

*the twelfth annual*

# CAPSTONE



# FESTIVAL

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**MAY 11, 2017**

**THE SHOWCASE OF UNDERGRADUATE RESEARCH,  
SCHOLARSHIP, AND CREATIVE ACTIVITY AT MARY BALDWIN UNIVERSITY**

**SENIOR PROJECTS • HONORS PROJECTS • SPECIAL PROJECTS**



**PARTICIPANTS IN THE CAPSTONE FESTIVAL HAVE BEEN NOMINATED BY THE FACULTY BASED  
ON THE HIGH QUALITY AND ORIGINALITY OF THEIR WORK AND HAVE ACCEPTED NOMINATION.**

# CAPSTONE



# FESTIVAL

In the early days of Mary Baldwin Seminary, a Capstone Festival of sorts existed.

“All final examinations were held in public and members of the board of trustees and the townspeople attended to view students parse sentences, do intricate math problems, and recite soliloquies,” writes Professor Emerita of History Patricia H. Menk in her book *To Live in Time; The Sesquicentennial History of Mary Baldwin College 1842–1992*.

By the late 1800s, the practice of public recitations had disappeared. In 2006, Mary Baldwin College inaugurated a new Capstone Festival. The 2017 Festival marks the first as Mary Baldwin University.

At each year’s festival, a select group of students, nominated by faculty, present their senior, honors, and special undergraduate research projects to the MBU community and the general public. The high quality and breadth of research, scholarship, and creative activities on display is a testament to the legacy of those earlier years and a celebration of our future.

The 2017 Festival is sponsored by the MBU Advisory Board of Visitors, the Office of Sponsored Programs and Undergraduate Research, the Global Honors Scholars Program, the Vantage Point, and the Greater Augusta Regional Chamber of Commerce.

# FESTIVAL PARTICIPANTS



## KAYLA ALLEN

**Project and Academic Advisor:** Martha Saunders

**Type of Project:** Senior Project

**Presentation Category:** Visual or audio-visual creation

**Title:** Derma

**Abstract:** "Derma" brings light to my anxiety disorder and dermatil-

lomania. The paintings render my body, but the paintings extend outside of my personal struggles with dermatillomania and anxiety to become more universal. Painting body parts allows the viewer to internalize the issues being referenced. Dermatillomania and anxiety disorders affect many people and are often stigmatized. "Derma" brings awareness, power, struggle, and beauty to the disorders.

**Biography:** Kayla Allen is a studio art major with a minor in art history who currently lives in Mount Solon, Virginia. She plans to attend graduate school in the near future and will continue making art.

truth-telling, has the capability to make up for what the legal and mediation models lack. Using Standpoint Theory, this analysis explains how restorative justice can be used in the United States in a way that applies specifically to domestic violence. The goals of this analysis are to provide empowerment to victims, while also providing them with justice. This analysis indicates that restorative justice has been used successfully in other countries in domestic violence cases. Currently in the United States, use of restorative justice is still an emerging concept, although support for the movement is growing. Restorative justice is practical in domestic violence cases, because it allows the telling of narratives, which allows for healing between the victim and offender. Justice can be provided through restitution agreements, which should be agreed upon by the participants before being approved by the facilitator.

**Biography:** Kelsey Allen is a criminal justice major from Virginia Beach, Virginia. In the fall, Kelsey will attend Old Dominion University to study applied sociology with an emphasis in criminal justice.



## KELSEY ALLEN

**Project Advisor:** Beth Easterling

**Academic Advisor:** Douglas Davis

**Type of Project:** Senior Project

**Presentation Category:** Presentation with multi-media support

**Title:** Restoring the Voice of

Victims: Restorative Justice in Domestic Violence Cases

**Abstract:** Attempts to reduce domestic violence have been made through legislative measures, such as passing stricter laws, making arrests mandatory, and prosecuting more strongly, as well as through non-adversarial methods such as mediation. Both approaches, however, fail to address the ongoing needs of the victim. The legal model fails to address the victim as an active participant in her own life and does not address the underlying causes of domestic violence. Similarly, the mediation model negates the status of victims and often forces them to remain silent. Restorative justice, a form of justice based on community involvement and



