High-PURCS

HIGH POINT UNVERSITY RESEARCH & CREATIVITY SYMPOSIUM 2019

URCW

-Welcome from the-

DIRECTOR OF UNDERGRADUATE RESEARCH AND CREATIVE WORKS

Welcome to the 7th High Point University Research and Creativity Symposium (High-PURCS). High Point University is an institution which fosters intellectual and creative scholarship through student engagement and student-faculty collaboration. Our students do intellectual and creative contributions in significant work mentored by faculty and regularly share their disciplines at professional national and regional conferences. However, High-PURCS is an opportunity for students to showcase their work here on campus so HPU students, faculty, and staff can witness our students' professional development and gain a glimpse of tomorrow's future leaders, artists, scientists, teachers and scholars. At this year's symposium, we have 191 students mentored by 82 faculty from 28 different fields across all of High Point University's schools showcasing 153 presentations. Our students' achievement is a reflection of HPU's holistic learning approach and the dedication of its caring faculty. Thank you for being part of the 2019 High Point University Research and Creativity Symposium.

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

THE 7TH HIGH POINT UNIVERSITY RESEARCH AND CREATIVITY SYMPOSIUM

(High-PURCS)

| APRIL 16, 2019 |

1:00 pm – 1:20 pm	**Welcome, Opening Remarks & Awards** *Phillips Hall 120*
1:30 pm – 2:30 pm	**Oral Session I** *Phillips Hall 2nd floor*
2:30 pm - 3:30 pm	**Oral Session II** *Phillips Hall 2nd floor* **Dance performances** *Hayworth Fine Arts Center*
3:30 pm – 5:00 pm	**Poster Session, Exhibit & Reception** *Slane Basketball Court*

URCW
HIGH POINT UNIVERSITY

Congratulations to our 2018-2019 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 three students who have recently completed the program and have earned the title of Research Apprentice.

New Spring 2019 Apprentices:

Camarie Schmidt

Madison Gotro

Valerie Olzer

Research Apprentices recognized in a fall ceremony:

Jordan Bramhall
Sarah Culver
Ella Cusano
CJ Deroy
Melinda Franke
Lauren Herb
Alan Hsueh
Nicholas Kirby
Will LeFever
Sawyer Lyons
Victoria Macqueen
Elizabeth Malone
Mckenna McGovern
Jordan Mister
Avery Moon
Maria Mosconi
Cassidy O'Brien
Kayla Pennycuff
Ashley Robinson
Sydney Sanders
Sara Seaford
Peyton St. John
Jessica Vedrani
Evan White
Alex Wirth

ORAL PRESENTATION SCHEDULE

1:00-1:20 p.m. Opening Remarks from Dr. Dennis Carroll and Awards
Phillips Hall, Room 120

	Room 116	Room 215	Room 216	Room 217	Room 218	Room 220	Room 221	Room 222	Room 223
Session 1	**Math I**	**Computer Science I**	**Psychology & Nonprofit**	**English Literature I**	**Physics**	**History**	**Biology**	**Francophone Studies I**	**Spanish I**
1:30 - 1:45	Sophie Kestner	Ty Carlson	Charlotte Kennedy	Emily Burke	Joseph Godoy	Karen Davis	Alexandria Cedrone	Ariana Breckinridge	Jennifer Urena
1:45 - 2:00	Sarah Poiani	Chris Schorn	Niamh Tattersall	Emmi Palenbaum	Brandon Inscoe	Yasmene Dergham	Hannah Cozart	Isabella Diez	Cassandra Billig
2:00 - 2:15	Kelsey Quinn	Ryan Diaz		Meagan Pusser	Nolan Roth	Zach Quimby	Katelyn Greer Layla Welch	Lindsey Edwards	Julia Blumberg
2:15 - 2:30		Ty Carlson Alex Cohan			Isaac Shore		Shauna Talbot		

Session 2	**Math II**	**Computer Science II**	**Business**	**English Literature II**	**Commun-ication**	**Chemistry**	**Pharmacy & Neuroscience**	**Francophone Studies II**	**Spanish II**
2:30 - 2:45	Matt Knifper	Joe Davidson Matthew Olker	Lindsey Watts	Raegan Thomas	Jasmine Bush	Kaylee Campbell	Isabella Grifasi	Erica Schimmel	Christina Dunn
2:45 - 3:00		Daxton Loy	Jennifer Urena	Julia Wallace	Jennifer Zeleski	Nicholas Cutrona	Jeremy Muhr Sarah Jiudice	Savannah Stoughton	Lauren Perrone
3:00 - 3:15		Kelsey Quinn Madison D'Ostuni		Brooke Allen					Maegan Raboin
3:15 - 3:30		Ryan Felton							

Session 2	**Dance** – Hayworth Fine Arts Center
3:00 - 3:15	Liv Huang**,** Samantha Bridge, Kaylah Davis, Emily Durant, Alex Griswold, Chéyse Lattie, Madison Mendyk, & Molly Packard
3:15 - 3:30	Grace Ann Letzinger**,** Samantha Bridge, Alex Griswold, Liv Huang, Chéyse Lattie, & Madison Mendyk

3:30-5:00 p.m. Posters & Tech and Design Exhibit with Reception at Slane Basketball Court

POSTER PRESENTATIONS

Space	Presenter(s)	Topic
1	Kristen Brokaw	Biochemistry
2	Taylor Cunningham & Amaiya Anthony	Biochemistry
3	Hannah Lee Dixon	Biochemistry
4	Molly Hulver	Biochemistry
5	Lindsey Palmquist	Biochemistry
6	Mikaela Seemann	Biochemistry
7	Julia Trautman & Sebastian Roszczenko	Biochemistry
8	Phillip Armentrout & Billy Hagmeier	Biology
9	Sarah Jessica Forte	Biology
10	Jordan Gannon	Biology
11	Emily Hahn & Maricruz Macias-Villalpando	Biology
12	Sammi Harstad & Natalee Laasch	Biology
13	Kennedy Jackson	Biology
14	Kristina Jansen	Biology
15	Blake Jones, Lauren Herb & Alexa Kummrow	Biology
16	Ericka Luongo & Hannah Cozart	Biology
17	Sawyer Lyons	Biology
18	Jake Schleppy	Biology
19	Harrison Seitz	Biology
20	Peyton St. John	Biology
21	Candyce Sturgeon	Biology
22	Leah Vadas, Claire Zanolli & Ashton Huff	Biology
23	Kendall Ziegler	Biology
24	Rachel Berndsen	Chemistry
25	Kaylee Campbell	Chemistry
26	Katherine Conner & Maximillian Thomas	Chemistry
27	Christopher Goudarzi	Chemistry
28	Nathan Grinalds	Chemistry
29	Brandon Hunter	Chemistry
30	Soo Min Lee	Chemistry
31	William LeFever	Chemistry
32	Juliana O'Brien	Chemistry
33	Seyi Oladipo	Chemistry
34	Lauren Pferdmenges	Chemistry
35	Isabella Postle	Chemistry
36	Samantha Savrides, Shauna Talbot & Joseph Hoelle	Chemistry
37	Katharine Storo	Chemistry
38	Ryan Mijumbi	Game and Interactive Media Design
39	Ashley Campbell	Strategic Communication

40	Eric Small	Strategic Communication
41	Michael Welter	Computer Science
42	Sarah Culver	Criminal Justice
43	Aurora Jaques, Niamh Tattersall & Lucie Kirby	Criminal Justice
44	Brandon Meade	Criminal Justice
45	Ha'leigh Warden	Criminal Justice
46	Ashley Elizeus	Economics
47	Allison Patrick	Education
48	Loren Bowser, Lyndsey Clos & Sara Anderson	English Writing
49	Josh Brown, Sarah Seventko & Corina Woodson	English Writing
50	Morgan Dunham, Abigail Ray & Amelia Spanier	English Writing
51	Piper Henderson, Sarah Clark & Regina Pruden	English Writing
52	Emmitt Kussrow, Penn Cosler & Sabrina Schrader	English Writing
53	Hannah Nemanic, Sara Anderson & Caroline Hamrick	English Writing
54	Philip Sherwin, Josh Brown & Julia Dekovitch	English Writing
55	Jordan Wise, Leanne Pagus & Cailyn Walter	English Writing
56	Haley Fair & Valerie Olzer	Exercise Science
57	Gabrielle Ferrara	Exercise Science
58	Monet Gilmore	Exercise Science
59	Kendra Hairston	Exercise Science
60	Garrett Hill	Exercise Science
61	Rachel Kordonowy	Exercise Science
62	Claire Lauterbach	Exercise Science
63	Emily Lyon	Exercise Science
64	Kennedy Marshall & Valerie Olzer	Exercise Science
65	Jordan McClung	Exercise Science
66	Madison Rivera	Exercise Science
67	Jenna Smith	Exercise Science
68	Anika Weisbrod	Exercise Science
69	Chloe Hasden	Human Relations
70	Kathryn Kiefer	Human Relations
71	Alexandra Vaughn	Human Relations
72	James Dew	Neuroscience
73	Jacob Dunn	Neuroscience
74	Christopher Trevisani	Neuroscience
75	Carson Spering	Nonprofit Studies
76	Ambryia Davis	Pharmacy
77	Eva Greengrove	Pharmacy
78	Victoria McQueen & Sydney Sanders	Pharmacy
79	Courtney McCorkle	Pharmacy
80	Brooke Guthrie	Physical Therapy
81	Sam Mycroft	Physics

82	Stephen Walser	Physics
83	Skylar Altimari	Psychology
84	Janae Baiamonte	Psychology
85	Alec Campbell	Psychology
86	Meredith Chapman	Psychology
87	Julia Corrigan	Psychology
88	Megan Deiling & Hannah Hicks	Psychology
89	Gerard Dulac	Psychology
90	Hannah Hagans	Psychology
91	Meghan Lemmo	Psychology
92	Cameron Newman	Psychology
93	Sara Seaford	Psychology
94	Raniya Shakir	Psychology
95	Samantha Stevens	Psychology
96	Erika Tan	Psychology

DESIGN & TECH EXHIBITS

Space	Presenter(s)	Topic
97	Ryan Felton, Ben Rolison, Kevin Rubin & Travis Stop	Computer Science
98	Riley Greer, Shaun Stevenson, Eleonora Fallabrino & Frankie DiMatteo	Game & Interactive Media
99	Sean Loftus & Preston Cox	Game & Interactive Media
100	Alison Ho, Chad Thomas, Ben Rolison & Shane Berthoud	Game & Interactive Media
101	Morgan Sandberg	Interior Design

ORAL PRESENTATIONS

Oral Session I • 1:30 p.m. – 2:30 p.m.

