Elkin R. Isaac
Student Research Symposium
Albion College

2018

Albion College

2018 Elkin R. Isaac Student Research Symposium

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The Twenty-Ninth Annual Elkin R. Isaac Student Research Symposium

Albion College | April 18-19, 2018

SCHEDULE OF EVENTS

Wednesday, April 18, 2018

7:30 p.m. **Elkin R. Isaac Alumni Lecture: Amy Elaine Wakeland, '91**

Welcome: Marc Roy, Provost
Speaker Introduction: Mary Collar, Professor of English
Towsley Lecture Hall/Norris Center 101

Reception immediately following the program
Mitchell Museum, Norris Center

Thursday, April 19, 2018

9-10:15 a.m. **Student Research Platform Presentations**

Forum #1
Norris Center 100

Forum #2
Towsley Lecture Hall/ Norris Center 101

Forum #3
Norris Center 102

Forum #4
Norris Center 104

10:45 a.m. **Honors Convocation**
Goodrich Chapel

1:15-4:15 p.m. **Student Research Platform Presentations**
See locations above.

4-5 p.m. **Student Research Poster Session**
Science Complex Atrium

7 p.m. **Joseph S. Calvaruso Keynote Address: Dacher Keltner**
"The Foundations and Practices of a Civil and Kind Society"

Welcome: Marc Roy, Provost
Speaker Introduction: Grace Boudjalis, '18
Goodrich Chapel

Reception immediately following the program
Bobbitt Visual Arts Center Lobby

Elkin R. Isaac Alumni Lecture

AMY ELAINE WAKELAND, '91

Amy Elaine Wakeland, the first lady of Los Angeles, Calif., is a political strategist, public policy expert, and advocate for children and families. She is active with organizations and campaigns focused on combating sexual and domestic violence, empowering women and girls, and serving the city's most vulnerable residents.

She recently led successful efforts to fund and complete Los Angeles' first-ever data-driven analysis of the status of women and girls and to expand the city's Domestic Assault Response Teams (DART) to all L.A. police divisions. DART is now a universal city program for the first time since its inception in 2001.

Wakeland helped found the Los Angeles Neighborhood Land Trust, which builds parks in the city's most park-poor neighborhoods, and the Pobladores Fund, a giving circle that contributes to local grassroots social justice causes. She is a past board member of People Assisting the Homeless, Just Detention International, and the Liberty Hill Foundation. She also advises organizations, including the Coalition to Abolish Slavery and Trafficking and the L.A. Alliance for a New Economy, on human rights and economic justice work on behalf of women and girls.

As first lady, Wakeland has actively partnered with the Getty House Foundation Board of Directors and the Mayor's Office to open Getty House, the mayoral residence, to more members of the public—over 14,000 visitors to date—and reinvigorate its programming. Campaigns launched or unveiled through this programming include tripling the number of jobs available to Los Angeles youth, funding L.A.'s ambitious immigration reform efforts, and initiating L.A.'s drought education campaign.

Her professional career also includes positions as executive director of the Coalition for Kids, director of the Progressive L.A. Network, and strategic planner for the Los Angeles County Department of Public Social Services, as well as experience on presidential, statewide, and local political campaigns.

Wakeland studied at the University of Oxford as a 1993 Rhodes Scholar following her graduation from Albion College, where she majored in English and minored in public policy as a member of the Gerald R. Ford Institute for Leadership in Public Policy and Service.

Joseph S. Calvaruso Keynote Address

DACHER KELTNER

Through his research and teaching, Dacher Keltner focuses on the biological and evolutionary origins of compassion, awe, love, beauty, power, social class, and inequality. As professor of psychology at the University of California, Berkeley, and director of the Berkeley Social Interaction Lab, he is a leading scholar in the study of emotion, including a new project on awe around the globe. Keltner also serves as faculty director of the Berkeley Greater Good Science Center.

Keltner is the author of *The Power Paradox: How We Gain and Lose Influence* (2016) and the best-selling *Born to Be Good: The Science of a Meaningful Life* (2009); he is also an editor of *The Compassionate Instinct: The Science of Human Goodness* (2010). Keltner has published more than 190 scientific articles, including seminal works on the psychology of awe (Keltner & Haidt, 2003), and is the co-author of two textbooks. He has written for *The New York Times Magazine, The Times* of London and *Utne Reader*, and his research has been covered in *Time, Newsweek*, *The Wall Street Journal*, *The New York Times*, CNN, NPR, and the BBC as well as many other outlets.

In addition to his university work and research, Keltner has collaborated on projects at Facebook and Google, and served as a scientific consultant for Pixar's highly acclaimed 2015 film *Inside Out*, for which he helped revise the story emphasizing the neurophysiological findings that human emotions are mirrored in interpersonal relationships and can be significantly moderated by them. He is also featured in Tom Shadyac's 2011 documentary *I Am*.

Keltner has twice presented his research to His Holiness the Dalai Lama as part of a continuing dialogue between the Dalai Lama and scientists. A recipient of outstanding teacher and research mentor awards from UC Berkeley, Keltner has seen 20 of his Ph.D. students and postdoctoral fellows become professors. *Wired* magazine has rated the podcasts of his "Human Emotion" course as one of the five best academic podcasts in the country, and *Utne Reader* named Keltner as one of its 50 Visionaries of 2008.

Student Presentation Schedule | Thursday, April 19, 2018

FORUM #1 – NORRIS 100

9:00	Patrick Sheperd (Streu)	Synthesis of a Photoswitchable Hemithioindigo Analogue of a Tubulin Polymerization Inhibitor
9:15	Brock Swartz (Streu)	Chasing Hedgehogs: The Synthesis and Characterization of Second-Generation Azologues
9:30	Ashley Ball (Cervantes)	Understanding the Signal that Leads to Changes in Cell Morphology for Mating
9:45	Zerick Dill (Streu)	Progress Toward the Synthesis of an Azo-derivative of a Hedgehog Signaling Pathway Inhibitor
10:00	Jessica Bush (Rohlman)	Rps10 Protein Contribution to Ribosomal mRNA Selectivity
1:15	Lauren Kelsey (Streu)	Hunting ALK: Synthesis and Characterization of a Novel, Photoisomerizing Compound to Inhibit ALK5
1:30	Taylor Alpert (Rabquer)	miR429 Regulates IL-17A Expression in Inflammatory Monocytes in Rheumatoid Arthritis
1:45	Rebecca Enerson (Cervantes)	Determining if Mating-Type Proteins Play a Role in Immaturity in the Ciliate *Tetrahymena thermophila*
2:00	Alex Reid (Metz)	Nickel as a Catalyst for the Methanol Oxidation Reaction
2:15	Megan Reilly (Lyons-Sobaski)	Saddlebred or Morgan: Discerning Differences Between Equine Breeds
2:30	Michael Bernard (McCaffrey)	Catalytic Activity of Dioxovanadium(V) Salicylaldehyde Semicarbazone Complexes in Oxidation Reactions: Scope of Reaction
2:45	Olivia Conover (McCaffrey)	The Effect on Catalysis of Differing Electron Densities Within Vanadium Semicarbazone Complexes
3:00	Tristan Budd (Rabquer)	Binding Potential Between miR-126 and KLotho to Inhibit Inflammation in U937 Monocytes
3:15	Marcin Kazmierczak (Streu)	Light Drugs: Synthesis and Characterization of Biologically Active Azologues
3:30	Matthew Stander (Rabquer)	Investigation of SOCS5 as a Gene Target of miR-9 in Inflammatory Monocytes
3:45	Anna Miller (Saville)	The Effect of Hobo Transposon Excision and DNA Repair in *Drosophila melanogaster*
4:00	Zachary Kohanov (Harris)	Homocoupling of Alkyl and Vinylboronic Acids Using a Manganese Catalyst: A First Look

FORUM #2 – TOWSLEY LECTURE HALL/NORRIS 101

9:00	Adam Jarvis, Michael Martin, Darcy Muns, Laura Newbury, Virgile Ascenzio De Esteve, Norman Mayeur, Tadchchayane Thangathurai, Yanis Touzi (Baker, Draudt, Bruneteaux-Swann, Towhill)	Business Plan Development: An International Partnership Between the USA and France – UniSMART
9:15	David Brown, Lucas Harder, Ramona Huang, Alec Palmer, Maxime Caboco, Lisa Del Bergolio, Riyhad Draief, Mickaël Guillemain (Baker, Draudt, Bruneteaux-Swann, Towhill)	Business Plan Development: An International Partnership Between the USA and France – Flaire: Automotive Fleet Care
9:30	Sarah Fuller, Harrison Palmer, Marceline Redick, Laure Duphil, Nicolas Hainaux, Léa Favretto, Charlène Dacosta Neto (Baker, Draudt, Bruneteaux-Swann, Towhill)	Business Plan Development: An International Partnership Between the USA and France – TravelUs
9:45	Chase Palmer, Emma Schiefelbein, Mark Stewart, Clémence Maurice, Nancy Bramble, Lydiane Roudaut, Valentin Rouault (Baker, Draudt, Bruneteaux-Swann, Towhill)	Business Plan Development: An International Partnership Between the USA and France – La Galerie
10:00	Julie Clore (Carlson)	Improving Patient Outcomes Using Telehealth

1:15	Emily Allison (Christensen)	Writing to Know, Writing to Say: The Relationship Between Self-Discovery and Creative Expression in a Literary Journal
1:30	Katerina Boni (MacInnes)	Working for the Companies that Brought *The Godfather, Fight Club*, and *Harry Potter* to Print: A Profile of the Publishing Field
1:45	Ellery Ekleberry (Chytilo)	Exploring My Relationship with Memory, Vulnerability, and Growth Through Art
2:00	Joshua McGarry (Abbott, Ball)	Edvard Grieg's Piano Concerto
2:15	Elizabeth Barnes (M. Hill, Price, Fischer)	Shakespeare in Prison, *Macbeth*, and the Importance of the Performing Arts
2:30	Kelly Pitt (Chytilo)	The Finality of Truth: Visualizing Being Seen
2:45	Jessi Fore (Abo, Ball)	The Rare Sighting of a Viola Concerto: Hummel's Potpourri Op. 94 for Viola and Orchestra

(continued on next page)

(afternoon session continued)

3:00	Evan Rieth (Christensen)	Campanilismo: Lesson on Being of a Place
3:15	Athena Balcoff (Chytilo)	Colony Collapse: Constructing a Metaphor of Deterioration
3:30	Travis Brady (Harnish)	Writing a Way Out: Henry Blake Fuller and the Romance of Escape
3:45	Emily Allison (MacInnes)	"You Will Needs Buy and Sell Men and Women Like Beasts": Examining Geographical Inflection of Bawdry and Prostitution in Early Modern London and Shakespeare's *Measure for Measure*
4:00	Emily Cummo (Wickre)	Bernini: Capturing Movement in Marble

FORUM #3 – NORRIS 102

9:00	Leanne Wegley (Seely)	A Comprehensive Study of the Ion-Atom Merged Beams Apparatus and the Merged Beams Technique
9:15	Julia DiFiore (Olapade, Zellner)	Resistance of *Escherichia coli* and *Bacillus cereus* to Simulated Conditions of Extreme Extraterrestrial Environments
9:30	Jennifer Nelson (Menold)	Combining Remote Sensing and Geochemistry Data in the North Qaidam UHP Terrane, China
9:45	Antoniu Fodor (Zellner)	A Photometric Analysis of Eclipsing Binary Stars: A Star Wars Story
10:00	Oana Vesa (Zellner)	Analysis of the Gaia RVS Region in ESPaDOnS Spectra of Asteroseismic Calibration Stars

1:15	Victoria Stewart (E. Hill)	Predictors of Help-Seeking Stigmas in Minority and Majority Groups
1:30	Grace Boudjalis (Christopher)	Gender Differences in Perception of Behaviors in Service-Oriented Careers
1:45	Rachael Vitale (Wieth)	Breaking the Barriers to Pelvic Floor Physical Therapy
2:00	Wendi Wang (Keyes, Schmitter)	A History of Premedical Education: A Case Study at Albion College
2:15	Tyler Collins-Blankenship (Moss)	The History of the Medical Field: Defying Conventional Beliefs
2:30	Ian Stewart (E. Hill)	Self-Esteem, Gender, and Ego Threat: Predicting Benevolent and Hostile Sexism
2:45	Chelsei Carpenter (Christopher)	Work Ethic as a Predictor of Belief in a Just World
3:00	Samantha Ely (Wieth)	The Impact of Mood and Cortisol Levels on Empathy
3:15	Sydney Rudowski (E. Hill)	Predictors of Attitudes Toward Genetic Technologies
3:30	Jodie Bosheers (Boyan)	Student-Athlete Leadership Development: Developing Scholars, Professionals, and People

3:45	Victoria Ruprecht (Albertson)	A Master Manipulator: Effects of *Wolbachia* on Host Locomotion and Cold-Shock Tolerance
4:00	Virginia Kivel (Henke)	Understanding and Implementing Summer Programs for Positive Youth Development

FORUM #4 – NORRIS 104

9:00	Isabel Allaway (Schoene)	Institutional Distrust, Tactical Repertoires, and the World System
9:15	Katherine Murphy (Walling)	Peacekeepers and Sexual Exploitation and Abuse in Post-Conflict Nations
9:30	Rachel Barry (M. Hill)	Trump's New Order? A Content Analysis of Persuasive Rhetoric in the Controversial Power Campaigns of Donald Trump and Adolf Hitler
9:45	Elaina Braunschweig (Myers)	Failed Integration: Education and Professional Outcomes for Turks in Germany
10:00	Roohia (Schoene)	Nuclear Proliferation: The Pakistani Case

1:15	Laura Newbury (Jaqua)	Americans' Assets, Debts, and Retirement Decisions During the 2007-2009 Financial Crisis
1:30	Henry Carnick (Jordon)	Ramsey Theory: Graph Theory Edition
1:45	Rebecca Barry (M. Hill)	Reexamining Environmentalism Through a Communication Lens
2:00	Nichole Brown (Jordon)	± Skolem-Type Difference Sets
2:15	Chaz Hopkins (Melzer)	Exploring Toxic Masculinity at Albion College
2:30	Skyler Campbell (Sacks)	Rewriting History: A Study of How the History of the Civil War Has Changed in Textbooks from 1876 to 2014
2:45	Queana Langston (Harnish, Seidler)	Questioning Cass: The Lies and Legacy Behind Michigan's First Territorial Governor
3:00	Sam Raseman (Kirby)	Examining Tarski's Semantic Conception of Truth
3:15	Madison Kase (Valdina)	Holy Cow! The Beef Behind Political and Religious Controversy in India
3:30	Phillip Voglewede (Sacks)	Thomas Moran's Yellowstone and American West: Chromolithography and the Development of Western Imagery
3:45	Robert Joerg (Brade)	Jewish Life in Poland After the Holocaust
4:00	Bailey Downs (Dick)	Eleanor Roosevelt and the Great Depression: A Portrait of Courage, Conscience, and Compassion

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POSTER SESSION – SCIENCE COMPLEX ATRIUM, 4-5 P.M.

