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## 2019

**Undergraduate Research and Creative Arts Symposium**

**New Mexico State University**

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The Undergraduate Research and Creative Arts Symposium, now in its twenty-fourth year, is the longest-running student symposium at New Mexico State University. Since 1996, more than 2,000 students have presented their work at the symposium. Many of these students have gone on to graduate school, law school, and medical school, and a few have returned to NMSU as professors.

URCAS is intended to recognize outstanding undergraduate research and creative projects and the faculty who have mentored them. It is also meant to show off the work of creative undergraduate students to the university and the community. And, of course, presenting at the symposium gives our students valuable professional experience.

The symposium is an annual celebration of undergraduate creativity in all fields. Represented here are some of the most advanced and creative projects presently being undertaken at NMSU. Many of the students presenting today are completing Honors Thesis/Capstone, while others have worked with mentors in laboratories and other research and arts settings through the MARC, AMP, HHMI, BRAiN, CAMP, and other mentoring programs.

Congratulations to these outstanding students and their faculty mentors!

Dr. Miriam Chaiken, Dean, Honors Colleg
Dr. Michael Johnson, Director, MARC Program
Dr. Barbara Lyons, Director, BP-ENDURE (BRAIN) Program
Dr. Lakshmi Reddi, Dean, College of Engineering and Director, New Mexico and Alliance for Minority Participation (AMP)
Dr. Michele Shuster, Howard Hughes Medical Institute Program at NMSU (HHMI)
Dr. Cynthia Bejarano, College Assistance Migrant Program (CAMP)
Dr. Nancy McMillan, Director, Discovery Scholars (DS)
Dr. Luis Cifuentes, Vice President for Research
Dr. Enrico Pontelli, Dean, College of Arts and Sciences
Dr. Rolando Flores, Dean, College of Agricultural, Consumer and Environmental Sciences
Dr. Susan Brown, Interim Dean, College of Education
Dr. James Hoffman, Dean, College of Business
WILLIAM CONROY HONORS COLLEGE (WCHC)
The Honors College provides qualified undergraduate students with opportunities to broaden and enrich their academic programs. In small classes taught by master teachers, honors students engage in lively discussion and collaborative investigation of interdisciplinary topics. Through the Honors Thesis, students undertake original research in humanities, science, engineering, agriculture, business, education, and the arts under close supervision by faculty mentors. Many students prepare for their thesis by doing an internship in a scientific laboratory or undertake independent research under the supervision of a faculty mentor.

NEW MEXICO ALLIANCE FOR MINORITY PARTICIPATION (AMP)
The New Mexico Alliance for Minority Participation, funded by the National Science Foundation, is a partnership of New Mexico’s six four-year universities and twenty public two-year community colleges. The goal of the Alliance is to increase the state’s graduation rate of ethnic minority students with baccalaureate degrees in science, mathematics, engineering, and technology.

HOWARD HUGHES MEDICAL INSTITUTE PROGRAM AT NMSU (HHMI)
The NMSU Howard Hughes Medical Institute Program (HHMI) broadens access to science by providing students with opportunities to be successful in science through outreach to high schools in under-served communities, through the enhancement of undergraduate biology courses, by providing students with undergraduate research opportunities, and by providing the next generation of faculty with training in Scientific Teaching.

MAXIMIZING ACCESS TO RESEARCH CAREERS (MARC)
The MARC Program (formerly Minority Access to Research Careers) is sponsored by the National Institute of General Medical Sciences within the National Institutes of Health. The goals of the program are: to assist selected undergraduate students who demonstrate an interest in and the potential for research in the biomedical sciences to continue their education beyond the baccalaureate degree; to provide a research experience sufficient to result in presentation of research data at professional meetings; to facilitate an 8-10 week summer research experience off-campus; to improve academic performance; to provide funds for travel to professional meetings; and to assist students in entering graduate and professional programs. All past NMSU-MARC students have received bachelor’s degrees and more than 75% have gone on to graduate programs.

BUILDING RESEARCH ACHIEVEMENT IN NEUROSCIENCE (BRAIN)
The NMSU Building Research Achievement in Neuroscience (BRAIN) Program was founded in 2010 with a grant from the NIH BP-ENDURE initiative. The BRAIN partnership between UC Denver and NMSU faculty aspires to broaden participation among the doctoral (PhD) ranks of neuroscience and biobehavioral scientists by providing research and professional development opportunities for undergraduate juniors and seniors. BRAIN Scholars participate in academic year research at NMSU and a summer internship at the UC Denver Medical Campus. Enhancement activities include a yearly Honors seminar experience and attendance at national conferences such as SFN and ABRCMS.
**COLLEGE ASSISTANCE MIGRANT PROGRAM (CAMP)**

The NMSU College Assistance Migrant Program (CAMP) is a federally-funded program to help migrant or seasonal farm worker students attend college. Our program’s goal is to ensure that each CAMP student graduates from NMSU with a Bachelor's degree. The program offers the first line of support for students to succeed in their first/freshmen year at NMSU and also provides many retention resources to help students persist to graduation. The program has been in existence since 2002, and will continue until 2022.

**DISCOVERY SCHOLARS (DSP)**

The Discovery Scholars Program (DSP) is a college wide interdisciplinary program which was created in Fall, 2014. DSP is a mentorship program where undergraduate students engage in research/creative activity with faculty mentors. The goal of the program is to support student research/creative activity and encourage students to apply for and successfully complete a Master's degree, perhaps even a Ph.D. Through the program students are challenged to think through research questions and/or creative activities, find solutions or ways to answer questions or implement creative activities, and then write up and present the outcome(s) of their work.
“Scattered” choreography by Debra Knapp

“RA” choreography by Elijah Gibson
PREVIOUS SYMPOSIUM SPEAKERS

2018
Fable Jazz Trio
(under the direction of Dr. Pancho Romero)

2017
Bill McCamley
State Representative

2015
Dr. Debra Knapp & Prof. Frank “Paco” Gilpin
Sol y Arena Dance Company

2015
Dr. William Eamon, Emeritus
Professor of History

2014
Dr. Sean Rogers
Department of Management

2013
Dr. Collin Payne
Assistant Professor of Marketing

2012
Dr. Paul Bosland
Regents Professor of Horticulture and Director of the Chile Pepper Institute

2011
Dr. Kenny Stevens
Associate Professor of Engineering Technology

2010
Dr. Kenneth Hammond
Professor of History

2009
Dr. Connie Falk
Professor, Agricultural Economics and Business

2008
Salim Bawazir, Ph.D
Associate Professor of Biology

2005
Prof. David Taylor
Department of Art

2004
Dr. Robert Armstrong
Regents Professor of Physics

2003
Dr. Ann Hales
Professor, Department of Nursing

2002
Dr. Steven Stochaj
Associate Professor, Kilpsch School of Electrical and Computer Engineering

2001
Robert Marquez
Doctoral Student, Chemistry

2000
Dr. Reta Beebe
Professor, Department of Astronomy

1999
Dr. Rudolfo Chavez Chavez
Regents Professor, Department of Curriculum and Instruction

1998
Kathleene West
Professor, Department of English

1997
Dr. Cookie White Stephan
Professor, Department of Sociology

1996
Dr. Champa Sengupta-Gopalan
Professor, Department of Agronomy and Horticulture
SCHEDULE OF EVENTS

8:30 AM REFRESHMENTS & WELCOMING REMARKS
Dona Ana Room
Dr. April Mason, Interim Provost
Office of the Provost

9:00 AM - 12:00 PM POSTER SESSIONS
West Ballroom 3rd Floor

9:00 AM - 10:00 AM PAPER SESSIONS
SESSION 1A
Col. Fountain Room 324
New films from the Creative Media Institute Program

SESSION 1B
Socorro Room 226
Panel Discussions:
Intersectionality and Ethnicity I

SESSION 1C
Rio Grande Rm. 228
Innovations in Biological Research I

10:15 AM - 11:15 AM
SESSION 2A
Col. Fountain Room 324
Creative Arts Projects

SESSION 2B
Socorro Room 226
Panel Discussions:
Intersectionality and Ethnicity II

SESSION 2C
Rio Grande Rm. 228
Innovations in Biological Research II

11:30 AM - 12:30 PM
SESSION 3A
Col. Fountain Room 324
Research in the Social and Behavioral Sciences

SESSION 3B
Socorro Room 226
Panel Discussions:
Intersectionality and Ethnicity III

SESSION 3C
Rio Grande Rm. 228
Issues in Conservation and Environmental Science

12:30 PM - 1:30 PM LUNCHEON
Corbett Center East Ballroom
Luncheon Event:
“Scattered” choreographed by Debra Knapp
“RA” choreographed by Elijah Gibson
LUNCHEON

12:30pm - 1:30pm
Corbett Center East Ballroom

Luncheon Event:

“Scattered” choreography by Debra Knapp

“RA” choreography by Elijah Gibon
Each year the Advanced Graphic Design class taught by Professor Brita D’ Agostino is summoned to design the URCAS logo, and the winning logo goes on to be incorporated in branded marketing materials. The students in the class were divided into teams and each student created and pitched a logo. This year, the students that participated in the URCAS logo design challenge included Madison Chagnon, Anthony Tekala, Alexxis Ortiz, and Angelica Jones. The winning URCAS 2019 logo design belongs to Madison Chagnon, with assistance from Anthony Tekala. The logo represents the many ideas that are brought into the URCAS competition and how they represent a larger group, NMSU.

Honorable mentions are awarded to the following students: Anthony Tekala, Alexxis Ortiz, and Angelica Jones. Angelica Jones also created the final poster design. Angelica is a Senior and will graduate in May with her Bachelors in Fine Art Emphasis in Painting. Alexxis Ortiz created the final program cover design and will graduate with her Bachelors in Fine Art Emphasis in Graphic Design in May of 2020. Anthony Tekala created impressive designs for the logo, poster, & program and contributed to the program design layout. Anthony is a Senior majoring in Studio Art and will graduate in May. Madison Chagnon created the winning logo concept and was appointed art director & team leader. She is a Senior and will graduate in May with her Bachelors in Studio Art with a focus in Graphic Design.

The URCAS Design Teams collaborated throughout the process of conceptualizing, organizing, & designing the unique URCAS 2019 logo & brand.
PAPER SESSIONS

9:00 AM - 10:00 AM

SESSION 1 A
Col. Fountain Room 324
New films from the Creative Media Institute Program

SESSION 1 B
Socorro Room 226
Panel Discussions:
Intersectionality and Ethnicity I

SESSION 1 C
Rio Grande Room 228
Innovations in Biological Research

10:15 AM - 11:15 AM

SESSION 2 A
Col. Fountain Room 324
Creative Arts Projects

SESSION 2 B
Socorro Room 226
Panel Discussions:
Intersectionality and Ethnicity II

SESSION 2 C
Rio Grande Room 228
Innovations in Biological Research

11:30 AM - 12:30 PM

SESSION 3 A
Col. Fountain Room 324
Research in the Social and Behavioral Sciences

SESSION 3 B
Socorro Room 226
Panel Discussions:
Intersectionality and Ethnicity III

SESSION 3 C
Rio Grande Room 228
Issue in Conservation and Environment Science
SESSION 1
9:00AM - 10:00AM

1A: NEW FILMS FROM THE CREATIVE MEDIA INSTITUTE PROGRAM
Col. Fountain Room 324
Moderator: Dr. Miriam Chaiken, Honors College

AMANDA VILLALOBOS
“Grief, and its Agonizing Stages” - a short film
Major: Digital Filmmaking
Faculty Advisor: Prof. Julian Alexander, Creative Media Institute
Honors Capstone

ALANA MURPHY
“Labeled” – a short film
Major: Digital Filmmaking
Faculty Advisor: Prof. Julian Alexander, Creative Media Institute
Discovery Scholars

RAQUEL MADRIGAL
“The Femme and Failure: Pink Queerness”
Major: Studio Art
Faculty Advisor: Prof. Rachel Stevens, Art
Honors Capstone
1B: PANEL DISCUSSIONS: INTERSECTIONALITY AND ETHNICITY I
Socorro Room 226
Moderator: Efren Miranda Zepeda, Curriculum and Instruction

ALMA SANDOVAL, EFRAIN GARCIA, YATZIL MARRERO
“The Role of a Teacher in Making a Difference in our Borderland Community”
Major: Early Childhood Education
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction
College of Education

JOSEPH BAUMGARN, BRIANNA COVARRUBIAS, DAVID GURULE, JENNIFER MORALES
“Discrimination in Sports”
Major: Secondary Education
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction
College of Education

1C: INNOVATIONS IN BIOLOGICAL RESEARCH Rio Grande Room 228
Moderator: Prof. Frank Gilpin, Kinesiology and Dance

KRYS TAL VARGAS
“In Search of Nutraceuticals in Capsicum Species”
Major: Horticulture
Faculty Advisor: Dr. Ivette Guzman, Plant and Environmental Sciences
MARC

RAWAN ELAKSHER
“Characterization of two Highly Expressed Genes Potentially Involved in Chemotaxis”
Major: Genetics and Biotechnology
Faculty Advisor: Dr. Paola Mera, Chemistry and Biochemistry
MARC

LIZET MARTINEZ
“Transformation vs. Conjugation: Developing a Superior Genetic Tool for the Vibrio fischeri genetic engineering tool-box”
Major: Microbiology
Faculty Advisor: Dr. Michelle Nishiguchi, Biology
MARC

KARLA LOPEZ
“You Talkin to Me?” Interspecies communication fosters collaboration between closely related symbionts in the sepiolid squid-Vibrio mutualism
Major: Genetics
Faculty Advisor: Dr. Michele Nishiguchi, Biology
MARC
SESSION 2
10:15AM - 11:15AM

2A: CREATIVE ARTS PROJECTS
Col. Fountain Room 324
Moderator: Dr. Miriam Chaiken, Honors College

DANIEL VELASCO
“Who Really Killed Martin Luther King Jr.? His family says the wrong man went to prison”- Poetry Reading
Major: Kinesiology
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction
Honors College

MADELEINE WOODWARD
“Prima Donna” (screenplay)
Major: Digital Filmmaking
Faculty Advisor: Prof. Amy Lanasa, Creative Media
College of Arts & Sciences

NOELIA DE LA ROSA AND MARIELENA DE LA ROSA
“Detangling”
Major: Dance
Faculty Advisor: Prof. Jermey Edmonson, Dance
College of Education
PANEL DISCUSSIONS: INTERSECTIONALITY AND ETHNICITY II
Socorro Room 226
Moderator: Dr. Judith Flores Carmona, Curriculum and Instruction

ESMERALDA BRAVO, YASMINE CONTRERAS, GABRIELLA RAMIREZ, YVETTE SANDOVAL
“Importance of Critical Family History”
Major: Early Childhood Education
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction
College of Education

ADRIENNE LEBLANC, CRISTINA COLLAROS, JAYDEN RAHAL, ARACELI WILLS
“Mental Health and Education System”
Major: Family and Child Sciences
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction
College of Education

INNOVATIONS IN BIOLOGICAL RESEARCH II
Rio Grande Room 228
Moderator: Prof. Elvira Masson, History

KARLY MILLER
“Effects of Phospho-Tau Mutations on Neuron Survival After Oxidative Stress Treatment”
Major: Genetics & Biotechnology
Faculty Advisor: Dr. C. Brad Shuster, Biology
BP-ENDURE (BRAIN)

TRUNG NGUYEN
“Biophysical Characterization of DNAJB1-PRKACA in Fibrolamellar Hepatocellular Carcinoma”
Major: Genetics and Biotechnology
Faculty Advisor: Dr. Barbara Lyons, Chemistry and Biochemistry
HHMI

PRISILA RAMIREZ
“Assessing the Role of DNA-PKcs in R-loop Formation”
Major: Genetics and Biotechnology
Faculty Advisor: Dr. Amanda Ashley, Chemistry & Biochemistry
HHMI

