

# Abstracts for Talks & Performances

**Emma Alvarez de la Rosa**, “Lullabies on the Border: Lullaby Singing and Parenthood in the Maquiladora Society of Ciudad Juárez”

Majors: Music Performance and Anthropology; Honors Capstone

Faculty Advisor: Dr. Lois Stanford

Lullabies play important roles in children’s development, mother’s well-being, and healthy parent-child relationships. These songs also compromise musical repositories of cultural values and traditions. This honor capstone examined the presence of lullabies in the Valle de Juárez and Ciudad Juarez region grounded in ethnographic and ethnomusicological analysis to understand their importance in the border region’s culture. The conclusions discuss the impacts of maquiladora work on maintaining the lullaby tradition and the potential impacts on parent-child bonds. The project relied on ethnographic fieldwork to gather data as well as bibliographical research. The main part of the fieldwork was completed during the summer of 2022 at El Museo Regional del Valle de Juárez. Musical transcription and analysis of both lyrics and melody were completed, as well as open-ended interviews with participants. Concerning the persistence of lullabies, results detail a decline in lullaby singing, reflecting the historical increase in maquiladora work, the main source of income for most families of the region.

**Emma Alvarez de la Rosa**, “Rehabilitating the Amador Family Collection”

Majors: Music Performance and Anthropology; Honors Capstone

Faculty Advisor: Dr. Nathan Craig

The Amador family was among the most influential families of the late 19th century and early 20th century Las Cruces, greatly contributing to the city's development. Their famous Amador House and Amador Hotel once stood in the city's downtown, reflecting their importance in old Las Cruces. Beginning in 1962, several objects belonging to the Amador family were donated to the University Museum, creating what is now referred to as the Amador Collection. This presentation examines the University Museum's work in organizing and rehabilitating the Amador Collection. Using the museum’s archival records and collection surveying, the Museum staff has been able to correctly identify more than a hundred objects from the collection, many of which had been mislabeled or were not present in the museum’s electronic collections management system. The museum's Amador Collection, in conjunction with the NMSU Special Collection Archives, provides important information on the lives of this influential family and shows the long history of Hispanic heritage in the region.

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**Angel Eduardo Amabisco**, “CBP One App and the Digital Dispersion of Information”

Major: Government; Immigration Policy and US-Mexico Border Communities NSF-REU;

Honors Capstone

Faculty Advisor: Dr. Neil Harvey

Since the new global reliance on what is labeled as digital humanitarianism to respond to asylum seekers of today, the United States implemented the CBP One App of which has proven itself to

be not only a modern form of externalization but gave birth to new networks of migrants spreading and informing themselves on the asylum process in the United States. The researcher, Angel Amabisco took part in an NSF-REU opportunity where students from all over the country conducted qualitative interviews in migrant camps near the El Paso and Ciudad Juarez border in the summer of 2023. The team's findings showed how asylum seekers rely more on social media apps like TikTok compared to border officials to educate themselves on the process to seek asylum which highlights a new evolvement of information sharing but also misinformation. The researcher will present on his own behalf and Dr. Neil Harvey will serve as the faculty sponsor for the project. Angel is doing this presentation for a capstone project to graduate with full honors.

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**Juliette Chavez Gil and Karen Ramirez, “Object Detection and Static Obstacle Avoidance for UAS Operations”**

Majors: Juliette Chavez Gil (Mechanical Engineering Technology) and Karen Ramirez (Mechanical Engineering); ROLE Program

Faculty Advisors: Dr. Hilda Cecilia Contreras Aguirre and Dr. Luis Rodolfo Garcia Carrillo;  
Graduate Student Mentors: Nicholas Grivalja and Jesus Martinez

The research activities of the team of students and their mentors are supported by the NSF-funded Research-Oriented Learning Experiences (ROLE) program. The main objective of this project is to enhance the obstacle avoidance and object detection capabilities of Unmanned Aircraft Systems (UASs), with a particular focus on surveillance and flight surveillance operations. In order to accomplish the goal, our team of researchers are utilizing various software and hardware tools, including Python, the Robot Operating System (ROS), a motion capture system (MCS), and the camera-equipped Tello UAS. Additionally, we are incorporating novel algorithms like You Only Look Once (YOLO) and the Open Computer Vision (CV2) library. The team's technique uses a math model to map pixels to real-world distances, building on CV2's object detection libraries. These algorithms aim to calculate distances between the UAS and static objects nearby. Detecting and avoiding static obstacles is crucial for safe and timely obstacle avoidance maneuvers in UAS surveillance missions. This project is a significant step towards improving UAS capabilities for various real-world applications.