Rebecca Barry, Nick Leeman (Carlson, Draudt)	Ludington Center, Opportunity for Recruitment
Ryan Bomya, Samantha Coon, Lauren Wiegand (Carlson, Draudt)	Ludington Center Planning
Erin Boyle (Verduzco-Baker)	Pick One: Identity Negotiation Among Mixed-Race People, Children of Immigrants, Transnational Adoptees, and International Students
Madeline Denison (Streu)	Progress Toward the Synthesis of Azo-ZM 336372 as a Photoisomerizable Drug
McKenna Donahue (Shanton)	Athletes InterVarsity @ Albion College: An Analysis of Discipleship and Leadership Development
Lucas Lusk (Christopher)	Big Five Personality Factors and Motivations for Smartphone Usage
Caroline Manning (Henke)	Sharing the Outdoors with Albion's Youth
Jami Robbins (McCaffrey, Zellner)	Identification of Unknown Compounds Produced in Shock Experiments
Victoria Ruprecht (Noble)	Cultural Competencies in Medicine
Sabrina Silvestri, Nicole Woodhead (Rohlman)	Synthesis and Characterization of RNA Aptamers Targeted at *Aspergillus* Cell Surface Carbohydrates
Rachael Vitale (Saville)	A Comparative Genomics Analysis of contig48 from *D. Eugracilis*
Michael Bernard, Garrett Mason, Nikhil Patel, Hannah Schoon, Sabrina Silvestri, Sarah Subhi, Eryn VanderVlucht, Katherine Volker, Margaret Whitlock (Albertson)	*Drosophila melanogaster* as a Model for Human Disease

Abstracts of Student Presentations

ISABEL ALLAWAY, '20

Institutional Distrust, Tactical Repertoires, and the World System

Faculty Sponsor: Matt Schoene
Major: Sociology
Hometown: Des Moines, Iowa

Institutions provide the foundation on which mass society is built, and so it is vital that citizens both trust and participate in them. Alarmingly, citizens of countries all over the world are experiencing declining levels of trust in core institutions such as their political, educational, and economic systems. At the same time, new waves of protest, combination of tactical repertoires, and unconventional activism have been observed around the globe as social movements in our globalizing world adapt to new realities (Kaldor et al., 2012). Social movements have long been associated with institutions, but if global citizens no longer feel they can rely on institutions, it is reasonable to believe that a transformation of their methods of activism, like signing petitions and boycotting certain products, will occur as a result.

What this research then asks is whether individual levels of institutional distrust and institutional participation dictate the strategic social movement tactical repertoires seen throughout the world. In this analysis, we test this idea using the sixth round of the World Values Survey. We construct a series of multilevel, mixed-effects regression models to predict the likelihood of participation in four forms of social movement activity: signing a petition, joining in a boycott, attending a political demonstration and joining a strike. Our results indicate that participation in social protest is indeed sensitive to both institutional distrust and integration into social institutions. We conclude with implications for social movement activity and the politics of the world system.

EMILY ALLISON, '18

"You Will Needs Buy and Sell Men and Women Like Beasts": Examining Geographical Inflection of Bawdry and Prostitution in Early Modern London and Shakespeare's *Measure for Measure*

Faculty Sponsor: Ian MacInnes
Major: English
Hometown: Pinckney, Mich.

It is a common assumption that historical prostitution is tied to a fixed place, such as a brothel or red-light district. Even John Stow, author of *A Survey of London*, presents a list of municipal brothels in 16th-century Southwark as being unambiguous places of prostitution that operated continually until their suppression in 1546. However, attempting to locate these houses proves difficult, complicating the idea of what a "brothel" even is, as brothels often doubled as alehouses, inns, or other public buildings. Further, the figures who engage in the sale of sex were not always distinguishable among early modern London's social landscape, as the indefinite label of "prostitute" applied to a wide range of people, from brothel workers to outwardly respectable women occasionally selling sex. Drawing on Stow and other Elizabethan historians, as well as on legal documents, conduct literature, and poetry, I show how the difficulties inherent in defining and locating London's Elizabethan brothels and "lewd" persons indicate a larger societal trend of the spatial ambiguity of prostitution. Shakespeare's *Measure for Measure* is illustrative of this landscape of prostitution in London, as he explores then complicates notions of place-based activity, ultimately pointing to the way that the geography of prostitution elides the firm distinctions between the licit and illicit. The play also illuminates growing audience concerns for prostitution's implicit consequences surrounding the rise of an increasingly exchange-based society post-feudalism, as prostitution foreshadows an economic system based not on the sale of goods, but on increasingly dehumanizing instances of exchange.

Supported by: FURSCA—Hyde Fellows in Student/Faculty Research

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EMILY ALLISON, '18

Writing to Know, Writing to Say: The Relationship Between Self-Discovery and Creative Expression in a Literary Journal

Faculty Sponsor: Nels Christensen
Major: English
Hometown: Pinckney, Mich.

In the fall of 2017, I hand-stitched and assembled a journal and engaged in a form of literary nonfiction that I conceptualized as a "literary journal of place." The journal was intended to be largely observational, nature-oriented, and place-based, with a focus on attempting to establish a sense of home after places I came to associate with safety and comfort were compromised by sexual assault and trauma. In the process of writing, I found myself repeatedly disappointed by the expectations I had envisioned for myself: I had gone into my project demanding of my writing a certain healing power that it would not readily provide. To remedy this disappointment, I engaged in a series of rhetorical experiments—or "shoves"—designed to test and challenge the creative, technical, and structural dimensions of my writing. I also found myself incorporating seemingly unrelated aspects of

what I was reading and learning about in other classes into my journal. It was only when I shifted away from my personal obsession with "home" that I came to reconcile and reconnect with certain places and people, establishing constructive, creative, and joyful memories and associations alongside the destructive ones. At once anecdotal and descriptive, personal and private—and, at times, ugly—my journal writing forced me to confront issues of self and engage in meaning-making for a specific time and place in my life. My journal culminated in considerations of audience, in a final piece relating my college experience and self-discovery entitled "Us Two Together," inspired by and in response to "Sleepover" by Bonnie Jo Campbell.

TAYLOR ALPERT, '18

miR429 Regulates IL-17A Expression in Inflammatory Monocytes in Rheumatoid Arthritis

Faculty Sponsor: Brad Rabquer
Major: Biology
Hometown: Trenton, Mich.

Rheumatoid Arthritis (RA) is a chronic, autoimmune disorder that leads to inflammation and degradation of joints. IL17A, a proinflammatory cytokine, has been previously shown to be involved in migratory inflammation pathways in autoimmune disorders like RA. IL17A initiates RA pathogenesis, suggesting that treatments targeted to neutralize IL17A would be effective therapies. Currently, anti-IL-17 therapies are among the most efficacious for treating RA. Additionally, studies indicate that monocytes are also causative agents of inflammation in RA. microRNAs (miRNA) have been identified as translational inhibitors in mRNA of eukaryotic cells. The relationship among monocytes, miRNAs and mRNA must be better analyzed to depict inflammatory pathways involved in RA. miR429 was chosen in this experiment because previous research in our lab has suggested that it is upregulated in RA monocytes. We hypothesized that the binding of miR429 to the 3' UTR region of IL17A would down-regulate the expression of IL17A and thus inflammation. Gene targets involved in monocytes and inflammation were identified for miR429 in the miRNA databases miRanda and mirSVR. miR429 was found to have a relatively high binding score with IL17A. Isolating the 3' UTR of the IL17A target gene was the first step in our series of experiments. U937 monocytes were grown and cDNA was created from isolated RNA. Primers were then designed using the Primer-BLAST program, and were created based on the hypothetical binding site on the IL17A 3' UTR. PCR was used to amplify the 3' UTR and a restriction enzyme digest was performed on the insert DNA and the pMirGlo vector. Our results suggest that IL17A and miR429 are expressed by monocytes and may interact to modulate inflammation in RA.

Supported by: FURSCA— Kenneth Ballou, '47 Research Endowment for Biology

ATHENA BALCOFF, '18

Colony Collapse: Constructing a Metaphor of Deterioration

Faculty Sponsor: Lynne Chytilo
Major: Art
Hometown: Troy, Mich.

What is killing the honeybees? Both domestic and native honeybees are disappearing at an alarming rate and were just recently put on the endangered species list. Throughout my research I have been working with concepts that focus on colony collapse and the extinction of bees. I have been constructing art that not only represents the bees but also how colony collapse relates to my life. After spending time contemplating my distress with colony collapse, I have come to the realization that I see aspects of my life in terms of a collapse. Recently several close family members have suffered from serious illnesses; this is the first time I have had to face these challenges. I create most of my sculptures using porcelain clay. This material acts as an avenue for self-expression, because there are so many different ways you can manipulate it. My work does not revolve around the idea of beauty, but rather my artwork is an expression of cataclysm. One second everything is fine, but now I feel like everything around me is collapsing in on itself. I express the ideas of death and deterioration, along with the emotions these experiences can cause throughout my body of work.

Supported by: FURSCA

ASHLEY BALL, '18

Understanding the Signal that Leads to Changes in Cell Morphology for Mating

Faculty Sponsor: Marcella Cervantes
Major: Biology
Hometown: Detroit, Mich.

Tetrahymena are characterized by nuclear dimorphism, having a germline micronucleus (MIC) and a somatic macronucleus (MAC). The two nuclei have different functions. Nuclei can be strained with DAPI and observed with fluorescence microscopy. *Tetrahymena* are single-celled ciliated eukaryotes with seven sexes. For cells to mate, they must first be starved. Next, co-stimulation is implemented, among cells of a different mating type. Co-stimulation is a required step, where the cells have cell-cell contact. We mix cells of complementary sex type with each other. Contact must be made with another sex type. It only works with non-self, cell-cell contact. This initiates the sequential co-stimulation. Our primary question is whether knockouts of the mating-type genes can cause co-stimulation or can be co-stimulated.

To study gene function, we will do single and double knockouts of the mating genes MTA and MTB. These genes are paired head-to-head. Each gene encrypts a mating type-specific segment and a transmembrane domain that is shared by all mating types. Somatic gene knockouts have shown that both of these genes are needed to perform the successful mating. We will determine if co-stimulation occurred using conA-FITC; conA inhibits conjugation in the ciliate by attaching to the conA receptor, suggesting that the conA receptor may be a mating-type receptor.

ELIZABETH BARNES, '18

Shakespeare in Prison, *Macbeth*, and the Importance of the Performing Arts

Faculty Sponsors: Megan Hill, Katey Price, Zach Fischer
Majors: Communication Studies, Political Science
Hometown: Portage, Mich.

Shakespeare in Prison is a program in the Women's Huron Valley Correctional Facility in Ypsilanti, Mich. The aim of this research project is to provide a qualitative measurement of the impact of the performing arts for participants in this program. The program, currently in its seventh season, has an ensemble consisting of 24 enrolled participants, four co-facilitators, and two student co-facilitators. The program officially runs from late September to late June, ending the process with three performances of a work by Shakespeare selected by participants. This season's selection is *Macbeth*. As this is an ongoing season, the current ethnographic research project is limited to the first half of Shakespeare in Prison's season. The findings thus far suggest that people who participate in the program increase their self-esteem and self-reflection skills. With this knowledge, the paper makes a prediction about the potential possibilities of correctional programming and the longitudinal application of these programs post-release.

RACHEL BARRY, '18

Trump's New Order? A Content Analysis of Persuasive Rhetoric in the Controversial Power Campaigns of Donald Trump and Adolf Hitler

Faculty Sponsor: Megan Hill
Major: Communication Studies
Hometown: Saginaw, Mich.

During the presidential campaign of Donald J. Trump, Americans saw the Republican nominee compared to Adolf Hitler in multiple news media. The parallel was drawn by individuals ranging from Mexican President Enrique Peña Nieto to Pope Francis of the Catholic Church, and a myriad of well-known sources, such as *The New York Times* and *Rolling Stone* magazine, ran stories on the comparison. This association was further perpetuated via social media, with heated debate for and against the allegations of similarity. The question, therefore, is how much, if any, truth is in these claims? To attempt to answer this question, I compare the campaign of Donald Trump to Adolf Hitler's rise to power through content analysis of each man's use of ethos, pathos, and logos. I analyzed 12 speeches to determine if there is a likeness between each man's use of these rhetorical devices. The results show that, while not identical, there are significant similarities between Trump's and Hitler's use of persuasive rhetoric. Although we may not see an exact copy of Hitler repeated in modern-day United States politics, a man has risen to power that rhymes.

REBECCA BARRY, '18

Reexamining Environmentalism Through a Communication Lens

Faculty Sponsor: Megan Hill
Majors: Business and Organizations, Communication Studies
Hometown: Manistee, Mich.

Today, we are seeing and feeling the repercussions of global warming like never before. Yet, in the United States (U.S.), even the idea of global warming remains conflict-ridden, with understanding of the issue deeply affected by one's political leanings. This thesis examines the dissonance between scientific consensus and public discourse in the U.S., and highlights the importance of communication in shaping our understanding of the environment. As an entity, the environment is ultimately understood through personal identity, history, and culture. Our interpretation of each of these elements is context-based, meaning we come into contact with information that is not only value-laden but made sense of through pre-existing organizational structures called frames. Examining these frames demonstrates the drastic need for greater environmental communication and education in the U.S. How, exactly, did discourse in the U.S. get to such a catastrophic place of disagreement regarding the environment? This thesis takes an auto-ethnographic approach to answering just that.

REBECCA BARRY, ’18
Majors: Business and Organizations, Communication Studies
Hometown: Manistee, Mich.

NICK LEEMAN, ’18
Major: Business and Organizations
Hometown: South Lyon. Mich.

Ludington Center, Opportunity for Recruitment
Faculty Sponsors: John Carlson, Laurel Draudt

Albion College is moving toward incorporating the city of Albion with the campus. Many businesses have been added to downtown Albion, making it an attractive place for students and community members. The Ludington Center is one of many places downtown Albion has to offer. For the 2018 Senior Capstone project, we plan on examining how the Ludington Center can be seen and used as a marketing tool for prospective and current students. The building has the capabilities of impressing these students if it is utilized correctly. We believe the best way to do this is by bridging relationships between student academic standings, increasing networking opportunities and resources, and creating new initiatives like collaborative sessions. By implementing market research like interviews and surveys, we hope to employ social and academic events, and therefore increase the collaboration between students, faculty, and staff, and in turn increase Albion College involvement with the Ludington Center.

MICHAEL BERNARD, ’18
Catalytic Activity of Dioxovanadium(V) Salicylaldehyde Semicarbazone Complexes in Oxidation Reactions: Scope of Reaction
Faculty Sponsor: Vanessa McCaffrey
Major: Biology
Hometown: Grand Blanc, Mich.

Dioxovanadium(V) complexes have been investigated to understand their ability to fight cancer and help those with diabetes. Current work is showing that these complexes can also be used as catalysts in oxidation reactions. Dioxovanadium(V) complexes have been shown previously to oxidize alcohols and also to act as epoxidation catalysts of both alkenes or alkynes. In this work, we are testing the scope of the oxidation reaction of a previously synthesized dioxovanadium(V) complex derived from a salicylaldehyde semicarbazone. The substrates chosen for this study were used to test how aromaticity, hybridization, electron density, and extent of oxidation of a substrate have an effect on the distribution of epoxidation, oxidation, and oxidative cleavage products. The reactions were performed in varying solvents for two hours in a heated oil bath with set times for sampling. Samples were then analyzed by GC/MS. The addition of oxygen along with the cleavage of double bonds for our substrates show that dioxovanadium(V) semicarbazone complexes show great promise in catalytic oxidative reactions.

Supported by: FURSCA— Bethune Fellows Student Research Endowment, Chemistry Department

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MICHAEL BERNARD, ’18
(See Advanced Genetics Lab)

RYAN BOMYA, ’18
Majors: Business and Organizations, Finance
Hometown: Northville, Mich.

SAMANTHA COON, ’18
Major: Business and Organizations
Hometown: Ypsilanti, Mich.

LAUREN WIEGAND, ’18
Major: Business and Organizations
Hometown: Brighton, Mich.

Ludington Center Planning
Faculty Sponsors: John Carlson, Laurel Draudt

Our goal is to give a student’s perspective on making the Ludington Center the primary home of the Gerstacker and Ford institutes, the Institute for Healthcare Professions, and the Career and Internship Center. We want to increase student traffic by emphasizing the benefits of the Ludington Center and the easy access to businesses and restaurants downtown. We plan to reimagine the spaces to fit all the offices and the needs of students, along with addressing any questions or concerns that may come from moving the institutes from the heart of Albion to the future of Albion.

KATERINA BONI, '18

Working for the Companies that Brought *The Godfather*, *Fight Club*, and *Harry Potter* to Print: A Profile of the Publishing Field

Faculty Sponsor: Ian MacInnes
Majors: English, Communication Studies
Hometown: St. Clair, Mich.