Math I

Phillips 116

1:30 – 1:45

Defeating Gerrymandering Through a Multi-Party System

Sophie Kestner*, High Point University

Mentor: Adam Graham-Squire, Mathematics

We investigated different ways to apply the efficiency gap formula to situations involving more than two parties, as well as whether or not those methods of calculation accurately identify gerrymandering. We have found a method for three party elections that is able to identify gerrymandering with few anomalies.

1:45 – 2:00

Set Squares

Sarah Poiani*, High Point University

Mentor: Jenny Fuselier, Mathematics

Set is a card game with fascinating mathematical properties. We will discuss how sets can be used to create an analog for word-ladders and word-squares. The length of Set Ladders will be examined and the new structure, Set Squares, will be introduced. A method for constructing Set Squares is demonstrated.

2:00– 2:15

A Graph Theory Approach to Gerrymandering

Kelsey Quinn*, High Point University

Mentor: Laurie Zack, Mathematics

Gerrymandering is the manipulating of precinct boundaries to effect districting outcomes. District maps can be modeled through graphs and corresponding matrices. This talk will focus on connections between gerrymandering, graph theory, and matrix observations. We are including findings representing Hamming distances, matrix/upper triangular differences, and their relationships to district maps.

Computer Science I

Phillips 215

1:30 – 1:45

Developing a Self-Driving Toy Vehicle Using Computer Vision Techniques For Obstacle Detection and Avoidance

Ty Carlson*, Spencer Ader, Max Mauer, and Martin DeWitt, High Point University

Mentor: Martin DeWitt, Physics

This project utilized functions from a library of computer vision functions to enable a Raspberry Pi and a USB camera to drive a toy car all by itself. To achieve this primary goal, our group focused on image analysis and obstacle detection techniques based on pixel displacement between image frames.

1:45 – 2:00

From Mechanics to Electronics: Modifying Golf Cart Components for Remote Driving

Chris Schorn* and Michael Welter, High Point University

Mentor: Jeff Regester, Physics

In order for a mechanically-controlled golf cart to take commands from a computer, the components that maneuver the vehicle (such as the steering wheel and the accelerator and brake pedals) must first be replaced with electronically/remotely-controlled systems. We explore how an Arduino can be used to accomplish this task.

2:00 – 2:15
Affordable Differential GNSS (GPS) for Undergraduate Self-Driving Vehicle Research
Ryan Diaz*, High Point University
Mentor: Roger Shore, Computer Science

High accuracy location tracking is vital for the development of self-driving vehicles. We will discuss the results of testing the accuracy of standalone GPS vs Differential GNSS for our project and how we approached the problem.

2:15 – 2:30
Exploring the Capabilities of an Inertial Measurement Unit and Its Function on Our Autonomous Vehicle
Ty Carlson*, Alec Cohan*, and Aaron Titus, High Point University
Mentor: Aaron Titus, Physics

The IMU turns sensor data from an accelerometer, gyroscope, and magnetometer into actual 3-D space orientation. Our implementation required a method to track the cart's heading which, when utilized alongside the differential GPS, would complete the cart's ability to navigate the promenade.

Nonprofit/Psychology

Phillips 216

1:30 – 1:45
Examination of Top Private, Corporate, and Community Foundations in North Carolina
Charlotte Kennedy*, High Point University
Mentor: Christine Cugliari, Nonprofit Leadership and Management

Three common types of foundations are community foundations, corporate foundations, and private foundations. With needs varying depending on the community, each foundation is managed uniquely, and the purpose of this presentation is to synthesize communalities based off of interviews conducted from 10 of the top granting foundations in North Carolina.

1:45 – 2:00
Barriers to Reporting Sexual Misconduct on University Campuses
Niamh Tattersall*, High Point University
Mentor: Deborah Danzis, Psychology

The effects of membership in Greek organizations and gender on the likelihood of reporting an incident of sexual assault, domestic violence, and stalking were assessed. Results showed that Greek affiliated members were more likely to report incidents than non-Greek members and there was no effect of gender on reporting.

English Literature I

Phillips 217

1:30 – 1:45
The Child's Empire: Themes of Imperialism in Pre and Post-World War British Children's Literature
Emily Burke*, High Point University
Mentor: Matthew Carlson, English Literature

Children's literature serves to prepare children to fit into whatever role society has set out for them. In British culture, where the empire is so ingrained into the everyday lives of people, themes of imperialism manifest themselves strongly in children's books both before and after the World Wars.

1:45 – 2:00
Marlow as the Buddha in "Heart of Darkness"
Emmi Palenbaum*, High Point University
Mentor: Matthew Carlson, English Literature

Conrad's *Heart of Darkness* uses Marlow to convey the tensions between the Eastern and Western worlds through his position as Buddha, which entails his higher understanding of the symbolic darkness, skepticism of the so-called civilizing mission in Africa, and his ability to lead others through their personal journeys of reflection.

2:00 – 2:15
American Illusions in "Death of a Salesman"
Meagan Pusser*, High Point University
Mentor: Matthew Carlson, English Literature
Mentor: Kirstin Squint, English Literature

Through the character arcs of Willy and Biff Loman, Arthur Miller's *Death of a Salesman* offers a unique analysis of capitalism's impact on fatherhood, identity, and the human psyche.

Physics

Phillips 218

1:30 – 1:45
Non-Equilibrium Correlation Dynamics in Tight-Binding Fermion Lattices and Spin-Chains
Joseph P. Godoy*, High Point University
Mentor: Jarrett Lancaster, Physics

Non-equilibrium quantum quench dynamics are explored in systems of tight-binding fermions and spin-chains. The initial state possesses a domain wall density profile and evolves unitarily under a Hamiltonian which possesses a gapped energy spectrum. Intriguing similarities between free fermions and interacting systems are discussed.

1:45 – 2:00
Introducing the Strong Nuclear Interaction in Undergraduate Quantum Mechanics
Brandon Inscoe*, High Point University
Mentor: Jarrett Lancaster, Physics

Intriguing aspects of the strong nuclear interaction are investigated in a simplified model which is based on an analogy between color charge and the quantum theory of spin. VPython is used to create animations to aid in visualizing the complex dynamics of color charge within protons and neutrons.

2:00 – 2:15
Characterizing the Structure of Fibrin Clots using Image Analysis Algorithms in Python
Nolan Roth*, High Point University
Mentor: Briana Fiser, Physics

The body's ability to close wounds through clotting is vital—but irregular clotting can cause deadly diseases. Understanding how various clotting mechanisms affect the structural properties of a blood clot's fiber network is integral in preventing these diseases. Three algorithms were implemented in Python to quantify structural network characteristics.

2:15-2:30
Path Tracing and the Rendering Equation
Isaac Shore*, High Point University
Mentor: Roger Shore, Computer Science

In modern movies, many of the images displayed on the screen are computer generated. This research project focused on the theory behind how these images are generated, and the pros and cons that must be weighed when implementing a rendering program.

History

Phillips 220

1:30 – 1:45
Oil for Security: The Sale of United States Military Arms and Equipment to Saudi Arabia Under Jimmy Carter's Administration
Karen Davis*, High Point University
Mentor: Larry Simpson, History

The relationship between President Carter's administration and Congress was tested by the proposed sale of F-15 Eagles to Saudi Arabia. Using oil as leverage, Saudi Arabia was able to secure the purchase of the F-15 Eagles, which gave the small nation a sense of security in the tumultuous Middle East.

1:45 – 2:00
The Aspirations of Kamal Jumblatt v. The Ford Administration
Yasmene Dergham*, High Point University
Mentor: Larry Simpson, History

A discussion on the political aspirations of Kamal Jumblatt, leader of the Lebanese Druze, during the lead up to the 1975 Lebanese Civil War and how United States' foreign policy, determined by the Ford Administration, hindered Jumblatt's efforts.

2:00 – 2:15
The Carter Administration, The Military Option, and The Iranian Hostage Crisis
Zach Quimby*, High Point University
Mentor: Larry Simpson, History

In November 1979, President Carter faced a great challenge: the Iranian Hostage Crisis. After months of failed attempts to release the hostages diplomatically, Carter ordered an unsuccessful rescue mission. Although Carter faced a significant impasse, his idealistic approach floundered. He should have considered acting more forcefully sooner than he did.

Biology

Phillips 221

1:30 – 1:45
Analysis of Thrombin- Treated GerE on Binding to cot Promoters that are Repressed during Sporulation in Bacillus subtilis
Alexandria Cedrone*, Maria Valverde, and Dinene Crater, High Point University
Mentor: Dinene Crater, Biology

This experiment evaluates GerE binding to repress transcription during sporulation. Cloned gerE, using pET-28 plasmid, contains an excess histidine tag prohibiting binding. Thrombin was used to allow the native structure of GerE to form to then to bind to the promoter DNA, allowing the repression of transcription during sporulation.

1:45 – 2:00
Lingual Dental Variation in Esthonyx (Mammalia: Tillodontia)
Hannah Cozart*, Ricki Luongo, and Heather Ahrens, High Point University
Mentor: Heather Ahrens, Biology

The extinct genus, *Esthonyx*, includes specialized herbivores from the Eocene (56-33.8 mya) deposits of Wyoming. We assessed interspecific and temporal variation and examined morphological disparity along the tooth row using geometric morphometrics. We found that the morphology was conserved along the tooth row, as well as between species and through time.

2:00 – 2:15
Potential Correlation between Growth, Elevation, and Parasite Load in Woodchucks (Marmota monax) of North Carolina
Katelyn Greer* and Laylah Welch*, High Point University
Mentor: Brett Woods, Biology
Mentor: Kelli Sapp, Biology

North Carolina's woodchucks are large ground squirrels that hibernate. In the spring, they accumulate fat in preparation for winter. We trapped and monitored their growth across various elevations. Fecal samples were collected to measure parasite load. Our goal is to observe the relationship between growth, elevation, and parasite presence.

2:15 – 2:30
GIS Analysis of the Range Shift of Mammals from the Quaternary to the Present
Shauna Talbot* and Christian George, High Point University
Mentor: Christian George, Biology

I used GIS to compare current distributions of mammals in North America to fossil records from the FAUNMAP database. My analysis revealed both evidence of dispersal due to environmental change and that there is the possibility that the identification of the fossils was biased by the modern ranges.

Francophone Studies I

Phillips 222

1:30 – 1:45

Behavioral Changes as a Result of the Department Store in Emile Zola's Au Bonheur des Dames

Ariana Breckinridge*, High Point University
Mentor: Virginia Leclercq, French

This paper will examine the significance of the department store as adapted by Émile Zola's Au Bonheur des Dames, its effect on women in society specifically, their desire, what causes or drives their desire, and their new freedoms as women at work and women-wanderers using Rancière and Peters-Crick.

1:45 – 2:00

Les Acheteuses Créés : Marketing chez « Au Bonheur des Dames »

Isabella Diez*, High Point University
Mentor: Virginia Leclercq, French

Malicious marketing strategies accompanied Zola's department store, Au Bonheur des Dames. By arousing female desire, these strategies created shopaholics and kleptomaniacs. Drawing on marketing and managerial scholarship, I will explore the department store's managerial style and will argue that it and its marketing strategies created a new type of woman.

