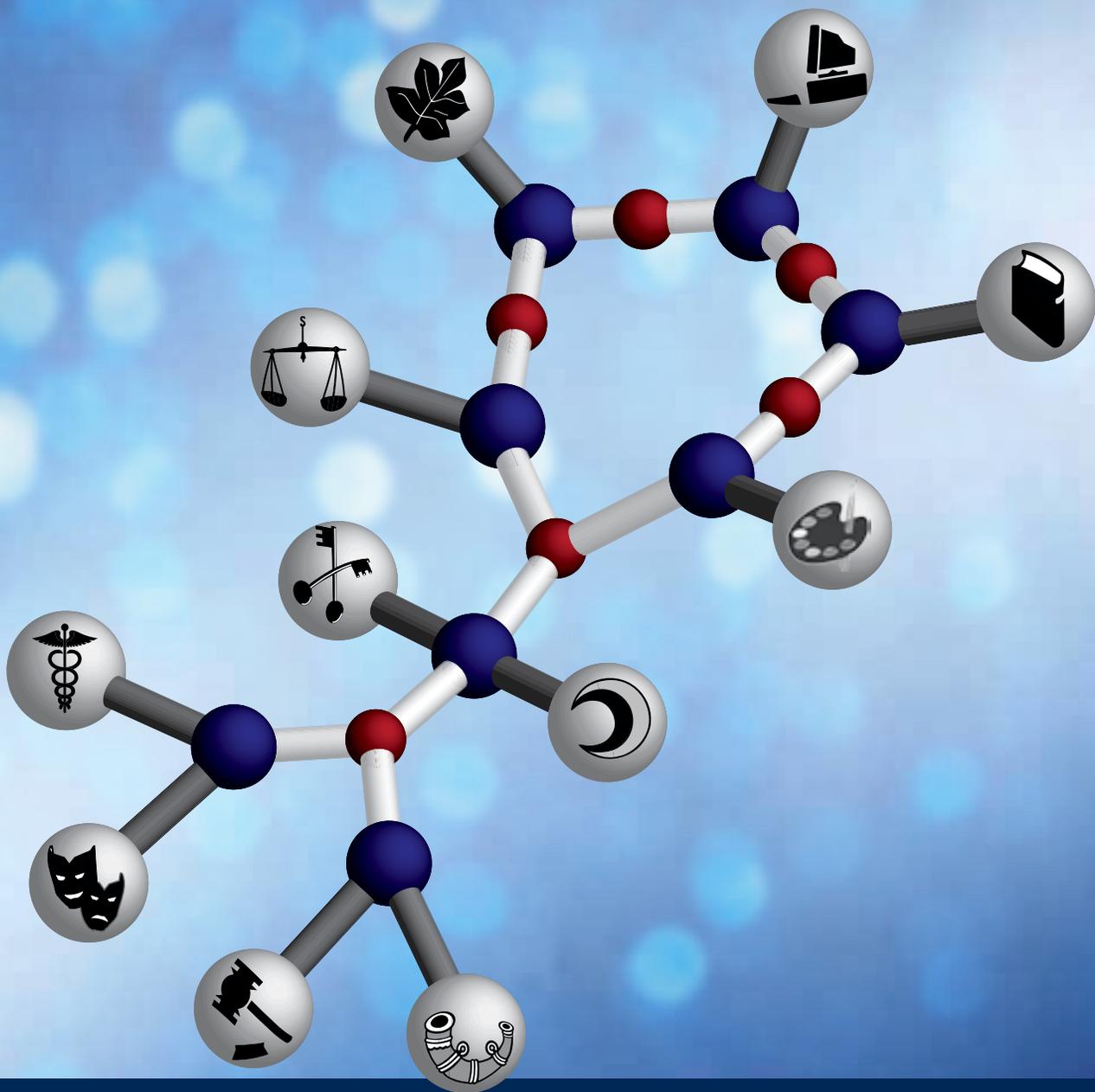


15th Annual

Student Research SYMPOSIUM

April 8, 2022



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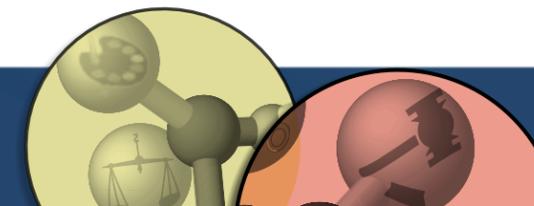
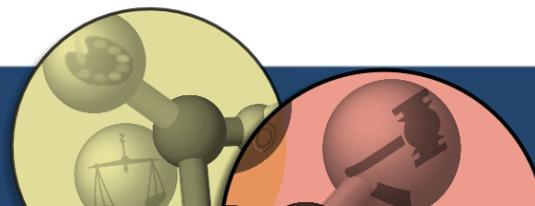
Greetings!

The University of Arkansas - Fort Smith proudly welcomes you to the 15th Annual Student Research Symposium. Our faculty and staff are committed to fostering an environment that promotes not only learning but also enlightenment. As you will see in today's presentations, our students have accepted the challenge, explored unique areas of research, and synthesized their results in the form of lectures, studio art, demonstrations, posters, and performances.

These presentations represent the academic diversity of UAFS's programs and the intellectual excellence of our students. On their behalf, thank you for your participation. I invite you to engage the presenters during the question-and-answer segments of their presentations. Your active involvement ensures that UAFS remains a dynamic learning community.

A handwritten signature in cursive script that reads "Georgia M. Hale".

Dr. Georgia Hale
Provost and Vice Chancellor for Academic Affairs



Oral Presentations

Library 122 – Presentations in History, Arkansas History, and Finance

- Noon [Megan Sonnenmoser – Remember the Ladies, Black Men, and Indigenous Peoples: The Forgotten Memory of Women and Minorities During the American Revolution](#)
- 12:30 [Jerry Rico – The Works of Rex Nelson and the Impact to Arkansas's History](#)
- 1:00 [Nicholas Thompson – The Effects of Pandemics on Stock Market Returns and Volatility](#)

