On behalf of the Loyola Center for Experiential Learning and the Loyola Undergraduate Research Opportunities Program (LUROP), we welcome you to the Undergraduate Research & Engagement Symposium. During the Weekend of Excellence, this symposium is Loyola’s annual celebration of student scholarship, including research, community engagement projects, and scholarly, creative works conducted by Loyola University Chicago undergraduate students.

In light of the Center for Experiential Learning celebrating its 10-year anniversary, this year’s symposium theme is significant: Learning Together: Deepening Inquiry, Deepening Dialogue. As a celebration of students’ scholarly work, this symposium provides space for critical interrogation into and reflection upon many disciplinary topics. Such scholarship actively demonstrates Loyola’s mission to “expand knowledge in service to humanity through learning, justice, and faith.” Through student research projects, community-based learning projects (from service-learning courses or academic internship courses), and reflective learning portfolios, students demonstrate their knowledge, skills, attitudes, and values forming as a result of a Loyola University Chicago education.

During each summer and academic year, Loyola undergraduate students spend hours inside and outside of their classrooms to conduct hands-on, original research and to lead community-engaged projects. Such projects not only engage student learning differently, but also student perspectives are changed, knowledge co-created, and communities strengthened. The breadth of multi-disciplinary projects and presentations are presented today in two poster sessions, oral presentations, community engagement projects, and student learning portfolios alongside original research projects. We encourage you to take advantage of the wide array of student presentations in all sessions of the Undergraduate Research & Engagement Symposium.

We thank the faculty, staff, and community partners who serve as mentors to our students – your work in guiding student learning is significant, and we appreciate your time, energy, and commitment! We are very grateful to the faculty, alumni, staff, campus partners, and graduate students who are serving as evaluators this year and ensuring an enriching, learning experience for our undergraduate students.

For more information about Loyola’s Center for Experiential Learning, a curriculum development center which facilitates high-impact, engaged learning opportunities for students across the curriculum, visit us at www.luc.edu/experiential. To learn more about the undergraduate research program or the funded fellowships through LUROP, please visit www.luc.edu/lurop. We hope you enjoy the scholarly work of our students!

In Service,

Patrick M. Green, Ed.D.
Director, Center for Experiential Learning
Clinical Instructor, Experiential Learning
SCHEDULE

Poster Presentations: Session 1 ............................................................. 11:00AM-12:30PM
(Mundelein Auditorium)

Public-led Research in Dance Performance ................................. 11:30AM-12:00PM
Undergraduate Research in Dance
(Newhart Family Theatre, Floor 2)
Set.seed(1234), An Interdisciplinary Research Project Combining Statistical Software Coding
with Dance Choreography
(Lobby of Institute for Environmental Sustainability)

Oral Presentations ................................................................. 12:50PM - 1:50PM
(Mundelein Classrooms, Floors 2-5)

Poster Presentations: Session 2 .................................................. 2:00PM-3:30PM
(Mundelein Auditorium)

Awards Ceremony ................................................................. 3:45PM - 4:30 PM
(Newhart Family Theatre, Floor 2)
  ✦ Outstanding Loyola Undergraduate Researcher Award
  ✦ Langerbeck Award for Undergraduate Research Mentoring
  ✦ Graduate Student Mentor Award
  ✦ Hayes Award for Advising and Mentoring
  ✦ Loyola University Libraries Undergraduate Research Paper Award
  ✦ Community Engagement Award for Social Justice
  ✦ Community Engagement Award for Innovation in Sustainability
  ✦ Community Engagement Award for Impact

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LOYOLA UNDERGRADUATE RESEARCH OPPORTUNITIES PROGRAM (LUROP)

In addition to hosting the 2018 Undergraduate Research & Engagement Symposium as part of the Center for Experiential Learning (CEL), the Loyola Undergraduate Research Opportunities Program (LUROP) offers guides for external research opportunities, travel grants for conference presentations, workshops on research and presentation skills, and more. You can find these resources at www.luc.edu/lurop. In addition, LUROP coordinates or supports nineteen undergraduate research fellowships. Many, though not all, of the students presenting at the Symposium received support from these fellowships.

Biology Research Fellowship Program
The Biology Research Fellows Program funds long-term research projects under the direction of a faculty mentor in the Department of Biology. Students work for two years on their respective projects during the academic year and in the intervening summer.

Biology Summer Research Fellowship Program
The Biology Summer Research Fellowship funds summer research projects under the mentorship of a faculty member from the Department of Biology.

Carbon Undergraduate Research Fellowship
The Carbon Fellowship offers a full two-year, interdisciplinary research opportunity for science and math majors to work closely with two faculty mentors. This program is designed for students who plan to pursue research in graduate or professional schools.

Carroll and Adelaide Johnson Scholarship
The Carroll and Adelaide Johnson Scholarship offers rising juniors a two-year scholarship to support a research project on women, leadership, and social justice under the mentorship of a Loyola faculty member.

Center for Urban Research and Learning (CURL) Fellowship
The CURL Fellowship facilitates involvement of students in collaborative research projects with community-based organizations, social service agencies, health care providers, businesses, and government. Fellows are active participants in efforts to improve the quality of life of all members of the Chicago metropolitan community.

Community Research Fellowship
The Community Research Fellowship connects undergraduate students with community partners and faculty members to participate in research. With the community partner and faculty member serving as guides, this unique fellowship allows students to participate in community-based research with the community.

Institute of Environmental Sustainability (IES) Undergraduate Research Fellowship
Formerly known as the CUERP Fellowship, the IES Fellowship is for students to conduct interdisciplinary research on issues related to unsustainable natural resource uses in the greater Chicagoland region. The Center encourages research projects to combine elements of ecosystem structure and function, impacts on human health, public policy, behaviors, and other environmental factors.

Interdisciplinary Research Fellowship
The Interdisciplinary Research Fellowship connects undergraduate students with two faculty members in different disciplines on a research project that engages multiple disciplinary lenses. In an effort to foster interdisciplinary collaboration, this fellowship was created to provide a pathway for students to engage directly in interdisciplinary research. With support from two faculty mentors from different disciplinary perspectives, students are encouraged to engage in research that demonstrates how knowledge creation is enhanced with multi-disciplinary approaches.
The Joan and Bill Hank Center for the Catholic Intellectual Heritage (CCIH) Undergraduate Research Fellowship
The Joan and Bill Hank Center for the Catholic Intellectual Heritage (CCIH), in support of the Catholic Studies minor, offers a research fellowship to undergraduate students who are currently enrolled in the Catholic Studies minor program. This fellowship is dedicated to support for CCIH-funded faculty research projects, as well as CCIH's international research projects.

McNair Post-baccalaureate Achievement Program
The Loyola University Chicago McNair Scholars Program is an independent program that prepares qualified undergraduate students for graduate study at the doctoral level. Students participate in scholarly activities during the academic year and over the summer. An integral component of the McNair program is the summer research internship through which students conduct research under the tutelage of a faculty mentor.

Molecular & Computational Biology Summer Research Fellowship
Students in this program study a special class of viruses, called bacteriophages, that preys on bacterial hosts in Lake Michigan. These students look into the impact that these viruses have on the bacterial levels in the lake. This effort combines both molecular and computational biology.

Mulcahy Scholars Program
The Mulcahy Scholars Program supports over 70 College of Arts and Sciences majors in the hard sciences who are working on an individual research project with a faculty mentor, serving as a research assistant, or engaging as a member of a collaborative research team to support ongoing faculty projects throughout the academic year.

Provost Fellowship for Undergraduate Research
The Provost Fellowship supports over 70 undergraduate students in any academic discipline across the university conducting research with the support of a faculty mentor.

Research Mentoring Program (RMP)
This program is designed to partner graduate students who are working on their dissertation with undergraduates who are interested in participating in research. This summer program is designed to support doctoral students in their dissertation research while providing an opportunity for undergraduates to learn more about graduate studies and graduate-level research.

Ricci Scholars Program
The Ricci Scholars Program is an innovative research and cultural immersion program organized around the theme of the meeting of East and West. The program awards selected students with scholarships for travel, research, and exploration during a junior year of study divided between two of the world’s most important cities: Rome, Italy, and Beijing, China.

Rudis Fellowship Program
The Anthony and Mary Rudis Fellowship provides scholarships to students whose research focuses on the comparative study of constitutions. Recipients of the scholarship will write a 20-25 page research paper during the academic year under the guidance of a faculty member in the Department of History or the Department of Political Science.

Social Innovation/Social Entrepreneurship Fellowship
This fellowship is designed for undergraduate students who are developing a social innovation project or social entrepreneurship venture.

Social Justice Research Fellowship
The Social Justice Research Fellowship support students conducting faculty-mentored research that explores issues of social justice or contributes to social justice.
**Summer Fellowship in Neuroscience**
This summer, the Center for Interdisciplinary Thinking and Interdisciplinary Neuroscience Minor will provide students with the opportunity to work with a neuroscientist at the Lake Shore Campus. This opportunity allows students to see how questions are asked, answered, and the results disseminated.

**Women in Science Enabling Research (WISER)**
The oldest undergraduate research fellowship at Loyola, WISER is designed for undergraduate women seeking to explore research science, work closely with faculty, learn how laboratory work is conducted, and build a sense of community.
**Poster 1**

*Structural Mechanisms of interaction of Klech-like 1 Protein with CaV3.2*

**Caitlin Nicolai**, Molecular/Cellular Neuroscience, Biology (2018), McNair Post-baccalaureate Achievement Program; Mentored by Dr. Erika Piedras-Renteria, Physiology

The role of the actin cytoskeleton is crucial for modifying and/or regulating formation of synapses, axons and dendrites and interactions between actin-binding proteins (ABP). ABPs have the ability to influence other mechanisms of the cell including ion channels. The actin-binding protein KLHL1, also known as Kelch-like 1 protein, is an example of that matter. It has been proven that without actin, KLH1 cannot function properly, so knowing how KLHL1 binds to CaV3.2 is crucial to understand its underlying mechanism of regulation. Advances in understanding this mechanism properly can lead to alleviate symptoms in diseases such as diabetic neuropathy or epilepsy.

**Poster 2**

*Epigenetic functions of GATA1 in erythropoiesis and pathogenesis of Diamond-Blackfan anemia with GATA1 truncated mutation*

**Hiral Patel**, Spanish Literature, Molecular Biology (2019)  
Community Partner: Dr. John Crispino, Dr. Te Ling  
Mentored by Dr. Joseph Milanovich, Biology

Throughout the world, approximately 1.62 billion people are affect by anemia (“Global anaemia prevalence…). Diamond-Blackfan anemia (DBA) has been “characterized by the production of enlarged (macrocytic) erythrocytes” and by “therapeutic response to corticosteroids” (Sankaran et al., 2012). Mutations in the genes that code for the transcription factors GATA1, its truncated form, GATA1s, and GATA2 have been associated with DBA. Intentions of this project include cloning viral vectors carrying human GATA1, GATA1s, and GATA2 coding sequences, introducing viral vectors into packaging cell lines, collecting and concentrating the viruses, infecting human hematopoietic stem cells, and completing an erythroid differentiation analysis.

**Poster 3**

*Convergence: The Implications of Euro Adoption for Poland*

**Thomas Keene**, Economics, Music-Jazz Studies (2018), Provost Fellowship; Mentored by Marc Hayford, Professor, Quinlan School of Business

Poland is the fastest growing economy in Eastern Europe. It was one of the few countries in the EU to grow during the Great Recession in 2008. Poland faces a choice as its economy gets closer to the convergence criteria for the Economic Monetary Union: whether to actually join. Joining the EMU would greatly limit Poland’s current fiscal and monetary policies, but also opens a world of possible prosperity by linking itself closely to some of the biggest economies in the world. This project analyzes the overall policies of both institutions in order to decide whether Poland should converge.

**Poster 4**

*Foley Catheter Anatomical Model*

**Lauren Bermke**, Biomedical Engineering (2021), Mirza Baig, Shalaka Kollerkandy  
Mentored by Dr. Gail Baura, Engineering Science; Dr. Jason Streeter, Engineering Science; Dr. Carol Kostovich, School of Nursing

In the Introduction to Engineering Design course, a First Year Design Project implemented the need for the design of an anatomical model for the Foley catheter with a particular focus on the understanding of the engineering process and its relation to the designing of the model. Using SolidWorks programming, the creation of an anatomical model was made possible to help sophomore nursing students in Loyola's Marcella Niehoff School of Nursing better understand the anatomical structures involved in the insertion of a Foley catheter.
**Poster 5**

*The Interactions between HPMC and Surfactants Using Molecular Dynamics*

**Ramsin Michael**, Biochemistry (2018), Mulcahy Scholars Program; Mentored by Dr. Ken Olsen, Chemistry and Biochemistry,

Hydroxypropyl methylcellulose (HPMC) is used in oral medications to control drug release. The benefits of HPMC is that it is non-Newtonian making it viscoelastic that contain both elastic and viscous properties when deforming. This allows drug developers to gain better control of when the active ingredients are released. Surfactants work with HPMC to control the solubility of the medication. Research of HPMC-surfactant interactions is new, and our goal is to use MD to determine how HPMC interacts with a wide variety of surfactants.

**Poster 6**

*Humane Euthanasia of Oreochromis*

**Naxi Shah**, Engineering Science (2021), Samantha Frey, Jack Segal

Mentored by Dr. Erickson, Urban Agriculture Coordinator, Sustainable Agriculture; Dr. Baura, Director of Engineering, Engineering Science; Dr. Johnston, Professor, Engineering Science; Dr. Streeter, Professor, Engineering Science

To better the current euthanasia of Oreochromis, the time the process takes needs to be shortened to improve the morality. The process needs to include a purge tank to improve the taste of the fish, and should be cost efficient.

**Poster 7**

*Diversity, Distribution, and Habitat Associations of Non-Native Mollusks in the Chicago Region*

**Jenny Par**, Environmental Science (2018), Mulcahy Scholars Program; Mentored by Dr. Reuben Keller, Professor, Institute of Environmental Sustainability; Erin O'Shaughnessey, Graduate Student, Institute of Environmental Sustainability

Invasive mollusks have proven particularly damaging with impacts that include displacement of native species, altered food webs, modified ecosystem processes. Future invasions have the potential to cause similar impacts, and a major management goal is to prevent the arrival of new non-native mollusk species. Despite this goal, there is little coordinated sampling taking place to identify any new arrivals. Such sampling could be particularly valuable in highly populated areas where new species are most likely to be released, and on the southern margins of the Great Lakes where warming conditions may create viable habitat for species that have previously been excluded.

**Poster 8**

*Biodiesel Water Content*

**Kyle Quan**, Engineering (2021), Anna Zachary, Abeer Bershed, Joshua Washington

Mentored by Gail Baura, Engineering; Chad Johnston, Engineering; Zach Waickman, Institute of Environmental Sustainability

Loyola’s biodiesel is a renewable, biodegradable fuel manufactured from recycled restaurant grease. This is used for the intercampus shuttles daily, but high levels of dissolved water prevent maximum efficiency and increase the risk of biological contaminants in the solution. Since there are rumors in the biodiesel community that biodiesel standards could change to match diesel standards, our goal was to reduce the amount of dissolved water in this biodiesel solution from 1,800 ppm (parts per million) to at least 500 ppm. Using a method called 2k factorial, we used different combinations of nitrogen and heat to achieve our goal.

**Poster 9**


**Hannah Chin**, Journalism (2019)

Community Partner: Brenda Baldwin-White, Senior Judicial Education Attorney, Federal Judicial Center; Dana Chipman, Education Director, Federal Judicial Center

Mentored by Susan Dimock, Director, Loyola University Chicago Washington, D.C. Program
Last fall, I spent four months studying and interning in our nation’s capital, Washington, D.C. My internship was with the Federal Judicial Center, the research and education agency of the judicial branch of the United States government. Using examples and reflection techniques, this project captures the personal, professional and civic developments I obtained through my experiential learning adventure. Through this experience, I recognized the importance of civic engagement within American politics; the individual and collective actions performed by citizens to address the needs of special populations improves the quality of life for all people.

**Poster 10**

*Nutrient Leaching in Relation to Landscaping Practices*

**Kaylene Hung**, Physics-Engineering (2018), Mulcahy Scholars Program; Mentored by Dr. Zhu, Analytical Lab Manager, Institute of Environmental Sustainability

The project will assess the environmental impact of the current landscaping practices by extracting samples from different locations on the Lakeshore Campus. Loyola's located in an urban setting where campus landscape require a great deal of attention every season. Maintenance dedicated to outdoor plantations leads to many influential factors being introduced into the system. This project's intended to evaluate these systems. Because LUC’s groundwater is directly dispensed into Lake Michigan, a main freshwater source in the Midwest, it is crucial that we acknowledge the purity of the water being dispensed into the Lake Michigan.

**Poster 11**

*Maternal Effects on Adult Obesity in Mice*

**Rachel Schneck**, Biology, Ceramics and Sculpture (2019), Mulcahy Scholars Program, Provost Fellowship; Mentored by Dr. James M. Cheverud, Biology

Obesity and other heritable metabolic diseases have recently reached epidemic levels in the United States. Even though predisposition to these diseases is inherited, they are also strongly affected by the environment. Some of the strongest environmental effects are created by mothers during pregnancy and early development. These effects are collectively known as maternal effects. This study will use mice as a model species to test the hypothesis that a mother on a high fat diet will cause her offspring to be more prone to obesity and related metabolic diseases regardless of the offspring’s diet later in life.

**Poster 12**

*Effectiveness of Vitamins Post-operatively for Laparoscopic Bariatric Surgery and Laboratory Correlations*

**Meili Burns**, Biology (2018) Mentored by Dr. D. Megan Helfgott, Biology

This project is focused on vitamin supplementation during post-operative care for bariatric surgeries. The two major laparoscopic surgeries performed here by the team of surgeons are Roux-en-Y Gastric Bypass and Sleeve Gastrectomy. I collected patient data on a particular set of bloodwork pre-operatively, and post-operatively, compliance of the patient, and action taken by the bariatric team in follow-up. The goal of this project was to determine if vitamins really are necessary post-operatively, if there are any correlations with preconditions and postoperative lab results, and if there are any specific lab results that will predict specific outcomes.

**Poster 13**

*Exploration of the Bacteriophage in the Female Urinary Microbiota*

**Taylor Miller-Ensminger**, Bioinformatics (2020), Interdisciplinary Research Fellowship, Mulcahy Scholars Program; Mentored by Dr. Catherine Putonti, Bioinformatics

We have recently begun to look at the phages in the bladder. From our collection of catheter-urine samples from about 1000 women, we sequenced 300 bacterial isolates in an effort to identify the viral species present. The sequences from these samples were run through our software, developed in Python, which integrates the tool VirSorter3 and novel functionality to automate downstream analyses. A key challenge of identifying phage genomes via computational methods is the dearth of characterized phages. Nevertheless, we identified phage which infect a myriad of species commonly found within the bladder’s microbiota.
**Poster 14**

*Elegantly Removing Noise in Cudahy Library*

**Michael Mendoza,** Engineering (2021); **Michael Mendoza,** Xavier Oberhelman, Brooke McDonald, María Catalina Pámanes Cantú

Mentored by Dr. Marianne Ryan, Dean of Libraries; Dr. Geoff Swindells, Associate Dean of Libraries; Elise Aversa, Director of Administrative Services; James Conley, Media Services Librarian; Cudahy Library staff; Dr. Gail Baura, Director of Engineering; Dr. Jason Streeter, Clinical Assistant Professor, Engineering; Dr. Chad Johnston, Assistant Professor, Engineering

We will be describing how we came about finding a beautiful way to solve a sound problem in a library.

**Poster 15**

*Examining Student Talk in Bilingual vs. Non-Bilingual Educational Programs*

**Mallika Iyer,** Biology (2018), Provost Fellowship;

Mentored by Dr. Perla Gamez, Assistant Professor, Psychology

This study will be examining the relationships between middle school aged language minority students and English only students. Specifically, it will be looking at the impact that bilingual and English only education has on sentence complexity and degree of talk between the two student groups.

**Poster 16**

*The Effects of Summertime Organized Activity Involvement on Delinquency*

**Courtney O'Keefe,** Psychology (2018), Provost Fellowship;

Mentored by Dr. Amy Bohnert, Psychology; Amy Governale, Graduate Student, Psychology

Unstructured time is consistently linked to higher levels of delinquent behaviors. During the summer, youths have more unstructured time, which could make it a riskier time for youths. Positive youth development research and organized activity (OA) involvement has established that adolescents who participate in OAs report fewer delinquent activities compared to those who do not participate (Thames & Vaismi-Tzachor, 2009). Research has focused mostly on the school year; thus, more summertime research is needed. This study hypothesizes that adolescents who participate in organized activities during the summer will have lower rates of delinquency compared to those who do not participate.

**Poster 17**

*Predicting Hotel Occupancy*

**Emma Houser,** Accounting (2019), Maxim Raykov, Grant Uline, and Jacquelin Farquhar

Mentored by Carolyn Kmet, Professor, Information Systems

This research is intended to accomplish the goal of predicting Chicago hotel occupancy by determining which factors drive Chicago travel and tourism. Factors will be derived from: permit requests, crime, S&P 500 monthly average, unemployment rate, holidays, and temperature. As global economies, politics, and people become more interdependent and connected, the necessity to understand factors that may influence individual behavior towards globalization becomes more prevalent. If a model to predict factors that influence hotel occupancy is developed, it could help the hotel and tourism industry, and it could be implemented in other cities.

**Poster 18**

*The Key to Kickstarter Success*

**Hannah Kern,** Accounting (2018), Dylan Zernich, Amelia Jerkatis

Mentored by Carolyn Kmet, Professor, Information Systems

The goal for this study is to identify characteristics of a successful Kickstarter campaign and, using data mining techniques, build a model that will be able to successfully predict the success of a Kickstarter campaign prior to its launch. This model could be used by backers to help their funding decisions, project owners to help draw more funding to their project, and Kickstarter to increase their profits so that they may bring in innovation to help more individuals create successful projects in the future.
Hunger for Success: Predictors for Tasting Victory in the Restaurant Industry
Mentored by Carolyn Kmet, Professor, Information Systems

Restaurants are a large contributor to the social and economic fabric of a city. The purpose of this study is to analyze Yelp restaurant review data along with socioeconomic data for zip codes across the country in order to determine the success factors for a restaurant. This case will be beneficial to all restaurants by creating a blueprint that indicates how restaurant attributes may affect their success within zips that have certain socioeconomic characteristics. Additionally, this case will allow for new restaurant entrepreneurs to better predict their potential of success based on the desired restaurant attributes and neighborhood locations.

Predicting a Boom
Scott Stepanovic, Finance, Information Systems (2019), Alex Mathies, Cormick Breslin, Richard Cooke
Mentored by Carolyn Kmet, Professor, Information Systems

What predicts a strong real estate boom? That’s a billion-dollar question. Many large and small investors try every day to predict how they can make money, and the capability of programs and data visualization is a great way to see if there are any correlations. Huge sums of wealth can be built by investing in real estate. Huge sums of money can also be lost with ease when investing in real estate. The difference between success and failure in the real estate game is timing. Timing is everything, and we are seeking to answer at least a portion of that billion-dollar question: What factors can be used to help predict a real estate boom?

My Hijab, My Choice: The Perceptions of the Hijab within an American Context
Mentored by Dr. Marilyn Krogh, Associate Professor, Sociology

At a time when Islamophobia is rampant, the hijab has been stripped of its religious, social, and personal significance. The goal of this research is to recognize how the perceptions of Muslim and non-Muslim women shape the role of hijab within American society. Through a total of eight qualitative interviews, it was clear there was an appreciation for hijab’s diversity in terms of a woman’s religious, personal, and ordinary connection with her hijab. In understanding the dynamism of the hijab, we can begin to reform our perceptions of both this religious symbol as well as the women who wear it.

Gene Expression in Orbital Inflammatory Syndrome
Shreya Wadhwa, Bioinformatics, Biology (2019), Mulcahy Scholars Program; Community Partner: Dr. Vinay Aakalu
Mentored by Dr. Catherine Putonti, Bioinformatics

Orbital inflammatory syndromes (OIS) are an understudied group of disorders that can lead to pain, vision loss, and may be harbingers of systemic diseases. A variety of conditions fall under the umbrella term, OIS, including non-specific orbital inflammation (NSOI), sarcoidosis, granulomatosis with polyangiitis (GPA), thyroid eye disease (TED), and infectious diseases. These diseases can affect any part of the orbit, but frequently affect the lacrimal gland and orbital fat. Using retrospective and prospective studies, our team is working to develop phenotypic-transcriptomic associations in these poorly studied orbital diseases in an Indian cohort using techniques such as Principal Component Analysis (PCA).

Immigration Stress, Familism, and Coping in Mexican-Origin Immigrant Families
Yesenia Zetino, Psychology (2018)
Mentored by Dr. Catherine DeCarlo Santiago, Psychology; Stephanie Torres, Psychology; Yvita Bustos, Psychology
Latino immigrants in the United States are often affected by stressors related to discrimination, legal status, and language barriers. Many Latino/a individuals in this community experience high levels of acculturative stress, which is associated with increased psychological distress among Mexican immigrant populations (Hovey & Magaña, 2000). Research has shown that immigrant stressors also impact children of Latino immigrants. However, positive coping strategies have been linked to better adjustment to the US in Latino immigrants (Torres, 2010). Primary control (e.g., problem solving) and secondary control (e.g., cognitive restructuring) coping have been associated with better mental health (Jaser et al., 2005).

**Poster 24**

**A Sociofunctional Approach to Transphobia**

*Alexandra Bakalich,* Psychology (2019), Provost Fellowship; Mentored by Dr. Robyn Mallett, Psychology; Linas Mitchell, Psychology

Although a great deal of transgender individuals have personally encountered harassment (U.S. Transgender Survey, 2015), transphobia has yet to be mapped psychologically using a theory-driven approach and empirical research. Our research is the first to employ this tactic in order to understand transphobia. Applying the sociofunctional threat model (Cottrell & Neuberg, 2005), we have examined the perceived threats and emotional responses that transgender groups elicit compared to non-transgender groups.

**Poster 25**

**Signaling Downstream of FLT3-ITD Sensitizes Cells to ATRA Treatment in Acute Myeloid Leukemia**

*Yuliya Pomeranets,* biology (2018), Provost Fellowship; Mentored by Fr. Peter Breslin, S.J., Oncology Institute; Dr. Jiwang Zhang, Oncology Institute

The objective of this study was to determine which of three FLT3 downstream signaling pathways make(s) AML cells more sensitive to All-Trans Retinoic Acid (ATRA). The project was conducted with MM6 and ML2 human leukemia samples that do not naturally have FLT3 mutations but were infected with the FLT3-ITD, FLT3-ITDY/F, FLT3-TKD, and FLT3-ITD-TKD viruses. Each mutated cell line was used in a cell growth culture experiment, GFP measurement experiment, and colony forming unit assay to determine response to ATRA treatment compared to DMSO. FLT3-ITD, FLT3-TKD, and FLT3-ITD-TKD showed sensitivity to ATRA treatment, while FLT3-ITDY/F did not.

**Poster 26**

**Modeling Parkinson's Disease in Drosophila: A Platform for Drug Testing**

*Christina Frasik,* Biology (2018), Biology Research Fellows Program; Mentored by Dr. Jennifer Jemc, Assistant Professor, Biology; Dr. Bruce Gaynes, Assistant Professor, Stritch School of Medicine

Parkinson's disease (PD) is the second most common neurodegenerative disorder present in the human population. The disease is believed to be pathologically linked to the overexpression and aggregation of the protein, alpha-synuclein, in the brain and other neural tissues. In this project transgenic flies expressing the human protein alpha-synuclein were used for a general analysis of climbing ability as a measure of the motor symptoms of PD and to test various polyphenolic compounds as potential treatments for PD.