ISABELLA TERRAZAS
“Cortical Granule Motility in Response to Hormone Stimulation During Sea Star Melosis”
Major: Microbiology
Faculty Advisor: Dr. Charles Shuster, Biology
AMP
SESSION 3
11:30AM - 12:30PM

3A: RESEARCH IN THE SOCIAL AND BEHAVIORAL SCIENCES
Col. Fountain Rm. 324
Moderator: Dr. Miriam Chaiken, Honors College

FAY YURWIT
“Migration and Integration in Munich”
Major: Government and German
Faculty Advisor: Dr. Sabine Hirshauer, Government Discovery Scholars

LORISSA HUMBLE
“Community on Campus and Sports Team Identification”
Major: Sociology and Computer Sciences
Faculty Advisor: Dr. Stephanie Arnett, Sociology
College of Arts & Sciences

HALEY STEWART
“Federal Indian Land Policy and the Tribes of New Mexico”
Major: Government and Criminal Justice
Faculty Advisor: Dr. Thaddieus Conner, Government Honors Capstone
3B: PANEL DISCUSSIONS: INTERSECTIONALITY AND ETHNICITY III
Socorro Room 226
Moderator: Cynthia Wise, Curriculum and Instruction

AUDREY CHRISTENSEN, DALLAS CORDERO, BRANDY TORRES, DANIELA VARGAS

“Media Analysis”
Major: Elementary Education
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction
College of Education

CYNTHIA TELLEZ, MABEL CUEVAS, SAVANNAH JIMENEZ, NAYELI REYES

“The Education Pipeline and the Leaks that Affect our Latinx Community”
Major: Counseling and Community Psychology
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction
College of Education

3C: ISSUES IN CONSERVATION AND ENVIRONMENTAL SCIENCE
Rio Grande Room (228)
Moderator: Dr. Tim Ketelaar, Psychology

CARLOS I. CAMPOS
“Genetic Structure and Diversity in Wild and Captive Populations of the Critically Endangered Blue-Throated Macaw”
Major: Biology
Faculty Advisor: Dr. Timothy F. Wright, Biology
HHMI

ANTHONY CORNWELL
“Phycoremediation of Clofibric Acid: An Emerging Environmental Concern”
Major: Biology
Faculty Advisor: Dr. Omar Holguin, Environmental Science
MARC

ESaida LOPEZ
“Remediation of Soil and Water at Legacy Uranium Mining Sites”
Major: Chemical Engineering
Faculty Advisor: Dr. Catherine Brewer, Chemical Engineering
MARC
SIDNEY AGUILERA
“Evaluation of an acoustic focusing flow cytometer”
Major: Chemical Engineering
Faculty Advisor: Dr. Jessica Houston, Chemical Engineering

DANIEL Q. AGUIRRE
“In-Silico Dual Specificity Protein Phosphatase Comparisons for Differentiation”
Major: Chemical Engineering/Chemistry
Faculty Advisor: Dr. Marat Talipov, Chemistry and Biochemistry

AMIE AMIOTTE, ASIA LA TORRA, ROGER MARQUEZ
“Dawgz”
Major: Psychology
Faculty Advisor: Dr. Marlena Fraune, Psychology

APRILINA ARAIZA
“Synthesis of FTY720 Compounds for Neurotrophic Factor Expression to protect Oligodendroglia against hydrogen peroxide Mediated Oxidative Stress”
Major: Biochemistry
Faculty Advisor: Dr. Ramesh Chinnasamy, Chemistry and Biochemistry

ETHAN BILLINGSLEY
“Design and Fabrication of a Gannet-Inspired Aerial-Aquatic Drone”
Major: Mechanical Engineering
Faculty Advisory: Dr. Abdessattar Abdelkefi, Mechanical and Aerospace Engineering

VALERIE BREWER
“Effects of Urbanization on extra-pair paternity in the song sparrow”
Major: Conservation Ecology
Faculty Advisor: Dr. Karen Mabry, Biology

PASCUAL CAMACHO
“Design and Construction of a prototype for a Bio-Inspired Pile Foundation System”
Major: Civil Engineering
Faculty Advisor: Paola Bandini, Civil Engineering

LAPORSHA CAMPBELL
“Characterization of two highly expressed genes potentially involved in chemotaxis”
Major: Microbiology
Faculty Advisor: Dr. Paola Mera, Chemistry and Biochemistry

ADAN CAMPOS
“Conceptual design, manufacturing, and experimental testing of a carangiform fish-like robot using cable-driven actuators”
Major: Mechanical Engineering
Faculty Advisor: Dr. Abdessattar Abdelkefi, Mechanical and Aerospace Engineering

MARIA CARMONA - MONTAÑO
“Qualitative Phytochemical and Antioxidant Analysis of a Tropical Plant in Search of Cancer Cure”
Major: Chemical Engineering and Biology with a Biomedical Engineering Minor
Faculty Advisor: Dr. Francisco Omar Holguin, Plant and Environmental Science

LORENA CASIANO, TOTTEONA GRAY, ALEXIS TORRES, FRANCHESCA ORTEGA
“The Synergitic Effect of Capsaicin and Dihydrocapsaicin for the Treatment of Glioblastoma”
Major: Genetics and Biotechnology
Faculty Advisor: Dr. Elba Serrano, Biology
AMP, BP-ENDURE (BRAIN)

EDGARDO CAZARES, MARIELA MUNOZ
“Medicinal Compounds and Nutritious Value in the Onion from the Allium Family”
Major: Civil Engineering
Faculty Advisor: Dr. Laura Rodriguez Uribe, Plant and Environmental Sciences
CAMP

FRANCISCO CHACON
“New Mexico’s Superfood: Chile Peppers”
Major: Genetics & Biotechnology and Biology
Faculty Advisor: Dr. Ivette Guzman, Plant and Environmental Sciences
MARC

VALENCIA CHAVEZ
“Lights Shines More in the Darkness”
Major: Kinesiology
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction Honors College

SEAN CHRISTESON, JINAN SKAFI
“Cross-Cultural Preferences for Group-Based Language”
Major: Psychology
Faculty Advisor: Dr. Marlena Fraune, Psychology
Discovery Scholars

KEVIN CISNEROS
“Differences in Energy Production Between Skeletal Muscle and Electric Organ Sternopygus macrurus”
Major: Biology
Faculty Advisor: Dr. Graciela Unguez, Biology
HHMI

NICOLAS DELOVATO
“Enhancement of Microchannel Heat Transfer Using Liquid Metal and PCM Slurries”
Major: Mechanical Engineering
Faculty Advisor: Dr. Sarasda Kuravi, Mechanical and Aerospace Engineering
USDA I-DISCOVER

JORDYN DOBSON
“NFkB Activation in ovine placenta during Early Gestation”
Major: Biochemistry
Faculty Advisor: Dr. Ryan Ashley, Animal and Range Sciences
MARC

SIMON DRIVER, KEVIN LIAW, MARLENA FRAUNE, ROCIO GUZMAN, TAMMY TSAI, TYLER CHATTERTON
“Impact of Robot Sociality on Human/Robot Team Interactions”
Major: Biochemistry
Faculty Advisor: Dr. Marlena Fraune, Psychology Department
College of Arts & Sciences

MARTIN DURON, ISREAL MONSIVAIZ
“Phenolic Compound in Different Species of Cinnamon and Their Antibacterial Capabilities”
Major: Aerospace Engineering
Faculty Advisor: Dr. Laura Rodriguez Uribe, Plant and Environmental Sciences
CAMP
LEONARDO ESCAMILLA III
“Design and Fabrication of an Albatross inspired Tilt-wing Drone System”
Major: Mechanical/Electrical Engineering
Faculty Advisor: Dr. Abdessattar Abdelkefi, Engineering
AMP

MARIELA ESTRADA
“Comparing rhizosphere microbial communities in Creosote, Tarbush, Mesquite and Mariola”
Major: Range Science
Faculty Advisor: Dr. Nicole Pietrasiak, Plant & Environmental Science
SWNRCT, College of ACES

BRIAN FARNELL, MANUEL FRANCO
“Music Learning Through App Technology”
Major: Psychology
Faculty Advisor: Dr. Marlena Fraune, Psychology
HHMI, Discovery Scholars

ISABEL FERNANDEZ
“Design and Prototype of Flapping Wing Micro Air Vehicle with High Endurance”
Major: Mechanical Engineering & Aerospace Engineering
Faculty Advisor: Dr. Abdessattar Abdelkefi, Mechanical & Aerospace Engineering
AMP

ANDRUW FIERRO, IMRAN ALI, PRISILA RAMIREZ
“Evaluating R-loop abundance in multiple cancer cell lines”
Major: Biochemistry
Faculty Advisor: Dr. Amanda K. Ashley, Chemistry & Biochemistry
College of Arts & Sciences

TIFFANY FLORES
“LGBT+ students representation and treatment on college campuses”
Major: Criminal Justice, Psychology
Faculty Advisor: Dr. Judith Flores Carmona
Honors College

VIRGINIA FUENTES
“Design and Fabrication of a Bioinspired Robotic Jellyfish Using Cable-Driven Actuation”
Major: Mechanical Engineering
Faculty Advisor: Dr. Abdessattar Abdelkefi, Mechanical and Aerospace Engineering
AMP

MADISON FULLER
“Evaluating Phytoene/Phytofluene in UV-induced DNA Damage Repair”
Major: Biology
Faculty Advisor: Dr. Amanda Ashley, Chemistry and Biochemistry
AMP

DENISE GARCIA
“Quanitation of β-Carotene, Provitamin A, in Dietary Supplements and Capsicum annuum”
Major: Genetics & Biotechnology
Faculty Advisor: Dr. Ivette Guzman, Plant & Environmental Science
USDA BASE

JORGE GARCIA
“Prediction of Seismic Wave Arrivals Using a Convolutional Neural Network”
Major: Physics
Faculty Advisor: Dr. Lauren Waszek, Physics
College of Arts & Sciences
JACOB GONZALEZ, TERESA SLETTEN, VIVIANA BELT, JASMIN WHITTAKER
“How a Music Trivia App Can Bring People Together”
Major: Psychology
Faculty Advisor: Dr. Marlena Fraune, Psychology
Honors College

JACOB GONZALEZ, GABE HERNANDEZ
“How Diverse Aggies: Social Challenges and Medical Obstacles to Overcome”
Major: Psychology
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Honors College

ANTHONY GRANITE
“Discovering Cyanobacteria Diversity from Vernal Falls, Yosemite”
Major: Genetics and Biotechnology
Faculty Advisor: Dr. Nicole Pietrasiak, Plant and Environmental Sciences
College of ACES

GABRIELLE GRAVES
“Morphing Drone”
Major: Mechanical Engineering
Faculty Advisor: Dr. Abdessatar Abdelkefi, Mechanical Engineering
AMP

SEAN GRAY
“Differential Expression in Domains of AcrABC Efflux Pumps, and their Implications in Antibiotic Resistance”
Major: Biochemistry
Faculty Advisor: Dr. Paola Mera, Chemistry and Biochemistry
College of Arts & Sciences

TOTEONA GRAY
“Hepatocyte injury drives atypical fibrinogen cross-linking: Potential role of TGM2”
Major: Animal Sciences
Faculty Advisor: Dr. Elba Serrano, Biology
AMP

LUIS GUTIERREZ, HANNAH ANTHOLZNER, JACOB DONOHUE, LAUREN FLORES
“This Care of Mine - Short Film”
Major: Digital Filmmaking
Faculty Advisor: Sherwin Lau, Creative Media Institute
Discovery Scholars

FREDERICK HANSEN
“The effect of vegetation zones, abiotic variables, and physical disturbance on soil microbial communities of the Chihuahuan Desert”
Major: Biology
Faculty Advisor: Dr. Nicole Pietrasiak, Plant and Environmental Sciences
HHMI

CHRISTINA HERMES
“The Road Less Traveled By: An Immigrant’s Journey to the United States”
Major: Undeclared
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Honors College

HANA HERNANDEZ
“Carotenoid Bioavailability from Microalgae Chlamydomonas sp. DOE 0101 via in Vitro Digestion”
Major: Environmental Science
Faculty Advisor: Dr. Omar Holguin, Plant and Environmental Science
MARC
RACHEL SARAH HUNTER  
“Colorism In Beauty”  
Major: Music Business  
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction  
Honors College

GRACE IGWE, TERESA SLETEN, MERCEDES WALT  
“Improving Human-robot Interaction Efficiency During Robot Mode Swaps”  
Major: Mechanical Engineering  
Faculty Advisor: Dr. Marlena R. Fraune, Psychology  
College of Engineering

BENJAMIN JENKINS  
“The Commodification of Social Movements”  
Major: Economics  
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction  
Honors College

JAMIE LEE JUSTICE  
“Antifeminism in U.S. Politics”  
Major: Philosophy  
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction  
Honors College

ABIGAIL KANE  
“Identification of a Mycobacterium spp. Endosymbiont in the Freshwater Snail Biomphalaria glabrata”  
Major: Genetics & Biotechnology  
Faculty Advisor: Dr. Maria Castillo, Biology  
College of Arts & Sciences

LAUREN KEENER  
“Is Goal an Emotion?”  
Major: Psychology  
Faculty Advisor: Dr. James Kroger, Psychology  
BP-ENDURE BRAiN

OMAR KHODARY  
“Soil Aggregate Stabilization with Biopolymer Additives for Wind Erosion Control”  
Major: Chemical Engineering  
Faculty Advisor: Dr. Reza Foudazi, Chemical Engineering  
USDA

TALIA KOLIKANT, BAILEY BROWN DANIEL HERRERA, ANALYSIA HOLGUIN  
“Comfort Levels in Human-Robot Interaction”  
Major: Economics  
Faculty Advisor: Dr. Marlena Fraune, Department of Psychology  
College of Business

ADRIENNE LEBLANC, ARACELI WILLS, CRISTINA COLLAROS, JAYDEN RAHALL  
“Mental Health and the Education System”  
Major: Family and Child Sciences  
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction  
College of Education

ARIAH LEDAY  
“Stimulation of Macrophage Phagocytosis of Pediatric Brain Tumors”  
Major: Biology and Microbiology  
Faculty Advisor: Dr. William Maio, Chemistry  
MARC
SABRINA LUCERO
“How Temperature Affects the Activity of the Organ Mountain Colorado Chipmunk”
Major: FWCE Wildlife Science
Faculty Advisor: Dr. Jennifer Frey, Fish, Wildlife & Conservation Ecology
College of ACES

YVONNE LUCERO
“Southern New Mexico Dietary Practices and Carotenoid Content in Traditional Mexican Meals”
Major: Human Nutrition and Dietetic Science
Faculty Advisor: Ivette Guzman, Plant & Environmental Science
College of ACES

MARLIE MAESTAS
“CXCR4 Regulation of Autophagy in Pregnant Ewes”
Major: Biology
Faculty Advisor: Dr. Ryan Ashley, Animal Science
AMP

DANIELA MARTINEZ
“Worldwide Crisis associated with race, age, and gender”
Major: Pre-Nursing
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Honors College

KARLA MARTINEZ
“Colourism in the Latino Community”
Major: Social Work
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Honors College

PRISCYLA MARQUEZ
“Surface Complexation Modeling on Selenium Sorption on Iron-Modified Zeolites”
Major: Civil Engineering
Faculty Advisor: Dr. Lambis Papelis, Civil Engineering
AMP

CARLA MAXAM
“Ovine Inflammatory Response to Inhibition of CXCR4 during Early Pregnancy”
Major: Animal Science
Faculty Advisor: Dr. Ryan Ashley, Animal and Range Science
HHMI

