochemistry</i> Undergraduate Research Initiative Co-Authors: Carolina Santamaria, Raffaella Diotti, Prachi Anand Faculty Mentor: Mande Holford</p> <p>Developing a High Throughput In-Vitro Screen to Assess Novel Terebrid Peptide Neurotoxicity</p> <p>Neurite outgrowth assays are routinely used to assess the effects of chemical compounds on neuronal cells. However, many of the screening methods are costly and lengthy. In order to assess the effects of novel peptides from venomous terebrid snails (teretoxins) on neurite outgrowth, a high-throughput screening (HTS) method that relies on automated image acquisition and analysis was established. The HTS will enable us to efficiently and rapidly measure manipulation of neurite outgrowth due to treatment with teretoxins. The HTS procedure developed uses PC12 cells that are treated and stained with HCS CellMask Red and Hoechst 3342 to measure cellular morphological changes. PC12 cells are derived from a Pheochromocytoma of the rat adrenal medulla and are commonly used as a model for neurotoxicological studies. These cells can differentiate and adopt a neuronal phenotype characterized by extensive neurite outgrowth upon addition of nerve growth factor (NGF). In order to reduce preparation time, a PC12 expressing YFP stable cell line was also established. PC12 cells were exposed to varying concentrations of Tv1, a bioactive teretoxin from <i>Terebra variegata</i>, before, during, and after induction of differentiation with NGF. After fixing and staining the cells, the mean neurite length per cell was analyzed. Our preliminary results indicate that exposure to Tv1 before nerve growth factor treatment may have an effect on neurite outgrowth.</p>
67	<p>Presenter: Dayanni Bhagwandin, <i>Chemistry</i> Yalow Scholar, MARC Scholar Co-Authors: Stewart Bachan, David R. Mootoo Faculty Mentor: David R. Mootoo</p> <p>Synthetic Studies on Immunostimulatory Glycolipids</p> <p>α-Galactosylceramide (α-GalCer) is a glycolipid known for its ability to stimulate natural killer T (NKT) cells in the immune system to release specific cytokines. Derivatives of α-GalCer that suppress or stimulate the immune system are potential therapeutics against autoimmune diseases and cancer. However, for such applications, α-GalCer analogues with carefully regulated modulatory properties may be needed. To this end, we hypothesize that structural analogues of α-GalCer will elicit different cytokine effects, and provide a pool of structures from which glycolipids with clinical potential will emerge. Introduction of fluorine to bioactive molecules can lead to new receptor contacts and improve their binding to targets and their metabolic stability. Fluorine derivatives of bioactive molecules have been shown to have increased efficacy in vivo and in vitro, compared to their parent molecules. Accordingly, the objective of this research is to synthesize a C-linked α-GalCer with two fluorines attached α to the pseudoanomeric center. Key steps in this synthesis are: (i) preparation of a difluorinated precursor, and (ii) elaboration of this material with the ceramide segment of the glycolipid. To date, a difluorinated α-C-GalCer aldehyde has been prepared using an organocatalyzed fluorination on a galactose-derived aldehyde. This difluorinated aldehyde will be transformed to the eventual, completely elaborated glycolipid target. Future directions of this project include cytokine profiling of the difluorinated α-GalCer derivative which will provide insight into the molecular details of the interaction between α-GalCer and NKT T-cells. This information will be important for designing new derivatives of α-GalCer with tailored cytokine regulatory properties.</p>
68	<p>Presenter: Dean Gailey, <i>Womens & Gender Studies and Biology</i> JFEW Eleanor Roosevelt Scholars, LGBT Social Science and Public Policy Center Intern Faculty Mentor: Elizabethe Payne</p> <p>Alternatives to the "Other Box": Supporting Non-Binary Gender Identities via Medical Documentation</p>

	<p>In an attempt to accommodate alternative gender designations, some medical providers have begun to include “Other” as an alternate gender option in addition to “Male” and “Female” on intake forms and patient surveys. This study utilizes existing scholarship from a variety of disciplines to examine the influence of the inclusion of the “Other Box” on medical forms and surveys and the effects of “othering” patients of non-binary gender identity via the intersections of race, gender, and class. This study identifies the harmful effects for patients encountering the “Other Box” in a healthcare environment as well as suggests alternate terminology which healthcare providers can utilize in medical and survey documentation to provide a supportive environment for people with non-binary gender identities.</p>