2:00-2:15

The Grand Magasin's Illusion of Female Autonomy: Émile Zola's Au Bonheur des Dames

Lindsey Edwards*, High Point University
Mentor: Virginia Leclercq, French

Au Bonheur des Dames details the advent of the *grand magasin* – an institution that revolutionized 19th-century France. This paper will explore the illusion of female autonomy deliberately created by the store's owner, Octave Mouret, by drawing on Lewis Kamm's discussion of reification and Françoise Jaouen's theory of illusionist sale.

Spanish I

Phillips 223

1:30 – 1:45

Santiago en Carnaval

Jennifer Urena*, High Point University
Mentor: Claudia Femenias, Spanish

Parte del orgullo dominicano se celebra cada febrero con el Carnaval. Este toma lugar en varias ciudades y da cabida a la representación de personajes culturales. El carnaval de Santiago presenta la identidad de la ciudad a través de los personajes de barrios que muestran orgullosamente sus orígenes.

1:45 – 2:00

Las Revelaciones De Una Guía Turística: El Análisis De La Ciudad Imaginada Y La Ciudad Vivida De Cusco, Perú.

Cassandra Billig*, High Point University
Mentor: Claudia Femenias, Spanish

Este trabajo analizará dos guías turísticas, una de los E.E.U.U. y otra de Perú, comparándolas y contrastándolas. A través de esta exploración, se examinan nuevas perspectivas sobre los efectos y expectativas del turismo y la idea de la ciudad imaginada de los turistas y la ciudad vivida por los indígenas.

2:00 – 2:15

Fotografías de Fluz Quito: Un Análisis De La Ciudad Fragmentada Y Sus Implicaciones Para El Futuro De Quito, Ecuador

Julia Blumberg*, High Point University
Mentor: Claudia Femenias, Spanish

Este trabajo analizará fotografías del libro *Fluz Quito* y su representación de Quito como ciudad fragmentada. Se explorará la diferencia entre la ciudad monumental y la ciudad vivida y sus implicaciones para el futuro de Quito y posibles cambios para resolver estos problemas y abandonar la visión de Quito fragmentado.

ORAL PRESENTATIONS

Oral Session II • 2:30 – 3:30 p.m.

Math II

Phillips 116

2:30– 2:45
How To Stop a Nazi: Ranked-Choice Remixed
Matthew Knipfer*, High Point University
Mentor: Adam Graham-Squire, Mathematics

Ranked-choice is an alternative to our Plurality voting method, the former allowing moderate candidates and third-parties. However, with every voting model come limitations. In this presentation, I propose two augmentations to Ranked-choice that have potential to mitigate some of these issues and promote candidates with greater mean and median favorability.

Computer Science II

Phillips 215

2:30– 2:45
Understanding User Experience and Application Development For Controlling An Autonomous Vehicle
Matthew Olker*, Madi D'Ostuni, Roger Shore, and Joe Davidson*, High Point University
Mentor: Roger Shore, Computer Science

To control our self-driving vehicle with ease, we developed an application that allows users to choose pre-determined destinations of academic buildings on campus. In the case that manual control is needed, the application also allows the user to manually drive the vehicle.

2:45– 3:00
Extrapolating Computer Readable Driving Instructions from Varying Sensory Information
Daxton Loy*, High Point University
Mentor: Roger Shore, Computer Science

To determine what instructions are needed for a given situation, the "brain" computer must read in information from multiple sources (cameras, Lidar, GPS, etc.) and process them in an asynchronous fashion. However, the end computer readable driving instructions must flow synchronously to the Arduino controlling the movement of the cart.

3:00– 3:15
Object Detection and Avoidance in Self-Driving Vehicles
Kelsey Quinn* and Madi D'Ostuni*, High Point University
Mentor: Roger Shore, Computer Science

Object detection and collision avoidance are critical in the design of a safe self-driving vehicle. We will discuss the results of testing the accuracy of sonar vs LIDAR for our project and how we approached the problem.

3:15– 3:30
Computer Vision for Autonomous Driving
Ryan Felton*, High Point University
Mentor: Roger Shore, Computer Science

We will discuss the methods used in computer vision software to turn video data from a camera into instructions for an autonomous vehicle.

Business

Phillips 216

2:30– 2:45
NAFTA 2.0: Changes and Implications
Lindsey Watts* and Miguel Sahagun, High Point University
Mentor: Miguel Sahagun, Marketing

NAFTA 2.0 or USCAM (United States-Canada-Mexico) seeks to address problems that arose with increased globalization not considered under NAFTA. The changes involve four areas: rules of origin, Canada's dairy market, intellectual property laws, and the US-Mexico automobile industry. This paper analyzes what the changes could mean for North American businesses.

2:45– 3:00
Economic Development Review
Jennifer Urena*, High Point University
Mentor: Peter Summers, Economics
Mentor: Bob Hirth, Management

During the fall 2018, I conducted a review of Economics literature, summarizing articles varying in topics from entrepreneurial drive to access to banking in different countries. From information found in this review, I refined my question to "how does access to banking affect development in Dominican Republic?"

English Literature II

Phillips 217

2:30– 2:45
Heteroglossia in "The Sound and the Fury"
Raegan Thomas*, High Point University
Mentor: Matthew Carlson, English Literature

Although Faulkner's *The Sound and the Fury* was published before Mikhail Bakhtin defined heteroglossia, the novel exemplifies Bakhtin's idea by not conforming to a unitary language. By providing perspectives and voices from different characters, Faulkner uses the fragmented languages of characters to create a multi-layered novel.

2:45– 3:00
Conrad and Marlow's Crisis of Representation
Julia Wallace*, High Point University
Mentor: Matthew Carlson, English Literature

In *Heart of Darkness* Conrad as the author is using his narrator Marlow to express a critical conversation he is trying to have not only with the reader, but with himself. Marlow expresses his inability to tell his own tale, just as Conrad cannot effectively tell his story of Africa.

3:00 – 3:15
Tug-of-War of Renaissance Bodies
Brooke Allen*, High Point University
Mentor: Nathan Hedman, English Literature

There is a fine line between "too much" and "too little," a push-and-pull between when to look and when not to. This tug-of-war is accentuated in Cranach the Elder's *Venus*. His seemingly erotic painting emerges amid the Protestant Reformation and encompasses the irony of past representations of female sensuality.

Communication

Phillips 218

2:30 -2:45
FOREVER
Jasmine Bush*, High Point University
Mentor: Joe Michaels, Communication

"Forever" is a short film that's written, produced, and directed by Jasmine Bush, a senior at High Point University, for her Senior Production class. However, it is an idea she's had for years. She never felt like she had the best gear, crew, and actors to make it, until now.

2:45 – 3:00
Zenith; The High Point of Student Journalism
Jennifer Zeleski*, High Point University
Mentor: Bobby Hayes, Communication

The journalism industry is headed in one direction—digital. Student journalists at High Point University needed an opportunity to pitch, write, report, create, edit and publish digital journalism that would get them experience their future careers need and deserve. That's why I created Zenith.

Chemistry

Phillips 220

2:30 – 2:45
Preparation of Surface-Grafted Poly(3-hexylthiophene) Brushes Using an Easily Cleavable Self-Assembled Monolayer
Kaylee Campbell* and Pamela Lundin, High Point University
Mentor: Pamela Lundin, Chemistry

Surface-initiated catalyst transfer polycondensation is a polymerization that attaches an initiator to surfaces via a self-assembled monolayer. We prepared new silane capable of performing Kumada CTP, grafted poly(3-hexylthiophene) to different silica surfaces and then cleaved the silane. The steps of this sequence are characterized using AFM, SEM/EDX, and NMR.

2:45 – 3:00
Synthesis and Evaluation of Fused Tricyclic Ring Scaffolds with Antibiotic Adjuvant Activity in Methicillin-Resistant Staphylococcus aureus (MRSA)
Nick Cutrona*, High Point University
Mentor: Meghan Blackledge, Chemistry

Methicillin-resistant Staphylococcus aureus (MRSA) is an opportunistic pathogen. We are working to develop antibiotic adjuvants, novel compounds that restore antibiotic sensitivity in MRSA. We have synthesized and analyzed several compounds to understand the structural requirements that contribute to adjuvant activity in MRSA. Synthetic and biological data will be presented.

Pharmacy and Neuroscience

Phillips 221

2:30 – 2:45
A Comparison Of Hippocampal Microglia Responses In Aged And Young Rodents Following Dependent And Non-dependent Binge Drinking
Isabella Grifasi*, Eva Greengrove, Christopher Trevisani, Scott McIntosh, and Simon Alex Marshall, High Point University
Mentor: S. Alex Marshall, Basic Pharmaceutical Sciences

Binge-like amounts of ethanol impact the neuroimmune system, specifically eliciting alterations in hippocampal microglia. Both non-dependent and dependent models of alcoholic binge drinking resulted in altered microglia function during intoxication, however, only aged individuals depicted microglial changes persisting through abstinence.

2:45 – 3:00
Developing and Validating a Damage Paradigm to Examine Neuronal Regeneration
Jeremy Muhr*, Sarah Jiudice*, and Kristin Ackerman, High Point University
Mentor: Kristin Ackerman, Biology

Zebrafish exhibit a robust innate capacity to regenerate a multitude of tissues. We developed a novel damage paradigm to study retinal regeneration, specifically for use in an undergraduate setting. All retinal damage paradigms require a two-week dark adaption, in developing our model we tested whether this is necessary.

Fracophone Studies II
Phillips 222

2:30 – 2:45
Prostitution and the Representation of the Body in Emile Zola's "Au Bonheur des Dames"
Erica Schimmel*, High Point University
Mentor: Virginia Leclercq, French

Emile Zola's *Au Bonheur des Dames* plays with the representation of the bodies of men, women and a department store. Through the depiction of the store as a prostitute servicing men and woman, Zola argues that superficial societal gender separations fail to acknowledge how both have the same innate desires.

2:45– 3:00
AU BONHEUR DES GUERRES: Reading War in "Au Bonheur des Dames" by Émile Zola
Savannah Stoughton*, High Point University
Mentor: Virginia Leclercq, French

Émile Zola's *Au Bonheur des Dames* is a literary study of French society during the Second Empire. The military aspects of the novel are evident but not well represented in existing research. This paper will explore the department store as an allegory for war and French colonization.

Spanish II
Phillips 223

2:30 – 2:45
¿Qué Significa Habana Blues?: Un Análisis De La Representación De La Habana A Través De La Música En La Película Habana Blues (2005)
Christina Dunn*, High Point University
Mentor: Claudia Femenias, Spanish

Este trabajo investigará las muchas maneras en que Habana está representada a través de la música y las imágenes adjuntas en la película *Habana Blues*, y explorará temas como la censura, la opresión, la separación de la familia, y la identidad para descubrir el significado detrás del título *Habana Blues*.