RENE MCPHERSON, SEAN CHRISTESON, MERCEDES WALT
“An Interactive Interface Assisting Students with Their Studies”
Major: Psychology
Faculty Advisor: Drs. Marlena Fraune & Dominic Simon
College of Arts & Sciences

RENE MCPHERSON
“Creation of a large, open-access database of complex visual scenes for use in experimental psychology”
Major: Psychology
Faculty Advisor: Dr. Michael Hout, Psychology
Discovery Scholars

LAURAINF MEDIAVILLO
“Assessing the Role of Zn Transporter Genes in Paracoccus denitrificans”
Major: Biotechnology
Faculty Advisor: Dr. Erik Yukl, Chemistry and Biochemistry
BP-ENDURE BRAiN
ALAN MOYA
“Energy Valorization of Food Waste via Hydrothermal Liquefaction”
Major: Chemical Engineering
Faculty Advisor: Mr. Umakanta Jena, Chemical Engineering
AMP

AHMED MUHYI
“Investigation of the effect of additives and water bath composition on the properties of ultrafiltration polyether-sulfone membranes”
Major: Biology
Faculty Advisor: Dr. Reza Foudazi, Chemical & Materials Engineering
College of Engineering

FALLON MURPHY
“Afrofuturism and Its Implications on African-American Student Participation in STEM”
Major: Communication Studies
Faculty Advisor: Dr. Eric Morgan, Communication Studies
Discovery Scholars

ANA NATERA
“Evaluating the sensitivity of a spectral flow cytometer”
Major: Chemical Engineering
Faculty Advisor: Dr. Jessica Houston, Chemical Engineering
College of Engineering

IBRAHIM NDAYOU
“Internet of Things (IoT) Rain Gauge Device”
Major: Electrical Engineering
Faculty Advisor: Dr. Young Ho Park, Mechanical & Aerospace Engineering
College of Engineering

TRUNG NGUYEN
“Biophysical Characterization of DNAJB1-PRKACA in Fibrolamellar Hepatocellular Carcinoma”
Major: Genetics and Biotechnology
Faculty Advisor: Dr. Barbara Lyons, Chemistry and Biochemistry
HHMI

JONATHAN ORTIZ
“Development of reliable reduced-order models of carbon nanotube-based sensors”
Major: Mechanical Engineering
Faculty Advisor: Abdessattar Abdelkefi, Mechanical and Aerospace Engineering
AMP

PABLO PARADISE
“Anodic oxidation”
Major: Electrical Engineering/Physics
Faculty Advisor: Dr. Stefan Zollner, Engineering
AMP

ANDREW PARRA
Characterization of a Caulobacter crescentus mutant strain with a “chubby” morphology
Major: Biochemistry
Faculty Advisor: Dr. Paola Mera, Chemistry and Biochemistry
BP-ENDURE BRAiN

VICTORIA PEREA
“Using Instrument-Assisted Soft Tissue Mobilization To Improve Musculoskeletal Functioning Following Injury”
Major: Athletic Training
Faculty Advisor: Prof. Michael Gregory, Kinesiology of Psychology
Capstone
KITT PHI
“Simulating an open terrain visual search environment in three-dimensional virtual reality”
Major: Computer Science
Faculty Advisor: Dr. Michael Hout, Psychology
Discovery Scholars

GABRIELA QUINTANA
“Asylum Laws and the Prejudice Within”
Major: Government
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Honors College

SARAH RAMIREZ
“The more the merrier? Bioprospecting the bitterness of cytogenetic variants from creosote (Larrea tridentata (DC.) Coville, Zygophyllaceae) in the Sonoran and Chihuahuan desert”
Major: Horticulture
Faculty Advisor: Dr. Sara Fuentes-Soriano, Animal Range Science, NMSU Herbaria
AMP

LUCAS RIVERA
“Laboratory Testing to Assess EICP Cementation in Two Natural Sands”
Major: Civil Engineering
Faculty Advisor: Dr. Paola Bandini, College of Engineering
AMP

FELICIA RODRIGUEZ
“Using fluorescence lifetime-based flow cytometry to profile metabolism in cultured cells”
Major: Chemical Engineering
Faculty Advisor: Dr. Jessica Houston, College of Engineering
BP-ENDURE BRAiN

JADZIA RODRIGUEZ
“Influence of Local and Landscape Factors on Burrowing Owl Artificial Habitat Site Occupancy in Arizona”
Major: Wildlife Science
Faculty Advisor: Dr. Martha Desmond, Fish, Wildlife and Conservation Ecology (FWCE)
NRCT, WOS, Jed Burtt Undergraduate Mentoring Grant, College of ACES

GABRIEL RONQUILLO
“Sex Education and Its Impact on the Latinx Community”
Major: Government
Faculty Advisor: Dr. Judith Flores-Carmona, Curriculum & Instruction
Honors College

IZAK RUBIO
“Immunofluorescence Study of Adult and Regenerating Muscle and Electric Organ Tissues in Eigenmania virescens”
Major: Biology
Faculty Advisor: Dr. Graciela Unguez, Biology
MARC

FELIPE ESCALANTE SALAIS
“Crossing of Bed Bugs with different Insecticide Resistance Profile for use in Insecticide-Efficacy Tests”
Major: Horticulture
Faculty Advisor: Dr. Alvaro Romero, Entomology, Plant Pathology, Weed Science
AMP

MARIANNE SALAS
“Environmental Justice, Prejudice, and Law”
Major: English and Government
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Honors College
CONCEPCION SANCHEZ
“Determining how metabolism is altered during tamoxifen resistance in breast cancer cells”
Major: Biochemistry
Faculty Advisor: Dr. Jessica Houston, Chemical & Materials Engineering
HHMI

KAREN SANCHEZ
“Remediation of Soil and Water at Legacy Uranium Mining Sites”
Major: Chemical Engineering
Faculty Advisor: Dr. Catherine Brewer, Chemical Engineering
College of Engineering

NICHOLAS SANDOVAL
“The Injustice of Hispanic Students”
Major: Economics & International Business
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Honors College

CIARRA SANNER
“Inequalities in the Workplace”
Major: Family and Child Sciences.
Faculty Advisor: Dr. Judith Flores Carmona Curriculum & Instruction
Honors College

BRIAN SAUNDERS
“Comparison of beam and shell theories for the modeling of different-sized CNT-based bio-mass sensors”
Major: Mechanical Engineering
Faculty Advisor: Dr. Abdessattar Abdelkefi, Mechanical and Aerospace Engineering
AMP

SEAN SMITH
“Vertical Profiling of Dust in the Troposphere using Modular Open Source Micro-Controllers in Multiple Environments”
Major: Engineering Physics
Faculty Advisor: Prof. Michael DeAntonio, Physics
AMP

JANEL SOWERS
“Overexpression of Insulin-like Growth Factor Binding Protein 1 (IGFBP-1) in Breast Cancer Cells Results in Tamoxifen Resistance by Hyperactive MAPK and ERK Signaling”
Major: Biochemistry
Faculty Advisor: Dr. Kevin Houston, Chemistry and Biochemistry
MARC

DAVID STOLTZFUS
“Towards the Total Synthesis of Laingolide A”
Major: Chemical Engineering
Faculty Advisor: Dr. William Maio, Chemistry
MARC

ARIANNA THOKSAKIS
“The Use of Heavy Metal Music as an Aggression Agent During Brain Stimulation”
Major: Psychology
Faculty Advisor: Dr. Justin MacDonald, Psychology
Discovery Scholars

RHIANA THOMAS
“Evaluating a social determinants of health screening tool in a primary healthcare setting”
Major: Psychology
Faculty Advisor: Dr. Mary Alice Scott, Department of Anthropology
College of Arts & Sciences
CHRISTINA VAQUERA
“Improving Human-robot Interaction Efficiency During Robot Mode Swaps”
Major: Public Health Sciences
Faculty Advisor: Dr. Rebecca Palacios, Public Health Sciences
College of Arts & Sciences

MOLLY WILLIAMS
“The Effects Of Yoga On Speech Rate Entrainment And Turn Taking In Children With Autism Spectrum Disorder”
Major: Communication Disorders
Faculty Advisor: Dr. Heike Lehnert-Lehouiller, Communication Disorders
Honors Capstone

APRIL WRIGHT
“Hydrothermal Liquefaction of Wastewater Algae”
Major: Chemical Engineering
Faculty Advisor: Dr. Catherine Brewer, Chemical & Materials Engineering
AMP
SIDNEY AGUILERA

“Evaluation of an acoustic focusing flow cytometer”
Major: Chemical Engineering
Faculty Advisor: Dr. Jessica Houston, Chemical Engineering
Program Sponsor(s): College of Engineering

Cytometry systems generally rely on hydrodynamic focusing of cells, which can limit throughput and is result in inadequate sampling of cells. We have contracted a modular flow cytometry system that will improve aspects of cell alignment. Additionally it can, measure fluorescence life times has increased signal to noise and throughput. This system uses acoustic focusing with standing acoustic waves (SAW) that create very highly focused sample streams with low separation tolerance. Herein we present the optimized cytometer evaluate it using white blood cells as well as fluorescence microspheres. This new cytometer is a promising new technology with a powerful interrogation platform that leaves a smaller overall footprint for future modular use.

DANIEL Q. AGUIRRE

“In-Silico Dual Specificity Protein Phosphatase Comparisons for Differentiation”
Major: Chemical Engineering/Chemistry
Faculty Advisor: Dr. Marat Talipov, Chemistry and Biochemistry
Program Sponsor(s): MARC

Dual Specificity Protein Phosphatases (Dusp) are a class of phosphatases responsible for dephosphorylating certain kinases with both phosphoserine/threonine and phosphotyrosine residues. One such protein, Dusp5, is a nuclear protein responsible for the dephosphorylation, and inactivation of Extracellular Signal-Regulated Kinases 1&2 (ERK1&2) which contribute to cellular proliferation, differentiation, survival and more. Herein we express the potential to differentiate Dusp active sites, especially from Dusp5, through the use of Molecular Dynamic (MD) simulations. Key active site residues as well as the presence of a disulfide bridge make Dusp5 a unique Dusp, perhaps capable of selective targeting.

AMIE AMIOTTE, ASIA LATORRA, ROGER MARQUEZ

“Dawgz”
Major: Psychology
Faculty Advisor: Dr. Marlena Fraune, Psychology
Program Sponsor(s): HCI/HRI

Walking daily can benefit people and their pets, while strengthening the bond between dogs and owners. This application was built to connect people who want to walk their own dogs. In doing this, both people and dogs have a better, healthier lifestyle. Previous applications were made to find another person to walk your dog. We created several prototypes and tested them to better develop the design for the final application. By allowing users to find nearby pet stores and veterinarians as well as keeping track of their walks and offering the option to send messages we hope to increase health.

APRILINA ARAIZA

“Synthesis of FTY720 Compounds for Neurotrophic Factor Expression to protect Oligodendroglia against hydrogen peroxide Mediated Oxidative Stress”
Major: Biochemistry
Faculty Advisor: Dr. Ramash Chinnasamy, Chemistry and Biochemistry
Program Sponsor(s): BP-ENDURE (BRAIN)

Multiple system atrophy (MSA) pathology includes α-synuclein (αSyn) accumulation in glial cytosolic inclusions (GCI) inside oligodendrogial cells (OLGs) of brain. The impact of oxidative stress on OLG cell viability as αSyn-accumulates was studied by OLN-93 cells treated with FTY720, FTY720-C2 and FTY720-Mitoxy and observed OLN-93 cell viability was normal. FTY720 and FTY720-C2 increased nerve growth factor (NGF) expression and FTY720-Mitoxy increased BDNF, GDNF, and NGF expression. Pretreating OLN-93 cells with FTY720s for 48 hr blocked cell death at 2 hr of H2O2 and with FTY720s at 12 hr followed by 24 hr of H2O2 + FTY720s did not reduce OLN-93 death. We conclude that early treatment of MSA patients with new FTY720 analogs may protect OLGs by increasing major trophic factor expression.
JOSEPH BAUMGARN, BRIANNA COVAR-RUBIAS, DAVID GURULE, JENNIFER MORALES

“Discrimination in Sports”
Major: Secondary Education
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction
Program Sponsor(s): College of Education

Whether based on race, class, and/or gender people in sports have experienced prejudice, discrimination, and oppression (Sexism, Racism, Classism). Our presentation will answer the following: How are women perceived and how do they experience inequality in sports? Second, how do people from more affluent backgrounds gain more access and opportunities to follow their athletic ambitions than people from less affluent positionalities? Third, how has racism played a role in the history of athletics and is this still pertinent? Lastly, how do LGBTQ athletes continue to face an uphill battle when it comes to acceptance and equal opportunity in sports?

ETHAN BILLINGSLEY

“Design and Fabrication of a Gannet-Inspired Aerial-Aquatic Drone”
Major: Mechanical Engineering
Faculty Advisory: Dr. Abdessattar Abdelkefi, Mechanical and Aerospace Engineering
Program Sponsor(s): AMP

Many drones on the market are proficient at either flying or swimming. However, very few drones can incorporate both of these functions as well as transition between both mediums successfully. My research involves fabrication of a drone that can dive into the water and transition back to the air. My approach is to fabricate a wing-fuselage assembly that can partially fill with water to manage buoyancy. At this point, we have determined that the S1223 airfoil will be an optimal template for constructing our wing. We have also conducted simulations to evaluate the aerodynamic forces on the system.

ESMERALDA BRAVO, YASMINE CONTRERAS GABRIELLA RAMIREZ, YVETTE SANDOVAL

“Importance of Critical Family History”
Major: Early Childhood
Faculty Advisor: Dr. Judith Carmona, Curriculum & Instruction
Program Sponsor(s): Dr. Judith Flores Carmona

Demographics and migration can lead to different socialization in our lives. This can involve— but is not limited to— being introduced to a new culture, losing culture, Americanization, and acknowledging the fact that families come in different types. Through this panel we explore and research our critical family history, across generations and its impact intergenerationally. Critical family history has impacted our mindsets on not only the “Americanization” of the Hispanic population but our understanding/perception of family. Drawing from scholarship and research, the four of us will share personal experiences and personal family narratives/genealogy and its importance in Multicultural Education.

VALERIE BREWER

“Effects of Urbanization on extra-pair paternity in the song sparrow”
Major: Conservation Ecology
Faculty Advisor: Dr. Karen Mabry, Biology
Program Sponsor(s): MARC

Urbanization can affect the behavior of free-living animals. We examined the effects of low-density urbanization on extra-pair mating in urban and rural populations of song sparrows (Melospiza melodia) in Montgomery County, VA. We genotyped nestlings and social parents from 27 nests, along with all other captured adults at 15 microsatellite loci. We successfully assigned genetic paternity to 38 of 70 nestlings using Cervus. Our data suggest that up to 34% of nestlings may be the result of extra-pair mating. Due to a limited sample size of rural nests, we cannot draw conclusions about the effects of urbanization on extra-pair mating.
PASCUAL CAMACHO
“Design and Construction of a prototype for a Bio-Inspired Pile Foundation System”
Major: Civil Engineering
Faculty Advisor: Paola Bandini, Civil Engineering
Program Sponsor(s): AMP

The project goal is to design and build bench-scale and mid-scale prototypes for a new bio-inspired pile foundation that consists of a longitudinally thin-wall, split steel pipe that expands radially after installation in the ground. The pile expansion seeks increasing the lateral confinement against the pile to enhance the side frictional resistance when the pile is vertically loaded. The details of the prototype components and test setups designed by the project team were documented in Computer Aided Drawings. The prototype test was also modeled using finite element method to assess the boundary condition effects on pile displacement and load capacity.