69	<p>Presenter: Dennis Melendez, <i>Psychology</i> RISE Co-Authors: Jonathan Benichov, Ofer Tchernichovski Faculty Mentor: Ofer Tchernichovski</p> <p>Behavioral Plasticity as a Predictor of Vocal Plasticity</p> <p>Birdsongs are culturally transmitted, as songbirds imitate the songs of adult individuals who interact with them, giving rise to local song dialects. This vocal learning is similar to the acquisition of spoken language in humans. Since individual songbirds vary in their vocal learning capacity, we hypothesize that individual variation in vocal plasticity might correlate with other modalities of behavioral plasticity. In order to assess behavioral plasticity in songbirds, we designed an experimental apparatus where we expose zebra finches to an environment which allows us to vary the location of a water source while unbeknownst to the bird. First we trained birds to associate a distant landmark with a water source. We then rotated the environment, shifting the landmark away from the water source, and measured how long it took the bird to alter its search strategy. In this way, we were able to quantify how individual songbirds establish habits, how difficult it is for it to break those habits and acquire new ones, and then compare this with how they perform in vocal exchange experiments with a robot bird. We found that the birds can successfully use distant landmarks to locate water sources in our controlled environments. After manipulating the environment we were able to measure exploratory behavior and assess strategies used by the bird for finding the water source. Thus far we have identified definite individual differences between birds in their exploratory behaviors and their inclinations for habituation.</p>
70	<p>Presenter: Gisela Lopez & Hana Lee, <i>Psychology and Sociology</i> Co-Authors: Adam Shavit Faculty Mentor: Adam Shavit</p> <p>The Effect of Flavor on Human Swallowing Behavior</p> <p>The sensory properties of foods and drinks can modulate various aspects of swallowing. We measured the effect of lemon juice and sugar dissolved in water on the duration and volume of swallowing. The participants (n=32) reported no acute or chronic swallowing difficulties or disruptions in taste or smell. We prepared four drink combinations, using lemon juice (5% in volume) and white sugar (7.5% in weight) in 50ml room temperature servings. Three trials of each of the four drinks (water only, with lemon, with sugar, with both) were randomly ordered in 12 trials. We found significant interactions in the effects of sugar and lemon on the duration and volume of swallowing, as well as a main effect for the presence of lemon on both measures. Adding lemon impaired swallowing overall, but while adding sugar impaired swallowing to a lesser degree, in the presence of lemon, adding sugar reduced this impairment.</p>
71	<p>Presenter: Hala Haddad, <i>Psychology</i> Honors in Psychology BP-ENDURE Program Co-Authors: Amber Alliger Faculty Mentor: Amber Alliger</p> <p>Effects of Environment Induce Neurogenesis that Increases Memory on the Radial Arm Maze</p>

Environmental Enrichment provides laboratory animals with physical and social stimuli that are not usually provided with standard housing in laboratory settings. The aim of our study is to examine the relationship between memory and neurophysiological changes, specifically adult neurogenesis, in rats that were housed in an enriched environment. We hypothesize that behavioral differences in memory on the radial arm maze are positively correlated with neurophysiological differences in adult neuron growth and development. Using a standard 8-arm radial arm maze (RAM), we calculated the percent correct choices per trial. After the behavioral tests, we analyzed the neurophysiological changes using immunohistochemistry staining using DCX antibody, and imaging methods. We have found that rats from enriched environments performed better on RAM than controls, $F(1) = 26.53$, $p = 0.000$. Based on our hypothesis and results, we propose that environmental enrichment may increase neurogenesis, thus leading to improved performance on memory tasks.