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**Jonathan (Jack) Davis, "Duel with an Out-of-control Sappho without Sorrow or a Handkerchief”**

Major: English, Creative Writing

Faculty Advisor: Creative Writing instructors

"Duel with an Out-of-control Sappho without Sorrow or a Handkerchief", a prose-poem-play, was inspired by 1) the fact there are no known Elizabethan plays that feature a female dueling with a male, 2) the case of the 17th century Irishwoman Kit Cavanagh, who while cross-dressed as a man in the English army, almost killed a soldier defending the honor of another woman (usually duels were NOT about third-parties). Instead of being hung, Kit was expelled from the English army, but managed to join a new unit: "A Few, Good Men" eh! 3) "Requiem for a Nun" by William Faulkner; "nun: was the Elizabethan Protestant code word for "prostitute." After I

read the work (1 page) and thank my teachers, I hope to spark a possible "out of control" discussion as to "What is literature today?"

"Oh death, where is thy sting, oh grave, where is thy victory?" Shortly before WWI, my wife's maternal grandmother Victoria Feliner Kaiser, left her home town of San Sebastián in the Spanish Basque country as a teenager for Paris, along with a young friend named Cristóbal, to learn haute couture'; WWI sent both back to neutral Spain, where Victoria's business thrived while Cristóbal's did not. After WWI, Cristóbal returned to Paris to try again, Victoria married, had three daughters and never left Spain again. And why did she not marry Cristóbal, her long-time friend and fellow designer? In this poem, you will learn why the fashion design company founded in Paris by Cristóbal BALENCIAGA marked its centennial in Paris (1918-2018), while Victoria's company in Spain went to hell...literally...and never came back, in 1936. I originally wrote the poem in Spanish and then translated it into English.

**Jonathan (Jack) Davis**, "Hamlet, Prince of China: Contemporary Shakespearean Politics on the World Stage"

Major: English, Creative Writing

Faculty Advisor: Dr. Tracey Miller-Tomlinson

Shakespeare (1564-1616) first arrived in China on a British warship during the Opium Wars (1839-1860). At first, he languished in obscurity. But after Chinese republic was founded (1912), Shakespeare was embraced as a model for "modernity." Yet even though Marx embraced the Bard, after the 1949 Communist Revolution, Shakespeare went back into hiding. Then, after Mao's death (1976), the Bard re-emerged, China held its first Shakespeare festival in 1986, and foreign Shakespeareans came to China. *Hamlet, Prince of Denmark* has been translated into Mandarin at least ten times, and there are many movie versions and theatre adaptations. Yet phrases like "To be or not to be" cannot be translated into Mandarin, nor does China have Greco-Latin or Judeo-Christian roots. But the Bard is now part of British-Chinese foreign relations; as one Chinese scholar has written, "The story of Shakespeare in China is as much a story about China as it is about Shakespeare."

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**Amber Diaz**, "Development of a Kalman Filter for Attitude Determination and Control of a Satellite Mission"

Major: Mechanical & Aerospace Engineering; NanoSat Lab INCA-2

Faculty Advisor: Dr. Steve Stochaj

For satellite missions, it is important to determine and control the orientation of the system to achieve mission objectives. As for the Ionospheric Neutron Content Analyzer (INCA) mission, the objective is to gather data on the latitude and time dependencies of the neutron spectrum in low earth orbit. With this in mind, we must ensure that the orientation of the satellite is positioned to accurately collect data and remain in communication with the ground station. To achieve this goal, a rate gyro and a magnetometer will be used as sensors, while the Kalman Filter being developed will be used to measure the rotational rate when it can't be measured directly. Since the environment model is assumed to have Gaussian noise, the Kalman Filter can also find the best state estimate as it takes the inputs as an initial state and converges to the best estimate for the state of the system. Then, a Monte Carlo algorithm can be run several

times to find random samples of the convergence time. This data will be useful in preparing for the launch by reducing the error of the sensors and improving the time it takes the Kalman Filter to converge.