ADAN CAMPOS
“Conceptual design, manufacturing, and experimental testing of a carangiform fish-like robot using cable-driven actuators”
Major: Mechanical Engineering
Faculty Advisor: Dr. Abdessattar Abdelkefi, Mechanical and Aerospace Engineering
Program Sponsor(s): AMP

Aquatic Unmanned Vehicles (AUVs) have grown in research because of their applications in a diverse range of missions. These drones are transitioning from rigid to more flexible bodies to replicate motion from a biological system. The combination of soft and rigid materials, and cable-driven actuators has proven to be the best option to fabricate a capable system that can perform different types of motion. A carangiform inspired AUV is fabricated with different design considerations that uses a cable-driven actuator to determine the best configuration based on power efficiency, swimming depth, speed, and endurance for a specific mission. Research is conducted from previous AUVs to design 3D models for our own system.

LAPORSHA CAMPBELL
“Characterization of two highly expressed genes potentially involved in chemotaxis”
Major: Microbiology
Faculty Advisor: Dr. Paola Mera, Chemistry and Biochemistry
Program Sponsor(s): MARC

Chemotaxis is an organism’s movement toward favorable conditions or away from unfavorable conditions. In Caulobacter crescentus, there are two genes that we hypothesize to be involved in flagella movement, cagA and cagA1. To test our hypothesis, we completed growth curves in rich and minimal media. We also observed swarming and swimming rates between wild type, single and double knockout mutant strains. We found significant differences in swimming between wild type and the double deletion. We plan to test the function of CagA/1 in cell’s ability to biofilm. We expect our results to provide insights into how bacteria regulate their motility.

CARLOS I. CAMPOS
”Genetic Structure and Diversity in Wild and Captive Populations of the Critically Endangered Blue-Throated Macaw”
Major: Biology
Faculty Advisor: Dr. Timothy F. Wright, Biology
Program Sponsor(s): HHMI

A key aspect in the conservation of endangered populations is understanding their underlying genetic structure. The blue-throated macaw is endemic to Bolivia and is one of the most endangered species of macaw. Our aim was to assess genetic structure and diversity in captive and wild populations of blue-throated macaw, determine the presence of a population bottleneck, and quantify inbreeding. Using a panel of 12 microsatellite loci, we genotyped 56 wild and 58 captive individuals. Initial STRUCTURE results show that the wild and captive populations are genetically distinct. Our results will help to aid captive breeding and reintroductions of blue-throated macaws.
**MARIA CARMONA - MONTALVO**  
"Qualitative Phytochemical and Antioxidant Analysis of a Tropical Plant in Search of Cancer Cure"

Major: Chemical Engineering and Biology with a Biomedical Engineering Minor  
Faculty Advisor: Dr. Francisco Omar Holguin, Plant and Environmental Science  
Program Sponsor(s): AMP

Phase I: this research project evaluates the most efficient methods to extract cancer-fighting (antioxidant) properties of a primarily tropical plant, grown in the southwest part of the United States. During the second phase of the project the phytochemical properties of the tropical plant will be analyzed utilizing HPTLC (High-performance thin-layer chromatography), DPPH (C18H12N5O6 -- 2,2-di-phenyl-1-picrylhydrazyl), and ABTS (C18H18N4O6S4 -- 2,2’-azino-bis(3-ethylbenzothiazoline-6-sulphonic acid) assays. The results of the trials will then be compared to those of a well-established antioxidant compound. Phase III: the project will result in a novel engineering technique which will destroy cancerous cells and aid in rapid cell regeneration.

**LORENA CASIANO, TOTTEONA GRAY, FRANCHESEA ORTEGA, ALEXIS TORRES**  
"The Synergetic Effect of Capsaicin and Dihydrocapsaicin for the Treatment of Glioblastoma"

Major: Genetics and Biotechnology  
Faculty Advisor: Dr. Elba Serrano, Biology  
Program Sponsor(s): AMPBP-ENDURE (BRAIN)

Treatment of glioblastoma, a refractory and deadly cancer, is further challenged by the high risk of damaging surrounding non-malignant brain cells. Capsaicinoids have been successful as antineoplastic agents due to their mechanism of inducing apoptosis in cancer cells. We aspire to examine the lesser studied synergistic impact of capsaicin and dihydrocapsaicin as anti-oncogenes. Using high-performance liquid chromatography, then cell culture, and light microscopy we will examine the metabolic functions in brain cancer cells following treatment utilizing different concentrations of capsaicinoids. We expect that the synergistic effect will promote a higher percentage of apoptosis in the cell samples.

**EDGARDO CAZARES, MARIELA MUÑOZ**  
"Medicinal Compounds and Nutritious Value in the Onion from the Allium Family"

Major: Civil Engineering  
Faculty Advisor: Dr. Laura Rodriguez Uribe, Plant and Environmental Sciences  
Program Sponsor(s): CAMP

Health issues affect millions of people in America every year. The scientific community has discovered medicinal properties in plants that can help aid and prevent some of the most common diseases of the U.S. One plant that is rich in medicinal compounds and nutritious value is the Onion (Allium cepa) from the Allium family. Research shows that onions have antioxidant activities, anti-cancerous and anti-inflammatory properties. However, few studies have been done to discover the impact of color variety in those medicinal compounds found in onions.

**FRANCISCO CHACON**  
"New Mexico’s Superfood: Chile Peppers"

Major: Genetics & Biotechnology and Biology  
Faculty Advisor: Dr. Ivette Guzman, Plant and Environmental Sciences  
Program Sponsor(s): MARC

Phenolic compounds are antioxidants that hold nutritional value in protection against infectious diseases, inflammation, and certain types of cancers. Our goal was to measure the total amount of phenolics in Capsicum spp. Thirty-four varieties of peppers were extracted and analyzed for total phenolics and compared to a phenolic-rich superfood, blueberries. Phenolics were extracted with 2% methanolic acetic acid and quantified via a spectrophotometer utilizing a gallic acid standard curve. Two Capsicums contained higher amounts of phenolics (4.64 and 4.54 mg/g) than a nationally recognized superfood, blueberries, indicating that they should also be considered a superfood with high nutritional value.
VALENCIA CHAVEZ

"Lights Shines More in the Darkness"
Major: Kinesiology
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Program Sponsor(s): Honors College

First appearance matters to any individual to where it can produce assumptions. Skin color is the main characteristic that everyone sees, which judgements are made. The poster will represent the judgements that many people have based on skin color. The preferred skin color is light rather than dark, which is based on colorism. There will be a poster with many words that are the first judgements of first appearance with a light side and a dark side. The inferences that will be made from the poster will express the assumptions that people see when they see light and dark-skinned people.

AUDREY CHRISTENSEN,
DALLAS CORDERO, BRANDY TORRES,
DANIELA VARGAS

“Media Analysis”
Major: Elementary Education
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Program Sponsor(s): College of Education

From a young age, females have been portrayed in the media as vulnerable, sensitive, and dependant on men. The messages we receive make us unsure of our place in society—who are we and where do we belong? Women have been objectified and sexualized in the media. The effects the media has on women of all ages can lead to harmful habits to achieve a certain look. Becoming aware of media manipulation/misrepresentation, from a critical perspective, allows us as a society to self-define and resist misogynistic messages, therefore allowing us to grow and become who we desire to be.

SEAN CHRISTESON, JINAN SKAFI

“Cross-Cultural Preferences for Group-Based Language”
Major: Psychology
Faculty Advisor: Dr. Marlena Fraune, Psychology
Program Sponsor(s): Discovery Scholars

In the near future, humans and robots will work together on a regular basis around the world. Literature suggests that participant collectivism may increase their preference for robot teammates that use group-based language (e.g., “We’re doing great”), whereas individualism may increase preference for individual-based language (e.g., “You’re doing great”). In this study, we examine if three countries (USA, Portugal, and Japan) are ideal for testing cultural differences in preferences for robot use of group-based language. If these locations are fitting, we will use them in future studies to examine actual cross-cultural interaction with robots using group-based vs. individual-based language.

KEVIN CISNEROS

“Differences in Energy Production Between Skeletal Muscle and Electric Organ Sternopygus macrurus”
Major: Biology
Faculty Advisor: Dr. Graciela Unguez, Biology
Program Sponsor(s): HHMI

The electric organ of the electric fish Sternopygus macrurus is derived from skeletal muscle fibers and is electrically activated at a constant frequency of 50-200 Hz, which is significantly different from that of slow-twitch (~8-30 Hz) or fast-twitch (intermittent 50-100 Hz) muscle cells. This study aims to characterize the ATP energy metabolism profile of EO cells (electrocytes). We will perform histochemical studies and analysis of the morphology and spatial distribution of mitochondria in electrocytes and different muscle fiber types. These data represent the first quantitative comparison of energetic properties in electrocytes and skeletal muscle fibers.
ANTHONY CORNWELL
“Phycoremediation of clofibric acid: an emerging environmental concern”
Major: Biology
Faculty Advisor: Dr. Omar Holguin, Environmental Science
Program Sponsor(s): MARC

An emerging concern for the environment is the accumulation of pharmaceuticals in water supplies. Current waste-water treatment methods are unable to remove many of these pharmaceuticals. This includes clofibric acid which is an herbicide, as well as the metabolite of an anti-lipid medication. Effects on human health are currently unknown; however, there are chronic effects observed in wildlife at environmental concentrations. Microalgae species have been shown to be an effective and cost-efficient method of treating toxic substances in groundwater. This study shows that the algal species Scenedesmus obliquus may be an effective means of neutralizing clofibric acid from water sources.

NOELIA DE LA ROSA, MARIELENA DE LA ROSA
“Detangling”
Major: Dance
Faculty Advisor: Dr. Jeremy Edmonson, Dance
Program Sponsor(s): Kinesiology & Dance

Curly hair is often exoticized and the subject of colorism, especially within Afro-Latin families. This spoken-word and dance duet relates the voice and the psyche of an individual’s experience of her curly hair; tracing its roots to its origins in the African Diaspora, its history of colorism within Dominican families, and its ties to the social encounters and conversations associated with being Afro-Latinx. “Detangling” gives voice to an experience of living in the middle-ground as an Afro-Latina woman.

NICOLAS DELOVATO
“Enhancement of Microchannel Heat Transfer Using Liquid Metal and PCM Slurries”
Major: Mechanical Engineering
Faculty Advisor: Dr. Sarasda Kuravi, Mechanical and Aerospace Engineering
Program Sponsor(s): USDA I-DISCOVER

The rapid increase in the power densities of devices demands the improvement of technologies such as the manifold microchannel heat sink. We conducted a parametric study of a microchannel with a liquid metal with phase change material (PCM) slurries. The parameters varied are the PCM concentration, the channel’s aspect ratio, and the slurry’s inlet temperature. This study determined the thermal and hydrodynamic performance of the microchannel. A 3D microchannel was simulated for conjugate heat transfer analysis using COMSOL Multiphysics. The optimal parameters were found for the microchannel to have the highest thermal performance over an increase in pressure loss.

JORDYN DOBSON
“NFκB Activation in ovine placenta during Early Gestation”
Major: Biochemistry
Faculty Advisor: Dr. Ryan Ashley, Animal and Range Sciences
Program Sponsor(s): MARC

Reproductive success in livestock is paramount to food supply and the livestock industry. The CXCL12/CXCR4 chemokine axis plays critical roles during placenta development, which is essential to conceptus survival and health. NFκB is a transcription factor that regulates transcription for genes associated with cell proliferation, anti-apoptosis, and immune response, all of which are critical for a developing placenta. NFκB is downstream of the CXCL12/CXCR4 signaling pathway in other models, but whether it is involved in placentation is unknown. The objective of this study was to determine if NFκB is involved in the CXCL12/CXCR4 axis during placental development.
SIMON DRIVER, TYLER CHATTERTON
ROIO GUZMAN, KEVIN LIAW,
TAMMY TSAI

“Impact of Robot Sociality on Human/Robot Team Interactions”
Major: Biochemistry
Faculty Advisor: Dr. Marlena Fraune, Psychology Department
Program Sponsor(s): Psychology Department

Robots are entering everyday life (e.g., medical robot, iRobot for house cleaning) to improving improve quality of life. Humans collaborate more effectively with social than nonsocial robots, but will this remain true if robots’ social cues are irrelevant? Will irrelevant social cues more affect females than males? To test this, participants played a game in team of two humans and two robots against similarly-composed teams. Robots were either social or nonsocial. Participants were then surveyed regarding trust towards robotic teammates compared to human teammates. Data analysis is ongoing.

RAWAN ELAKSHER

“Characterization of two highly expressed genes potentially Involved in chemotaxis”
Major: Genetics and Biotechnology
Faculty Advisor: Dr. Paola Mera, Chemistry and Biochemistry
Program Sponsor(s): MARC

Chemotaxis allows bacteria to adapt by moving to chemically favorable environments. In Caulobacter crescentus, the gene cagA is found within a region that control chemotaxis; however, its function remains unknown. Our hypothesis is that CagA has a role in chemotaxis. To test our hypothesis, we used genetic engineering, double recombination, and bacterial physiology assays. We found that Caulobacter encodes an additional gene (cagA1) with similar DNA sequence. We then hypothesized that both genes play a role in chemotaxis. We are currently conducting swarming and swimming assays to determine if the genes play a role in motility. Next, we will conduct chemotaxis assays to determine if the genes are involved in chemotaxis.

MARTIN DURON, ISRAEL MONSIVAIZ

“Phenolic Compound in Different Species of Cinnamon and their Antibacterial Capabilities”
Major: Aerospace Engineering
Faculty Advisor: Dr. Laura Rodriguez Uribe, Plant and Environmental Sciences
Program Sponsor(s): CAMP

Is your cinnamon true cinnamon? This question derives from the fact that there are actually two different groups of cinnamon; True and Common Cinnamon. Which really dont have not much difference in taste but those who know can tell that True Cinnamon is easier to break, has a light-brown color, and originates from Sri Lanka. True Cinnamon is known to posses multiple medicinal uses which include lowering of blood sugar levels and reduction of heart disease risk factors to name a few. True Cinnamon, specifically the species Cinnamomum zeylanicum possesses antibacterial capabilities due to its contents of Ferulic and Caffeic Acid. C. zeylanicum derives from Sri Lanka, an island nation which is located south of India.

LEONARDO ESCAMILLA III

“Design and Fabrication of an Albatross inspired Tilt-wing Drone System”
Major: Mechanical/Electrical Engineering
Faculty Advisor: Dr. Abdessattar Abdelkefi, Engineering
Program Sponsor(s): AMP

Engineers have made significant improvements in the way drones are fabricated and implemented. One such classification of drones, tilt-wing drones, have much to offer to the drone research field, as they have many characteristics not found in conventional drone designs. The aim of this study is to fabricate a bioinspired tilt-wing drone system. From previous research, the Albatross is chosen to be the inspiration for the drone system. A fabrication process is then presented, where important milestones are emphasized. Finally, fabrication of the drone system begins, with the fabrication of the wings and implementation of the actuation mechanism and electronic systems.
MARIELA ESTRADA  
“Comparing rhizosphere microbial communities in Creosote, Tarbush, Mesquite and Mariola”  
Major: Range Science  
Faculty Advisor: Dr. Nicole Pietrasiak, Plant and Environmental Sciences  
Program Sponsor(s): SWNRCT, College of ACES  

Many dryland areas that were once dominated by grasslands are now converting into desert shrublands. Shrubs can prevail in a changing environment due to their drought tolerance, extensive root growth, and greater resistance to stress but less is known about their root zone microbiomes. This study characterizes the soil microbial communities of four shrubs, Creosote, Mariola, Mesquite, and Tarbush from the Jornada Experimental Range (JER), Chihuahuan Desert. At 3 locations we collected soil from the roots of each shrub species as well as away from the roots (bulk soil). DNA based methods were used to characterize microbial communities. Our poster will show preliminary results comparing soil microbial diversity and structure of these four Chihuahuan Desert shrubs.