72	<p>Presenter: Heeyewon Jeong, <i>Psychology</i> Faculty Mentor: Kimberly Robinson</p> <p>Cultivating Mindfulness for Psychological Well-being: Mindfulness Meditation as a Stress and Anxiety Reducer among College Students</p> <p>According to the American College Health Association, nearly 25 % of American college students have felt overwhelmingly anxious within the past two weeks. Research demonstrates that prolonged or constant anxious emotion may occur mood disorders. To promote psychological well-being, a number of researchers have recently shown that mindfulness-oriented therapeutic intervention produces beneficial results in reducing stress-related symptoms and levels of anxiety in clinical settings. Mindfulness is a conscious state of mind that involves observing insight without evaluating and judging. Mindfulness training has been associated with positive effects on managing emotional reactivity, such as anxiety, worry, and anger, and psychological health. Thus, in the current study, we will study whether an 8-week mindfulness meditation intervention would improve psychological well-being among college students. We will measure levels of perceived stress, anxiety, and rumination as mediating factors of the impact of the mindfulness meditation intervention. We hypothesize that the 8-week mindfulness meditation intervention will lower the level of stress and anxiety as well as ruminative thoughts.</p>
73	<p>Presenter: Karen Ebenezer, <i>Biology and Latin</i> Thomas Hunter Honors Program, Yalow Scholarship, Eta Sigma Phi Honor Society Co-Authors: Daphne Ko, Jayne Raper Faculty Mentor: Jayne Raper</p> <p>Assessing the Structure and Function of TLF3, a Good Cholesterol Found in Lupus Patients</p> <p>Trypanosomes are eukaryotic parasites that cause African sleeping sickness (also called African trypanosomiasis). A particular species of trypanosomes, called <i>Trypanosoma brucei brucei</i>, is animal-infective, but can be controlled by our innate immune system via high-density lipoproteins, or 'the good cholesterol' called Trypanosome lytic factors (TLFs). These TLFs possess proteins on their surfaces such as Haptoglobin Related Protein (HPR), which participates in uptake of the TLF complex, and Apolipoprotein L-I (APOLI) that facilitates the cellular death of the trypanosome, effectively killing the parasite through pore-formation. The existence of two TLF complexes - TLF1 and TLF2 (the latter of which is attached to a naturally occurring antibody called an IgM) - is known and well documented. We hypothesize the existence of TLF3, a high-density lipoprotein bound to mature IgG antibodies. There is an increased possibility for TLF3 to be found in patients suffering from lupus, an autoimmune disease where antibodies bind to the body's own molecules, causing self-harming immune responses. In lupus patients, naturally present antibodies such as IgMs begin expressing as mature IgGs through a process called class switching, making it more likely for TLF3 (which is attached only to an IgG antibody) to be present. To discover the presence, size and function of TLF3, the serum of lupus patients are used; the proposed size of this complex is smaller than the other TLFs. Our goal is to assess the presence of TLF3 by testing for predominant TLF proteins such as APOLI, HPR and APOA1 (Apolipoprotein A-I, which is the core protein of high-density lipoproteins). Our goal is also to analyze this lupus serum through various purification procedures (such as chromatography) that would isolate TLF3, so that we may assess its trypanosome-killing activity and further understand the significance of its structure and function.</p>
74	<p>Presenter: Katherine Lopez, <i>Psychology</i> NIGMS RISE Co-Authors: Hamed Khandaker, Stella Chin Faculty Mentor: Glenn Schafe</p> <p>The Effects of Curcumin on Morphological Changes in the Infralimbic Cortex and Lateral Amygdala Following Chronic Restraint Stress in Rats</p> <p>Stress is an emotion that has an evolutionarily significance in protecting us from predators, and</p>

	<p>influencing hormone release, such as cortisol, in order to respond to stressors and threats in the most effective way. However, a repeated stress response over time can lead to more negative effects. The medial prefrontal cortex, MPFC, and the amygdala are affected with the changes from the effects of glucocorticoids and gene expression that can be mediated by chronic stress. Psychological disorders, like PTSD, and physical abnormalities, such as high levels of inflammation in the body, may become present as a result of the body being under persistent stress. Thus the productivity of these structures becomes altered as they undergo changes in their arrangement. Curcumin has been shown to inhibit many molecules known to play a role in inflammation, a major factor that occurs during chronic stress. Curcumin may have protective effects from neurodegenerative disorders, such as PTSD. To investigate this, we examined whether chronic restraint stress is associated with spine changes within the lateral amygdala and infralimbic cortex in a rodent model. Based on previous literature, we expect to find an increase in dendritic spine density in the amygdala due to chronic restraint compared to controls, and a decrease in dendritic spine density in the infralimbic cortex due to chronic restraint compared to controls. This study it can potentially lead to improved biological therapies for patients who suffer from anxiety and stress-related disorders such as PTSD.</p>