## ELIZABETH BAILEY

**Project and Academic Advisor:**

Laura van Assendelft

**Type of Project:** Senior Project

**Presentation Category:** Presentation with multi-media support

**Title:** Grievance Theory and the Arab Spring: a Comparative Case

Study of Egypt, Tunisia, and Saudi Arabia

**Abstract:** Political participation in a variety of forms, ranging from peaceful protest to terrorism, has risen greatly in the Middle East over the past several decades and most notably over the last generation. The rise of democratization movements and radical terrorist movements are very different in many ways, but both seem to signify a belief that change is possible and a willingness to embrace radical change that is significantly different from the attitude of the previous generation. This paper explores political violence in the Middle East during the 21st century, especially the Arab uprisings that began in 2011, through the lens of the grievance theory

of civil war causation and considers the possible impact of the following variables: economics/the decrease in oil prices, increased religiosity, foreign actors in the Middle East, and modernization and globalization. The relationships among these variables is examined with a comparative analysis of the economic, social and political conditions in Egypt and Tunisia, two states that had sustained uprisings, and Saudi Arabia, which did not. These comparative case studies may provide evidence for the complex role of historical and ongoing injustices in a people's collective decision to rebel against the state.

**Biography:** Elizabeth Bailey is a political science major from Williamsburg, Virginia. She has published her thesis in the Pi Sigma Alpha Undergraduate Journal of Politics, and she is a member of the Pi Sigma Alpha and Omicron Delta Epsilon honor societies. Elizabeth will be taking a gap year before pursuing her Ph.D. in international affairs.



**OLIVIA ANN CRONK**

**Project and Academic Advisor:**

Lise Keiter

**Type of Project:** Senior Project

**Presentation Category:**

Presentation with multi-media support

**Title:** We're Off to See the Wizard!

**Abstract:** "The Wizard of Oz" has

become a household name over the 117 years since its birth in 1900. The original children's novel by Frank Baum, *The Wonderful Wizard of Oz*, eventually led to the 1939 MGM film, *The Wizard of Oz*, as well as later Broadway shows, including *The Wiz* and *Wicked*. This project focuses on how each version contains elements from Baum's original work, but with new ideas and themes. The project also analyzes and compares the music from each production. There is also a focus on the notable differences between Baum's and MGM's version of the characters Dorothy and the Wicked Witch of the West. Between these two characters, there are hints of cultural and social views in regards to the typical roles of women.

**Biography:** Olivia Cronk is a music major with a minor in biology. Her hometown is Farmville, Virginia. In the fall, Olivia will be entering a physician assistant master's degree program at either Murphy Deming College of Health Sciences, Jefferson College of Health Sciences, Lynchburg College, or James Madison University.



**MEGAN EDWARDS**

**Project and Academic Advisor:**

Bruce Dorries

**Type of Project:** Senior Project

**Presentation Category:**

Presentation with multi-media support

**Title:** An External Organizational Communication Audit of

Independent Rap Label Reach Records using Systems Theory

**Abstract:** Reach Records is a prominent American urban record label with Christian values that was founded in 2004. Reach is an imprint of the Columbia Records Group, a division of Sony Music Entertainment. The label stands strong, with six artists who have made headlines and released some of the biggest selling albums in the genre without the support of radio managers. The artists have garnered attention from mainstream outlets, thus allowing them to win Grammy awards. Reach Records has redefined mainstream popular culture, making it the most successful Christian Hip-Hop label in the history of the genre. Megan conducted an external communication audit using systems theory, examining the label's brand, key success factors, and target market; her goal was to analyze the strengths and weakness of the organization to determine whether the label will be able to sustain its new-found success.

**Biography:** Megan Edwards is a marketing and communications major with a minor in peace-building and conflict resolution. She resides in Richmond and works in the marketing and promotions department at Radio One Richmond, an urban-oriented, multi-media company that primarily targets African-American and urban consumers.