BRIAN FARNELL, MANUEL FRANCO  
“Music Learning Through App Technology”  
Major: Psychology  
Faculty Advisor: Dr. Marlena Fraune, Psychology  
Program Sponsor(s): HHMI, Discovery Scholars  

Advancements of learning and technology have created an environment for teaching with technology. An aspect of teaching with technology is music learning. Previous mobile applications in this area are lacking in usability. The app KeyMe, is a mobile keyboard teaching app designed to provide a learning experience for novice learners and perks for more advanced players. The app aims to lend in-depth lessons and provide personalized feedback. Prototypes have been built and tested to guide design for the final product. Our app will offer an advantageous learning experience for novice players and a creative space for experienced players of piano/keyboards.

ISABEL FERNANDEZ  
“Design and Prototype of Flapping Wing Micro Air Vehicle with High Endurance”  
Faculty Advisor: Dr. Abdessattar Abdelkefi, Engineering  
Program Sponsor(s): AMP  

Flapping wing micro air vehicles (FWMAV) possess a number of unique advantages, including agility, maneuverability, ability to hover, and for their ability to be used in complex environments around obstacles. Their applications include mapping, search and rescue, and reconnaissance. This project aims to design, optimize, fabricate, and test an FWMAV with hovering and forward flight capabilities. After designing and fabricating the FWMAV, aerodynamic modeling techniques will be used to model and test its performance. The design will then be optimized to maximize efficiency and increase flight time so that it can perform an increased number and variety of missions.

ANDRUW FIERRO, PRISILA RAMIEZ, IMRAN ALI  
“Evaluating R-loop abundance in multiple cancer cell lines”  
Major: Biochemistry  
Faculty Advisor: Dr. Amanda Ashley, Chemistry and Biochemistry  
Program Sponsor(s): College of Arts & Sciences  

RNA-DNA hybrids formed during transcription, called R-loops, can contribute to multiple normal cellular events, but may also drive genomic instability. Our goal is to quantify R-loop formation in triple negative breast cancer (BT20) or gliobastoma cell lines expressing (MO59K) or lacking (MO59J) the DNA repair protein DNA-PKcs. We expect to observe higher levels of R-loops with topoisomerase I inhibition and less with α-amanitin treatment compared to controls. We used immunofluorescence to quantify R-loop formation and compare this method to the dot blot method. Overall, we will discern how varying genotype and/or exposure to DNA damage impacts R-loop formation.
TIFFANY FLORES
“LGBT+ students representation and treatment on college campuses”
Major: Criminal Justice, Psychology
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Program Sponsor(s): Honors College

LGBT+ students in college campuses have been treated not only unfairly, discriminated, and harassed, but have also gotten a negative or no representation at all in college campuses. Gary Gates of UCLA’s Williams Institute theorizes that approximately 3.5% of Americans identify as lesbian, gay, or bisexual, while 0.3% are transgender. Some of which are young college students. Many students across college campuses feel that their colleges do not represent LGBT+ well enough. There are many issues LGBT+ students face on campus as well as how they are represented and it needs to be addressed and known.

VIRGINIA FUENTES
“Design and Fabrication of a Bioinspired Robotic Jellyfish Using Cable-Driven Actuation”
Faculty Advisor: Dr. Abdessattar Abdelkefi, Mechanical and Aerospace Engineering
Program Sponsor(s): AMP

Currently, there is a growing need for the adaptation of autonomous robotic systems capable of performing tasks in aquatic environments that present a challenge for hominoid observation. This challenge persists due to human fragility in aqueous environments and the underdeveloped robotic systems that are deployed. To contribute to this science, the design and fabrication of a bioinspired robotic jellyfish is being carried out. The motion of the system is performed using cable-driven actuation. The mold to create the silicone mantle of the robotic jellyfish was 3D printed along with a base to hold the servomotor. Eight spring-steel strips attached to the servomotor base serve as the internal structure for the silicone mantle and being anchor points for the wire guides.

MADISON FULLER
“Evaluating Phytoene/Phytfluene in UV-induced DNA Damage Repair”
Major: Biology
Faculty Advisor: Dr. Amanda Ashley, Chemistry and Biochemistry
Program Sponsor(s): AMP

Melanoma causes the vast majority of skin cancer deaths in the US; most are attributable to UV exposure. Carotenoids, including phytoene/phytfluene (PP) also provide UV protection, skin lightening, and prevent DNA damage following UV exposure. PP are of interest in topical applications, as they lack the pronounced color characteristic of many carotenoids. Our group developed a novel mechanism for accumulation of high levels of PP in algae, and we are testing these compounds in human melanocytes to evaluate mechanism(s) of impairing melanin formation and DNA damage following UV radiation. Our research will inform the use of naturally-derived PP in cosmeceuticals.

DENISE GARCIA
“Quantitation of β-Carotene, Provitamin A, in Dietary Supplements and Capsicum annuum”
Major: Genetics and Biotechnology
Faculty Advisor: Dr. Ivette Guzman, Plant and Environmental Science
Program Sponsor(s): USDA BASE

The popularity of supplements has increased due to their convenience in delivering dietary vitamins in an effective and easy manner. The study’s objective was to evaluate the quantities of beta-carotene in dietary supplements and in dried red chiles. Total carotenoids and beta-carotene were extracted from five different brands of dietary supplements and packaged dried New Mexico red chiles. All extractions were done in triplicates and analyzed using thin layer chromatography (TLC). The five supplements and the red chile pepper indicated that all contained beta-carotene. High-performance liquid chromatography (HPLC) revealed that the supplements also contain extra non-provitamin A carotenoids.
JORGE GARCIA

“Prediction of Seismic Wave Arrivals Using a Convolutional Neural Network”

Major: Physics
Faculty Advisor: Dr. Lauren Waszek, Physics
Program Sponsor(s): College of Arts & Sciences

Large amounts of seismic data are needed to have a detailed image of the Earth’s internal structure and its evolution; typical datasets are composed of over 100,000 seismic records. With the exception of some basic processing methods, going through the datasets is done by hand using simple visualization software. The goal of the project is to be able to develop tools with the ability to automate the processing and identification of seismic waves, thus reducing human error and time spent sorting data. We implement a Convolutional Neural Network and train a model capable of predicting the arrival time of a desired seismic wave within obtained seismograms to accelerate the task of data processing. We compare the results obtained from the model to those of an experienced seismologist.

JACOB GONZALEZ, GABE HERNANDEZ

“Diverse Aggies: Social Challenges and Medical Obstacles to Overcome”

Major: Psychology
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Program Sponsor(s): Honors College

Transgender individuals have a long history of being mistreated, discriminated against, and physically harassed. Our focus for URCAS will be transgender students between the ages of 18 and 25 who are attending or considering attending NMSU. We will present an announcement board (poster) which will highlight health issues / instances of institutional discrimination and overall everyday injustices that the transgender community face. At the end of explanations, we will provide attendees handouts which will list LGBTQ+ friendly medical and mental health providers in the Las Cruces and possibly El Paso area(s) to raise awareness and offer resources.

JACOB GONZALEZ, TERESA SLETTEN, VIVIANA BELT, JASMIN WHITTAKER

“How a Music Trivia App Can Bring People Together”

Major: Psychology
Faculty Advisor: Dr. Marlena Fraune, Psychology
Program Sponsor(s): College of Arts & Sciences

Music and games have long been known to unite people, as multiple-studies on music’s connective properties and sociocultural influence have supported. Combining music, a trivia game, and a socializing app would link similarly-interested people on a local and global level. Our application, Ear2Ear, innovatively combines these aspects in one where others are lacking: local concert information, interpersonal connectivity, and ways to expand a user’s musical tastes. After several prototyping iterations and modifications, a final testing prototype was created. It is projected that users (ages 13+) will understand the app enough to use it and build social relationships through music.

ANTHONY GRANITE

“Discovering Cyanobacteria Diversity from Vernal Falls, Yosemite”

Major: Genetics and Biotechnology
Faculty Advisor: Dr. Nicole Pietrasiak, Plant and Environmental Sciences
Program Sponsor(s): College of ACES

Epilithic cyanobacteria communities from wet rock walls are highly diverse. However, diversity surveys of epilithic cyanobacteria from North America are underrepresented. Our objective is to explore the cyanobacterial diversity and phylogenetic relationships from a wet rock wall surface at Vernal Falls in Yosemite. We used morphologic and DNA-based information to characterize 108 cyanobacterial strains. Our poster will showcase the diversity we discovered representing 11 families in cyanobacteria and will present novel insights into the phylogenetic relationships between the epilithic cyanobacterial strains.
GABRIELLE GRAVES

“Morphing Drone”
Major: Mechanical Engineering
Faculty Advisor: Dr. Abdessatar Abdelkefi, Mechanical Engineering
Program Sponsor(s): AMP

The flight performance during the drone’s transitional phase was analyzed aerodynamically while the wings in the unexpanded and unswept mode were examined structurally. Aerodynamic theory based on Vortex Lattice Method was used to evaluate the lift and drag forces for various wing shapes and airfoils. Based on these results the rectangular wing shape was selected with a NACA airfoil of 24010 and 20101. Then the finite element analysis was used to examine the strength of the considered material for the proposed mission. Modal and dynamic analyses were performed to test the stress-strain relations and the structural stability of the wings.

SEAN GRAY

“Differential Expression in Domains of AcrABC Efflux Pumps, and their Implications in Antibiotic Resistance”
Major: Biochemistry
Faculty Advisor: Dr. Paola Mera, Chemistry and Biochemistry
Program Sponsor(s): College of Arts & Sciences

Antibiotic resistant bacteria are an increasingly alarming factor in healthcare today. One mechanism conferring this ability in bacteria is the efflux pump AcrABC, allowing antibiotics to be pumped out. In a multidrug-resistant mutant strain of Caulobacter crescentus, cells have morphological defects stemming from a deletion in a regulatory region of acrABC. My project is to identify which component of acrABC is responsible for the developmental defects. I will test the effects from over-expression of the entire acrABC operon, and each gene individually. We expect our results to uncover new insights about multidrug efflux pumps which can potentially circumvent antibiotic resistance.

TOTEONA GRAY

“Hepatocyte injury drives atypical fibrinogen cross-linking: Potential role of TGM2”
Major: Animal Sciences
Faculty Advisor: Dr. Elba Serrano, Biology
Program Sponsor(s): AMP

Acetaminophen-induced liver injury is associated with activation of the coagulation cascade and deposition of cross-linked fibrin(ogen) in the liver. Prior studies show that hepatocytes can cross-link fibrinogen and suggest that tissue transglutaminase 2 (Tgm2) is involved in fibrinogen cross-linking. However, the effect of APAP on hepatocyte-directed fibrinogen cross-linking is unknown. We tested the hypothesis that APAP-treatment increases fibrin(ogen) cross-linking and determined the role of Tgm2 in hepato-catalyzed fibrinogen cross-linking. Our results indicate that APAP-injury increases hepatocyte-driven fibrinogen cross-linking and that hepatocyte-associated Tgm2 can cross-link fibrinogen. The results imply a novel mechanism whereby fibrin(ogen) structure may change during injury.

LUIS GUTIERREZ, HANNAH ANTHOLZNER, JACOB DONOHUE, LAUREN FLORES

“This Care of Mine - Short Film”
Major: Digital Filmmaking
Faculty Advisor: Sherwin Lau, Creative Media Institute
Program Sponsor(s): Discovery Scholars

This Care of Mine is a passion project from the team of Chromatic Stories. The short film deals with themes of Identity and Reconnection. Although Production has already been completed, our next big challenge is ensuring the longevity of the project. This involves post-production and the festival circuit run. Currently, the editing process is underway. After completing a final cut, the coloring and sound mixing process will begin. This will take little more than a month and will involve completing the imaging process and ensuring that the film is compelling both visually and sonically. After completion, the short will be submitted to as many festivals as possible; ensuring that the efforts from everyone involved are seen and recognized.
FREDERICK HANSEN
“The effect of vegetation zones, abiotic variables, and physical disturbance on soil microbial communities of the Chihuahuan Desert”
Major: Biology
Faculty Advisor: Dr. Nicole Pietrasiak, Plant and Environmental Sciences
Program Sponsor(s): HHMI

Soil microbial communities contribute actively to water and nutrient dynamics as well as erosion control in desert ecosystems. Soil microbial communities living at the desert soil surface are vulnerable to disturbances and have been historically understudied. Here we relate soil microbial communities, represented through next generation sequencing data of bacteria, archaea, and fungi to environmental variables including soil properties of 5 vegetation zones within the Chihuahuan Desert. Preliminary results indicate that soil texture and pH related to changes in microbial diversity and community structure. Our study provides novel insights into soil microbial communities and how they may be affected by plant community shifts, desertification, and disturbance in the Chihuahuan Desert.

CHRISTINA HERMES
“The Road Less Traveled By: An Immigrant’s Journey to the United States”
Major: Undeclared
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Program Sponsor(s): Honors College

Many people, looking at me based on the color of my skin or the way that I talk, would not know that I am Hispanic. This poster is aimed not only to show that I am, but also to document the journey my mother took to get me here, and the reason why she had to do it. The oppressive regime in power, the hopelessness, the need to make it in America, that is why I am here and that is what I have to share.

HANA HERNANDEZ
“Carotenoid Bioavailability from Microalgae Chlamydomonadales sp. DOE 0101 via in Vitro Digestion”
Major: Environmental Science
Faculty Advisor: Dr. Omar Holguin, Plant & Environmental Science
Program Sponsor(s): MARC

Carotenoids are yellow, orange, and red pigments found in plants, microbes, and fungi. Carotenoids are considered to have nutraceutical value because of their strong antioxidant properties and that the human body can convert them to Vitamin A, an essential nutrient. Different strains of algae are capable of producing a variety of carotenoid profiles. The vast diversity of carotenoid profiles found in microalgae offers a unique opportunity to identify novel carotenoids and carotenoid analogs. Where newly discovered strains can be evaluated for their potential use as nutraceuticals. Thus, the goal of this research is to determine the carotenoid bioavailability from a newly isolated microalga strain DOE 0101 via a three-stage in Vitro digestion.

LORISSA HUMBLE
“Community on Campus and Sports Team Identification”
Major: Sociology and Computer Science
Faculty Advisor: Dr. Stephanie Arnett, Department of Sociology
Program Sponsor(s): College of Arts & Sciences

This study’s objective is to determine if being involved in sports spectatorship personally and socially stimulates attachment to peers and the university as a whole. A survey assessing student attitudes about the atmosphere of community in the university and the degree to which students have a personal identification with the campus football team and will be administered to approximately 150 students from NMSU. The following hypotheses will be tested: (1) whether students who report a high degree of identification will describe an increased sense of community, (2) whether a team’s victory has an impact on team identification and community.
RACHEL SARAH HUNTER
“Colorism In Beauty”
Major: Music Business
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Program Sponsor(s): Honors College

The concept of colorism versus racism is a discussion rarely found, yet often seen on a variety of platforms across the United States, including but not limited to the world of fashion, beauty and social media. While blatant racism and cultural appropriation are now often spotlighted in a recent collective pursuit for social justice (sometimes to a fault), the idea of colorism within each racial group still seems untouched and maybe even encouraged, despite its harmful, unhealthy and dramatic effects to the population at large. Colorism is alive and well, and we see it every day without even realizing it.

GRACE IGWE, TERESA SLETEN, MERCEDES WALT
“Improving Human-robot Interaction Efficiency During Robot Mode Swaps”
Major: Mechanical Engineering
Faculty Advisor: Dr. Marlena R. Fraune, Psychology
Program Sponsor(s): College of Engineering

Robots have varied applications (threat detection, manufacturing, space exploration, etc.) For optimal functioning, these robots may swap modes between autonomous behavior and teleoperation, but this mode swapping may increase human stress levels and confusion. In this study, participants will complete a series of tasks with a robot that will either swap between modes (autonomous, participant-controlled, and teleoperated) or remain in a single mode. We hypothesize that stress levels will increase when teaming with a mode-swapping robot compared to a single-mode robot. The results will be used to suggest design improvements to enhance efficiency of human-robot teams.

