

HONORS SCHOOL



The Honors School Research Conference Fall 2019

***With great pleasure, the
Honors School presents its
Fall 2019 Research Conference***

Students will be presenting their research in the following fields:

Biology (BY)

Business (BU)

Chemistry (CE)

Education (ED)

English (EN)

Health Studies (HE)

History (HS)

Political Science (PS)

Psychology (PY)

Social Work (SW)

**FALL 2019
HONORS SCHOOL
RESEARCH CONFERENCE SCHEDULE
Friday, December 6, 2019**

SESSION 1: 1:30 p.m. - 3:00 p. m.

**Opening Remarks: Dr. Nancy J. Mezey
Dean of the Honors School**

Kathy Chen, Chemistry with a Concentration in Biochemistry

Alexa LaVere, Health Studies

Mika Schievelbein, Chemistry with a Concentration in Biochemistry

Catherine Harvey, History and Secondary Education

Alexia Raess, Social Work

Melanie Broman, English with a Concentration in Creative Writing

Michael Scognomillo, Clinical Laboratory Sciences

3:00 – 3:20 BREAK (light refreshments will be available)

SESSION 2: 3:20 p.m. - 4:30 p.m.

Chanell Singletary-Eskridge, Psychology

Thomas Prioli, History and Political Science

Nicole Tarsitano, English

Angelica Pellone, Interdisciplinary Studies and Elementary Education

Gianni Mazzone, Business, Economics and Finance

Omar Shah, Chemistry with a Concentration in Biochemistry

Jon P. Suttile, Political Science

Brian Mathew, Biology with a Concentration in Molecular Cell Physiology

Closing Remarks: Dr. Nancy J. Mezey

Opening Remarks

DR. NANCY J. MEZEY, *Dean of the Honors School*

Student Abstracts

In Order of Presentation:

KATHY CHEN (CE.BY) | *NMR Analyses of Rhenium Compounds*

First Reader: Dr. Gregory Moehring

Second Reader: Dr. Datta Naik

The dynamic processes of rhenium tetrahydride complexes that were synthesized by students in an inorganic chemistry lab were examined through variable temperature ^1H NMR spectroscopy and the simulations of those results. The hydrogens on the rhenium tetrahydride complexes displayed hydrogen exchange through two different reactions. One reaction involved 1H and 3H exchanging in a turnstile fashion. Another reaction involved exchange between 2H and 3H on the molecule. Eyring plots were formulated with the k values for each reaction found in the simulations and with the temperatures from which each measurement was taken at. The analyses of these specific compounds may be used as a method to analyze potential cytotoxic compounds in the future.

ALEXA LAVERE (HE.HE) | *The Impact of Brief Educational Interventions on the Dietary Practices, Perceptions, and Motivations of College Students*

First Reader: Dr. Sasha Canan

Second Reader: Dr. Chris Hirschler

The purpose of this study was to assess the effectiveness of brief interventions in causing college students to shift towards or adopt a vegetarian or vegan diet. Brief interventions consisted of short media clips no longer than five minutes in length. The baseline dietary practices, motivations, and perceptions were compared with those reported two weeks following the intervention. Participants consisted of 231 Monmouth University students, ages 18-24 enrolled in basic health courses. The six classes were broken down into three groups, with two course sections in each group. Group one viewed a four-minute video concerning the benefits of a vegan diet. Group two also viewed the same video as group one, as well as an additional video that consisted of a quick vegan cooking tutorial. Group three served as a control group, which would allow confirmation of any observed change to be attributed to the interventions. It was hypothesized that there would be a shift towards adopting vegetarian/vegan diets following brief interventions and especially among group two, which received both the educational video as well as the vegan cooking tutorial clip. Inconsistent to my hypotheses, all brief interventions utilized in this study produced no change in dietary practices, perceptions, or motivations that represented a causal relationship. Using the Transtheoretical Model as a guideline, it was concluded that this study design did not align with the complex, multi-stage process of change.

MIKA SCHIEVELBEIN (CE.BY) | *The Theophylline Riboswitch: Its Design and Implementation*