75	<p>Presenter: Keith Anne Ilagan, <i>Psychology and Biochemistry</i> Macaulay Honors College and Undergraduate Research Initiative Fellow Co-Authors: Amanda Lebron, Katie Darabos, Tracey A Revenson Faculty Mentor: Tracey A Revenson</p> <p>Do Social Constraints Affect Psychological Adjustment? Steps to Conducting a Systematic Literature Review</p> <p>The psychological construct of social constraints is the perception that your social network is unresponsive to your emotional disclosure (Lepore & Revenson, 2007). Social constraints have been associated with increased psychological distress among individuals with cancer. We are conducting a systematic literature review and meta-analysis to summarize the knowledge about the negative impact of social constraints on adjustment among individuals facing severe life stressors, including, but not limited to, cancer. This poster will focus on the steps of the systematic review process: how we searched the literature and applied inclusion and exclusion criteria to identify eligible studies using the Preferred Reporting Items for Systematic Review and Meta-analyses (PRISMA) guidelines. Empirical articles were identified through searches of six databases (e.g., PsychARTICLES, MEDLINE) for the years 1995-2015. The search resulted in 606 articles. After removing 227 duplicates, eligible studies were identified based on four inclusion criteria: 1) original empirical research that 2) included a sample facing a major stressor and measures of 3) social constraints and 4) psychological adjustment or distress. This resulted in a final sample of 59 articles for the systematic review. We also provide information about development of the coding scheme for full-text coding of those articles. A comprehensive synthesis and meta-analysis of all published articles on social constraints in the broader context of major stressors will allow us to determine the size of the effect as well as mediating or moderating mechanisms.</p>
76	<p>Presenter: Kirran Tiwari, <i>Biochemistry</i> William E. Macaulay Honors College Co-Authors: Kirran Tiwari, Charles M. Drain, Mark E. Hauber Faculty Mentor: Charles M. Drain, Mark E. Hauber</p> <p>The Effect of Temperature on the Blue-Green Chroma of the Eggshells of Selected Avian Species</p> <p>Avian eggshells come in a vast range of colors, but are generated by only two pigments: protoporphyrin IX (PPIX) and biliverdin. We were interested in how changes in temperature can influence the chemistry of these pigments and consequentially result in permanent color changes. We extracted the pigments from biliverdin-based eggshells of different avian species (crested tinamou, Chilean tinamou, emu, and American robin) and from PPIX-based eggshells (chicken) using a mild extraction method involving acetic acid. Using UV-visible spectrophotometry with a Peltier system, we observed the spectra of the extracts and calculated the blue-green chroma at temperature intervals during heating from room temperature to</p>

	<p>100 °C, followed by subsequent cooling. We observed that the eggshells from the crested tinamou were unique from the other avian species as the blue-green chroma permanently changed upon being heated to 100 °C, and that subsequent cooling failed to result in original blue-green chroma values. We hypothesized that an unusually high protein concentration in the crested tinamou eggshells may have led to this phenomenon. We measured the protein concentration of our extracts from the different species and found that the extract of the crested tinamou eggshell contained almost three times the amount of protein on average compared to the other biliverdin and PPIX-based eggshells. Analysis of the spectra and the blue-green chroma of a sample of standard biliverdin with 2.0 mg of BSA protein suggests that protein denaturation influences a permanent color change in avian eggshells with particularly high protein concentrations.</p>