BENJAMIN JENKINS
“The Commodification of Social Movements”
Major: Economics
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Program Sponsor(s): Honors College

Rising out of the most important civil rights and social movements of our time, such as Me Too, Black Lives Matter, and the LGBT movements we see an increase in advertising leaping on these bandwagons. From the outright exploitative, such as the Kendall Jenner Pepsi commercial to the more agreeable Gillette commercials. All these companies claim to join in “woke” movements; however, they could not care less about actual social change but instead only seek to commodify public outrage and encourage brand affinity while running sweat shops and exploiting prison labor.

JAMIE LEE JUSTICE
“Antifeminism in U.S. Politics”
Major: Philosophy
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum & Instruction
Program Sponsor(s): Honors College

The 116th Congress represents the largest leap in women members since the 1990s, with 102 of 434 members being women. It is the first year that both muslim and Native American women will serve. Still, The United States is behind countries like Iraq regarding women’s participation in national parliaments, a country that “has turned deadly for women who dream of education and a professional career.” (Jamail, 2008) A survey of literature over the past 100 years will provide an understanding of progress, or lack thereof, of the deeply systemic and historical discriminatory gender norms that are extant in modern America.
ABIGAIL KANE
“Identification of a Mycobacterium spp. Endosymbiont in the Freshwater Snail Biomphalaria glabrata”
Major: Genetics & Biotechnology
Facility Advisor: Dr. Maria Castillo, Biology
Program Sponsor(s): College of Arts & Sciences
The snail Biomphalaria glabrata is an intermediate host of a disease-causing parasite. An endosymbiotic bacterium has been identified in other Biomphalaria species and is of interest due to the possibility of modifying this bacterium to develop a snail-biological control method. We hypothesized that the Mycobacteria will be present in our laboratory snail strains. This was tested using PCR with specific primers. Preliminary results show that it is present in both lab strains, supporting the potential strategy to use modified bacteria to combat disease transmission to humans. Future work aims to isolate and culture the bacteria for further study.

OMAR KHODARY
“Soil Aggregate Stabilization with Biopolymer Additives for Wind Erosion Control”
Major: Chemical Engineering
Facility Advisor: Dr. Reza Foudazi, Chemical Engineering
Program Sponsor(s): USDA, College of Engineering
Wind erosion can reduce soil productivity, fertility and health by removing topsoil from uncovered land. Crop growth is negatively affected due to the wind erosion eroding the soil depth and removing necessary minerals and compounds such as potassium, phosphorus, and calcium. New Mexico is specifically affected due to its dry climate, bare flat land, and strong winds. To combat this, plant-based biopolymers were sprayed on the soil at various concentrations and amounts to observe any changes to soil erodibility. The results from the tests conducted will be used to quantify the binding properties of biopolymers on soil particles to show the significant enhancement in compressive strength through the formation of a thin film on the surface of soil.

LAUREN KEENER
“Is Goal an Emotion?”
Major: Psychology
Facility Advisor: Dr. James Kroger, Psychology
Program Sponsor(s): BP-ENDURE (BRAIN)
Historically, electroencephalographs (EEG) have had difficulty recording emotion-related brain activity, because they depend on the arrangement of pyramidal neurons in cortex, and sub-cortical structures responsible for emotion do not share this arrangement. It is likely that emotion still has characteristic effects on cortical activity that might be seen in EEG recordings during emotional tasks. We presented participants with photographs of very desirable objects and experiences, and undesirable objects and experiences. They rated on a Likert scale how much they would like to buy the object or experience. We also recorded heart activity and galvanic skin response (GSR)

TALIA KOLIKANT, BAILEY BROWN, DANIEL HERRERA, ANALYSIA HOLGUIN
“Comfort Levels in Human-Robot Interaction”
Major: Economics
Facility Advisor: Dr. Marlena Fraune, Department of Psychology
Program Sponsor(s): College of Business
Industry sectors’ increased robotic presence has spurred new research analyzing qualities of robots to improve human-robot interaction. Social and Non-Social robots are expected to affect comfort levels due to participants positive or negative perception. Using a between-subjects design, participants interact with Social or Non-social robots by playing two different games and completing a survey after each game using Likert-scale questions to rate their levels of comfort with the robot(s). We expect Social robots to create more discomfort in participants than Non-Social robots due to fear priming enforced beforehand suggesting these robots can compare to human skill levels for future jobs.
ADRIENNE LEBLANC, ARACELI WILLS, CRISTINA COLLAROS, JAYDEN RAHALL

“Mental Health and the Education System”
Major: Family and Child Sciences
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction
Program Sponsor(s): College of Education

Mental health starts at home and is carried into the classroom. It is our job to support children throughout the trials and tribulations they face. Teachers must prepare to teach a child while integrating the welfare of a child into the classroom. A child needs adults they know value and care about them. One way to achieve this is to have children write and share personal testimonials as a form of counseling. It is the responsibility of educators to identify mental health issues and take the initiative to help students overcome these barriers which can affect their ability to learn.

ARIAH LEDAY

“Stimulation of Macrophage Phagocytosis of Pediatric Brain Tumors”
Major: Biology and Microbiology
Faculty Advisor: Dr William Maio, Chemistry
Program Sponsor(s): MARC

This project seeks to find an immunotherapeutic solution to pediatric brain tumors. We demonstrate that using monoclonal antibodies to facilitate interruption of the interaction between CD47 and SIRP, which are expressed on tumor cells and macrophages respectively, allows for the phagocytosis of otherwise-“inedible” brain tumor cells in vitro. In addition to this data, we find that this phagocytosis event is Fc-domain dependent and blocking the FcRs on macrophages attenuates tumor cell destruction. This data was found in mice but suggests a blockade of CD47-SIRP could potentially be used for therapeutics in human patients.

ESAI LOPEZ

“Remediation of Soil and Water at Legacy Uranium Mining Sites”
Major: Chemical Engineering
Faculty Advisor: Catherine Brewer, Chemical Engineering
Program Sponsor(s): MARC

Former uranium mines in northwestern New Mexico pose environmental and health hazards. Rain water and runoffs have caused leaching of mine tailings into the soil and water near the mine. This has resulted in contaminated soils as well as contaminated underground drinking water. The uranium present in the mines undergoes radioactive decay and produces radium as a product. The synergistic approach is to remediate both the water and soil by implementing a closed loop system. Preliminary analysis results found the radium concentration in the water was .1905 mg/L. The electrical conductivity of the soil and water to be 0.5 dS/m (site 29) and 2.3 dS/m, respectively. Concentrations of the metals were measured using an ICP-OES.

KARLA LOPEZ

“You talkin to me?” Interspecies communication fosters collaboration between closely related symbionts in the sepiolid squid-Vibrio mutualism”
Major: Genetics
Faculty Advisor: Dr. Michele Nishiguchi, Biology
Program Sponsor(s): MARC

Sepiolid squids serve as hosts for two bioluminescent bacterial species: Vibrio logei and Vibrio fischeri. Vibrio bacteria produce unique communication molecules known as acyl-homoserine lactones (AHLs) that are used to modulate light via quorum sensing. Since V. logei and V. fischeri differ in many physiological properties, we used a biosensor assay to evaluate the type of AHLs that are being produced by each species. We also created a mutation on the regulator gene luxO in V. fischeri to determine whether mutations at this locus affect the ability of bacteria to communicate within and between both species during symbiosis.
YVONNE LUCERO
“Southern New Mexico Dietary Practices and Carotenoid Content in Traditional Mexican Meals”
Major: Human Nutrition and Dietetic Sciences
Faculty Advisor: Dr. Ivette Guzman, Plant and Environmental Sciences
Program Sponsor(s): College of ACES

Carotenoids are health-promoting compounds found in fruits and vegetables. Traditional Mexican meals like red chile enchiladas, squash calabacitas, and red chile posole may provide new insights about dietary access to carotenoids. Carotenoid extractions were performed with 10 g samples for each meal and analyzed using beta-carotene, lutein and zeaxanthin standards via high-performance liquid chromatography (HPLC). The enchilada meal contained the highest total carotenoid amount with 1.47 mg/plate and the highest beta-carotene and zeaxanthin amounts with 403.2 ug/plate and 132 ug/plate, respectively. Calabacitas contained 112.8 ug/plate of lutein. Differences in preparation and other minor variations between meals were captured by HPLC.

SABRINA LUCERO
“How Temperature Affects the Activity of the Organ Mountain Colorado Chipmunk”
Major: FWCE Wildlife Science
Faculty Advisor: Dr. Jennifer Frey, Fish, Wildlife & Conservation Ecology
Program Sponsor(s): Fish and Wildlife Conservation Ecology

We explored the relationship between temperature and activity of the Organ Mountains Colorado chipmunk (Neotamias quadrivittatus australis). We deployed remote cameras and iButton temperature recording devices at 12 sites in the Organ Mountains from 13 July to 15 November 2018. The iButtons collected local temperature every half hour during deployment. To determine if temperature influenced chipmunk activity, we compared temperature at times of chipmunk detections to all temperatures from the study period. We ran a two-tailed t test and found the difference in temperatures to be significant. Our results indicate chipmunks might be more active during cooler temperatures.

RAQUEL MADRIGAL
“The Femme and Failure: Pink Queerness”
Major: Studio Art
Faculty Advisor: Rachel Stevens, Art
Program Sponsor(s): Honors College

The Femme and Failure: Pink Queerness questions heterocentric notions of family, personal worth, and success which imply that queerness is failure. The artist, Raquel Madrigal, uses materials to evoke the essentialist feminine body: nylons, hair extensions, and clothes. Madrigal manipulates and distorts these materials to communicate the queer body latent beneath Western structures of sexuality.

MARLIE MAESTAS
“CXCR4 regulation of Autophagy in Pregnant Ewes.”
Major: Biology
Faculty Advisor: Dr. Ryan Ashley, Animal science
Program Sponsor(s): AMP, College of ACES

Autophagy is a cell survival process whereby cells degrade and recycle cellular components to stay alive during stressful conditions. This study examined the levels of LC3B, the classic marker for autophagy in placenta from pregnant ewes after inhibiting the CXCL12-CXCR4 chemokine axis in utero. The CXCL12-CXCR4 pathway plays a major role in embryo attachment to the maternal endometrium and subsequent placental development. We hypothesized that disrupting the CXCL12-CXCR4 during placental development would induce autophagy in placenta. Greater LC3B abundance was observed in placenta on days 20 and 35 of gestation after inhibiting CXCL12-CXCR4 signaling compared to control.
**PRISCYLA MARQUEZ**

“Surface Complexation Modeling on Selenium Sorption on Iron-Modified Zeolites”

Major: Civil Engineering
Faculty Advisor: Dr. Lambis Papelis, Civil Engineering
Program Sponsor(s): AMP

Elevated concentrations of selenium in food and water are associated with adverse health effects. The most common forms of selenium in water are selenite and selenate. The objective of the project was to develop a model to describe the sorption of selenite and selenate on iron-modified zeolites. Experimental data were modeled using the triple layer surface complexation model (TLM) as a function of selenium concentration, ionic strength, and pH. The model can reproduce the observed trends in experimental data as a function of pH, ionic strength, selenium concentration, and oxidation state. For similar conditions, selenate has a much lower affinity for the iron-modified zeolite surface compared to selenite, therefore ionic strength affects selenate sorption substantially more than selenite.

**DANIELA MARTINEZ**

“Worldwide crisis associated with race, age, and gender”

Major: Pre-Nursing
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction
Program Sponsor(s): Honors College

Homelessness is a worldwide crisis, associated with race, age and gender. Half of the homeless population is known to be over the age of 50. African Americans make up 40% of the homeless population. Men compose the greatest part of the homeless population that being 60.2%, in comparison to women who form 39.1%. Homelessness has an impact in economy that is spread across the region, it also whose to have impact on retail sales, foreclosures, worker absenteeism, and increasing the use of emergency rooms. To improve this issue, several charity projects are now trying to fight homelessness in our nation.

**KARLA MARTINEZ**

“Colourism in the Latino Community”

Major: Social Work
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction
Program Sponsor(s): Honors College

In today’s society, there has been a misusage of the word racism. The meaning of racism is being prejudice, discrimination, or antagonism directed against someone of a different race based on the belief that one’s own race is superior. About 51% of the border patrol agents were Mexican or Latinos in 2016. Border Patrol Agents are said to protect the border from those who try to trespass into the United States. This shows discrimination against other Mexicans for trying to obtain a better life. This type of discrimination could be referred to as colourism, which is prejudice or discrimination against individuals with a dark skin tone, typically among people of the same ethnic or racial group.

**LIZET MARTINEZ**

“Transformation vs Conjugation: Developing a superior genetic tool for the Vibrio fischeri genetic engineering tool-box.”

Major: Microbiology
Faculty Advisor: Dr. Michele Nishiguchi, Biology
Program Sponsor(s): MARC, College of Arts & Sciences

The bacterium Vibrio fischeri is used to study environmental specificity in mutualistic associations with animal hosts. V. fischeri colonizes sepiolid squids (Cephalopoda: Sepiolidae), producing luciferase-based light which provides ventral counter-illumination camouflage for the squid. We have optimized (DNA composition, exposure time, and recovery time) an alternative method to the current cumbersome tri-parental mating technique, utilizing induced transformation rather than conjugation. Reduced time, cost, and simplicity, as well as being able to introduce linear DNA from PCR in addition to standard plasmids will lead to improved genetic analysis of how this symbiotic bacterium interacts with its squid host.
CLARA MAXAM

“Ovine Inflammatory Response to Inhibition of CXCR4 during Early Pregnancy”
Major: Animal Science
Faculty Advisor: Dr. Ryan Ashley, Animal and Range Science
Program Sponsor(s): HHMI

Immunological changes after inhibiting chemokine receptor 4 (CXCR4) at the fetal-maternal interface in sheep were investigated. Pumps containing CXCR4 inhibitor (AMD3100) or saline (control) delivered treatments directly into the uterus. Blood was collected daily, on days 20 and 35 of gestation spleen and uterine horn cross sections were collected for analysis. Compared to control, less IL10 was observed on day 35 in uterine luminal epithelium. In spleen, TGFB1 increased while IL10 decreased on days 20 and 35, respectively upon CXCR4 inhibition. Results indicate disrupting CXCR4 signaling in the uterus impacts the cytokine levels in tissues outside of the uterus.

LAURINA MEDIAVILLO

“Assessing the Role of Zn Transporter Genes in Paracoccus denitrificans”
Major: Biochemistry
Faculty Advisor: Dr. Erik Yukl, Chemistry and Biochemistry
Program Sponsor(s): BP-ENDURE (BRAIN), College of Arts & Sciences

Zinc is an essential element for bacterial growth and is acquired through ATP binding cassette (ABC) transporters using high affinity solute binding proteins. We have deleted genes thought to be involved in zinc acquisition in the model organism P. denitrificans. Here we evaluate the growth and survival of these mutants in zinc-limited media. We conducted a bacterial growth curve analysis and measured colony forming units. Growth activity of mutated P. denitrificans will provide us a better understanding of the role of these genes in zinc acquisition and highlight the gene products as potential targets for the development of antibiotics.

RENE MCPHERSON, SEAN CHRISTESON, MERCEDES WALT

“An Interactive Interface Assisting Students with Their Studies”
Major: Psychology
Faculty Advisor: Dr. Marlena Fraune, Psychology
Program Sponsor(s): College of Arts & Sciences

The primary goal of this project is to develop an interactive website that will aid students in their academic journey. The website will enable users to ask questions, and receive responses in a timely manner. A gamification aspect of the website will incentivize users to answer questions as accurately as possible. We tested two paper prototypes and gained feedback that we incorporated into our final prototype. The final prototype included a user profile, and a shared feed where users can interact. The expectation is to create an online community of students who will challenge themselves while simultaneously assisting their peers.

