



2021

**UR&W**

High Point University Research  
& Creativity Symposium

Opens April 19

VIRTUAL



HIGH POINT UNIVERSITY

# ***THE 9<sup>th</sup> HIGH POINT UNIVERSITY RESEARCH AND CREATIVITY SYMPOSIUM (High-PURCS)***

***A VIRTUAL SHOWCASE***  
***| APRIL 19 - May 3, 2021 |***  
***| April 20 – Live Events |***

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***-Welcome from the-***  
**DIRECTOR OF UNDERGRADUATE  
RESEARCH AND CREATIVE WORKS**

Welcome to the 9th annual High Point University Research and Creativity Symposium (High-PURCS) and our 2nd virtual showcase. High Point University is an institution which fosters intellectual and creative scholarship through student engagement and student-faculty collaboration. Our students undertake significant work in intellectual and creative endeavors mentored by faculty. They regularly share their work at professional national and regional conferences. High-PURCS is an opportunity for students to showcase their projects here on campus so HPU students, faculty, staff, and family can witness our students' professional development and gain a glimpse of tomorrow's future leaders, artists, scientists, teachers and scholars.

Despite the ongoing pandemic, we have 114 students participating, mentored by 42 faculty from 20 different fields across all High Point University's schools. Our students' achievements reflect their resilience and courage coupled with the dedication of caring faculty. Especially in these unique and challenging times, thank you for being part of this 2nd virtual High Point University Research and Creativity Symposium.

Anyone can access this virtual conference at the online platform, *Symposium* at [symposium.foragerone.com/high-purcs2021](https://symposium.foragerone.com/high-purcs2021). Create an account using any email. Please be sure to let students know you viewed their work by leaving an encouraging comment; it is the virtual equivalent of applause.

Dr. Joanne D. Altman  
Director, Undergraduate Research and Creative Works

*-A Special Welcome from -*

**ACADEMIC AFFAIRS**

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Dear HPU Family,

Thank you for your dedication and commitment to creating another meaningful and significant undergraduate research experience for our students. High-PURCS is the culmination of passion to grow one's mind and push the limits of excellence. It requires innovative and creative thinking, thoughtful and deliberate decision making, outstanding mentorship, and a lot of hard work! In spite of the incredible challenges we have experienced this past year you, the students, faculty and staff of High Point University have shown tremendous resilience and character. We are proud of you and we support all of the undergraduate research and creative work endeavors of which you have been a part. Your efforts prepare you with the life skills to be successful in the world as it's going to be.

A special thank you to Joanne Altman, PhD, Director of Undergraduate Research and Creative Works, whose passion, commitment and expertise are evident in this outstanding program. Also, we acknowledge the many faculty and staff mentors who have willingly spent hours working with our students.

We wish you continued success in all that you do.

Daniel Erb, PT, PhD  
Senior Vice President of Academic Affairs



Angela Bauer, PhD  
Vice President of Academic Affairs



# Congratulations to our 2019-2020 Research Apprentices!



Research Rookies is a program for freshmen and first semester sophomores who desire to be incorporated into the research and creative works atmosphere of High Point University while still early in their undergraduate careers. Participants have two consecutive semesters to complete a variety of activities. Completing this program earns the title of Research Apprentice and shows students are committed to independent work which will give them an edge later in job interviews or applications for graduate or professional schools. This spring we are excited to congratulate six students who have recently completed the program and have earned the title of Research Apprentice.

## New Spring 2021 Research Apprentices:



**Kenzie  
DeLongis**



**Harris  
Goldstein**



**Lexi  
Jack**



**Keilah  
Moore**



**Anastazia  
Novembre**



**Hannah  
Wilhite**

## Research Apprentices recognized in the fall:

Garrett Alewine  
Paula Bender  
Elizabeth Carter  
Sarah Clancy  
Olivia Connelly  
Ashley Cruz  
Evan Dasburg  
Lauren Dinkla  
Kelsey Donmoyer  
Alyssa Dowdy

Gillian Fajack  
Trevor Gauronski  
Kieran Graves  
Grant Hines  
Matana Hoffman  
Brenna Ivory  
Olivia Lender  
Daniel Mallory  
Jordan Morrison  
Ariela Reid

Brittney Rudd  
Sophia Serafini  
Maria Schell  
Taylor Schuler  
Carolyn Sveden  
Grace Todd  
Katherine Vanderstad  
Julia Velasquez  
Teresa Webb

# APRIL 20<sup>TH</sup> LIVE EVENTS SCHEDULE

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Come engage with our students directly. Join us virtually to kick off events, recognize our most recent cohort to complete Research Rookies and become Research Apprentices, and come celebrate with students who find out they won the Best of High-PURCS Awards and the SIRG Award. All you need to do is attend the URLs. You can find them on Symposium:

<http://Symposium.foragerone.com/high-purcs2021>

12:30 PM – 1:00 PM    Opening remarks, Research Recognition and Awards

1:15 PM – 2:15 PM    QUESTION AND ANSWER (Q & A) SESSIONS I

SPANISH

BIOLOGY I (A- G)/BASIC PHARMACEUTICAL SCIENCES

CHEMISTRY I (A-J)

SCHOOL OF COMMUNICATION

SOCIAL SCIENCES/EDUCATION/ CLINICAL SCIENCES

ENGLISH

2:20 PM- 3:20 PM    QUESTION AND ANSWER (Q & A) SESSIONS II

FRENCH

BIOLOGY II (H-Z)

CHEMISTRY II (K-Z)/PHYSICS

SCHOOL OF ENGINEERING/MATHEMATICAL SCIENCES

# ORAL PRESENTATION ABSTRACTS

## Biology

### ***Anthocyanins in Zea mays L. As Inhibitors of Escherichia coli***

**Ellie Abel\*, Sam Dunn\*, and Sydney Salone\*, High Point University**

**Mentors: Andrew Wommack, Chemistry; Nichole Hughes, Biology; Meghan Blackledge, Chemistry**

Naturally occurring bacteria in the gut is beneficial in maintaining one's overall health. Anthocyanins, pigments found in fruits and vegetables, are theorized to regulate gut bacteria which promote gut function. This study focuses on anthocyanins in *Zea mays L.* and their potential ability to support commensalism while inhibiting enteroinvasive *E.coli*.

### ***Starting a Phenology Observation Program***

**Alec Garfield, High Point University**

**Mentor: Nicole Hughes, Biology**

Phenology is the study of plant and animal life-cycle stage events and when they occur coinciding with environmental factors. We studied the efficacy of implementing this program in relative science courses by measuring participation, overall awareness of issues, and quality of observations.