**Poster 27**

**The Role of raw in the Development of Glia in the Nervous System**

*Luselena Perez,* Biology (2019), Provost Fellowship; Mentored by Dr. Jennifer Mierisch, Assistant Professor, Biology

Glial cells are an important cell type of the brain. The similarities in glial biology between Drosophila melanogaster, fruit flies, and mammals is remarkable. We wanted to observe the role of raw in glia during development, specifically in the nervous system. Using the Gal4/UAS system, it is possible to knockdown raw expression specifically in glia. We observed a reduced number of glial cells in the two innermost nerves A8/9. Possible reasoning for why a reduction in the number of glia was hypothesized to cell death, reduced proliferation, and/or interactions in JNK signaling so experiments were conducted to address these options.
**Poster 28**

*The Role of Raw in the Development of Glia*

**Taylor Wendt**, Psychology (2019), Biology Summer Research Fellowship, Mulcahy Scholars Program; Mentored by Dr. Jennifer Mierisch, Biology

The role of raw in the development of glia can be analyzed in many ways. We looked into the role of raw in the development of glia in the Drosophila eye disc. With knockdown of raw, significantly less glia migrate to the eye disc from the brain and optic lobe, and the photoreceptor axons extend farther than the lamina and medulla layer creating gaps in their orientation. Then we examined how the spread of glia in the developing eye disc is affected in this condition. The spread of glial cells decreases along with the glial cell count.

**Poster 29**

*Role of rib in Gonad Development and Function*

**Danielle Talbot**, Biology (2019), Mulcahy Scholars Program; Mentored by Dr. Jennifer Mierisch, Assistant Professor, Biology

During organogenesis, cell signaling plays a critical role in the regulation of cell migration, proliferation, and the establishment of cell-cell interactions. The gonad has proven an excellent model to study how signaling pathways that function early in organ development act to maintain organ homeostasis. Previous studies identified the gene ribbon (rib) as a critical regulator of gonad development. Current studies are ongoing to understand the effects of differing rib levels, and to identify the context in which rib functions. Understanding the role of rib in the gonad will allow us to understand how it functions to promote development and homeostasis.

**Poster 30**

*Investigating the Contribution of Anatomically Distinct Clock Neuron Populations to Circadian Rest:Activity Rhythms.*

**Katrina Spontak**, Cellular/Molecular Neuroscience & Psychology (2018), Mulcahy Scholars Program; **Nicholas Bulthuis**, Provost Fellowship Mentored by Dr. Daniel Cavanaugh, P.I., Biology

Most physiological processes exhibit daily oscillations under the control of an endogenous circadian clock, which allows animals to adapt to the 24-hr rhythms of light and temperature that result from the rotation of the Earth. The circadian system consists of a central clock, input pathways responsible for transmitting environmental signals to the clock, and output pathways that connect the clock to behavioral rhythms. The central clock in Drosophila is comprised of ~150 clock neurons that each contains a cell-autonomous molecular clock. These clock neurons are divided into distinct subpopulations based on anatomical and functional properties.

**Poster 31**

*Comparative Analysis of Healthcare Companies: Abbott Laboratories & Baxter International Inc.*

**Teresa Riesgo**, Management (2018), **Maris Yurdana**, Brody Diehn, **Peter McCague** Mentored by Anuradha Krishnaswamy, Professor, Institute of Environmental Sustainability

How we currently define the US healthcare industry directly points towards a path counter to sustainable. Chronic diseases are increasing worldwide, constant innovation driving up costs on all fronts, and trust among patients is relatively low; participation in the industry appears inherently unsustainable. Yet the root of the problem lies in the healthcare industry’s lack of action from a new direction. Abbott Laboratories and Baxter International Inc. recognize this need and opportunity. In this report, we will explore these companies to see what they are doing, where they fall short, and the direction in which they are headed.

**Poster 32**

*Predicting the Correlation between Chicago Air Temperature and CTA Ridership*

**Alexa Jackson**, Marketing (2018), **Joshua Krause**, **Matthew Braatz** Mentored by Carolyn Kmet, Professor, Information Systems

As Business students attending Loyola University, we have been using public transportation daily for almost four years. Being so familiar with public transportation in Chicago, we think it would be very interesting to investigate the relationship between temperature and CTA ridership. Temperatures in Chicago fluctuate greatly, sometimes even within a single day, and we believe
it effects ridership when commuters are deterred from walking or biking. We want to know if we can use weather data to pre-
dict CTA ridership. A key source of data for this project is the Chicago Data Portal.

**Poster 33**

*Impact of Nearby Vegetation on the Potential for Character Displacement in Root Traits*

*Teresa Dorado*, Environmental Science (2018)

Community Partner: Regina Baucom, Principal Investigator, Ecology and Evolutionary Biology at the University of Michigan;
Sara Colom, Graduate Student, Ecology and Evolutionary Biology at the University of Michigan

Nutrient availability and plant fitness have largely been studied; however, there is a gap in studies on belowground root traits and their inclination to evolve as a response to reduce competition for belowground resources by the process of character displacement. The potential for character displacement to influence the evolution of root traits is examined by studying how belowground competition impacts fitness and how selection favors differences in root traits of two closely related species, Ipomoea purpurea and I. hederacea. Because character displacement is fueled by competition, vegetation in the experiments’ surroundings can effect resource availability and should therefore be considered.

**Poster 34**

*Epigenetic Characterization of Satellite III Subfamilies in Cancer*

*Sahar Khalid*, Biology, Cellular/Molecular Neuroscience (2018), Biology Summer Research Fellowship, Mulcahy Scholars Program;
Mentored by Dr. Jeffrey Doering, Biology

Recent studies have shown that satellite expression is elevated in cancer cells. Specifically, Satellite III subfamilies show the highest increase in expression. It has yet to be determined if different Satellite III subfamilies exhibit different levels of expression. We are studying histone modifications on the various subfamilies in both normal and transformed cells using chromatin immunoprecipitation with antibodies specific to the various histone modifications. We hypothesize that Satellite III subfamilies in cancer cells will show histone modifications consistent with expressional activation, with varying degrees of activation by subfamily, which could lead to development of biomarkers for cancer detection and prognosis.

**Poster 35**

*Correlation of String/Body Resonances on a Cello*

*Samantha Young*, Theoretical Physics, Applied Math (2018), Mulcahy Scholars Program;
Mentored by Dr. Gordon Ramsey, Physics Department

This research project focuses on a full size acoustic cello, and investigates the correlation of the resonance properties between the strings and wooden body. The goals are to investigate the radiation patterns of the produced sound waves, to take high-speed video of a played string to physically observe the standing wave, and to simulate the body resonance of the cello. String data will be compared to body resonances. These same methods will be applied in an anechoic chamber to test ideal conditions. Results of this research will contribute to the current acoustics research of stringed instruments.

**Poster 36**

*Gene-based Association Study for Lipid Traits in Diverse Cohorts Implicates BACE1 and SIDT2 Regulation in Triglyceride Levels*

*Angela Andaleon*, Biology (2018), Carbon Undergraduate Research Fellowship Program;
Mentored by Dr. Heather Wheeler, Biology and Computer Science

While many European-centric studies have been conducted on lipid genetics, their transferability to diverse populations is unclear. We performed SNP- and gene-level association studies of lipid traits in Filipinos and compared them to the results of larger, predominantly European meta-analyses. rs662799 (P = 2.7e-16) associated with triglyceride and has been previously implicated in East Asian studies. Our gene-based analysis revealed decreased expression of BACE1 and SIDT2 in several tissues, driven by rs662799, significantly associate with increased triglyceride (FDR < 0.1). In addition, our analysis implicated gene regulation as the mechanism underlying the associations of many other previously discovered lipid loci.
• Poster 37

Who is Talking?

**Albert Du**, Computer Science (2019), **Noel Castillo**
Mentored by Dr. Mark Albert, Computer Science; Dr. Ting Xiao, Computer Science

The purpose of this project was to make an app which determines who speaks in a conversation. This app uses two machine learning algorithms called the hidden Markov Model and K- means clustering to moderate a conversation and inform the users on who is speaking and how long they spoke.

• Poster 38

The Impact of Microloans on Women In Chicago

**Kelsey Helstrom**, Entrepreneurship, Marketing (2018), Social Justice Fellowship;
Mentored by Dr. Stacy Neier Beran, Marketing

The purpose of this study is to examine the knowledge of micro enterprise capabilities and how available they are to women within the Chicago area through individual narratives. This will determine how women are receiving funding for their business as well as how the information about different forms of funding are being communicated within the area. Research on their financial empowerment tool of micro enterprise funding is necessary in order to further understand the opportunities that are given to individuals while also understanding why they chose this funding route.

• Poster 39

Mario Kart: A Study of Image Formation and Total Internal Refraction

**Lana Tinawi**, Biophysics (2020), **John Cirone, Joe Summers, Matt Conway, Vincent Acuesta**
Mentored by Dr. Robert Polak, Physics

In Mario Kart 8, characters race through underwater tracks, yet, objects above water appear to be exactly where they would be - as if light refraction didn't occur. We present a lesson where we ask students to predict what a racer would see based on the physics they have learned. We demonstrate the principles of refraction and total internal reflection with a submerged GoPro camera and ray tracing. Thus, we show how underwater images can be used to determine the critical angle of water and its index of refraction, thus developing a fuller appreciation for underwater banana peels.

• Poster 40

International Happiness: Do Broad National Government Types Affect Citizen Happiness?

**Brad Horton**, International Business Administration (2019), **Jessica Mendez**
Mentored by Dr. Ann Reilly, Professor, Quinlan School of Business

This study explores the question “What broad national government type has the happiest citizens?” Data used was all second hand and collected using various reputable online sources. The main variable measured was the World Happiness Report (WHR)’s Cantril Ladder Measure, a subjective but dependable measure. Secondary measures include the Human Development Index measure, which is more of an objective measure taken by third parties, GDP per capita, and the individual factors that go into the World Happiness Report which include perceptions of social support, healthy life expectancy, freedom to make life choices, generosity, perceptions of corruption, and dystopia.

• Poster 41

Sequencing the Heterochromatic Regions of Human Chromosome 21p

**Julia Organ**, Biology (2018), Mulcahy Scholars Program;
Mentored by Dr. Jeffrey Doering, Biology

The Human Genome Project did not study the heterochromatic regions of the genome, which consists of more than 10% of the genome. Our lab is creating a sequence map for the short arm of human chromosome 21 (HC21p) as a model for understanding the structure of heterochromatic regions. My project involves filling in gaps in our map by extending sequences off of characterized regions, particularly SSW9, until there is overlap with another known region. The SSW9 region was initially composed of 1,385 nucleotides. Overlap with known HC21p sequence indicates that a gap in the sequence map is closed.
**Poster 42**

*Synthesis of Aryl Chlorides via Decarbonylation of Aroyl Chlorides*

**Priya Dhindsa**, Neuroscience (2018), Provost Fellowship;
Mentored by Dr. Hee Yeon Cho, PI, Chemistry and Biochemistry; Wiktoria Koza, Graduate Student, Chemistry and Biochemistry

Finding ways to synthesis aryl chlorides using various aroyl chlorides at optimal conditions. This process is done through decarbonylation using a transition metal catalyst.

**Poster 43**

*Palladium Catalyzed Amide Bond Formation from Esters and Amines*

**Samantha Benigni**, Biology, Spanish (2018), Provost Fellowship;
Mentored by Dr. Hee Yeon Cho, PI, Chemistry and Biochemistry; Jordan Delev, Graduate Student, Chemistry and Biochemistry

The goal of my project is to find ways to successfully synthesize amides while using various esters and amines at optimal conditions. This process is done through amidation using a transition metal catalyst.

**Poster 44**

*Effects of a PEG- and BSA-Based Photodynamic Therapy Agent in Zebrafish Embryo Development*

**Barbara Szynal**, Biochemistry (2019), Interdisciplinary Research Fellowship, Mulcahy Scholars Program;
Mentored by Dr. Ken Olsen, Professor, Chemistry and Biochemistry; Dr. Rodney M. Dale, Assistant Professor, Biology

Recently there has been great interest in the development of cancer drugs with fewer side-effects than traditional therapies. Most current cancer treatments lack selectivity, which causes unwanted side-effects, and offer no guarantee that the target tumor will be eliminated. Photodynamic therapy (PDT) offers a tool with double selectivity in tumor treatment, and this decreases cell death of healthy tissue. In this project, PDT compounds are synthesized based on polyethylene glycol (PEG) and bovine serum albumin (BSA). Both molecules act as a backbone that aids in solubilizing the hydrophobic photoactive dyes which serve either to create reactive oxygen species or fluoresce.

**Poster 45**

*Morphology of E. lucius and E. masquinongy*

**Giovanni Paolella**, Biology (2018)
Community Partner: Maggie Yarnold
Mentored by Dr. Theresa Grande, Biology; Cheryl Theile, Biology

The Northern Pike (Esox lucius) and Muskellunge (Esox masquinongy) are cold-water freshwater fish with a sympatric relationship and overlapping distribution in the Great Lakes region of North America. While there is a homologous relationship in cranial osteology, timing of development in these structures differ. The developmental timing of these bones explains their diet shift from zooplankton and smaller invertebrates to fish as ambush predators. Through the use geometric morphometric analysis, we examined the difference in development of landmarks in the neurocranial and mandibular bone structures between E. lucius and E. masquinongy to better understand changes in morphology.

**Poster 46**

*Revising the Illinois Aquatic Nuisance Species State Management Plan: Protecting Against the Future.*

**Deirdre Turner**, Sociology, Anthropology and Environmental Policy (2018)
Community Partner: Kevin Irons, Aquaculture and Aquatic Nuisance Species Program Manager, Illinois Department of Natural Resources
Mentored by Dr. Reuben Keller, Associate Professor, Institute of Environmental Sustainability; Erin O’Shaughnessey, Graduate Student, Biology

The Illinois Aquatic Nuisance Species State Management Plan was written in 1999. Revising the Plan is imperative to protect
the state from new and evolving aquatic invasive species (AIS) risks. Climate change is altering the routes through which species can be introduced, and the identity of species that can become established. As temperatures rise, viable habitats for many AIS will expand in temperate regions, allowing for more invasive species to infiltrate and flourish in Illinois waterways. We are working with the Illinois Department of Natural Resources and the US Fish and Wildlife Service to fully revise and update the Management Plan.

**Poster 47**

*Rewarding Effects of Cholinergic Inputs to the Rostromedial Tegmental Nucleus in Mice*

Rawan Harb, Neuroscience (2018), Mulcahy Scholars Program, Provost Fellowship; Mentored by Dr. Stephen Steidl, Biology

The rostromedial tegmental nucleus is a distinct part from the ventral tegmental area, which receives inputs from the pedunoculopontine tegmental nucleus and the laterodorsal tegmental nucleus. The RMTg projects inhibitory neurons to the VTA, so upon its activation it inhibits the dopamine neurons in the VTA, and controls dopamine levels in the forebrain. Increased levels of locomotion have been proven to correlate with dopamine levels; however, they cannot be equated to reward. We will use pharmacological blockades on cholinergic receptors of the RMTg along with conditioned place preference to determine if the increase in locomotion is a rewarding effect.

**Poster 48**

*Instagram Pics and Objectified Chicks: Exploring Cross-Cultural Representations of Female Bodies on Branded Social Media*

Anna Pristach, Marketing (2018), Carroll and Adelaide Johnson Scholarship; Mentored by Dr. Jenna Drenten, Marketing

Media have been shown to negatively influence body image ideals. While previous studies explore representations of women’s bodies in traditional mass media (e.g., magazines, television), they do not account for the increasing interest of social media among today’s adolescent and young adult women. Therefore, this research project explores how female bodies are represented across social media advertising targeted toward today’s young women. Specifically, this project follows a netnographic examination of Instagram nine fast fashion brands across seven countries to analyze body image, dismemberment, and female objectification in social media marketing.

**Poster 49**

*Isolation and Characterization of Cupriavidus pauculus Dioxygenase Enzyme*

Dillon Kurila, Biochemistry (2019), Mulcahy Scholars Program; Mentored by Dr. Domenic Castignetti, Professor, Biology

The dioxygenase enzyme of Cupriavidus pauculus represents the possibility to explore molecular evolution within bacterial species. The enzyme’s homology to class II aldolases suggests that it originates from a gene duplication event earlier on in the bacterium’s history. As a heterotrophic nitrifier the bacterium could also be of use in bioremediation, breaking down harsh pollutants and turning them into food for the organism. Further studies must be done in order to determine the best course of action in such application.

**Poster 50**

*Predicting the Genetic Regulation of Schizophrenia in African American Populations*

Peter Fiorica, Biochemistry & Biology (2020), Mulcahy Scholars Program; Mentored by Dr. Lauren Mogil, Post-Doctoral Fellow, Biology; Dr. Heather Wheeler, Principle Investigator, Biology & Computer Science

Schizophrenia is a heritable disease which’s expression has been identified to be regulated by a series of loci across the genome; however, most of the studies that have identified loci in heritable diseases have not recorded much of this information from populations of non-European descent. To better understand the genetic architecture of gene expression for schizophrenia
in non-European populations, PrediXcan, a gene-based association method, was applied to an African American cohort of 1,932 individuals. In doing so, five genes were determined to be associated with the phenotype.

**Poster 51**

*Pollination Ecology at Loyola University Retreat and Ecology Campus and at other Monarch Waystations, McHenry County, IL, 2017*

_Luke Landry,_ Chemistry (2019), LUREC Biodiversity Research Internship; _Kevin White_

Mentored by Stephen Mitten, S.J., Biology

A preliminary survey was conducted to identify floral visitors and their host flowers at Loyola University Retreat and Ecology Campus in McHenry County, Illinois. Pollen samples were gathered from 65 species of flowers and from 49 pollinators and biological slides were created. Monarch butterfly information was gathered from five different monarch butterfly waystations. 83 monarch eggs and 25 caterpillars were documented. Fifteen other species of butterflies and moths were also observed at these waystations. Pollination ecology is at its infancy and has great potential for assisting both specialist in ecosystem restorations and ecologist in determine the effects of climate change on pollination efficacy.

**Poster 52**

*Oxygen Structured Adsorbed onto Rh(111) Surfaces*

_Noelle Wands_, Biology (2018), Mulcahy Scholars Program; Mentored by Dr. Daniel Killelea, Associate Professor, Chemistry and Biochemistry; Rachael Farber, Graduate Student, Chemistry and Biochemistry; Marie Turano, Graduate Student, Chemistry and Biochemistry

The primary intention of the experiments is to understand how water surface structures are affected by the presence of oxygen on catalytic metal surfaces on the atomic level. Specifically, the chemical nature of rhodium (Rh) is being examined in order to understand the metal’s interactions with oxygen at the atomic scale. We have determined a reproducible method of oxidizing Rh(111) under UHV conditions for further water studies.

**Poster 53**

}*Talal Al-Assil*, Biology (2019), Mulcahy Scholars Program; Mentored by Dr. Wei-Tsung Lee, Assistant Professor, Chemistry and Biochemistry

As cancer continues to be a dangerous and incurable disease that attacks over half of the population, it is becoming increasingly vital to find ways to improve the quality of life for patients that are affected by this disease. While most drugs that are in clinical trials or have been FDA-approved might be effective at attacking cancerous cells, they also damage noncancerous, healthy cells. This inorganic chemistry project intends to synthesize ruthenium-based complexes that will have an improved biological reactivity and fewer side effects when compared to other chemotherapeutic agents.

**Poster 54**

*Patterns of Using a Mobile Application Delivering Mindfulness Exercises: Implications for College Student Mental Health Treatment*

_Noor Abdelfattah_, Psychology, Political Science (2019), Provost Fellowship; Mentored by Brynn Huguenel, M.A., Psychology; Dr. Colleen Conley, Psychology

Depression among college students continues to increase. With fewer students utilizing formal mental health resources (e.g., on-campus health centers), the role of mobile applications has become increasingly critical. This study examined the effects of a mindfulness-based mobile-phone app, Headspace, on reducing depression in college students. This poster specifically examines usage patterns, such as time of day, specific content users engaged in, and to what extent usage corresponds to initial goals. Past research examining the utilization of technological intervention is limited. This study provides unique insight into how college students engage in these resources.

**Poster 55**

*Seeing Intergroup Relations as a Win-Win or Zero-Sum Game Shapes Majority Support for Minority Collective Action*
Kathleen Keaney, Psychology (2018), Provost Fellowship; Community Partner: Dr. Anna Stefaniak, Psychology
Mentored by Dr. Robyn Mallett, Associate Professor, Psychology

Despite strong efforts to change the status quo, minority collective action is often unsuccessful without majority group allies. Such support from advantaged groups is often uncommon because privileged groups perceive intergroup relations as a zero-sum game whereby any status gains achieved by disadvantaged groups occur at the expense of the advantaged majority. The present research introduces an opposite orientation, called win-win, and tests whether a zero-sum mindset decreases and a win-win mindset increases intergroup empathy which then increases White Americans’ support for collective action. Participants answered a series of scales, measuring their endorsement of the zero-sum and win-win orientations.

**Poster 56**

The Assessment of Individual Neural Differences on Food Cue Reactivity and Inhibition Control Using Resting State EEG
Knista Smith, Psychology (2019), Mulcahy Scholars Program; Mentored by Dr. Robert Morrison, Psychology Department; Amy Heard, Graduate Student, Clinical Psychology Doctoral Program; Laura Nicholson, Graduate Student, Clinical Psychology Doctoral Program

The goal of this study was to use resting state EEG to assess whether individual neural differences are associated with response to food commercials, self-control, and behavioral action. Alpha and beta band activity was assessed before and after participants viewed both food and non-food commercials. We expected that individual behavioral and neural differences would be associated with active resistance and self-control failure. This research will inform obesity prevention efforts by identifying possible characteristics that may impact susceptibility to unhealthy food commercials.

**Poster 57**

Extrapolate the Function of DUF161 to Identify Novel Drug Targets
Harjot Uppal, Biochemistry (2019), Mulcahy Scholars Program; Mentored by Dr. Liu, Associate Professor, Chemistry; Zheng Yuanzhang, Graduate Student, Chemistry

The creation of pharmaceuticals is of great significance in human society. Drugs are used every day in the forms such as antibiotics, pain killers, and cancer medicines et al. Pharmaceuticals function via interactions with biological systems. Specifically, most drugs, over 40%, work by interacting with membrane proteins. Functions of membrane proteins are particularly difficult to study due to their lack of stability, and partially hydrophobic surfaces. To circumvent the difficulties, the goal of this project is to exploit the function of a currently unknown membrane protein (DUF161) via studying its' transcription regulator (DUF161R or DUFR in short).

**Poster 58**

Epigenetic and Developmental Effects of Parental Preconception Alcohol Exposure in Rats
Brandon O’Gorman, Biology (2018), Research Mentoring Program; Mentored by Andie Asimes, Graduate Student, School of Medicine

Many people are aware of the effects that alcohol has on our bodies at a macroscopic level. Less is known about the way alcohol affects our bodies at the molecular and cellular level. This project focuses on the latter, investigating the way that alcohol can alter how genes - the functional unit of DNA - are turned on or off, and how parental preconception alcohol exposure may lead to impaired development in a mammalian cell. Using rats as a model organism, hereditary changes in gene expression were analyzed via qPCR, while microscopic analysis of rat testes provided insight into developmental changes.

**Poster 59**

Single Molecule investigation of Peptide/LUV Interactions
Natalia Obrzut, Physics and Biochemistry (2018), Mulcahy Scholars Program; Mentored by Dr. Brian Cannon, Assistant Professor, Physics

Alzheimer’s disease is a neurodegenerative disease characterized by the formation and accumulation of toxic plaques within brain and is linked to the aggregation of amyloid-beta(Aβ) peptides on cell membranes. This project investigates the interaction of Aβ peptides with model membranes to understand how it destabilizes the integrity of the membrane and ruptures it as part of its role in disease progression. Single-molecule fluorescence assays were used to observe the interaction of Aβ peptides with
these membranes and quantify the connection between aggregation and rupture. We used the assays to explore the effect of membrane characteristics on aggregation and pore formation.

**Poster 60**
The Role of Tryptophan-106 in Allosteric Activation of ADP-Glucose Pyrophosphorylase in Agrobacterium tumefaciens

Emily Dobrzynski, Biochemistry (2018), Mulcahy Scholars Program;
Mentored by Dr. Miguel Ballicora, Chemistry and Biochemistry; Hirai Ben Patel, Chemistry and Biochemistry

The overarching purpose of our research is to better understand the protein ADP-Glucose Pyrophosphorylase (ADP-Glc PPase), an enzyme that catalyzes the first reaction in a vital energy storage pathway in plants and bacteria. While we currently seek to learn more about binding site structure and conformational activity, better understanding of the enzyme has potential implications in improving the nutritional value of plants, as well as improving the production of alternative fuels. This project investigates the competing effect fructose-6-phosphate and pyruvate have on the enzyme’s activity in Agrobacterium tumefaciens, and seeks to better characterize this relationship.

**Poster 61**
Development of a Quantitative Method of Analysis for 1,3-dimethylamylamine via Derivatization with Alkanoic Anhydrides

Emily Brisson, Forensic Science and Biology (2018), Justine K. Kwak
Mentored by Dr. James V. DeFrancesco, Chemistry and Biochemistry

The subject compound, 1,3-dimethylamylamine (DMAA), is a "natural" stimulant found in nutritional supplements, weight loss, and athletic performance-enhancing products. This amphetamine-like compound is linked to cardiovascular problems such as shortness of breath, arrhythmias, chest tightness, heart attacks, and multiple deaths. DMAA was banned in 2010 by the International Association of Athletics and the International Olympic Committee which both abide by the policies set forth by the World Anti-Doping Agency. Our laboratory recently developed a quantitative method to determine the presence and amount of DMAA in commercial products, using Gas Chromatography (GC) with Flame Ionization Detection (FID).

**Poster 62**
The Association between Coping Socialization and Coping Strategies in African American Adolescents and the Moderating Effects of Racial Identity

Danah Atassi, Psychology (2018)
Mentored by Dr. Noni Gaylord-Harden, Psychology

A subset of a broader domain of the ways children and adolescents adapt to stress is coping, which is defined as how youth actively respond to and manage stress. Coping socialization occurs when parents communicate to youth about potential coping strategies via coaching or explicit instructing. However, cultural asset frameworks for African American youth call for consideration of both mainstream assets and culturally-relevant assets when examining children’s adaptation to stress. The present study examined the association between coping socialization and coping strategies in African American youth, and additionally sought to determine how youth racial identity interacts moderates this association.