**JENNIFER EIBERT**

**Project and Academic Advisor:**

Martha Saunders

**Type of Project:** Senior Project

**Presentation Category:** Visual or audio-visual creation

**Title:** A Veil of Privacy

**Abstract:** Georgian architectural innovations prompted a shift in

domestic relationships. Primary sources from the era and historical commentary of Georgian England dissect the domestic issues of privacy, secrecy, and power. With this

literature, as well as historical and visual references, Jennifer created drawings depicting Georgian wallpaper, keys, and floorplans, all images that represent domestic experiences in Georgian England. The process of constructing these drawings and recognizing the relationships between them introduced an alternative understanding and context for domestic issues, both Georgian and contemporary.

**Biography:** Jennifer Eibert is a studio art major (emphasis in drawing and painting) from the Eastern Shore of Virginia. For the past three years, she has interned at Mary Baldwin's Hunt Gallery, assisting professional artists with their exhibitions. After graduation, Jennifer plans to pursue a Master of Fine Arts as well as continue her work with art galleries.



### CHRISTINE FENNER

**Project Advisor:** Paul Deeble  
**Academic Advisor:** Paul Callo  
**Type of Project:** Senior Project  
**Presentation Category:** Poster  
**Title:** Effects of Glucose Concentration on the Migration of HT1080 Fibrosarcoma Cells in a Scratch Assay

**Abstract:** One of the most important cells in the body is the fibroblast, a small cell that contributes to the extracellular matrix as well as to wound healing. However, like all cells in the body, fibroblasts can mutate into cancerous cells. Cancers that are derived from fibroblasts are known as fibrosarcomas. Chemotherapy is a common source of treatment for these cancerous cells. However, it is important to understand how cancers respond to non-traditional treatments and the basic science behind the tumor responses when exposed to various physiological conditions. A hallmark of cancer is its insidious ability to grow faster than the surrounding normal cells, without the ability to stop growing when no longer needed. Glucose is a primary energy source for all cells, and previous studies using normal fibroblasts showed that the cells would stop growing or migrating in the absence of glucose and that very high levels of glucose also could stop the migration of fibroblasts. I hypothesized that excess glucose would enhance fibrosarcoma activity. However, using a cell scratch assay coupled with varying glucose concentrations, I determined that fibrosarcoma cells migrate more slowly in high glucose (15 mM) concentrations as compared to physiologically normal (4 mM) and low (1 mM) concentrations of glucose. This finding has implications for possible future non-traditional therapies as well as providing insight into the

differences between normal and cancerous cells.

**Biography:** Christine Alexandra Fenner is a senior from Dayton, Virginia, who will receive a Bachelor of Science degree in biology. She plans to pursue a career as a veterinarian.



### KEVIN HALL

**Project Advisor:** Robert Klonoski  
**Academic Advisor:** Virginia Trovato  
**Type of Project:** Senior Project  
**Presentation Category:** Presentation with multi-media support  
**Title:** Thinking Beyond Industry:

Business Ecosystem Trends and Key Indicators of Success  
**Abstract:** This paper examines three books published on the topic of business ecosystems over the course of three decades. James Moore (1996) used biological ecosystems as metaphors to introduce the concept of business ecosystems in his book, *The Death of Competition*. Iansiti and Levien (2004) added to the body of knowledge by describing strategic roles within business ecosystems in *The Keystone Advantage*. Lastly, Rong and Shi (2015) studied modern complexities in their work, *Business Ecosystems Constructs, Configurations, and the Nurturing Process*. This paper identifies patterns of success and failure within business ecosystems to identify both trends and key indicators of success. Four ecosystems are analyzed: apparel, auto, retail, and personal computing.

**Biography:** Kevin Hall is a business major from Staunton, Virginia. He started as a computer information systems major in the Adult Degree Program in 2003. Kevin works at McKee Foods Corporation as a process analyst and lives in Waynesboro with his wife and son.