## Chemistry

### ***The Synthesis and Behaviors of Rhodamine B Dimers***

**Elizabeth Riser, High Point University**

**Mentor: Pamela Lundin, Chemistry**

Rhodamine B is an organic dye that is pink and fluorescent. They can be used with amines to synthesize various rhodamine B amide derivatives including dimeric structures based on diamine linkers. This presentation will include information on the synthesis of the target compounds and compare their observed behaviors.

## Computer Science

### ***Cybersecurity Laboratory Research: A Lush Ecosystem or Elephant Graveyard***

**Reilly Kobbe\*, Taylor Lynch\*, and Jason Pittman, High Point University**

**Mentor: Jason Pittman, Computer Science**

Only 30% of computer science research has been extended through follow up or replication after publication. Worse still, adjacent fields such as cybersecurity have not been analyzed at all. Thus, the purpose of this research was to measure to whether cybersecurity laboratory research is extended in a statistically significant manner.

### ***Effectiveness of Cellular Automata in Public-Key Cryptography***

**Alex Wirth, High Point University**

**Mentor: Jason Pittman, Computer Science**

Cellular automata, despite their simplicity, are prolific in many modern algorithms. The Clarridge and Salomaa Algorithm is an implementation of a CA public-key cryptosystem, but little is known about its effectiveness. The goal of this research is to measure its performance in regard to its composite parameters.

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\* Denotes presenters in cases of joint authorship

## Education

### ***A Review of the Education and Diagnosis of English Language Learners***

**Heather Simmons, High Point University**

**Mentor: Sarah Vess, Special Education**

English Language Learners (ELLs) are one of the fastest-growing populations in the U.S, but they are entering into an education system that does not fully understand their challenges. The current system leads to a multitude of problems for ELLs, including inappropriate qualification for special education. This project investigates those challenges.

## English

### ***Northrop Frye's Theory of Comedy and The Secret Garden***

**Leslie Bosse, High Point University**

**Mentor: Matthew Carlson, English**

This presentation applies Northrop Frye's theory of comedy to Frances Hodgson Burnett's children's novel *The Secret Garden* by analyzing the text's literal and metaphorical transition into springtime, its connections to the green world concept, and its ending that focuses on a familial and societal reunion.

### ***Behind the Mask and Between The Lines: Gender Performativity In Anna Karenina***

**Sarah Dahlberg, High Point University**

**Mentor: Virginia Leclercq, English**

In *Anna Karenina*, Leo Tolstoy presents a question on gender and identity which perhaps he never intended to ask. Using Judith Butler's concept of Gender Performativity—coined 100 years later—I ask the question: What lies beyond mask for the women of 19<sup>th</sup>-century Russia?

### ***Modes of French Language and Culture in Anna Karenina***

**Nicole Prince, High Point University**

**Mentor: Virginia Leclercq, English**

Leo Tolstoy's *Anna Karenina* demonstrates French language and culture as defining social forms in eighteenth- and nineteenth-century Russia. Tolstoy demonstrates how French themes of adultery, betrayal, and figurative disguise influence social roles and identities among Russian aristocratic characters and their complicated relationships. Their "Russianness" is challenged by their "Frenchness."

### ***The Search for Acceptance and Happiness: Reactions to Russian Social and Gender Stereotypes in Leo Tolstoy's Anna Karenina***

**Hailey Turner, High Point University**

**Mentor: Virginia Leclercq, English**

Gender and social stereotypes often push women to keep their voices hidden from others. During the nineteenth century, Russian women faced the choice between security and upholding societal standards or ostracization and pursuing their own happiness. Leo Tolstoy's *Anna Karenina* questions what or who defines happiness: the individual or society?

## Entrepreneurship

### *Lightning House*

**Maddie Drobny, High Point University**

**Mentor: Kathy Elliott, Entrepreneurship**

Lightning House is the most electric college roommate search experience. This platform is a mobile application used for finding a credible and compatible roommate. Through visual aids, a robust algorithm, and a 24/7 chatroom my application is catered to finding roommate compatibility instead of similarity.

### *Rememery*

**Cameron Labrecque, High Point University**

**Mentors: Kathryn Elliott, Entrepreneurship; Jason Pittman, Computer Science**

Rememery is a digital scrapbooking application which allows users to share their favorite life stories using pictures, video, and audio. User's narrated stories can range from birth until present day. Our goal is to allow users to live in the present, reminisce on the past, and share with the future.

### *Construction Printing Solutions*

**Thomas O'Hara, High Point University**

**Mentor: Kathy Elliott, Entrepreneurship**

Construction Printing Solutions is a completely new approach to modern construction, on any scale, as we think of it. We use a scaled-up 3D printing framework and a modular attachment system which allows our software and hardware ecosystem to construct an entire building autonomously.

### *Goliath the Ultimate Outdoor Chair™*

**Vincent Anthony Scavo V., High Point University**

**Mentor: Kathy Elliott, Entrepreneurship**

Entrepreneurs help others with their products. My product, Goliath, The Ultimate Outdoor Chair™ is a massive, reliable outdoor chair. It is for people who do not fit the status quo, are bigger and taller than most, a replacement for chairs that are not getting the job done.

### *Swarm Secure Messaging*

**Kyle Wiseman, High Point University**

**Mentor: Jason Pittman, Computer Science**

Swarm is a secure messaging application that will be the first to offer metadata protection while communicating online. Metadata can provide valuable personal information when collected and is not protected when a message is encrypted. Swarm uses proprietary software to conceal this metadata and give users control over their data.



## **Fashion Merchandising**

### ***Perception of Sustainability in Australia and New Zealand***

**Emily Longwell, High Point University**

**Mentor: Victoria Brown, Visual Merchandising Design**

The purpose of my presentation is to educate my audience about how other countries, in this case Australia and New Zealand, view sustainability. I will focus on consumer's perceptions, retailer's perceptions, as well as specific Australian and New Zealand brands and their observation and participation in sustainability.

### ***An Exploration of Fabric Design and Serviceability in School Uniforms***

**Sydney Brett, High Point University**

**Mentor: Victoria Brown, Visual Merchandising Design**

My study is about the materials used when creating school uniforms and if they are not only aesthetically pleasing but comfortable to the student. A survey was given to students asking about their experience about design, comfort and durability of their school uniforms, and their overall satisfaction of them.