77	<p>Presenter: Medea Asatiani, <i>Religion</i> Faculty Mentor: David Cereguas</p> <p>The Georgian Orthodox Church and Georgian Women</p> <p>I grew up in Republic of Georgia and I was member of the Georgian Orthodox Church. Ninety percent of Georgian population is Orthodox Christians. Christianity has been part of Georgia from IV century. I want to film documentary and explore the role, the Georgian Orthodox Church plays in shaping of the Georgian woman's role in the society. We have a saying in Georgia, "She is like a Georgian mother". This statement is meant to give full description of what motherhood means. In my research I hope to find, what makes Georgian mothers and Georgian women unique and what role the Church plays in shaping of the Georgian woman. My dream is to film this project in Georgia. My documentary currently has been filmed in USA and it demonstrates westernized Georgian women. I would like to film Georgian women in Georgia as well as Georgian Orthodox priests in Georgia to get clear sense of the Georgian woman's role in the society. I want to demonstrate the influence of the Georgian Orthodox Church on shaping the Georgian woman's role in the society.</p>
78	<p>Presenter: Michelle Naidoo, <i>Biology</i> NIGMS-RISE Program Co-Authors: Thahmina Ali, Victoria T. Durojaiye, Dibash K. Das Faculty Mentor: Olorunseun Ogunwobi</p> <p>The Protein FRY-like (FRYL) and Androgen Receptor (AR) Signaling in Prostate Cancer</p> <p>Prostate cancer (PCa) is the second most common cancer in men and the fifth leading cause of cancer deaths worldwide. High mortality rates of PCa are related to the development of androgen-independent prostate cancer (AIPC). Approximately 30% of prostate tumors in AIPC patients have overexpression of the androgen receptor (AR). Gaining an understanding of the molecular mechanisms of AR expression in PCa is critical to developing effective targeted therapies. In this study, we performed whole transcriptome analysis of the prostate tumor and adjacent normal tissue of fourteen patients using bioinformatics algorithms on the graphical user interface of the Galaxy web platform. We also analyzed mRNA and protein expression of relevant genes in PCa cell models. The analysis revealed a strong and statistically significant correlation between the overexpression of AR and the overexpression of a relatively new protein called FRY-like (FRYL) in the prostate tumor tissue of PCa patients. In PCa models, FRYL and AR were concurrently overexpressed in PCa cells in comparison to non-tumorigenic prostate epithelial cells. Also, in comparing the androgen-dependent cell line, LNCaP, and its derivative androgen-independent cell line, C4-2B, the data demonstrates that FRYL and AR are both significantly overexpressed in C4-2B compared to LNCaP. These observations strongly suggest that AR and FRYL may participate in the progression of AIPC. Consequently, further understanding the role of FRYL in AR signaling may provide novel therapeutic targets for the benefit of AIPC patients.</p>

79	<p>Presenter: Muyu Situ, <i>Psychology with a concentration in Behavioral Neuroscience</i> BP Endure and UGRI Faculty Mentor: Amber Alliger</p> <p>Environmental Enrichment Increases Neurogenesis Leading to Improved Working Memory</p> <p>Insufficient amount of research has been done on the paradigm of environmental enrichment (EE) on the brain and behavior to understand the neuroplasticity of the adult brain; thus the aim of our study is to determine if there is an influence on neurogenesis, particularly in the adult hippocampus of laboratory animals and working memory. We hypothesized that EE will lead to enhanced working memory and increased neurogenesis.. Our study used male Sprague Dawley rats. (EE, N = 24) and single housing (SH, N = 24). The EE were housed together with 12 rats per cage, given toys that were changed weekly and were each handled for two minutes two times per week. After 30 days of respective housing subjects were placed on the radial arm maze where working memory was measured. Using immunohistochemistry-staining protocol, DCX was used to measure neurogenesis. We propose that the results will show that enriched animals will have an increase neurogenesis resulting in fewer working memory errors.</p>
80	<p>Presenter: Nayab Khan, <i>Political Science and Biochemistry</i> Yalow Scholars Co-Authors: Changda Liu, Janaki Patel, Nan Yang, Xiu-Min Li Faculty Mentor: Greg Phillips</p> <p>2-Methyl-1, 3, 6-Trihydroxy-9, 10-Anthraquinone Isolated from Rubia Cordifolia L Inhibits IgE Production</p> <p>MTA (2-methyl-1,3,6-trihydroxy-9,10-anthraquinone) is isolated from a traditional chinese herb Qian Cao (QC). QC exhibits anti-inflammatory properties useful in combatting allergies. Particularly QC inhibits immunoglobulin E (IgE) production in vitro. If IgE production is inhibited then inflammation won't occur. Current medications to treat allergies may yield adverse effects developmentally thus non-toxic traditional Chinese herbal medicine is