First Reader: Dr. Jonathan Ouellet

Second Reader: Dr. Davis Jose

Fluorescence Activated Cell Sorting, or FACS, is a method that was used to convert the theophylline aptamer into a riboswitch. This method could theoretically be used to convert other discovered aptamers into riboswitches, however it is a costly method and is only available to those with access to these high-tech, expensive machines. The theophylline riboswitch was previously discovered by implementing the theophylline aptamer, with random sequences linking it to the expression platform, into a specifically-designed plasmid, and then using a FACS machine to sort the cells. We can structure a new system that would select only the correct sequence, containing the theophylline riboswitch out of a pool, without the use of a FACS machine. To do so, we place the pool of sequences containing the aptamer, linked to the Shine Dalgarno by eight randomized nucleotides, into a newly designed plasmid, placNEO, and transform the plasmid into bacteria cells. Then, the use of replica plating along with screening will select the cells that only contain the plasmid with the correct riboswitch sequence. By doing so, we confirm that this system is efficient in converting aptamers into riboswitches without the need for a FACS machine. After an aptamer has been successfully converted into its riboswitch, the system of ratiometric fluorescence will allow for testing of the riboswitch's function. This is done by designing a plasmid, pTRFlac, that contains genes for red and green fluorescence proteins, mCherry and GFP respectively, on either side of the inserted riboswitch. A PCR product encoding for mCherry, the riboswitch, and GFP will be inserted downstream of the lactose operon in pUC18. Ratios of the fluorescence intensities of the two fluorescent proteins will provide the ability to measure the riboswitch's function through fluorescence readings.

CATHERINE HARVEY (HS.EDS) | Slavery in the Classroom

First Reader: Dr. Katherine Parkin

As a preservice history and secondary education teacher, I found myself grappling with America's willingness to confront its historical past surrounding the coverage of slavery and reconstruction in the classroom. The address of these historical happenings is what propelled my research initially into the analysis of materials spanning the time immediately following the Civil War and into the twentieth-century. However, over time I realized that I wanted to understand the information that more directly preceded my role as a classroom teacher, and chose the 1970s for not only its temporal proximity to the Civil Rights movement but for the expansiveness of materials I uncovered in the time period. In the interest of addressing the way slavery and reconstruction have been taught from a variety of perspectives, I chose to focus on Mississippi, Kentucky, and New Jersey. I chose these states for their traditionally perceived classifications in the Civil War, as southern state, border state, and northern state respectively, so as to ensure representation of narratives as they may change based on geography. In analyzing these states for their representation of slavery in textbooks and educational materials, I have been able to connect the proliferation of misinformation surrounding the topic into a modern context.

ALEXIA RAESS (SW) | *High School Dropout Rates and School Social Work in Charter Schools: A Case Study*

First Reader: Dr. Sanjana Ragudaran

Second Reader: Professor Ralph Cuseglio

This is a case study analysis of a local public charter high school in the northeastern United States. The purpose of this research is to explore the relationship between school social work influences and high school dropout rates specific to charter schools. A mixed methodology means of data collection and analysis was utilized including direct observations, individual interviews of both staff and administrative personnel, and aggregate secondary data provided by the school administration. Data specific to dropout rates by cohort was analyzed over a period of five to six school years in order to seek out trends or themes. Findings suggest that dropout rates were relatively low within the entire school population. Data reveals that elements of the school's mission and its resulting student-centered culture, collaboration, and relationships were identified to be strengths of the overall school and its design. Further research is needed to study the important role of school social work within school systems. Keywords: case study, charter school, school social work, high school, dropout rates.

MELANIE BROMAN (EN.CW) | *The Locked Room Mystery—"Gutenberg"*

First Reader: Professor Alexander Gilvarry

The Gutenberg Bible was one of the first books printed in movable type at the start of the Gutenberg Revolution. Prized for its beautiful artistry and historical significance, a full copy had not been sold since the 1970s. Until now. Everett Knox, owner of a bookshop dealing with rare books, has been commissioned to handle and restore the first Gutenberg Bible to be bought in nearly fifty years. The incentive? A quarter of a million dollars. In taking on such an important project, much is at stake. Knox and his manager, West, must take every precaution to protect the Gutenberg, but will it be enough to stop ruthless collectors? Taking inspiration from such writers as Agatha Christie and Arthur Conan Doyle, "Gutenberg" is a classic locked-room mystery, full of crime, logic, and intrigue.

MICHAEL SCOGNOMILLO (CL.MLS) | *The Active and Passive Compliance of the German Population to Rising Nazi Anti-Semitism Between the Years of 1933-1939*

First Reader: Dr. Frederick McKittrick

People have been trying to explain and understand Nazi Germany since its fall in 1945. Historians have researched a multitude of topics such as Nazi policy, personalities, beliefs, etc. One area of study that has become more popular in the last decade is that of the German population under the Nazis. Historians have been trying to paint a picture of daily life in Nazi Germany and understand the mindset of the average person. In this case "average person" refers to the people who were not Jewish, did not have high ranking roles in the government, Nazi party, or the military; generally speaking "the little man." One of the primary goals of this type of research is to answer the question, why did the German population conform and actively support rising anti-Semitic policies and the racial beliefs of the Nazis? To answer this question, one must get an understanding of what daily life was like in Nazi Germany, why and how the Nazis gained control of Germany after 1933, who initially supported them, what was the Nazis' policy of control and how did they ease the population into anti-Semitic beliefs, and the overall history of anti-Semitism and racial thinking in Germany.