## **French and Francophone Studies**

### ***Freedom in Texaco Through the Lens of Marie-Sophie and Esternome***

**Bijan Arasteh, High Point University**

**Mentor: Denis Dépinoy, World Languages, Literatures, and Cultures**

This paper will trace the theme of freedom throughout the novel *Texaco*, following the characters of Marie-Sophie and Esternome in order to compare the role generational differences play in one's perception of freedom in the French Atlantic. In doing so, we can find out what defines freedom for these populations. (This presentation is in French.)

### ***The Impact Religion Has on The Creole Culture***

**Steven Boan, High Point University**

**Mentor: Denis Dépinoy, World Languages, Literatures, and Cultures**

This paper will examine and analyze the role religion takes with the development of the creole culture within Patrick Chamoiseau's *Texaco*. Research papers describe the presence of religion in the culture. Through *Texaco* and the research papers, it is evident religion has impacted the progression of the creole culture. (This presentation is in French.)

### ***Pratiques D'animalisation Dans Le Texaco De Chamoiseau***

**Ekabouna Joseph, High Point University**

**Mentor: Denis Dépinoy; World Language, Literature, and Culture Department**

This paper examines how the animalization of certain characters (such as slaves, freed slaves, the Beke, migrants, etc.) contributes to their construction in Patrick Chamoiseau's *Texaco*. Relying on animality theory, anthropocentrism, and posthumanism, I will argue that the animalization of these characters is to reveal their position and social status. (This presentation is in French.)

***Qui-suis-je ? La Lutte Pour Trouver une Identité d'Esternome Laborieux en Texaco Par Patrick Chamoiseau***

**Sawyer Lyons, High Point University**

**Mentor: Denis Dépinoy, World Languages, Literatures and Cultures**

I will examine how external and internal factors influence the identity of Esternome Laborieux in Patrick Chamoiseau's *Texaco*. His status as a slave/freeman, the abolition of slavery, and his desire to create a Créole community influence this change. Each moment creates a new identity, which impacts his societal associations. (This presentation is in French.)

***The Paradoxical Nature of Texaco and Its Esternome***

**Nicole Prince, High Point University**

**Mentor: Denis Dépinoy, World Languages, Literatures, and Cultures**

*Texaco* questions protagonist Esternome's belonging. He struggles between freedom and slavery, paradoxically reflecting deterritorialization and reterritorialization by créolité and "Chamoisification." Paradoxes share tense effects with his identity and its fluctuation of opposing forces. Through a "Chamoisification" lens, paradoxes are helpful to appreciate créolité as a literary movement and linguistic culture. (This presentation is in French.)

***How Chamoiseau Represents the Créole Identity and Its Complexity in Texaco***

**Mikaela Seemann, High Point University**

**Mentor: Denis Dépinoy, World Languages, Literatures, and Cultures**

Chamoiseau's *Texaco* is a historically convincing story that shows the struggles of the Martinican people. This project will expand on how Chamoiseau uses the context, the characters and narration to show the many facets of the creole identity. (This presentation is in French.)

***Les traditions de la narration orale telle qu'appliquée au texte écrit, Texaco***

**Courtney Smith, High Point University**

**Mentor: Denis Dépinoy, World Languages, Literatures, and Cultures**

I will examine how Patrick Chamoiseau explores the Creole identity by incorporating common characteristics of Creole oral storytelling in *Texaco*, a written text. Chamoiseau presents a modern form of Creole by using an atypical storytelling method of the Creole culture to preserve and share his culture's history and values. (This presentation is in French.)

## **Journalism**

***Jail, Julian Assange and the Future of Watchdog Journalism***

**Joseph Maronski, High Point University**

**Mentor: Dean Smith, Journalism and Sports Communication**

Julian Assange, the founder of WikiLeaks, is being tried under the Espionage Act of 1917. This paper will examine the many issues presented by Assange v. United States, discuss WikiLeaks and what led to this point, examine the defense avenues, and discuss the implications of a conviction on our lives.

## Mathematical Sciences

### ***March Madness: Math, Methods, Money***

**Anthony Quagliata, High Point University**

**Mentor: Brett Geiger, Mathematical Sciences**

One of the most exciting times of the year in sports is the NCAA Men's Basketball Tournament: March Madness. In this talk, we will showcase bracket-picking methods using mathematics in which we incorporate team statistics, historical trends within the tournament, bracket-media point systems, and betting markets.

## Psychology

### ***Relationship of Interparental Conflict with Mental Health***

**Jenna Duncan, High Point University**

**Mentor: Kimberly Wear, Psychology**

This study focused on the relationship of interparental conflict with various mental health issues, including trait anxiety, disordered eating habits, and suicidal ideation. It also examined the differences in these relationships between individuals with married parents and those with divorced parents, as well as differences across gender.

## Spanish

### ***La caza y el efecto del trauma en las generaciones españolas***

**Banks Cozart, High Point University**

**Mentor: Adam Winkel, World Languages, Literatures, and Cultures**

Through the film *La caza* (1966), directed by Carlos Saura, I am analyzing cinematic techniques used to illustrate trauma after the Spanish Civil War (1936-39). Through such effects, Saura is able to portray the lasting psychological toll caused by the war. (Talk is in Spanish)

### ***La Representación De La Pérdida En La Fotografía De "Arqueología De La Ausencia" (Lucila Quieto, 2001)***

**Alexandra Kapolis, High Point University**

**Mentor: Adam Winkel, World Languages, Literatures, and Cultures**

An analysis of the representation of loss in the photographs "Arqueología de la ausencia" to see how trauma is transmitted generationally. This is to understand why the group of Las Abuelas de Plaza de Mayo in Argentina have publicly gathered for over fifty years to demand justice. (Talk is in Spanish)

### ***El impacto de la cultura del silencio y miedo en la poesía de Alaíde Foppa***

**Cassandra Kinerson, High Point University**

**Mentor: Adam Winkel, World Languages, Literatures, and Cultures**

During the Guatemalan Civil War (1960-96), the military government was responsible for the disappearance of thousands, including poet Alaíde Foppa. The language and significance of Foppa's poems, "Las palabras" and "El tiempo", convey the impact of the culture of fear and silence caused by the Guatemalan government. (Talk is in Spanish)

***La violencia en la poesía de la Guerra Civil Española***

**Shayne Maggard, High Point University**

**Mentor: Adam Winkel, World Languages, Literatures, and Cultures**

I am studying depictions of violence in the poetry of Pablo Neruda, George Green, Manuel Machado, and Roy Campbell to explore how these poets, who experienced the war from opposing sides, expressed the events and effects of the Spanish Civil War (1936-39). (Talk is in Spanish)