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**Amelia Dunn, “Contemporary Dance Choreography as Emotional Expression”**

Major: Dance; NMSU Dance Theatre

Faculty Advisor: Director Ryan McMullen, NMSU Dance Program

In my artistic research, I aimed to use a self-choreographed dance performance to convey the complex emotional and sensory experience of being an entertainer. Through individual embodied practice, I incorporated multiple dance techniques such as modern and improvisation. This led to the experimentation of specific textures and intentions of movement that could facilitate the emotions of the performer. In addition to choreography, I explored how sound, costume, and lighting design can create an immersive experience for the audience. While simultaneously being choreographer and performer, it was useful for me to understand how to feel present and vulnerable on stage so that I may go on to articulate this to others.

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**Michelle Gutierrez, “Evaluating the efficiency of a progesterone radioimmunoassay to predict pregnancy and fetal numbers in ewes”**

Major: Animal Science; MARC

Faculty advisor: Dr. Jennifer Hernandez Gifford

Accuracy of pregnancy diagnosis in late-gestation is important for adjusting nutritional demands and management protocols. The objective of this study was to evaluate the efficiency of serum progesterone (P4) concentrations quantified via radioimmunoassay to determine pregnancy and number of lambs born. Blood samples were collected via jugular venipuncture at d100 of gestation (term ~147 d) from 373 ewes in this seven-year study. Progesterone concentration thresholds for predicted lamb number were: non-pregnant ( $\leq 3.8$  ng/mL), single (3.9 to 12.5 ng/mL), and multiple lambs ( $\geq 12.6$  ng/mL), and were compared to lambing data. We hypothesize that application of this threshold will provide a reasonable method of accuracy in predicting fetal numbers. The P4 radioimmunoassay was 99% accurate in predicting pregnancy at d 100 of gestation and 74% accurate in determining fetal number. This method could provide producers reliable pregnancy determination and allow for improved management practices accommodating for single or multiple lambs.

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**Devynne Hadley, Jessica Barrio, Alexandra Dimauro, Fisher Easley Smith, Kylie Garcia, Yvette Peters, Tanya Solis, and Thelma Solis, “The Agora, an interdisciplinary undergraduate journal of research and creativity**

Majors: Devynne Hadley (English, RPC), Jessica Barrio (Biology), Alexandra Dimauro (Psychology), Fisher Easley Smith (MA, Agricultural & Extension Education), Kylie Garcia (Communication; Minors: Journalism, Social Media Management), Yvette Peters (English), Tanya Solis (Philosophy), and Thelma Solis (Psychology)

Faculty Advisors: Dr. Tracey Miller-Tomlinson and Susan Beck

*The Agora* is an interdisciplinary undergraduate journal of research and creativity from the Honors College and the Library at New Mexico State University. The journal strives to provide a space for undergraduate students to share their research papers, creative works, and any other projects through an open-access and peer-review process. The editorial team behind *The Agora* consists of undergraduate and graduate students. Our URCAS presentation will give an overview of the submissions in our second edition as well as show how we have expanded our journal since publishing our first edition in the Spring of 2023. We will share our overall mission with *The Agora* and how we have continued to achieve it.

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**Mariah Leonard**, “Role of PRC1 in regulating microtubule stability during cytokinesis and midbody formation”

Major: Biology, NM AMP

Faculty Advisor: Dr. Charles B. Shuster

In animal cells, cytokinesis is initiated by microtubules of the central spindle, which direct assembly of the contractile ring. A complex containing Protein Regulator of Cytokinesis (PRC1) is thought to bundle central spindle microtubules and is essential for cytokinesis. However, in cultured human cells, PRC1-depleted cells can complete cytokinesis up to the midbody stage, where they fail to undergo abscission. We hypothesize that in PRC1-depleted cells, the post-anaphase microtubules are not sufficiently stable to organize a midbody. To examine microtubule stability in living cells, we employed StableMark, which preferentially binds stable microtubules. When co-expressed with fluorescent probes for all microtubules, this probe will allow us to determine whether stable microtubules are lost in PRC-depleted cells. Efforts are also underway to examine stable microtubules in large, embryonic cells, where less stable microtubules define the cleavage plane. Together, these studies will help define PRC1’s role in microtubule organization and stability during cytokinesis.