**Poster 63**
In-silico Modeling of Novel DapE Inhibitors

Estefany Rios Guzman, Biochemistry (2018), Mulcahy Scholars Program, Provost Fellowship;
Mentored by Dr. Ken Olsen, Chemistry and Biochemistry; Dr. Daniel Becker, Chemistry and Biochemistry; Tahirah Heath, Chemistry and Biochemistry; Dr. Cory Reidl, Chemistry and Biochemistry; Matt Kochert, Chemistry and Biochemistry

Alarming rates of antibiotic resistance has increased the demand to identify new enzymatic targets and their respective inhibition. Consequently, enzymes essential for bacterial survival, much like dapE-encoded N-succinyl-L,L-diaminopimelic acid desuccinylase (DapE) and its role in peptidoglycan cell-wall synthesis, are primary targets for biochemical and computational analysis. In-silico modeling and docking identified tetrazole analogues were executed using Molecular Operating Environment (MOE). Using novel inhibitors which had previously been tested through newly developed ninhydrin-based assays in the Becker lab, these series of molecular modeling serves as a pipeline to create potential therapeutics with higher potency against bacterial infections.
**Poster 64**

*Education and Outcomes in Women with Diabetes: An Investigation of Racial Disparities*

*Katelyn Sullivan*, Nursing (2019), Provost Fellowship;

Mentored by Dr. Sue Penkofer, PhD, RN, FAAN, Associate Dean Graduate of the School of Nursing; Ms. Colleen Kordish, MSN, RN, CNE

Time spent with healthcare providers today averages 20 minutes, which may cause patients with complex health problems, such as diabetes, to discuss only their chief complaint, neglecting disease self-management. This study addresses whether a set of racially diverse patients have been receiving diabetes education from healthcare providers. This study uses measures such as HgbA1c, depression, self-efficacy, diabetes distress, and perceived social support. There were significant differences in levels of depression, self-efficacy, and perceived social support between races with no differences in amount of education, HgbA1c, self-care, or diabetes distress. Disease specific education remains an important focus for patients with T2DM.

**Poster 65**

*Role of Meopontine Cholinergic Inputs to the Dopamine System in Opioid-Induced Locomotion and Reward*

*Loren Riedy*, Behavioral and Cognitive Neuroscience, Psychology (2018), Carroll and Adelaide Johnson Scholarship;

Mentored by Dr. Stephan Steidl, Psychology

Opioids induce rewarding effects by exciting brain dopamine pathways, which have their cell bodies in the ventral tegmental area (VTA). Cholinergic input to the VTA critically contributes to the ability of opioids to excite dopamine signaling. The pedunculopontine tegmental (PPTg) and the laterodorsal tegmental (LDTg) nuclei provide the only sources of cholinergic input to the VTA. We used Cre transgenic mice to inhibited PPTg or LDTg cholinergic cells via chemogenetics and optogenetics to define the source of cholinergic input to the VTA that critically contributes to morphine-induced locomotion and reward, which are behavioral correlates of brain dopamine activation.

**Poster 66**

*Longitudinal Patterns Reveal Sources of Microplastic in the Chicago River*

*Daniella Drapatsky*, Biology (2018), Sameer Khan, Asad Hasan

Mentored by Dr. Timothy Hoellein, Biology

Microplastic particles (< 5mm) can enter aquatic ecosystems through wastewater, environmental weathering of larger plastics, and atmospheric deposition. Rivers are a source of microplastic to oceans, but measurements of microplastic transport within rivers are uncommon. We examined microplastic and conductivity of surface waters at nine sites along the North Shore Channel, an urban canal in Chicago, IL. Because of its simple structure and minimal hydrologic connections, the canal is an ideal place to examine microplastic movement. Potential microplastic input sites included the O'Brien wastewater treatment plant and the North Branch of the Chicago River.

**Poster 67**

*The Effect of Land Use on Microplastic Abundance in Riverine Sediment*

*Deeb Omari*, Biology (2019), Hamza Asim, Homira Wardak

Mentored by Dr. Timothy Hoellein, Biology; Dr. Rae McNeish, Biology

Microplastics (<5mm in size) is a major concern worldwide. These plastics can enter freshwater habitats and become incorporated into aquatic food webs. We researched the effect of land use on microplastic concentrations in river sediment in 8 river tributaries of Lake Michigan. Studying rivers that span a land-use gradient (i.e., urban, agricultural, and forest) can help determine the relative importance of microplastic sources and interactions with sediment biota in river benthic zones. We predict rivers from more populated areas will have greater microplastic concentrations in sediment, and that microplastic concentration will be greater in sediment than surface water habitats.
**Poster 68**

*An Analysis of the 2018 Super Bowl Commercials*

**Kira Hutson**, Advertising Creative, Women’s Studies Gender Studies (2020)

Mentored by Dr. Pamela Morris, Director Advertising/Public Relations, School of Communications; Dr. Meghan Dougherty, Assistant Professor Digital Communication, School of Communications; Dr. Betsy Jones Hemenway, Program Director, Women’s and Gender Studies

Using mixed methods of both quantitative and qualitative analysis, this study examines representations of people and characters in the 2018 Super Bowl commercials. Characters in the advertisements were coded by race, gender, and other characteristics through content analysis to see if portrayals differed based on social identities. In addition, observation and autoethnography were employed to give a unique perspective on the individual’s response to such advertisements.

**Poster 69**

*Microplastic Abundance in Riverine Fish Along a Land-use Gradient*

**Melissa Achettu**, Psychology (2018), Mulcahy Scholars Program; **Janet Ross, Taha Siddiqui**

Mentored by Dr. Rachel McNeish, Biology; Dr. Tim Hoellein, Biology; Dr. John Kelly, Biology

Microplastic, < 5 mm in length and non-biodegradable, have been incorporated into aquatic food webs. We assessed microplastic abundance in fish from 8 major tributaries of Lake Michigan that spanned a forest urban-agriculture land-use gradient. Preliminary results suggested microplastic abundance in fish were not linked to land-use, but may have been linked with fish functional feeding groups. Investigating connections between land-use, fish traits, and microplastic abundance in fish may provide novel information on environmental conditions and ecological traits that make fish susceptible to consuming microplastic. This information may guide future fish management and conservation efforts.

**Poster 70**

*The Therapeutic Role of the Gut Microbiome in Leukemia by Converting Eicosapentaenoic Acid to the Active Delta-12 Prostaglandin*

**Aisha Jarad**, Biology (2019), Biology Summer Research Fellowship, Mulcahy Scholars Program;

Mentored by Dr. Michael Burns, Assistant Professor, Biology

Previous studies have established the ability of the eicosapentaenoic acid (EPA), a derived endogenous cyclopentenone prostaglandin (CyPG) metabolite of Delta-12 Prostaglandin (D12-PGJ3), to selectively target leukemia stem cells. This is of paramount importance in order to successfully prevent cancer relapse. With the microbiome playing an integral role in cancer, the proposed research will determine the extent to which the gut microbiome contributes to this anti-cancer effect. In the event that the hypothesis is correct, modulation of the gut microbiome in leukemia patients, alongside supplementation with dietary supplementation with EPA has the promise to become a new therapeutic approach.

**Poster 71**

*Does Variation Created by Hybridization Lead to Clonal Dominance in Invasive Cattails?*

**Danielle Abboud**, Environmental Science (2018), Mulcahy Scholars Program;

Mentored by Brendan Carson, MS, Institute of Environmental Sustainability

Hybrid cattails, Typha x glauca, in the Great Lakes coastal wetlands have become aggressively dominant, outcompeting native species and degrading vital habitat. This hybrid is the result of a cross between the native T. latifolia cattail and the non-native T. angustifolia. In order to create effective management tactics in response to the degradation caused by this species, we must first understand the nature of its invasive abundance. The goal of this study is to discover if the dominance of Typha x glauca in the Great Lakes region is due to a combination of both hybrid vigor and the variation produced through hybridization.

**Poster 72**

*Effect of Concurrent Color Similarity on the Stroop Interference Effect in Synesthesia*

Grapheme-color synesthetes experience colors (called "concurrents") when reading normal text. We conducted a modified Stroop task to assess the effect of concurrent color similarity on the Stroop interference effect. On each trial, a letter was presented in one of three color conditions: 1) the color identical to the synesthete's concurrent for that letter; 2) a color similar to the concurrent; 3) a color different from the concurrent. Results: Synesthetes experience much more interference when the color of the letter is different from the concurrent, and mixed results when the color of the letter is similar to the concurrent.

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**Poster 73**

*Circadian Control of Feeding Behavior in Drosophila*

Daniel Jabr, Neuroscience (2019), Mulcahy Scholars Program, Provost Fellowship; Mentored by Dr. Daniel Cavanaugh, Biology; Dr. Austin Dreyer, Biology

The circadian system is an endogenous timing mechanism that generates behavioral and physiological rhythms, the most extensively studied of which is locomotion. However, very little research has been done on another important output of the circadian system: feeding. Recent studies have demonstrated that there is circadian control of feeding independent of locomotion, but the neuronal circuitry that governs feeding as an output is not understood. By using genetic and behavioral techniques, we investigate the role of two distinct groups of neurons in the Drosophila brain that may constitute an output pathway, exploring how the circadian system modulates feeding behavior.

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**Poster 74**

*Spatial Temporal Analysis of Relational Integration During Analogical Reasoning*

Veronica Szpak, Psychology (2018) Mentored by Dr. Robert G. Morrison, Psychology

Analogical reasoning is critical for learning and creativity in everyday life, and has been shown to depend on the prefrontal cortex. Several Functional Magnetic Resonance Imaging (fMRI) studies have shown that one essential process for analogy, relational integration, depends on the rostrolateral prefrontal cortex (RLPFC). In this study we use scalp electroencephalography (EEG) to study the time course of processing during analogy. Specifically we found that relational integration depends on activity late during processing and a source analysis of our data suggests that this activity likely originates from the RLPFC.

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**Poster 75**

*Morphological Variation in Madagascar Birds*

Renee Perkowski, Biology (2018), Mulcahy Scholars Program; Madeline Beasley, Drashti Upadhyay, Meghana Venkatesan
Mentored by Dr. Sushma Reddy, Assistant Professor, Biology

Madagascar is an opportune area for studying avifauna evolution as its isolation allowed the diversification of endemic species with diverse morphologies. This project examines how the phenotypes of birds of Madagascar have evolved over time. It focuses on variations in bill morphology, including bill shape and size. We compared the phenotypic differences between Malagasy birds and their closest relatives in Africa and Asia to examine whether adaptations to ecological conditions in Madagascar resulted in unique bill forms. The examination of these morphologies ultimately contributes to a broader understanding of evolutionary changes over time.

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**Poster 76**

*Development of the Weberian apparatus in Danio rerio*

Barbara Folga, Chemistry, Biology (2018), Mulcahy Scholars Program; Mentored by Dr. Terry Grande, Professor, Biology; Dr. Rodney Dale, Assistant Professor, Biology; Paula Martin, Pickett Lab, Biology

The Weberian apparatus, diagnostic of the fish group Ostariophysi (carps, minnows, catfishes), is an assemblage enhancing sound transmission comprised of modified anterior vertebral elements that couple the swimbladder to the inner ear. This project investigates the development of the Weberian apparatus in the zebrafish, Danio rerio. We hypothesize that the Weberian appa-
ratus in this organism is an evolutionary functional module, containing co-varying components quasi-independent from other regions of the vertebral column. For this study, over 1000 zebrafish were raised, and the first appearance of individual Weberian ossicles was recorded and analyzed. Results strongly support modularity of the Weberian apparatus.

**Poster 77**

*Functional Investigation of Two Novel Plasmodium Genes Using the CRISPR Cas9*

**Chase Gauthier**, Molecular Biology, Cellular Neuroscience (2019), Biology Research Fellows Program; Mentored by Dr. Stefan Kanzok, Biology

To survive the passage through the mosquito, the malaria parasite develops into a motile form called an ookinete. This shape is generated and maintained by cytoskeletal elements, primarily microtubules, that are complexed with a multitude of accessory proteins. Few microtubule associated proteins (MAPs) have been identified in the malaria parasite. We have identified two genes that are hypothesized to regulate microtubule stability in the malaria parasite, thioredoxin-like protein-1 (TrxL-1) and SAXO-1. Adapting the CRISPR Cas9 system in the rodent model organism Plasmodium berghei, we have successfully disrupted each gene and present here the analysis of the resulting phenotypes.

**Poster 78**

*Plant Species Diversity in Lowland Amazonian Forest Floor*

**Colette Copic**, Environmental Science, International Studies (2019), Olivia Niosi
Mentored by Stephen Miten, SJ, Biology

We performed a rapid biodiversity assessment of plants on the forest floor in eastern Madre de Dios, Peru. By randomly selecting at three locations meter square plots of land along a transect every 30 meters, we determined the number of individuals and unique species with varying sunlight availability using five replicates at each location. We found that only a few species of small ferns and seedlings dominated all sampled plots, with little variation. We observed a total of 14 different species with each plot containing an average of seven unique species in each plot.

**Poster 79**

*Mammal Mania*

**Laura Swanson**, Environmental Science (2018), Katherine Spear
Community Partner: Inkaterra Field Guide Station
Mentored by Stephen Miten, SJ, Biology

Mammal species were surveyed in the Madre de Dios region of Peru, particularly around the area of the Inkaterra Field Guide Station from March 3rd to March 9th 2018. Diurnal and nocturnal surveys were conducted and included direct observations and use of camera traps. Sighting times and mammal species data was then compiled on a spreadsheet for comparison. Comparisons were examined to determine if external and characteristic factors impacted sightings. Relationship to number of sightings and other factors were determined.

**Poster 80**

*Birds of a Feather*

Community Partner: Inkaterra Association
Mentored by Stephen Miten, SJ, Biology

The goal of our research was to measure the bird species diversity across varying biogeographical locations around the Amazon in the Madre de Dios Region of Peru. Observations were submitted to eBird, a Cornell Lab citizen science database. We identified 130 bird species by using physical characteristics and unique bird calls. Six of the birds recorded in our study were captured and banded over the course of two days. We hypothesize that bird species will vary by vegetation type. According to vegetation type, bird species would be found in one area but not another.

**Poster 81**

*Investigating the Cellular Killing Mechanism of a Novel PDT Agent*

**Julia Stys**, Biology, Polish Studies (2019), Provost Fellowship
Photodynamic therapy (PDT) has shown to be an auspicious procedure, essentially helping in treating several types of cancer. PDT can be targeted explicitly at cancer cells, causing them to go into cell death through either necrosis or apoptosis. This type of treatment is composed of two parts, a nontoxic agent, and a light. A singlet oxygen is generated when the photosensitizer is exposed to a certain wavelength of light. The result of this is the production of a cytotoxic reactive oxygen species (ROS). The cancerous cells are then killed by the ROS through its activation of specific cell death.

**Poster 82**

*Designing Health & Wellness: Building Research Capacity & Brand Assets at Misericordia Home*


Mentored by Andrew Miller, Center for Experiential Learning

Misericordia is a nonprofit organization that is home to over 600 adults with developmental and physical disabilities. Through the Social Justice Internship Program at Loyola, several students began interning part time for the entirety of the academic year in various departments throughout Misericordia. For one intern in the Developmental Training Department, his time was spent using an understanding of qualitative research and a set of branding and marketing skills to help the Health & Wellness program reach and report a series of objectives as required by a funder.

**Poster 83**

*Perennial Legume Breeding For Use in Agriculture*

**Erin Kilbane**, Environmental Science (2018), **Ray Dybzinski, Andy Landsem**

Mentored by Dr. Ray Dybzinski, Assistant Professor, Institute of Environmental Sustainability

Current conventional agricultural practices have big impacts on agroecosystems. Intensive farming of annual crops causes disturbances to ecosystems, especially the soil. To combat this, researchers are developing perennial crops, which dramatically reduces the amount of disturbance to the agroecosystem. Perennial polycultures can then be created, modeled after natural plant communities, using ecological intensification. We are growing different species of annual and perennial wild legumes that were historically used as sources of food to analyze reproductive yields and growth rates, to determine suitable replacements for conventional crops. Research conducted in conjunction with The Land Institute (Salina, Kansas) and Saint Louis University.

**Poster 84**

*Seasonal and Land-Use Effects on Riverine Microplastic Concentration*

**Rachel Meyer**, Biology (2018), **Stuti Desai**

Mentored by Dr. Rachel McNeish, Biology; Dr. Timothy Hoellein, Biology

Microplastic (particles < 5mm in size) pollution is a major worldwide concern. It can enter aquatic habitats from point sources of pollution, including wastewater treatment plants. Our goal is to determine if microplastic abundance in rivers is influenced by change in land-use and seasonal patterns. We predict that microplastic abundance will be higher in spring and summer seasons due to increased outdoor human activity and urban and agricultural sites will have higher concentrations of microplastic compared to less developed, forested sites. These findings will aid us in finding the most efficient solution to this pressing problem.

**Poster 85**

*Cheers to Ol' Loyola*

**Adam Roberts**, Sociology & Journalism (2018)

This project focuses on drinking culture on Loyola's campus and understanding the universities restorative justice policy on drinking and looking for areas of improvement on safe consumption habits.

**Poster 86**

*Binge, Pamper, Repeat: Subjective Understandings of Self-Care Among Undergraduate College Students*

**Jolai Michel**, Sociology (2018)
Mentored by Dr. Marilyn Krogh, Sociology; Dr. Ruth Gomberg-Muñoz, Anthropology

The object of this paper is to provide new information regarding the subjective understandings of self-care among undergraduate students at Loyola University Chicago. The idea of self-care reaches as far back as 300 BC with Plato and has roots in political activism here in this country. More recently, however, the term has been coopted as marketing strategy. If we can better understand perceived self-care practices and their foundations, it will become more clear to us what may be missing; we can fill in each other’s gaps.

•Poster 87•

Phylogeny of the Schetba rufa Species
Phoenix Dempster, Biology (2019), Mulcahy Scholars Program
Mentored by Dr. Sushma Reddy, Dr. Jane Younger

Madagascar is known as one of the most biodiverse islands in the world, however very few studies have been done concerning the diversity among Madagascar's birds. I aimed to better understand the diversification of the endemic family Vangidae. Using multiple analyses, I was able to infer the phylogeny and diversification patterns of the Schetba rufa species. As a result, I noticed deep divergences within this species that may indicate cryptic speciation.

•Poster 88•

The Abundance and Movement of Microplastic in Urban Streams
Raul Lazcano, Biology (2020), Catherine Rovegno
Mentored by Anna E. S. Vincent, Graduate Student, Biology; Dr. Timothy J. Hoellein, Biology; Dr. John J. Kelly, Biology

Plastic pollution is a pervasive issue in oceans, but studies documenting this issue in freshwater ecosystems are rare. We adapted spiraling metrics originally developed for organic matter budgets to assess the abundance and movement of microplastic relative to organic matter. Samples were collected from the surface, water column, and benthic habitats of 3 Chicago-area streams. Microplastic was present at all sites, with the highest concentration at the North Branch Chicago River. Downstream velocities and indices of retention were similar for microplastic and suspended sediment. Using spiraling metrics to assess microplastic transport in streams is crucial for developing global plastic budgets.

•Poster 89•

“We are Not All Gangsters”: Enabling Impoverished Youth of Color to Revise Their Societal Representations through Multimedia Creativity
Jamie McDowell, Psychology (2020)
Mentored by Dr. Maryse Richards, Psychology; Kevin Miller, Psychology; Dr. Katherine Tyson, Social Work

Youth, all impoverished and African-American or Mexican-American participants in Chicago’s Saving Lives & Inspiring Youth (S.L.I.Y.) project expressed concern that they are pervasively misunderstood by mainstream society. They enthusiastically wanted to improve the accuracy of their representations by participating as co-researchers in this grant-funded cross age peer-mentoring program. The 140 high school youth from severely disadvantaged communities in Chicago mentored younger peers from their communities for one year. Youth used a photodocumentary, videos, a website, Facebook and Instagram to develop their own self-representations, and also interviewed each other to elicit the impact of these experiences.

•Poster 90•

The Interconnectivity Between and Consequences of Permafrost Degradation and Changing Global Climate Conditions
Guillermo Quellmalz, Business Management & Entrepreneurship (2018), Jack Miller, Miriam Pierce, Jessica Katsevman
Mentored by Anuradha (Anu) Krishnaswamy, Institute of Environmental Sustainability

As the global climate is warming at an unprecedented rate, permafrost around the world is melting at a similarly alarming speed. Starting with an extensive framework of its causes, our research group will dive into an exploration of the short- and long-term environmental, social, and economic impacts of permafrost degradation. Our overall goal is to raise awareness not only of the effects of melting permafrost as it relates to climate change, but also of potential solutions to rising threats.
Poster 91

*Human Trash and Microbial Treasures: Distinct Patterns of Microbial Biofilm Succession on Plastic Litter Surfaces*

Reyan Atassi, Neuroscience (2020), Omer Quddus, Mohammud Baleegh
Mentored by Dr. Samuel Dunn, Biology; Dr. Timothy Hoellein, Biology

Plastic production and disposal rates are accelerating. Accumulation of plastic litter occurs in local waters before transport to oceans. Microbial biofilm communities are ubiquitous in aquatic systems and are critical for metabolism and nutrient uptake. Over 5 weeks, clay tiles and plastics were incubated to observe biofilm colonization, community composition, and ecosystem function. Polyethylene and PVC were selected for autotrophic-dominated communities while polystyrene and clay tile selected for heterotrophic-dominated communities. Some plastic polymers host microbial biofilms that function differently than those on natural surfaces, which reveal controls on biofilm succession and suggest the potential for effects at larger spatial scales.

Poster 92

*Inquiring the Homology of Pyruvic Oxime Dioxygenase with Class II Aldolase in Heterotrophic Nitrifiers*

Afshan Hussain, Health System Management (2019), Provost Fellowship;
Mentored by Dr. Domenic Castignetti, Biology

The project team is examining the enzyme pyruvic oxime (PO) dioxygenase (POD) from the bacterium Cupriavidus pauculus, which degrades PO to nitrite and pyruvate. The enzyme is a dioxygenase that integrates an entire molecule of O2 into its substrate(s). When the nucleotide sequence for the POD gene was entered into Genbank, it was homologous to the class II aldolases with adducin. Aldolases are enzymes that perform an aldol reaction, which does not integrate the use of molecular oxygen. This knowledge inspired the team to purify the protein and prepare to further characterize the enzyme.

Poster 93

*Molecular Dynamics Study of Nucleotide Specificity of Sucrose Synthase*

Ibrahim Sakiri, Biology (2018), Provost Fellowship;
Mentored by Dr. Ken Olsen, Biochemistry

Sucrose synthase (SUS) uses UDP in Arabidopsis thaliana (AtSUS) but it uses ADP in Thermosyneccoccus (TeSUS). By using the molecular dynamics simulations we will determine the attraction of each protein for both ADP-glucose and UDP-glucose. Stimulation will be run again after mutating the active site residues in silico to change the binding site of the plant enzyme in order to make it look similar to that of the bacterial one. The residues in TeSUS are very different from the ones in the homologous positions in AtSUS.

Poster 94

*Quantitative Comparison of Culturing Methods in the Identification of UTIs in Female Bladders*

Isaac Rivera, Biology and Bioinformatics (2020), Research Mentoring Program;
Mentored by Travis Price, Dr. Alan J. Wolfe, Microbiology and Immunology

The focus of this study was to compare a new culturing method, Expanded Quantitative Urine Culture (EQUC), with the standard culturing method used to diagnose UTIs in female patients. Voided and catheterized urine from patients contracted with UTIs were sampled and cultured using these methods in order to identify known UTI-affiliated bacteria in the microbiome of each sample. The bacteria composition of each sample using both types of urine and both culturing methods were then compared to determine which method yielded the most significant result.

Poster 95

*Conjugation of BSA onto PEG8 via Strain-Promoted Azide-Alkyne Cycloaddition: a New Drug Delivery System*

Dzenita Huskic, Molecular and Cellular Neuroscience (2019), Mulcahy Scholars Program;
Mentored by Kenneth Olsen, Biology

The objective of this research project is to enhance the conjugation of Azide PEG Succinimidyl Carboxymethyl Ester backbone complex and bovine serum albumin (PEG-BSA) for use as a pharmaceutical carrier. My proposed research will enhance the limits of BSA attached to each PEG backbone. Previously, our lab has achieved attaching three to four BSA molecules to the 8-arm PEG. By lengthening the arms of the PEG backbone, we should be able to increase the surface area of the PEG, allowing for the attachment of more BSA molecules.
**Poster 96**

*Comparison of Nuclear Waste and Energy in France and the United States*

*Aerial Williams*, Biology (2018), *John Loxas, Ying Yu, Renelle D'Silva, James Straus*
Mentored by Anuradha Krishnaswamy, Institute of Environmental Sustainability

By conducting an in depth analysis of the social, environmental, and economic impacts of these country’s nuclear policies and radioactive waste management, we hope to identify the flaws and assets nuclear power can provide as a sustainable energy source, as well as how to implement these assets into our own national energy outlook.

**Poster 97**

*The Roles of Robo and Wnt in Embryonic Mammalian Cell Proliferation*

*Samuel Jaros*, Bioinformatics (2020), Mulcahy Scholars Program; Mentored by Dr. Thomas Sanger, Biology

Planar foot pads are present across all mammals, but little is known about their embryonic and evolutionary origins. The Slit-Robo and Wnt pathways are extremely active during fetal development and are also often observed in the same cells at the same time. I intend to determine where in the dermal layers and when during development these two pathways are expressed. I also plan to address whether Robo activates Wnt or vice versa. I will resolve these unknowns by correlating the size of mouse foot pads with knockout Robo genes and by comparing the timing of Robo and Wnt activity using fluorescent markers.

**Poster 98**

*Using Process Oriented Guided Inquiry Learning (POGIL) in an Online General Chemistry Course*

*Harsh Patel*, Bioinformatics (2020), Provost Fellowship; *Kacper Kubiszewski, Natalie Plys*
Mentored by Dr. Patrick L. Daubenmire, Chemistry & Biochemistry; Dr. Linda C. Brazdil, Chemistry & Biochemistry

Process Oriented Guided Inquiry Learning (POGIL) is a cooperative learning approach to teaching and learning chemistry which is based on valid and current models of learning. Prior research has analyzed how the POGIL approach elicits stages of student interactions during instruction (Daubenmire & Bunce 2008). These interactions have further been mapped to patterns of argumentation that students cycle through in POGIL classrooms (Kulatunga, Moog, & Lewis, 2013; Cole, Towns, Sweeney, Wawro, & Rasmussen, 2012). In these cases, inferences have been made about how students’ learning gains may depend on certain cycles of interactions and patterns of argumentation.

**Poster 99**

*Synthesis of Tetrazole Ligands as Inhibitors of the Bacterial Enzyme DapE*

*Iman Darwish*, Chemistry (2018), Provost Fellowship; Mentored by Dr. Daniel Becker, Professor, Chemistry and Biochemistry

Our research is grounded upon developing potential antibiotic treatments. One of our targeted enzymes is DapE, an enzyme used by bacteria to synthesize lysine. DapE inhibition would cause the bacteria to be killed, but will leave humans unharmed as DapE is unique to bacteria. After conducting a high throughput screen of many potential compounds against DapE, a few structures were found to bind best to this enzyme. Of these structures was a tetrazole derivative. We have developed and are in the process of executing a four step synthetic route to make more tetrazole ligands to test in our DapE assay.