CHANELL SINGLETARY-ESKRIDGE (PY) | *Decisions, Decisions...Exploring Workplace Bias in a Comparative Study*

First Reader: Dr. Janice Stapley

Despite the literature that supports diversity in organizational teams (e.g. Byoun, 2016), the business community has been slow to change their practices as there are still many teams that are lacking in this area. For instance, there are two times as many men than women represented on executive boards (Whitler & Henretta, 2018). Even in recent years, less than a quarter of Congress is female (Morgenson, 2016). The current study investigates how gender proportions influence perceptions of productivity within business teams by examining factors such as cooperation, timeliness, and decision-making.

THOMAS PRIOLI (HP) | *Wilson and U.S. Intervention in the Russian Civil War: The Path from Moralism to Pragmatism*

First Reader: Dr. Thomas Pearson

Following the 1917 Bolshevik Revolution, President Woodrow Wilson was presented with a military, political, and philosophical conundrum. He opposed the idea of intervention in the new Soviet Russia, espousing self-determination as the proper means of determining governance. Despite his distaste, Wilson did approve of U.S. intervention, both through indirect means such as financing operations, and even direct measures like putting US troops on the ground. Historians have argued over what inspired this change in Wilson's attitude and actions. This paper argues that due to a lack of reliable information and tremendous pressure from the Allies, Wilson eventually surrendered his principles and gave the green light to U.S. intervention.

NICOLE TARBITANO (EN.CW) | *Reciprocation: A Creative Thesis*

First Reader: Professor Melissa Febos

This creative thesis highlights how human relationships are reciprocated in the natural environment. Based on psychological studies that focus on human interaction, it was found that different types of relationships, such as familial, romantic or friendly, impact the individual in varying ways. These impacts are oftentimes mirrored in nature through the cycles that occur. Seasons, life cycles, and weather patterns, for example, can be used as metaphors that directly mirror the way humans cycle through relationships. Nature and psychology were used to inform a collection of original poems that also employ various techniques of the craft that were studied.

ANGELICA PELLONE (IS.EDE) | *Classroom Seating Matters!*

First Reader: Dr. Walter Greason

Second Reader: Professor Kurt Wagner

Children learn and grow within a classroom. An educator's goal is to create a comfortable and effective learning environment where students can learn and develop, both academically and socially. To create this classroom environment, classroom design must have two components: (1) promote social learning/collaboration and (2) provide students with a choice. These components allow students to obtain and build upon different academic and social skills. There is a multitude of seating arrangements teachers can utilize to create the desired productive environment for student learning. The four seating approaches discussed, Row seating, Cluster seating, Circular/Horseshoe seating and Flexible seating, are popular amongst the host of approaches educators may want to apply. Of the four seating arrangements, flexible seating, upheld these standards of an ideal classroom seating arrangement, while the other arrangements lack one or both of the crucial components of ideal classroom seating. While there are setbacks with flexible seating, such as cost and storage, educators have overcome these obstacles due to the major impact this particular seating design holds on a student's education. By upholding both characteristics of an ideal classroom seating arrangement, flexible seating creates an effective learning environment, as per why flexible seating is popularizing across classrooms nationwide.

GIANNI MAZZONE (BUBEF) | *The Future of Money: Block-chain and Cryptocurrency*

First Reader: Dr. Walter Greason

Second Reader: Professor Kurt Wagner

What is money? Most people would answer that money is a Dollar or a Euro, but they would only be partially correct. While the U.S. Dollar and the Euro are forms of currency, the original concept of money is sometimes lost in the shuffle. Money is like gravity, it is always bearing down on us, it is so common that we sometimes forget about the concept, and it follows a set of rules. The renowned economist David Hume philosophized that money is not in fact a part of the economy, but rather, money is the oil which keeps the wheel of the economy turning. Just as the wheel has evolved from a rounded stone slab, to a perfectly shaped, rubber cushioned circle, oil has been refined from a crude substance dug up from the ground, into a viscous, synthesized fluid with multiple applications. As the economy has evolved so has money; the world has gone from a barter system, to gold coins, to paper currency. Today, the boundaries of money are being pushed even further, into the realm of virtual currency and, more specifically, cryptocurrency.