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**Zenaida Levario**, “Mental Health and Agriculture: Investigating Agricultural Programming and Tools Supporting Veteran Mental Health”

Major: Agricultural & Extension Education; LEADING Hispanics Program

Faculty Advisor: Dr. Shannon Norris-Parish.

Conducts a qualitative systematic literature review with a focus on peer reviewed journal articles published between 2007 and 2024. Establishes inclusion criteria that are related to agriculture, gardening, and veteran mental health and remove unrelated articles by establishing exclusion criteria. Maintains relevant articles and inductively code articles to identify themes and subthemes related to the impact of agricultural pursuits and programming on veteran mental health. Establishes a qualitative framework describing the overall phenomenon.

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**Vanessa Loera**, “Glioblastoma Causes, Treatments, and Prevalence in New Mexico”

Major: Biology; Minors: Human Biology and Chemistry; Honors Capstone

Faculty Advisor: Dr. Elba Serrano, Biology

Glioblastoma is a type of malignant brain tumor that arises from glial cells in the brain, particularly astrocytes. It is the most deadly form of primary brain tumor in adults and even with aggressive therapies such as surgery, radiation, and chemotherapy, the prognosis for patients with glioblastoma is generally poor, with a median survival of around 12 to 18 months. This project uses open access primary and review articles, and open data sets to research the common causes, treatments, and diagnosis of Glioblastoma's, while also looking at the prevalence and effects it has on the New Mexico community. The review found that the eastern side of New Mexico has the highest rates of new cases and deaths of brain cancer, while also having limited access to Hospitals and Cancer centers. This impact on eastern New Mexicans shows that there needs to be more equal access to health care and new treatments.

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**Isaac Melendrez**, “A Post-Translationally Modified Virulence Factor in Non-Typeable *Haemophilus influenzae*”

Major: Biochemistry; MARC

Faculty Advisors: Dr. Erik Yukl, Dr. Graciela Unguez, Dr. Olivia Manley

Non-typeable *Haemophilus influenzae* (NTHi) is a pathogen causing COPD exacerbations in adults. NTHi lacks a vaccine, unlike typeable strains. Genome mining revealed NTHI1441, inducing host virulence within a biosynthetic gene cluster with a DUF-692 family protein. We hypothesize NTHI1441 as a ribosomally synthesized post-translationally modified peptide (RiPP). NTHI1441 maturation involves interactions with DUF-692 and DUF-2063 proteins (NTHI1443 and NTHI1444), leading to its activation. Our study aims to identify the PTM site in the 95-amino acid NTHI1441 peptide via truncations and mutagenesis. Co-expression with NTHI1443 and NTHI1444 yields post-translationally modified NTHI1441, exhibiting a detectable 302 nm chromophore. Truncations in the N-terminal retain the chromophore, while C-terminal ones lack it, indicating PTM presence in the C-terminal domain. Ongoing site-directed mutagenesis aims to pinpoint the amino acid responsible for the chromophore.

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**Joshua Mendoza**, “Bee-lining Conservation: Addressing Trap Waste and Seasonal Dormancy in Bee Research”

Major: Environmental Science

Faculty Advisor: Dr. Ashley Rodhe

Solitary bees comprise 70% of native bee species, but little is known about their life-histories beyond their critical role in pollination. In the face of decreasing bee population densities around the world, improved understanding of the life-cycles of solitary bees is vital for conservation and ecosystem management. Lethal passive trapping methods, while commonly applied for bee research, are criticized for indiscriminate capture of non-target species. Methods to study living solitary bees, particularly during seasonal dormancy, are not well developed. Our research addresses these issues by (i) refining commonly used passive lethal traps to minimize non-target captures and (ii) developing a novel method to trap and observe dormancy in living solitary bees. Successful implementation of our methods will provide crucial data from previously unstudied

life-stages in native solitary bees, improving our understanding of their life-histories and conservation statuses.