2:45– 3:00
Arte Callejero En Buenos Aires, Argentina: Las Paredes Están Hablando
Lauren Perrone*, High Point University
Mentor: Claudia Femenias, Spanish

El arte callejero está creciendo en popularidad en todo el mundo. El arte callejero en Buenos Aires refleja los diversos barrios y muestra a las personas los diferentes temas sociales y políticos. Este trabajo investigará seis barrios diversos en Buenos Aires y cómo utilizan el arte callejero en diferentes maneras.

3:00– 3:15
El Lado Oscuro de Barcelona: La Representación de los Barrios Periféricos en "Biutiful" (2010)
Maegan Raboin*, High Point University
Mentor: Claudia Femenias, Spanish

La presentación estudia la representación de los barrios olvidados y la gente que vive en ellos en *Biutiful*. Los efectos de la globalización, las vidas de los indocumentados, y las funciones de los espacios públicos en la película se analiza para demostrar que es una representación más completo de Barcelona.

PERFORMANCES

Session II • 3:00pm – 3:30pm
Hayworth Fine Arts Center

3:00 -3:15
Hostalgia
Liv Huang, High Point University
Performers: Samantha Bridge, Kaylah Davis, Emily Durant, Alex Griswold, Chéyse Lattie, Madison Mendyk, Molly Packard
Mentor: Lindsey Bramham Howie, Dance

The work investigates the words "hostile" and "nostalgia." In addition to exploring these emotions, the piece also explores the fusion of contemporary and hip hop dance forms. At the core is an investigation of sadness over the irretrievably of the past, never being able to get back what was. Rage over experiences ruined by others, and regret for words never said.

3:15-3:30
They Would Not Listen, They Did Not Know How
Grace Ann Letzinger, High Point University
Performers: Samantha Bridge, Alex Griswold, Liv Huang, Chéyse Lattie, Grace Ann Letzinger, Madison Mendyk
Mentor: Christine Stevens, Dance

Dance Faculty Christine Stevens' work explores form, function, abstraction, and realism. It is based on van Gogh's *Starry Night*. This dance grew into the idea of a group of people having a secret agreement to keep silent about an occurrence or situation in order to promote or protect selfish interests; the conspiracy of silence.

"Beyond the realm of education, conducting undergraduate research has taught me how to sell myself in an elevator pitch, find resources beyond the classroom, and adapt when things don't go according to plan (as research often does). I know I'll be able to apply these skills in my graduate studies and professional endeavors, something I will always be grateful for!"
- Yasmene Dergham

POSTER PRESENTATIONS

Slane Basketball Court • 3:30pm-5:00pm

Biochemistry

(1) ***Elucidation of the Efficacy of the Antitumor Quinones, Isobutyl-Deoxynyboquinone and Beta-Lapachone in a BRCA1-mutant Breast Cancer Cell Line Expressing Elevated NQO1 Levels***
Kristen Brokaw*, Lindsey Palmquist, and Melissa Srougi, High Point University
Mentor: Melissa Srougi, Biochemistry

Breast cancer affects 12.5% of women. Quinones have been found to be toxic in cells with elevated NQO1 levels. We, therefore, hypothesize that *BRCA1*-mutant breast cancers expressing NQO1 will be sensitive to β- lapachone and isobutyl-deoxynyboquinone. Our data suggest that β-lap and IB-DNQ are selective therapies for NQO1-expressing, *BRCA1*-mutant cancers.

(2) ***Investigating FDA-approved Compounds as Modulators of Virulence Gene Expression in MRSA***
Taylor Cunningham*, Amaiya Anthony*, Nick Cutrona, Heather Miller, and Meghan Blackledge, High Point University
Mentor: Heather Miller, Biochemistry
Mentor: Meghan Blackledge, Chemistry

Methicillin-resistant Staphylococcus aureus, (MRSA) is a major health concern. This study measured the expression of a virulence gene, penicillin binding protein 4. MRSA treated with the antibiotic oxacillin showed decreased levels of pbp4, which were then elevated upon treatment with a potential adjuvant.

(3) ***The Mechanism of IB-DNQ-Induced Cell Death in NQO1 Positive BRCA2-Mutant Breast Cancer Cells***
Hannah Lee Dixon*, Kristen Brokaw, Kate Hutchinson, Lindsey Palmquist, and Melissa Srougi, High Point University
Mentor: Melissa Srougi, Biochemistry

BRCA2-mutant breast cancer cells with increased expression of NAD(P)H:quinone oxidoreductase-1 (NQO1) undergo futile redox cycling with hydroquinone isobutyl-deoxynyboquinone (IB-DNQ). Treatment of *BRCA2*-mutant cells with IB-DNQ should cause DNA damage to induce cell death. Co-treatment with poly(ADP-ribose) polymerase-1 (PARP-1) inhibitors should potentiate cell death. Co-treatment with NQO1-inhibitor should decrease cell death.

(4) ***Analyzing the Role of Tat-SF1 in HIV-1 RNA Stability and Export***
Molly Hulver*, High Point University and Amanda Goodwin, Creighton University School of Medicine
Mentor: Heather Miller, Biochemistry

Tat-SF1 regulates HIV-1 RNA size classes by an unknown mechanism. We hypothesized that Tat-SF1 may regulate the size classes through export and/or stability. We knocked down Tat-SF1 in HeLa cells and used RT-qPCR to analyze HIV-1 transcripts in both nuclear and cytoplasmic fractions or cells with halted transcription.

(5) ***Elucidating the Efficacy of a Novel Quinone in the Treatment of BRCA2-Mutant Breast Cancer***
Lindsey Palmquist*, Hannah Lee Dixon, Kate Hutchinson, Kristen Brokaw, and Melissa Srougi, High Point University
Mentor: Melissa Srougi, Biochemistry

No specialized treatments exist that target cancerous cells while causing little harm to normal tissue. It is predicted BRCA ½ mutant breast tumors will be sensitive to Isobutyl-Deoxynyboquinone, which results in cell death. Research will provide information on the pathway of Isobutyl-Deoxynyboquinone-induced cell death in the presence of NQO1 cells.

(6) ***Identification of small molecules with antibiotic activity in M. smegmatis***
Mikaela Seemann*, High Point University
Mentor: Meghan Blackledge, Chemistry

Mycobacteria have innate immunity to common antibiotics, and antibiotic development remains stagnant. To identify novel scaffolds for antibiotic development, several small molecules with varying structural components were screened for antibiotic activity against *M. smegmatis*. Through this screening, a structure-activity relationship was developed for a set of compounds.

(7) ***Investigating Tat-SF1 Interactions with HIV-1 RNA***
Julia Trautman*, Sebastian Roszczenko*, and Heather Miller, High Point University
Mentor: Heather Miller, Biochemistry

This study analyzed possible interactions between the human protein Tat-Specific Factor 1 (Tat SF1) and HIV-1 RNA. EMSAs involving an HIV-1 RNA probe and HeLa cell nuclear extracts were performed. Together with super shifts using anti-Tat-SF1 antibodies, we demonstrate in vitro binding between HIV-1 RNA and Tat-SF1.

Biology

(8) ***In vitro Induction of Tetraploids in Iris domestica by Oryzalin***
Billy Hagmeier* and Phillip Armentrout*, High Point University
Mentor: Cindy Vigueira, Biology
Mentor: Patrick Vigueira, Biology

This study is focused on doubling the chromosomes of *Iris domestica*, commonly known as the blackberry lily. In an effort to transform *I. domestica* from a diploid to a tetraploid, we exposed seeds to oryzalin, an antimitotic herbicide that blocks proper division of plant cells.

(9) ***Anthocyanin's Increase Flower Temperature: A Study Using A Broad Range Of Taxa And Flower Morphologies***
Sarah Jessica Forte*, Nicole Hughes, and Briana Fiser, High Point University
Mentor: Nicole Hughes, Biology
Mentor: Briana Fiser, Physics

This study compared low, medium, and high amounts of anthocyanin pigment across five species of flowers and observed their effects on petal's internal temperature. Results showed that the greatest temperature differences between white and pigmented flowers were present in large flowers with planar morphology.

(10) ***3D Geometric Morphometric Analysis of Xenarthran Masticatory Morphology***
Jordan Gannon* and Jillian Davis, High Point University
Mentor: Jillian Davis, Exercise Science

Sloths are folivorous (eat leaves) in spite of reduced dentition and evolutionary history of insectivory. 3D surface scans of xenarthran (sloths and armadillos) skulls and jaws were examined via 3D geometric morphometric analysis in order to characterize unique features of the sloth masticatory apparatus that facilitate their unlikely dietary specialization.

(11) ***Effect of Fisetin on LNCaP Prostate Cancer Cells***
Emily Hahn*, Maricruz Macias-Villalpando*, and Kevin Suh, High Point University
Mentor: Kevin Suh, Biology

Fatty acid synthase is a key enzyme involved in neoplastic lipogenesis and is overexpressed in several human cancers including prostate cancer. In this study, we show that plant polyphenol fisetin can inhibit the expression of FASN and induce programmed cell death in LNCaP human prostate cancer cells.

(12) ***Seasonal Herbivory in the Wintergreen Orchid, Tipularia discolor***
Sammi Harstad*, Natalee Laasch*, and Nicole Hughes, High Point University
Mentor: Nicole Hughes, Biology

We aimed to characterize seasonal herbivory patterns of the wintergreen orchid, *Tipularia discolor.* We marked over 200 leaves with flags in September, and monitored damage every 2-4 weeks through April. Most whole-leaf defoliation events occurred between December-February. Small leaf holes (1-3mm in diameter) were also common, appearing primarily during fall.

(13) ***Using GIS to Analyze the Stratigraphic Control of Mammalian Fossils during the Early Eocene***
Kennedy Jackson*, High Point University
Mentor**:** Christian George, Biology

We used Digital Elevation Models and other measures of elevation to determine the stratigraphy of fossil localities to understand how mammal communities changed through the Early Eocene. We are now able to estimate the position of hundreds of sites that lacked stratigraphic information.

(14) ***Isolation and Identification of Bacteriophage from Commercially Available Bacillus thuringiensis***
Kristina Jansen*, High Point University
Mentor: Dinene Crater, Biology

The focus of this research was to identify an unknown bacteriophage from a commercially-available insecticide containing *Bacillus thuringiensis*. The bacteriophage was purified, and current experiments include DNA analysis to determine if a new *Bt*-specific bacteriophage was discovered. Electron microscopy will be performed for further classification of the phage.