of great interest. The aim of this study was to test MTA effects on IgE production in human B cell line and PBMCs in vitro. The compound was tested over a dose range (1.25 µg/mL to 20 µg/mL) for IgE reduction by U266 cells cultured at 2X10⁵ cells/mL for 6 days. Supernatant IgE levels were measured with ELISA. Human peripheral blood mononuclear cells were obtained from adults with allergies and controls and cultures included IL-4 + CD-40 with and without MTA. Cytokine levels were measured with a multiplex immunoassay. ELISA assay results showed inhibition of IgE production in a dose dependent manner from 1.25 µg/mL to 20 µg/mL by U266 cells in MTA. PBMCs which were co-stimulated with human rIL-3 and anti-CD-40 treated with MTA showed inhibition of IgE production. Simultaneous treatment with MTA showed IgE levels to decrease from ±150 ng/mL to ±25 ng/mL. MTA inhibits IgE production in the human B cell line and PBMCs which emulate two different scenarios in a allergic reaction. Therefore, MTA may be helpful as an alternate treatment for allergic reactions.</p>
81	<p>Presenter: Ria Kalyan, <i>Psychology</i> Honors Psychology Faculty Mentor: Amber Alliger, Steven Young</p> <p>Looking at You, Looking At Me: Positive and Negative Biases of Individuals With Social Anxiety Disorder</p> <p>Social anxiety disorder (SAD) or social phobia is characterized by an intense fear of negative evaluations resulting in extreme discomfort and excessive self-consciousness in everyday social situations. A specific bias in individuals with SAD is sensitivity to threatening faces, especially those in a crowd. In this study, we are examining how social anxiety predicts response times to locate a face in a crowd. To do so, participants will view positive and negative faces in crowds of 4 and 8 face matrices, presented on a computer monitor. For example, participants view matrices with 3 neutral faces and 1 angry face, and be tasked with locating this "target face" as quickly as possible. Following the task, social anxiety will be</p>

	<p>measured using the Social Phobia Inventory. 30 undergraduate students from Baruch College will participate in this study. We hypothesize that individuals with higher levels of social anxiety will be able to detect target angry faces faster than less anxious individuals.</p>
82	<p>Presenter: Shamima Khan, <i>Economics BA/MA</i> Roosevelt House Public Policy Faculty Mentor: Purvi Sevak</p> <p>Psychiatric vs. Physical Disabilities: A Comparison of Barriers and Facilitators to Employment</p> <p>Every year, approximately 1 in 25 adults in the US – 10 million – experience a serious mental illness that substantially limit one or more major life activities. Serious mental illness costs an estimated \$193.2 billion in lost earnings per year. My research was aimed to better identify barriers to and facilitators of employment of individuals with psychiatric disabilities and how these factors may differ for individuals with physical disabilities. My analysis uses data from the Survey of Disability and Employment on 2,148 individuals with psychiatric disabilities and/or physical disabilities who in 2014 applied for services from one of the three state vocational rehabilitation (VR) agencies. My results show what VR applicants with psychiatric disabilities have had longer periods of non-employment than individuals with physical disabilities. They are more likely than individuals with physical disabilities alone to report nonhealth reasons, such as getting fired and lacking skills, as barriers to employment. I found that a number of accommodations, including flexible schedules and modified work duties, are significantly associated with continued employment. The implications are that VR agencies should: 1) be aware that applicants with psychiatric disabilities greatly value being employed but face additional barriers to employment, 2) shorten the time between onset of disability and VR application, 3) increase focused outreach to individuals with psychiatric disabilities.</p>
83	<p>Presenter: Tamara Gillot, <i>Biochemistry</i> Co-Authors: Dibash Das, Ankita Dutta Faculty Mentor: Olorunseun Ogunwobi</p> <p>A Novel Synthetic Biotinylated microRNA-1207-3p Duplex Inhibits Migration and Induces Apoptosis of Prostate Cancer Cells</p> <p>Prostate cancer (PCa) is the second leading cause of cancer related death among men in the US. Studies have shown that faulty regulation of microRNAs contributes to the development of various cancers, including PCa. We have recently discovered that miR-1207-3p, encoded at the PVT1 gene locus on the 8q24 human chromosomal region, is significantly underexpressed in PCa cell lines and directly targets the 3' untranslated region (UTR) of Fibronectin type III domain containing 1 (FNDC1). We previously designed and synthesized a novel synthetic