***El desarrollo infantil durante y después de la Guerra Civil Salvadoreña***

**Elizabeth Manser, High Point University**

**Mentor: Adam Winkel, World Languages, Literatures, and Cultures**

Through the study of the film *Voces Inocentes (Innocent Voices, 2004)*, I analyze the destructive effect of the Salvadoran Civil War (1979-92) on child development. This encompasses the generational toll on mental health, emotional trauma, and social dynamics resulting from the forced recruitment of child soldiers. (Talk is in Spanish)

## Political Science

***Updating Our Understanding of the Relationship between Religion and Support for Female Political Leaders***

**Lauren Canfield, High Point University**

**Mentor: Mark Setzler, Political Science**

How do attitudes toward female political leaders differ as a result of religious identity and partisanship? Using public opinion data from 2018, this research analyzes how an individual's partisanship and religion—specifically those who identify as evangelical Protestants—influences their opinion on female political leadership in a changing political environment.



# PERFORMANCE ABSTRACTS

## ***The Unknown***

**Samantha Bridge, High Point University**

**Mentors: Emily Crofford, Theatre and Dance; Lindsey Howie, Theatre and Dance**

**Performers: Lauren Johnson, Olivia Keider, Chéyse Lattie, Avery Marchand, Lisa Motosicke,**

*The Unknown* explores what is beyond our earthly world. I decided to explore the daunting idea by diving into the unknown and trying to understand. Along the way, I have come to terms with the fact that we can find vitality not in what we know but what we do not know.

## ***Tumbling Lights***

**Alison Carroll, High Point University**

**Mentors: Michele Trumble, Theatre and Dance; Lindsey Howie, Theatre and Dance**

**Performers: Olivia Keider, Tabitha McGuire, Christina Robinson, Maggie Weinbaum, Abby Williamson**

Music is an amazing art form, that fills our ears and souls with emotions. This song specifically was used as a template to create movement that mimics the noises and sounds throughout the song, emanating vibes that match those heard in the music.

## ***Something Big Enough***

**Alex Griswold, High Point University**

**Mentor: Lindsey Howie, Theatre and Dance**

Originally a dance film, *Something Big Enough* portrayed frustration behind wanting to create lasting change. While being adapted to the stage it became a story of people. Despite a divided world, we found a community of support. We found unity despite differences and see good in people and the world.

## ***The Struggle Within***

**Rachel Peterson, High Point University**

**Mentor: Lindsey Howie, Theatre and Dance**

**Performers: Madison Faggart and Quinn Van Popering**

*The Struggle Within* portrays the pain of when you look in the mirror and see only flaws. You may not be able to push away those thoughts, but you choose whether to let them affect you. My hope is that people will walk away feeling inspired.

## ***The Land of Nod: A Short Dance Film***

**Emily Poindexter, High Point University**

**Mentor: Lindsey Howie, Theatre and Dance**

Inspired by Robert Louis Stevenson's poem of the same name, "The Land of Nod" is a dance film that explores the whimsy, excitement, and peculiarity of dreams. In a serene, lake-front scene, the dancer's movements convey different stages of sleep cycle through contemporary ballet and a hint of afro fusion.

***Longing to Dream***

**Tara Shtayyeh, High Point University**

**Mentors: Lindsey Howie, Theatre and Dance; Kerrie Ann Sparks, Theatre and Dance**

This dance represents the discomforting struggle between thoughts that keep *you* up at night and thoughts that help *one* to relax. It is the contrast between red and blue, sharp and smooth, and fast and slow as they deviate from normality and how the journey evolves until one side wins.

***Downstream***

**Quinn Van Popering, High Point University**

**Mentors: Christine Stevens, Theatre and Dance; Lindsey Howie, Theatre and Dance**

*Downstream* is loosely inspired by the uncontrollable movement of water moving down a river combined with the calmness of trees swaying in a forest surrounding it. This piece explores the dynamics between contrasting types and speeds of movements and how they work in unison together to create a cohesive piece.

*The best piece of advice I could give to any student is to give undergraduate research [or creative works] a try. Whether you bring a project idea to a professor or join an existing one, you will develop valuable skills in your academic and professional life, get to conduct some interesting work, and have great experiences along the way.*

- Kyle Wiseman '21 computer science

# POSTER PRESENTATION ABSTRACTS

## Biology

### ***Intraspecific Variation in The Endocast of *Vulpes vulpes****

**Steven Boan, High Point University**

**Mentor: Heather Ahrens, Biology**

My research investigates the intraspecific variation of brain morphology of red foxes. This was accomplished by modeling the three-dimensional structure of the endocranial cavity using computed tomographic scans of the skull of three specimens. We predict that intraspecific variation is less than interspecific variation within Caniformes.

### ***Climate Change and Niche Modeling with Texas Brown Tarantulas (*Aphonopelma hentzi*)***

**Samantha Ethier, High Point University**

**Mentors: Nicole Hughes, Biology; Christian George, Biology**

The ecological range of the Texas brown tarantula (*Aphonopelma hentzi*) will be plotted in the form of niche models using ArcGIS and Maxent. This software can then be used to estimate how the range has been affected by climate change.

### ***A Dazzling Array of Leaf Polymorphisms in the Monophyllic, Wintergreen Orchid, *Tipularia discolor****

**Emily Gonzalez\*, Trinity Erjo\*, Nicole Hughes, High Point University**

**Mentor: Nicole Hughes, Biology**

*Tipularia discolor*, the wintergreen orchid, produces a single leaf per year. These leaves exhibit a variety of colors, patterns, and textures. Two hypotheses attempt to explain these traits: herbivory defense and photoprotection. The purpose of this study was to document the variety exhibited to determine inheritance in the future.

### ***Exploring Rhizome Extract from *Iris domestica* as a Potential Antibiotic Adjuvant***

**Bill Hagmeier, High Point University**

**Mentor: Patrick Vigueira, Biology**

The genus *Iris* is comprised of flowering plants that are appreciated for their beauty and medicinal properties. We are investigating rhizome extract from *Iris domestica*, commonly known as blackberry lily, as a potential antibiotic adjuvant. Our initial experiments yielded promising results for the efficacy of several antibiotics against *Staphylococcus aureus*.

### ***Effect of Albendazole on PC3 Prostate Cancer Cells***

**Jonathan Jansma\* and Andrew Gustetic\*, High Point University**

**Mentor: Y. Kevin Suh, Biology**

Drugs such as albendazole are used for the treatment of a variety of parasitic worm infestations. Recently, these drugs gained considerable attention because of their unexpected effects against cancer. In this study, we show that albendazole can inhibit the proliferation of PC3 prostate cancer cells by inducing programmed cell death.