(15) ***Mutation Density in "Blondy" Okra (Abelmoschus esculentus)***
Blake Jones*, Lauren Herb*, and Alexa Kummrow*, High Point University
Mentor: Cindy Vigueira, Biology
Mentor: Patrick Vigueira, Biology

Okra plants of the "Blondy" cultivar were treated with EMS and observed for possible mutation. Samples of genomic DNA were collected for PCR and sequencing. Compared to the control group, no mutations were seen in the sequenced regions of any sampled plant.

(16) ***Occlusal Dental Variation in Esthonyx (Mammalia: Tillodontia)***
Ericka Luongo*, Hannah Cozart*, and Heather Ahrens, High Point University
Mentor: Heather Ahrens, Biology

The extinct clade Tillodontia includes numerous taxa, including *Esthonyx*, which were relatively common, specialized herbivores of the Eocene (56 – 33.8 mya). We quantified dental variation in occlusal view by both species and temporal unit (biochron) using geometric morphometrics. Our results indicate a well-conserved dental morphology within the *Esthonyx* lineage.

(17) ***The Neuroprotective Potential of Cannabidiol in an in vitro Model of Oxygen Toxicity***
Sawyer Lyons*, Jake Dunn, and Michael Grider, High Point University
Mentor: Michael Grider, Neuroscience

Following injury, reactive oxygen species can lead to neuronal death. We tested whether cannabidiol could protect neurons against a reactive oxygen species injury. A neuronal cell line, RN33B, was incubated in media containing 150 – 900 uM hydrogen peroxide for twenty-four hours, concurrent with 1uM CBD treatment, with cell viability analyzed.

(18) ***Drosophila melanogaster as a Model to Examine the Neurological Effects of Cannabinoids***
Jake Schleppy* and Jackson Sparks, High Point University
Mentor: Jackson Sparks, Biology

Cannabidiol (CBD) is a non-psychoactive component of marijuana known to agonize mammalian serotonin receptors and prevent seizures in humans. Our studies show that CBD ingestion affects locomotion and delays full development in vinegar flies. Serotonergic neurons are functionally conserved between mammals and insects; thus, flies may serve as a useful model for determining the mode of CBD action.

(19) ***Anthocyanin Profiles of Photinia glabra during Leaf Expansion, Senescence, and Infection by the Pathogenic Fungus Entomosporium mespili***
Harrison Seitz*, Sarah Jessica Forte, and Nicole Hughes, High Point University
Mentor: Nicole Hughes, Biology

Anthocyanins are plant tissue pigments commonly known for leaf coloration. Studies suggest they also have antifungal capabilities, but different varieties are used at different stages of infection. We analyzed types of anthocyanin found at each stage of infection in a *Photinia glabra* leaf infected with the *Entomosporium mespili* fungus.

(20) ***Improving Protein Yield During SPOIIID Purification***
Peyton St. John*, High Point University
Mentor: Dinene Crater, Biology

Sporulation allows bacteria to preserve genetic material while in unfavorable conditions. SpoIIID has been shown to be required for transcription regulation during sporulation in *Clostridium sporogenes*. The aim of this study was to develop a new protein purification method for SpoIIID to obtain a higher protein yield.

(21) ***Characterization of the Functional Relationship Between Atg27 and the YMl018C Protein***
Candyce Sturgeon*, High Point University
Mentor: Veronica Segarra, Biology

Atg27, a transmembrane protein important in the catabolic process of autophagy, physically interacts with uncharacterized protein YML018C. Our research seeks to confirm YML018C localization, characterize YML018C deletion phenotypes, and determine the dependability of YML018C localization on Atg27. We constructed and studied mutant cells lacking specific genes and containing GFP-tagged YML018C.

(22) ***Using Molecular Data to Resolve Phylogenetic Relationships of Flowering Plants in the Liatris Genus***
Ashton Huff*, Leah Vadas* and Claire Zanolli*, High Point University
Mentor: Cindy Vigueira, Biology

For the species of the plant genus *Liatris* (Asteraceae), we have created a phylogenetic tree based on maximum parsimony that improves upon previous studies. This project has the potential to reform what we know about *Liatris* and reveal the evolutionary relationships that underlie the classification of its species.

(23) ***Cannabidiol Affects Drosophila melanogaster Gene Expression and Behavior***
Kendall Ziegler* and Jackson Sparks, High Point University
Mentor: Jackson Sparks, Biology

Cannabidiol (CBD) is a bioactive cannabinoid with great therapeutic potential. Potential effects of CBD on invertebrates have not been reported. Here, we show CBD ingestion disrupts normal walking behaviors and alters the expression of many genes in vinegar flies. Several affected genes represent novel targets for investigation in humans.

Chemistry

(24) ***Synthesis and Evaluation of a Series of Carbazoles as Antibiotic Adjuvants in Methicillin-Resistant Staphylococcus aureus (MRSA)***
Rachel Berndsen*, Meghan Blackledge, High Point University
Mentor: Meghan Blackledge, Chemistry

Every year 90,000 Americans battle against MRSA. Due to its resistance to β-lactam antibiotics and other treatments, MRSA is extremely difficult to treat. We tested novel antibiotic adjuvants that potentiate [Symbol]-lactam antibiotics in MRSA. Lead compounds with excellent potentiation in MRSA and interesting strain-specific inhibitor activities were identified.

(25) ***Preparation of Surface-Grafted Poly(3-hexylthiophene) Brushes Using an Easily Cleavable Self-Assembled Monolayer***
Kaylee Campbell*, Soo Min Lee, and Bella Postle, High Point University
Mentor: Keir Fogarty, Chemistry
Mentor: Elizabeth McCorquodale, Chemistry

Organophosphates are carcinogens and toxic to the human body. They are also commonly found in nail polish, because the FDA doesn't heavily regulate cosmetics. High-Performance liquid chromatography (HPLC) was used to determine the concentration of three common organophosphates in popular nail polish brands. Results to date will be presented.

(26) ***A Temperature Dependent Identification of Volatiles in Tobacco Products Via Thermogravimetric Analysis***
Katherine Conner*, Nathan Grinalds, and Maximillain Thomas*, High Point University
Mentor: Keir Fogarty, Chemistry
Mentor: Elizabeth McCorquodale, Chemistry

To investigate the temperatures that toxic chemicals in tobacco are released, raw tobacco, cigarettes, and cigarillos were analyzed using thermogravimetric analysis. Tobacco samples were heated to 1000°C and the emissions were collected. Thermal gravimetric analysis (TGA), UV/Vis, and Fluorometry were used to identify emissions found at specific temperature ranges.

(27) ***Understanding the Mechanism of Photo-Redox Catalysis***
Christopher Goudarzi*, Keir Fogarty, and Andrew Wommack, High Point University
Mentor: Keir Fogarty, Chemistry
Mentor: Andrew Wommack, Chemistry

Photo-redox catalysis involves using visible light to promote a chemical reaction in order to synthesize common pharmaceuticals or other commonly desired products. We are currently studying the mechanism of light's role in the promotion of chemical photo-redox processes by using fluorometry.

(28) ***Photophysical Characterization of Novel Rhodamine B Dimers***
Nathan Grinalds*, Lauren Pferdmenges, Brandon Hunter, Pamela Lundin, and Keir Fogarty, High Point University
Mentor: Keir Fogarty, Chemistry

Intelligently synthesized fluorescent dimers were analyzed using fluorescence correlation spectroscopy, fluorometry, and computer simulations to investigate how the positioning of the dimers' fluorophores affects their fluorescent properties. The fluorescence characterization and theoretical structures of the dimers have applications to light harvesting technologies like optical electronics.

(29) ***Fluorescent Properties of Novel Rhodamine B Dimers***
Brandon Hunter*, Pamela Lundin, Nathan Grinalds, and Lauren Pferdmenges, High Point University
Mentor: Keir Fogarty, Chemistry

Rhodamine B is a fluorescent dye that was used to synthesize four stereochemically unique novel dimers. These dimers were analyzed via fluorometry to determine their fluorescent properties. Each dimer had a distinct peak wavelength at which it was excited and emitted light, indicating that the stereochemistry impacts fluorescence.

(30) ***Progress of Synthesizing the Donor and Acceptor Components of Organic Polymers***
Soo Min Lee* and Robert Glass, High Point University
Mentor: Pamela Lundin, Chemistry

Organic polymers show promise as the active material for solar cells. We have designed a polymer capable of being a single component active layer. We are synthesizing the repeat unit of this polymer, as well as its donor and acceptor components. We will present our progress synthesizing the acceptor component.

(31) ***Synthesis and Evaluation of the Unique Antimicrobial Peptide Polyphemusin-1***
Will LeFever*, Mikaela Seemann, Meghan Blackledge, and Andrew Wommack, High Point University
Mentor: Andrew Wommack, Chemistry

Polyphemusin-1 (PM1) is an antimicrobial peptide naturally derived from horseshoe crabs. The main structural motif of PM1 is a β-hairpin turn produced by two intramolecular disulfide bonds granting PM1 antimicrobial activity against Gram-negative bacteria. Antimicrobial assays of native PM1 and derivatives have determined the importance of disulfide bonding to activity.

(32) ***Synthesis of Carbetocin Using Photochemical Cyclization Techniques***
Juliana O'Brien*, Emma James Barksdale, Olivia Tornow, Jennifer Marshall, and Andrew Wommack, High Point University
Mentor: Andrew Wommack, Chemistry

Oxytocin (OT) is a naturally-occurring human hormone and neurotransmitter that is involved in myriad physiological and psychological phenomenon. Our research concerning photochemical construction of thioether linkages has facilitated improved synthetic access to carbetocin, a more heat-stable derivative of oxytocin utilized for medical applications.

(33) ***Photodecomposition Profiles of Beer***
Seyi Oladipo*, Brandon Hunter, and Kendall Ziegler, High Point University
Mentor: Keir Fogarty, Chemistry
Mentor: Elizabeth McCorquodale, Chemistry

Beer becomes "light-struck" after exposure to light, changing its flavor profile. To characterize the chemical changes, mass spectrometry of beer altered by light over a 48-hour period was done. Results show intensity decreasing for larger mass to charge peaks and increasing for smaller molecules after light treatment, indicating photodecomposition.

(34) ***Synthesis of Covalently-Linked Fluorescent Dye Derivatives***
Lauren Pferdmenges*, Pamela Lundin, and Keir Fogarty, High Point University
Mentor: Pamela Lundin, Chemistry
Mentor: Keir Fogarty, Chemistry

We have created covalently-linked fluorescent dimers using the dye molecule Rhodamine B and different 1,4-diamines as linkers, with the goal of altering the photo physics of the molecules. We will report the successful synthesis and characterization of these fluorescent dimers by nuclear magnetic resonance spectroscopy and optical measurements.