**Poster 100**

*Mapping the Brain*

*Matthew Cmiel*, Engineering Science (2020), Provost Fellowship; Mentored by Dr. Vincent Chen, Engineering Science

The purpose of the research project is to obtain a more accurate “map” of the brain waves and the origins of the brain waves. Through the collection of the brain wave readings, we tried to convert the readings into a power spectral density through the use of MATLAB in order to measure the correlation of the sequence compared to a known sequence. The higher the correlation is, the more certain we are as to the location of the brain wave.
**Poster 101**

*Design and Synthesis of Indoline-7-sulfonamide inhibitors of DapE as Potential Antibiotics*

Ademilola Tejuoso, Biochemistry (2019), Mulcahy Scholars Program; Mentored by Dr. Daniel Becker, Professor, Chemistry and Biochemistry; Dr. Tahirah Heath, Chemistry and Biochemistry

The issue of antibiotic resistance is a critically important issue for society and healthcare providers. Few advancements toward new antibiotics have recently emerged. In order to combat this issue, we are targeting the bacterial enzyme DapE which is a di-zinc metalloenzyme in the biosynthetic pathway of lysine in bacteria, but not humans. I am designing and synthesizing indoline N-acyl-7-sulfonamides toward potent inhibitors of DapE. Targeting DapE should lead to selective toxicity of bacteria toward the discovery of a new class of antibiotics.

**Poster 102**

*Effects of Plastic on Macroinvertebrate Communities in Freshwater Ecosystems*

Nils Hoffmann, Biology (2019), Mulcahy Scholars Program; Alejandra Bravo, Ian Comerford

Mentored by Dr. Timothy Hoellein, Biology; Lisa Kim, Graduate Student, Biology

Plastic enters freshwater ecosystems can and used as a resource by aquatic organisms. We studied how plastic and natural cottonwood leaves impacted macroinvertebrate density and functional feeding groups using a "leaf-bag" approach. We predicted 1) that cottonwood leaf packs would have the greatest density of detritivores compared to plastic and mixed (plastic and cottonwood) leaf packs and 2) plastic leaf packs would have the highest density of predators. Initial data suggests cottonwood leaves supported greater macroinvertebrate density and species richness compared to other treatments. These findings help guide future work in freshwater ecosystems to understand how plastic impacts aquatic biota.

**Poster 103**

*Science Rambler: Citizen Science Research Hub*

David Saffo, Software Engineering (2018), Mulcahy Scholars Program; Mentored by Dr. Laufer, Computer Science

Science Rambler is a web hub and mobile application for citizen science based research. Citizen science is the collection, and sometimes analysis, of data by members of the general public. The app functions as a home for researchers to post their research projects. Once posted, users can contribute data to the study in an intuitive and convenient way. With this app, researchers will have a way to collect data of all kinds for their projects from a centralized user base. Researchers can thereby expand the scope of their research by collecting data from wherever users are located. Citizen science is a powerful tool, and with this app it will become even more powerful.

**Poster 104**

*Comprehensive Study of Horseradish Peroxidase with Experimental Enzymatic Assays to Develop Theoretical Differential Model*

Margaret Schulz, Biophysics (2018), Mulcahy Scholars Program; Mentored by Dr. Conrad Naleway, Chemistry, Dr. Kenneth Olsen, Biochemistry

Using the well-known three step oxidation reduction mechanism of horseradish peroxidase (HRP), the kinetic properties of this enzyme can be readily studied using Wolfram Alpha Mathematica. This mechanism and its individual steps were converted into a differential equation of concentration and time, which was then solved. In order to affirm the theoretical model, a thorough experimental study was performed. Spectrophotometry techniques were used to determine the initial rates and absorbance at particular wavelengths. A study of the full spectrum of HRP from 200 to 900 nm wavelength shows trends of the oxidation of pyrogallol, a polyphenol, to purpurogallin.

**Poster 105**

*The Response of Developmentally Expressed Wnt Genes to Thermal Stress*

Puja Brahmbhatt, Biology (2018), Mulcahy Scholars Program, Provost Fellowship; Mentored by Dr. Thomas Sanger, Biology

The goal of my project is to determine the expression patterns of genes involved in the development of facial prominences in A. sagrei, the brown anole, and whether their expression changes during thermal stress by using immunofluorescence and beta-
catenin. My project determines whether Wnt expression is involved in craniofacial patterning of lizards and if it is expressed at a time where it could affect the development of facial prominences. By observing the progression of neural crest cell development in experimentally manipulated embryos, I will shed light on how exactly the Wnt pathway can influence the development of neural crest cells.

**Poster 106**

*Effect of Sleep Quality on Self-Regulation and Behavior in At-Risk Preschool Children*

**Alanna Bonfiglio**, Psychology (2018)
Mentored by Dr. Christine Li-Grining, Psychology

Preschool aged children who develop self-regulation skills are more likely to succeed socially and academically in the future. I hypothesized that children’s sleep quality and quantity would have a positive effect on their self-regulation skills and behavior. Preschool children’s sleep habits were assessed by an Actiwatch monitor, while their self-regulation skills and behavior were assessed by teacher and parent surveys and reports. The results indicated that higher quality sleep positively impacts the child’s classroom behaviors.

**Poster 107**

*Effects of AiiB Lactonase Treatment on Pseudomonas aeruginosa Virulence Factors*

**Monica Mazur**, Neuroscience and Biology (2018), Biology Summer Research Fellowship;
Mentored by Domenic Castignetti, Professor, Biology

Under conditions of reduced immunological defense of the host, P. aeruginosa makes and secretes virulence factors, which are molecules that promote or lead to increased pathogenesis by P. aeruginosa. Many P. aeruginosa virulence factors are under control of quorum sensors, or molecules that coordinate and control gene expression. Previous research has shown that P. aeruginosa quorum sensor molecules can be destroyed when the enzyme AiiB is added to P. aeruginosa cultures. We will confirm and extend these results by examining whether AiiB, via its role as a quorum sensor-destroying enzyme, results in diminishing the virulence factor expression of pyocyanin.

**Poster 108**

*Future Proofing the Video Streaming Industry in the United States*

**Nicole LoDuca**, Marketing and Information Systems (2018), Erica Byrne, Katherine Cabajal
Mentored by Stacy Neier Beran

The television has been a staple of American culture for more than half a century. However, in recent years, consumers have shifted the way they view serialized programs. With the introduction of streaming, television has quickly become a pertinent piece of a much larger, on-demand, “new economy” society. What remains unknown is how to future proof streaming so that it continually enhances the consumer experience. We were able to gain insight into the video streaming industry after constructing and carrying out an interactive survey and a focus group.

**Poster 109**

*Summer Vacation: Risk and Protective Factors on Adolescent Behavior*

**Maya Sheikh**, Psychology (2018), Research Mentorship Program;
Community Partner: Chicago Park District
Mentored by Amy Governale, Developmental Psychology Graduate School, Graduate Student; Dr. Jessica Horowitz, Associate Dean for Student Services

Organized activities have been shown to be protective for low-income, ethnic minority adolescents. Parental monitoring, the strategies parents utilize to gain information about children’s’ whereabouts while unsupervised, has also been shown to reduce risk-taking among teens. However, the relation between parental monitoring strategies and organized activity participation has not yet been fully explored. Using the Schools and Families Educating (SAFE) Children study, a longitudinal dataset of low income adolescents in Chicago, this study aims to explore the relationship between parental monitoring, organized activities, and adolescent risk behaviors.

**Poster 110**

*Climate Action and Awareness at Loyola's Watertower Campus*
Loyola has a climate action plan with the goal to be carbon neutral for directly controlled emissions by 2025. As students, we have observed sustainability and climate-related initiatives to be most visible on the Lakeshore campus. We believe that Water Tower campus (WTC) can benefit from more climate-related initiatives and increased student awareness of sustainability in order for Loyola to reach its goal. We sought to gain insights into ways that students, staff, and/or faculty at WTC prefer to participate in actions to mitigate and/or adapt to climate change.

Poster 111

Trifluoromethylation of Nickel Metal Complex to Increase Lipophilicity

Chris Stanek, Biochemistry (2019), Mulcahy Scholars Program; 
Mentored by Dr. Wei-Tsung Lee, Assistant Professor, Chemistry and Biochemistry

The fluorine atom has many beneficial properties, which are often incorporated into a vast number of pharmaceuticals and agrochemicals. Introducing a fluorine group into a drug frequently causes a dramatic effect on the neighboring carbon centers and increases selective activity. Fluorine substituents also increase the molecules lipophilicity. The fluorine addition is important for pharmaceuticals in vivo due to the sharp rise in bioactivity. The goal of this project is to synthesize nickel fluoride complexes in hope to reduce the cost and energy efficiency of fluorinating various pharmaceuticals to enhance lipophilicity.

Poster 112

How our Social Identities Impact our Leadership through Service

Noah Walker, Sociology (2021), Frances Romero, Lizbeth Herrera, Megan Japcyzk 
Mentored by Paige Gardner, Student Diversity & Multicultural Affairs

The purpose of this project is to present the idea of how our social identities impacted our leadership while in STARS LEAD. Through the organization Family Matters, our main objective was to expose elementary school students on social issues they might not have encountered. Our social identities influenced the way we perceived topics such as bullying, homelessness, gun control, and disaster relief. Recognizing others’ social identities helped our mentees realize their privileges and oppressions by researching these topics. The significance of this project was to create awareness within the future generations surrounding their communities and the power within themselves.

Poster 113

Synthesis of DapE Inhibitors as Novel Antibiotics

Claire Herbert, Chemistry (2019), Mulcahy Scholars Program, Provost Fellowship; 
Mentored by Dr. Daniel P. Becker, Chemistry and Biochemistry; Dr. Tahirah K. Heath, Chemistry and Biochemistry

The rate at which antibiotic resistance is growing outpaces the current development of new drugs. N-succinyl-L,L-diaminopimelic acid desuccinylase (DapE) is a crucial enzyme for bacteria survival and has not been previously targeted by other drugs. The intent of this project is to design and synthesize inhibitors of DapE. Analogs of the lead molecules are developed with the guidance of molecular docking simulations. Each analog is tested for inhibition of DapE in a validated biochemical assay. By synthesizing a variety of structures and obtaining inhibition data, we develop evidence of structure-activity-relationships (SAR), which guide the research toward more potent inhibitors.

Poster 114

Synthesis and Characterization of Novel Nickel(II) Redox Non-Innocent Ligand Metal Complex

Patrick O’Brien, Biochemistry and Neuroscience (2019), Provost Fellowship; 
Mentored by Dr. Wei-Tsung Lee, Chemistry and Biochemistry

Our compound contains an Ni(II) atom with a slightly distorted square-planar coordination environment. The Ni—O and Ni—N bond lengths are longer than those observed in the phenyl backbone counterpart, which can be attributed to the steric hindrance of the naphthyl group. The molecule is substantially distorted, with both the planar naphthalene-1,8-diamine and imino–methyl–phenolate substituents rotated against the Ni(N,N,O,Br) plane by 38.92 (7) and 37.22 (8), respectively, giving the molecule a
twisted appearance. Different intermolecular forces connect the molecules into dimers, and an offset stacking interaction between naphthyl units interconnect these dimers into a three-dimensional network.

•Poster 115•

Using CRISPR Networks to Study Bacteriophage Host Range
Abdul Zakkar, Biology, Bioinformatics, Computer Science (2018), Biology Research Fellows Program; Mentored by Dr. Catherine Putonti, Bioinformatics

Bacteriophage are viruses that infect bacteria. The CRISPR system in bacteria allows them to recognize and eliminate the threat of bacteriophage. To study the host range of these bacteriophage, we analyzed the gene sequences of the CRISPR system across many bacterial species, and found similarities between them. We created a network using this data, which allows us to visualize these similarities. The network shows that different species often do not share similarities with other species. However, we are interested in those rare similarities that help us understand the range of hosts a bacteriophage my have.

•Poster 116•

The Effect of Fee Increases on National Park Visits
Leah Vasarhelyi, Environmental Policy and Environmental Science (2018)
Mentored by Dr. Max Melstrom, Institute of Environmental Sustainability

Visitor demand for U.S. National Parks is influenced by environmental landmarks and recreation opportunities. My research measures the effects of fees restricting people’s ability and desire to visit National Parks. I accomplish this by modeling the visitation to 375 parks between 1992-2016. This model builds upon findings from peer reviewed literature and National Park Service studies on visitation. Understanding how fees influence people’s ability to visit National Parks can aid in the creation of informed policies regulating our common resources.

•Poster 117•

Observing Processing Trends across Sensory Systems Using Perceptual Weights
Amel Baker, Psychology; Neuroscience (2018), Mulcahy Scholars Program; Mentored by Dr. Raymond Dye Jr., Biology

We are contacted with a multitude of environmental stimuli every second from different acoustic frequencies and intensities to a range of visual signals. The brain is tasked with effectively processing these stimuli. The demands of processing require that observers optimize their decision-making through an ideal strategy, segregating task-relevant information from irrelevant information, distractors. These strategies can be studied by looking at how participants respond to targets with distractors present and computing the weights, or importance, given to each component of a stimulus.

•Poster 118•

The Effect of Parental Monitoring on Adolescent Externalizing Behaviors
Samantha Kay, Psychology (2018), Provost Fellowship;
Mentored by Amy Governale, Professor, Psychology

As adolescence gain independence, parents must adjust approaches to observe their child's whereabouts. Parental monitoring refers to strategies used to track children while unsupervised. This study analyzes the relation between levels of parental monitoring and adolescent’s self-reported externalizing behaviors (delinquency and aggression). The study’s data is from Schools and Families Educating (SAFE) Children, a longitudinal study of inner-city youth (n=308, Mage=16.9, SD=.449). It was hypothesized that levels of parental monitoring would have an effect on externalizing behaviors, moderated by gender. Results indicate that parental monitoring was a significant predictor of youth’s externalizing behaviors, but was not moderated by gender.

•Poster 119•

Bilingual Education and English Language Production in Sixth Grade Bilingual Students
Dana Zakieh, Psychology, Spanish (2018)
Mentored by Dr. Perla B Gamez, Psychology

The purpose of the current study is to observe whether sixth grade Spanish-English bilingual students previously enrolled in a
bilingual education program would speak using similar amounts of English production errors as their bilingual peers who did not undergo bilingual education. Theoretically, if bilingual education produces English proficient students, then the number of English language errors made by students who have had bilingual education should not differ drastically from other bilingual peers in their age group who have not received bilingual education.

**Poster 120**

**Combating The Re-Emergence Of Vector-Borne Infectious Diseases Caused By Climate Change**

*Suraj Sheth*, Biology, Molecular Neuroscience (2018)

Mentored by Anu (Kris) Krishnaswamy, CEO, Magnova Global Consulting and Adjunct Lecturer, Institute of Environmental Sustainability

Rising global temperatures due to climate change have led to changes in urban ecosystems. These changes have caused the patterns of the transmission of infectious diseases by vectors such as mosquitos to vary considerably. Diseases such as Dengue Fever and Malaria have become more pervasive in the areas they already existed, and have now emerged in cities where they were previously not seen. The TripleRM Global Health Model for Disease Outbreak and Response is useful in risk identification, resilience building and resource management, and can be utilized to research the effectiveness of processes implemented in disease detection and response.

**Poster 121**

**Stress and Ethnic Identity Membership: The Impact on Internalizing Symptoms**

*Sydney Maten*, Psychology (2018)

Mentored by Dr. Maryse Richards, Psychology; Cynthia Ogechi, Psychology

Stress is the source of many physiological ailments and is correlated with internalizing symptoms such as anxiety and depression especially among minority youth residing in urban, low income communities (Edlynn, Gaylord-Harden, Richards & Miller 2008). However, ethnic identity can serve as a protective factor for minority youth to weaken the potential negative outcomes of stress (Torres & Santiago, 2017). The current study examined the relationship between stress and internalizing symptoms for African American and Latinx adolescents from low income, high crime communities.

**Poster 122**

**Chromosomal Organization and Methylation Patterns of L1 Subfamilies on Human Acrocentric Chromosomes**

*Mit Patel*, Information Systems (2018), Provost Fellowship;

Mentored by Dr. Jeffrey Doering, Professor, Biology; Dr. Timothy O'Brien, Professor, Mathematics and Statistics

This study explores the organization of repetitive sequences in acrocentric chromosomal arms. It draws on two projects to examine the distribution of different classes of repetitive sequences in acrocentric chromosomes and the DNA methylation patterns within Long Interspersed Nuclear Element-1 (LINE-1, L1) repeats, a class of repeats associated with chromosomal aberration. Chi-Square Test of Independence and Relative Risk calculations were calculated on the frequencies and densities of ALU, L1, and full-length (FL) L1 elements and sequences. FL L1 and L1 sequences were enriched in heterochromatic regions whereas ALU sequences were enriched in the euchromatic regions.

**Poster 123**

**The Role of raw in Photoreceptor Neurons During Development of Drosophila melanogaster**

*Mit Patel*, Biology (2019), Mulcahy Scholars Program;

Mentored by Dr. Jennifer Mierisch, Biology

In the developing nervous system of mammalian creatures, glial cells and neurons are vital to the proper development of the central and peripheral nervous system. While the role of Raw protein in photoreceptor neuron’s dendrites is known to affect the dendritic arborization and terminal dendrite patterning, the role of Raw in photoreceptor axon development is unclear. With the use of RNAi to knockdown the Raw in the eye discs, it will be observed as to how crucial the impact of Raw is on morphology and patterning of the axon projection into the lamella and the medulla of the brain.

**Poster 124**

**The Superpower of Reading**

*Paulette Matuk*, Psychology (2018)

Community Partner: Cool Classics!
Mentored by Dr. Colleen Conley, Psychology

Cool Classics! is an after-school program in the Chicago area dedicated to immersing diverse and disadvantaged children in the world of the arts, theatre, literature, film, dance, and more in order to widen and brighten their education. I input student’s test scores and answers into data files and code their answers. My project involves calculating and analyzing the improvement percentage scores of every child at the multiple schools the program serves to show the growth of each child and illustrate the value of informal education for all children regardless of societal status or ethnicity.

**Poster 125**

*Stress and Depression: The Role of Coping Strategies among Mexican-Origin Children of Immigrant Families*

**Alex Leon,** Psychology, Sociology, Anthropology (2018)
Mentored by Laura Distel, Psychology; Dr. Catherine DeCarlo Santiago, Psychology

The stressors that children from low income Mexican-origin immigrant families experience place them at risk for depression (Ortega et al., 2009). Exposure to multiple stressors in early childhood has consistently been found to be associated with poor health outcomes that extend across the lifespan (McEwen, 2008). The way one copes with stress can greatly influence the severity of depressive symptoms (Abela, Hankin, Sheshko, Fishman, & Stolow 2012). The current study examines the relations among coping strategies, stressors, and depressive symptoms in a sample of 104 children (60.6% female; Mage = 8.39) and their primary caregivers (97.1% female; Mage = 37.13).

**Poster 126**

*Attunement: The Key to Strengthening Mentoring Relationships a*

**Grace Christian,** Psychology, Social Work (2018), Provost Fellowship;
Mentored by Dr. Julia Pryce, Associate Professor, School of Social Work;

Dr. Pryce's pioneering of the construct attunement describes the strength of the relationship between mentors and their mentees. This fellowship focused on the development of the FAN, a tool used to measure attunement in mentoring relationships. The FAN encourages mentors to reflect on calming, thinking, feeling, doing, and reflecting processes during mentor sessions. By strengthening the mentoring relationship, mentees are more likely to reach their goals.

**Poster 127**

*The Road to Legal Status: U.S. Immigration and Naturalization*

**Ellie Kust,** Spanish, International Studies (2018), Social Justice Fellowship
Community Partner: Catholic Charities
Mentored by Andrew Miller, Center for Experiential Learning

Reflecting upon my year-long internship with Catholic Charities, one of the greatest obstacles for me has been mastering the steep learning curve of the U.S. immigration system. It is a challenging and frustrating path to reach citizenship, and nearly a million people every year navigate this process to immigrate legally. My presentation seeks to describe the process of reaching legal status in the United States, demonstrating the process in a clear, concise way while avoiding oversimplification. I hope that my presentation educates and empowers people to promote global unity.

**Poster 128**

*Black Girls on the Margins of Magic: The Effects of Community Violence on the Mental Health of African-Americans Girls*

**Keesha Moliere,** Psychology
Mentored by Dr. Noni Harding-Gaylord, Psychology; Elizabeth Sargent, Graduate Student, Psychology

Research on community violence exposure in African American communities focuses predominantly on Black boys, but Black girls are equally susceptible to high levels of violence. The current study explores how violent victimization of family members and friends impacts girls’ depressive symptoms. In a sample of 216 Black girls (Mean age = 12.6, SD = 1.0), 22% of girls had a family member killed in a violent incident and 13% had a close friend killed in a violent incident. The type of depressive symptoms experienced was affected deferentially by the trauma of losing a close friend versus a family member.
Mechanistic Properties of Iron(III)-Catalyzed Carbonyl-Olefin Metathesis

Madeleine Armer, Biology (2019), Mulcahy Scholars Program;
Mentored by Dr. James J. Devery, Carly Hanson, Susan Phan; Chemistry and Biochemistry

The rapid construction of complex carbon-carbon double bonds via olefin-olefin metathesis has revolutionized the synthesis of biologically active organic molecules. Conversely, the analogous carbon-olefin metathesis reaction has received little attention until recently. Our mechanistic studies focus on understanding and improving Fe(III)-catalyzed carbonyl-olefin metathesis—a new approach for the construction of cycloalkenes. It is our hypothesis that the success of this reaction hinges upon Fe(III)-mediated formation of intermediate oxetane via a [2+2]-cycloaddition followed by Fe(III)-mediated cycloreversion to the metathesis product, and that the characterization of this reactivity will reveal new avenues of reactivity.

Determining The Molecular Structure Of Phosphoducin-like Protein-3 ΔH Of The Malaria Parasite Plasmodium.

Sara Khan, Biology (2018), Mulcahy Scholars Program;
Mentored by Dr. Stefan Kanzok, Biology

PhLP-3 is a thioredoxin-like protein identified by our lab that belongs to highly conserved PHLP family. It is hypothesized to co-chaperone protein folding. We had successfully cloned, expressed and demonstrated Plasmodium PhLP-3 to be redox active. Since PhLP-3 precipitated, we generated a truncated version, PhLP-3ΔH which was found to be redox active. Our goal is to crystallize the protein in collaboration with Dr. Dali Liu in the Biochemistry department, to determine its 3-dimensional structure and study its biochemical mechanism and functioning. My project is to express Plasmodium PhLP-3ΔH at high concentration and assist in the determination of its 3-dimensional structure.

Investigating Localization of Putative Microtubule Associated Proteins of Plasmodium in Eukaryotic HeLa Cells

Farah Siddiqi, Biology (2018), Mulcahy Scholars Program;
Mentored by Dr. Stefan Kanzok, Biology

Many apicomplexan parasites, such as Plasmodium and Toxoplasma, display a highly polarized banana-shape morphology, which is maintained by microtubules (mt) positioned just beneath the plasma membrane. These subpellicular mts are regulated by microtubule-associated proteins (MAPs). We are currently characterizing two Toxoplasma MAP homologs in Plasmodium, namely Thioredoxin-Like Protein-1 (Trxl-1) and Thioredoxin Like Associated Protein-2 (TLAP2). To demonstrate that the Plasmodium proteins bind to microtubules, I adapted an in vivo binding assay using Toxoplasma Trxl-1 and TLAP-2. I optimized conditions for this assay in order to generate fluorescent images of HeLa cell microtubules.

Complexities of Carbonyl-Lewis Acid Interactions in Catalytic Systems

Sameera Siddiqi, Biology (2019), Mulcahy Scholars Program;
Mentored by Dr. James Devery III, Assistant Professor, Chemistry; Carly Hanson, Graduate Student, Chemistry

The utilization of Lewis acids to activate substrates containing carbonyls is ubiquitous in organic synthetic methods. While a great deal of information has been found for classical stoichiometric regimens, like the Friedel-Crafts reaction, little has been unearthed about the complexities of these powerful interactions between the carbonyls and Lewis acids in catalytic systems. Therefore, a fundamental understanding of how the carbonyl specifically interacts with Lewis acids in solution will provide synthetic chemists with mechanistic information crucial for developing high yielding procedures as well as opening new reaction trajectories via structural modification of the catalyst.
Robert Baurley, History (2018)
Mentored by Dr. Theodore Karamanski, Associate Professor, History; Marie Pellissier, Graduate Assistant, History

AD MAJOREM DEI GLORIAM. Loyola University Chicago’s boastful institutional motto associates our Jesuit education to honoring the greater glory of God. Through this analysis, we can understand how honoring God, historically, has also compelled actions where glory isn’t found. Slavery in Jesuit Country: How French Jesuit Missionaries Interacted & Responded to Early Native American & African Slavery in the New World, sheds light on the Society of Jesus’ interaction with indigenous and foreign slave practices; while the order established Catholic mission communities within the North American French frontier. This research aims to critique the historical narrative of Jesuit slavery participation.

Mission Memory: Analyzing the Historical Legacy of Mission San Juan Capistrano
Garrett Gutierrez, History (2018)
Mentored by Dr. Theodore Karamanski, Associate Professor, History; Marie Pellissier, Graduate Assistant, History

In recent decades, a revisionist history of the California missions has challenged the long-dominating pro-Catholic, romantic However, the new wave of scholarship highlighting Franciscan abuse of Native Americans has yet to inspire any noticeable change in the historical presentation at the missions. For instance, while Mission San Juan Capistrano continues to venerate its Franciscan founding fathers, discuss 18th and 19th century life at the mission, and celebrate the Legend of the Swallows, the mission fails to provide a holistic history of the Native American experience.

The Catholic Church’s Response to the Abuse of Native American Children in Catholic Boarding Schools
Caroline Hitt, History (2020)
Mentored by Dr. Theodore Karamanski, Associate Professor, History; Marie Pellissier, Graduate Assistant, History

Analyzing the different kinds of abuse and personal examples of abuse experienced by Native American children in Catholic boarding schools while evaluating the different responses of the Catholic Church overtime. Focusing specifically if the Church has done enough to help heal these deep wounds and if they have put correct measures in place to prevent these events from repeating themselves.

Art in Evangelization
Ciara Johnson, History (2019),
Mentored by Dr. Theodore Karamanski, Associate Professor, History; Marie Pellissier, Graduate Assistant, History

A comparison between how the doctrines and histories of three monastic orders--Dominican, Jesuit, and Franciscan--impacted how each used art while evangelizing the indigenous populations in New Spain

The Failure of the La Florida Missions
Christian Geppo, Economics (2018)
Mentored by Dr. Theodore Karamanski, Associate Professor, History; Marie Pellissier, Graduate Assistant, History

This presentation explores the failure of the Franciscan missions in Spain's La Florida colony. Though commonly solely attributed to England's 1702 and 1704 invasions, the colony's decades-long economic struggles, administrative infighting, and souring attitudes among the native Apalachee tribe are most responsible for its downfall.

Remembering Father Marquette
Jacob Kreiner, Environmental Science (2018)
Mentored by Dr. Theodore Karamanski, Associate Professor, History; Marie Pellissier, Graduate Assistant, History
Father Pere Jacques Marquette is one of those historical figures that many people have heard of even if they are not quite sure why he should be remembered. I focused on discovering the how and why he is remembered by asking the question of how have people commemorated him and his exploits over time? To do this I started my research by focusing on the tercentenary of his birth that occurred in 1937 and the festivities that surrounded it.

*Catholic Indian Identity Shaped by Missions*

Mentored by Dr. Theodore Karamanski, Associate Professor, History; Marie Pellissier, Graduate Assistant, History

My research encompasses the effect that Catholic missions have had on how American Indians view Catholicism through the education of Indian children in Catholic mission schools, events that took place in the Church, and personal accounts of Indians' experiences with their faith. How traditional Indian beliefs have clashed with and syncretized with those of the Church compromises the base of this inquiry.