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\* Denotes presenters in the case of joint authorship

***Detecting Morphologic Change in Eukaryotic Cells via Machine Learning***

**Libby Johnson, High Point University**

**Mentor: Christian George, Biology**

The goal of our research is to differentiate mammalian cells through deep learning algorithms. Cells undergo physical changes when they have been damaged, and these changes are usually detected by visual inspection. Our approach is to quantify cell damage through machine learning using geographical information systems.

***Identification and Evaluation of Small Molecules That Potentiate Vancomycin in VISA and VRSA***

**Ashley King, High Point University**

**Mentor: Meghan Blackledge, Chemistry**

Vancomycin resistant *Staphylococcus aureus* (VRSA) strains are often resistant to multiple drug classes including beta-lactams and glycopeptide antibiotics. Antibiotic adjuvants may be a promising new approach to combat antibiotic resistance because they potentiate our existing antibiotic arsenal. Biological data, SAR, and initial mechanism of action studies will be presented.

***Quantification of Growth and Survival Following Injury in a Differentiated Neuronal Cell Line***

**Elizabeth Manser, High Point University**

**Mentor: Michael Grider, Biology**

Pheochromocytoma cells (PC12) differentiate into dopaminergic neurons and are a favorable model for investigating injury and development. We aim to 1) define optimal conditions for cell growth and adhesion, 2) characterize cell viability following injury and treatment protocols, and 3) develop automated detection of cellular viability to correlate with established methodologies.

***Do Anthocyanins Elevate Leaf Temperature In The Wintergreen Orchid, *Tipularia discolor*?***

**Joshua Onufer, High Point University**

**Mentor: Nicole Hughes, Biology**

The object of this experiment is to determine whether greater concentrations of anthocyanins permit leaves of *Tipularia discolor* to absorb more heat. Leaves temperature is being measured under controlled conditions and GIS will be applied to determine if anthocyanin-rich, purple-leaved individuals exist in greater density in colder climates.

***Anthocyanins Elevate Flower Temperature in Ten Plant Taxa***

**Elizabeth Ragan\* and Nicole Hughes, High Point University**

**Mentor: Nicole Hughes, Biology**

Anthocyanin pigments absorb strongly in green and UV-B wavebands. In flowers of ten angiosperm taxa with varying concentrations of anthocyanins, we observed a concentration-dependent warming effect. Those with high anthocyanin content paired with dermal papillae and a large, flat morphology had the highest temperature increase relative to white flowers.

***Nitrogen Concentration Effects on Pigmentation of Autumn Leaves in Oak Species***

**Sarah Spangler, High Point University**

**Mentors: Christian George, Biology; Nichole Hughes, Biology**

The phenomenon of autumn leaves turning red has yet to be completely explained. Our hypothesis is that there may be a correlation between nitrogen abundance in soil and leaf coloration in oak species. We will conduct a spatial analysis of our data using ArcGIS Pro.

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\* Denotes presenters in the case of joint authorship



### ***Understanding The MRH-abrogated Atg27 Defects in Traffic and Autophagy***

**Nicholas Zanghi, High Point University**

**Mentor: Veronica Segarra, Biology**

Eukaryotic cells survive stress and starvation by activating autophagy. Our research examines the function of Atg27, a membrane protein that helps coordinate this process. The function of Atg27 remains unknown. Previous research indicated that mutating residues in Atg27 resulted in cells surviving starvation and localizing membrane compartments differently than wild type. Our goal is to understand the MRH-abrogated Atg27 defects in traffic and autophagy.

## **Chemistry**

### ***Identification of Economical Cross-Coupling Catalysts by Small Scale Reaction Screening with Gas Chromatography-Mass Spectrometry***

**Luke Akers, High Point University**

**Mentor: Pamela Lundin, Chemistry**

Palladium on carbon nanocrystals is an effective cross-coupling reaction catalyst, though the financial and environmental consequences of palladium use are unfavorable. Thus, we have tested various heterogeneous catalyst, including copper on carbon and cobalt on carbon nanocrystals, via small-scale reaction screening analyzed on our calibrated gas chromatography-mass spectrometry.

### ***Surface Attraction: Evaluating Physical and Chemical Modifications of Surfaces to Inhibit Bacterial Adhesion and Biofilm Formation***

**Michael Alcoser\*, Claire Cartrette\*, Abigail Copeland\*, and Margaret Mauer\*, High Point University**

**Mentors: Meghan Blackledge, Chemistry; Briana Fiser, Physics; Pamela Lundin, Chemistry**

Our team explored ways to alter surfaces of medical materials, primarily polydimethylsiloxane (PDMS), that would inhibit bacterial biofilm formation. Specifically, we wanted to determine whether we could physically and chemically modify the surface through surface patterning and self-assembled monolayers that would inhibit bacterial adhesion to the PDMS.

### ***Using CRISPR/Cas9 to Delete *stk1* in MRSA***

**Amaiya Anthony, High Point University**

**Mentor: Heather Miller, Chemistry**

Methicillin-resistant *Staphylococcus aureus* (MRSA) has been difficult to treat because of its resistance to beta-lactam antibiotics. Our lab is studying small molecule adjuvants that inhibit the master regulator *stk1*. This study uses CRISPR to perform knockouts of the *stk1* gene in different MRSA strains that do not yet exist.

### ***The Effects of 5-bromo-2,2'-bithiophene on P3HT Polymer Aggregation***

**Olivia Armendarez, High Point University**

**Mentor: Lundin, Chemistry**

Kumada polymerization can be used to control the chain length and regiospecificity of the conjugated polymer poly(3-hexylthiophene) (P3HT). The P3HT polymer chains tend to aggregate over time. Different conditions that effect the aggregation of P3HT polymers are being studied with the catalytic initiator 5-bromo-2,2'-bithiophene.

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\* Denotes presenters in the case of joint authorship

***A Picture Is Worth A Thousand Assays***

**Tom Bermel, High Point University**

**Mentor: Kier Fogarty, Chemistry**

This research project focuses on utilizing cellular imaging techniques to identify differentiation in cell phenotypes. Our hypothesis is cells have undergone differentiation from damage will experience morphological changes in the cell's phenotype. We hope to identify such changes using sophisticated machine learning based image analysis techniques.