### FAITH HARRIS

**Project Advisor:** Katherine Turner  
**Academic Advisor:** Kristen Egan  
**Type of Project:** Senior Project  
**Presentation Category:** Delivered paper  
**Title:** Escaping Patriarchy: Constraining Women in American Society

**Abstract:** American women have long been confined

within the "domestic sphere" due to patriarchal ideology. However, social change occurring from the late 18th century onwards encouraged new attitudes among women towards their position in American society. Women began to seek liberation from institutionalized gender roles, but social influence and domestic duty hindered many from succeeding. This project examines how Hannah Webster Foster's *The Coquette* (1797), Charlotte Perkins Gilman's *The Yellow Wallpaper* (1892), and Kate Chopin's *The Awakening* (1899) critique gender roles placed on women in America. Using very different narrative techniques, each work depicts a woman who aspires to escape the rigid control of patriarchy and the domestic sphere. Each woman, however, finds her efforts to be futile, as patriarchy destroys her. The novels, through their innovative narrative strategies, chart the physical and psychological impact of patriarchal ideology on women in America.

**Biography:** Faith Harris is a senior English major with minors in anthropology and religious studies. She was born in Germany and currently lives in Richmond, Virginia. She is a member of two honor societies: Sigma Tau Delta and Alpha Lambda Delta. She plans to attend graduate school in fall 2018 to pursue her Master of Library Science degree.



### JESSICA HICKMAN

**Project and Academic Advisor:**

Amy Tillerson-Brown and Mary Hill Cole

**Type of Project:** Senior Project

**Presentation Category:**

Presentation with multi-media support

**Title:** Wartime Profit: Forsaking

Morality for Money

**Abstract:** On the morning of July 12, 1917, a group of more than 2,000 armed vigilantes gathered in Bisbee, Arizona, to carry out the largest deportation in United States history. These vigilantes were business owners, members of the Citizens Protective League, and deputies from Douglas, a neighboring town. After roughly rounding up 1,186 men, the vigilantes loaded them onto cattle cars and shipped them off to New Mexico, where the kidnapped strikers were dropped off without food or water. Why did this deportation take place? What do the Industrial Workers of the World (IWW) have to do with it? Why and how did the federal government get involved? All of these questions can be answered with two words: wartime profit. The IWW's involvement in organizing the workers' strike in Bisbee disrupted the WWI war effort, which resulted in the Bisbee Deportation and

the federal government's legal attack on the organization. The federal government's indifferent attitude towards those responsible for the deportation, as well as the treatment the deportees received, reflect how they were more concerned with guarding Phelps Dodge's interests, because of the company's role in wartime production, rather than the welfare of the workers. The federal government's subsequent legal attack and eventual destruction of the IWW and its members also reflect this idea — that the overall economic interests of the company, and in turn the U.S. economy, were far more important than the legal rights of the people.

**Biography:** Jessica Hickman is a history major with a minor in education. Her hometown is Prescott Valley, Arizona. In the fall, she will enter a master's degree program in history either at California State University, Los Angeles, or California State University, Long Beach.



### AALEYAH JOE

**Project and Academic Advisor:**

Barbara Merk

**Type of Project:** Senior Project

**Presentation Category:** Poster

**Title:** Antibiotic Enhanced Silver Nanoparticles against *E. coli*, *S. aureus*, and *M. smegmatis*

**Abstract:** In recent years, the

development and increase of resistance to antimicrobial agents by pathogenic bacteria has become a major health issue. Silver nanoparticles (Ag-NPs) have been known for their bactericidal effects and serve as a potential solution to this health problem. This study explored the combination of silver nanoparticles with the antibacterial effects of antibiotics against *Staphylococcus aureus*, *Escherichia coli*, and *Mycobacterium smegmatis*. To perform these experiments, we determined the minimum inhibitory concentration (MIC) of ampicillin against each microorganism. Bacteriological tests were performed in Tryptic Soy medium on solid agar plates supplemented with ampicillin and varying concentrations of nanosized silver particles. The results show that the antibiotic activity of ampicillin was increased in the presence of silver nanoparticles. These results are promising, but further research should be conducted to examine and identify the mechanism of the silver nanoparticles.

**Biography:** Aaleyah Joe is a biology major with a double minor in chemistry and physics. Her hometown is Fredericksburg, Virginia. In the fall, she will enter a master's degree program and continuing on with research at a government facility.