Independently and through the New York Arts Program I have completed five publishing internships—two at literary agencies, two at publishing houses, and one at Books and More (now Stirling Books and Brew). Each of these experiences has provided a unique insight into the process of how a book goes from the author's computer to the consumer's hands. In my presentation I will discuss what a literary agency is and how a publishing house functions as well as my experience with each company, what my responsibilities as an intern were, and some of the key lessons I learned.

JODIE BOSHEERS, '18

Student-Athlete Leadership Development: Developing Scholars, Professionals, and People

Faculty Sponsor: Andy Boyan
Major: Mathematics
Hometown: Washington Township, Mich.

A study published by the National Collegiate Athletic Association (NCAA) found that student-athletes seek more aid from the institutions they attend; student-athletes are asking for more assistance in career development, overall health and well-being, and how to live a balanced, well-managed life. While Albion College athletics have been historically successful, it may be time to ask what more we can do to help develop student-athletes as leaders, scholars, professionals, and people outside of their field of competition? This presentation will look at the need for additional student-athlete development and present what a possible course would look like to do so. The topics examined will include academic development and time management, leadership skills and identity, NCAA compliance, career development, mental and physical wellness, and diversity training. This presentation will also discuss the benefits a student-athlete development course would have on individuals, teams, and the institution as a whole.

GRACE BOUDJALIS, '18

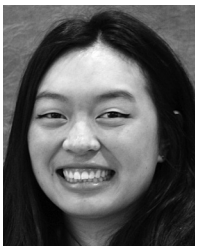
Gender Differences in Perception of Behaviors in Service-Oriented Careers

Faculty Sponsor: Andrew Christopher
Major: Psychological Science
Hometown: Traverse City, Mich.

In occupations that involve customer service, "service with a smile" is often expected, meaning that employees should always present themselves with a positive demeanor when interacting with customers. Indeed, researchers have found that smiling influences a customer's willingness to tip (Bujisic et al., 2014), as well as being predictive of how skilled a nurse is perceived (Wysong & Driver, 2009). Additionally, research suggests that although smiling influences both men and women's judgments, it appears to influence men's judgments to a larger extent than women's, especially when the person being evaluated is female (Mehu, Little, & Dunbar, 2008). To examine how smiling or not smiling influences the perception of service, as well as how this perception varies between gender and career type, 219 online participants were surveyed following a prompted hypothetical scenario where they received service in either a hospital or restaurant setting by a certified nursing assistant (CNA) or server, and an image of the hypothetical employee they were interacting with, who was either a male or female smiling or not smiling. Participants rated the hypothetical employee regarding appearance and service mannerisms based off of their interpretation of the scenario and image.

It was found that men rated the non-smiling female server less positively than how women rated the same female employee. Additionally, this rating was lower than both men's and women's ratings of the non-smiling male server, the female server who was smiling, and the men's and women's ratings of the male and female CNA who was smiling and not smiling, suggesting that men are particularly influenced by smiling in a traditional service-industry setting.

Supported by: FURSCA



ERIN BOYLE, '18

Pick One: Identity Negotiation Among Mixed-Race People, Children of Immigrants, Transnational Adoptees, and International Students

Faculty Sponsor: Lynn Verduzco-Baker
Major: Sociology
Hometown: Beaver Island, Mich.

The identity processes of mixed-race people, children of immigrants, transnational adoptees, and international students include similar pressures to conform to mono-racial identities and cultural

practices. Although these pressures vary by race, they share a similar dynamic. Using qualitative research, I aim to construct a contemporary framework that allows social scientists to better understand the similarities as well as the differences between how these groups negotiate conflicting cultures within their families and society as they form their identities. This study is unique because the analysis examines similarities in the identity processes and experiences across these groups. This presentation will discuss how previously theorized themes of identity operate within four different identity groups: international students, mixed-race people, children of immigrants and transnational adoptees. For example, I will present analysis of transnational adoptees and mixed-race people's experiences and responses to pressure to assimilate into existing mono-racial categories, pressure that arises from within families and friendship groups and in response to assumptions made by strangers. This analysis comes from 20 semi-structured interviews I conducted with people from all four identity categories and ranging in age from 18 to 40.

Supported by: FURSCA

TRAVIS BRADY, '18

Writing a Way Out: Henry Blake Fuller and the Romance of Escape

Faculty Sponsor: Allison Harnish
Majors: Anthropology, English (Creative Writing)
Hometown: Howell, Mich.

The romances of Chicago author Henry Blake Fuller are examples of what we might now recognize as queer literature, with "queer" referring to the uncategorizable, the fluid, and the non-normative, even if Fuller would not have used the term as such. Three of his romances, *The Chevalier of Pensieri-Vani, The Last Refuge: A Sicilian Romance,* and *Gardens of This World*, depict homosexual relationships in similar ways to his literary contemporaries, identified by James Gifford as the "Natural" homosexual model, in addition to depicting Fuller's own idealized view of a homosexual relationship. Outside of these depictions, the romances also explore themes that we now recognize as queer due to the growing field of queer theory, in topics such as aesthetics, music, and historiography.

Supported by: FURSCA—Richard L. and Barbara J. Meyer Student Research Endowment

ELAINA BRAUNSCHWEIG, '18

Failed Integration: Education and Professional Outcomes for Turks in Germany

Faculty Sponsor: Perry Myers
Majors: German, Economics and Management
Hometown: Clarkston, Mich.

Since the end of World War Two, Germany has experienced waves of mass migration mainly prompted by three events: guest worker recruitment beginning in the 1950s, the fall of the Soviet Union in 1989, and the recent Syrian Refugee Crisis. The demographics of these groups has diversified the German population in terms of religion as well as expanded the growing youth migrant population in Germany. Because integration has been an issue left unaddressed until the past 10 years, people are questioning why groups, like the Turkish guest-worker minority, have had more difficulty integrating into German society.

The purpose of this research was to determine if the German government's proposed integration measures, which focus on education and language competence, were effective in integrating the Turkish minority in Germany, and if not, then why these measures did not succeed. In order to research this, I examined various studies comparing the Turks' educational, language, and professional outcomes with that of other minorities in Germany who immigrated during the same time period. Due to the lower Turkish success rates across all fields, it was clear that there were barriers preventing them from succeeding. The largest barrier to integration has been the lack of social acceptance of Muslim minorities in Western countries, which prevented Turks from properly integrating and gaining social prestige. This problem has continued over generations and remains unresolved in today's Germany. Moreover, lower Turkish achievement levels ultimately support the notion that educational transitions and institutional discrimination have contributed to ineffective Turkish integration. Policymakers' continual avoidance of integration measures and the refusal to acknowledge Muslim cultural values has only further exacerbated this problem. However, the question of Muslim integration is not one to be ignored. With the recent influx of 1.6 million refugees, most of whom are Muslim, useful policymaking and better integration outcomes are a necessity. Without effective policies, the integration of current refugees will also fail.

DAVID BROWN, '18

(See Albion/SDV Entrepreneurial Exchange: Business Plan Development: An International Partnership Between the USA and France – Flaire)

NICHOLE BROWN, '19

± Skolem-Type Difference Sets

Faculty Sponsor: Heather Jordon
Major: Mathematics
Hometown: Williamston, Mich.

For a positive integer t, a Skolem-type 3-tuple difference set of order t is a partition of the set $\{1, 2, ¼, 3t\}$ into triples $\{a_i, b_i, c_i\}$ such that $a_i + b_i = c_i$. A practical application of Skolem-type difference sets involves rewriting the triple $\{a_i, b_i, c_i\}$ as $a_i + b_i + c_i = 0$ where c_i is necessarily negative. Hence, we study ±Skolem-type 3-tuple difference sets of order $2t$ which are partitions of the set $\{±1, ±2, ¼, ±3t\}$ into triples $\{a_i, b_i, c_i\}$ such that $a_i + b_i + c_i = 0$. We also study a Langford-type generalization of this concept, namely, partitions of the set $\{±d, ±(d + 1), ¼, ±(d + 3t – 1)\}$ into $2t$ triples $\{a_i, b_i, c_i\}$ such that $a_i + b_i + c_i = 0$ for $d = 2$ and $d = 3$.

TRISTAN BUDD, '18

Binding Potential Between miR-126 and KLotho to Inhibit Inflammation in U937 Monocytes

Faculty Sponsor: Brad Rabquer
Major: Biochemistry
Hometown: North Muskegon, Mich.

Rheumatoid Arthritis (RA) is a chronic, autoimmune disease that is characterized by inflammation of synovial tissue in the joints. Monocytes play a key role in the pathophysiology of inflammation initiation in the innate immune system, and have been found to be activated in patients with RA. Micro RNA (miRNA) have also been shown to be expressed in RA. miRNA can bind to messenger RNA (mRNA) and turn off or reduce the rate of protein translation in approximately 30% of protein-coding genes in humans. Previous work in Dr. Rabquer's laboratory has revealed specific miRNA molecules, including miR-126, that are overexpressed in monocytes isolated from RA patients. In order to find potential target genes for miR-126, the database microrna.org was used. After evaluating different binding scores, potential mRNA targets for miR-126 were the MFAP4 and KLotho genes. The MFAP4 gene has been shown to influence monocyte migration, while the KLotho gene has been shown to play a role in monocyte migration and inflammation. Preliminary experiments excluded MFAP4 as a potential gene target for this study, so the majority of the laboratory was spent working with KLotho. Various laboratory techniques were used in order to prepare a KLotho DNA insert and pmirGLO vector for ligation and transformation. We hypothesized that miR-126 binds to the 3' UTR of KLotho mRNA, thus inhibiting the translation of inflammatory proteins. Unfortunately, the presence of KLotho insert DNA was not confirmed to be transformed into the pmirGLO vector.

Supported by: FURSCA— Lawrence B., '72 and Frances Schook Research Fund

JESSICA BUSH, '18

Rps10 Protein Contribution to Ribosomal mRNA Selectivity

Faculty Sponsor: Christopher Rohlman
Majors: Biology, Chemistry
Hometown: Marshall, Mich.

Previous work from the Karbstein Lab on ribosomal biogenesis has shown that interactions between the ribosomal protein Rps26 and the mRNA promotes mRNA selectivity, thereby shaping protein homeostasis. Importantly, cells lacking sufficient amounts of Rps26 follow a distinct translational program, which might explain in part the pathogenesis of Diamond-Blackfan Anemia (DBA), a disease caused by lack of ribosomal proteins, including both Rps26 and Rps10. Both Rps26 and Rps10 are located near the translated mRNA within the entry channel and can be used to predict contact with mRNA downstream of the start and stop codon during translation initiation and termination, respectively. Initial tests were conducted to observe the effects from mutation of the putative Rps10-contact region on translation. Five mutated plasmids were studied for their effect on Rps10 binding. Results from dual luciferase assays have shown a significant decrease in protein production as a result of mutations in the mRNA plasmid. This decrease appears be dependent on Rps10 levels when compared to the traditional Kozak sequence. To test this hypothesis, three different yeast strains were used: WT, TEF, and Dox yeast strains. Wild-type yeast cells contain their own endogenous copies of the Rps10 genes. TEF and Dox are both genetically modified yeast strains in which the endogenous copies of Rps10 were removed from the genome and replaced by a newly introduced copy in a plasmid under control of either a TEF or Dox promoter. These promoters allow for controlled Rps10 production levels. Doxycycline can be added to cells to further repress their Rps10 production. Using western analysis, we observed that yeast cells with the Dox promoter and treated with doxycycline had significantly reduced levels of Rps10 in their ribosomes. Cells that were successfully depleted of Rps10 had significantly lower protein production then their Rps10 replete counterparts. This translational difference is believed to be a result of a decreased ability of the ribosome to bind mRNA as a result of diminished Rps10 levels.

SKYLER CAMPBELL, ’19

Rewriting History: A Study of How the History of the Civil War Has Changed in Textbooks from 1876 to 2014

Faculty Sponsor: Marcy Sacks
Major: Social Studies
Hometown: Grand Rapids, Mich.

History textbooks provide an insight into the views and attitudes of their respective time period. The way textbooks portray certain events and groups of people has a profound impact on how children learn to view those groups and events. That influence then has the potential to trickle down to future generations, fabricating a historical narrative that sometimes avoids telling the whole truth, or uses selective wording to sway opinions on certain topics. This paper analyzes the changes in how the Civil War is written about in 12 textbooks dating from 1876 to 2014. Notable topics of discussion include slaves and slavery, as well as the recognition, or lack of, the impact of minority groups on the war effort. Many changes were traced, some demonstrating a regression to former historical attitudes, and quite a few showcasing a more comprehensive vision of the Civil War. Despite the efforts to make history textbooks more historically accurate, there is still a lot of room for improvement, especially in regard to the continuing history of race relations and the causes behind the deadliest war in American history.

HENRY CARNICK, ’18

Ramsey Theory: Graph Theory Edition

Faculty Sponsor: Heather Jordon
Major: Mathematics
Hometown: Ashland, Ohio

In this presentation, we will explore Ramsey theory using methods from the field of graph theory. As the name would suggest, Ramsey theory came about as a result of a theorem, known as Ramsey’s Theorem, proved by the mathematician, economist, and philosopher Frank P. Ramsey in 1928. This theorem was actually a minor lemma in Ramsey’s work but would later become a foundational result in the field of combinatorics. Loosely speaking, the theorem states that given certain conditions, a mathematical abstraction regardless of its construction will always exhibit a form of order. Thus the subfield of graph theory known as Ramsey theory was born. The focus of this presentation will be to explore traditional Ramsey numbers; in graph theory terms this is the minimum order of a complete graph such that every edge coloring with two colors results in a monochromatic complete graph of smaller order as a subgraph. Lastly, we will explore generalized Ramsey numbers where we consider the minimum order of a complete graph such that every edge coloring with more than two colors results in a given monochromatic graph as a subgraph.

CHELSEI CARPENTER, ’19

Work Ethic as a Predictor of Belief in a Just World

Faculty Sponsor: Andrew Christopher
Majors: Psychological Science, Business
Hometown: Muncie, Ind.

There is concern in the field of psychological research that there is redundancy among the thousands of measures used to assess individual differences and predict outcomes. The current study examined if the construct of work ethic adds any incremental power in predicting just-world beliefs after accounting for the Big Five Personality Factors of conscientiousness, openness, agreeableness, extraversion, and neuroticism.

Work ethic is a construct that refers to the extent to which someone works hard and avoids wasting time. Previous research (Christopher et al., 2008) found work ethic to be strongly related to the construct of conscientiousness, which consists of being dutiful, orderly, competent, self-disciplined, and deliberative. It is possible that these two constructs, work ethic and conscientiousness, are redundant. To explore this possibility, the current study examined the extent to which work ethic adds to the Big Five Personality Factors in predicting belief in a just world. Belief in a just world is rooted in the need to perceive the world as a predictable and orderly place in which people get what they deserve from life (Lerner, 1965). Belief in a just world has been positively correlated with conscientiousness and neuroticism (Bollmann et al., 2015). Additionally, belief in a just world has been positively correlated with work ethic (Christopher et al., 2008).

Participants (N = 440) were recruited using Amazon’s Mechanical Turk, an online survey service. Among other measures, participants completed an assessment of work ethic (e.g., “It is important to stay busy at work and not waste time”), personality (e.g., “I see myself as someone who does a thorough job”), and belief in a just world (e.g., “I believe that most of the things that happen in my life are fair”). Hierarchical multiple regressions, controlling for personality, will shed light on whether work ethic is a separate construct from the Big Five, or if it might be an instance of construct redundancy, subsumed in the Big Five Personality Factors.

Supported by: Faculty Development Committee

JULIE CLORE, '18

Improving Patient Outcomes Using Telehealth

Faculty Sponsor: John Carlson
Major: Economics and Management
Hometown: Northville, Mich.