***Synthesis of a Meta-Substituted Poly(phenylene ethynylene) as a Helical Polymer***

**Caitlyn Bontempo, High Point University**

**Mentor: Pamela Lundin, Chemistry**

Helical polymers can be used to mimic enzymes and have shown promising signs of possessing antibacterial properties. We are synthesizing a novel meta-substituted poly(phenylene ethynylene) polymer with an alkyl sidechain and studying its unique properties. Details of the monomer and polymer synthesis will be described.

***Functionalization of An Elastomer with An Amine Based Self-Assembled Monolayer***

**Abby Copeland, High Point University**

**Mentor: Pamela Lundin, Chemistry**

In evaluation of antimicrobial properties in relation to biofilms, a self-assembled monolayer (SAM) will be applied to a layer of polydimethylsiloxane(PDMS). The SAM will be made up of (3-aminopropyl)triethoxysilane(APTES) and 11-aminoundecyltriethoxysilane (AUTES). Further investigation of the SAM functionalization includes using drugs such as desloratadine to create antimicrobial PDMS.

***Transcriptomic Changes in MRSA Upon Treatment with A Small Molecule Adjuvant***

**Taylor Cunningham\* and Bri Viering, High Point University**

**Mentor: Heather Miller, Chemistry**

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a public health concern, due to its antibiotic resistance. To determine the molecular details behind antibiotic resistance and its inhibition, RNA was purified from MRSA 43300, sequenced, and then analyzed to determine which genes were affected by treatments with oxacillin, an adjuvant, and a co-treatment.

***The Effectiveness of Using EDC to Synthesize the Rhodamine B Dimer with 1,4-diaminobenzene over Using POCl<sub>3</sub>***

**Charles Edwards, High Point University**

**Mentor: Pamela Lundin, Chemistry**

Rhodamine B is a pink, fluorescent dye that can form dimers with various "target" molecules, including 1,4-diaminobenzene. The dimer formed with this molecule can be synthesized by two methods: one involving the use of EDC and one involving POCl<sub>3</sub>. EDC is hypothesized to be more effective in forming the dimer.

***Identifying serine-threonine kinase 1 substrates in MRSA with a phosphoproteome analysis***

**Franziska Jakobs\*, Rachel Berndsen, Myaisha Lucas, Meghan Blackledge, Heather Miller, High Point University**

**Mentors: Meghan Blackledge, Chemistry; Heather Miller, Chemistry**

Stk1 is a kinase that has been shown to play an important role in antibiotic resistance in MRSA; however, very few substrates have been identified. Phosphoprotein analysis by mass spectroscopy was used to identify substrates which were no longer phosphorylated when Stk1 was inhibited by a novel adjuvant.

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***Evaluation of Small Molecules That Inhibit Stk1, A Ser/Thr Kinase That Controls Antibiotic Resistance and Virulence Gene Regulation In Staphylococcus aureus***

**Lauren Kaelin\*, Dexter Boldog, Rachel Bernsden, and Taylor Cunningham, High Point University**

**Mentors: Meghan S. Blackledge, Chemistry; Heather Miller, Chemistry**

*Staphylococcus aureus* is a gram-positive pathogen that causes systemic and soft tissue infections in humans and livestock through the formation of antibiotic resistance. We have screened and discovered multiple potent compounds with similar structures shown to inhibit the kinase domain of Stk1 resulting in potentiation of  $\beta$ -lactam resistant strains.

***Phosphoproteins of Stk1 by SDS-PAGE***

**Myaisha Lucas, High Point University**

**Mentor: Heather Miller, Chemistry**

Methicillin resistant *Staphylococcus aureus* (MRSA) poses a large burden on the healthcare system. The elucidation of the substrates of Stk1, a moderator of virulence gene expression, could provide therapeutic benefits to affected patients. Untreated and Stk1 inhibitor-treated MRSA cultures were separated based on molecular weight using SDS-PAGE to observe phosphorylated proteins.

***Analyzing the Antibiotic Activity of a Cyclic Compound Library in M. Smegmatis and M. Abscessus***

**Mikaela Seemann, High Point University**

**Mentor: Meghan Blackledge, Chemistry**

Mycobacterium cause numerous human infections and are increasingly resistant to antibiotics. To identify novel scaffolds for antibiotic development, we screened small molecules for antibiotic activity against *mycobacteria*. Several scaffolds showed low MICs against *M. smegmatis* and varying activity against *M. abscessus*. Complete data and future directions will be presented.

***Establishing Desired Properties in SAM Conjugated Polymers***

**Evan Silver, High Point University**

**Mentor: Pamela Lundin, Chemistry**

Self-assembled monolayers (SAMs) are molecular assemblies that adhere to surfaces or substrates by head groups and can be functionalized to establish desired properties on a surface. SAM structures can be manipulated to adhere to many different substrates and establish new properties, such as conductivity and antimicrobial activity, on these surfaces.

***Small Molecule Adjuvants Suppress Gene Expression of Resistance Genes in MRSA***

**Brianna Viering\*, Taylor Cunningham and Heather Miller, High Point University**

**Mentor: Heather Miller, Chemistry**

Adjuvants combined with antibiotics are promising in the treatment of Methicillin-resistant *Staphylococcus aureus* (MRSA). Our lab is investigating how novel adjuvants that inhibit Stk1 work at the molecular level. To test gene expression levels of key resistance genes, RNA was extracted from treated cells and analyzed by RT-qPCR.

***DBPs Also Swim in High Point's Pools***

**Kristen Weiss, High Point University**

**Mentor: Joshua Allen, Chemistry**

Disinfection by-products (DBPs) can form in swimming pools as an unintended consequence from the reaction of disinfectant (usually chlorine) and natural and anthropogenic matter present (synthetic dyes, sunscreens, lotions, urine, sweat). Here, we investigate DBP formation from the reaction of synthetic dyes and chlorine to understand their possible contribution to DBPs in swimming pools.

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## Computer Science

### ***A Model and Design for Automated Honeypot Detection***

**Timothy Beal, Ashlyn Hanks\*, and Christos Haramis, High Point University**

**Mentor: Jason Pittman, Computer Science**

Honeypot literature is not clear on what specific network or system attributes may be used to detect a honeypot. Further, detection is performed manually. In this research, we provide the next step towards an automated software tool capable of detecting honeypots with a statistically significant accuracy based on network characteristics.

### ***Measuring Connectivity Performance Thresholds for Moving Target Defenses***

**Nicholas Greiner, High Point University**

**Mentor: Jason Pittman, Computer Science**

One network defense mechanism growing in popularity is moving target defense, a technique used to move services around on a network. We conducted a series of experiments that were designed to test the connectivity performance thresholds of a common network service, SSH, to determine connectivity performance requirements for moved services.