*Medicinal History in the Great Lakes Region*

**Brittany Stieferman,** Psychology/Pre-Med (2018), Ramonat Seminar;
Mentored by Dr. Theodore Karamanski, Associate Professor, History; Marie Pellissier, Graduate Assistant, History

The seventeenth-century French Jesuit missionaries in the Great Lakes region had the clear goal of converting the Amerindians to Catholicism to bring them to God. Medical care was deeply embedded in their evangelizing efforts—caring for the sick was a necessary good, a priori. And so, in the wake of epidemic and disease in the “New World”, the Jesuit missionaries proselytized medically. They influenced Native American medical knowledge, but were equally influenced, if not more so, by the Native peoples.

**MUNDELEIN 303**

*Climatology of Extreme Precipitation in the Midwestern United States*

**Paul Campion,** Environmental Science (2019), Institute of Environmental Sustainability Undergraduate Research Fellowship;
Mentored by Dr. Ping Jing, Assistant Professor, Institute of Environmental Sustainability

This study examines the climatology of extreme precipitation in the Midwestern United States for the 1950–2015 period using the daily unified gauge-based analysis of precipitation from the Climate Prediction Center (CPC) of the National Oceanic and Atmospheric Administration (NOAA). Total annual precipitation in the Midwest has increased during this period. We compare the characteristics of extreme precipitation to those of overall precipitation including their frequency, intensity, and seasonality. In addition, we identify changes over time at the state level in the Midwest. Across states, the annual amount of extreme precipitation has increased by 46% to 119%.

*Civil Unrest Modeling in the face of Climate Change*

**Angelo Kelvakis,** Environmental Science / Policy (2018)
Mentored by Dr., Ray Dybzinski, Professor, Institute for Environmental Sustainability

In the paper, Jones et al. 2017, they use an advanced mathematical model to show the corollary relationship between how stable a State is and how food insecure they are and how these two variables can be used to predict the chance that the State will have a civil unrest event. In my research I have used a know parameter model comparison method to analyze their results and I not only pose these methods as a formal method for model deconstruction, but I also offer up suggestions for future modeling of this topic.

*Chicago-based Data Resource to Bridge the Gap between Environmental and Social Justice Organizations*

**Lian Lucansky,** Environmental Science (2018), Social Justice Fellowship;
Mentored by Dr. Brian Ohsowski, Institute of Environmental Sustainability
While the connection between environmentalism and social justice is embedded in the Jesuit tradition, it is less apparent to the public and policy makers. This project aims to deepen that connection by creating a website where environmentalism and social justice are literally put side by side. I have created a database of environmental and social advocacy groups in Chicago for Loyola University Chicago students to find concise information regarding social-justice oriented organizations, and the internships, volunteer, or job opportunities they offer. The finished resource is a user-friendly searchable website.

Anaerobic Digestion for a Zero-waste Urban Campus
Nicole Spehn, Environmental Science (2018), Monica Dever, Olivia Niosi, Nicole Spehn, Megan Tomerlin
Mentored by Drew Monks, Institute for Environmental Sustainability

In an effort to sustain Loyola’s mission to creating a zero-waste campus, we are investigating anaerobic digestion (AD) as a means to create biogas and divert campus waste from landfills. We have tested the amenability of three on-campus waste streams (i.e., biodiesel lab waste, food waste, invasive plant biomass) for methane production to calculate ideal loading rates and retention times for a benchtop-scale continuous flow AD system. Our results reveal valuable waste stream combinations for biogas production, with an emphasis on various biodiesel lab waste products, which can be utilized for designing a large scale AD system on campus.

MUNDELEIN 304
Constitutional Protections for Immigrants and Immigration from North Africa: Comparison of the Italian and U.S. Constitution and Practices
Ahnika Kroll, Political Science, International Studies (2019), Rudis Fellowship;
Mentored by Dr. Peter Schraeder, Political Science

The primary purpose of my research, which I will conduct under the mentorship of Professor Peter J. Schraeder (Department of Political Science), is to explore the issue of how immigrants and immigration are treated in the Italian and the United States constitutions. I believe this is an important area of study due to its keen relation to current events.

Latinx Immigrant Narratives: Handing Over the Mic
Cristina Nunez, History/Women’s Studies and Gender Studies (2019), Community Research Fellowship; Elizabeth Salgado, Vanessa Huerta, Iliana Barragan
Community Partner: Taller de Jose
Mentored by Dr. Patrick Green, Center for Experiential Learning

The researchers collected narratives from the individuals they serve and identify with to learn more about their experiences, specifically 1) their migration story and 2) their “stay” story (why they stayed in the Chicago community neighborhood). Taller de José worked with researchers to collect narratives from clients. In working together, the student(s), the Executive Director of Taller de José, and a faculty mentor collaboratively identified themes of patriotism, ambition, and a passion for “home.”

What Countries do Americans Think Deserve Foreign Aid? An Experimental Test of Colin Powell’s Pottery Barn Rule
Matthew Pajor, Philosophy, Political Science, History (2019), Provost Fellowship; Dina Hanania
Mentored by Dr. David Doherty, Associate Professor, Political Science; Dr. Amanda Bryan, Assistant Professor, Political Science

We examine whether Americans find Colon Powell’s argument that when a major power “breaks it” they are responsible for “buying it” they are responsible for varying the characteristics of the targeted countries—e.g., level of democracy, poverty rates—as well as the purpose and cost of the aid package. In some conditions the name of the targeted countries were also presented. This allows us to assess whether public support for foreign aid to countries like Iraq and Afghanistan exceeds what would be expected based on those countries’ other characteristics.
Campaign Promises and Public Opinion

Reid Willis, Political Science, Global and International Studies (2019), Provost Fellowship; Paul Witry
Mentored by Dr. David Doherty, Dr. Amanda Bryan; Political Science

We examined what the public thinks about campaign promises. What is more important: keeping your word or following the opinions of constituents? What about the opinions of those who voted for you? How do Republicans and Democrats differ on these questions?

MUNDELEIN 307

Mutational Effects on the Effector Binding Domain of Bacillus subtilis GabR

Elana Baltrusaitis, Biochemistry (2018), Carbon Undergraduate Research Fellowship Program;
Mentored by Dr. Liu, Associate Professor, Dr. Ballicora, Professor; Chemistry and Biochemistry

The Y281A mutation within the effector binding domain of Bacillus subtilis GabR could demonstrate a difference in substrate recognition. These findings might imply the evolutionary change from the protein’s role as an enzyme to a transcription factor. Crystallographic and structural studies will be performed to demonstrate different substrate binding with the protein. Spectroscopic studies will be performed to determine the presence of enzymatic activity and protein stability.

The Effects of Novel PLP and GABA Analogues on the PLP-dependent proteins, OAT and GabRd

Denis Cipurko, Biochemistry (2019), Carbon Undergraduate Research Fellowship Program;
Mentored by Dr. Dali Liu, Dr. Daniel Becker, Dan Catlin, Graduate Student; Chemistry and Biochemistry

Lactic acid bacterial GabR is an enzyme that regulates the production of GABA in humans via the gut brain axis. PLP and GABA are two molecules key to the activity of GabR, a drug target for diseases related to neurological disorders associated with neurotransmitter deficiency. By investigating the structural and kinetic differences of GabR in the presence of PLP and GABA analogues, the efficacy of binding and activity for those analogues can be determined. This information, in turn, may identify novel drug target pathways and drug candidates in the treatment of neurological disorders.

Bacteriophages of the Urinary Microbiome

Andrea Garretto, Bioinformatics (2018), Carbon Undergraduate Research Fellowship Program;
Mentored by Dr. Catherine Putonti, Bioinformatics; Dr. Heather Wheeler, Biology

Bacterial viruses (bacteriophages) play a significant role in microbial community dynamics. Within the urinary microbiome, the role of phages is largely unknown. Preliminary metagenomic surveys of the urinary virome indicate a rich diversity of novel lytic phage sequences, but exclude the lysogenic phages residing within the bacteria of the bladder. To characterize this phage population, we examined 181 genomes representative of the phylogenetic diversity of bacterial species within the female urinary microbiota. Phages were prevalent within the bladder bacteria: 86% of the genomes examined contained at least one phage sequence, most identified as novel phages.

The Enhancement of microplastics on PCB 126 accumulation in Daphnia magna

Mariana Felix-Kim, Environmental Science (2019)
Mentored by Kathryn Renyer; Paul Chiarelli; Chemistry; Tham Hoang; Institute of Environmental Sustainability

Increasing abundance of plastics in aquatic environments catalyzed researchers to explore consequences. Reports haven’t discussed the effect of plastics on polychlorinated biphenyls (PCBs) accumulation in zooplankton. The objective is to determine if adsorption of PCB-126 on microplastics enhances the accumulation of PCB-126 in Daphnia magna. D. magna was exposed to PCBs in water with microplastics or no plastics for 21 days.

MUNDELEIN 308

Low Wage Work and Health: Navigating Financial Insecurities and Work Stressors

Loraine Arikat, Anthropology (2018), Social Justice Fellowship;
Mentored by Dr. Ruth Gomberg-Muñoz, Anthropology
Work related injuries, both chronic and acute, plague workers in industries across the United States. Yet, low wage workers’ dependence on these jobs can keep them working under the same conditions that compromise their health in the first place, exacerbating and prolonging in jury and illness. By stepping across the unspoken social barrier that separates workers and students, I explored how work stressors transcend past the walls of their workplace into social support systems, and shape workers’ decisions about managing their health. This research will contribute to an anthropological perspective on health and wellness in the framework of structural vulnerability.

Working for and with One Another: A Conversation on Interdisciplinary Social Work in a Multidisciplinary World

Community Partner: Cabrini Green Legal Aid

Whether or not we acknowledge it, social workers are the binding thread of society---supporting and empowering individuals to lead lives of value and independence. They serve all: students in our education systems, patients in our hospitals, and individuals in our prisons. In turn, social workers collaborate actively with varying professions, yet there remains a distinct difference between active partnership and passive communication. Though, the nature of the social environment and human need beckons an honest form of collaboration which aims beyond the subtleties of multidisciplinary work and towards an integrative form of association known as the interdisciplinary model.

The Value In Behind-The-Scenes Work

Tim Platten, Sociology & Political Science (2020)
Community Partner: Catholic Charities
Mentored by Andrew Miller, Center for Experiential Learning

Social service providers do amazing work for their respective communities. These services can range from serving a hot meal to our brothers and sisters experiencing homelessness to hosting after-school programs and much more. How does it all come together? Who links the wonderful volunteers to these awesome opportunities? Often, we don’t get to see all the invaluable work that goes on behind-the-scenes within this industry. Interning at the Board Relations and Mission Engagement Department of Catholic Charities of the Archdiocese of Chicago has given me a unique glimpse into that work.

Refugee Children's Experience with The U.S. Education System

Rekha Thapa Chhetri, Psychology (2018)
Mentored by Kaori Paxton; Chester Ong; Andrew Miller, Center for Experiential Learning

This presentation will focus on refugee families’ experiences, struggles and challenges as they integrate into the U.S. education system. The way our current U.S. education system handles refugee families’ needs does not provide adequate support for them. It mainly focusses on the post arrival experiences and needs. Lack of understanding among teachers and staff about the refugee families’ resettlement history can negatively impact refugee children, particularly if they need additional resources for their academic success. Furthermore, it will address how educational institutions like Loyola University can make a positive impact on refugee families’ educational experiences.

Films Every Kid Should See

Jena DiMaggio, English, Women’s Studies Gender Studies (2018), Carroll and Adelaide Johnson Scholarship;
Mentored by Dr. Bren Ortega-Murphy, Professor of Communications and Affiliated Faculty of Women's Studies Gender Studies

I will be discussing how my mentor and I assess the values represented in children's films and how we aim to organize this information as a website for use by parents, guardians, care-takers, and teachers.

Man into Woman: Production of a Digital Archive

Matthew Gallagher, Classical Civilization, English (2019), Interdisciplinary Research Fellowship;
Mentored by Dr. Pamela Caughie
This presentation will discuss the publication history of the narratives surrounding the life of the historical transgender figure Lili Elbe and the particulars of producing a digital archive with the many layers that go into such an extensive project. The presentation will include background information of Lili Elbe and transgender/transexual history as it has evolved since her death in 1931.

**Mind and Body: The Relationship Between Exercise Type and Body Satisfaction**

**Joseph Huey, Psychology, Political Science (2019)**

Mentored by Dr. Denise Davidson, Psychology

This study investigates the relationship between cardio versus strength training exercise and women’s body dissatisfaction. 453 women reported their primary exercise type (e.g., cardio, strength), as well as completed four measures of body dissatisfaction (i.e., body shame, body surveillance, physical appearance state anxiety, and body discrepancy). The cardio group scored significantly higher in body shame, body surveillance, and physical appearance state anxiety. These results demonstrate a relationship between cardio exercise and higher body dissatisfaction. In a world dominated by constantly new exercise trends, it is vital to know the relationship between a person’s preferred exercise and their body image.

**Dominance through Durability: Schoolboy Graffiti in the Greco-Roman World**

**Stephanie Wong, Classical Civilization, Spanish (2018), Provost Fellowship;**

Mentored by Prof. Laura Gawlinski, Classical Studies

As modern readers of classical works honor authors such as Virgil, Ovid, and Homer, ancient students learned from their literati as well. Sites like Pompeii show evidence of graffiti produced by students learning these authors’ age-old works. Creation of graffiti connotes the intention of staking one’s claim to an idea, and I investigate several examples of these schoolboy inscriptions. Forever etched into ancient walls, these graffiti represent the spontaneity, vulgarity, and ephemerality of their authors.

**How the Lavender Scare Made 'Gay' White**

**Maxim Belovol, History (2018)**

Mentored by Professor Alice Weinreb, History

How the Lavender Scare, a subset of the Red Scare, prompted a gay rights movement that made the dominant archetypal depiction of gay in America synonymous with upper middle class white male.

**Consequences of Fundraising in Native American Catholic Mission Schools**

**Elyse Burns, History and Political Science (2018)**

Mentored by Dr. Theodore Karamanski, Associate Professor, History; Marie Pellissier, Graduate Assistant, History

The Catholic Church operated many schools for Native American children as a part of their missions. When they lost government funding, they were forced to fundraise. The materials that the mission schools distributed were littered with a paternalistic attitude that has survived into today.

**William Blake's Influence on Children's Literature Illustration**

**Marie Hofer, Art History, English (2018)**

Mentored by Dr. Dunn, Associate Professor of Fine Arts, Art History; Dr. Wisotzki, Professor of Fine Arts, Art History

William Blake’s Songs of Innocence and Experience influenced author-illustrators of children’s literature, notably Christina Rossetti and Maurice Sendak. These author-illustrators appropriated Blake’s style not only for its aesthetic value, but also for its ability to comment on childhood, morality, and contemporary social issues during time periods that were highly censored. By creating children’s literature meant for both children and adults, Rossetti and Sendak were able to create a layered text meaningful to a dual audience. Presenting and receiving social commentary through the perspective of children, these author-illustrators created a textual space to discuss controversial material.
These Ain’t No Ladies, These are SisterSerpents: The Art, Activism, and Community of a Chicago Feminist Collective, 1989-1998

Amanda Malmstrom, History, Art History (2018)
Community Partner: Women and Leadership Archives
Mentored by Dr. Paula Wisotzki, Professor, Fine and Performing Arts; Dr. Marilyn Dunn, Professor, Fine and Performing Arts

The SisterSerpents, a feminist artist collective of the 1990s, infused Chicago’s galleries and streets with arresting and angry imagery attacking the patriarchy. Through guerrilla art campaigns plastering the city with posters and stickers, a zine entitled "MadWoman," exhibitions at women-only galleries, and performance art, the SisterSerpents attacked the misogyny tightly knitted into society by using “art as a weapon.” The SisterSerpents’ steadfast dedication to fighting sexism while empowering women prompted the collective to embrace activities on three fronts: the production of feminist art, the protest of misogyny, and the cultivation of community.

The Contemplative Function of Hip-Hop Explicitly and Implicitly

Sylvester Francis Alonz, Communication, Religious Studies (2020), Joan and Bill Hank Center for the Catholic Intellectual Heritage Research Fellowship; Mentored by Dr. George Villanueva, Professor, School of Communication; Dr. Michael Murphy, Joan and Bill Hank Center for Catholic Intellectual Heritage

In the Chicago diaspora, hip-hop culture functions in many ways to unite communities to organize around causes of social justice. From a theological perspective, a gospel of liberation precedes a gospel of prosperity. Consequently, I will present how the explicit nature of hip-hop is more rooted than is expected and how theological themes resonate among varying religious traditions. Hip-hop is a catalyst for introducing social issues and theological contemplation functions to induce meaningful work and reflection in order to sustain long-term change or attention. I will focus on what Dr. Villanueva's discussions introduce in terms of hip-hop and faith based organizing.

Curation and Database Design for 15 Years of Multi-Institution Wetland Restoration Data in Great Lakes Coastal Wetlands

Mason Majszak, Philosophy, Environmental Science (2018), Mulcahy Scholars Program; Mentored by Dr. Brian Ohsowski, Institute of Environmental Sustainability

The lab of Dean Nancy Tuchman, Team Typha, has a 15-year history of conducting research studying the invasive hybrid cattail, Typha x glauca, in Great Lakes Coastal Wetlands. However, a system of data curation to archive the group’s data didn’t exist. My project involved organizing all the data to create a single database, allowing researchers to easily input data and access historical data. Secondly, Team Typha determined that harvesting Typha from wetlands could remediate phosphorus enrichment, however the content of Chicago-area wetlands was unknown. Thus, this project filled this gap in the data by quantifying the enriched Chicago area wetlands.

Does it Pay to Work for the Catholic Church?

Jenna Meyers, Economics (2018), Joan and Bill Hank Center for the Catholic Intellectual Heritage Research Fellowship; Mentored by Dr. Michael Murphy, Catholic Studies

There are a variety of financial and economic factors that impact the rising number of lay men and women working at parishes and dioceses in the United States. Per capita income, firm number of the area, cost of living, educational attainment, and unemployment impact the dioceses, churches, and personal job satisfaction of those working in ministry. This case study and broader survey results will frame the question: Do lay ministers work for the vocation, the people, the benefits, the pay, or something else? How might this impact the United States Catholic Church in the next 50 years?

Research to Praxis: Enhancing Middle Grade Science Instruction through Ecological Research

Micah Zaker, Middle Grades Science Education (2018), Provost Fellowship; Mentored by Dr. Lara Smetana, School of Education

Middle grade science teachers and their classrooms are often disconnected from current real world scientific research. In science classrooms, it is essential to engage students in authentic learning by utilizing applicable scientific experiences and situa-
tions. This presentation will detail one middle grade science teacher's journey and reflections as they collaborated with researchers from Loyola's Biology department to develop a science unit on Anthropogenic Litter.
Research Poster Presentations: Session 2
2:00 PM - 3:30 PM

*Poster 1*

Environmental Gentrification: Causes & Solutions for Communities
Sienna Fitzpatrick, Environmental Policy (2018), Social Justice Fellowship; Danielle Abboud
Mentored by Dr. Tania Schusler, Institute for Environmental Sustainability; Dr. Amy Krings, School of Social Work

This project involves a literature review and an educational zine made for the Little Village Environmental Justice Organization. The literature review drew from Loyola's library database using terms like "environmental gentrification" and "ecological gentrification". Relevant articles were reviewed to find information on preventing environmental gentrification—when new, green services attract people who can pay more for those services than existing residents—as well as the specific positive or negative impacts of the green feature on the community. The zine discusses Planned Manufacturing Districts with the purpose of educating residents of Little Village about the effects of PMDs on local jobs and health.

*Poster 2*

The Effect of Regulatory Fit on Expectations of Backlash
Brittany Presley, Human Resource Management (2018), Provost Fellowship; Mentored by Dr. Robyn Mallett, Psychology; Rayne Bozeman, Psychology

Although confronting racism can reduce future prejudice and biased behavior, people hesitate to confront in part because they fear reprisal (Czopp et al., 2006; Shelton & Stewart, 2004). Yet, research shows that confrontations may go better than expected (Mallett & Wagner, 2011). We hypothesized that experiencing regulatory fit during a pro-confrontation persuasive appeal would encourage allies to overcome the barriers to confronting, thereby tempering their expectations of backlash. Regulatory fit occurs when individuals adopt goal pursuit strategies that match their regulatory orientation (Higgins, 2000). Our findings are poised to inform anti-racism interventions and reduce prejudice.

*Poster 3*

Experiences in Teaching and Learning Biochemistry
Nicholas Theodore, Biology/Art (2019), Mulcahy Scholars Program; Madison Smith, Elizabeth Stumpe
Mentored by Dr. Daubenmire, Chemistry

My presentation will document the preliminary results of a study based around applying a Tobii eyetracker to a set of problems focused on the threshold concepts of biochemistry to reveal at what stage these concepts are understood.

*Poster 4*

The Effect of Religiosity on the Wellbeing of Muslim College Students
Diana Ahmad, Psychology (2018), Social Justice Fellowship; Noor Fattah
Mentored by Dr. Rebecca Silton, Psychology

Muslims face a variety of stressors in American society that may negatively affect their mental health and wellbeing. Therefore, there is a critical need to improve our understanding of the intersection between the religiosity and mental health of Muslims. Religiosity has long been associated with increased subjective well-being. In the present study, the relationship between the religiosity, acculturation and subjective well-being of Muslim college students is examined. This study will consist of male and female students who were recruited to participate from several universities' Muslim Student Associations.

*Poster 5*

Utilization of Underwater Robotics for Enhanced Ocean Sustainability
Mentored by Dr. Anu Krishnaswamy, Professor, Institute for Environmental Sustainability
By learning more about robotics holistically, as well as the environmental issues effecting Earth’s oceans, this report’s overall intent is to bridge the gap between the two. By understanding both topics so deeply, this project hopes to arrive at an understanding of how underwater robotics could potential act as a solution or at the very least mitigate some or even all of these issues. There are no doubt limitations of robotics when it comes to the ocean, and the report will better decipher what those are, and potential ways to get around any road blocks that are hindering underwater robotics from helping to mitigate environmental challenges present in the oceans of our planet.

**Poster 6**

*CO oxidation on Rh(111): Comparison of oxide to reconstruction*

**Yann Souchaud**, Chemistry (2018), Mulcahy Scholars Program; 
Mentored by Dr. Killelea, Associate Professor, Chemistry Department

Oxygen molecules dissociate into two oxygen atoms when they come in contact with a hot iridium filament. The O atoms produced are adsorbed when they land on a Rh(111) metal surface below the iridium filament. O atoms bound to the metal repel each other. When enough oxygen becomes attached to the surface, the balance create by those repulsions cause oxygen adsorbate to order up into well-defined and periodic structures. Rh2O3 and (2x1)-O on Rh(111) are phase that can form on Rh(111). My presentation will conclude which metal phase, between Rh2O3 and (2x1)-O, is more reactive towards CO oxidation.

**Poster 7**

*Assessment of Drug Therapies on a Drosophila Parkinson’s Model and their Effects on Motor Function and Aggregate Formation*

**Mary Makarious**, Bioinformatics, Behavioral/Cognitive Neuroscience, Biology (2018), McNair Scholars; 
Mentored by Dr. Jennifer Mierisch, Biology

Parkinson’s disease (PD) is the second most common neurodegenerative disease that affects humans worldwide and is characterized by the progressive loss of the main source of dopamine in the nervous system, the dopaminergic neurons. Mutations in several neuronal proteins have been associated with PD, particularly α-Synuclein, a main component of Lewy bodies. Lewy bodies are are caused by the aggregation of proteins, and these clusters are associated with the characteristic loss of physical and mental function.

**Poster 8**

*A Year at Misericordia*

**Angelica Parker**, Criminal Justice and Social Work (2020) 
Community Partner: Misericordia

After interning a complete academic year at Misericordia Home I have learned an abundance of things. In my presentation, I will be talking about Misericordia and why we need more places like it.

**Poster 9**

*How Hispanic Young Adults Interact with Brand in a Digital World*

**Lauren Holstad**, Marketing (2018), Patrycja Sporschill 
Mentored by Stacy Neier Beran, Marketing

Young adults, aged 18-25 years old are now the most diverse age group in American history. The purpose of this research is to determine how their cultural diversity affects the way they perceive, interact, and become aware of products and brands. Specifically, how are Hispanics in the age range of 18-25 years old, the largest minority, building relationships with brands in a digital world. The use of language, social media, mobile devices, shopping habits, and economic perceptions of respondents will be investigated through the use of a survey.

**Poster 10**

*Adapting to Sea Level Rise in New Orleans*

**Ansley Ostiguy**, Environmental Studies (2019) 
Mentored by Dr. Anu Krishnaswamy, Institute of Environmental Sustainability
In New Orleans, Louisiana, efforts are being made to protect the city from events such as sea level rise (SLR) and flooding. My study reveals both the city’s efforts for Climate Change resilience in regard to sustainable architecture, and its motivation for implementing resilient solutions. Resilience strategies include enhancement of infrastructure to protect against worsening storms, adaptation of housing to withstand floods, and restoration of habitats to create natural barriers. The extent to which New Orleans mobilized and continues to mobilize these strategies is driven by their specific geographical vulnerabilities, access to information, availability of funds, and tragic human and environmental losses from past natural disasters.

**Poster 11**

**Illinois’ Progressive Policies: Meeting the Needs of the Youngest English Learners**

**Jenine Ybañez**, Elementary Education (2019), Social Justice Fellowship; Mentored by Amanda Roudebush, Clinical Assistant Professor, Bilingual, Bicultural Education

With the dramatically changing demographics of students, how can preschool target the needs of some of the most vulnerable children? This research examines the policy shifts in Illinois Early Childhood Education aimed at supporting young English Learners. It follows historical and recent developments as policy actors struggle to determine what constitutes as quality education for all students. This research highlights the challenges and recommendations for implementing progressive language policies in the hope that these will inform the construction of additive language policies in other states.

**Poster 12**

**Airbnb’s Effect on Urban Rent Prices in the United States**

**Ian Millman**, Finance (2018), **Nick Zielinski, William Laveck, Jack Bobruk**

Mentored by Professor Kmet, Senior Lecturer, Quinlan School of Business

The cities being analyzed are Los Angeles, Chicago, Miami, and New York. There is a greater availability of data from Airbnb and other sources that will allow deeper examination of the desired parameters. For each city, the data for rent, tourism, transportation, and hospitality will be pulled and analyzed alongside Airbnb’s availability and pricing for each city. Using the available data we will examine how the presence of Airbnb has affected the cities it operates in.

**Poster 13**

**Jesuit Values in Action – Serving Loyola Community Adults for 26 Years. The Loyola Community Literacy Center**

**Clarissa Schooley**, English (2020), **Rachel Goldense, Jessica Mamalio, Salvatore Ocello, Johanna Sawyer**

Mentored by Jacqueline Heckman, English Department; Casey Jergenson, English Department; Shelby Sleevi, English Department

The Loyola Community Literacy Center offers free tutoring in a welcoming, supportive environment for local adults. Our learners are immigrants, refugees, and native speakers who are learning English and improving literacy skills. Loyola students serve as tutors and staff, and tutors can earn credit in English 393 or Honors 290 for their service. In its 26th year, the Literacy Center is a project of the Department of English and the College of Arts and Sciences and supported by The Paul Glassco Endowment.