## SHARANYA RAO

**Project Advisor:** Chandra Mason

**Academic Advisor:** Jenna Holt

**Type of Project:** Honors Thesis

**Presentation Category:**

Presentation with multi-media support

**Title:** Section 377 and Well-being: Minority Stress in Indian Sexual

Minorities under Homophobic Legislation

**Abstract:** Section 377 of the Indian Penal Code is a law that effectively criminalizes homosexuality in India. Similar to California's Proposition 8, which banned same-sex marriage, Section 377 may be considered a source of minority stress under Meyer's (2003) minority stress model, which states that sexual minority individuals, because of their minority status, are more vulnerable to and have a higher prevalence of mental illness than those who are not sexual minorities. In response to a dearth of cross-cultural empirical literature on this subject, this study first examined differences in sense of belonging and depression symptoms by sexual identity in an Indian sample (N=214). Next, a theoretical causal model in which perceived impact of Section 377 increases depressive symptoms of sexual minorities by increasing concealment stress, leading to a diminished sense of belonging, was tested. Analyses revealed a significant difference between straight and sexual minority participants in terms of sense of belonging and depression symptoms. Path analysis did not indicate a good fit of the data to the original hypothesized model, but exploratory post hoc analyses found a good fit of the data to a revised model. The present study therefore highlights a pressing need for more inclusive legislation as well as mental health and social support for sexual minorities in India.

**Biography:** Sharanya Rao is a psychology major with a mental health emphasis and minors in women's studies and art history. She is an international student from Mysore, India, and was elected to Phi Beta Kappa as a junior. Sharanya plans to earn her PhD in clinical psychology and focus her research on Indian gender and sexual minority health.



## KATELYN RICE

**Project Advisors:** Joe Johnson and John Ong

**Academic Advisor:** Joe Johnson

**Type of Project:** Senior Project

**Presentation Category:**

Presentation with multi-media support

**Title:** Outlining the Procedure for Predicting Knot Products of Gin Invertase

**Abstract:** Knot theory is the study of strings that twist and tangle to form knots. The theory can be applied to DNA to model processes happening inside the cells. Using assumptions from experimental data, the twisting and knotting of DNA during cellular processes can be studied to gain insight into the mechanism by which these processes are performed. An invariant of knots (and links unless specified) is a property that is specific for each knot and does not change. One important invariant for knot classification is the two-variable polynomial. This method of classification is useful in the study of site-specific recombination. When recombination occurs, the DNA changes form and knotting can be created. The structure of products can be defined using the polynomial for every round of recombination. This method can be used repeatedly to create a recursive formula to predict the nth product of the nth round of recombination. The Gin system encodes an invertase that performs a type of site-specific recombination. Once the enzyme attaches to the G segment of DNA, the sites to be recombined are brought together. In the case of Gin, the G segment is inverted when recombination occurs. For example, if the sequence were ATGC, it would become CGTA. Every round of recombination will introduce a negative crossing at the site and subsequently introduce knotting. The two-variable polynomial can be used to create a recursive formula to predict the nth-round product. If the products of multiple rounds of recombination can be predicted, it would be possible to analyze the DNA from experimental data and deduce the orientation of the G segment based on the product found. The orientation is important for the growth and infection process of the virus it is found in.

**Biography:** Katelyn Rice is an applied mathematics major from Hot Springs, Virginia. She plans to work for a year before applying for graduate school at Georgetown University.