### ***The Splintered Shards: Intent and Action in a Bogus Non-Invasive Brain-Machine Interface Experiment***

**Kyle Hoffpauir, High Point University**

**Mentor: Jason M. Pittman, Computer Science**

Non-invasive brain-machine interfaces (BMI), such as an EEG, allow users to convert neural activity into input for a system. Users may believe they are controlling a system when they are not. Through replication of past experiments into feelings of control, we can investigate how BMI affects our feelings of agency.

### ***Evolution of Cybersecurity Laboratory Pedagogy***

**Reilly Kobbe\*, and Jason Pittman, High Point University**

**Mentor: Jason Pittman, Computer Science**

The evolution of cybersecurity education research can be traced through the progression of keywords in the published literature. Such keywords appear between the abstract and body of the work. We analyzed keywords over the past 15 years with the goal of establishing bibliometric artifacts for future analysis.

### ***Measuring System Utilization During A SlowLoris Laboratory Exercise***

**Taylor Lynch, High Point University**

**Mentor: Jason Pittman, Computer Science**

Cybersecurity education research does not consider the system utilization needed to conduct experiments. We developed a tool to analyze the precise amount needed so no resources are wasted. Our experiment was a DoS attack targeting a HTTP server by implementing a SlowLoris technique to capture the system utilization data.

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***Measuring Attacker Intent in High Interaction Honeypots***  
**Nathan Markle\* and Jason Pittman, High Point University**

**Mentor: Jason Pittman, Computer Science**

Differentiating between malicious and benign activity within a honeypot is often time-consuming and tedious work. Expediting identification of malicious activity allows for faster and more effective design of threat countermeasures. Thus, we propose a novel, activity logging solution to illuminate malicious intent within high interaction honeypot technologies.

***Differentiating Between Mobile and Desktop Application Network Traffic***

**Tyler Percy, High Point University**

**Mentor: Jason M. Pittman, Computer Science**

The last several years has shown explosive growth for both the mobile application marketplace as well as accompanying cybersecurity issues related to such applications. Thus, this study sought to measure the potential differences in network traffic characteristics in a popular financial trading application with mobile and desktop versions.

***Improving the Future of IoT Security Through Blockchain Integration***

**Spencer Peters, High Point University**

**Mentor: Lloyd Williams, Computer Science**

The Internet of Things (IoT) consists of our many connected devices. Although these devices such as smart light switches, smart home assistants, and many others make our lives easier, they suffer from major security flaws. Blockchain technology integrated into IoT devices could provide a tamper-proof and secure network of devices.

***Open Sesame - Validation of Port Knock Sequence Generation***

**Kyle Wiseman\* and Jason Pittman, High Point University**

**Mentor: Jason Pittman, Computer Science**

Port knocking is a technology which keeps services concealed until receiving a crafted communication sequence or *knock*. However, knocks can be replayed to gain unauthorized access. Replay is possible because knocks are static. This work proposes a novel port knocking algorithm which employs dynamic generation to achieve stochastic port sequences.

## **Exercise Science**

***Preliminary Data: Dietary Nitrate Supplementation Does Not Extend Dry Static Apnea or Wingate Performance***

**Phillip Armentrout, High Point University**

**Mentor: Colin Carriker, Exercise Science**

Previous studies have examined dietary nitrate supplementation and its effects on dry static apnea, and peak power. Dietary nitrate supplementation has been found to increase maximal apnea and peak power output. The purpose of this study was to determine the effects of beetroot juice on dry static apnea and Wingate performance.

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## Home Furnishings and Interior Design

### ***Research on Housing and Design in The Philippines***

**Kayla Prado, High Point University**

**Mentor: Jane Nichols, Home Furnishings and Interior Design**

The Philippines has been experiencing a housing crisis due to overpopulation, natural disasters, and the government's failure to find lasting solutions. This research analyzes how those factors have led to the ongoing issue and explores successful housing projects that could benefit their nation's situation.

### ***Homeless Population Research and Proposed Community Center Design Plan***

**Kayla Wattenbarger, High Point University**

**Mentor: Jane Nichols, Home Furnishings and Interior Design**

Demographic research on the homeless living in High Point has led me to propose a new community center specifically designed to benefit this population. The primary goal this semester is to conduct a literature review and develop the design spatial program for the community center project.

## Pharmacy

### ***Impact of a Multidisciplinary Educational Training Program (OverdosED) on Knowledge and Perceptions of Depressant Substance Use on a College Campus.***

**Christina Carilli\*, Shaina Musco, Brenden Hargett, Tara Shollenberger, and Jackson Kicklighter, High Point University**

**Mentor: Shaina Musco, Pharmacy**

Substance use on college campuses in the United States is a documented issue. There is minimal educational programming in place to teach students about the use and misuse of depressant substances. OverdosED was developed to increase college students' ability to appropriately recognize and respond to suspected overdose on depressant substances.

### ***Mu Opioid Receptor Signaling in Neurofibromatosis Type 1.***

**Billy Mathias\*, Robert Coover, Scott Hemby, and Scot McIntosh, High Point University**

**Mentors: Robert Coover, Basic Pharmaceutical Sciences; Scott Hemby, Basic Pharmaceutical Sciences**

Neurofibromatosis type 1 is a genetic disorder affecting several systems. In addition to being a tumor predisposition syndrome, afflicted patients present with high incidences of pain. Therefore, we set out to investigate, at the receptor level, how opioid receptors respond to stimulation in a cell model of neurofibromatosis.

### ***Dopaminergic DRD-1 and DRD-2 Receptor Signaling in Neurofibromatosis Type 1***

**Gabrielle M. Schmale\* and Alec C. Manzer\*, High Point University**

**Mentor: Robert A. Coover, Basic Pharmaceutical Sciences**

Neurofibromatosis is an autosomal dominant genetic condition. Functional mutation(s) in the gene that encodes for neurofibromin, a RAS-GAP domain containing protein, influence cAMP and DA signaling. Thus, the goal was to test the hypothesis that proper DA signaling of DRD-1 and DRD-2 is influenced by the NF1 protein.

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***Glycosaminoglycans Alter Stress Responses in Bacterial Pathogens***

**Allison Tucker, High Point University**

**Mentor: Aurijit Sarkar, Pharmacy**

Bacteria encounter glycosaminoglycans (GAGs) in the extracellular matrix. The effect of GAGs on bacterial stress response has been scarcely studied. We are investigating how a GAG called heparin affects bacterial growth during periods of elevated temperature and nutrient starvation. We will present our most up to date findings here.