OMAR SHAH (CE.BY) | *Exploring Oxazole- and Thiazole-based Macrocyclic Binding to DNA*

First Reader: Dr. Yana Kosenkov

Second Reader: Dr. William Schreiber

The presented research is devoted to a computationally-aimed selection of small organic molecules (ligands) that have shown potential as anti-cancer drugs with low toxicity. Different ligands, depending on their structure and substituents, bind highly selectively to certain DNA forms. In the current work, a small set of oxazole- and thiazole-based macrocycles have been selected to explore the potential of these molecules for optimal binding to specific DNA forms, and subsequent targeted inhibition of telomerase in cancer cells. Initially, a comprehensive sampling of various conformations of the preselected oxazole- and thiazole-based macrocycles have been performed. The density functional theory (as implemented in the B3LYP functional) has been employed for geometry optimization of the selected conformations. At the next stage, molecular docking methods, embedded into the AutoDock4.2 program, has been used to explore the ligand interactions with DNA. Each low-energy conformation resulted from our DFT optimization being docked to a double stranded dodecanucleotide d (CGCGAATTGCG) obtained from the Protein Data Bank.

JON P. SUTTILE (PS) | *A Comparative Analysis of the Historical Rise of Nazi Germany and Contemporary Populist Movements of Hungary and Austria*

First Reader: Dr. Kevin Dooley
Second Reader: Dr. Rekha Datta

Populist movements are challenging democratic institutions worldwide. Democratic institutions such as free and fair elections, an adherence to the constitution, a free press, the separation of powers and political opposition are vital to the strength and quality of democratic governance. What are the historical antecedents that Europe has witnessed that have caused the erosion of democratic institutions paving pathways to the rise of populism? This paper will review the historical transition of Germany, from the Weimar Republic, to the rule of Hitler and the Nazi Party. The historical transition will depict how the populist Nazi Party was able to weaken democratic institutions in order to consolidate power. As an interesting parallel, in contemporary Europe, populist movements in Hungary and Austria have increased. Political leaders are attempting to reshape their countries. Hungary has witnessed an erosion of the constitution and separation of powers, a decline of free press and an increase of anti-immigration sentiments. In Austria, there has been an increased threat to free press, separation of powers and free and fair elections. Thus, this paper will analyze the historical and contemporary challenges that populism presents to democratic institutions in European countries, such as Austria and Hungary.

BRIAN MATHEW (BY.MCP) | *Mechanism of Action of Rhenium-based Compounds on Cancers*

First Reader: Dr. Jeffrey Weisburg

Oral Cancer affects many people worldwide, with a high prevalence in both developing and developed countries. Common treatment options, such as chemotherapy have shown to be effective in combating this disease. In the past few years, metal-based chemotherapeutic drugs, specifically platinum-based (platins) have skyrocketed in popularity and utilization. Although these platins have shown high efficacy in targeting and destroying cancer cells, it has been known to lead to a multitude of negative side effects, more so than other treatment options. Extensive research has been done on the side effects, but these platinum-based cancer drugs are still consistently being used due to their effectiveness. This calls for research on possible metal alternatives to platinum that can be just as effective, yet lead to significantly less side effects. Rhenium is a third-row transition metal that has similar chemical properties to platinum; as a result, it is now being experimented with and researched on. However, there is still no clear verdict on whether or not Rhenium can match the efficiency of platinum-based chemotherapeutic drugs. The goal of this project is to further contribute to this new wave of chemotherapeutic research in order to better the outcomes for those suffering from cancers, specifically oral cancer. We will be testing the effectiveness of Rhenium-based compounds on cancerous oral cell lines, such as HSC-2 along with the healthy oral cell line HF-1. We will determine both the Rhenium compound's mechanism of action, as well as its ability to attack the cancer cells with high specificity. A series of experiments and tests will be performed in order to ultimately determine whether or not Rhenium-based cancer drugs can be a realistic alternative to platins.

Closing Remarks

DR. NANCY J. MEZEY, *Dean of the Honors School*

A Message from Dean Mezey



Being the Dean of the Honors School is a great joy. My job is to ensure that high achieving, high ability, and highly motivated students at Monmouth receive the guidance and support needed to take a deeper dive into their intellectual passions, explore fields of study that expand those passions, and connect them with like-minded students and faculty.

Our flexible curriculum allows students to take ownership of their education. The curriculum culminates in an honors capstone project that provides students the time and space to engage in serious academic work in which they ask important and challenging questions, work toward solving difficult problems, and create and share new knowledge. I would like to congratulate the students who presented their research today for achieving this milestone. On behalf of the Honors School, we are very proud of you.

Along the intellectual journey, our students are supported through academic advising and an engaged host of faculty and staff, especially our academic thesis advisors, and first and second thesis readers. I would like to thank everyone who contributed in support of our students and our mission.

RECENT GRADUATE SCHOOLS ACCEPTING MU HONORS STUDENTS