KARLY MILLER

“Effects of phospho-Tau Mutations on Neuron Survival After Oxidative Stress Treatment”
Major: Genetics and Biotechnology
Faculty Advisor: Dr. C.Brad Shuster
Program Sponsor(s): BP-ENDURE (BRAIN)

Alzheimer’s disease (AD) is characterized by the death of large populations of neurons in regions of the brain closely associated with memory and learning. At the cellular level, accumulation of a toxic protein (MAP-Tau) within neurons forms neurofibrillary tangles, eventually leading to apoptosis. When neurons are exposed to oxidative stress, tau becomes hyper-phosphorylated and is no longer able to bind microtubules. The result is loss of transport along axons. We created a cell line from rat-derived dopaminergic neurons (N27A) that overexpresses an AD-associated human mutant tau gene (P301L). Immunohistochemical stainings show that these mutant cells have hyper-phosphorylated MAP-Tau protein in tightly clustered, intracellular aggregates modeling AD.
ALAN MOYA
“Energy Valorization of Food Waste via Hydrothermal Liquefaction”
Major: Chemical Engineering
Faculty Advisor: Mr. Umakanta Jena, Chemical Engineering
Program Sponsor(s): AMP, College of Engineering

Wet food waste slurries can be converted into high value products by hydrothermal liquefaction (HTL) that can be used as suitable alternatives to fossil fuels. Changing temperature, pressure and reaction time, desired product yield and composition can be obtained at an optimal reaction condition. In the actual HTL experiment temperature conditions ranged from 240-295°C with a solid concentration of 15%. The three most common products produced under the experimental conditions were biocrude oil, char, and gas. CHNSO analysis will be performed to determine composition of products obtained to create a detailed mass/energy balance.

AHMED MUHYI
“Investigation of the effect of additives and water bath composition on the properties of ultrafiltration polyethersulfone membranes”
Major:Biology
Faculty Advisor: Dr. Reza Foudazi, Chemical and Materials Engineering
Program Sponsor(s): SMART

We study the effect of additives, guar gum and sodium alginate, on the properties of ultrafiltration polyethersulfone (PES) membranes. We added 0-0.5 wt% additives in the 18 wt% PES/dimethylformamide (DMF) solutions via the NIPS process. We also studied the effect of water bath composition on the properties of final membrane. We added 10 and 20 wt% calcium chloride (CaCl₂) to the water bath to alter the phase separation process. The water flux values of membranes were tested using dead-end filtration. Results show that the incorporation of additives as well as addition of CaCl₂ to the water bath, decrease the water flux of membranes resulting in decreased pore size. These results will be used for the study of this study can be used for the smaller pore size and more pollutant rejection.

FALLON MURPHY
“Afrofuturism and Its Implications on African-American Student Participation in STEM”
Major: Communication Studies
Faculty Advisor: Dr. Eric Morgan, Communication Studies
Program Sponsor(s): Discovery Scholars

Afrofuturism is a genre of media which explores the relationship between African-American cultural practices and identity and technology within futuristic contexts. This study will explore the effects of popular Afrofuturism media on discourses about science within African-American communities. We assert that, with various media such as Black Panther gaining popularity, changes in discourse and attitudes about African Americans in the sciences will occur. Through the collection of qualitative data regarding attitudes, the collection of data on African-American student participation in STEM curricula, and the observance of African-American students’ conversation on the topic, this research seeks to prove that a shift in discourse has occurred.

ALANA MURPHY
“Labeled”
Major: Digital Filmmaking
Faculty Advisors: Mr. Sherwin Lau, Creative Media Institute
Program Sponsor(s): Discovery Scholars

Elevated concentrations of selenium in food and water are associated with adverse health effects. The most common forms of selenium in water are selenite, and selenite. The objective of the project was to develop a model to describe the sorption of selenite and selenate on iron-modified zeolites. Experimental data were modeled using the triple layer surface complexation model (TLM) as a function of selenium concentration, ionic strength, and pH. The model can reproduce the observed trends in experimental data as a function of pH, ionic strength, selenium concentration, and oxidation state. For similar conditions, selenate has a much lower affinity for the iron-modified zeolite surface compared to selenite, therefore ionic strength affects selenate sorption substantially more than selenite.
ANA NATERA
“Evaluating the sensitivity of a spectral flow cytometer”
Major: Chemical Engineering
Faculty Advisor: Dr. Jessica Houston, Chemical Engineering
Program Sponsor(s): College of Engineering

Flow cytometry is a bioanalytical approach in which measurements of fluorescence from fluorescently tagged cells are made to rapidly characterize a variety of cell features. In this research we utilize a spectral flow cytometer, which measures a broad emission spectrum from each cell. In order to evaluate the sensitivity of this system, we have designed an experiment in which we evaluate the “minimum equivalent soluble fluorochrome (MESF) detectable. Our results demonstrate MESF values can be used to approximate the signal-to-noise for this instrument. By continuously measuring the MESF over time, we can assess how sensitivity might decrease over time.

IBRAHIM NDAYOU, SALEH AL-RAEESI, ALONSO CORRAL, D’ONTEE SANDOVAL
“Internet of Things (IoT) Rain Gauge Device”
Major: Mechanical Engineering
Faculty Advisor: Dr. Young Ho Park, Mechanical & Aerospace Engineering
Program Sponsor(s): NIFA

The purpose of this project is to improve upon an existing rain gauge design currently in use with CoCoRaHS. This is done by making it more automated to allow for more accurate and frequent data collection. Our team proposes to create an additional package to the current design that consists of introducing a load cell and circuitry to calculate the amount of rain in inches from the weight of the water collected. This will allow for a digital readout for users as well as data transmission to the database without human interaction.

TRUNG NGUYEN
“Biophysical Characterization of DNAJB1-PRKACA in Fibrolamellar Hepatocellular Carcinoma”
Major: Genetics and Biotechnology
Faculty Advisor: Dr. Barbara Lyon, Chemistry and Biochemistry
Program Sponsor(s): HHMI

Fibrolamellar Hepatocellular Carcinoma (FL-HCC) is a rare pediatric liver cancer that occurs on a healthy background of young patients without underlying liver diseases. The primary driver of FL-HCC is a chimeric fusion between the catalytic subunit alpha (PRKACA) of protein kinase A and the J-domain of the heat shock protein 40 (DNAJB1). We are performing a biophysical characterization of the DNAJB1-PRKACA chimera versus the wild-type protein kinase A to understand differences in thermodynamics and kinase activity due to the J-domain’s fusion in the chimera, which may modify the protein’s phosphorylation function, thereby changing its signaling network implicated in FL-HCC development.

JONATHAN ORTIZ
“Development of reliable reduced-order models of carbon nanotube-based sensors”
Major: Mechanical Engineering
Faculty Advisor: Abdessattar Abdelkefi, Mechanical & Aerospace Engineering
Program Sponsor(s): AMP

Carbon nanotubes (CNTs) are essentially rolled sheets of graphene with diameters and lengths on the order of several nanometers. Due to their unique material properties, such as high tensile strength, high flexibility, lightweight structure, and high electrical and thermal conductivity, CNTs have become a hot topic of research in nanotechnology. Their applications range from components in micro-electromechanical systems (MEMS), nano-electromechanical systems (NEMS), highly sensitive mechanical resonators and sensors, as novel targeted drug delivery systems, and more. In this work, efforts are made to mathematically model CNTs from a dynamical and vibrational point of view, rather than from traditional experimental or chemistry points of view. Specifically, CNTs as highly sensitive mechanic
PABLO PARADIS

“Anodic oxidation”
Major: Electrical Engineering/Physics
Faculty Advisor: Dr. Stefan Zollner, Physics
Program Sponsor(s): AMP

Anodic oxidation is a widely acknowledged electrochemical process that produces thick and stable oxides on metallic surfaces, which enhances the surfaces’ resistance to corrosion in particular engineering applications. This process requires a significant voltage drop at the desired surface inside an electrolyte solution. The idea is to control oxide thickness as one varies the applied voltage bias across the substrate. We hope to develop a method of anodic oxidation in various solutions as a function of applied voltage. To confirm desired results, one can plot conductivity as a function of oxide thickness, as we know the two are inversely related.

ANDREW PARRA

“Characterization of a Caulobacter crescentus mutant strain with a “chubby” morphology”
Major: Biochemistry
Faculty Advisor: Dr. Paola Mera, Chemistry and Biochemistry
Program Sponsor: BP-ENDURE (BRAIN)

The role of multidrug efflux pumps in correlation to drug resistance and cell development is not well understood in cancers and bacterial infections. We have isolated a mutant of Caulobacter crescentus resistant to structurally different antibiotics with altered morphology. Using growth curves and Colony Forming Unit assays, I showed that this mutant was less viable and displays a slower growth rate. Under high-resolution microscopy, the mutant displays a “chubby” phenotype compared to wild-type. We are currently reconstructing the mutant strain to confirm phenotype and to better understand the connections between efflux pumps and cell morphology.

VICTORIA PEREA

“Using Instrument-Assisted Soft Tissue Mobilization To Improve Musculoskeletal Functioning Following Injury”
Major: Athletic Training
Faculty Advisor: Prof. Michael Gregory, Kinesiology and Dance
Program Sponsor(s): Honors College

Instrument-assisted soft tissue mobilization (IASTM) is a manual therapy technique for treating musculoskeletal injuries using tools designed to manipulate and modify injured tissues. Based on previous studies, it is believed that IASTM helps in the healing process by increasing overall patient functioning. The purpose of this literature review is to examine the efficacy of IASTM, and consider patient outcomes following the use of this manual technique on healing tissues. This subject is important for clinicians, and researchers, to guide future treatment decisions and the implementation of best practices to achieve optimal patient outcomes.

KITT PHI

“Simulating an open terrain visual search environment in three-dimensional virtual reality”
Major: Computer Science
Faculty Advisor: Dr. Michael Hout, Psychology
Program Sponsors: Discovery Scholars

This project simulates an outdoor “clue search” task in a virtual environment. The virtual environment is modeled after a real-world location wherein participants conduct a difficult, open-terrain visual search task. Our simulation is intended to allow participants to experience a parallel, VR-based version of the same search task. We hope to replicate basic behavioral patterns and search performance in the VR environment. These replications would provide a proof of concept that VR models may be used to simulate real-world search tasks, allowing for significantly more experimental control and more precise observations of participants’ behavior and performance.
To be eligible for asylum in the United States, migrants must prove that they have faced persecution, or have a well-founded fear of future persecution, based on their “race, religion, nationality, political opinion, or membership in a particular group.” Unfortunately, these five categories exclude many persecuted groups, inhibiting them from attaining asylum. Many of the groups that are neglected by the asylum laws are extremely vulnerable groups. I will examine the various forms of prejudice the United States’ asylum laws present and interview local immigration lawyers to determine how this prejudice is manifested in the surrounding border region.

Creosote is a shrub widely used medicinally that differs in ploidy levels among populations found in North American deserts. The role of ploidy variation in the specific medicinal properties of the species has not been explored. Therefore, the primary goal of this project is to test the hypothesis that there is a correlation between ploidy and differences in the bioactive compounds present in the species. the development of antibiotics.
**FELICIA RODRIGUEZ**

“Using fluorescence lifetime-based flow cytometry to profile metabolism in cultured cells”

Major: Chemical Engineering  
Faculty Advisor: Dr. Jessica Houston, College of Engineering  
Program Sponsor(s): BP-ENDURE (BRAiN)

Flow cytometry can detect fluorescence from a range of excitable intracellular proteins, enzymes, lipids, and other molecules. Reduced nicotinamide adenine dinucleotide (NADH), is one such compound that naturally fluoresces when excited a 375-nm. NADH is an important cofactor for cellular metabolism and has a unique fluorescence lifetime shift (F.L.S.) that correlates with certain metabolic pathways. In this work, we measure F.L.S. with a uniquely designed flow cytometer in order to profile the metabolism of cultured breast cancer cells when treated with tamoxifen. We expect to extend this work to metabolic changes within neurodegenerative diseased cell models.

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**GABRIEL RONQUILLO**

“Sex Education and Its Impact on the Latinx Community”

Major: Government  
Faculty Advisor: Dr. Judith Flores-Carmona, Curriculum and Instruction  
Program Sponsor(s): Honors College

The following presentation will examine the relationship between teenage pregnancy—namely within the Latino community—and a lack of sex education within high schools, including the various factors that may influence lack thereof on a national, state, and local level. Factors analyzed will involve religious stigma and beliefs, immigration patterns, cultural values, and gender expectations pertaining to the Latino community. This presentation will also analyze the differences, if any, in teenage pregnancy rates between U.S. born and foreign-born Latinos and why such differences may occur.

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**JADZIA RODRIGUEZ**

“Influence of Local and Landscape Factors on Burrowing Owl Artificial Habitat Site Occupancy in Arizona”

Major: Wildlife Science  
Faculty Advisor: Dr. Martha Desmond, Fish, Wildlife and Conservation Ecology (FWCE)  
Program Sponsor(s): Natural Resources Career Tracts (NRCT), Wilson Ornithological Society (WOS), Jed Burtt Undergraduate Mentoring Grant, College of ACES

The Western Burrowing Owl (Athene cunicularia hypugaea) is declining throughout its range. One common conservation and mitigation strategy involves the relocation of owls to artificial habitat. However, few studies have examined the influence of local and landscape factors on artificial burrow occupancy. We will assess how factors such as the site size, number of burrows, date of establishment, time since last maintenance and dominant land-use type influence occupancy of artificial habitat in the Phoenix, AZ area. Findings will allow us to provide recommendations for site selection to improve the methods of creating viable habitats.

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**IZAK RUBIO**

“Immunofluorescence Study of Adult and Regenerating Muscle and Electric Organ Tissues in Eigenmania virescens”

Major: Biology  
Faculty Advisor: Dr. Graciela Unguez, Arts and Science  
Program Sponsor(s): MARC

Eigenmania virescens is a weakly electric fish with a muscle-derived electric organ (EO) that produces electric signals for communication and sensory purposes. Previous studies in the closely related gymnotiform Sternopygus macrurus showed that adult EO cells (i.e. electrocytes) continue to express muscle proteins, and after tail amputation fast myosin heavy chain-containing fibers appear to fuse and form electrocytes. The study will determine the myogenic phenotype of adult electrocytes and regeneration process of E. virescens using an immunofluorescence approach as done previously. These data will inform the extent to which the regeneration processes are conserved among electric fish species.
**Felipe Escalante Salaiz**

“Crossing of Bed Bugs with different Insecticide Resistance Profile for use in insecticide-Efficacy Test”

Major: Horticulture  
Faculty Advisor: Dr. Alvaro Romero. Entomology, Plant Pathology, Weed Science  
Program Sponsor(s): AMP

In the last 20 years the world had witnessed a sudden resurgence of bed bugs. This is a blood-feeding insect that has become a public health problem because its bite produces itchy reaction to the skin as well as a psychological impact on affected people. Bed bugs have been reported spreading dramatically in all the 50 states of US and Predictions indicate that this urban pest will stay in modern society for many years. Application of insecticides is the most common method control infestations. However, the intense use of them has led to the development of insects “immune” or resistant to commonly used insecticides used as pyrethroids and neonicotinoids. The presence of bed bug populations resistant to insecticides complicate the management of this pest because this reduces the effic

**Marianne Salas**

“Environmental Justice, Prejudice, and Law”

Major: English and Government  
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction  
Program Sponsor(s): Honors College

The following presentation will analyze environmental justice as defined by the EPA and what its implementation may mean in terms of combating air pollution, water pollution, and other adverse effects of climate change on a national and state-based scale. This presentation will look into recent statutes and public policy efforts made by New Mexico in order to reduce said effects and if such laws may prove as injustices to people of various socioeconomic backgrounds. Lastly, and connected with the previous point, this presentation will examine factors that may affect individualistic efforts of climate change.