(35) ***Patterning Conjugated Polymer Growth by Microcontact Printing***
Isabella Postle* and Pamela Lundin, High Point University
Mentor: Pamela Lundin, Chemistry

We are functionalizing gold surfaces with a new self-assembled monolayer that initiates polymerization, and later can be selectively cleaved to release the polymer. We are using microcontact printing to nanopattern our substrates so that we can use atomic force microscopy to show that polymerization only occurs on our SAM.

(36) ***Exploration of Heavy Metals in Well Water***
Samantha Savrides*, Shauna Talbot*, and Joseph Hoelle*, High Point University
Mentor: Keir Fogarty, Chemistry
Mentor: Elizabeth McCorquodale, Chemistry

Given the industrial past of cities in the Triad, well water contamination has been a prevailing topic for years. Unfiltered and filtered well water from different parts of the triad were tested for copper, lead, iron, arsenic, chromium, and mercury contamination. No metal concentrations exceed national EPA guidelines for Colfax.

(37) ***Investigating Novel Nanocrystals as Catalysts for Heterogeneous Cross-Coupling Reactions***
Katharine Storo*, Hui Li, Scott Geyer, and Pamela Lundin, High Point University and Wake Forest University
Mentor: Pamela Lundin, Chemistry

Catalysts used in cross-coupling reactions are extremely important in the fields of organic synthesis and medicinal chemistry. We are testing novel nanocrystals as heterogeneous metal catalysts under different conditions for known cross-coupling reactions. Adjusting reaction components allowed conditions to be optimized. The outcome of each reaction was analyzed via GC-MS.

Communication- Game and Interactive Media Design

(38) ***Qualifications for Entry Level Game Design Jobs***
Ryan Mijumbi*, **High Point University**
Mentor: Brian Heagney, Communication

This study looks at the qualifications for entry level game design positions. We are currently surveying all LinkedIn job posts in the U.S. that are specifically categorized as "entry level" for the specific keyword search terms: "game design" and "game designer". This research is still in progress.

Communication: Strategic Communication

(39) ***Family Communication Patterns and Young Adult Television Viewing Motivations***
Ashley M. Campbell*, High Point University
Mentor: Virginia McDermott, Communication

The social institution of family is central to the lives of every individual, but communication patterns within families vary. The purpose of this research study was to determine whether or not family communication patterns influence young adults' media choices, and if so, whether this relationship is dependent on geographic location.

(40) ***Child-Oriented Promotional Features on Cereal Packaging: Differences by Sugar Content and Self-Regulatory Pledge***
Eric Small*, Sarah Vaala, and Matthew Ritter, High Point University
Mentor: Sarah Vaala, Strategic Communication
Mentor: Matthew Ritter, Strategic Communication

In 2009, major food companies began imposing nutritional self-regulations on cereal targeting children. This study examines child-oriented features on 126 cereal packages, and whether these features vary by industry pledge and sugar content. Results indicate boxes with moderate sugar and without industry pledges display the most features.

Computer Science

(41) ***Building an Autonomous Vehicle at HPU***
Michael Welter*, High Point University
Mentors: Jeff Regester, Physics

HPUminds–an HPU student organization made up of physics and computer science students–has replaced a golf cart's mechanical components with state-of-the-art programmable electronic controls. These controls, paired with environment-monitoring, path and obstacle-detecting cameras and sensors, allow a central computer to elegantly maneuver the vehicle around campus while also actively avoiding collisions.

Criminal Justice

(42) ***The Economics of Practicing Law***
Sarah Culver*, High Point University
Mentor: Joanne Altman, URCW

According to the American Bar Association, the average student law school debt can range from $84,000 to $122,158. New attorneys must find a way to balance this debt against the income of their new job. This study was conducted to determine the economic viability of practicing different types of law.

(43) ***The Effect of Tablet Education Courses on Recidivism: A Multi-Stakeholder Qualitative Analysis***
Aurora Jaques*, Niamh Tattersall*, Lucie Kirby*, and Thomas Dearden, High Point University
Mentor: Thomas Dearden, Criminal Justice

Tablet courses used in a North Carolina jail were investigated. These programs are in place so inmates may recieve resources for successful re-entry. Researchers interviewed inmates and officers for their opinions regarding tablet use and suggested improvements. Generally, inmates and officers alike expressed optimism about the tablet's effect on recidivism.

(44) ***Analyzing Immigrant Violent Crime Rates in Texas***
Brandon Meade*, High Point University
Mentor: Jessica Swanson, Criminal Justice

In the United States immigration has become a hot topic of political discussion. This study evaluates the impact immigrants have on violent crime rates in Texas and whether there is a correlation between immigration and violent crime.

(45) ***Delinquents or Victims?: The Evaluation of Child Maltreatment and Problem Behavior***
Ha'Leigh Warden*, High Point University
Mentor: Jessica Swanson, Criminal Justice

Juvenile delinquency is an ongoing issue across the world with many different forms. This study evaluates how child maltreatment induces problem behavior and delinquency. Outcomes related to the various forms of abuse are essential to understand because of the potential for more serious involvement with the Juvenile Justice system.

Economics

(46) ***The Bee-Pocalypse***
Ashley Elizeus*
Mentor: Daniel Hall, Economics

Colony Collapse Disorder (CCD), the "Bee-Pocalypse," affects both feral and managed honeybees and ultimately the crops they pollinate. A transition from monoculture and pesticide overuse towards conservation agriculture is while the causes of CCD become more defined, particularly because there are already other well-known environmental benefits.

Education

(47) ***Parent-Child Interaction Therapy (PCIT) for Families of Children with Autism Spectrum Disorders (ASD)***
Allison Patrick* and Sarah Vess, High Point University and Jon Campbell, University of Kentucky
Mentor: Sarah Vess, Specialized Curriculum

This research explores the efficacy of utilizing PCIT with children diagnosed with ASD. PCIT is an evidence-based therapy for children with externalizing disorders. The extension of the use of PCIT to families of children with ASD to increase positive parent-child interactions while maintaining the original two-phase protocol will be discussed.

English Writing

(48) ***Hidden Diversity on HPU's Campus: Recommendation Report***
Loren Bowser*, Lyndsey Clos*, and Sara Anderson*, High Point University
Mentor: Erin Trauth, English Writing

In this poster presentation, the presenters provide an overview of issues related to diversity on HPU's campus. Using primary and secondary research methods, the presenters explore diversity issues and make recommendations for improving diversity on campus. These results can lead to real and lasting change to HPU's diversity expansion.

(49) ***Technical Writing Revisions and Creation of Career Readiness Manual for Tiny House Community Development***
Josh Brown*, Sarah Seventko*, and Corina Woodson*, High Point University
Mentor: Erin Trauth, English Writing

The presenters provide results of a collaboration on a Career Readiness Manual between ENG 2135 and a local non-profit organization, Tiny House Community Development. The writers collaborate with the client to utilize technical writing techniques and communication strategies to provide the client with information on construction careers for future use.

(50) ***Recommendation Report: Plastic Usage in HPU Campus Dining***
Morgan Dunham*, Abby Ray*, and Amelia Spanier*, High Point University
Mentor: Erin Trauth, English Writing

In a poster presentation, the presenters showcase an overview of students' consensus regarding plastic usage in HPU dining. Using surveys and secondary research, the presenters will establish recommendations for the university to reduce plastic consumption in campus dining facilities. These results will illuminate student concerns and result in increased sustainability.

(51) ***A Recommendation Report: Alleviating Hunger in High Point, NC***
Piper Henderson*, Sarah Clark*, and Regina Pruden*, High Point University
Mentor: Erin Trauth, English Writing

In this presentation, the presenters highlight issues and give suggestions to alleviate hunger in the community. Students that attend High Point University are given a meal plan, with many going unused while the local community suffers. HPU could benefit from aiding the community by taking advantage of this opportunity.

(52) ***On-Campus Recycling and High Point University's Carbon Footprint: An Analysis and Recommendation Report***
Penn Cosler*, Emmitt Kussrow*, and Sabrina Schrader*, High Point University
Mentor: Erin Trauth, English Writing

In this presentation, the presenters review issues related to recycling efforts on High Point University's campus. Through primary and secondary research, the presenters analyze faults in the current recycling system and suggest improvements that, if implemented, could lead to improved sustainability and a reduced carbon footprint on a long-term scale.

(53) ***Revision of 2-Page Technical Brochure and Creation of New 2020 Campaign Brochure for Tiny House Community Development***
Sara Anderson*, Hannah Nemanic*, and Caroline Hamrick*, High Point University
Mentor: Erin Trauth, English Writing

The presenters, in this poster presentation, demonstrate technical writing skills gained from ENG: 2135 by revising professional documents for Tiny House Community Development. The presenters use design principles and technical writing essentials to create cohesive and informative brochures that provide THCD with professional documents ready for distribution.

(54) ***Recommendations for Revision of HPU's Campus Emergency Communications and Planning***
Philip Sherwin*, Josh Brown*, and Julia Dekovitch*, High Point University
Mentor: Erin Trauth, English Writing

This poster presentation provides an overview of issues related to emergency communications and planning on HPU's campus. Using both primary and secondary research methods, the presenters highlight communications problems and make recommendations for improving communication of procedures. These results can lead to effective changes for HPU's emergency-related plans.

(55) ***Revision of Tri-Fold Brochure and Creation of Individualized Program Brochures for Tiny House Community Development***
Jordan Wise*, Leanne Pagus*, and Cailyn Walter*, High Point University
Mentor: Erin Trauth, English Writing

The presenters display the product of a partnership between Tiny House Community Development (THCD) and ENG: 2135 (Technical Writing). Through collaboration with the client, the presenters develop their communication strategies by implementing various digital design programs applied to brochures. THCD utilizes these materials to market its organization in future partnerships.

Exercise Science

(56) ***Normotensive Habitual Caffeine Consumers Experience No Change in Blood Pressure or Pulse Wave Velocity Following the Combined Consumption of Caffeine and Dietary Nitrate***
Haley Fair*, Justin Waller, Kennedy Marshall, Valerie Olzer*, James Smoliga, and Colin Carriker, High Point University
Mentor: Colin Carriker, Exercise Science

Caffeine is a known vasoconstrictor, while dietary nitrate has vasodilatory effects. However, results from this study indicate that in habitual caffeine consumers, neither of the two supplements— whether consumed in combination with, or independently of, each other— significantly alters blood pressure, heart rate, or arterial stiffness.

(57) ***The Association Between Socioeconomic Status and Access to Physical Activity Related Environment in Children***
Gabrielle Ferrara* and Kerry Lee, High Point University
Mentor: Kimberly Reich, Exercise Science

Low socioeconomic status (SES) is associated with physical inactivity and obesity in children. Limited access to opportunities for physical activity may be a barrier to participation. The purpose of this study is to investigate the association between SES and aspects of the environment such as parks/green spaces and residential density.