**Poster 14**

**Exploring Subsistence Strategies at Helton 20 Using Dental Microwear Texture Analysis**

**Taylor Emery**, Anthropology (2017), Provost Fellowship; Community Partner: Dr. Jane Buikstra, Arizona State University, Center for American Archeology; Dr. Chris Schmidt, University of Indianapolis

Mentored by Dr. Anne Grauer, Anthropology; Dr. Kristen Krueger, Anthropology

Dental microwear texture analysis is performed on the juvenile population within Helton Mound 20, a Late Woodland mortuary site located in the lower Illinois River Valley. It has been suggested that Helton 20's demographic similarity to Mississippian sites, despite dating to the Late Woodland period, are due to a shift in subsistence strategy from foraging towards maize agriculture. Molars (n=8) were cleaned, molded, cast, and analyzed following standard procedure. Scale-sensitive fractal analysis software was used to calculate several variables which characterize the occlusal surface of each tooth.
Nursing Students’ Behavioral Intention to Seek Mental Health Services
Long Yi Yip, Nursing (2018)
Mentored by Dr Lindsey Garfield, PhD, RN, School of Nursing

One fifth of American adults experience mental health problems. Recent reports indicate 30 to 45 percent of college students experience a mental health problem annually, but only 10 percent seek professional help. Increased level of stress put nursing students at a greater risk while 33 percent of nurses reported burnout in a recent study. Stress has been linked to negative mental wellbeing, clinical safety and performance. No previous study has explored Midwestern nursing students’ behavioral intention to seek mental health services and its relations to social support, perceived benefits and barriers, stigma, seriousness and susceptibility of mental health problems.

Misericordia: An Important Community Partner for Many
Dorian Manion, Environmental Science (2018), Social Justice Fellowship;
Community Partner: Misericordia
Mentored by Andrew Miller, Center for Experiential Learning

Although Misericordia Heart of Mercy relies greatly upon the support of hundreds of volunteers each year, the non-profit also provides many benefits to the Rogers Park community as well. Without Misericordia, Chicago families would be left without the long term care and respect so desperately needed for adults with developmental disabilities. Additionally, far fewer jobs would exist in the northern neighborhood of Rogers Park, and institutions like Loyola would lose an invaluable partnership. Misericordia's benefits extend largely beyond the obvious, and I am here to share the qualitative data that proves why Misericordia is so special.

Annotating the D. eugracilis Genome
Lana Tinawi, Biophysics (2020)
Mentored by Dr. Jennifer Mierisch, Biology

The 4th chromosome in Drosophila species is made of heterochromatin, tightly packed regions that are gene poor. In most genomes, heterochromatic regions are considered transcriptionally-silent; however, this isn't the case for the 4th chromosome in Drosophila. Many of the genes on the 4th chromosome are required for development and survival; thus, the goal is to identify regulatory regions that allow these genes to be accessible and expressed despite their presence in a heterochromatic environment. Annotating the genomes of Drosophila species and comparing them to the previously annotated genome of D. melanogaster helps us gain a better understanding of these mechanisms.

The Effects of TLC on Internal and External Motivation in Individuals
Sindhu Pazhampally, Exercise Science (2019)

This presentation is focusing on understanding the effects of tender loving care on internal and external motivation in individuals. These individuals are children from newborns to 18 years old that I have been blessed to work with at two organizations: Almost Home Kids and Voice of the People Housing. This presentation will not only focus on understanding the effects, but I will be reflecting on my experience at both locations and providing a better understanding of the importance of these non-profit organizations.

Exposure to an Environmentally Relevant Mixture of Pharmaceuticals Alters Activity and Composition of Stream Biofilm Communities
Brianne Coffey, Bioinformatics (2018), Biology Summer Research Fellowship, Mulcahy Scholars Program;
Community Partner: Monash University, Cary Institute of Ecosystem Studies
Mentored by Dr. John Kelly, Biology
Pharmaceuticals and personal care products (PPCPs) are biologically active compounds that are pervasive in aquatic ecosystems globally. Multiple studies have demonstrated that PPCPs can affect benthic microbial communities, which are key components of stream ecosystems. Most prior studies have analyzed effects of single compounds, but in nature PPCPs are generally present in low concentrations and complex mixtures, creating the possibility for synergistic effects. To assess potential effects of PPCP mixtures, we added a cocktail of eight pharmaceuticals to laboratory-scale stream mesocosms at a concentration observed in an urban field site.

**Poster 20**

*Climate Change Resilience and Adaptation*

**Amanda Soukup**, Environmental Science (2020), **Kayla Lowisz, Paul Campion, Leah Vasarhelyi, Brody Diehn**

Mentored by Aaron Durnbaugh, Institute of Environmental Sustainability

The goal of our project is to expand upon the framework of Loyola’s current Climate Action Plan to create a Climate Resilience and Adaptation plan for the University. This plan offers a blueprint to guide Loyola into a future with an increasingly disruptive climate. The Resilience plan focuses on the natural, social, and built environments of the University and outlines how we can prepare for the health, infrastructure, and energy challenges of the future. The Plan resulted from collaboration with stakeholders from many parts of the university.

**Poster 21**

*Effect of Size and Length of a Critical Residue on the Regulation of Escherichia coli ADP-glucose Pyrophosphorylase*

**Anisha Sharma**, Biochemistry (2018), Mulcahy Scholars Program; Mentored by Dr. Miguel Ballicora, Chemistry and Biochemistry

ADP-glucose pyrophosphorylase is a regulatory enzyme in the production of glycogen and starch in bacteria and plants, respectively. Through site-directed mutagenesis and kinetic characterization of five different mutations, the effect of length and size of mutations on L33, a critical site in the activation of AGPase in E.coli, can be seen to effect the activity of the enzyme. L33 has been found to play a critical role in previous studies mutating the residue to alanine and valine. Further characterization with isoleucine, phenylalanine, and methionine mutations have uncovered the various inhibitory effects of these mutations on the allosteric regulation of AGPase compared to the wildtype.

**Poster 22**

*Maternal Dietary Environment's Effects on Adult Offspring's Diabetes-related Traits in a Mouse Model*

**Alexa Hinkleman**, Molecular Biology (2018), Biology Summer Research Fellowship, Mulcahy Scholars Program; Mentored by Dr. James Cheverud, Biology

Variance in the maternal dietary environment has been discovered to possess an effect on adult offspring features. Mother mice from the F60 generation of an Advanced Intercross line (LG:SM-G60) were fed either a high or low-fat diet from 3 weeks of age through the weaning of their own pups. Upon mating and offspring development, Intraperitoneal Glucose Tolerance Tests (IPGTT) and Insulin Response Tests (IRT) were conducted to determine the maternal diet's effect on their adult offspring's diabetes status. In addition to weekly weighing, this combined information provided significant insight of maternal effects on traits measured in adulthood.

**Poster 23**

*Differential Amplification of Autonomous and Non-Autonomous Members of a Retrotransposon Family in Closely Related Clover Species*

**Jacob Borge**, Molecular Biology (2018), Mulcahy Scholars Program; Mentored by Dr. Howard Laten, Professor, Biology

Prior studies have shown that the non-autonomous members are surprisingly more numerous than the autonomous members in Trifolium repens, but an exact number of the members had yet to be determined. My project was to quantitatively analyze the copy numbers of autonomous and non-autonomous members of a retrotransposon family in Trifolium repens, as well as Trifolium occidentale, Trifolium pallescens, and Trifolium nigresens. Data was gathered with a chemifluorescence protocol that utilized biotin-labeled probes.
**Poster 24**

*Relationships Between Neuronal Birthdates and Their Tonotopic Locations and Connections in the Mouse Cochlear Nucleus*

**Jenny Scheffel,** Neuroscience (2020)
Mentored by Wei-Ming Yu, Assistant Professor, Biology

Tonotopy is a key structural feature of the vertebrate auditory system, where neurons at various levels in the auditory pathway are topographically arranged by their response to different sound frequencies. In the cochlea, spiral ganglion neurons are born in a basal to apical progression along the length of the cochlea, with neurons in the base responding to high frequency sounds born early around mouse embryonic day E9.5-10.5 and those in the apex responding to low frequency sounds born late around E12.5 to 13.5.

**Poster 25**

*Studying the Spatiotemporal Sequence of How Spiral Ganglion Neurons Innervate Cochlear Nucleus Neurons and Form the Endbulb of Held Synapse*

**Samiha Mohammed,** Molecular and Cellular Neuroscience (2019), **Rishika Joshi**
Mentored by Dr. Wei-Ming Yu, Assistant Professor, Biology

Though it is estimated that 2 to 3% of all children have Central Auditory Processing Disorders (CAPDs), little is known about the causes of these hearing disorders. CAPDs are conditions characterized by difficulty performing different auditory tasks, such as accurately locating a sound source in space. The precise neural circuits within the cochlea, the auditory brainstem, and their giant specialized synapse, the endbulb of Held, are essential for processing binaural cues for sound localization.

**Poster 26**

*Determining the Molecular Mechanism of Tonotopic Map Formation in the Mouse Cochlear Nucleus*

**Amali Fernando,** Biology, Neuroscience (2019)
Mentored by Dr. Wei Ming Yu, Assistant Professor, Biology

Spiral ganglion neurons innervate cochlear nucleus neurons in a tonotopic fashion, meaning the neurons are organized by frequency response. The purpose of this project is to determine what molecules regulate the formation of the tonotopic map. The family of signaling proteins called Ephs and ephrins are known to be involved in the developments of topographic gradients. My project seeks to determine if these proteins guide spiral ganglion neurons to create a frequency gradient. Using RNAscope in situ hybridization assays, the expression pattern of Eph/ephrin molecules in the cochlea and cochlear nucleus is identified.

**Poster 27**

*RIPPEN*

**Donald Stolz,** Software Engineering (2018)
Mentored by Dr. Gregory Matthews, Statistics Department; Dr. Mark V. Albert, Computer Science Department

RIPPEN aims to measure a QBs passing performance and provide a meaningful quantification that can be easily analyzed. In a simulated world, how well would a QB perform starting from their 20 yard line and only performing pass plays. The results of each play will be selected using a Bayesian model, which allows rookies and backups with minimal data to be fairly evaluated. Drives would end in a TD(7pts), FG(3pts), or Turnover(0pts). A player’s RIPPEN is the average number of points they would be expected to score per drive (or x10 drives a game).

**Poster 28**

*Improving Models of Global Climate Change: Empirical Determination of Critical Plant Nitrogen Uptake Functions*

**Leah Vasarhelyi,** Environmental Science and Environmental Policy (2018), **Angelo Kelvakis, Samantha Panock, Kanyarak Anuchitlertchon, Erin Kilbane, Olivia Niosi, Kevin White**
Mentored by Dr. Ray Dybzinski, Institute of Environmental Sustainability

The separate and interactive influence of nitrogen availability and fine root activity on plant nitrogen uptake rate is a critical point of contact between the carbon (C) and nitrogen (N) cycles in coupled-CN terrestrial biosphere models. However, empirical data do not exist that directly relate these variables, and in their absence modelers have made a wide variety of assumptions about their relationship. We developed a simple, novel greenhouse method for empirically determining this relationship and used it to demonstrate that plant nitrogen uptake rate, while strongly dependent on nitrogen availability, is largely independent
of fine root mass.

**Poster 29**

*Innervation Strategies of Frequency Dependent Spiral Ganglion Neurons into the Cochlear Nucleus*

**Annie Parng**, Biology (2018), Biology Summer Research Fellowship, Mulcahy Scholars Program; Mentored by Dr. Wei-Ming Yu, Assistant Professor, Biology

Hearing impairment is the most common sensory defect in humans, affecting three in 1000 US newborns and seventeen percent of American adults. Any effective hearing therapy treatments require the knowledge of how spiral ganglion neurons (SGNs) form a precise circuit to link hair cells to neurons in the cochlear nucleus. To transmit sound information to the brain, SGNs extend their central processes to connect to cochlear nucleus neurons in a tonotopic arrangement. For my study, I will explore how this tonotopic organization is established by labeling high-frequency and low-frequency SGN fibers respectively using genetic approaches.

**Poster 30**

*A Comparative Analysis of Green Roofs*

**Eileen O’Gorman**, Multimedia Journalism (2020), **Kiera Grady, Kyle Chan, Silvia Miyares, Nathan Hicks**
Mentored by Dr. Anu Krishnaswamy, Institute of Environmental Sustainability

For this semester-long project we looked into green roofs and the impact they have on communities both socially, economically and environmentally. During this time, we looked at what makes a roof green. Not just the types of plants that can survive in rooftop conditions, but how much green roofs cost per square foot, how the initiative began and where the scientific community can take green roofs in the future. We brought together a comprehensive review on green roofs from our very own city of Chicago to the city with the most eco-friendly rooftops in Switzerland.

**Poster 31**

*Phylogeny's Influence on Primate Vaginal Microbiomes*

**Rita Smith**, Anthropology (2018)
Mentored by Dr. Michael Burns, Assistant Professor, Biology

My research involves reassessing a previously done study that analyzed primate vaginal microbiome species’ specificity. The previous study was done using out-dated softwares and both the genetic and microbiome phylogenetic trees were built with maximum parsimony methods. My reassessment uses the most recent software and compares microbiome and genomic phylogenetic trees using the maximum likelihood method, a more reliable determination of relatedness and evolutionary history than maximum parsimony.

**Poster 32**

*Small-Scale Herpetology Survey of Madre de Dios Region, Peru- March 3-9*

**Colleen Murphy**, Anthropology (2018), **Paul Hitch, Thomas Mauck, Brooklyn Doherty**
Mentored by Stephen Mitten S.J., Biology; Mark Mackey S.J., Biology

The diversity of herps in the Madre de Dios region of Peru were observed in relationship to four microhabitats: leaf litter, trees and vines, rivers and banks, and open area. We deployed visual survey methods within 3 meters of the trail edge over the period of 7 days. We observed 30+ species that included various amphibians and reptiles.

**Poster 33**

*Femme-ing the Factory: JARC’s Initiative to Recruit Women in Manufacturing*

**Zachary Enriquez**, Advertising, Public Relations (2018), Center for Urban Research and Learning Fellowship; **Keesha Moliere**
Mentored by Dr. Gina Spitz, CURL; Bill Byrnes, CURL

While women make up more than 47% of the U.S. workforce, they hold less than a third of manufacturing positions. Women face recruitment and retention barriers that contribute to their underrepresentation in manufacturing. To determine how to more
effectively recruit and retain women in manufacturing jobs, researchers from the Center for Urban Research and Learning (CURL) interviewed women about their experiences as students in the Jane Addams Resource Corporation’s (JARC) Women in Manufacturing program. Findings show that JARC should highlight successful woman graduates during recruitment, intensify direct recruitment strategies, and emphasize their wraparound services and job placement assistance.

**Poster 34**

*Contrasting and Correlating Prostate Cancer Genetic Susceptibility in Multiple Populations*

Mohammed Abdul Sami, Biology (2019), Mulcahy Scholars Program;
Mentored by Heather E. Wheeler, Professor, Departments of Biology and Computer Science

We aim to analyze information about prostate cancer from Japanese and African populations to understand population differences in disease risk, widen the database of risk alleles, and reveal previously unknown mechanisms within populations in comparison to prior European studies. We will conduct genome-wide association studies (GWAS) and utilize PrediXcan to observe correlations between gene expression levels and prostate cancer. We intend to create necessary models to locate risk alleles and genes, and hypothesize that some alleles will be more prevalent in any one population, creating a higher risk of prostate cancer for one population over the others.

**Poster 35**

*Home Ranges of Captive-Reared, Recently-Released Juvenile Blanding’s Turtles (Emydoidea blandingii)*

Isabella Lentini, Biology (2018), Mulcahy Scholars Program;
Mentored by Armand Cann, Graduate Assistant, Biology; Dr. Joseph Milanovich, Assistant Professor, Biology

Blanding’s turtles (Emydoidea blandingii), are a native Midwestern species listed as Endangered on the IUCN Red List. In response, captive-breeding programs have been established to augment population sizes, where turtles are reared and released into natural wetlands. We used radio telemetry to track 12 recently-released juvenile turtles and calculate bi-monthly home ranges between May to November 2017 using ArcGIS software. We found range sizes to be significantly larger during summer months than during the fall. This suggests recently-released juveniles have a similar ecology to wild-hatched individuals. These data will provide wildlife managers with insight to more effectively conserve the species.

**Poster 36**

*Humidity and Temperature Conditions on Chrysalis Emergence*

Mentored by Martin Berg, Aquatic Ecology

Examined how different humidity and temperature conditions affected the chrysalis emergence of two butterfly species from different regions of the globe. This included the Common Morpho (Morpho peleides) from the Neotropics and the Rice Paper (Idea leuconoe) from the Oriental.

**Poster 37**

*Nasogastric Tube Anatomical Model*

Shannon Roney, Biomedical Engineering (2021), Sebastian Caceres
Mentored by Dr. Baura, Engineering Science; Dr. Kostovich, Marcella Niehoff School of Nursing

3D Design of an anatomical model created by freshman engineering students at Loyola University Chicago. The model will be used by nursing students to learn proper insertion of a nasogastric tube.

**Poster 38**

*Chiral Catalyst Synthesis for Organocatalytic Carbene Insertion*

Michael O’Brien, Biochemistry (2018), Mulcahy Scholars Program;
Mentored by Dr. Hee Yeon Cho, Chemistry and Biochemistry

The objective of our research is to establish novel methods of asymmetric synthesis in organic chemistry reactions. Such reac-
tions can be used ubiquitously to produce medicinally useful compounds. Products produced by our reaction can be easily modified to include a wide variety of organic functional groups while maintaining sterospecificity of the molecule. An added bonus of this project is that it will rely on organocatalysts, eliminating the need of costly and environmentally damaging transition metals. My work has involved synthesizing chiral BINOL derivatives that can be used as catalysts for this reaction.

Poster 39

Ambivalent Drinking: An Examination of Sexism and Alcohol Consumption Among Female Loyola Students
Taylor Lippert, Psychology (2021)
Mentored by Hannah R. Hamilton, Psychology; Dr. Tracy DeHart, Psychology

Research conducted by Zucker and Landry (2007) suggests that sexism is related to increased alcohol consumption, however their research only addressed general sexism. Glick and Fiske (1996) defined two forms of sexism: hostile and benevolent. This study tested whether each form of sexism, leads to increased alcohol consumption among female students. We brought participants into the lab, where they read an article relating to a form of sexism. The next day, participants reported how much alcohol they had consumed that night. With 199 participants (152 follow-ups) our study suggested that both hostile and benevolent sexism lead to increased alcohol consumption.

Poster 40

Exploring Gendered Performances in Social Media Among Millennials: An Individual Welfare Perspective
Klaudia Kondakciu, Marketing (2018), Provost Fellowship; Melissa Souto
Mentored by Dr. Linda Zayer, Professor, Marketing

Past research demonstrates that individuals engage in self-expression online. Gender is a core aspect to the self-concept. This study focuses on exploring the gendered expression of individuals on social media. That is, how do men and women express gender through their social media platforms? We take a qualitative approach by employing in-depth interviews to receive the individual participants’ verbalized experience, and a collage technique that allows the participants to visually express what they may not be able to verbalize. We offer implications for how gender ideals are conceptualized and demonstrated in society and what impact this has on individual welfare.

Poster 41

Determining the Mechanism and Effect of Exopolysaccharide (EPS) on Dendritic Cells and T Cell Proliferation
Nikolay Todorov, Biochemistry (2018)
Mentored by Dr. Knight, Stritch School of Medicine; Dr. Kalinina, Stritch School of Medicine; Dr. Won Paik, Stritch School of Medicine; Dr. Lanning, Microbiology and Immunology

My poster will focus on describing a series of tests done using a probiotic molecule exopolysaccharide (EPS) isolated from a strain of bacteria. The poster will show the results of a series of experiments that are used to determine the function of the molecule and its effect on a certain subset of cells.

Poster 42

Sustainable Healthcare Real Estate: Comparative Analysis Between Ventas, Inc. and Welltower, Inc.
Frances Rafferty, Environmental Policy (2021), Eric Iles, Renae Marshall, Aaron Stefanovksy
Mentored by Dr. Anu Krishnaswamy, Institute of Environmental Sustainability

In today’s society, the real estate industry has begun to transition to a more balanced approach to corporate social responsibility. Although the economic and social aspects of corporate social responsibility have been the primary lenses for this aspect of business management, real estate companies have chosen to increase their awareness of the environmental lens. Our intent is to dive deeper into key aspects of corporate social responsibility by exploring the relationships and patterns between clientele/stakeholders of Ventas Inc. and Welltower Inc. the companies’ regulations and/or expectations. Specifically, we will examine the real estate aspects of the healthcare industry.

Poster 43

Determining Risk Alleles of Prostate Cancer in Latino Populations
John Morris, Bioinformatics (2019)
Mentored by Dr. Heather Wheeler, Computational Biology; Dr. Lauren Mogil, Computational Biology

The use of Genome Wide Association Studies (GWAS) has shaped how advanced medicine functions – going from a population treatment to precision care for the individual. GWAS of non-European populations are starkly underrepresented in modern genetic datasets. In my project, the aim is to analyze information about prostate cancer in Latino populations. It is suspected that variants of differing populations may lead to higher likelihood of developing prostate cancer. With the results of the GWAS, we can create statistical models based on our phenotypic data and compare them to similar studies being done.

**Poster 44**

*Modeling Climate Change Mitigation Strategies Using the CURB Tool*

**Emily Hammermeister**, Environmental Science (2019), **Amanda Huegelmann, Sierra Chmela**

Mentored by Dr. Gajan Sivandran, Engineering Science

The City of Evanston, Illinois is used as a template to better understand various climate change mitigation techniques. This research utilizes the World Bank Group’s “Climate Action for Urban Sustainability” (CURB) toolkit to 1) better predict the most impactful urban factors on environment and 2) assess the impact of potential mitigation strategies the city can implement. By using data collected from the City of Evanston, it provides local leaders with a more comprehensive vision when attempting to combat climate change at the municipal level. This can then further determine the significance of each factor when translated into real-life scenarios.

**Poster 45**

*Parent Mentor Program Evaluation*

**Michelle Sharpe**, Early Childhood Special Education, Education Policy Studies (2019), Carroll and Adelaide Johnson Scholarship; Mentored by Dr. Maria Vidal de Haymes, Social Work; Dr. Amy Krings, Social Work

This presentation provides a summary of the findings from the evaluation of the Parent Mentor Program (PMP) of the Parent Engagement Institute (PEI - a partnership between the Southwest Organizing Project (SWOP) and the Logan Square Neighborhood Association (LSNA). The Parent Mentor Program is designed to reach low-income immigrant parents with the goal of promoting stronger parent-school-community relationships through a context-specific and process oriented Ecological Model for Parent Engagement.

**Poster 46**

*Phytoremediation of Lead via Indian Mustard (Brassica juncea) and EDTA*

**Madeline Demo**, Environmental Science (2019)

Mentored by Dr. Larry De Buhr, Institute for Environmental Sustainability; Kevin Erickson, Institute for Environmental Sustainability; Dr. Zhenwei Zhu, Institute for Environmental Sustainability

This project aims to test the viability of B. juncea and EDTA to uptake lead and effectively lower total lead concentration in contaminated soil in Chicago’s West Pullman neighborhood. Habitat for Humanity Chicago owns land contaminated by lead and other heavy metals and is in need of a remediation method. Previous research indicates that EDTA can increase lead uptake in plants, but may limit growth potential. We will observe differences in total biomass production of B. juncea with treatments differing in timing and concentration of EDTA application, as well as different fertilization treatments.

**Poster 47**

*Exposing Illinois’ Neglect: Shriver Center Investigation into Distribution of Early Childhood Resources Among Vulnerable Families*

**Yasmeen Khayr**, Sociology-Anthropology, Spanish, History (2018), Center for Urban Research and Learning Fellowship; **Sarah Paulus, Kimberly Ocampo**

Community Partner: The Sargent Shriver National Center for Poverty Law

Mentored by Teresa Neumann, Center for Urban Research and Learning
The lack of services provided by the state of Illinois has left vulnerable families without the support to raise healthy and well-developed children. In collaboration with CURL, the Shriver Center has conducted numerous focus groups across the state of Illinois to explore resources available, the obstacles faced, and the services needed. As a result of these focus groups, there were clear challenges to accessible healthcare, developmental screenings and early intervention, child care, housing, etc. It is clear there is a need for Illinois to improve the services and accessibility to resources to better support working class families with young children.

**Poster 48**

*Perception of Gender Bias in Jury Verdicts of Sexual Assault Cases*

**Beatriz Reiner**, Psychology (2017), Provost Fellowship;  
Mentored by Dr. James Larson, Psychology

The present study examined whether people perceive gender bias in jury verdicts of sexual assault cases. Participants were more likely to expect a male defendant to be convicted by a mostly-female jury than by a mostly-male jury. This research extends knowledge of perceptions of gender bias to the legal system.

**Poster 49**

*Constitutional Democratization Following the Arab Spring*

**Trisha Camara**, Political Science, International Studies (2019), Rudis Fellowship;  
Mentored by Dr. Tofigh Maboudi, Political Science

This research explores whether the Arab Spring provided an opportunity for states to write a constitution that functions as a limit on state authority by deploying Tunisia, Egypt, Bahrain, and Morocco as case studies. I analyze three constitutional institutions: judicial independence; the head of state selection process; and the degree to which the legislative branch can hold the executive accountable. I conclude that constitutions drafted by revolutionaries in Tunisia and Egypt are more democratic than constitutions drafted by the state under popular democratic pressure in Morocco and Bahrain.

**Poster 50**

*Synthesis Of 3,3'-Bis(trifluoromethyl)-2,2'-Dihydroxy-1,1'-Binaphthyl*

**Nicholas Hamilton**, Chemistry (2019), Mulcahy Scholars Program, Provost Fellowship;  
Mentored by Dr. Cho, PI, Chemistry

The synthesis of 3,3'-Bis(trifluoromethyl)-2,2'-Dihydroxy-1,1'-Binaphthyl proceeds through a four step process (protection, iodination, trifluoromethyltion, deprotection) from the BINOL starting materials. The final product of this reaction contains 6 C-F bonds which are among the strongest in nature and hold great significance in modern medicinal chemistry.

**Poster 51**

*Mapping an Inducible Promoter in the Malaria Parasite Plasmodium*

**Sierra Cole**, Biology/Philosophy (2018), Mulcahy Scholars Program;  
Mentored by Dr. Stefan Kanzok, Biology

Malaria, an infectious disease caused by the protozoan parasite Plasmodium, affects millions of people a year. The parasite Plasmodium goes through a complex life cycle between animal and mosquito. The mosquito midgut poses a particularly challenging environment to the parasite. Plasmodium enters the mosquito as part of its blood meal. We recently showed that the parasite senses increasing ROS in its environment and initiates a defense response by upregulating the transcription of specific antioxidant defense genes, prominently 1-cysteine peroxidoxin (1-cysprx), which has an inducible promoter. It is our goal to understand the mechanism behind the inducible expression of 1-cysprx.

**Poster 52**

*Harvesting Algae Grown in Biodiesel Wash Water for Fish Food*

**Megan McCawley**, Environmental Science (2019), Mulcahy Scholars Program;  
Mentored by Zach Waickman, Institute of Environmental Sustainability
In the Searle Biodiesel Lab, algae can extract nutrients from our wastewater so that it may be reused in the biodiesel production process. The algae is then harvested to create a sustainable fish food for the tilapia that are grown in the Institute of Environmental Sustainability's greenhouse. We test the algae for macronutrients that the tilapia require and work towards identifying and testing an additional natural product (plant, worm, etc.) to create a balanced fish food for the tilapia. This project aims to create a new sustainable option for growing tilapia so that unsustainable commercial food is no longer required.