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**Ian Nelson**, “Measurements of the rate of insect DNA degradation in field-deployed passive traps”

Major: Biology

Faculty Advisor: Dr. Brook Milligan, Scarlet Sellers

Blue vane traps (BVTs), passive traps commonly used to efficiently capture native bees, are used by ecologists and can be set for extensive periods of time for lethal capture. Data from passive traps are often not applied to molecular ecology studies and there is currently little information on the rate of DNA degradation of captured samples. To understand the tradeoff between time in the trap and DNA quality of samples, we measured the effects of environmental exposure on DNA following extraction. We simulated field conditions with bee samples left in BVT treatments varying in exposure time. We predict that DNA degradation will be highest when the samples are exposed longer and the degradation rate will increase over time, with intermediate times producing sufficient and useful DNA. This experiment will improve efficient use of passive trapping in arthropods and the understanding of environmental impact on DNA quality.

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**Karla Ortega-Sandoval**, “Metabolic profiling of tamoxifen-sensitive and tamoxifen-resistant breast cancer cells utilizing a high-throughput time-resolved flow cytometer and fluorescence lifetime imaging microscopy”

Major: Chemical Engineering; Minor: Biomedical Engineering; MARC; Honors Capstone

Advisor: Dr. Jessica Houston, with Dr. Kevin Houston and Samantha Valentino

In this project, we use time-resolved flow cytometry to measure autofluorescence lifetimes to identify metabolic profiles of tamoxifen resistance in breast cancer cells. NAD(P)H and FADH autofluorescence lifetimes have been correlated to the metabolic pathways oxidative phosphorylation and glycolysis. The prospective analysis is to utilize an optical redox ratio of NAD(P)H/FAD, to analyze the metabolism of the ER-positive breast cancer cell line T47D with flow cytometry and fluorescence lifetime imaging microscopy (FLIM). These techniques will be used to analyze the metabolism of tamoxifen-sensitive cells and tamoxifen-treated cells over the course of twenty-one days until full resistance development. The goal is to develop an understanding of the baseline metabolic profile of tamoxifen resistance in breast cancer with the T47D ER-positive cell line and assess the adequacy of the redox ratio of NAD(P)H/FAD to measure progressive resistance development.

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**Marissa Padilla**, “The Impact of Variations of Urban Microclimate on Transcription of Midgut Immune Genes in Aedes Mosquitoes”

Major: Biology; MARC

Faculty Advisor: Dr. Kathryn Hanley

Our world is constantly remodeled by humans. One of the most impactful anthropogenic effects

is urbanization- the expansion of cities at the cost of natural and agricultural lands. Urbanization alters local microclimate (temperature and humidity) and is therefore likely to affect the spread of mosquito-borne viruses such as dengue and Zika. In this project, we tested whether transcription of immunity genes changed in *Ae. albopictus* mosquitoes, a key vector of urban mosquito-borne viruses, that were reared in conditions that simulated the microclimate of highly urbanized areas in Manaus, Brazil, or in Manaus forested parks. Midgut RNA was subjected to qRT-PCR to quantify transcription of immune genes relative to housekeeping genes. We found that rearing *Ae. albopictus* in urban-like microclimates didn't significantly change immune gene transcription compared to forested parks. This suggests slight temperature and humidity differences between urban areas and parks may not significantly impact mosquito susceptibility to arboviruses.

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**Elena Pearson**, “The Impact of Ect2 on the Mechanical Functions in the Cytoskeleton in Sea Star Oocytes during Meiosis”

Major: Biology; MARC

Faculty Advisor: Dr. C Brad Shuster

Female meiosis represents a highly asymmetric cell division that results in a single gamete. Meiotic re-entry also triggers several changes that prepare the oocyte for fertilization and development. In starfish, oocytes are rested in G2 of meiosis I, and upon stimulation with a hormone, undergo M phase entry within 30 minutes. Interestingly, G2-arrested oocytes have the highest cortical tension levels measured for any cell type; but following hormone addition, cortical tension levels drop as the oocyte enters meiosis. We hypothesized that the changes in the mechanical properties of oocytes are driven by the RHO-GEF Ect2. *Patiria miniata* oocytes were injected with NG-ECT2 mRNA to localize Ect2 prior to and following hormone stimulation. Prior to hormone stimulation Ect2 was localized within the nucleus, however, following GVBD Ect2 was found within the cytoplasm and cortex of the oocyte. Current efforts are aimed to knockdown Ect2 to measure polar body formation.