## Physics

***Nonequilibrium Steady States in XY Spin Chain with Next-Nearest Neighbor Exchange Interactions.***

**Daniel Allen, High Point University**

**Mentor: Jarrett Lancaster, Physics and Astronomy**

We present results of an investigation of the quantum dynamics of a particular class of spin chains starting from a domain wall initial state. The inclusion of next-nearest neighbor exchange interactions necessitates a computational approach to compute observables in the long-time limit.

## Psychology

***The Relationship Between Preferred Learning Method, Stress, and Social Isolation: How Do College Students Want to Learn During the COVID-19 Pandemic?***

**Jordan Bramhall, High Point University**

**Mentor: Jana Spain, Psychology**

How do students want to learn during the COVID-19 pandemic? Participants completed online questionnaires about their learning method preference during the pandemic, stress levels due to COVID-19, and feelings of social isolation. Results showed that COVID-19 stress levels were significantly related to different learning method preferences during the pandemic.

***Motivations for Outcomes on FWB Relationships***

**Evonne Marsh, High Point University**

**Mentor: Deborah Danzis, Psychology**

The effects of gender and type of motivation (sexual or emotional) for “Friends with Benefits” (FWB) relationships on risky sexual behavior, friendship status, and reputation were studied. Results showed that the sexual motivation led to more risky sexual behavior. Friendship status and reputation were not affected by gender or motivation.

***TV Show Preferences, College Majors, and Career Choices***

**Francesca Mauceri, High Point University**

**Mentor: Deborah Danzis, Psychology**

Amount of TV watched, TV preferences, and college major were studied among undergraduates to see if these were related. Results showed a relationship between amount of TV watched and extent to which people feel TV affects their career choice. In addition, results showed some correspondence between majors and TV preferences.

# EXHIBIT ABSTRACTS

## Popular Culture and Media Production

### ***Senior Capstone – Autumn’s Song Music Video***

**Victoria Romero, High Point University**

**Mentor: Joe Michaels, Pop Culture and Media Production**

This music video explores broken relationships and the difficulty of moving on. Using barbies as the main subjects of the film, coupled with miniature sets, beautiful outdoor locations, and polaroid pictures, this music video takes a unique approach encompassing the nostalgia of lost love through the use of children’s toys.

## Game and Interactive Media Design

### ***On the Dodge - Western Hide and Seek***

**Elijah Hawkins\*, Logan Mayo\*, Tift Hollis\*, Josh Shogren\*, High Point University**

**Mentor: Brian Heagney, Game and Interactive Media Design**

In the Unreal Engine, we created a playable version of Hide and Seek with an economy that allows players to buy power-ups. The host takes the role of the seeker as the players spread out into a small western town to find gold and avoid the seeker.

### ***The Last Stand of the Plushies***

**Storm Kaffenberger\*, Katie Pearson\*, Matt Boyer\*, Ross Woods\*, Carter Shipes\*, and Sam Stewart\*, High Point University**

**Mentor: Brian Heagney, Game and Interactive Media Design**

Our project aims to illustrate the knowledge we have obtained in the Game design program over the four years at HPU. We will showcase our game we created as a group and explain further what it took for us to create *The Last Stand of the Plushies*.

### ***Medieval Mayhem: What Goes into Designing a Video Game***

**Trey Kivett\*, Scott O’Neil\*, Nicolas Bloom\*, and Daniel Nixon\*, High Point University**

**Mentor: Brian Heagney, Game and Interactive Media Design**

Medieval Mayhem is a video game that we have been developing for our capstone project for the year of 2021. We wish to show how many components goes into developing and designing a video game; as our team used a variety of programming, level design, asset creation, and animation to create this game. We wish to demonstrate our skills, as well as inspire and motivate others in our game development department.

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Ellie Abel	Ashlyn Hanks	Scott O'Neil
Anthony Akers	Elijah Hawkins	Joshua Onufer
Michael Alcozer	kyle Hoffpauir	Katie Pearson
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Amaiya Anthony	Franzi Jakobs	Spencer Peters
Bijan Arasteh	Jonathan Jansma	Rachel Peterson
Olivia Armendarez	Elizabeth (Libby) Johnson	Emily Poindexter
Phillip Armentrout	Laura Johnson	Kayla Prado
Tom Bermel	Ekabouna Joseph	Nicole Prince
Nicolas Bloom	Lauren Kaelin	Anthony Quagliata
Steven Boan	Storm Kaffenberger	Elizabeth Ragan
Caitlyn Bontempo	Alexandra Kapolis	Elizabeth Riser
Leslie Bosse	Olivia Keider	Christina Robinson
Matt Boyer	Cassandra Kinerson	Victoria Romero
Jordan Bramhall	Ashley King	Sydney Salone
Sydney Brett	Trey Kivett	Vincent Scavo
Samantha Bridge	Reilly Kobbe	Gabrielle Schmale
Lauren Canfield	Cameron Labrecque	Mikaela Seemann
Christina Carilli	Cheyse Lattie	Carter Shipes
Alison Carroll	Emily Longwell	Josh Shogren
Claire Cartrette	Myaisha Lucas	Tara Shtayyeh
Abby Copeland	Taylor Lynch	Evan Silver
Banks Cozart	Sawyer Lyons	Heather Simmons
Taylor Cunningham	Shayne Maggard	Courtney Smith
Sarah Dahlberg	Alec Manzer	Sarah Spangler
Madison Drobny	Elizabeth Manser	Sam Stewart
Jenna Duncan	Avery Marchand	Allison Tucker
Samantha Dunn	Nathan Markle	Hailey Turner
Charles Edwards	Joseph Maronski	Quinn Van Popering
Trinity Erjo	Evonne Marsh	Brianna Viering
Samantha Ethier	Billy Mathias	Kayla Wattenbarger
Maddison Faggart	Francesca Mauceri	Maggie Weinbaum
Alec Garfield	Margaret Mauer	Kristen Weiss
Emily Gonzalez	Logan Mayo	Abby Williamson
Nicholas Greiner	Tabitha McGuire	Alex Wirth
Alexandra Griswold	Lisa Motosicke	Kyle Wiseman
Andrew Gustetic	Daniel Nixon	Ross Woods
Bill Hagmeier	Thomas O'Hara	Nicholas Zanghi

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**Mentorship Matters.**