(58) ***An Uphill Climb***
Monét Chauntell Gilmore*, High Point University
Mentor: Tony Kemerly, Exercise Science

This essay analyzes a black woman who enters the culture of fitness and/or sport and the judgement and critique society places on her physical body while comparing it to that of a white woman in an identical role. Using *The Hunger Games*, specifically the characters of mutations, this essay critiques society using historical context to prove the racial disparities of women in fitness and sport culture based on race.

(59) ***The Effects Uncarboxylated Osteocalcin on Myotube Metabolism and Insulin Sensitivity***
Kendra Hairston*, Hailey Parry, Madison Rivera, Roger Vaughan, and Kyle Sunderland, High Point University
Mentor: Roger Vaughan, Exercise Science

Osteocalcin (uOC) has been linked to increased mitochondrial biogenesis and insulin sensitivity. This work explored the metabolic effects of uOC on myotubes. uOC caused subtle changes in basal and peak mitochondrial metabolism and decreased insulin-mediated glucose uptake. Interestingly, uOC did not alter myotube insulin signaling with or without insulin resistance.

(60) ***Heat Acclimation Protects C2C12 Myotubes Against Subsequent Challenge with Hypoxia and LPS***
Garrett Hill*, Matthew Kuennen, and Roger Vaughan, High Point University
Mentor: Matthew Kuennen, Exercise Science

This study investigated HA cross tolerance in C2C12 myotubes. Heat and control myotubes were challenged with hypoxia or hypoxia + LPS for 2h. Cells were collected at +0h and +12h post. HA activates the heat shock response and causes lower inflammatory and apoptotic drive. This HA-mediated cross tolerance is not evident until +12h.

(61) ***Division I Women's Collegiate Volleyball: Do Jump Count, Anthropometrics, and Biomechanics have a Correlation with Knee Injury Acquired in a Season?***
Rachel Kordonowy*, Jenna Smith, Jeffrey Taylor, and Kevin Ford, High Point University
Mentor: Jeffrey Taylor, Physical Therapy

The purpose of this study was to analyze the correlation between various anthropometrics, biomechanics and jump count with the prevalence of knee injuries acquired over one season.
The results indicate that there is no correlation between the specific anthropometrics, biomechanics and jump count to knee injury incidence during one season.

(62) ***Validation of Garmin Watch Pulse Oximeter Sensor***
Claire J. Lauterbach*, Phebe Romano, and Dalaina Brimecombe, High Point University
Mentor: Matthew Kuennen, Exercise Science

Wearable "medical" technology is extremely popular. The Garmin Fenix® wristwatch purportedly provides non-invasive pulse oximetry measurements. The validity and reliability of the Garmin Fenix® will be assessed on forty resting persons in a normobaric hypoxia chamber at the following simulated altitudes: 12000ft, 10,000ft, 8000ft, 4000ft.

(63) ***Valine-Catabolite, 3-Hydroxyisobuterate Alters Myotube Metabolism and Reduces Insulin Signaling***
Emily Lyon*, Madison Rivera, Michele Johnson, Kyle Sunderland, and Roger Vaughan, High Point University
Mentor: Roger Vaughan, Exercise Science

Valine-catabolite 3-hydroxyisobuterate (3HIB) was shown to enhance skeletal muscle lipid uptake explaining the correlation between circulating BCAAs and insulin resistance. We examined the effect of 3HIB on myotube insulin signaling and metabolism. Our findings showed 3HIB may reduce insulin sensitivity in vitro, supporting a role of 3HIB in metabolic disease.

(64) ***The Decline in Excess Post-exercise Oxygen Consumption in Response to Dietary Nitrate is Eliminated with Concurrent Caffeine Intake***
Kennedy Marshall*, Justin Waller, Haley Fair, Valerie Olzer*, James Smoliga, Colin Carriker, High Point University
Mentor: Colin Carriker, Exercise Science

Dietary nitrate has shown to reduce VO_2 and caffeine intake increases exercise VO_2 and EPOC. A 3mg/kg dose of caffeine did not elevate exercise VO_2 or EPOC. Dietary nitrate reduced EPOC and elevated peripheral and aortic SBP in recovery. The decrease in EPOC was abolished when supplements were consumed together.

(65) ***Effect of Ankle Sprain History on Ankle Inversion Biomechanics in High School Football Players***
Jordan P. McClung*, Anh-Dung Nguyen, Audrey Westbrook, Jeffrey Taylor, Chris Bleakley, and Kevin Ford, High Point University
Mentor: Kevin Ford, Physical Therapy

Ankle sprains occur at a high rate in high school football. Three-dimensional analyses of football related tasks were performed in players with and without history of ankle sprain. Playing position influenced the magnitude of inversion load that football players with a history of ankle sprain exhibit.

(66) ***Effect of Valine on Myotube Metabolism and Insulin Sensitivity***
Madison Rivera*, Emily Lyon, Michele Johnson, Kyle Sunderland, and Roger Vaughan, High Point University
Mentor: Roger Vaughan, Exercise Science

Circulating levels of branched chain amino acids (like valine) correlate with severity of insulin resistance. This study investigated the effect of valine on muscle metabolism and insulin sensitivity. Valine suppressed myotube metabolism without altering related gene expression. Interestingly, valine partially rescued insulin signaling during mild, but not severe insulin resistance.

(67) ***Women's Collegiate Volleyball Players Exhibit Kinetic Asymmetries During Sport- Specific Tasks***
Jenna Smith*, Rachel Kordonowy, Kevin Ford, Audrey Westbrook, and Jeffery Taylor, High Point University
Mentor: Jeffrey Taylor, Physical Therapy

The purpose of this study was to analyze the asymmetrical differences in collegiate women's volleyball players by using Standard 3-D motion capture techniques. Results show that collegiate women's volleyball players exhibit significant asymmetry in the knee and the ankle during jumping and landing tasks.

(68) ***Validity and Reliability of a Markerless Motion Capture System***
Anika Weisbrod*, Richard Brindle, Eric Hegedus, and Kevin Ford, High Point University
Mentor: Kevin Ford, Physical Therapy

The purpose of this study was to determine validity and reliability of a clinic-based treadmill with integrated markerless motion capture. Hip and knee angles had moderate to high between-day reliability. Caution should be exhibited interpreting joint angles from this clinic-based motion system as disagreement existed between the gold standard measure.

Human Relations

(69) ***A Thematic Analysis and Investigation of Illness Survivorship Through Narrative***
Chloe Hasden*, High Point University
Mentor: Sarah Nielsen, Human Relations

Through qualitative data analysis, researchers examined personal narratives of 100+ cervical cancer survivors. Themes of survivorship were identified and led to the conclusion that narratives offer healing and teaching benefits for both the survivors and medical professionals, as well as the entire cancer community.

(70) ***Training the Type-A Personality***
Kathryn Kiefer*, High Point University
Mentor: Elizabeth Jeter, Human Relations

Research done developed insight regarding Type-A Personality Behavior (TAPB) and its effects on individuals. The work introduces TAPB, discusses results intra- and interpersonally, and its correlation to competition, role stress, and burnout. The deliverable was created to understand TAPB, develop awareness around TAPB, and present tools to decrease TAPB severity.

(71) ***The Academic Coloring Book: Investigating the Use of Creative Tools in a Professional Environment***
Alexandra Vaughn*, High Point University
Mentor: Elizabeth Jeter, Human Relations

Data collected from our "Academic Coloring Book" examined if the use of creative tools in a professional environment leads to more authentic responses in comparison to a traditional work survey. It also gave us data on how people interpreted the tools for potential use in future training and development programs.

Neuroscience

(72) ***Zebrafish Gene Analysis with Varying Nicotinic Concentrations***
James Dew* and Kristin Ackerman, High Point University
Mentor: Kristin Ackerman, Biology

Following the verification of zebrafish as a model for miscarriage, an analysis of nicotinic acetylcholine receptor expression in 24 hours post fertilization zebrafish was performed using polymerase chain reaction (PCR) after treatment of embryos with 1 nM-100 uM nicotine.

(73) ***Cannabidiol Has Not Demonstrated Neuroprotective Effects in Neuronal Cells Following Injury***
Jacob Dunn*, High Point University
Mentor: Michael Grider, Neuroscience

We investigated the ability of CBD to protect against a hypoxic insult in a pure neuronal population. Concurrent with a 24-hour injury, cells are exposed to varying concentrations of CBD, measuring viability using an MTT assay. We found that CBD did not protect against the injury and may be neurotoxic itself.

(74) ***The Effects of Sex on Alcohol Induced Astrocyte Activation***
Chris P. Trevisani*, Eva L. Greengrove, Scot McIntosh, and Alex Marshall, High Point University
Mentor: Alex Marshall, Basic Pharmaceutical Sciences

Excessive drinking impacts the neuroimmune system which leads to altered astrocyte-activation within the hippocampus. A non-dependent binge-drinking model was used to assess astrocytes between males and females. Previous reports indicate that females have a more active immune system, so we expect that females will have higher astrocyte-activation compared to males.

Nonprofit Studies

(75) ***An Analysis of Annual Reports for Community Foundations Located in Appalachia***
Carson Spering* and Christine Cugliari, High Point University
Mentor: Christine Cugliari, Nonprofit Leadership and Management

The Appalachian Region is an area of economic contrasts. The purpose of this study is to develop an understanding of counties' economic status on the quality of the region's 81 community foundations' grant making and annual reports.

Pharmacy

(76) ***Effects of Ethanol on Glutamate Levels in GFAP DREDD+ Transgenic Mice***
Ambryia Davis* and Alex Marshall, High Point University
Mentor: Alex Marshall, Basic Pharmaceutical Sciences

Using transgenic mice, we are interested in testing glutamate levels after ethanol exposure. Specifically, the GFAP-DREADD+ mice have an artificial receptor that is expressed in astrocytes. Astrocytes are known to regulate glutamatergic tone which is dysregulated by ethanol. This study seeks to determine if GFAP-DREADD activation is altered by ethanol.

(77) ***The Effects of Non-Dependent Binge Drinking on Astrocyte Variability Based on Sex***
Eva Greengrove*, Christopher Trevisani, Scot McIntosh, and Alex Marshall, High Point University
Mentor: Alex Marshall, Basic Pharmaceutical Sciences

Excessive bouts of episodic binge drinking lead to neuroimmune responses that alter astrocyte functioning, primarily within the amygdala. Following a non-dependent binge drinking model, previous results indicate dysregulation in astrocyte activity. This study seeks to determine whether the astrocyte response is different in males and females.

(78) ***Investigating the Role of G Protein Beta and Gamma Subunits in Hepatic Glucose Production***
Victoria MacQueen* and Sydney Sanders*, High Point University
Mentor: Sally McMillin, Basic Pharmaceutical Sciences

GPCRs regulate gluconeogenesis by signaling through G proteins, which consist of alpha, beta, and gamma subunits. The actions of G alpha are well characterized, but little is known about beta and gamma. This project is designed to elucidate the role of G beta and gamma subunits in hepatic glucose production.