## DOMINIKA MARIA SEAL

**Project Advisor:** Bob Robinson

**Academic Advisor:** Marion Ward

**Type of Project:** Senior Project

**Presentation Category:**

Delivered paper

**Title:** Alternative Transportation for Individuals in the Commonwealth of

Virginia in Need of Psychiatric Treatment

**Abstract:** Providing alternative transportation for individuals held under a temporary detention order has been a topic of discussion for quite some time across the United States. Currently, these transports are handled by law enforcement agencies, mainly sheriff's offices, and, although they are a civil matter, the individual is, nonetheless, transported to the psychiatric treatment facility in restraints. Dominika has explored this topic in theory and practice, studying the Code of Virginia, which already allows for an alternative transportation provider when certain criteria are met; investigating a pilot program at the Mount Rogers Community Services Board; and experiencing the issue first-hand through her employment with the Page County Sheriff's Office. While label and stigma might still prevent an individual who is in crisis and involved family members and/or friends from seeking out much-needed assistance, alternative transportation may make this process less daunting and hopefully encourage psychiatric treatment. Cost is also a major hurdle when looking into the possibility of establishing and providing alternative transportation, especially since budget constraints are felt everywhere and at all levels; however, in the long run, alternative transportation is a win-win situation for all involved. When a transport is conducted by law enforcement, the individual who is transported is viewed as a criminal; when a transport is conducted via ambulance, the individual who is transported is viewed as someone in need of immediate medical treatment. This paper examines the roles, duties, and responsibilities of law enforcement, the hospitals, the community services boards, the psychiatric treatment facilities, and, of course, most importantly, the individual in crisis and in need of services, around whom this entire process is centered.

**Biography:** Dominika Maria Seal is a criminal justice major. She has been employed with the Page County Sheriff's Office since 2002 as a Deputy assigned to the jail. She also serves as the Chair of the Board of Northwestern Community Services and is a Department of Criminal Justice Services-certified General Instructor.



**MADELEINE STOUT**

**Project Advisors:** Mary Hill Cole and Amy Tillerson-Brown

**Academic Advisor:** Abigail Wightman

**Type of Project:** Senior Project

**Presentation Category:** Presentation with multi-media support

**Title:** Starvation for a Cause: Stalin's First Five-Year Plan and Ukrainian Nationalism

**Abstract:** One of the deadliest famines in the twentieth century took place in Ukraine from 1932-33. This event is known as the Ukrainian terror-famine, or "Holodomor." The Ukrainian terror famine of 1932-33 is significant to the study of history because it was a man-made famine constructed for political gain to preemptively stop a revolution from happening. The effect of the agricultural reforms of the first Five-Year Plan (1928-1932), during Stalin's dictatorship in the Soviet Union, and their impact on Ukrainian farmers, were the main causes of the famine. Stalin used the Five-Year Plan to stimulate and continue the circumstances that led to the famine as a way to crush Ukrainian Nationalism. The use of firsthand accounts, literature on the Holodomor, and the text of the first Five-Year Plan were used to develop answers to the following questions: How did the Five-Year Plan contribute to this particular famine, and why did it take place in Ukraine despite the country being known as the breadbasket of the Soviet Union? The horrors of the Holodomor arguably took place in the Ukraine due to Stalin's fear of Ukraine again becoming independent.

**Biography:** Madeleine Stout is a double major in history and international affairs with a minor in philosophy. Her hometown is Norfolk, Virginia. Madeleine plans to continue her education in the fall by pursuing a Master's in history at Villanova University.



**JESSICA SULLIVAN**

**Project and Academic Advisor:** Abigail Wightman

**Type of Project:** Honors Thesis

**Presentation Category:** Presentation with multi-media support

**Title:** Cultural Experiences and Impressions of Asian Women on the

Mary Baldwin University Campus and Their Implications on Female Human Trafficking in Asia

**Abstract:** The social world that individuals routinely navigate is comprised of dialectical relationships that establish and reaffirm certain behaviors and motifs of the social world through cultural symbols, materials, institutions, and other various societal constructions. One phenomenon that affects individuals' abilities to navigate their social interactions is the application of stereotypes. Through two sets of focus groups on the campus of Mary Baldwin University, Jessica collected data on the perceptions of Asian women to attempt to



understand how perceptions and adherence to stereotypes may affect women who identify as Asian. This data was then analyzed through the lenses of feminist theory and globalization to comprehend how perceptions of Asian women may impact their involvement in human trafficking within Asia. Ultimately, this work will argue that, while no tangible results can be had from such limited data, smaller social circumstances and larger social phenomena have the capacity to create dialectal situations in which each social realm affects the other.