biotinylated miR-1207-3p duplex (b-miRNA-1207-3p duplex) which directly targets the 3'UTR of FNDC1. To assess the effects of our novel b-miR-1207-3p duplex in comparison to a novel synthetic biotinylated scrambled control duplex (b-scrambled duplex), wound healing assays and Annexin V assays were performed. These effects were assessed using two PCa cell lines namely, the mildly tumorigenic E006AA and its aggressively tumorigenic derivative, E006AA-hT. Wound healing assays revealed that the novel synthetic b-miR-1207-3p duplex significantly inhibited cellular migration in E006AA PCa cells by 20% and E006AA-hT PCa cells by 40% when compared with novel synthetic b-scrambled duplex. Furthermore, Annexin V staining analysis using flow cytometry showed that the novel synthetic b-miR-1207-3p duplex increased apoptosis by nearly 2-fold in E006AA and E006AA-hT cells compared to the novel synthetic b-scrambled-duplex. These results show that the novel synthetic b-miR-1207-3p significantly inhibits migration and induces apoptosis in both mildly and aggressively tumorigenic PCa cell lines. Consequently, the novel synthetic biotinylated miR-1207-3p can potentially be a novel therapeutic agent in PCa.</p>

84	<p>Presenter: Veronica Bueno, <i>Biochemistry</i> Undergraduate Research Initiative Fellowship Co-Authors: William Perea, Junior Gonzales, Dinesh Bhupathiraju Faculty Mentor: Nancy L. Greenbaum</p> <p>Conjugating a Chlorine derivative with Lysozyme and Bovine Serum Albumin</p> <p>Fluorescent molecules conjugated to biomolecules that target specific cellular markers are useful for bio-imaging and therapeutic purposes. The purpose of this research was to synthesize, purify, and characterize a bio-conjugate in which a strongly fluorescent chlorin (a porphyrin that has one less double bond in its structure) was covalently attached to a lysozyme or bovine serum albumin (BSA) protein. The chlorin derivative was synthesized and activated for conjugation in Prof. Drain's laboratory. We then tested a range of conditions for attachment to the protein through a four-carbon linker molecule containing an activated NHS ester on the chlorin. The N-terminus of the protein and lysines are available for conjugation. The best conditions to date for conjugation were found to occur in 100% dimethyl sulfoxide (DMSO) with both protein and chlorin at concentrations of 100 μM. Products were purified by size exclusion chromatography and analyzed by SDS-PAGE and non-denaturing PAGE. Derivatives will be characterized further by mass spectrometry to assay for purity and oligomerization state. We will then attempt to improve reaction yield and to identify whether chlorin is attached at the N-terminus or internal lysine residues on the proteins. The conjugates have promising spectroscopic properties that can be used in photodynamic therapy (PDT) or bio-imaging.</p>
85	<p>Presenter: Wendy Li & Kenel Zhao, <i>Biochemistry</i> Macaulay Honors College, Undergraduate Research Initiative Fellow Co-Authors: Huong Chu, William Perea, Nancy L. Greenbaum Faculty Mentor: Nancy L. Greenbaum</p> <p>Role of Spliceosomal RBM22 in Folding of Human U2-U6 snRNA Complex Analyzed by Fluorescence Resonance Energy Transfer Techniques</p> <p>Precursor messenger (pre-m)RNA splicing is the process by which introns—noncoding regions—must be removed and exons—coding regions—are ligated to create mature mRNA encoding a message for protein synthesis. This process is catalyzed by the spliceosome, a multi-megaDalton ribonucleoprotein complex comprising five small nuclear (sn) RNAs (U1, U2, U4, U5 and U6) and more than 100 proteins. The U2-U6 snRNA complex forms the catalytic core of the spliceosome, and undergoes conformational change prior to the two-step splicing reaction. The spliceosomal protein RBM22, which has been shown to interact with U6 snRNA, has been proposed to have an important role in remodeling the U2-U6 snRNA complex prior to the first step of splicing (1). However, details of protein-RNA interactions and activity of the protein remain unclear. We will investigate the effect of RBM22 on folding of the U2-U6 snRNA complex by time resolved fluorescence resonance energy transfer (trFRET) between fluorescent probes placed at selected sites on the RNA. We propose that RBM22 activates U2-U6 by inducing a conformational change, bringing catalytically critical sites closer together. Studying the effect of RBM22 on human U2-U6 snRNA will help develop a more universal understanding of how the remodeling of U2-U6 snRNA prompts the first catalytic step in splicing reactions. (1) Rasche, N., Dybkov, O., Schmitzová, J., Akyildiz, B., Fabrizio, P., & Lührmann, R. (2012). Cwc2 and its human homologue RBM22 promote an active conformation of the spliceosome catalytic centre. <i>The EMBO Journal</i>, 31(6) 1591-1604.</p>