*Poster 53*

**Effective Mobilization and Allyship in Environmental Community Organizing: Case Study Of Pilsen, Chicago**  
Mentored by Amy Krings, MSW, PhD, School of Social Work

This study analyzed the roots of environmental campaigns in Pilsen’s Environmental Rights and Reform Organization (PERRO). It investigated the relationship between grassroots environmental organizing and the community it works in. Beyond investigating why environmental movements exist, this sociological study focused on what makes environmental campaigns work, what mobilizes people for the environment, and the most effective strategies for intersectional environmental organizing, especially in light of gentrification. This study interviewed past and present members of PERRO involved in the city-wide coalitions that defeated the Fisk and Crawford Coal Fired Power Plants in 2012, and its newest members.

*Poster 54*

**Analysis of XMN1 and SNAB1 Cis-Regulatory Regions of RALDH2 Gene**  
Suraj Sheth, Biology, Molecular Neuroscience (2018), Carbon Undergraduate Research Fellowship Program, Mulcahy Scholars Program, Provost Fellowship; Megan Delaney  
Mentored by F. Bryan Pickett, Associate Professor, Biology

Two cis-regulatory regions of the RALDH2 gene in zebrafish were studied through the use of stable transgenic deletion constructs. A two part TOL2 Transposon System [2] was used. In this experiment, we utilized two “mini-genes”- a heart marker called CMLC2::mCherry [3] and modified versions of the RALDH2 promoter and regulatory region deletions, fused with an EYFP (Enhanced Yellow Fluorescent Protein) gene. After stable transgenic lines were developed, “SCORE Imaging [4]” was utilized to visualize the anatomy of the embryos and localize the expression of EYFP. We have discovered significant deviations in expression in relation to the wild-type cis regulator.

*Poster 55*

**Fate Mapping Suggests Early Compartmentalization of Zebrafish Caudal Skeleton**  
Leah Greveich, Biology, Mulcahy Scholars Program;  
Mentored by F. Bryan Pickett, Associate Professor, Biology

The zebrafish caudal fin is a complex structure consisting of bone, vasculature, nerves, dermal fibroblasts and other tissues that are capable of regeneration in the adult. We used a microinjection procedure to generate genetically marked clones and fluorescence microscopy to visualize migration of clones over time to address questions about fate determination in the zebrafish caudal fin. Preliminary results revealed the most sharing between the two most medial hypurals suggesting that they are produced by an early developmental compartment. Developmental distances with other structures are quite large, thus there may be a medial inductive center.

*Poster 56*

**The Relationship Between Motor Skills and Physical Activity Behavior of Children With and Without Autism Spectrum Disorder**  
Jamie Miller, Exercise Science (2018), Gregory Grigoropoulos, Heather Cigas, Doug O'Neil  
Mentored by Dr. Kiley Tyler, Marcella Niehoff School of Nursing

The EXCM Physical Activity Research Team resides at Loyola University Chicago’s lakeside campus. Our mission is to explore the physical activity processes of children with and without developmental disabilities. Physical activity has been associated with improved academic performance in children, however, the amount of physical activity that school-age children engage in tends to decline across childhood into adolescence (Bartholomew & Jowers, 2011; Tyler et al., 2014). A primary objective of the EXCM Physical Activity Research Laboratory is to serve the Chicago Public School Districts by providing curriculum-based support to middle school physical education classes.
Structure-Function Relationships in Oncogenic G-Proteins

Saad Kothawala, Biochemistry and Software Engineering (2018), Carbon Undergraduate Research Fellowship Program; Mentored by Dr. Ken Olsen, Chemistry and Biochemistry; Dr. Duarte Mota de Freitas, Chemistry and Biochemistry

G-Proteins play an important role in cell signaling. Previous studies have shown that mutations in GNA1 gene that encode for the residues at the Arginine 208 position have been associated with tumors in the large intestine. We studied how the structure-function relationships of oncogenic Giα differ from those of the wild-type protein. Using functional assays, X-Ray crystallography, and molecular dynamic simulations, we propose a mechanism for the differences seen between the wild-type and oncogenic mutant.

Body Dissatisfaction and Reward Sensitivity in Eating Behavior

Veronica Szpak, Psychology (2018), Mulcahy Scholars Program; Mentored by Dr. Robert G. Morrison, Associate Professor, Psychology; Dr. Amy Bohnert, Associate Professor, Psychology; Amy Heard, Graduate Student, Psychology

Research shows that individuals with eating disorders display heightened reward sensitivity, but little is known about the mechanisms behind that relation. There is some evidence to suggest that dietary restraint, often seen in eating disorders, may play a role. However, less is known about how other components of eating pathology may relate. The current study seeks to examine the relation between body dissatisfaction and reward sensitivity in a sample of undergraduate students. Data collection for this project is ongoing as part of a larger study examining inhibition in response to unhealthy food cues in individuals with and without disordered eating concerns.

Detecting Muskrat-induced Changes in Cattail Stand Density Using UAV-collected Imagery

Nicole Spehn, Environmental Science (2018), Mulcahy Scholars Program; Mentored by Dr. Brian Ohsowski, Institute for Environmental Sustainability; Drew Monks, Institute for Environmental Sustainability; Brendan Carson, Institute for Environmental Sustainability

Coastal wetland communities are an asset to the Great Lakes (GL) region, but many are dominated by invasive hybrid cattail (Typha x glauca). Previous studies suggest that rising water levels can constrict hybrid cattail invasion as a result of ecological engineering done by muskrat communities. To quantify the impact of muskrat herbivory on Typha dominated wetlands, I have analyzed imagery from the Munuscong wetland (within the Saint Marie river) collected in concurrence with rebounding GL water levels. Using ArcGIS, I have been able to determine the impact of muskrat herbivory and lodge-creation on the total area of a Typha dominated wetland.

The Uncertainty of Refugee Resettlement: Reflecting on My Experience with a Resettlement Agency

Molly Mrzlak, Global & International Studies and French (2018)

I started my work with the Catholic Charities Refugee Resettlement Program at the tail end of an unprecedented year for changes in refugee policy. In my time at the agency, I witnessed the already stressful day-to-day operations of refugee resettlement compounded with the aftermath of harmful policies that were implemented during 2017. My work was essential to the development of interpersonal skills and understanding the nuances of refugee resettlement—aspects necessary for my professional aspirations of working for refugee rights. In this internship, I was able to work toward social justice while developing skills to do so in the future.

Family Diversity Experiences

Kelsey Johnson-Davis, Psychology (2019), Provost Fellowship;
Mentored by Dr. Christine Li-Grining, Professor, Psychology; Zahra Naqi, Graduate Student, Psychology

Family Diversity Experiences examines the effects of indirect influences on child development. This project is aimed at understanding how parent-experienced microaggressions may influence child self-regulation skills and child sleep habits.

**Poster 62**

Cervical Dilation Anatomical Model  
**Priyana Kumar,** Biomedical Engineering (2021), Valentine Geze, Sophia Sklar, Luke Dorrian  
Mentored by Dr. Jason Streeter, Engineering Science; Dr. Carol Kostovich, School of Nursing; Dr. Gail Baura, Engineering Science; Dr. Emily Chin, School of Nursing

The Marcella Niehoff School of Nursing at Loyola needs an anatomical model of the cervix to understand the different stages of cervical dilation. The model not only shows the dilation process during labor, but also effectively shows the different stages of effacement in the cervix.

**Poster 63**

Investigating the molecular basis of craniofacial malformation in *Anolis sagrei*  
**Dryden Lachance,** Biology (2017), Provost Fellowship;  
Mentored by Dr. Thomas Sanger, Biology

Previously, we have discovered that as incubation temperatures of *A. sagrei* embryos increase from 27°C to 39°C, survivorship decrease while malformations increase. Additionally, we have found that malformations appear in a significant proportion (83%) of heat shocked embryos (an hour at 39°C). Craniofacial abnormalities are the most abundant malformation in both experiments. I investigated the molecular basis of these malformations. Sonic hedgehog (Shh) genes are critical in the signaling pathway of facial formation. I used antibody staining to observe the cell death and proliferation ratios in the developing telencephalon, Shh expression region, of *A. sagrei* embryos.

**Poster 64**

Sugar Babies & the Question of Agency  
**Natasha Slavin,** Sociology and French (2019), Social Justice Fellowship;  
Mentored by Dr. Elise Martel Cohen, Sociology

Sugar babies are often caught at the fragile intersection of various axes as they navigate their ambiguous and newly forming roles within the sex industry. The default alignment of sugar babies with other sex workers, along with the umbrella categorization of sex workers as a homogenous group, blur the profound differences in agency that various sex workers possess. My project seeks to understand online sugar babies through the lens of agency—how it is denied, constructed, and reclaimed by them.

**Poster 65**

Low Positive Affect is Associated with Abnormal Prefrontal Brain Activity in Remitted Depression  
**Afreen Hussaini,** Biology and Psychology (2018)  
Mentored by Dr. Rebecca Silton, Psychology

Anhedonia is a hallmark feature of depression that is associated with low positive affectivity (PA). Low PA has been associated with unremitting depression. Abnormal levels of left prefrontal alpha activity have also been identified as a potential risk factor for depression. Previous research using alpha oscillations has relied on categorical diagnoses of depression, but prefrontal abnormalities may be related to a specific index of affect, such as low PA. This study evaluated the hypothesis that prefrontal alpha is associated with low PA in individuals with remitted depression. As predicted, low PA was associated with lower levels of left prefrontal activity.

**Poster 66**

Labor Unions and Labor Movements Promoting Social Justice in International Relations  
**Phillip Bugajski,** English, Political Science (2018), Provost Fellowship;  
Mentored by Dr. Alexandru Grigorescu, Political Science
This project examines the role played by labor unions and labor movements promoting social justice in international relations. I seek to understand how domestic actors have developed into international, nongovernmental agencies, and how these “international actors” have shaped the international labor realm over the past century and a half. My work will focus on the emergence of international labor movements before the establishment of the International Labor Organization (ILO) in 1919 and their work both with and outside of the ILO after 1919.

*Poster 67*

Synthesis of a PEG-Hemoglobin Complex to Serve as a High Affinity Oxygen Carrier

Paula Skowron, Chemistry (2018), Mulcahy Scholars Program; Mentored by Dr. Ken Olsen, Chemistry and Biochemistry

Hemoglobin Based Oxygen Carries may be able to provide blood substitutes during shortages of blood for patients who need blood transfusions. This research is trying to create blood substitutes by creating the least amount of oxidative damage to the heart and increase the blood supply. Creating an arm-extension to the PEG-backbone, it will increase the surface area for oxygen to bind and be transported throughout the body.

*Poster 68*

Tracking Gmr30 Retrotransposons with Splinkerette-PCR in Glycine max and Glycine soja

Austin Tracey, Biology (Molecular Emphasis) (2018), Biology Research Fellows Program, Mulcahy Scholars Program; Mentored by Dr. Howard Laten, Professor, Biology

Soybean is important commercially and agriculturally, and has a sequenced genome. Retrotransposons, including Gmr30 elements, have been annotated extensively in the soybean genome. Retrotransposition location provides insights into evolutionary biology, as retrotransposition remodels genomes and alters phenotypes. Domesticated and wild soybean phenotypes are drastically different, and perhaps one of the contributors to this change is retrotransposition. Using splinkerette-PCR, we successfully amplified Gmr30 elements and flanking DNA sequences from Glycine max and Glycine soja. Flanking sequences were mapped to soybean’s reference genome to determine if retrotransposition was occurring. Currently, data is being collected with these methods to determine Gmr30 activity.

*Poster 69*

Fitness, Health and Wellness at Misericordia

Rachel Gerton, Psychology (2018), ; Community Partner: Misericordia Mentored by Andrew Miller, Center for Experiential Learning

Through the Social Justice Internship at Loyola, I have spent 8 months with the Moore Fitness and Aquatic Center at Misericordia. Misericordia, a home for people with intellectual and developmental disabilities, works to maximize each individual’s “independence, self-determination, interpersonal relationships, and engagement in the community”. As the Fitness and Aquatics intern, I have contributed to this mission through maintaining fitness routines among residents and promoting general wellness in the community.

*Poster 70*

The Functional Role of L-type Voltage Dependent Calcium Channels (VDCCs) in Electric Field–induced Neural Stem Cell Differentiation

Anthony Volchek, Bioinformatics, Biology (2018), Mulcahy Scholars Program, Provost Fellowship; Mentored by Dr. Hui Ye, Biology

Control of stem cell differentiation plays an important role for efficient stem cell therapy. Although the mechanism for electric field-guided differentiation remains unknown, it is speculated that voltage-dependent calcium channels may be involved. Application of direct-current electric fields to cells undergoing differentiation favors neuron production. Immunocytochemistry will help determine the role of VDCC’s using nifedipine as a calcium channel blocker.
Identification of Optimal Growth Conditions for Chlorella protothecoides to Yield Maximum Nutrient Redemption of Biodiesel Wash Water

Kelsey O’Malley, Biochemistry (2019), Provost Fellowship; Mentored by Zach Waickman, Biodiesel Lab Manager, Institute of Environmental Sustainability

Biodiesel Wash Water (BWW) is a nutrient rich by-product of the Biodiesel fuel production. BWW has been identified as a suitable media for algae based on their ability to absorb large quantities of lipids, heavy metals, in addition to living off nutrients from nitrogen, potassium, and sodium [1]. By analyzing algae growth patterns in response to the concentration of BWW a culture receives, optimization of those conditions can maximize nutrient redemption of BWW. To evaluate, measurements of nutrient absorption from the BWW, growth rates, retention times, and pH balance were conducted through longitudinal studies.

Pupil Dilation Tracking

Julia Adamski, Computer Science (2018), Nikola Gjakovik
Mentored by Dr. Ting Xiao, Computer Science

Intrinsically photosensitive retinal ganglion cell (ipRGC) abnormalities can be detected by evaluation of pupil constriction responses to various forms of light stimuli. Dr. Bruce Gaynes is researching the function of ipRGCs in Parkinson's disease patients and examining if there is a relationship between ipRGC abnormalities and patients with sleep abnormalities. To simplify data collection, we have written a program that allows the user to manually select the pupil diameter and adjust it in subsequent frames or detect data semi-automatically using difference of Gaussian image processing techniques.

Discovery of Transcription Factor Binding Sites in Plasmodium Berghii

Alexander Linder, Bioinformatics (2018), Interdisciplinary Research Fellowship; Mentored by Dr. Kanzok, Biology; Dr. Putonti, Biology

The parasite responsible for malaria belongs to the genus Plasmodium, and undergoes a complex, multi-staged life cycle. The parasites’ successful transition between different hosts and environments relies on the transcription of highly specialized gene products. The expression of certain genes products is controlled by regulatory processes known as transcription factors, which bind to specific regulatory regions within the parasite genome known as transcription factor binding sites or TFBS (Concepts of Genetics).

Targeting AiiA: An Examination of N-Acyl Cyclobutanone Derivatives as Potential Inhibitors of Di-Zinc Metallo-Enzymes

Yasmine Payne, Biochemistry (2018), Mulcahy Scholars Program; Mentored by Dr. Daniel Becker, Thahani Habeeb Mohammad Shifna

This project focuses enzyme AiiA (Autoinducer inactivator A) found in Gram negative bacteria, critical for quorum quenching. AiiA is an AHL hydrolase, cleaving the acyl groups off of acyl-homoserine lactones and inhibits the signal transduction. This project aims to inhibit quorum sensing of AiiA by attacking its di-zinc mediated active with a peptidomimetic cyclobutanone ligand with acyl groups of various lengths. The enzyme relies on its metallo-active site for catalysis of ring opening, but recent research has shown that cyclobutanones have enzyme inhibitory features of metalloenzymes because increased ring strain enhances the ketone’s reactivity.

Area Residents’ Willingness to Pay for Environmental Goods: A Contingent Valuation

Greg Boudreaux, Economics (2018), Provost Fellowship; Mentored by Dr. Donald Jones, Quinlan School of Business; Dr. Max Melstrom, Institute of Environmental Sustainability
My research uses an economic stated preference approach to estimate the mean willingness of Chicago residents to pay for environmental goods, such as green roofs and Stormwater management infrastructure. These estimates can be used to better inform sustainable community development policy in the future.

**Poster 76**

*The Role of Arginine on the Metabolism of Sucrose by co-cultures of Streptococcus mutans and Streptococcus gordonii: Bridging the Biology and the Chemistry*

**Zachary Pang,** Biology (2019), Interdisciplinary Research Fellowship;
Mentored by Dr. Domenic Castignetti, Professor, Biology; Dr. Conrad Naleway, Chemistry and Biochemistry

Streptococcus mutans, a common bacterium in saliva is a leading cause of dental cavities. S.mutans metabolizes sucrose and produces lactic acid, which causes cavities by acidic demineralization of tooth enamel. Epidemiological studies indicate that the amino acid arginine in toothpaste decreases the rate of cavities. However, few studies have investigated the effects of arginine upon human oral bacterium. This research focuses on the effects of arginine on acid production by S.mutans when cultured alone and when co-cultured with Streptococcus gordonii. S.gordonii is able to degrade arginine and generate the base, ammonia, which neutralizes acid, such as acid produced by S.mutans.

**Poster 77**

*Liquid-Liquid Phase Separation of Drug Molecules*

**Nathan Schoenrade,** Chemistry (2018), Mulcahy Scholars Program;
Mentored by Dr. Ken Olsen, Biology

Polarity in molecules drives like molecules together in solution creating phase separation as seen with water in oil. These same thermodynamic properties affect the solubility and subsequent absorption of large hydrophobic drug molecules in the body. Using the molecular dynamics software NAMD and visualization software VMD, these properties are explored on a variety of drug molecules to demonstrate their prominence and determine the properties of the newly formed phases. Featured are simulations of Ritonavir, Nifedipine, Cabergoline, and others along with the detailed analysis of benzene as a model for future separation candidates.

**Poster 78**

*Novel Inhibition of PTP1B for Possible Diabetic Treatment*

**Nick Marotta,** Biochemistry (2018), Mulcahy Scholars Program;
Mentored by Dr. Dali Liu, Chemistry and Biochemistry; John (Yuanzhang) Zheng, Chemistry and Biochemistry; Daniel Catlin, Chemistry and Biochemistry

Protein tyrosine phosphatase 1B (PTP1B) when active inhibits the insulin signaling pathway responsible for lowering the blood sugar levels. An imbalance in the insulin triggered phosphorylation pathway could result from the over activity of PTP1B. Specifically, the insulin receptors are dephosphorylated by PTP1B on the tyrosine residues of the receptors when insulin is bound. A consequence of PTP1B down regulation on insulin bound receptors contributes to insulin resistance in type 2 diabetes. Type 2 diabetes, glucose is not entering the cells and building up in the blood stream.

**Poster 79**

*Methylation of Chromosome 21 Region 2 and 3*

**Nicole Rock,** Biology (2018), Mulcahy Scholars Program;
Mentored by Dr. Jeffrey Doering, Biology

My efforts in the laboratory are placed on the subtelomeric 6.3kb sequence on the short arm of acrocentric chromosome 21. Two different regions of the 6kb sequence are being studied in both normal and prostate cancer cell lines by bisulfite sequencing PCR method to analyze methylation patterns. My discoveries are meant to one day serve as a biomarker to best treat the stages of prostate cancer because methylation patterns, throughout the different stages of prostate cancer progression, are differing, and this should be taken into account to effectively treat the patient at their current stage.
**Poster 80**

Ephrin-A/EphA Signaling during Gustatory and Somatosensory Innervation of Fungiform papillae  
Kajol Doshi, Exercise Science (2018), Mulcahy Scholars Program; Mentored by Dr. William Rochlin, Molecular/Cellular Neuroscience

During Development, axons respond to guidance cues that help them reach their targets. This work, using taste papillae as our model system, focusses on Ephrin-As – lipid linked proteins. Ephrin-As are expressed in the taste papillae during innervation and EphAs that act as the receptors are expressed on sensory axons. When axons penetrate the fungiform papilla epithelium, ephrin-A3 and ephrin-A1 is more concentrated in the lingual epithelium and less in gustatory epithelium. Ephrin-A3 repels E18 rat-derived geniculate neurites significantly more than trigeminal neurites. Additionally, preliminary results from EnA1, A3, and A4 triple knockout mice suggest that normal innervation depends on ephrin-A signaling.

**Poster 81**

Meta-Analysis of Robustness and Pan-Cancer Signals in Cancer Microbiome Studies  
Abigail Erickson, Biology (2019), Provost Fellowship; Sidra Sohail  
Mentored by Dr. Michael Burns, Assistant Professor, Biology

The results of studies that compare the microbiome of normal tissue to that of cancerous tissue can provide insight into biological markers of cancer. We are analyzing and comparing such studies, running each set of data through an identical bioinformatics data processing pipeline. We will be testing for the robustness of each study by comparing the studies’ results with the results produced from our pipeline. Additionally, we will be testing for pan-cancer signals by identifying commonalities in the cancer microbiomes alone. This meta-analysis will determine each study’s robustness and help identify possible biological markers for cancer.

**Poster 82**

Life After Deportation: Deportee Reintegration in Mexico  
Melissa Hernández, Environmental Science (2018), Social Justice Fellowship; Marisa Laabella  
Mentored by Dr. Ruth Gomberg-Muñoz, Associate Professor, Anthropology

This research conducted a rapid assessment of the needs of deportees who attempt reintegration in Mexican society after being deported from the United States. Thirty days of ethnographic fieldwork in Zapotlanejo, Jalisco, Mexico elucidated a cumbersome reintegration process for Mexican citizens as they’re often unfamiliar with the bureaucratic requirements of return; their U.S. citizen children also encounter specific barriers to integration. Findings have extended Know-Your-Rights advocacy material to include information on the reintegration process in Mexico. Additionally, a resource asset map has been created identifying government and NGO institutions in Mexico that provide services specific to the needs of deportees.

**Poster 83**

CRISPR Mediated Abation of OTUD6B Isoforms.  
Nicholas Armijo, Neuroscience (2018), Mulcahy Scholars Program; Mentored by Dr. Maurizio Bocchetta, Professor, Pathology

Deubiquitinase (DUB) are involved in the regulation of central biological processes. Studies have been done determining that deubiquitinase OTUD6B is critical regulator of growth and proliferation in Non Small Lung Cancer Cells (NSCLC). OTUD6B is spliced into two isoforms: a "long" OTUD6B-1 isofrom, which moderates growth and proliferation and the "shorter" OTUD6B-2 isoform which is up regulated in NSCLC cells and specimens compared to their normal counterparts. OTUD6B-2 has opposing effects on global protein synthesis and proliferation compared to OTUD6B-1, its expression correlates with malignant features.

**Poster 84**

Loyola4Chicago  
Harsh Parikh, Erika Oller
Community Partner:
Mentored by Hannah Sternig, Community Engagement Coordinator, Loyola University Community Service and Action

Loyola4Chicago is a direct service program that creates a link between Loyola University students and the surrounding community. Students serve in many capacities at many different sites, and learn skills through reflection on their experiences in the program.

**Poster 85**

*Identification of circadian output clocks genes that affect rhythms in Drosophila*

**Saffia Bajwa**, Biology (2018), Biology Research Fellows Program; Mentored by Dr. Cavanaugh, Biology

Inside the Drosophila melanogaster, there are endogenous circadian clocks that exhibit daily cycles, consisting of a 24 hour rhythm. The circadian system has three main parts: input pathways, core clock cells, and output pathways. The input pathways are influenced by environmental cues, such as light and temperature, affecting the core clock cells. These then process information and trigger a behavioral response, affecting the rest:activity rhythms via the output pathways. Although much is known about the input pathways and the molecular clock, little is known about the output pathways.

**Poster 86**

*Spatiotemporal analysis of Anterior Cingulate Cortex in Older Adults with Exceptional Memory*

**Nicole M. Dosamantes**, Cognitive and Behavioral Neuroscience (2018), Carroll and Adelaide Johnson Scholarship; **Emma Sims**

Mentored by Dr. Robert G Morrison, Psychology

In collaboration with researchers at Northwestern University we have developed a cohort of SuperAgers, 80 years or older, with exceptional long-term memory to investigate factors contributing to cognitive variability in old age. Brain scans of these individuals have shown that they have much larger Anterior Cingulate Cortices (ACC) than age matched controls with typical memory. In this study we analyze EEG data recorded while they performed a task known to activate the ACC and use EEG source analysis to see whether they show differential ACC activity related to memory performance as a result of their difference in brain structure.

**Poster 87**

*Sustainability Comparison in the Hotel Industry*

**Izabela Burns**, Environmental Science (2018), **Haley Diel, Anh Le, Brian Klafta, Chelsea Caulfield**

Mentored by Dr. Anu Krishnaswamy, Institute for Environmental Sustainability

In today’s society, hotels contribute a lot of waste and pollution to the environment. While this is a major issue, some companies are making many positive changes to ensure the sustainability of the environment. Our project looks into the sustainability of the hotel industry and these positive changes being made. We compared two companies, Wyndham Worldwide Corp and InterContinental Hotels Group PLC, to research what makes them sustainable not only environmentally, but as successful businesses. Our project compares the two companies using different topics such as environmental impacts, human rights, economics, health and safety, and more.

**Poster 88**

*Characterization of Skin Microbiome in Melanoma Cell Lines*

**Vane Ristov**, Biology (2018), Biology Research Fellows Program; Mentored by Dr. Michael Burns, Biology

The human body is not a entity by itself, it exists in state of mutualistic interaction with all of the microbiota on the body. These interactions undergo certain changes when the human body develops cancer. In some cases this affects the formation and development of the cancer and this has been seen in the relatively well studied microbiome of the gut. As melanoma progresses there are also changes on the microbiome which possibly increase inflammation and drive the disease.
Differentially Methylated Regions of Human Chromosome 21

**Joseph Werner**, Biology (2018)

Mentored by Dr. Jeffrey Doering, Biology

Methylation plays an important role in gene expression, and its effects are seen differently throughout the genome. Through the amplification and sequencing of Bisulfite treated DNA, levels of methylation have been discovered in various L1 in human chromosome 21. Comparing different loci and cell lines allows analysis into the distinction of differential methylation associated with the human genome.

Microplastic in Rivers and Headwater Streams

**Naiha Sharma**, Neuroscience (2019), **Ricardo Tijerina**

Mentored by Dr. Hoellein, Biology; Dr. Rachel McNeish

The concentration of microplastic (i.e., particles <5mm) in marine and freshwater ecosystems has become a growing concern and is acknowledged as an important field of study. Rivers are freshwater habitats that act as bridges between the terrestrial landscape and marine habitats; however, little microplastic research has focused on identifying potential links between changes in land-use from headwater streams to major rivers at different spatial scales. We are studying the accumulation of microplastic in urban, agricultural and forested areas among watersheds. This will provide major contributions to understanding the impact of land-development and watershed size on concentration of microplastic in freshwater.

Analysis of Compounds Derived from Aquatic Plastic Pollution by Mass Spectrometry

**Bret Naanep**, Molecular Biology, Molecular Neuroscience (2019), Mulcahy Scholars Program;

Mentored by Dr. Paul Chiarelli, Chemistry

Plastic pollution represents one of the largest anthropogenic threats to aquatic environments. We reacted a variety of polymers (described in the results section below) with the disinfectants NaOCl and Ca(OCl)2 in solution at room temperature for variable amounts of time. The focus of this research is to characterize the reaction products of microplastics with oxidizing agents and under conditions that are currently being employed in wastewater treatment.