**Biography:** Jessica Sullivan is an anthropology and international relations double major from Spotsylvania, Virginia. In the future, she hopes to attend graduate school to further study cultural anthropology. In the meantime, Jessica aspires to gather practical work experience with a government-related agency.



### TERA WARF

**Project and Academic Advisor:**

Robert Robinson

**Type of Project:** Senior Project

**Presentation Category:** Delivered paper

**Title:** Incarceration, Mental Health and the Labeling Theory

**Abstract:** Prisons and jails current-

ly house more individuals diagnosed with mental illnesses than do psychiatric hospitals in the United States. Other mandated treatment options are often court ordered; however, many of these orders are not enforced. Many of these individuals are released into their communities without linking and following through on mental health service options. The focus of this project was to look at the gap between incarceration, mandated treatment options, and mental health services, including ways to assist individuals in gaining access to their service needs while reducing recidivism rates. This importance of this issue became apparent to me while working as a mental health case manager focusing on justice-involved individuals.

**Biography:** Tera Hiner Warf is a sociology major from Monterey, Virginia. She is a member of Alpha Kappa Delta honor society, is listed in *Who's Who Among Students in American Universities and Colleges*, and received both the 2016 Academic Excellence in Sociology Award and Sociology Public Service Award from Mary Baldwin's Sociology Department. Tera has worked at Valley Community Services Board for approximately 13 years in the Recovery and Support Services Department, most recently as a mental health case manager focusing on individuals found not guilty by reason of insanity.



### BROOKE WILES

**Project Advisor:** Roderic Owen

**Academic Advisor:** Paul Deeble

**Type of Project:** Honors Thesis

**Presentation Category:**

Delivered paper

**Title:** CRISPR and its Ethical Implications in Genetic Modification

**Abstract:** The ethical complexities associated with the progression of genetic modification, especially its application in humans, are analyzed in this thesis. CRISPR, a newly developed method of genome modification, has greatly improved the effectiveness, precision, affordability, and practicality of this research area. Although the ethics of human genetic modification have long been debated, the creation of CRISPR has reignited the debate. I compare and contrast the ethical distinctions between several forms of human genetic intervention and analyze the concerns that arise with each application. In addition, I consider the impact of language on public perception and public discourse. Lastly, I critically review the cautionary measures taken with the advancement of CRISPR and related technologies and develop my own critical and reflective assessment with cautious optimism.

**Project and Academic Advisor:** Paul Deeble

**Type of Project:** Senior Project

**Presentation Category:** Poster

**Title:** The Effects of SLPI Knockdown on Colorectal Cancer Progression

**Abstract:** Secretory leukocyte protease inhibitor (SLPI) is a tissue-protective and anti-inflammatory enzyme under investigation for its role in cancer progression. Based on the current literature, this role is unclear, as some studies have demonstrated an accelerative role and others a repressive one. This study investigates the expression of SLPI in HCT-15 cells. In order to examine the role of SLPI in this colorectal cancer cell line, I utilized CRISPR/cas9 to perform a knockdown of the SLPI gene. I hypothesized that this SLPI-null cell line would have decreased cell viability. MTT cell viability assays were performed to assess the results of the SLPI knockdown. SLPI knockdown was not shown to decrease cell viability in comparison to untransfected cells.

**Biography:** Brooke Wiles is a biology major with an emphasis in biomedical science and a minor in philosophy. Her hometown is Allen Park, Michigan. She was elected to Phi Beta Kappa in her junior year, and, in the fall, she will begin a Master's degree program in public health at one of the following universities: Johns Hopkins University, University of New South Wales, Yale University, University of Pittsburgh, or New York University. She hopes one day to work at the World Health Organization.

Congratulations to all students participating in the  
**2017 CAPSTONE FESTIVAL**

Nomination to the Capstone Festival is in itself a high honor. To recognize extraordinary achievement, top honors will also be given in each presentation category. Panels of three judges will evaluate the creativity, challenge, and execution of the projects as well as the ability of the presenters to communicate the content and significance of their work to a general audience. Top honors awards are accompanied by a cash prize of \$150.



**MB** MARY BALDWIN  
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