Library 202 – Presentations in Nursing and Healthcare Administration

- Noon [Kain Suh – Evidence-Based Practice in Typhoid Fever](#)
- 12:30 [Alexis Kleman & Makayle Stone – Vaginal Seeding: A Literature Review](#)
- 1:00 [Megan Hamerlein – Factors Associated with the Overutilization of Laboratory Testing](#)

Library 203 – Presentations in English

- Noon [Chelsea McKim – Women and Keats: Feminism in Masculine Romanticism](#)
- 12:30 [Avreigh Watson – Women Support Women: A Vindication for Protofeminists](#)
- 1:00 [Melanie Bradley – Plausibility and Jane Austen](#)
- 1:30 [Emilee Hatwig – The Importance of Victorian Upper Class and Gender](#)

Library 206 – Presentations in Education, Rhetoric & Writing, and Colonialism

- Noon [Victoria Schmitt – All Means ALL: Inclusion of Students with Low-Incidence Disability](#)
- 12:30 [Alina Chuong & Allen McCullers – Reflections of the Teacher Apprenticeship Experience](#)
- 1:00 [Emily Clem – Missing and Murdered Indigenous Women and Girls: From “Killers of the Flower Moon” to the Present](#)
- 1:30 [Holly Farrar – Digital Empire](#)

Library 209 – Presentations in Technology, Electrical Technology, and Control Engineering

- Noon [Aaron Tomlin, Yu-Cho Pang, & James Moore Jr. – Team Mini Hulk](#)
- 12:30 [Hayden Pittman & Ethan Owens – The Design and Use of a Smart Key Cabinet](#)
- 1:00 [Cooper Black & Kalen Griffin – Resonant Capacitive Coupling Using a Vacuum Tube Tesla Coil](#)
- 1:30 [Ian Schweizer – Coupler Controller Redesign](#)

Health Science 121 – Presentations in Engineering, Geoscience, and Animation Technology