Synthesis of Aryl-Fluorides via Transition-Metal Catalyzed Decarbonylation of Aroyl Fluorides

**Michelle Park**, Cellular/Molecular Neuroscience (2018), Mulcahy Scholars Program, Provost Fellowship;

Mentored by Dr. Hee Yeon Cho, Assistant Professor, Chemistry and Biochemistry; Anthony Stark, Graduate Assistant, Chemistry and Biochemistry

Fluoroorganic chemistry has made a great impact in chemical industry. The high sensitivity of 19F NMR’s makes the fluorine nucleus ideal for biological studies: diagnostic 19F MRI is widely used in medicinal practice. Fluoroorganic chemistry is seen in agrochemistry, medicinal chemistry, and pharmaceuticals. Although there has been a rise in fluorination methods, there is still a lack of practical and efficient methods to synthesize aryl fluorides. Transition-metal catalysts, such as palladium and rhodium, have been explored to yield the aryl fluoride product. Different combinations of ligands have been utilized at different temperatures to run the reactions to completion.

The Relationship of Age, Gender, and Medical History on Concussion in Children and Adolescents

**Jacob Wild**, Biology (2019)

Community Partner: Ann and Robert H. Lurie Children’s Hospital of Chicago

Mentored by Dr. Brian Pickett, Biology

The purpose of this study is to describe physical, emotional, psychosocial, and sports participation data on a large prospective cohort of pediatric patients who have sustained a concussion.
**Poster 94**

*A Comparative Study of the Sustainable Management Practices of Biotechnology Companies: AbbVie Inc and Biogen Inc*

Bilguun Delgersaikhan, Environmental Policy (2021); Kendall Kupferberg, Casey Morris, Erin O’Donnell

Community Partner:
Mentored by Dr. Anu Krishnaswamy, Institute for Environmental Sustainability

Biotechnology offers the potential for enormous benefits, but also carries potential risks. The aim of our research is to compare and contrast the sustainable practices of biotechnology companies AbbVie Inc and Biogen Inc. We seek to analyze the company’s overall business models, their strategies for sustainable development, the success of their products in the pharmaceutical marketplace, and their plans to adhere to the United Nations Sustainability Goals.

**Poster 95**

*The Health Effects of Coal in the United States*

Catherine Friedman, Psychology (2019), Julius Zavala, Mary Zenger, Rachel Phan, Nicole Katsevman

Mentored by Dr. Anu Krishnaswamy, Institute of Environmental Sustainability

Coal is used to produce a seemingly limitless supply of electricity and industrial goods. However, coal has the highest pollution emitted per unit of energy produced, when compared to other fossil fuels. Our objective was to conduct deep research into health effects of coal production and use in the United States. We examined the issue from three perspectives: social, economic, and environmental. Our project synthesized information about health risks to coal miners, populations near coal mining operations, and residents near coal burning plants. Finally, we analyzed the benefits of coal use and compared the health risks to the potential benefits.

**Poster 96**

*The Effects of Near Peer Coaching on the Development of Self-Concept in At-Risk High School Freshmen*

Miriam Pierce, Advocacy and Social Change (2018), Provost Fellowship;
Mentored by Mary Charles, School of Education

Ninth grade, which marks the shift between elementary and secondary education, is commonly regarded as a critical period of adolescent growth. This study seeks to ascertain the changes in students’ self-concept that occur during their first year of high school. Research will take place at three Chicago public schools partnered with Target New Transitions (TNT), a program that pairs college-aged academic coaches with at-risk high school freshmen. By following the unique coach-student relationships as they evolve throughout the year, this study furthermore aims to provide possible insights into the interrelated nature of near peer coaching and the development of self-concept.

**Poster 97**

*The Data Behind the Game*

Tessa Boukal, Sport Management, Info Systems (2018), Provost Fellowship;
Mentored by Professor Svetlozar Nestorov, Quinlan School of Business

Sports analytics is a rapidly growing industry. In 2021, the market size of the industry is to reach $4.7 billion, up from $125 million in 2014. This growth creates an opportunity & demand for sports analytics on a wider scale. The purpose of this project was to analyze women’s college basketball data and visualize it in a way that allows for the benefit of coaches, players, and the media. The ability to visualize statistics in an understandable way will lead to greater adoption and success for teams and greater resources created for the women’s game.

**Poster 98**

*Influence of Entomophagy on the Structure and Function of the Healthy Human Gut Microbiota*

Gabrielle Martinez, Molecular Biology (2018), Mulcahy Scholars Program;
Mentored by Dr. Michael B. Burns, Assistant Professor, Biology

Our lab is investigating the change in human gut microbiome as a function of dietary availability of standard, Western diet or a diet supplemented with protein derived from insect sources. The microbiome will be assessed both *vitro* and *in vivo*. All participants are assessed prior, then spend a designated time frame in either the experimental or control arm, with daily stool self-
sampling. The hypothesis is that there will be alterations in the microbiome that are specific to an insect-enriched diet when compared to a standard Western diet.

**Poster 99**

*Loyola Athletics Fan Experience*

Jonathan Garcia, Marketing (2019), Deanna White and Mine Dafiagh
c
Community Partner: Loyola Athletics
Mentored by Dr. Stacy Neier Beran, Senior Lecturer, Marketing

Our team will present marketing research on behalf of the Athletic Department within Loyola University. We designed research that utilizes secondary data, observational data, and focus group data. We used this data to create recommendations for Loyola Athletics in order to increase attendance at sports events, invest in student satisfaction, and increase awareness of the importance of an athletics experience within our university community.

**Poster 100**

*Invertebrate Community Structure Along a Temperature Gradient in Elodea Infested Ponds on the Copper River Delta, Alaska*

Samuel Wilkinson, Biology (2018)
Mentored by Dr. Martin Berg, Biology

Investigating the influence of increasing water temperatures and an invasive macrophyte, Elodea canadensis, on invertebrate communities in coastal wetland ponds across the Copper River Delta, AK.

**Poster 101**

*Precision Treatment of Breast Cancer using Pathological Data, Clinical data and Next Generation Sequencing*

Alyssar Habib, Biology (2018)
Mentored by Dr. Michael Burns, Assistant Professor, Biology

Personalized medicine has become a new frontier in breast cancer treatment that utilizes molecular and genomic data to treat patients. Different biomarkers such as hormone receptors, lymph node presence and HER2 sensitivity allow scientists to determine the best course of treatment for individual patients. The Oncotype DXTM genomic assay has been used to compute a risk score for recurrence for breast cancer patients. This study utilizes pathologic data including risk scores and Next Generation Sequencing clinical data to analyze resistance pathways and ultimately identify optimal treatment for breast cancer patients.

**Poster 102**

*Leadership, Social Justice, and Loyola*

Hind Mothana, Biology (2021), Sylwia Balata, David Lescano, Brianna Powell
Community Partner: Student Diversity & Multicultural Affairs
Mentored by Paige Gardner, Student Diversity and Multicultural Affairs

This project revolves around service leadership and how it permits for furthering social justice on the Loyola campus. We will be looking back at our own service leadership experience, which involved mentoring youth at Family Matters, and connect it to the importance of leadership when it comes to permanent social change, as opposed to committing temporary charity. Drawing upon our mentorship experience, hallmarked by a mentor/mentee collaborative project focused on social justice initiatives, our research seeks to delve into the merits of “people-driven” social change.

**Poster 103**

*Unearthing ECC10: Characterization of a Novel P2 Virus*

Bridget Brassil, Biology (2018), Women in Science Enabling Research;
Mentored by Dr. Catherine Putonti, Bioinformatics

Bacteriophages are viruses that infect bacteria, and despite their extraordinary abundance, many are undiscovered. I have been working with a novel phage, ECC10, which was originally isolated from soil and can now grow on lab strains of E. coli. The bacteriophage was sequenced, and found most similar to the phage, Wphi, showing that ECC10 was most likely in the genus,
P2 virus. I further characterized ECC10 by identifying its host range, determining its growth parameters, verifying its predicted morphology (based on P2 viruses’ shape), and annotating its genome to align it with all P2 viruses and identify unique genes.

*Poster 104*

**Social Enterprise Success in the United States: Working Together to Create a Better Tomorrow**

*Rachel Taylor*, Management (2018), *Erin Barnier*
Mentored by Dr. Anne Reilly, Quinlan School of Business

Our research is about what makes social enterprises in the United States successful and our recommended models for future social enterprises. This research closely examines 30 US-based social enterprises to discuss appropriate business models, reach, and implications for the future.

*Poster 105*

**E-Commerce, Social Media, & the Effect of Stores’ Responsiveness to Consumers: An exploratory research study into the women’s apparel industry**

Mentored by Dr. Anne Reilly, Quinlan School of Business

The women’s apparel industry is one of the biggest industries in the United States. We examined how consumer desires effect retail businesses. We believed that if retailers are incorporating consumer trends, then they will have more followers as well as e-commerce sales. To create our data set, we judged each online site based on their eco-friendly fabrics options, expanded sizes selections, and sizing tools. We found that there was a correlation between the retailer’s e-commerce growth rate and the sizing tools metric. Our findings solidified the value of social media data to business and created a path for future exploration.

*Poster 106*

**Organizing and Advocacy for Social Justice**

Community Partner: Catholic Charities
Mentored by Andrew Miller, Center for Experiential Learning

In order to effect positive social change, communities must be able to organize and advocate for the causes that matter to them. Successful community organizing and advocacy require building interpersonal relationships, evaluating community assets, and democracy. This presentation connects the work done in the Government Relations Department at Catholic Charities to organizing and advocating for social justice on a grand scale.

*Poster 107*

**Approximate Algorithm for Insertion into Gene Network**

*Nicholas Predey*, Computer Science, Math (2019), Carbon Undergraduate Research Fellowship Program; Mentored by Dr. Catherine Putonti, Bioinformatics

Despite their ubiquity and obvious importance, our level of understanding of viruses generally is still equivalent to being in the dark ages. In fact, the vast majority of viruses sequenced have no resemblance to any characterized known virus. We developed a new approach for analyzing viral DNA sequences using graph and network theory. This project uses comparison of Jaccard index for k-mer sets to determine the position of potentially added genes into our network. Our solution provides a faster, approximate solution to an exponential time algorithm with roughly 80% insertion accuracy.

*Poster 108*

**The Mediation Effects of Self-Efficacy on the Relationship between Neighborhood Perception and Academic Achievement**

*Christina Tran*, Psychology, Criminal Justice (2018)
Mentored by Dr. Maryse Richards, Professor, Clinical Psychology; Cara DiClemente, Graduate Assistant, Child and Adolescent Clinical Psychology

This research seeks to determine whether self-efficacy mediates the relationship between negative perceptions of one’s neighborhood and academic achievement. Children growing up in very poor families are at a clear academic disadvantage (Boardman & Robert, 2000); do neighborhoods with high poverty and violence create similar disadvantages? Environments of
poverty can foster doubt surrounding one’s ability to succeed, and low self-efficacy can decrease grades. This study analyzed self-report measures and school GPA within a sample of 108 youth (65% female, 95% African American, mean age = 16.4) from the south side of Chicago to assess for mediation effects.

**Poster 109**

*Solar Energy Technology and Policy: A Comparative Analysis Between the United States and Germany*

*Sonia Ohashi*, Environmental Science (2018), *Natalia Gardocki, Leah Carson, Serena Mackey, Megan Herdegen*
Mentored by Dr. Anu Krishnaswamy, Institute of Environmental Sustainability

This project will be a comparative analysis of the developments in solar energy between Germany and the United States. Our goal is to gain a better understanding of the energy policies these countries hold and their economic, social, and environmental impacts. Because climate change and environmental degradation are contemporary global issues, countries must rely on each other to find strategies and solutions to these crises. We chose to compare the U.S. to Germany because of their progressive initiatives in generating solar energy. Through our analysis we hope to create recommendations for the U.S. to improve our use of solar power and our impact on the energy industry.

**Poster 110**

*Children’s Mental Health in the Context of Neighborhood Violence: The Intervening Role of Parenting Behaviors*

Mentored by Anna Maria Ros, M.A.; Dr. Catherine DeCarlo Santiago, Psychology

Latino immigrant families face disproportionate rates of exposure to contextual risk factors, such as neighborhood violence. Given this, the present study investigated the moderating role of parenting behaviors on the relationship between neighborhood violence and child psychological symptoms in a sample of low-income, Mexican-origin families. Parental warmth and monitoring were found to be negatively associated with child internalizing and externalizing symptoms cross-sectionally. Additionally, longitudinal analyses revealed that parental warmth and monitoring predicted fewer externalizing symptoms over the course of three years. Significant interactions between parental monitoring and neighborhood violence on child externalizing symptoms were also found both cross-sectionally and longitudinally.

**Poster 111**

*Shock and Pattern Development in Vertically Shaken Granular Media*

*Nicholas Corkill*, Physics, Mathematics (2019), *Anirrudh Krishnan*
Mentored by Dr. Jon Bougie, Physics

Granular media, such as a sand beach or a bowl of rice, can exhibit interesting properties that are much like properties of fluids and can be thought of as a continuum much like a fluid. The Navier-Stokes equations are used to model a continuum fluid flow, but there is not currently an established set of equations that will model a continuum granular media flow. Authors have previously modified the Navier-Stokes equations to produce a set of equations that if solved would become a base set for modeling granular media flow. This project tests these equations to relate shock and pattern formation in granular media.

**Poster 112**

*GEX1A Splicing Modulator Shows Growth-Inhibiting Effects in Select Acute Myeloid Leukemia (AML) Cells*

*Mark Sellin*, Biology (2018)
Mentored by Fr. Peter Breslin, Oncology Institute; Dr. Jiwang Zhang, Oncology Institute; Wei Wei, Oncology Institute

GEX1A is a modulator of mRNA splicing. It inhibits spliceosome activity by binding to SB3F1 of the U2 snRNP and deactivates it. Since many AML subtypes are known to show aberrant pre-mRNA splicing, it is anticipated that AML subtypes with abnormal splicing activity can be selectively killed by targeting those cells with abnormal SN3R1 expression and/or phosphorylation. With this in mind, we tested several different AML subtypes with various concentrations of GEX1A to determine their IC50 response to the drug. In doing so, we identified some AML subtypes which are sensitive to this drug and the genetic aberrations related to these responses.

**Poster 113**

*Identifying the Issue*

*Makayla Wietek*, Human Services (2021), *Breanna Stokes, Sanja Zainulabdin, Raven Cole*
Mentored by Paige Gardner, Student Diversity and Multicultural Affairs

By implementing our social identities in our leadership positions with STARS, we were able to educate the youth at Family Matters on the various social issues that challenge society. Through mutual bonds, we are able to help the next generation become more aware and involved. We hope that in doing so, the upcoming generation can implement the same tactics in their future endeavors in addressing societal issues for the promotion of a better society.

Poster 114

Endotracheal Tube Anatomical Model

Hannah White, Environmental Engineering (2021), Camryn Aten
Mentored by Dr. Streeter, Clinical Assistant Professor; Dr. Baura, Director, Engineering Science; Dr. Kostovich, Associate Dean, Simulation-Based Teaching and Learning

My partner, Camryn Aten, and I will be presenting our ENGR 101 Freshman Design Project: The Endotracheal Tube Anatomical Model. We incorporated the SolidWorks 3D printing program and utilized the iterative engineering design process to design an anatomical model which will be utilized by the faculty and students housed in the Marcella Niehoff School of Nursing.

Poster 115

Intrastrand Base Pair Formation in Repetitive DNA Sequences

Marisa Mitchell, Biophysics (2018), Mulcahy Scholars Program;
Mentored by Dr. Brian L. Cannon, Physics; Michael Leveille, Physics

Repetitive trinucleotide DNA motifs at distinct genetic loci are responsible for triggering numerous hereditary, neurodegenerative diseases, such as spinocerebellar ataxia and Huntington's disease. The occurrence of non-helical DNA structure within these motifs interferes with normal DNA processing and ultimately leads to pathogenic states. The precise role of these structures in this interference remains unresolved; therefore, an improved understanding of these structures is critical for developing targeted therapies. As a first step, we characterized the formation and dynamics of CAG and CTG repeat DNA hairpins, a specific non-helical structure that can form within these trinucleotide domains.

Poster 116

Optimizing Gene Predictors in Diverse Populations

Jennifer Takamura, Biology (2019)
Mentored by Dr. Wheeler, Biology; Dr. Mogil, Biology

Genome wide association studies are predominantly performed on European populations, however, these results cannot be accurately applied to non-European populations. Our goal is to expand the current database of gene expression prediction models for multi-ethnic populations using data from the International HapMap Project and from Stranger et al. 2012. To make the gene predictors we used ElasticNet, which analyzes how much each SNP contributed to gene expression. We then used PrediXcan, which is a gene-association test that predicts gene expression levels for complex traits. We hypothesize that gene predictors that are similar to multi-ethnic populations will outperform European gene predictors.

Poster 117

The Effects of S. Gordonii DL1 Ammonia Production on pH Buffering in the Oral Cavity

Richard Padovano, Biology, Spanish (2019), Mulcahy Scholars Program;
Mentored by Dr. Domenic Castignetti, Biology

Recent studies have found a new approach to prevent cavities that involve using arginine. Streptococcus gordonii DL1, a bacterium found in the oral cavity, has an enzyme called arginine deiminase. Bacteria that have this enzyme can metabolize arginine which leads to the production of ammonia. Ammonia can then act as a base, absorbing acid and reducing the acidity in the mouth (2). Our goal is to determine if the new bacterium can produce enough base to counteract the amount of acid that is being produced by both itself and S. mutans when the two are co-cultured.

Poster 118

The Effects of Ammonia Production on Buffering Capabilities in Oral Environments

Michael Ross, Biophysics (2018), Mulcahy Scholars Program;
Mentored by Dr. Domenic Castignetti, Biology; Dr. Conrad Naleway, Chemistry and Biochemistry
It is our intention to quantify how the metabolic ammonia production of S. gordonii can buffer the acidification of oral environments.

**Poster 119**

*Comparison of Sustainable Initiatives Between Gap Inc. and Best Buy Co, Inc.*  
Ali Graczyk, Environmental Science (2019), Annika Tanus, Chuck Kuo, Kamren Thames  
Mentored by Dr. Anu Krishnaswamy, Institute for Environmental Sustainability

The goal of this project was to compare the sustainability of the companies Gap Inc. and Best Buy Co, Inc. Many companies publish annual Corporate Social Responsibility (CSR) reports stating their sustainable initiatives. In this project, we have conducted research on whether Gap Inc. and Best Buy Co, Inc. hold true to their goals and compare the two retail giants’ sustainability efforts.

**Poster 120**

*Synthesis of π-Conjugated Systems Containing Pentalene Units*  
Maxwell Harsha, Biochemistry (2019)  
Mentored by Dr. Hee Yeon Cho, Chemistry and Biochemistry

Pentalene units are π-conjugated systems with unique structural and electronic properties. Molecules that contain these units have wide areas of application in organic electronics, organometallic catalysts, and medicinal chemistry. A known synthesis of a pentalene precursor can lead to the unknown oxidation reaction affording a dibenzo[a,f]pentalene derivative. After the unknown oxidation reaction is completed, the synthesis of the pentalene derivative will be optimized for efficiency.

**Poster 121**

*Analyzing the Impact of Climate Change on Migration Patterns Throughout Africa*  
Sarah Steiner, Criminology, Criminal Justice (2018), Katie James, Nick Tyndorf, Zion Banks, Luke Landry  
Mentored by Dr. Anu Krishnaswamy, Institute for Environmental Sustainability

Climate change has caused many problems that have directly affected people all around the globe. Africans, in particular, have been disproportionately impacted by extreme weather events, drought and the loss of agricultural productivity, negatively altering their way of life, resulting in huge displacements of populations. Our research is focused on understanding the threats faced by people who are forced to leave their homes while seeking refuge in places of safety that can provide their families the basic necessities for subsistence such as food, water, and shelter. Our team seeks to conceptualize and create innovative solutions to combat these challenges.

**Poster 122**

*Analyzing Sustainability in the Waste Management Industry*  
Maryam Butt, Neuroscience (2020), Natalie Soriano, Brenna Plucinski, Jackie Nichols, Diego Ramirez, Javier Ayala  
Mentored by Dr. Anu Krishnaswamy, Institute for Environmental Sustainability

The purpose of this project is to take a closer look at the recycling processes that are done currently between Waste Management and Republic Inc, and use the information gathered to decide which company has more efficient and sustainable practices. Research must be conducted to understand why there is continuous growth in landfill waste even though it’s harmful implications on the environment is general knowledge. Research gathered will be an aid in exposing flaws in the recycling process, and where improvements can be made for the everyday consumer.

**Poster 123**

*Broad Strokes: Examining America's Relationship to Land Through Art*  
Catherine Hanczor, Art History (2018)  
Mentored by Dr. Marilyn Dunn, Fine and Performing Arts; Dr. Paula Wisotzki, Fine and Performing Arts

I will examine the relationship America has to its land by analyzing art within four historical frameworks. Using works from the Hudson River School, Earth Art, Photography and Contemporary Art I will demonstrate continuity, change, and evolution in American attitudes towards the country's natural environment and how these changes are reflected in depictions of American landscapes.
•Poster 124

The Hospitalist Project
Sarah Paracha, Biology (2018)
Community Partner: The Hospitalist Project
Mentored by Dr. Linda Brazil, Director, Center for Science and Math Education

The Hospitalist Project's objective is to improve both inpatient and outpatient care through the use of Comprehensive Care Physicians. These physicians focus their practice on a small number of patients, who are more likely to need hospital care, to ensure the physicians have familiarity with their patients and their health status. The Project is a randomized clinical trial that evaluates this new model of care in hopes of improving the health of patients who are more susceptible to hospitalization.

•Poster 125

Ribbon Regulation of Gonad Development and Function
Usama Khan, Psychology (2018), Interdisciplinary Neuroscience Fellowship, Provost Fellowship;
Mentored by Dr. Jennifer Mierisch, Biology

The ribbon gene is required for the compaction of the embryonic gonad. Our goal is to explore if ribbon has further developmental roles in the adult fruit fly. This is done by overexpression of the gene as well as knockdown to see what phenotypes will be produced in the adults. Given mutant adult phenotypes, we are aiming to explore the earlier stages of development to track which larval stages the mutations become apparent.

•Poster 126

Nitrogen Insertion Catalysis Using a Nickel (I) NNN Pincer Ligand-Metal Complex
Jack Ghannam, Biology (2018), Mulcahy Scholars Program;
Mentored by Dr. Wei-Tsung Lee, Biology

Recently, there has been much interest in late 3d transition metal complexes containing multiple bonds to nitrogen, especially in their use as catalysts for nitrene-group transfer reactions. These species' ability to “functionalize” C-H bonds via nitrene insertion, such as in the aziridination and amination of olefins and alkanes, respectively, highlights their potential to be excellent catalysts in difficult hydrocarbon conversion reactions. Here, we present a novel T-shaped Ni(I) complex with C-H amination capabilities that are mediated via an even more novel Ni(III) nitrene intermediate, as evident by an isolable intramolecular C-H activation product and Ni(III) nitrene activated by photolysis.

•Poster 127

Elucidating the Function of an Evolutionarily Conserved Embryonic Splice Variant of Type II Collagen During Vertebrate Development
Sophia Lam, Biology (2019), Biology Research Fellows Program;
Community Partner:
Mentored by Dr. Rodney M. Dale, Biology; C. Lantz Ingersoll, Graduate Student, Biology

Our project focuses on the genetic regulation and protein activity of the zebrafish gene col2α1a, one of two orthologs of the human COL2α1 gene. The goal is to observe the early zebrafish development during the overexpression of the VWF-C protein domain of col2α1a in its native tissue expression. We hypothesize that the overexpression of the VWF-C domain will create abnormal BMP signaling gradients, disrupting organogenesis. This work could elucidate a novel mechanism to utilize a structural protein having a secondary function as a molecular sponge to soak up excess morphogen and maintain gradient coordinate system for the vertebrate body plan.

•Poster 128

The Formidable Legacy of Family Brassicaceae at LUREC: Measuring the Extent, Arbuscular Mycorrhizal Community Potential, and Restoration Challenges Associated with Brassicaceae Invasion
Connor Tomaka, Environmental Science (2017), Provost Fellowship;
Mentored by Brian Ohsowski, Institute of Environmental Sustainability
Arbuscular mycorrhizal fungi, a ubiquitous plant symbiont that associates with ~80% of land plants, are well known to influence plant phosphorus acquisition and shape plant community diversity. AM fungi develop extensive hyphal networks that increase plant nutrient access in soils in exchange for plant sugars. Competitive advantage is gained in family brassicaceae through the secretion of allelopathic chemicals. In this study we analyzed invasions of Hesperis matronalis and Alliaria petiolata at LUREC. By measuring the extent, arbuscular mycorrhizal community potential, and restoration challenges associated with Brassicaceae invasion we are better able to understand and properly manage these invasions.
OUTSTANDING LOYOLA UNDERGRADUATE RESEARCHER

This award has been established to honor Loyola undergraduates who conduct exceptional research, articulate their research to others, and enhance Loyola’s reputation as a quality research university by integrating research into their academic learning experience.

LANGERBECK AWARD FOR UNDERGRADUATE RESEARCH MENTORING

The Langerbeck Award recognizes the exceptional work of Loyola’s faculty mentors who are contributing significant time and effort to the intellectual, ethical, and academic development of undergraduate researchers.

GRADUATE STUDENT MENTOR AWARD

This award is designed to recognize the work that Loyola’s graduate students perform in mentoring undergraduate researchers, fostering their intellectual, ethical, and academic development.

HAYES AWARD FOR ADVISING AND MENTORING

The Hayes Award recognizes faculty who demonstrate a commitment to advising and mentoring students within and outside the classroom. Excellent faculty mentors are involved in helping students discover their passions, develop a dedication to life-long learning, and guiding students’ intellectual, personal, social, and spiritual growth.

LOYOLA UNIVERSITY LIBRARIES UNDERGRADUATE RESEARCH PAPER AWARD

This award recognizes outstanding research conducted by undergraduate students at Loyola University Chicago. The award is not only given based on the paper itself, but also the author’s reflection on the research process, including the role of the library’s resources and services.
COMMUNITY ENGAGEMENT AWARD

The Community Engagement Award for Social Justice, Community Engagement Award for Innovation in Sustainability, Community Engagement Award for Impact, and Community Engagement Award for Solidarity will be presented to the student or group of students who represent an active and ongoing pursuit in social justice, sustainability, impact, or solidarity in their community.

LOYOLA EXPERIENCE ENGAGEMENT KEY

The Loyola Experience Engagement Key focuses on engaging Chicago and the world. As such, this key focuses on the integration of a student’s engaged learning experience and academic course content. Students were asked to consider the values named in the mission statement of Loyola to “expand knowledge in the service or humanity through learning, justice, and faith” and demonstrate how they have shown a commitment to one or more of these values through their engaged learning experience.

LOYOLA EXPERIENCE CULMINATING LEARNING PORTFOLIO

In a few short years at Loyola, students have been completely transformed. They have developed the skills, knowledge, and values needed to make a real difference in this world. The Loyola Experience is a collection of integrated academic, spiritual, and social activities distinguished by students’ own unique talents, gifts, and desires.
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