The healthcare industry has seen a vast amount of changes within the past decade. Technology has played a major role by introducing telehealth to advance access to care for patients. My research investigated the primary goals of healthcare systems that utilize telehealth solutions. These goals include improving patient outcomes, improving patient convenience, and increasing patient engagement and satisfaction as the most common objectives for telemedicine programs. Leveraging access to specialists, a reduction in patient readmission rates, and a cost-conscious manner in delivering results are other key goals. Further analysis reveals telehealth plays a large role in radiology, mammography, and stroke diagnosis.

Telehealth offers virtual care between patient and specialist, which serves to be not only cost-effective, but delivers more convenient care for the patient. This allows patients more flexibility while delivering improved results, including patient experience and satisfaction.

TYLER COLLINS-BLANKENSHIP, '18

The History of the Medical Field: Defying Conventional Beliefs

Faculty Sponsor: Robert Moss
Major: Exercise Science
Hometown: Jackson, Mich.

The goal of this paper is to identify changes in the medical-industrial complex throughout the late 19th and early 20th centuries, and their relationships to the declining state of our current healthcare system. The pressure to reform the curriculum of medical schools in the United States originated from the incentives wished to be obtained by corporate interests. An empirical hierarchy was branded into the foundation of Western medicine which separated research from practice, and created a system of top-down control. By patronizing one aspect of medicine over another, there was a back-door takeover that allowed special interests to steer the direction of medical education.

Through distorting scientific inquiry in the favor of corporate interests, unethical medical procedures (i.e. research, diagnosis, and treatment) have remained unencumbered by punishment up to this present day. By manipulating the perception of professionalism, little attention would be drawn to the newly developing patient-doctor relationship, which would serve to reinforce authoritative medicine. Currently it is estimated that over 33% of the population will develop some type of cancer, and more than 20% of those individuals will die of cancer. The United States currently spends over $2 trillion per year in treatment coverage costs, and yet more than 100,000 people die due to medical treatment complications per year. At the cost of many innocent and unsuspecting lives, the drive for profit has impeded the ability of the modern physician to be as effective as possible.

OLIVIA CONOVER, '18

The Effect on Catalysis of Differing Electron Densities Within Vanadium Semicarbazone Complexes

Faculty Sponsor: Vanessa McCaffrey
Major: Biology
Hometown: Flushing, Mich.

Dioxovanadium(V) salicylaldehyde semicarbazone complexes have been shown to have a variety of applications, including use in alternative fuels and anti-tumor activity. Vanadium(V) complexes with related bonding motifs are found in algae haloperoxidases and have been shown to be effective oxidation catalysts in the bromination of organic compounds. In the research lab, literature reports have shown that these types of catalysts have been effective in the oxidation of styrene. In this work, we have synthesized a series of dioxovanadium(V) salicylaldehyde semicarbazone complexes with a variety of substituents on the salicylaldehyde ligand framework. These complexes were synthesized with a variety of substituents on the ring structure of the complex. Then they were used as catalysts in styrene oxidation to investigate the effect of the substituents on catalytic behavior. Results were analyzed via GC/MS. Major products in the reaction include benzaldehyde, styrene oxide, and benzoic acid. Further differences in oxidation activity as a function of electron density on the ligand structure will be discussed.

Supported by: FURSCA— Hyde Fellows in Student/ Faculty Research, Chemistry Department

SAMANTHA COON, '18

(See Ryan Bomya, '18; Samantha Coon, '18; Lauren Wiegand, '18)

EMILY CUMMO, ’18

Bernini: Capturing Movement in Marble

Faculty Sponsor: Bille Wickre
Major: Art History
Hometown: Newburgh, N.Y.

Gian Lorenzo Bernini was a 17th-century artist known for his ability to render realistic human form and movement in his sculptures. His innovations in sculpting challenged contemporary artistic traditions by breaking away from the idealized and static forms typical during the Renaissance. By using dynamic poses and climactic moments, Bernini engages the viewer in the dramas of mythic or Biblical narratives. Transformation and transcendence are communicated through the rendering of expression, mutating materials, gestures, engaged musculature, dramatic lighting, and active fabrics. Creating an illusion of movement allows Bernini to produce lifelike qualities within his work.

MADELINE DENISON, ’19

Progress Toward the Synthesis of Azo-ZM 336372 as a Photoisomerizable Drug

Faculty Sponsor: Craig Streu
Majors: Chemistry, Spanish
Hometown: Grosse Pointe Woods, Mich.

My research involves the synthesis of azologues of a cancer drug, ZM 336372, in hopes of reducing the side effects of the original drug. The azologues can be manipulated by exposure to specific wavelengths of light. This light causes a shape change in the molecule, which changes its biological activity. This photoswitching allows the drug to be essentially activated by exposure to light. My drug, ZM 336372, treats cancer by inhibiting the enzyme c-Raf from the MAPK pathway, which is a key cell-division signaling cascade. Progress toward the synthesis of the proposed compound will be reported.

JULIA DiFIORE, ’18

Resistance of *Escherichia coli* and *Bacillus cereus* to Simulated Conditions of Extreme Extraterrestrial Environments

Faculty Sponsors: Ola Olapade, Nicolle Zellner
Major: Biology
Hometown: Farmington Hills, Mich.

As we learn more about terrestrial organisms that thrive in extreme conditions, the possibility for life on other moons and/or planets becomes more intriguing. This study was designed to temporally examine the effects of ultraviolet irradiation on the morphological, physiological, and biochemical properties of two different bacterial types i.e., *Escherichia coli* and *Bacillus cereus,* under controlled laboratory conditions. The responses of both *E. coli* and *B. cereus* were examined at time intervals using combinations of approaches including spectrophotometry, viable bacterial counts, and standard microbiological assays, after exposure to constant UV light at 254nm under controlled laboratory conditions for 48 hours. The t-test analyses were performed to analyze the differences in bacterial abundance between the sampling times during the study periods. The overall results showed that the UV irradiation treatments negatively impacted the survivability of both bacterial types; however, the total cell counts based on turbidity of *E. coli* cells tend to be relatively more sensitive to UV irradiation when compared to *B. cereus* cells ($p = 0.00792$), but less so when the viable cells were compared ($p = 0.98465$). Therefore, in general, the results of this study further validate the idea that the survivability of bacterial cells under extreme conditions is probably due to their unique morphological, physiological, and biochemical properties. These results thus contribute to studies of cellular life forms under extreme conditions, such as UV irradiation, as observed on Mars and Europa.

Supported by: NASA’s Exobiology and Evolutionary Biology Program, FURSCA— Jane Seymour Kilian, ’39 Endowed Fellowship

ZERICK DILL, ’20

Progress Toward the Synthesis of an Azo-derivative of a Hedgehog Signaling Pathway Inhibitor

Faculty Sponsor: Craig Streu
Major: Biochemistry
Hometown: Columbus, Ohio

The hedgehog signaling pathway is an essential process for cell differentiation as well as cell division. There is a detrimental mutation in this pathway that accounts for diseases such as basal cell carcinoma. Therefore, the hedgehog signaling pathway has been a candidate for selective drug targeting. There have been recent pharmaceuticals that have been developed to battle against this mutation within the pathway; however, they cause undesirable side effects from off-target interactions. Thus, increasing the selectivity of the drug would be ideal. Photosensitive molecules are one superb way to affect timing and location of drug activation. One particularly useful strategy is to make azologs of well-validated pharmaceuticals given the ability of azo groups to undergo conformational changes in response to light. We herein report our progress in developing photosensitive hedgehog signaling pathway inhibitors.

Supported by: FURSCA— Orpha Leiter Irwin Fellowship

McKENNA DONAHUE, ’18

Athletes InterVarsity @ Albion College: An Analysis of Discipleship and Leadership Development

Faculty Sponsor: Kyle Shanton
Major: English/Language Arts Elementary Certification
Hometown: Huntington Woods, Mich.

My project is the study and analysis of Athletes InterVarsity Christian Fellowship at Albion College to identify themes to bring new understanding and serve as guidelines for the ministry’s future. I investigated this topic through narrative inquiry. Specifically, this inquiry was autobiographical and consisted of my writing of various narratives about my experience as a planter, developer, and leader within Athletes InterVarsity at Albion. In analyzing my data, I became more aware of both my leadership and discipleship experience and pedagogy. In addition, I was able to identify some basic themes related to student involvement and the influence of events on the overall InterVarsity chapter. There were three themes that I found across all of my data. One was that individual experiences and single chapter events tend to expand outside of themselves and can influence the overall InterVarsity culture. I also found that people seem to transition in their involvement from being considered a guest to member after chapter members repeatedly meet one or more of their basic needs. And, lastly, I found that some form of risk-taking is required, whether that be by the inviter or invitee, in order for progress to be made in one’s chapter involvement. These findings are significant because they inform me (as someone who will be working for InterVarsity Christian Fellowship at Albion College next year) and other leaders within Athletes InterVarsity how to structure and implement future ministry curriculum. I have included related suggestions to this in the conclusion section of my work.

BAILEY DOWNS, ’21

Eleanor Roosevelt and the Great Depression: A Portrait of Courage, Conscience, and Compassion

Faculty Sponsor: Wesley Dick
Major: Biochemistry
Hometown: Munising, Mich.

Eleanor and Franklin Roosevelt were born into aristocratic and privileged families. They became president and first lady during the depths of the Great Depression. President Roosevelt’s New Deal policies and Eleanor Roosevelt’s unorthodox role as first lady are credited with restoring hope to America’s “forgotten people.” This study is focused on Eleanor Roosevelt’s contributions. How did a privileged woman become committed to the needs of “down and out” Americans? Drawn to the plight of unemployed coal miners, one of her pet projects was Arthurdale, the “subsistence homestead” of Scott’s Run in West Virginia. What were the limitations and successes of the Arthurdale experiment? America was segregated in the 1930s and challenging racism was politically charged. Arguably, Eleanor was the heart of the New Deal in fighting for civil rights and in combatting prejudice. Perceiving Eleanor Roosevelt as a kindred soul, the American people wrote thousands of letters to her. The bulk of the letters illustrate that Eleanor Roosevelt was greatly admired. She was also the target of hate. This study draws on the wealth of letters to illustrate her popularity and her vilification. Eleanor Roosevelt was a prolific writer, penning her “My Day” newspaper column six days a week. This presentation examines the works of historians, citizen letters, and Eleanor Roosevelt’s own writings in illuminating the following questions: Was she a feminist? Was she a revolutionary? Her fascinating journey and her life of service are explored in the hope that they can serve as inspirational role models for today.

ELLERY EKLEBERRY, ’18

Exploring My Relationship with Memory, Vulnerability, and Growth Through Art

Faculty Sponsor: Lynne Chytilo
Major: Art
Hometown: Fort Worth, Texas

I create large-scale, clay sculptures in response to challenging events in my life. As a child, I watched my father deteriorate from a degenerative brain disease that I may one day inherit. And two years ago I discovered my stepfather motionless on his bathroom floor from a heart attack. Through my art, I attempt to communicate the fragile yet consuming nature of these memories. I have been fascinated by the way clay is able to take and hold information. So, clay has become the medium of my choice that I feel best expresses my emotions.

My ceramic process starts with wet clay that I form into sculptures using a coil building technique because it allows me to have control of the size and surface of the form while adding information layer by layer. I have created a personal language by building clay into an abstracted manifestation of my memories. During the final firing, I glaze the work with a ceramic compound that agitates and disrupts the surface, creating a rough and inconsistent finish throughout the entire piece. The way the glaze pools and sits on the surface highlights the dents and impressions created by my fingers into the clay, similar to the way letters in a book come together to tell a story.

Supported by: FURSCA— Jean Bengel Laughlin, ’50 and Sheldon Laughlin Endowment for Student Research

SAMANTHA ELY, '18

The Impact of Mood and Cortisol Levels on Empathy

Faculty Sponsor: Mareike Wieth
Major: Psychological Science
Hometown: Battle Creek, Mich.

Empathy is a multidimensional construct comprised of a cognitive and emotional component. The Hot-Cold Empathy Gap hypothesizes that in order for someone to feel empathy, they need to be in a "hot" state of emotion, rather than just assess and respond to the situation cognitively (Read & Loewenstein, 1999). Studies have indicated a correlation between empathy and a person's cortisol levels. Cortisol is a hormone produced by the HPA axis in order to aid the body in coping with physical and psychological stress. Interestingly, findings on the connection between cortisol and empathy have been mixed: studies have both shown that an increase in cortisol is positively related to empathy (Shirtcliff et al., 2009) and that an increase in cortisol is negatively related to empathy (Cheng et al., 2013). Based on these findings, it is therefore possible that individuals will only experience empathy when they are both in a "hot" state and there is a cortisol change. Experiencing a "hot" state or a cortisol change alone may not be enough to evoke empathy.

In this study, we used a mood induction to place participants into a "hot" state of emotion. Afterward, participants read an open-ended story designed to test for situational (or "state") empathy. Participants gave a cortisol sample before and after undergoing these tasks. Potential covariates such as depression, anxiety, narcissism, and trait resiliency were also assessed through the use of self-report surveys. Results of the study will be discussed.

Supported by: FURSCA, Psychological Science Department, Neuroscience Concentration

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REBECCA ENERSON, '18

Determining if Mating-Type Proteins Play a Role in Immaturity in the Ciliate *Tetrahymena thermophila*

Faculty Sponsor: Marcella Cervantes
Major: Biology
Hometown: Huntington Woods, Mich.

Tetrahymena thermophila is a free-living ciliate that is commonly found in freshwater ponds and often used as a model research organism. Nuclear dimorphism is exhibited through a somatic nucleus and a smaller germline nucleus, with each nucleus existing simultaneously. Mature *Tetrahymena t.* cells will only mate after they have been starved and are put in the presence of a different mating type. It is currently unknown if the mating-type genes are expressed in immature progeny since they do not mate until they reach a certain age. This study examined two strains of *Tetrahymena t.* to determine if the immature progeny express mating-type proteins. It is hypothesized that the mating-type proteins are not expressed in immature progeny cells following mating. This experiment was carried out with two mature strains of *Tetrahymena t.* mating types, VI and II. Mating was induced between the two strains and the progeny were isolated based on antibiotic sensitivity in the mature cells. Four conditions were then tested for mating-type gene expression: log phase growth of the mature parental strains, log phase growth of the progeny, and starvation of the parent strains. Though not yet complete, it is expected that the immature progeny of *Tetrahymena thermophila* will not express the mating-type genes as they are not yet ready to mate.

ANTONIU FODOR, '18

A Photometric Analysis of Eclipsing Binary Stars: A Star Wars Story

Faculty Sponsor: Nicolle Zellner
Majors: Physics, Mathematics
Hometown: Sterling Heights, Mich.

The Milky Way galaxy is estimated to contain more than 300 billion stars, many of which are in binary systems. Studies of binary systems allow for parameters such as mass, diameter, and chemical composition to be determined. In particular, eclipsing binaries, where one star passes in front of another as viewed from Earth, provide additional information about how a star ages. The eclipsing binaries V0728 PER, IU PER, and KX PER have been studied. Using photometric data obtained by ground-based visible telescopes and analyzed using the AIP4WIN software, light curves that describe the variability in brightness have been created. To increase our knowledge about these stars, this information will be uploaded to the American Association of Variable Stars Observers website, the official variable star database. In this talk, light curves for these eclipsing binary stars will be presented along with specific characteristics of each star.

Supported by: FURSCA

JESSI FORE, '19

The Rare Sighting of a Viola Concerto: Hummel's Potpourri Op. 94 for Viola and Orchestra

Faculty Sponsors: Takeshi Abo, James Ball
Major: Music with Performance
Hometown: Wenatchee, Wash.

Often confused with the violin, the viola is actually more akin to the cello. Being a middle-range instrument, it is rarely composed for soloistically in an orchestral setting. The overall lack of viola repertoire makes Hummel's Potpourri Op. 94 for viola and orchestra stand out within its field. Using the wide range offered by the viola along with the darker, richer voice, Hummel created a dramatic piece of music that pulled together quotes from arias composed by Mozart and Rossini. He couples these themes with his own introduction and conclusion to create an expressive viola solo that contradicted those who believed the viola was too middle-range to stand out over an orchestra.