(79) ***Characterization of Fenofibrate Self-Emulsifying Drug Delivery Systems***
Courtney McCorkle* and Bradley Clark, High Point University
Mentor: Bradley Clark, Basic Pharmaceutical Sciences

A self-emulsifying lipid delivery system of fenofibrate produces oil-in-water emulsions upon contact with aqueous gastric and intestinal fluids that increases the surface area for drug release and enhances absorption of the poorly soluble drug. This study aimed to determine the best spontaneous emulsifying formulation using drug dissolution and HPLC methods.

Physical Therapy

(80) ***The Influence of Predictability on Turning Styles***
Brooke Guthrie* and Dora Gosselin, High Point University
Mentor: Dora Gosselin, Physical Therapy

This study assessed if the predictability of a walking route had an influence on typically developing childrens' style of turning. The results of this study can further be compared to how children with underdeveloped gait patterns respond to direction change under those conditions.

Physics

(81) ***The Effects of Surface Patterning on the Growth of Bacteria***
Sam Mycroft*, High Point University
Mentor: Briana Fiser, Physics

We are investigating the effects of micron-sized surface patterns on the growth of bacteria. These patterns could be implemented in surgical implants to reduce the risk of bacterial infection. We present our process for creating these patterned surfaces and discuss future work to measure bacterial growth on them.

(82) ***Evryscope Photometry of the New Hot Subdwarf Reflection Effect Binary EC 01578-1743***
Stephen Walser*, Kyle Corcoran, Brad Barlow, and Sam Mycroft, High Point University
Mentor: Brad Barlow, Physics

EC 01578-1743 is a new hot subdwarf binary discovered by the "wide-seer" Evryscope array on Cerro Tololo in Chile. Here we present our photometric and spectroscopic analyses and argue that the companion is a red dwarf, and one with higher mass than usual for HW Vir-type binaries.

Psychology

(83) ***Establishing the Relationship Between Political View, Big Five Personality Traits and Dark Triad Traits***
Skylar Altimari*, High Point University
Mentor: Jessica Swanson, Criminal Justice
Mentor: Deborah Danzis, Psychology

Recent events such as the "Unite the Right" rally in Charlottesville have renewed interest in political identity. This correlational study examined the relationship between political view, Big Five personality traits, and dark personality traits as represented by the Dark Triad. Extremity of political view was also a core focus.

(84) ***Romantic Attraction: Personality Traits Most Desired by Narcissists?***
Janae Baiamonte*, High Point University
Mentor: Kimberly Wear, Psychology

The current study assessed the correlations between scores on the Narcissistic Personality Inventory-40 (NIP; Raskin & Terry, 1988) and attraction ratings of hypothetical partners. Results indicate both individuals who scored high and low on the NPI found the same three personality traits attractive, thus not supporting the self-orientation model.

(85) ***Calm in the Face of Uncertainty: The Relationship Between Mindfulness and Locus of Control***
Alec Campbell*, High Point University
Mentor: Deborah Danzis, Psychology

This study examined the relationship between Mindfulness and aspects of Locus of Control. There existed a significant negative correlation between Mindfulness and Locus of Control Chance (a subset of Locus of Control). Regression analysis revealed Mindfulness and Neuroticism were significant predictors of Locus of Control Chance.

(86) ***The Impact of Injury on Eating Attitudes & Behaviors in College Athletes***
Meredith Chapman* and Christopher Lootens, High Point University
Mentor: Christopher Lootens, Psychology

Research indicates that college athletes show heightened risk for disordered eating, a risk that may increase further among injured athletes specifically. This study expands on previous research by examining the roles that perfectionism, appearance orientation, and injury play in problematic eating attitudes and behaviors in a sample of college athletes.

(87) ***Exploring the Role of Personality and Helicopter Parenting in Predicting Academic and Social Self-Efficacy in College Students***
Julia Corrigan*, Erika Tan, and Julie Burkett, High Point University
Mentor: Kirsten Li-Barber, Psychology

The relationship between helicopter parenting behaviors, student personality and academic and social self-efficacy were examined. Hierarchical regression analyses indicated that personality, but not helicopter parenting, significantly predicted changes in both self-efficacy scores.

(88) ***Comparing Stigma Toward Behaviors of Psychological Disorders and Disorder Names***
Megan Deiling*, Hannah Hicks*, and Sarah Ross, High Point University
Mentor: Sarah Ross, Psychology

In a college student population, this study compared stigma toward psychological disorder names to stigma toward the DSM-V symptoms associated with a disorder. Results indicate that there is significantly more stigma towards the symptoms of a disorder compared the name for three of the five psychological disorders examined.

(89) ***Personality, Parenting Style, and Workplace Expectations***
Gerard Dulac* and Sarah Nielsen, High Point University
Mentor: Sarah Nielsen, Human Relations

Helicopter parenting has been shown to affect a variety of psychological attitudes. This project sought to examine the impact of helicopter parenting and college students' personality (nonclinical narcissism, specifically) on several career and workplace expectations. Results showed that narcissism impacted career expectations, but narcissism and helicopter parenting appear unrelated.

(90) ***The Production Effect and Metacognitive Monitoring in Preschoolers***
Hannah Hagans*, High Point University
Mentor: Stacy Lipowski, Psychology

The production effect is the phenomenon that words spoken aloud are better remembered than words studied silently. The primary goals of this study were to examine whether this extends to preschoolers and whether production improves metacognitive monitoring. Preschoolers studied pictures and made judgments about their ability to remember them later.

(91) ***Comparing Outcomes of an Online versus In-Person College Student Suicide Prevention Program***
Meghan Lemmo*, Janae Baiamonte, Sarah Ross, High Point University
Mentor: Sarah Ross, Psychology

The current study compared outcomes from different formats, online and in-person, of a suicide prevention gatekeeper training program for college students. Preliminary results indicate that in-person training reduces feelings of helplessness related to intervening with a suicidal peer significantly more than the online training.

(92) ***Evaluating the Effects of Obesity on Cognitive Functioning in a Sample of Multiple Sclerosis Patients***
Cameron Newman*, Christopher Lootens, High Point University, and Adam McDermott, Wake Forest Baptist Health
Mentor: Christopher Lootens, Psychology

Obesity has been linked to increased cognitive issues in otherwise healthy individuals (Fergenbaum et al., 2009). This present study examines whether obesity is associated with more cognitive dysfunction in those with Multiple Sclerosis by comparing scores on tasks measuring memory, processing speed, and executive functions; areas commonly affected in MS.

(93) ***"What's Under Your Mattress": Sales Associates' Views of Consumer Understanding***
Sara Seaford*, High Point University
Mentor: Joanne Altman, URCW

High Point University, in collaboration with a mattress association, created an online survey to evaluate how relevant the association's promotion "What's under the mattress" is to their industry. The survey assessed sales associates' impressions of the consumer's knowledge and interest in bed support systems.

(94) ***Dark Personalities, Self-Adornment, and Risky Sexual Behavior: How Do They Correlate?***
Raniya Shakir*, High Point University
Mentor: Deborah Danzis, Psychology

This study examines the relationship between dark personality constructs and deviant sexual behaviors. Many relationships form on first impressions; identifying manipulative tendencies at zero-acquaintance will help avoid risky situations. Self-report scales were collected from students to examine the relationship between narcissism, psychopathy, self-adornment, and risky sexual behavior.

(95) ***Misophonia Severity in Relation to Age, Anxiety/Depression Symptoms, and Life Satisfaction***
Samantha Stevens*, High Point University
Mentor: Deborah Danzis, Psychology

Age, anxiety and depression symptoms, and life satisfaction were assessed to investigate the relationship with misophonia severity. Current age, reported age in which misophonia symptoms began, and life satisfaction were all negatively correlated with misophonia severity. Anxiety and depression symptoms were positively correlated with misophonia severity.

(96) ***Mass Media Consumption: An Analysis of Binge-Watching and its Psychological Effects***
Erika Tan*, High Point University
Mentor: Kimberly Wear, Psychology

A new phenomenon, binge-watching, has emerged as pertinent to one's life, even leading to more addictive behaviors. The current study assessed binge-watching behavior and found it was associated with higher levels of anxiety and stress, but lower levels of depression. Binge-watching behavior was also associated with higher levels of self-esteem.

"Doing research with Dr. Vaughan in the wet lab has given me the opportunity to learn skills, practice procedures, and work with state of the art equipment. I even have my name on some published papers! This experience has not only been educational, but also enjoyable, as I have traveled to conferences with peers to present our work."

- Emily Lyon

TECH & DESIGN EXHIBIT

Slane Basketball Court • 3:30pm-5:00pm

(97) ***Building a Virtual Reality Headset***
Ryan Felton*, Ben Rolison*, Kevin Rubin*, Travis Stop*, High Point University
Mentor: Roger Shore, Computer Science

Virtual Reality is a rapidly evolving industry. To better understand this technology, we created our own virtual reality headsets. We assembled the devices and programmed a simple VR application to display on them. We will be discussing the lessons learned over the course of creating the device.

(98) ***Prisom Break***
Riley Greer*, Eleonora Fallabrino*, Frankie DiMatteo*, and Shaun Stevenson*, High Point University
Mentor: Brian Heagney, Games and Interactive Media Design

Prisom Break is a 3rd person game where you play a rectangular prism named Ricky Tengul. Join Ricky in his harrowing escape from prison while he dodges various traps and reunites with his love Sophera.

(99) ***Dungeon in the Dark***
Sean Loftus*, Preston Cox*, and Kevin Smith, High Point University
Mentor: Brian Heagney, Games and Interactive Media Design

Dungeon in the Dark is a virtual reality game based upon the popular role playing game dungeons and dragons. Explore an intricate dungeon, fight dangerous monsters, and rebuild an abandoned town in this unique VR experience.

(100) ***Representing Autism Spectrum Disorder in Video Games: "Ciel"***
Alexandra Vaughn, Alison Ho*, Chad Thomas*, Shane Berthoud*, and Ben Rolison*, High Point University
Mentor: Brian Heagney, Games and Interactive Media Design

When constructing a game around a mental disorder, portraying narrative solely through player interaction, level design can have a meaningful impact on the player experience. Individuals with Autism Spectrum Disorder rarely find accurate representation in video games; we sought to change this with "*Ciel*".

(101) ***Urban Recycling Station: Adaptive Reuse of British K2 Phone Box***
Morgan Sandberg*, High Point University
Mentor: Adrian Boggs, Interior Design

The project's goal was to design an adaptive reuse of the British K2 phone box. The design objective was to create an intuitive and easy-to-use interaction experience that would simplify and encourage the practice of post-consumer recycling in the built environment on the individual-user (street) level.

STUDENT INDEX

MENTOR INDEX

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Mentorship Matters.