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**Fin Pelowitz**, “LGBTQ+ Identities in STEM”

Major: Biochemistry

Faculty Advisor: Dr. Paulette Vincent-Ruz

Many of the ways that STEM classes are organized are directly based on classist, racist, and sexist backgrounds. These foundations come primarily from straight, cis, white men with an interest in maintaining the status quo. This, however, causes direct harm to minority groups and individuals, leading to students lacking motivation, confidence, and ability to perform in these hostile or cold environments. This research presentation focuses on looking in-depth at LGBTQ+ students enrolled at a college level in STEM majors or courses in order to analyze and amplify their experiences with a goal of understanding what unique and shared experiences and difficulties they face.

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**Yvette Peters**, “The Yellow Wallpaper’: Discharging Hysteria”  
Major: English, Creative Writing; Minor: Music; Honors Capstone  
Faculty Advisor: Rose Conley

This presentation will be looking into Charlotte Gilman's "The Yellow Wallpaper", comparing the yellow wallpaper within the story to women's bodies, especially in relation to their reproductive organs and their excrements. This will include connecting Gilman's imagery and themes with the current (at the time of publication) societal views and hindrances on women's bodies as well as the stigmas surrounding it, with certain focuses on the mental health impact of such pressures. The points will be substantiated by research that spans medical journals, historic accounts, and literary analyses previously published on "The Yellow Wallpaper". There is no or very little research published based on the connection of vaginal reproductive systems and the wallpaper, so this presentation (and the essay it is based on) will be adding new perspective of research to the existing catalog of literary analysis.

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**Kennedi Pyper**, "The Impact of Synthetic Cannabidiol Derivatives (+)-abnCBDP and (+)-abnCBD on Trophoblast Proliferation and Viability”  
Major: Genetics and Biotechnology  
Faculty Advisors: Dr. Ryan Ashley and Dr. Amanda Ashley

Cannabidiol (CBD) is the major non-psychoactive component of cannabis and is commonly reported to be used during pregnancy for treatment of related discomforts. Cannabinoid receptors are expressed throughout the placenta and may play a role at critical steps in early development, including during placentation and implantation which depend on properly regulated trophoblast cell proliferation, migration, and invasion. A significant knowledge gap exists describing how disrupted endocannabinoid system homeostasis can influence reproduction, especially trophoblast functions. Our objective is to elucidate how exogenous cannabinoids may perturb normal processes and affect pregnancy outcomes. To investigate this, we synthesized a novel cannabinoid, derived from the (+)-abnormalcannabidiol (abnCBD) scaffold, a compound noted for its potent vasodilatory and anti-inflammatory properties. This derivative, (+)-abnormalcannabidiphorol (abnCBDP), was evaluated alongside abnCBD and CBD for changes induced to cellular functions. Results from our studies will provide valuable insights into the roles cannabinoids and the endocannabinoid system play during placental development.

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**Abril Romero**, “The effect of warming on decomposition rates of dryland fungi”  
Major: Biochemistry; MARC  
Faculty Advisor: Dr. Adriana L. Romero-Olivares

Global climate change profoundly impacts ecosystems worldwide, yet one understudied effect of climate change is the effect of increasing temperatures on fungal decomposition, especially in dryland ecosystems such as the Chihuahuan Desert. Therefore, in this study, I aim to quantify how rising temperatures affect decomposition rates in dryland fungi. I measured decomposition rates of mesquite leaves by eighteen species of dryland fungi exposed to two different temperatures of 27°C (control) and 37°C to simulate rising temperatures. Preliminary results

under control conditions showed species-specific decomposition rates of mesquite. Under warming, I anticipate increased decomposition rates compared to control conditions. My findings are pivotal to understanding the extent of climate change in dryland ecosystems and can help predict the adaptive capacities of dryland fungi to changing environments. Additionally, exploring the decomposition rates of these fungi under higher temperatures can help us better predict greenhouse gas emissions from dryland ecosystems under climate change.

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**Celeste Romero, “Underground Journalism at NMSU”**

Major: History

Faculty Advisor: Dr. Ken Hammond

Throughout NMSU’s history, underground student journalism has been a tool for change and a way for students to expand free speech on campus. The tradition of underground journalism, which exploded in the 1960s during a time of protest against NMSU’s mandatory ROTC program and the censorship of President Roger Corbett’s NMSU administration, has carried on into the present century, with papers like *The Ground-Up* providing an alternative voice on campus.