SARAH FULLER, '20

(See Albion/SDV Entrepreneurial Exchange: Business Plan Development: An International Partnership Between the USA and France – TravelUs)

LUCAS HARDER, '18

(See Albion/SDV Entrepreneurial Exchange: Business Plan Development: An International Partnership Between the USA and France – Flaire)

CHAZ HOPKINS, '18

Exploring Toxic Masculinity at Albion College

Faculty Sponsor: Scott Melzer
Major: Sociology
Hometown: Homer, Mich.

Toxic masculinity is the social conditioning and gender performance that encourages boys and men to conform to displays of manhood that are dangerous to men and those around them, such as risk-taking and violence. The transitional and transformative nature of college can foster destructive behaviors in young men, since proving their masculinity often depends on acceptance from other college men. Using grounded theory method, I conducted open-ended, semi-structured interviews with 10 college men to examine their attitudes, observations, and experiences related to toxic masculinity. Three key findings emerged from my research: Men who conformed to traditional masculinity, or the traditional gender expectations men in society are asked to live up to, were unable to identify societal expectations related to men's gender identity and performance; generally, men showed a willingness to seek help academically and utilize their support systems for personal problems; and violence on campus was not expressed through public physical altercations between men. Based on the findings of this research, Albion College might find ways to foster men's help-seeking behaviors among students struggling academically, including strengthening social support networks and connections with faculty and staff.

Supported by: FURSCA— Bethune Fellows Student Research Endowment

RAMONA HUANG, '19

(See Albion/SDV Entrepreneurial Exchange: Business Plan Development: An International Partnership Between the USA and France – Flaire)

ADAM JARVIS, '19

(See Albion/SDV Entrepreneurial Exchange: Business Plan Development: An International Partnership Between the USA and France – UniSMART)

ROBERT JOERG, '19

Jewish Life in Poland After the Holocaust

Faculty Sponsor: Laura Brade
Major: Political Science
Hometown: Fremont, Ohio

Before the Holocaust the Jewish population in Poland constituted a thriving and vibrant community, and was a leading light for Jews across the world. However, the Holocaust and post-war emigration reduced the Jewish populace from over three million in 1939 to fewer than four thousand self-identifying Jews by 2000. Through historical documents, in-person experiences, and interviews with Jews living in Poland today, I examine the evolution of the Jewish community in Poland from the conclusion of World War I to the present, with a specific emphasis on Jewish life after the Holocaust. My research highlights the committed efforts of modern Polish Jews and Jewish immigrants to Poland to revitalize the once vibrant Jewish culture in the country. Significantly, my research shows that Jewish life in Poland has begun a rebirth, and that the future of the Jewish community in Poland, despite the rise of nationalism and revisionist laws, is bright.

MADISON KASE, ’18

Holy Cow! The Beef Behind Political and Religious Controversy in India

Faculty Sponsor: Peter Valdina
Majors: Public Policy, Religious Studies
Hometown: Boise, Idaho

“Holy Cow!”: A declaration and a religious symbol. In 2017, the Supreme Court of India suspended a ban on the selling of cows for slaughter. Earlier implemented at the state and federal level, the ban was controversial among religious minorities in India, sparking violence and unrest particularly with regard to Muslim communities. Amid violent outbreaks and legislative processes, Narendra Modi, the prime minister of India, praised the efforts to protect cows in contemporary India and in the past. Here I explore the history of political and religious statements regarding the sanctity of the cow, to ask whether such statements can be seen as representative of *all* Hindus today. To get to the hoof of the issue, I use the cow as a case study to explore and synthesize historical representations of the cow in political spheres, sacred texts, and vernacular practices. I apply my findings to the modern political context to analyze whether universal claims about the sanctity of the cow have legitimate grounds to be made, with regards to Hindu traditions and legislation in India’s secular democracy.

MARCIN KAZMIERCZAK, ’18

Light Drugs: Synthesis and Characterization of Biologically Active Azologues

Faculty Sponsor: Craig Streu
Major: Biochemistry
Hometown: Clinton Township, Mich.

Photoisomerizable drugs are selectively controlled by light irradiation and have pharmaceutical and research applications. Azologues of known drug molecules can be turned “on” or “off” in the presence of a specific wavelength of visible light because they change conformation, or shape, in response to light. This research focuses on the synthesis and characterization of azologues of Bcr/Abl and Toll Like Receptor-2 inhibitors, with implications for cancer therapy and inflammation, respectively. In theory, after light irradiation the molecule is turned off, rendering it inactive for a specific duration of time. These photoswitchable molecules can be used to reduce drug side effects due to their selectivity. Furthermore, azologues have utility as novel chemical tools in order to study the molecular pathway that the drugs afflict.

Supported by: FURSCA— Orpha Leiter Irwin Fellowship

LAUREN KELSEY, ’18

Hunting ALK: Synthesis and Characterization of a Novel, Photoisomerizing Compound to Inhibit ALK5

Faculty Sponsor: Craig Streu
Major: Biochemistry
Hometown: Sanford, Mich.

Chemotherapeutics may cause an array of negative side effects including hair loss, nausea, and fatigue. These side effects can often be attributed to the lack of target or tissue selectivity in these drugs. This research is aimed at the synthesis of a photo-switchable kinase inhibitor, which can be activated by light with spatial and temporal selectivity to decrease the negative side effects substantially. The photoswitchability is made possible through the incorporation of an azo functional group to known enzyme inhibitors, allowing for light-induced, reversible conformational changes of the drug. This work outlines the successful synthesis and activation of two compounds.

Supported by: FURSCA

VIRGINIA KIVEL, ’18

Understanding and Implementing Summer Programs for Positive Youth Development

Faculty Sponsor: Suellyn Henke
Major: Integrated Science (Elementary Education)
Hometown: Dexter, Mich.

Over the past two years, I have conducted research through FURSCA with the aim of increasing accessible positive youth programming at Albion College during summer months. Over the summer of 2016, I gathered information about existing programs in the community through both qualitative and quantitative research methods. I began by surveying fourth and fifth graders in the Albion Community School to learn about their interests and experiences with various types of programs. To learn more about the community specifically, I volunteered at local programs for over 130 hours and interviewed 11 program directors. As I compiled the information, I met with Dr. Harry Bonner, director of Kids at Hope, to help organize a meeting of stakeholders in the community. We met two times as a larger group with the aim of coordinating programming efforts and resources to optimize the opportunities for youth to participate in a variety of summer activities. During the following summer, I worked with the College and Director David Green of the Whitehouse Nature Center to enact some of my findings. Along with fellow student Caroline Manning, I worked under Green to create a diverse and inclusive curriculum for both a series of weekly summer camps and a summer-

long program called Teens Exploring Nature, which focused specifically on creating a college-positive experience in nature for local middle and high school students. With the new program design and increased networking strategies, we were able to make the camps very successful for all parties involved.

Supported by: FURSCA— Orpha Leiter Irwin Fellowship

ZACHARY KOHANOV, '18

Homocoupling of Alkyl and Vinylboronic Acids Using a Manganese Catalyst: A First Look

Faculty Sponsor: Cliff Harris
Major: Chemistry
Hometown: Fort Gratiot, Mich.

Coupling reactions, or reactions that involve attaching smaller molecules to one another, are crucial for creating larger and more complex molecules. There exist many different coupling reactions developed for either specific attachment of molecules or other reasons. This research investigates a specific reaction involving vinyl and alkylboronic acids, or boronic acids that are attached to double-bonded or carbon rings. With the use of a metal reagent that helps facilitate the reaction, the boronic acid is removed and through a multistep process couples to itself to create a symmetrical molecule. The scope of this reaction was tested with 10 different vinyl and three different alkylboronic acids; six of the vinyl acids were successfully homocoupled.

Supported by: FURSCA

QUEANA LANGSTON, '18

Questioning Cass: The Lies and Legacy Behind Michigan's First Territorial Governor

Faculty Sponsors: Allison Harnish, Justin Seidler
Major: Anthropology/Sociology
Hometown: Cleveland, Ohio

Questioning Cass reveals the lies and legacy of Lewis Cass. Cass was a general in the War of 1812, territorial governor of Michigan from 1813 to 1831, secretary of war for President Jackson's cabinet, and U.S. senator from Michigan from 1845 to 1857. As the "Architect of Indian Removal" and the "Father of Popular Sovereignty," Cass was responsible for both the Trail of Tears and for prolonging slavery. While Cass is honored with place names (from Cassopolis to Cass Lake, and from Cass County to Cass Street), few realize how he used his power to enact devastating social policies. In our current climate, when monuments to Confederate figures are being removed from city squares throughout the American South, it is appropriate to ask, why do we honor this man? This project draws on archival research at the William R. Clements Library at the University of Michigan and interviews with Albion residents. It will culminate in a public exhibit of Cass's Letters, which reveal in his own words the biased and bigoted opinions he held toward People of Color.

NICK LEEMAN, '18

(See Rebecca Barry, '18; Nick Leeman, '18)

LUCAS LUSK, '19

Big Five Personality Factors and Motivations for Smartphone Usage

Faculty Sponsor: Andrew Christopher
Majors: Communication Studies, Psychological Science
Hometown: Naperville, Ill.

Cell phone usage is becoming more common in today's society, especially with the advent of affordable smartphones. Whereas most past research focuses on problematic smartphone usage, ranging from distractions to depression, little to none has looked at people's everyday cell phone usage. More specifically, what individual differences account for why people use cell phones? Thus, the purpose of this study is to better understand the unique (based on the Big Five Personality Factors) motives for cell phone usage that people have. This was accomplished by having a sample of 301 participants (151 men, 149 women, 1 unspecified gender), recruited through Amazon Mechanical Turk, complete the 60-item NEO-FFI-3 (Costa & McCrae, 2008), which measured neuroticism, extraversion, openness, agreeableness, and conscientiousness. In addition, participants completed a 10-item cell phone attachment measure (Konok et al., 2016) as well as indicated how frequently they used their smartphones for 19 different activities. These activities were divided into five distinct categories (leisure, utilities, business, entertainment, and traditional communication). The results of hierarchical multiple regression suggested that older participants were less likely to use their smartphones for leisure and entertainment and expressed less attachment to their phones than did younger respondents. Regarding personality, extraversion and neuroticism were consistent predictors of smartphone activities. Specifically, extraverted people tended to use their phones for everything but entertainment and indicated strong attachments to their phones. Neurotic people tended to use their phones for leisure, utilities, and also had strong attachments to their phones. Finally, open people tended to use their smartphones for leisure.

Supported by: Faculty Development Committee

CAROLINE MANNING, ’20

Sharing the Outdoors with Albion’s Youth

Faculty Sponsor: Suellyn Henke
Major: Psychological Science
Hometown: Bloomfield Hills, Mich.

During the summer of 2017, my research consisted of creating and implementing culturally relevant curriculum for local youth, grades first through 12th, at the Whitehouse Nature Center (WNC). Cultural relevancy is teaching in ways that enable students to relate the curriculum to their own lives. The WNC has been running summer programs for many years, but there has been very little variation in the programs. The purpose of this research was to introduce more youth from the surrounding Albion area to the WNC, so they can be exposed to nature’s beneficial effects, while having their experience be pertinent to their lives. I first reviewed literature regarding therapeutic effects of nature and the importance of culturally relevant curriculum. I also did extensive networking with community stakeholders from the surrounding communities, as well as the local public schools. Lastly, this summer project consisted of writing the lesson-plan curriculum for the various programs, and then implementing the programs throughout the summer. Significant outcomes of the program were increased amount of participants, as well as the creation of 100 collaboratively written sustainable lesson plans that can be varied for continued use. This will be advantageous for the WNC in that lesson plans can continue to be varied and reused for subsequent summers, serving both new and old participants.

Supported by: FURSCA—Vernon and Gladys B. Lawson Endowed Research Fellowship

MICHAEL MARTIN, ’20

(See Albion/SDV Entrepreneurial Exchange: Business Plan Development: An International Partnership Between the USA and France – UniSMART)

GARRETT MASON, ’18

(See Advanced Genetics Lab)

JOSHUA McGARRY, ’19

Edvard Grieg’s Piano Concerto

Faculty Sponsors: David Abbott, James Ball
Major: Music with Performance
Hometown: Macomb, Mich.

Edvard Grieg’s Piano Concerto in A Minor, Op. 16, is one of the great staples of the piano concert repertoire. Composed in 1868, this piece is a fusion of the bravura and lyricism of the Romantic Period piano literature and the folk dance styles of Grieg’s native Norway at that time. Also evident are the influence of Franz Liszt and Robert Schumann, particularly the latter’s piano concerto.

This concerto is comprised of three movements – *Allegro molto moderato*, *Adagio*, and *Allegro moderato molto e marcato – Quasi presto – Andante maestoso*. Here I will be presenting the first movement. This movement is a perfect example of the dichotomy in Grieg’s music between the traditional Romantic and Norwegian folk styles. Soaring melodies that suddenly morph into playful dances and brilliant solo cadenzas contribute to the dramatic character. Grieg’s genius is showcased by his ability to bring nationalistic elements to the forefront while using a largely traditional harmonic palette. Above all, the transcendent and memorable melodies blend seamlessly throughout this work and have made it one of the most well-known piano concerti of all time.

ANNA MILLER, ’18

The Effect of Hobo Transposon Excision and DNA Repair in *Drosophila melanogaster*

Faculty Sponsor: Ken Saville
Majors: Biology, Music
Hometown: Livonia, Mich.

As the repository of genetic information, it is critical to organisms that DNA damage is repaired quickly and with high fidelity. When DNA damage is improperly repaired, it may cause diseases such as cancer, Cockayne syndrome, and severe combined immunodeficiency. DNA can be mutated by numerous agents both external and internal. One internal source of DNA damage is from the transposition of transposable elements, including the P and hobo elements. Transposable elements “jump” out from one section of the DNA and reinsert into another, leaving double-strand DNA breaks at the excision site. Hobo excisions can be repaired by homologous recombination (HR), but they are preferentially repaired by nonhomologous end-joining (NHEJ). DNA repair and transposable elements themselves can be studied in *Drosophila melanogaster*. This study looked at the hobo element, HOP8. The P element is located inside of the hobo element; HOP8

is nonautonomous and needs hobo transposase to be supplied in trans. Curly winged, glazed-eye female flies that have an inducible source of hobo transposase were crossed with HOP8 male flies and heat-shocked to trigger transposition, leaving behind a double-strand DNA break requiring repair. The resulting mosaic-eyed male flies were then crossed with wild-type female flies because mosaic eyes mark meiotic recombination in the P element. Female flies with white, indicating that hobo transposition occurred, were collected and stored in a freezer. Primers have been designed and tested that would detect HR in progeny flies. PCR of progeny flies currently show that all of the hobo element failed to repair.

Supported by: FURSCA

DARCY MUNS, '20

(See Albion/SDV Entrepreneurial Exchange: Business Plan Development: An International Partnership Between the USA and France – UniSMART)

KATHERINE MURPHY, '18

Peacekeepers and Sexual Exploitation and Abuse in Post-Conflict Nations

Faculty Sponsor: Carrie Booth Walling
Major: Political Science
Hometown: Grosse Pointe, Mich.

The purpose of this thesis was to research the causes behind an increase in sex trafficking and sexual exploitation and abuse (SEA) upon United Nations (UN) peacekeeping deployment in post-conflict nations. I argue that an influx of peacekeeping troops increases SEA in the nation where peacekeepers are deployed. In order to combat this, I argue that more women should be hired as peacekeeping personnel, more troops should be drawn from countries with domestic traditions of gender equality, the UN should focus on positive socialization in target states and, lastly, the UN must provide better training and data recording during peacekeeping missions. Although UN peacekeepers are generally effective and helpful in maintaining peace in post-conflict nations, there are some unintended consequences of these missions that need to be addressed.