**Concepcion Sanchez**

“Determining how metabolism is altered during tamoxifen resistance in breast cancer cells”

Major: Biochemistry  
Faculty Advisor: Dr. Jessica Houston, Chemical & Materials Engineering  
Program Sponsor(s): HHMI

Metabolic intermediates within cells like Nicotinamide Adenine Dinucleotide (NAD(P)H) have been shown to be endogenous fluorophores. Changes in NAD(P)H lifetimes can be attributed to changes in metabolism of the cell which can be helpful in diagnostic techniques. Fluorescence lifetime measurements can indicate if a cell is in a disease state (i.e. cancer) and give insight into metabolic alteration occurring after treatment of drugs. To create a metabolic profile of breast cancer cell lines (resistant and susceptible to Tamoxifen), a lifetime-measurable flow cytometer will be used to track NAD(P)H lifetime shifts of these cells after treatment with Tamoxifen.

**Karen Sanchez**

“Remediation of Soil and Water at Legacy Uranium Mining Sites”

Major: Chemical Engineering  
Faculty Advisor: Dr. Catherine Flores Brewer, Chemical Engineering  
Program Sponsor(s): College of Engineering

Leaching from spent ore piles and mine tailings, and small particles moved by the wind, have concentrated uranium and uranium decay products (radium) in the soil and water near legacy uranium mines in northern New Mexico. According the U.S. EPA, the most likely source for human exposure to uranium and radium is through drinking water. One effective approach for preventing exposure is a combined remediation of the water and soil. Algae will be used to extract uranium and radium from contaminated groundwater; plants will be used to extract the elements from the soils. Biomass from the algae and terrestrial plants will be evaluated for their potential to produce biofuels. Methods will be developed to quantify concentrations of uranium and radium absorbed through the remediation strategies.
ALMA SANDOVAL, EFRAIN GARCIA, YATZIL MARRERO
“The Role of a Teacher in Making a Difference in Our Borderland Community.”
Major: Early Childhood Education
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction
Program Sponsor(s): Honors College

Living, growing and learning in a borderland community led us to understand how important education is for our culture and for ourselves. The lack of support that students face from their teachers leads to misunderstanding of a subject, negative experiences which lead to drop-outs or poor academic skills. Teachers may not make prioritize students’ learning or are not prepared or trained to be a teacher which affects the education of a student’s life. The success in our community lies in our own hands and taking the responsibility of becoming an educator is one that we should make a priority.

NICHOLAS SANDOVAL
“The Injustice of Hispanic Students”
Major: Economics & International Business
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction
Program Sponsor(s): Honors College

Hispanic students have the lowest college attainment rate out of any other ethnicity group. The overall purpose of this study is to learn why their numbers are so low and the factors that go into this compared to other ethnicity groups. Latinos are disproportionately poor, living in low-income communities where the schools aren’t preparing children for the rigor of college courses. As they enter adulthood, many are supporting their families and don’t have the luxury to focus on schoolwork. Economic factors and Immigration remain an obstacle to college enrollment for many Hispanics.

CIARRA SANNER
“Inequalities in the Workplace”
Major: Family and Child Sciences.
Faculty Advisor: Dr. Judith Flores Carmona, Curriculum and Instruction
Program Sponsor(s): Honors College

When thinking of inequalities in the workplace, the most common thing thought of is the wage gap between men and women. Inequalities, such as ageism and sexism, play huge factors. It’s essential to see that sex and age segregation causes implications between customers, co-workers, and managers. While ageism is most commonly directed towards older adults, it can affect younger people. Sexism can determine authority in situations, which otherwise would be neutral. The limitations imposed are unspoken, unwritten rules that are daily applied. There are many steps to be taken to help prevent ageism and sexism in the workplace.

BRIAN SAUNDERS
“Comparison of beam and shell theories for the modeling of different-sized CNT-based bio-mass sensors”
Major: Mechanical Engineering
Faculty Advisor: Dr. Abdessattar Abdelkefi, Mechanical and Aerospace Engineering
Program Sponsor(s): AMP

In our research, we investigated the linear free vibration and dynamic behavior of carbon nanotubes (CNT) for nanoscale mass sensing applications. We modeled CNTs as both an elastic Timoshenko beam and Flügge shell with an atomic mass deposited at an arbitrary location along the CNT longitudinal axis. Eringen’s nonlocal elasticity theory accounts for size-dependent effects that become influential at the nanoscale. We then performed a parametric study to compare the models to an Euler-Bernoulli model. This determined the effects of terms such as transverse shear deformation and rotary inertia on the sensitivity of the CNT to the nanoscale object’s mass.
SEAN SMITH
“Vertical Profiling of Dust in the Troposphere using Modular Open Source Micro-Controllers in Multiple Environments”
Major: Engineering Physics
Faculty Advisor: Prof. Michael DeAntonio, Physics
Program Sponsor(s): AMP

The primary goal of this project will be to build and utilize a modular control system for existing dust sensors. We will be using the Engineer Design Process to analyze existing technology to control a particle counting dust sensor, store data, and send it via radio transmission to a remote data collector to detect dust and possibly the precursors of forming dust storms. The design will be such that it can used for aerial or ground platforms.

JANEL SOWERS
“Overexpression of Insulin-like Growth Factor Binding Protein 1 (IGFBP-1) in Breast Cancer Cells Results in Tamoxifen Resistance by Hyperactive MAPK and ERK Signaling”
Major: Biochemistry
Faculty Advisor: Dr. Kevin Houston, Chemistry and Biochemistry
Program Sponsor(s): MARC

Tamoxifen is a common treatment for estrogen receptor-positive (ER) breast cancers. Tamoxifen functions, in part, via activation of G protein-coupled-estrogen receptor and accumulation of the insulin-like growth factor binding protein 1 (IGFBP-1). We hypothesized that IGFBP-1 accumulation is required for tamoxifen resistance. Cells engineered to overexpress IGFBP-1 were tamoxifen resistant and had hyperphosphorylated MAPK similar to chemoresistant cells. ERK-mediated-pathway inhibitor cotreatment restores tamoxifen sensitivity. This suggests IGFBP-1 overexpression leads to Tamoxifen resistance by dysregulated ERK signaling.

HALEY STEWART
“Federal Indian Land Policy and the Tribes of New Mexico”
Major: Government and Criminal Justice
Faculty Advisor: Dr. Thaddieus Conner, Government
Program Sponsor(s): Honors Capstone

The challenges faced by American Indian tribes resulting from federal policies aiming to divide and diminish them is a common focus of Indigenous literature. However, it is often difficult to determine the effects of federal policy on the diverse New Mexico tribes. The Pueblos, while known for their rich cultures and their unique status of sovereignty recognized when the United States absorbed New Mexico, are often overlooked in the discussion of federal policy affecting the tribes located within America. In this thesis, the effect of federal policies affecting Indian lands will be examined in context of tribes within New Mexico.

DAVID STOLTZFUS
“Towards the Total Synthesis of Laingolide A”
Major: Chemical Engineering
Faculty Advisor: Dr. William Maio, Chemistry
Program Sponsor(s): MARC

Laingolide A is a 15 membered macrolide produced by Lyngbya bouil lonii, a cyanobacteria found on Laing Island in Papua New Guinea. This natural product was isolated and its structure was determined by high-field 1D and 2D NMR, although the naturally occurring stereochemistry was never reported. As of 2016, a total of 64 macrolides had been isolated and studied; many of these macrolides have shown promising pharmacological activity including antibacterial, antitumor, and antimalarial bioactivity. In the present work we provide a proof of concept for the ring expansion step in the total synthesis of Laingolide A. In order to mimic the ring expansion step in this planned total synthesis, an alcohol containing azide was first prepared by epoxidation of an alkene and then ring opening using sod.
In this presentation, the four us will address factors that impede educational attainment for our local community. The staggering data from the Chicana/o Educational Pipeline shows that many students are literally getting pushed out of schools. Based on research about graduation, tracking, subtractive teaching/schooling, and the lack of counseling at a Borderlands school district, we intend to compare national data to local statistics. A number of factors lead to different “leaks” in the educational pipeline that target Students of Color but Latinx students in particular. We will explore these issues employing a critical multicultural approach that zeros-in on intersectionality.

Proper development requires that a single sperm binds and enters the female oocytes. A specialized vesicle termed a cortical granule (CG) undergoes exocytosis in response to sperm binding, and its contents prevent polyspermy. We identified a burst of actin polymerization following hormone stimulation, and we hypothesize that this actin aids in CG translocation to the membrane. Towards these ends, we have generated two fluorescent probes for CGs, and have tracked CG motility during oocyte maturation using 4D confocal timelapse microscopy. We have identified two modes of motility; long distance movement deep in the cytoplasm and shorter movements closer to the membrane.

Beyond genetic and biological components of medicine, some aspects, called social determinants of health (SDH), also shape our overall health and well-being. Examples of SDH include food security, personal safety, financial security, and employment. In this presentation, I will present preliminary data on a mixed methods approach to evaluate an SDH screening tool in a primary care clinic. Through patient and physician interviews, as well as patient-physician interaction observations, this project not only investigates whether SDH are addressed by physicians in encounters with their patients, but possible barriers to the discussion and resolution of the social determinants affecting patients health.
CHRISTINA VAQUERA
“Improving Human-robot Interaction Efficiency During Robot Mode Swaps”
Major: Public Health Sciences
Faculty Advisor: Dr. Rebecca Palacios, Public Health Sciences
Program Sponsor(s): U54 Cancer Outreach Core, College of Arts & Sciences

A Colorectal Cancer Screen to Save Initiative in Dona Ana County
Colorectal cancer (CRC) is the second most commonly diagnosed cancer and third leading cause of cancer death in the US. The National Cancer Institute launched the Screen to Save (S2S) Initiative to increase CRC screening rates among adults 50 years or older from racially and ethnically diverse communities. The NMSU Cancer Outreach Program collaborated with community partners to implement the S2S intervention in Dona Ana County. Participants were administered a pre-survey, the S2S intervention, post-survey and given a free at-home CRC screening kit. We hypothesize that CRC knowledge, screening intention and completion will increase significantly after implementation of S2S activities.

KRISTAL VARGAS
“In Search of Nutraceuticals in Capsicum species”
Major: Horticulture
Faculty Advisor: Dr. Ivette Guzman, Plant and Environmental Sciences
Program Sponsor(s): MARC

The xanthophyll lutein is beneficial in preventing macular degeneration, promoting brain development and healthy cognitive function. Different genetic varieties of yellow chile peppers contain varying amounts of carotenoids including lutein. Thirty-four yellow peppers were extracted and analyzed for lutein and total carotenoid content. Chromatography results from thirty-four yellow Capsicum fruits indicated that only six varieties contain high amounts of lutein and one variety contained 67% lutein of the total carotenoids found in the fruit. This research profiled chile carotenoids and may be used to increase the health promoting compound lutein in other Capsicum species.

DANIEL VELASCO
“Who Really Killed Martin Luther King Jr.? His family says the wrong man went to prison”
Major: Kinesiology
Faculty Advisor: Ms. Judith Carmona, Curriculum and Instruction
Program Sponsor(s): Honors College

Racism is a main theme within this “Justice Without Prejudice” class, so I decided to do my URCAS project on one of the most prominent activists that has impacted the recent history within the United States. Our history has been blessed with certain individuals that are capable of uniting people that were socially oppressed by the government and society. Martin Luther King Jr. is the most iconic example of an activist that dedicated his life towards the sole purpose of inspiring change within his own people. He simply did not accept the unfair treatment that was prevalent within the United States half a century ago. The movement that he created ended up costing him his own life but it allowed the African-American community to move forward in life with courage.

AMANDA VILLALOBOS
“Grief, and its Agonizing Stages - a short film”
Major: Digital Filmmaking
Faculty Advisor: Prof. Julian Alexander, Creative Media Institute
Program Sponsor(s): Honors Capstone

My film is centered on overcoming grief. Losing somebody you love is something no one can prepare for, but LUCY, my protagonist, discovers how to move forward. Despite being a short film we will explore multiple stages of grief as we pass time through Lucy’s perspective. From denial and depression, to learning how to stand without the support of the person she loved so much - all leading up to Lucy’s graduation day. This is a story that is very close to my heart and I want to remind people to love those close to them, because nothing truly is promised.
MOLLY WILLIAMS
“The Effects Of Yoga On Speech Rate Entrainment And Turn Taking In Children With Autism Spectrum Disorder”
Major: Communication Disorders
Faculty Advisor: Dr. Heike Lehnert-Lehouiller, Communication Disorders
Program Sponsor(s): Honors Capstone

Autism Spectrum Disorder (ASD) is characterized by deficits in social communication that are causally linked to this population’s high anxiety levels. Evidence shows yoga is an anxiety reducing activity. In this study, participants with ASD completed a recorded common-goal conversational task before and after a thirty-minute yoga practice. Pre and post yoga recordings were analyzed using acoustic software PRAAT for prosodic and pragmatic conversational features, specifically speech rate entrainment and turn taking. Results show yoga didn’t affect the speech rate entrainment of those with ASD but did increase conversational efficiency by reducing conversational turns needed to reach a common goal.

MADELEINE WOODWARD
“Prima Donna (Screenplay)”
Major: Digital Filmmaking
Faculty Advisor: Prof. Amy Lanasa, Creative Media Institute
Program Sponsor(s): Honors Capstone

After losing a major audition, a soprano reliant on fame and audience adoration is sent on tour in remote United States towns. Suddenly expelled from her European concerthouse, she is reduced to singing in America’s middle school cafeterias, where unexpected connections with fellow musicians reframe her outlook on love, passion, and music. She realizes that music is not a luxury for elite audiences, but is a source of joy and inspiration that belongs to all. Prima Donna is based on the ideals of the Piatigorsky Foundation, which brings world-class musicians to perform for remote and disadvantaged communities across the US.

APRIL WRIGHT
“Hydrothermal Liquefaction of Wastewater Algae”
Major: Chemical Engineering
Faculty Advisor: Dr. Catherine Brewer, Chemical and Materials Engineering
Program Sponsor(s): AMP

Wastewater algae can be used to produce bio-crude oils through hydrothermal liquefaction (HTL). Co-solvents, glycerol in particular, may have the ability to improve the yields and quality of the bio-crude oils from HTL of wastewater algae. Glycerol is a byproduct of biodiesel production that could potentially find a higher-value and fuel-related application as a co-solvent. In this study, wastewater algae was acquired the 700 L pilot photobioreactors at the Jacob A. Hands Wastewater Treatment Plant in Las Cruces, NM. HTL was performed in a 1.8 L batch reactor using reagent-grade glycerol and crude glycerol from a local biodiesel company. HTL uses subcritical water (270°C-350°C and 8-18 MPa) as both a solvent and reaction medium to convert complex organic matter into energy-rich bio-crude oil.

FAY YURWIT
“Migration and Integration in Munich”
Major: Government & German
Faculty Advisor: Dr. Sabine Hirschauer, Government
Program Sponsor(s): Honors Capstone

Migration is among the most salient global issues, complicated by restrictive policies and exclusionary attitudes. My goal is to use Munich as a case study to analyze how international and regional frameworks encourage or restrict the integration of asylum-seekers into the host community, considering how the native majority perceives the foreign minority may influence or reflect shifting policies. My research will be conducted over the course of a five-week period from June to July in the summer of 2019 with the support of Caritas, a non-governmental organization and one of the world’s leading humanitarian aid providers. The data I collect will serve to improve humanitarian responses to the contemporary crisis of global migration.