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**Flora Saenz, “Dancing Borders: A Visual Journey”**

Major: Animation & Visual Effects, Honors Capstone

Faculty Advisor: Judith Flores Carmona

"Dancing Borders," is a project that weaves together my journey as a rookie animator on a real feature film with two compelling digital drawing series: "Folklor" and "Life at the Border." Growing up in a country with so much art and culture, it is hard to place one’s artistic passion and become grounded with one’s personal artistic abilities. I want “Dancing Borders” to be a lens into how the culture and beauty of Mexico translates into my daily life while also showing how I have started working on placing myself in the artistic industry. This project encapsulates personal growth, cultural exploration, and artistic expression. The research for this project will be focused on the cultural artistry of Mexico and history of Juarez. The filmmaking, animation, and VFX aspect will be tackled through a memoir-esque retelling of successes.

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**Delaney Sivils, Maya Jones, and Alexa Alvarez, “From Soil to Saving Lives: Discovering Antibiotics from Unexpected Sources”;** presented by Delaney Sivils

Major: Biology; BIOL 2110L at DACC

Faculty Advisor: Dr. Concepcion M. Miller

Infections caused by bacteria can be anything from a sore throat to life-threatening ailments like a central nervous system infection. The wide variety of infections caused by bacteria leads to the need for many different antibiotics. But with antibiotic resistance, effective antibiotics are rare. To find promising bacterial isolates, serial dilutions were performed from a soil sample and the isolates obtained were tested against human-safe pathogens *Enterococcus raffinosus* (a safe relative of *Enterococcus faecium*) and *Enterobacter aerogenes* (a safe bacterium from the

*Enterobacter* species) using spread/patch methods. Tests resulted in one isolate that showed an area of antibiotic production against *E. raffinosus* on TSA media. However, this result was not seen when retested on Muller-Hinton media. The promising isolate was Gram-positive, and it was identified through the Biolog Identification system as *Bacillus atrophaeus*. Further identification of the isolate could provide a new antibiotic to be used against *E. raffinosus* infections.

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**Tanya Solis**, “Nonhuman Animals, Rationality, and Cognitive Abilities (A collection of essays on Animal Ethics)”

Major: Philosophy; Honors Capstone

Advisor: Dr. Jean-Paul Vessel

In this project, I will discuss issues about nonhuman animals, rationality, and moral intelligence. In the first essay, I hope to demonstrate that in Christine Korsgaard’s book, *Fellow Creatures*, the distinction she draws between humans and nonhumans when it comes to rationality is incorrect. In the following essay, I will discuss and analyze a concept I call “moral intelligence” and argue that any satisfactory normative theory needs to take into account the varying degrees of cognitive abilities of nonhuman animals and humans. Finally, I will include a third essay in which I will argue that it is morally permissible to allow some breeds of dogs to serve in the armed forces. The final product will be a collection of essays (something akin to an anthology) related to animal ethics on rationality and cognitive abilities.

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**Andrew Villalobos**, “Associations Between Socioeconomic Status Variables and Cognitive Abilities”

Major: Psychology; McNair Scholars Program

Faculty Advisor: Dr. Andrew Conway

Previous research has demonstrated that students from Low SES backgrounds typically perform less well on cognitive tasks and exhibit lower cognitive abilities. However, much of the existing research lacks extensive and varied participant samples. This study employs baseline data (N=10,404) from the Adolescent Brain Cognitive Development Study (ABCD), to explore the association between environmental factors—specifically, combined household income and parent education—and cognitive abilities. Cognitive abilities were assessed using the NIH Toolbox-Cognition Battery, with participants falling within the age range of 9 to 10 years old. The analysis adopts a three-factor structure, involving working memory, verbal ability, and executive functions. The findings reveal that low-SES children tend to exhibit lower scores across all three factors. Notably, the most substantial difference is observed in verbal ability. Suggesting that verbal ability interventions should be targeted toward low SES children."

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**Lacey Yates**, “Deciphering STEM: Diversity in STEM”

Major: Human Development and Family Sciences

Faculty Advisor: Dr. Paulette Vincent-Ruz

My research project is figuring out why students do not want to pursue a career in STEM and what we have been doing in our classrooms to help students develop an identity in STEM. Also, for students who are Dyslexic, what can we do to help students learn and understand chemistry and possibly consider pursuing a STEM-related career.