JENNIFER NELSON, '18

Combining Remote Sensing and Geochemistry Data in the North Qaidam UHP Terrane, China

Faculty Sponsor: Carrie Menold
Major: Geology
Hometown: Kalamazoo, Mich.

ASTER images collected of the Qaidam basin in northern Tibet show exposures of ultra-high-pressure (UHP) metamorphic rocks interfolded with an ophiolite sequence. These units are both thought to be large bodies of consistent age formed by a single tectonic event, with a genetic relationship proposed to exist between them. However, this is still speculative due to a lack of detailed geologic data and mapping in this remote area of Tibet. Using ASTER imagery and spectral properties, more data about the potential genetic link between these exposures can be obtained. Four localities along the north Qaidam margin were examined: Dulan Shan, Xitie Shan, Luliang Shan, and Qing Shan. Specific focus was placed on Luliang Shan, as fieldwork done in that area provided a detailed field map and petrologic samples of the rock units to use as a comparison to spectral data. These rock units were spectrally analyzed with bandwidth ratios and band-math, then compared with the field samples to confirm where the different rock units were present and what factors could have caused the distinct contacts visible in the ASTER images. Isolating the factors that distinguished between the UHP metamorphics, granitic intrusions, and the ophiolite sequence in the ASTER imagery could allow these factors to be applied to imagery of other remote areas in the Himalayas, providing geologic data and preliminary mapping without needing to reach these areas to do fieldwork.

Supported by: FURSCA, Lawrence D. Taylor Fund for Undergraduate Research in Geology

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LAURA NEWBURY, '18

Americans' Assets, Debts, and Retirement Decisions During the 2007-2009 Financial Crisis

Faculty Sponsor: Daniel Jaqua
Major: Economics and Management
Hometown: Harbor Springs, Mich.

This presentation reports evidence about the relationship between assets, debts, and retirement age of Americans. I use panel data from the 2007-2009 Survey of Consumer Finances to estimate the correlation between assets, debts, and retirement age. I do not interpret the observed relationships as causal effects because during the chaos of the financial crisis, it is difficult to determine a credible identification strategy. Nevertheless, evidence from this time period

is important to our understanding of retirement decisions. I attempt to answer the following three questions: Controlling for other factors, do individuals with higher assets/debts retire sooner or later? Does the composition of assets/debts change the relationship to the retirement age? Can we identify changes in these relationships before and after the financial crisis?

LAURA NEWBURY, '18
(See Albion/SDV Entrepreneurial Exchange: Business Plan Development: An International Partnership Between the USA and France – UniSMART)

ALEC PALMER, '20
(See Albion/SDV Entrepreneurial Exchange: Business Plan Development: An International Partnership Between the USA and France – Flaire)

CHASE PALMER, '20
(See Albion/SDV Entrepreneurial Exchange: Business Plan Development: An International Partnership Between the USA and France – La Galerie)

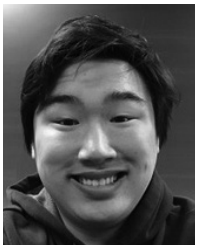
HARRISON PALMER, '18
(See Albion/SDV Entrepreneurial Exchange: Business Plan Development: An International Partnership Between the USA and France – TravelUs)

NIKHIL PATEL, '18
(See Advanced Genetics Lab)

KELLY PITT, '18
The Finality of Truth: Visualizing Being Seen
Faculty Sponsor: Lynne Chytilo
Majors: Art, Economics and Management
Hometown: Madison Heights, Mich.

When you keep parts of yourself from being seen you give others the freedom to fill in the blanks, to edit your history and character to match their preferred version of you. But when you express yourself honestly and publicly, others are forced to take your identity as given. My work addresses the finality of being seen as you truly are and the fear that comes with it, especially in regards to my identity as a lesbian. In this thesis I will describe the process and ideas behind the work I've created in 2017 and 2018. These works, in sculpture, drawing, and painting, use contrast between hot and cold, inside and outside, agency and inaction to reflect the difference between the comfort of what is known, to the fear produced by unfamiliar freedom.

Supported by: FURSCA—Russell Bradshaw, '30 Endowed Research Fund



SAM RASEMAN, '19
Examining Tarski's Semantic Conception of Truth
Faculty Sponsor: Jeremy Kirby
Major: Philosophy
Hometown: Kalamazoo, Mich.

In this presentation I provide an account of a problem in language called the antinomy of the liar, which arises when one develops a sentence that predicates truth of itself, and then I discuss a proposal for solving this problem developed by Alfred Tarski. Thereafter, I assess the extent to which the proposal is successful.

Supported by: FURSCA

MARCELINE REDICK, '20
(See Albion/SDV Entrepreneurial Exchange: Business Plan Development: An International Partnership Between the USA and France – TravelUs)

ALEX REID, '18
Nickel as a Catalyst for the Methanol Oxidation Reaction
Faculty Sponsor: Kevin Metz
Major: Chemistry
Hometown: Holt, Mich.

Currently the world is in an energy crisis as we have found that the Earth's supply of oil is being used at a far quicker pace than it can be replenished. It is the goal of many researchers to find a new fuel source to replace oil with the purpose to reduce carbon emissions by humans. One fuel of interest is methanol. To make methanol a useable fuel source, it must first be oxidized. Currently, that oxidation reaction is being catalyzed by platinum- and palladium-based catalysts that are easily poisoned by side reactions when trying to convert methanol into fuel. In this work, I have synthesized nickel-impregnated carbon microspheres for a new catalyst for the methanol oxidation reaction. These microspheres were synthesized through ultrasonic spray pyrolysis (USP) and characterized by thermogravimetric analysis

and microscopy. The catalytic activity was tested by cyclic voltammetry. The results of this research will be presented in this presentation.

Supported by: FURSCA

MEGAN REILLY, '18

Saddlebred or Morgan: Discerning Differences Between Equine Breeds

Faculty Sponsor: Sheila Lyons-Sobaski
Major: Biology
Hometown: Brighton, Mich.

The American Saddlebred and Morgan horse breeds originated in the United States in the 1700s. Both breeds have a light muscle type and are used for sport and recreational riding. Currently, both breed associations require DNA testing of both parents for inclusion into the breed registry. If alleles and/or allelic frequencies are specific to each breed, horses with unknown lineage could be classified to breeds without parental DNA, allowing for breed registry. Using microsatellite genetic markers, this study seeks to discover if significant differences are present between American Saddlebred and Morgan horse breeds, and if enough variation exists between the breeds to allow for breed assignment based only on an individual horse's genetic information. Genetic analysis was performed using eight microsatellite genetic markers on a sample of 34 American Saddlebred and 29 Morgan horses.

Supported by: FURSCA— Harriet E. Elgin, '36 Endowed Fellowship, Biology Department

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EVAN RIETH, '19

Campanilismo: Lesson on Being of a Place

Faculty Sponsor: Nels Christensen
Majors: Environmental Studies, English
Hometown: Three Oaks, Mich.

I was born in Three Oaks, Mich., where I've spent most of my life living and working with my family on our farm. I grew to love and value the physical work of farming, the food produced by that work, and the people I did that work and ate that food with.

This last summer, though, I decided to leave my home, to study abroad in Italy, to look for a place-based culture and cuisine. And I found it. Despite Italy being so different, so foreign and unfamiliar, separated by distance and separated by language, I found a word and a way of life that was an amazing example of living committed to a locale: *campanilismo*. Campanilismo literally translates to "in the shadow of the bell tower," but it has come to mean "love of hometown." During my time in Italy, I lived in the campanilismo, worked for it, and ate the foods of it.

And yet, I couldn't help feeling plucked from my place. At one point in late September, I remember calling my dad on the phone and talking to him about the work they had done and the work they were doing, and wanted nothing more than to share in that work with the people I loved. I felt like I had left some vital part of me behind.

I found that the very thing I had been looking for was the very thing I had left. But I wouldn't—couldn't—have known that if I didn't leave first.

JAMI ROBBINS, '18

Identification of Unknown Compounds Produced in Shock Experiments

Faculty Sponsors: Vanessa McCaffrey, Nicolle Zellner
Major: Chemistry
Hometown: Battle Creek, Mich.

There is much interest surrounding the origins of organic molecules that are necessary for life. One process that leads to the synthesis of these compounds is through shock-catalyzed synthesis during the impact of extraterrestrial bodies with the earth. This project aims to identify compounds produced in shock experiments that are meant to simulate meteoric impacts with Earth. The shock experiments were conducted on mixtures of glycolaldehyde (GLA) with a montmorillonite clay ("C" and "F"). After silylation, experimental samples were analyzed by GC/MS. Proposed products were also silylated and analyzed by GC/MS. The reference spectra were compared to experimental spectra to confirm the presence or absence of proposed products. Focus for this research has been placed mostly on shock experiments involving a GLA/FClay (1:20) mixture. FClay is a montmorillonite-rich bentonite clay. The mixture was shocked at three different pressures: 5, 12, and 19 GPa with the flat-plate accelerator at the Johnson Space Center. Glycolic acid and ethylene glycol were synthesized in previous experiments which utilized CClay instead of FClay. A minute amount of glycolic acid was found in the unshocked FClay control but none was found in the experimental FClay samples. No ethylene glycol was found in either unshocked control or the experimental samples. This research has been a great first step in identifying the unknown products produced in these shock experiments. Our findings also have implications for mineral-directed prebiotic synthesis as demonstrated by the montmorillonite clays utilized in these experiments.

Supported by: FURSCA, NASA's Exobiology and Evolutionary Biology Program

ROOHIA, ’18

Nuclear Proliferation: The Pakistani Case

Faculty Sponsor: Matthew Schoene
Major: Sociology
Hometown: Quetta, Pakistan

Nuclear proliferation is a source of constant concern and potential source of instability within the world system. This research explores factors that led to Pakistan acquiring nuclear weapons. Researchers continue to be concerned by Pakistan’s nuclear capabilities due to the country’s status as a weak state and presence of potential hostile non-state actors. Drawing upon mostly primary sources including published articles, documented interviews, reports generated by certain Pakistani institutions, and cross-national quantitative data, I ask what factors besides the Pakistani state’s rivalry with India motivated the country to become a nuclear power. Most prior research on the topic addresses the Indian influence on the decision, which undermines Pakistan’s geographical role in the world. This paper applies the World Systems Analysis theory to understand Pakistan’s decision and how a nuclear Pakistan changed the worldview of the region. My research indicates that factors such as the dependency on the nuclear umbrella, the unreliability of the Western alliances, prestige in the Islamic world, the energy needs of the country, and regional strategic considerations were important motivating factors for Pakistan becoming a nuclear power.

SYDNEY RUDOWSKI, ’20

Predictors of Attitudes Toward Genetic Technologies

Faculty Sponsor: Eric Hill
Majors: Biology, Psychological Science
Hometown: St. Clair, Mich.

The present study examined predictors of U.S. attitudes toward genetic technologies. The use of genetic testing and gene editing is as much an ethical issue as it is one of scientific advancement. Thus, attitudes toward these technologies may be linked to ideological beliefs. For example, Singer et al. (1999), using data from the 1990 and 1996 General Social Survey, found that those who attended religious services more frequently tended to think that prenatal genetic testing would do more harm than good. Evans et al. (2007), using a national panel survey, found that people who belonged to more conservative religious denominations tended to be more opposed to the use of reproductive genetic technologies. The present study examined, in data from a 2004 U.S. sample, religiousness and political conservatism as predictors of genetic-testing attitudes. And, given recent developments in gene-editing technology (see Scheufele et al., 2017), the present study also analyzed data from a 2016 U.S. sample to see if religiousness and conservatism might also predict attitudes toward this new genetic technology.

Secondary analyses were conducted using data from the 2004 General Social Survey and Wave 15 of the Pew Research Center American Trends Panel survey, conducted from March 2 to March 28, 2016. In the 2004 data, more frequent religious service attendance and political conservatism were both linked to the perception that genetic testing would do more harm than good. In the 2016 data, religious service attendance, religious commitment, and political conservatism each predicted greater worry for society as a whole about the possibility of gene editing.

VICTORIA RUPRECHT, ’18

Cultural Competencies in Medicine

Faculty Sponsor: Marcie Noble
Majors: Spanish, Biology
Hometown: Grosse Pointe Shores, Mich.

As citizens of the world, we strive to create cultural understanding to foster effective relationships amongst people of varying backgrounds. This project explores the implications and importance of cultural competence in the field of medicine, with a focus on examining interactions between healthcare providers and Spanish-speaking populations. I will also be sharing my experiences from working with youth at a Spanish enrichment program that focuses on creating activities that integrate the Spanish language and culture into learning.

VICTORIA RUPRECHT, ’18

A Master Manipulator: Effects of *Wolbachia* on Host Locomotion and Cold-Shock Tolerance

Faculty Sponsor: Roger Albertson
Majors: Spanish, Biology
Hometown: Grosse Pointe Shores, Mich.

Wolbachia is the causative agent of several human illnesses, including river blindness and elephantiasis. A related but harmless strain of bacterium is found in most insects. It forms a symbiotic relationship with its host, which include species like *Drosophila*, the common fruit fly. Interestingly, *Wolbachia*-infected flies are resistant to some viral strains. In fact, scientists have used *Wolbachia* to combat mosquito-borne diseases, such as Dengue. This project investigates the effects of *Wolbachia* on host locomotion and cold-shock tolerance in *Drosophila* second instar larvae. It also assesses various aspects of physiology, like behavior, viability, and motor control. This information could be used to learn more about the insect’s fitness and how it copes with changes to its microenvironment and surroundings.

Results showed that *Wolbachia* had no effect on host locomotion between infected larvae versus cured larvae in respective strains; however, cold-shock treatment resulted in faster recovery time and increased revival. In the future, these results may be applicable to increase fitness in *Wolbachia*-infected mosquitoes.

Supported by: FURSCA—Upjohn Student Summer Biology Research Endowment

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EMMA SCHIEFELBEIN, '18

(See Albion/SDV Entrepreneurial Exchange: Business Plan Development: An International Partnership Between the USA and France – La Galerie)

HANNAH SCHOON, '19

(See Advanced Genetics Lab)

PATRICK SHEPERD, '19

Synthesis of a Photoswitchable Hemithioindigo Analogue of a Tubulin Polymerization Inhibitor

Faculty Sponsor: Craig Streu
Major: Biochemistry
Hometown: Petoskey, Mich.

Uncontrolled cell division is responsible for tumor development and progression, and tubulin, which polymerizes to make microtubules, is a critical protein in the cell replication process. By stopping tubulin from polymerizing, a single drug can effectively stop cell division. Indanocine is a drug that stops tumor development by binding directly to the binding site between the alpha and beta subunits of tubulin, preventing polymerization. As with many chemotherapeutic drugs, however, Indanocine does not select for tubulin in cancer cells, and thus causes many side effects due to off-site interactions. To reduce side effects, photoswitchable drugs have been researched to increase the site selectivity of drugs within the body. A photoswitchable compound is one whose conformation can be changed with light, effectively changing the physical properties of the compound. In therapeutic drugs, photoisomerization can act as an "on-off switch," allowing a drug to be introduced into a patient in high quantities of its inactive form, and be "switched" to its active form by light only in the targeted areas of the body. Hemithioindigo (HTI) is a photoswitchable compound that has recently attracted much attention and shares a core structure with tubulin polymerization inhibitor Indanocine. I hypothesize that if Indanocine's structure is altered by the replacement of one single carbon with a sulfur atom, like that in hemithioindigo photoswitches, it will retain its chemotherapeutic properties while gaining photoswitchable capabilities. Synthesis and photophysical properties of the target compound will be discussed.

Supported by: FURSCA

Silvestri

SABRINA SILVESTRI, '18

Major: Biology
Hometown: Novi, Mich.

Supported by: FURSCA—Anna and Carl Weiskittel Endowed Chemistry Fellowship

Woodhead

NICOLE WOODHEAD, '19

Major: Biochemistry
Hometown: Buffalo Grove, Ill.

Supported by: FURSCA—Orpha Leiter Irwin Fellowship

Synthesis and Characterization of RNA Aptamers Targeted at *Aspergillus* Cell Surface Carbohydrates

Faculty Sponsor: Christopher Rohlman

Aspergillosis is a disease characterized by the degradation of the respiratory system due to *Aspergillus* fungi. The slow growth rate of the infection allows it to establish a strong foothold within the body, making it difficult to treat, and making early detection vital to successful therapy and patient survival. Traditional methods for the detection of *Aspergillus* in the body can be extremely difficult and invasive. Additionally, these methods provide only minimal rates of detection and high mortality rates in immuno-suppressed patients. RNA aptamers have the potential to bind selectively to cell surface carbohydrates of the fungus *Aspergillus*, and aid in the detection of Aspergillosis, where fluorescent detection could be used to increase the sensitivity of ligand binding and the identification of infection. In this study, RNA aptamers targeted at the *Aspergillus* cell surface carbohydrate Galactomannan were selected from a 40-nucleotide randomized sequence population. Aptamer template pools were synthesized using PCR amplification to generate the initial cDNA pool. RNA aptamers were synthesized via *in vitro* transcription of the template pool utilizing modified NTPs. Successful aptamers were selected through rounds of binding to Galactomannan, followed by repetition of the amplification and transcription process. We will describe the characterization of the sequence diversity of the aptamer pool as well as its binding characteristics. We continue to refine the current pool of aptamers in order to obtain aptamers with high affinity for the carbohydrate Galactomannan. This research will help the advancement of our project goal of developing medical diagnostics and analytical biosensors that can detect the presence of *Aspergillus*.

SABRINA SILVESTRI, ’18

(See Advanced Genetics Lab)

MATTHEW STANDER, ’19

Investigation of SOCS5 as a Gene Target of miR-9 in Inflammatory Monocytes

Faculty Sponsor: Brad Rabquer
Major: Biology
Hometown: Grosse Pointe, Mich.

Rheumatoid arthritis (RA) is a chronic autoimmune disease that is characterized by inflammatory joint destruction. The inflammation is caused in part by monocyte migration into the joints and subsequent macrophage differentiation. MicroRNA (miRNA) are short, single-stranded, non-coding RNA that bind to mRNA to regulate gene expression. Our lab has previously found that miR-9 was upregulated in monocytes isolated from patients with RA. SOCS5 is part of the suppressor of cytokine signaling (SOCS) family which downregulates cytokine expression such as epidermal growth factor receptor and interleukin-6. We hypothesize that SOCS5 is a gene target of miR-9 and propose a luciferase assay to confirm binding.

Using microRNA.org, SOCS5 was determined as a target gene of miR-9 *in silico* with a mirSVR predicted binding score of -2.17. microRNA.org uses a combination of miRanda, an algorithm to predict miRNA binding sites, and mirSVR, a support vector regression that provides a predicted binding score. PCR primers that amplify the miR-9 3’ UTR binding site of SOCS5 were designed using primer-BLAST. U937 monocytes were grown, mRNA was isolated, and cDNA was produced. The PCR product and pmirGLO vector were digested with Sac1 and Sal1 restriction enzymes and then ligated. The ligated vector was transformed into *E. coli* cells. Plasmid vector was isolated from single colonies. We determined the ligation and transformation were successful by performing PCR using sequencing primers that amplify the multiple cloning site. Gel electrophoresis was used to separate and view the ligated plasmid PCR product. The SOCS5 insert was calculated to be 576 bp, whereas the non-ligated plasmid came out to be 380 bp. The ligated plasmid was sequenced to confirm ligation.

In conclusion, we have determined that SOCS5 is expressed by U937 monocytes. We have also successfully cloned the 3’ UTR miR-9 binding site of SOCS5 into the pmirGLO vector for use in luciferase assays to assess binding between miR-9 and SOCS5.

Supported by: FURSCA—Bruce A., ’53 and Peggy Kresge, ’53 Endowed Science Fellows

IAN STEWART, ’19

Self-Esteem, Gender, and Ego Threat: Predicting Benevolent and Hostile Sexism

Faculty Sponsor: Eric Hill
Major: Psychological Science
Hometown: Laingsburg, Mich.

Research suggests that self-esteem may motivate prejudice under certain circumstances. Collange, et al. (2009), for example, found that threat to self-image led to an increase in prejudice. When examining the predictive effects of self-esteem on prejudice, Jordan and colleagues (2003) suggest that it may be important to consider two different types high self-esteem: secure and defensive. Defensive self-esteem (DSE) is unstable and more likely to be influenced by ego threats because, at an unconscious level, people with defensive high self-esteem have an inflated sense of self created through self-deception (Raskin, Novacek, & Hogan, 1991). This suggests that when someone with defensive high self-esteem feels threatened and challenged, they may lash out. The present study looked at how self-esteem, gender, and ego threat affect sexism.

In this study, participants were recruited through the introductory psychology participant pool at a small liberal arts college in the Midwestern U.S. and on the internet via Amazon Mechanical Turk. Participants completed survey measures of social desirability, self-deception, self-esteem, narcissism, and sexism, among others. Participants were threatened by either reflecting on a previous failure or were given negative feedback on an intelligence test.

Among those asked to reflect on failure, hostile sexism increased among men low in DSE but actually *decreased* among men high in DSE. Among those given the intelligence threat, implicit gender bias increased in both men *and* women. Defensive self-esteem was positively correlated with impression management.

Supported by: FURSCA—K.D. Metalonis, 1999 Memorial Endowed Student Research Fellowship; Robson Family Fellows Endowment

MARK STEWART, ’18

(See Albion/SDV Entrepreneurial Exchange: Business Plan Development: An International Partnership Between the USA and France – La Galerie)

VICTORIA STEWART, '18

Predictors of Help-Seeking Stigmas in Minority and Majority Groups

Faculty Sponsor: Eric Hill
Major: Psychological Science
Hometown: Southfield, Mich.

The present study examined predictors of mental illness and attitudes toward seeking help—and whether these relationships differ in minority communities as compared to majority communities. Research suggests that as individuals see more positive messages about their own race, they also connect more with their minority identity, which is then associated with increased perceived discrimination (Lee, 2013). Perceived discrimination, in turn, predicts a variety of negative mental health outcomes (Coakly et al., 2017). Ironically, for people of color, anticipated stigma for people with mental health issues as well as stigma from parents (Turner, 2015) create a situation in which those who might benefit the most from seeking help might also have the greatest amount of self-stigma toward seeing a therapist (Quinn, 2015). The present study looked at how predictors of stigma might differ in minority and majority communities.

In this study, 355 participants (203 women, 62 black people, 202 white people, M_{age} =34.10, SD_{age} =10.73) were recruited using Amazon Mechanical Turk to complete surveys assessing minority status and identity, perceived discrimination, internalized racism, anxiety, stress, and depression, parents' attitudes toward help-seeking, and self-stigma toward seeking help. Black and white people were the groups that were ultimately assessed separately. Results suggest that negative mental health symptoms tended to be more strongly correlated with self-stigma toward seeking help among black people as compared to white people. All the predictors seemed to play a role in increasing stigma among black people, while parents' negativity was the greatest predictor of self-stigma among white people.

Supported by: FURSCA

SARAH SUBHI, '19

(See Advanced Genetics Lab)

BROCK SWARTZ, '18

Chasing Hedgehogs: The Synthesis and Characterization of Second-Generation Azologues

Faculty Sponsor: Craig Streu
Major: Chemistry
Hometown: Parma, Mich.

Drug side effects are often due to the drug binding to targets throughout the body as well as the afflicted area. Therefore, an effective way to reduce side effects is to increase a drug's selectivity. One way to do this is with the introduction of azo-stilbene chemistry. Due to the ability of these molecules to change shape in response to specific wavelengths of light, they can be activated and deactivated at will. My work this past summer was the application of this chemistry to the drugs Vismodegib and Imatinib. Vismodegib is an FDA-approved smoothened inhibiter used in the treatment of basal cell carcinoma. Imatinib is used to treat chronic myeloid leukemia, a diseased caused by the Philadelphia chromosome.

Supported by: FURSCA—Anna and Carl Weiskittel Endowed Chemistry Fellowship

ERYN VANDERVLUCHT, '20

(See Advanced Genetics Lab)

OANA VESA, '18

Analysis of the Gaia RVS Region in ESPaDOnS Spectra of Asteroseismic Calibration Stars

Faculty Sponsor: Nicolle Zellner
Majors: Physics, Mathematics
Hometown: Macomb Township, Mich.

While surface gravity can be measured from asteroseismology, asteroseismology cannot be applied to every star. Surface gravity is a critical stellar parameter because it can be used to calculate the radii of stars—and by extension, the radii of exoplanets orbiting that star. Here I present spectroscopic observations from ESPaDOnS, an instrument on the Canada-France-Hawaii Telescope, of 172 benchmark "Gold-Standard" stars observed by the NASA Kepler Mission for which densities and surface gravities have been precisely measured using asteroseismology. The goal is to discover an empirical correlation between the equivalent width of the spectral lines in the infrared Ca II triplet region (from 8470-8740 Å) against surface gravity and other stellar parameters, such as effective temperature and metallicity. Using Python, I created a routine that performs a curve-fitting process on each of the spectral lines to derive the equivalent widths. I have found that the Ca II (8498.02 Å), Ca II

(8662.14 Å), and Fe I (8515.108 Å) lines have the best potential to be indicators of surface gravity; however, degeneracies with effective temperature and metallicity need to be explored further. If a true indicator for surface gravity can be found, then it can to be applied to the medium-resolution (~11500) Gaia radial velocity spectra, which will be released for millions of stars over the coming years. This would potentially allow us to characterize host stars of exoplanets.

Supported by: National Science Foundation

RACHAEL VITALE, '18

Breaking the Barriers to Pelvic Floor Physical Therapy

Faculty Sponsor: Mareike Wieth
Major: Psychological Science
Hometown: St. Clair Shores, Mich.

Pelvic floor physical therapy (PFPT) is a branch of rehabilitative medicine that develops, maintains, and restores the maximum movement and functional ability of the pelvic floor muscles (APTA, 2018). It is used to treat disorders like urinary and fecal incontinence, pelvic organ prolapse, and many sexual dysfunctions including pain disorders. Both males and females can be affected by these disorders, though a disproportionate number of females are affected. Previous research has shown that it is effective in treating all of the aforementioned disorders (Bø & Herbert, 2013; Ibrahim et al., 2014; Bedaiwy, Patterson, & Mahajan, 2013). However, PFPT is not prescribed as often as it could be, with physicians opting to prescribe medications or surgery, instead of physical therapy (Jundt, Peschers, & Kentenich, 2015). The purpose of this study was to examine why PFPT is not utilized more often for treating these disorders as well as the barriers for this type of treatment. Local physical therapists were asked to provide their professional opinions regarding treatment as well as the barriers they perceive, if any. This, along with previous research, was used to determine the most common reasons people do not utilize PFPT and to propose solutions and ways to overcome those barriers. Results of the interviews and suggestions on how to overcome the barriers to pelvic floor physical therapy will be discussed in the presentation.

RACHAEL VITALE, '18

A Comparative Genomics Analysis of contig48 from *D. Eugracilis*

Faculty Sponsor: Ken Saville
Major: Psychological Science
Hometown: St. Clair Shores, Mich.

This project is part of a larger research project being carried out by the Genomics Education Partnership at Washington University in St. Louis. The overall goal of this project is to use comparative genome annotation to compare a specific type of genetic material called heterochromatin between various species of *Drosophila* in order to learn about chromosome evolution. My part of the project was to compare a control region of euchromatin from the recently sequenced species *Drosophila eugracilis* with that of the well-characterized species *Drosophila melanogaster*. Genome annotation, the process of identifying locations of genes in a DNA sequence, is a crucial part of understanding how genetic material codes for observable traits and behaviors. This can be accomplished through comparative genomics, a process designed to compare different genomic features of organisms. The bioinformatic tools used to accomplish the comparison and annotation were provided by the Genomics Education Partnership (GEP), a project designed to allow undergraduate students to investigate and create gene models in an aim to fully annotate all genomes in the different *Drosophila* species. This project investigated the DNA in the 48th contiguous region on the third chromosome of the *Drosophila eugracilis.* The comparative analysis to the *Drosophila melanogaster* genome was complete using databases like GEP, NCBI BLAST, and Flybase. It was estimated that there were six distinct genes in this region, with between 0-11 isoforms. A detailed analysis of contig48 will be discussed.

PHILLIP VOGLEWEDE, ’19

Thomas Moran’s Yellowstone and American West: Chromolithography and the Development of Western Imagery

Faculty Sponsor: Marcy Sacks
Major: History
Hometown: Oxford, Ind.

In 1876, Louis Prang and Company produced 15 chromolithographs based off of watercolors by the artist Thomas Moran in a portfolio called *The Yellowstone National Park and the Mountain Regions of Portions of Idaho, Nevada, Colorado, and Utah*. These chromolithographs were financially more accessible to Americans than original works of art and were the first color prints of the American West ever manufactured. Building off of previous scholarship, which has analyzed the 15 chromolithographs with Moran’s watercolors, my research focuses on comparing and contrasting the chromolithographs with other American West artworks in order to understand how the American West was being presented to Americans.

KATHERINE VOLKER, ’18

(See Advanced Genetics Lab)

WENDI WANG, ’18

A History of Premedical Education: A Case Study at Albion College

Faculty Sponsors: Barbara Keyes, Ruth Schmitter
Major: Biochemistry
Hometown: Midland, Mich.

Lin et al. (2013) discussed the limited amount of available information on the undergraduate premedical experience and factors that play a pivotal role in the professional development of future physicians. This study is based on interviews with three cohorts of premedical students (1965-1974, 1975-1984, and 1985-1994) who attended a small liberal arts college, completed medical school and residency, and are either practicing or retired physicians. The goal of this research is to determine if there are generational differences in former premedical students’ perception of their undergraduate experiences. Participants responded to questions about their background, curricular and extracurricular activities, support system, and preparation for medical school. A thematic analysis was employed to examine the data, and cohort differences were identified in reasons for choosing Albion College, in family background, and in the value placed on liberal arts course work. Overall, however, the cohort groups were much more similar than different. A major limitation of this study was the small number of interviewees.

Supported by: FURSCA

LEANNE WEGLEY, ’18

A Comprehensive Study of the Ion-Atom Merged Beams Apparatus and the Merged Beams Technique

Faculty Sponsor: David Seely
Majors: Physics, French
Hometown: Columbus, Ohio

Ion-atom collisions have been studied in some way, shape, or form for a long time. High-energy collisions display well-defined classical physics behavior, similar to that of scattering marbles, whereas low-energy collisions prove to be more mercurial. The manner of studying these low-energy collisions varies greatly depending on the parameter demanded of the experiment. The novelty of the merged beams method for studying ion-atom collisions is that it allows for low-energy collisions between ions and atomic forms that would not exist in traditional gas cell targets. The Ion-Atom Merged Beams Apparatus (IAMBA) at Oak Ridge National Laboratory (ORNL) is unique even among merged beams apparatuses due to the capacity of the 2ω Caprice electron cyclotron resonance source to fully strip light atoms as well as the apparatus’s ability to maintain atomic hydrogen over the entire merge section and to measure absolute cross sections. These qualifications make the IAMBA an ideal apparatus for measuring cross sections and making detailed models of charge exchange in order to better X-ray spectroscopic analysis of difficult-to-observe astronomical environments (13-APRA13-0058).

Supported by: FURSCA, Dorothy and David Kammer Fund, Physics Department

MARGARET WHITLOCK, ’20

(See Advanced Genetics Lab)

LAUREN WIEGAND, ’18

(See Ryan Bomya, ’18; Samantha Coon, ’18; Lauren Wiegand, ’18)

NICOLE WOODHEAD, ’19

(See Sabrina Silvestri, ’18; Nicole Woodhead, ’19)

ADVANCED GENETICS LAB
Drosophila melanogaster as a Model for Human Disease

MICHAEL BERNARD, ’18
Major: Biology
Hometown: Grand Blanc, Mich.

GARRETT MASON, ’18
Major: Biology
Hometown: Traverse City, Mich.

NIKHIL PATEL, ’18
Majors: Biology, Economics and Management
Hometown: Grosse Pointe Woods, Mich.

HANNAH SCHOON, ’19
Major: Biochemistry
Hometown: Canton, Ill.

SABRINA SILVESTRI, ’18
Major: Biology
Hometown: New Hudson, Mich.

SARAH SUBHI, ’19
Major: Biology
Hometown: East Lansing, Mich.

ERYN VANDERVLUCHT, ’20
Major: Biology
Hometown: Roseville, Mich.

KATHERINE VOLKER, ’18
Major: Biology
Hometown: Macomb, Mich.

MARGARET WHITLOCK, ’20
Major: Biology
Hometown: Nevada City, Calif.

Faculty Sponsor: Roger Albertson

The fruit fly, *Drosophila*, is an excellent model organism to study human diseases. Approximately 75% of human disease-causing genes have a functional homolog in the fly. *Drosophila* can be genetically manipulated in experiments to investigate the underlying physiological basis of the disease. Here, we use *Drosophila* to examine how a few key genes contribute to four neurological diseases: Alzheimer’s (APP gene), Huntington (HTT), Fragile-X (FMR1), and hereditary spastic paraplegia (NRG). Neuromuscular capacity for flies carrying disease-causing mutations was tested in a locomotion assay. In addition, the UAS-GAL4 expression system was used to test the effects of misexpressing specific genes. Misexpression of the FMR1 in the eye caused massive cellular death, while misexpression of FMR1, HTT, and NRG in the nervous system caused significant locomotion defects.

Albion/L'École Supérieure de Vente (SDV) Entrepreneurial Exchange

Faculty Sponsors: Vicki Baker (Economics and Management), Laurel Draudt (Gerstacker), Catherine Bruneteaux-Swann (SDV), Annie Towhill (SDV)
Program Director: Robyn Murphy (Gerstacker)

We are pleased to announce another successful international exchange—blending students from Albion College's Carl A. Gerstacker Institute for Business and Management with students from France—to create international and intercultural business plans. The International Entrepreneurial Exchange (IEE) partnership was started in 2008 and lives on in Gerstacker's annual exchange with L'École Supérieure de Vente (SDV), a business school located in Saint-Germain-en-Laye, near Paris. The goal is simple—create a partnership and student exchange for upperclassmen (juniors and seniors) around experiential learning opportunities dealing with entrepreneurship, innovation and change, and business plan development and implementation.

Albion students, along with their advisor, spent the week of fall break in France. During this time French and American students, working in teams, developed market surveys and started to lay the groundwork for the development of a new business venture. They created a market research plan and marketing strategy for their chosen business. Student teams were coached by French and American experts on their specific endeavor and marketing strategy. At the end of the week, students presented their preliminary business plans. With relationships solidified and plans in place, the teams took on the next steps to continue working together from afar—utilizing virtual meeting rooms and other technology to stay in touch and move the plans forward. The French students spent the week leading up to the Elkin R. Isaac Student Research Symposium in Albion, visiting their American teammates and putting the final touches on their plan, culminating in presentations at the Symposium. The French team(s) with the best business ideas will have the opportunity to present in front of French bankers and venture capitalists in the near future.

The participants are driven by the guiding principles of discovery, creativity, sharing, and empowerment, which determine the success of their projects. This special partnership provides a unique opportunity to grow as an individual, a student, and an entrepreneur. The most valuable aspect of an exchange like this is the opportunity to become familiar with cultures from around the globe, to learn foreign business practices and teamwork, and to make lasting friendships. The business plans each student team developed are described on the following pages.

BUSINESS PLAN DEVELOPMENT: An International Partnership Between the USA and France – Flaire: Automotive Fleet Care

DAVID BROWN, ’18
Major: Economics and Management
Hometown: Milford, Mich.

LUCAS HARDER, ’18
Major: Finance
Hometown: Naperville, Ill.

RAMONA HUANG, ’19
Major: Accounting (CPA)
Hometown: Shenzhen, China

ALEC PALMER, ’20
Major: Finance
Hometown: Spring Lake, Mich.

MAXIME CABOCO
Major: Sales Engineering in B-to-B
Hometown: Saint-Cyr-l’École, France

LISA DEL BERGOLIO
Major: Sales Engineering in B-to-B
Hometown: Saint-Germain-en-Laye, France

RIYHAD DRAIEF
Major: Sales Engineering in B-to-B
Hometown: Juziers, France

MICKAËL GUILLEMAIN
Major: Sales Engineering in B-to-B
Hometown: Bois-d’Arcy, France

Flaire is an automotive fleet care company specializing in mobile refueling and vehicle detailing. This service will serve corporate clientele with the eventual plan to expand to a consumer presence as well. Our company uses innovative software to accurately measure our consumer’s wants and needs. Through market research we have found that our prospective customers find peace of mind through the use of our company. This is a new product on the market. Abandoning the traditional gas station allows for employees to save time both on their daily commute as well as in taking care of required maintenance of their vehicle. We believe that our company is adding value to every company we partner with.

BUSINESS PLAN DEVELOPMENT: An International Partnership Between the USA and France – La Galerie

CHASE PALMER, ’20
Major: Finance
Hometown: Spring Lake, Mich.

EMMA SCHIEFELBEIN, ’18
Major: Accounting (CPA)
Hometown: Troy, Mich.

MARK STEWART, ’18
Majors: Business and Organizations, Music
Hometown: Bloomfield Hills, Mich.

CLÉMENCE MAURICE
Major: Sales Engineering in B-to-B
Hometown: Bazainville, France

NANCY BRAMBLE
Major: Sales Engineering in B-to-B
Hometown: Paris, France

LYDIANE ROUDAUT
Major: Sales Engineering in B-to-B
Hometown: Versailles, France

VALENTIN ROUAULT
Major: Sales Engineering in B-to-B
Hometown: Versailles, France

La Galerie is an online art-based community platform that allows members to connect, stay in touch, share content, and promote their work. This amazing new digital community sells subscriptions to colleges and universities looking for an art-career-specific networking resource for their emerging artists. La Galerie targets undergraduate art students, MFA students, and recent graduates who are less than five years graduated. We also offer a separate subscription for art entities such as galleries to promote themselves and locate new talent, artist residency programs based in both the USA and abroad, and retail establishments that sell original artwork. La Galerie is designed to connect emerging artists with valuable opportunities found within its art-based network.

Networking is an excellent way to connect with collegiate and post-graduate career opportunities. Career service centers at today’s colleges and universities are realizing the benefits of online networking platforms. They are utilizing services that provide connections to many business and community opportunities to assist their students. However, the specialized needs of emerging artists are underrepresented in these current networking systems. We at La Galerie have identified a better way for emerging artists to connect with the art community they aspire to enter—whether it be shops, galleries, or connections for sales. La Galerie is a networking site designed specifically for the art community.

BUSINESS PLAN DEVELOPMENT: An International Partnership Between the USA and France – TravelUs

SARAH FULLER, ’20
Major: Accounting
Hometown: Dexter, Mich.

HARRISON PALMER, ’18
Majors: Finance, Communication Studies
Hometown: Spring Lake, Mich.

MARCELINE REDICK, ’20
Majors: Accounting, French
Hometown: San Marcos, Calif.

LAURE DUPHIL
Major: Sales Engineering in B-to-B
Hometown: Saint-Germain-en-Laye, France

NICOLAS HAINAUX
Major: Sales Engineering in B-to-B
Hometown: Saint-Germain-en-Laye, France

LÉA FAVRETTO
Major: Sales Engineering in B-to-B
Hometown: Saint-Germain-en-Laye, France

CHARLÈNE DACOSTA NETO
Major: Sales Engineering in B-to-B
Hometown: Saint-Germain-en-Laye, France

TravelUs is a smartphone travel application that allows users to fill out a personal profile to best match their interests to a variety of insider attractions such as restaurants, shops, and events in the top tourism cities of the U.S. This unique approach to travel will allow for an insider experience that fully immerses the user into the culture of their desired city. Our presentation includes a financial report, a feasibility study, market research, and a competitive analysis to demonstrate the value of our business proposition.

BUSINESS PLAN DEVELOPMENT: An International Partnership Between the USA and France – UniSMART

ADAM JARVIS, ’19
Major: Economics and Management
Hometown: Ada, Mich.

MICHAEL MARTIN, ’20
Major: Accounting
Hometown: Farmington Hills, Mich.

DARCY MUNS, ’20
Major: Biology
Hometown: Lake Orion, Mich.

LAURA NEWBURY, ’18
Major: Economics and Management
Hometown: Harbor Springs, Mich.

VIRGILE ASCENZIO DE ESTEVE
Major: Sales Engineering in B-to-B
Hometown: Saint-Germain-en-Laye, France

NORMAN MAYEUR
Major: Sales Engineering in B-to-B
Hometown: Saint-Germain-en-Laye, France

TADCHCHAYANE THANGATHURAI
Major: Sales Engineering in B-to-B
Hometown: Saint-Germain-en-Laye, France

YANIS TOUZI
Major: Sales Engineering in B-to-B
Hometown: Saint-Germain-en-Laye, France

UniSMART is a company that innovates technology to improve the safety features of Personal Protective Equipment (PPE) for those in the electrical field. Our purpose is to mitigate the risk of injuries among electricians and solidify accountability among the electric companies through a connected uniform system that is equipped with contact sensors and voltage gauges. We create voltage gauges that sense nearby voltage, as well as contact sensors that monitor whether or not employees are wearing all of their appropriate and safe PPE. These intelligent and innovative sensors and gauges are readily available to be integrated into multiple PPE items. The contact sensors are made to work for all PPE items and will be activated by contact with the worker’s skin. On our website application, each activated sensor that the worker is currently wearing will send real-time data to managers via 4G and be shown in green, with each unactivated/unworn sensor in red. Our voltage gauges indicate any change in nearby voltage through red or green lights on the outside leather grips on the worker’s gloves. These voltage gauges notify both the workers and managers when the workers are within a certain distance of voltage. If a red light appears, the workers are then required to wear their rubber insulated gloves—a green light will indicate no outside voltage detected and a red light will indicate that live voltage is present.

About the Symposium

Albion College's Student Research Symposium is now in its 29th year. The first symposium, held on April 20, 1990, involved seven students making presentations describing their research projects in the sciences. Three years later, a poster session was added. The program has been offered annually since its founding and now typically features the work of more then 100 students recommended by their faculty mentors. Representing a broad array of disciplines, the symposium has become the College's principal showcase for outstanding student research, scholarship, and creative activity.

The Elkin R. Isaac Endowment

The Elkin R. Isaac Endowed Lectureship was created in 1991 by Albion College alumni in honor of their former teacher, coach, and mentor, Elkin R. "Ike" Isaac, '48. Isaac taught at Albion from 1952 to 1975 and coached basketball, track, and cross country. He led his teams to one Michigan Intercollegiate Athletic Association basketball title, six consecutive league championships in track, and three cross country championships. He also served as the College's athletic director and created Albion's "Earn, Learn, and Play" program and the "Albion Adventure Program." In 1975, Isaac joined the faculty at University of the Pacific and became athletic director in 1979. He retired there in 1984. He passed away in August 2013.

Proceeds from the endowment have been used to sponsor an alumni lecture each year. In 1997, the lectureship was expanded and is now associated with the College's annual Student Research Symposium, which now bears Isaac's name.

The Isaac Endowment Committee

Cedric W. Dempsey, '54
Thomas G. Schwaderer, '56
Leonard F. "Fritz" Shurmur, '54 (deceased)
John R. Taylor, '55 (deceased)

The Joseph S. Calvaruso Keynote Address Endowment

Joseph S. Calvaruso, '78, and his wife, Donna, established an endowment fund in 2005 to support the annual Elkin R. Isaac Symposium keynote address. The keynote address now bears Calvaruso's name. An Albion native, he currently serves as executive director of the Gerald R. Ford Presidential Foundation in Grand Rapids. Before joining the foundation, he was senior vice president and director of risk management for Mercantile Bank in Grand Rapids. Active in the Republican Party on the state and national levels, Calvaruso is a member of the Albion College Board of Trustees.

In keeping with Calvaruso's personal goal to "try different things in life," the keynote endowment ensures the symposium will continue to provide an exceptional variety of presenters from the arts, sciences, social sciences, and humanities.

Past Isaac Symposium Speakers

Elkin R. Isaac Alumni Lecture
Emilio DeGrazia, '63 (1999)
James Misner, '66 (2000)
John Vournakis, '61 (2001)
Joseph Serra, '56 (2002)
Denise Cortis Park, '73 (2003)
John Porter, '53 (2004)
Elkin Isaac, '48 (2005)
Joseph Calvaruso, '78 (2006)
Eileen Hebets, '94 (2007)
James Beck, '97 (2008)
James Gignac, '01 (2009)
Kristen Neller Verderame, '90 (2010)
John Ferris, '89 (2011)
Lawrence Schook, '72 (2012)
Michael Harrington, '85 (2013)
Hugh McDiarmid, '84 (2014)
Samata Singhi, '05 (2015)
Mallory Brown, '08 (2016)
Nick Whitney, '00 (2017)

Joseph S. Calvaruso Keynote Address
Wade Davis (1999)
Stephen Jay Gould (2000)
Doris Kearns Goodwin (2001)
Kurt Vonnegut (2002)
Salman Rushdie (2003)
Gloria Steinem (2004)
Edward O. Wilson (2005)
Regina Carter (2006)
Steven Pinker (2007)
Carl Hiaasen (2008)
David Trimble (2009)
Mira Nair (2010)
Annie Leonard (2011)
Laurie Garrett (2012)
Alexander McCall Smith (2013)
Richard Alley (2014)
Nathan Wolfe (2015)
Benjamin Jealous (2016)
Mary Jean Eisenhower (2017)

The 2018 Isaac Student Research Symposium Committee

Craig Bieler (Chemistry)
Andrew Christopher (Psychological Science)
Allison Harnish (Anthropology/Sociology)
E. Dale Kennedy (Biology/Brown Honors Program)
Lisa Lewis (Chemistry)
Jill Mason (Stockwell-Mudd Libraries)
Anne McCauley (Art and Art History)
Patrick McLean (Ford Institute)
Ashley Miller (English)
John Perney (Marketing and Communications)
Michael Van Houten, Chair (Stockwell-Mudd Libraries)
John Woell (Academic Affairs)

Foundation for Undergraduate Research, Scholarship, and Creative Activity (FURSCA)

The Foundation for Undergraduate Research, Scholarship, and Creative Activity (FURSCA) was established to promote and support student research, original scholarship, and creative efforts in all disciplines. Through a number of programs, taking place at all points in a student's career at Albion, FURSCA can help students pursue independent study in their areas of interest. Students work closely with a faculty mentor to develop and carry out research or other creative projects. Participation in such projects provides valuable experience beyond the scope of classroom work, and enhances a student's preparedness for future employment or graduate studies. Some examples of FURSCA programs are listed below.

Student Research Partners Program—Geared toward first-year students, this program pairs a student with a faculty mentor to work on a project related to the faculty member's research or creative area. Students gain hands-on experience with scholarship in a specific field, and may elect to continue during their sophomore year. Participation is selective, based on high academic achievement, and stipends are awarded.

Research Grants—Students may apply for funds to support research or other creative projects. Students must work closely with a faculty adviser; however, projects are not limited to any particular discipline. Grants may be awarded to pay for supplies, printing costs, subject payments, software, or other costs associated with completion of the project.

Travel Grants—Students may be awarded travel funds to help cover expenses associated with travel to attend professional meetings at which they will present the results of their research or creative projects.

Summer Research Fellowship Program—A select number of students may remain on campus during the summer, earning a stipend, to work on research or creative projects. In addition to working closely with a faculty adviser, students participate in weekly seminars with other students in the program.

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