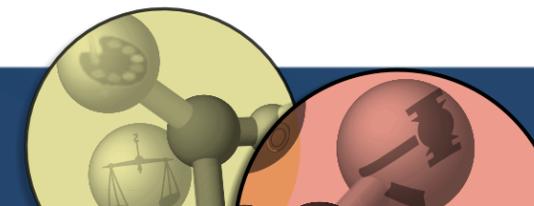
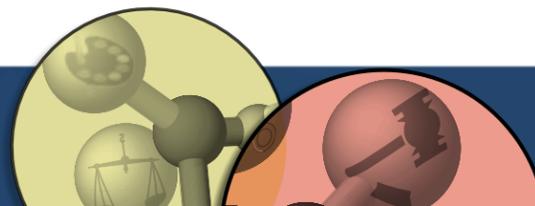
- Noon [Mason Sayers, Spencer Simpson, Cassandra Bell, & Beau Nelson – Intelligent Vehicle Challenge](#)
- 12:30 [Anthony Ming, Rebecca Martinez, Ben Philpot, Rylynd Bullington, & Drew Montgomery – Lunar Terrain Vehicle](#)
- 1:00 [Jacob McLain – Regional Perspective on Joints in the Mid-Pennsylvanian McAlester Formation, Arkansas](#)
- 1:30 [Michael Cruz – The Use of Real-Time Rendering Through Game Engines Impact on the Movie Industry](#)

Health Science 124 – Presentations in Music History, Women's Studies, Musicology, Media Communications, and Global Complexities

- Noon [Jaymz Vance & Nikita Wemmerus – Digital Discoveries: Six Lost Works by Anna Amalia, Duchess of Saxe-Weimar-Eisenach Uncovered in Archduke Rudolph's “Musikalien Register Nr 9”](#)
- 12:30 [Melissa Hayden – Conductor, Composer, Philanthropist: The Life of Emma Roberto Steiner](#)
- 1:00 [Jillian Rose – “Are We Going to Prom or Hell?": A Rhetorical-Cultural Analysis on “Heathers”](#)
- 1:30 [Brittany Morris – Various Complexities from Around the World](#)

Health Science 133 – Presentations in Computer Science and Electronics

- Noon [Julton Sword – Deep-Seeker: Autonomous Robotic Path-Recognition Network](#)
- 12:30 [An Le, Adrian Cuevas, & Fernando Estrada – Keep It Clean, Don't Be Mean: Multimodal Intent Classification](#)
- 1:00 [Josue Martinez & Austin Figueroa – Automatic Sentiment Aggregation of Social Media](#)
- 1:30 [Isaiah Russell, Angie Palacios, & Devin Turley – Portable Solar Water Heater](#)



Poster Presentations

Noon to 2 p.m., Boreham Library

Table 1 – Biology: [Hannah Smith – The Effect of the SLC24A4 Gene on Amelogenesis](#)

Table 2 – Biology: [Danielle Randolph & Joshua Thammathong – Dictyostelium Discoideum as a Host: Microbe Model for Screening Drug-Like Therapeutic Candidates \(DLTCs\) for Anti-Virulence Properties](#)

Table 3 – Biology: [Kairy Galvez – Testing of Quinazolinone-Based Drug Candidates as Treatments for Antibiotic Resistant Bacterial Infections](#)

Table 4 – Biology: [Bryan Elam, Paul Gambill, & Logan Perez – The Effects of Biochar on Turf Grass](#)

Table 5 – Chemistry: [Harmeet Kaur Choahn – Quantitative Structural Activity Relationship \(QSAR\) Analysis of Drug-Like Therapeutic Candidates Against Resistant Bacterial Infections](#)

Table 6 – Geoscience: [Johnny Pruitt – A Comparative Analysis of Dolomitized Carbonate Samples Taken from the Engadine Group](#)

Table 7 – Geoscience: [Ross Metcalf & Cassandra Huggins – Identification of Geothermal Calcium Carbonate Rocks from Magnet Cove, Arkansas](#)

Table 8 – Geoscience: [Alex Burns, Payton Karr, Andrew Edmonds, & Mariah Thomas – Investigation of a Recent Landslide in Fort Smith, Arkansas](#)

Table 9 – Geochemistry: [Jon Turco & Matt Neal – Determining the Impact of Surfactant Type and Concentration on Microplastic Recover](#)

Table 10 – Ethnomusicology, Performance: [Leslie Rosa – Marisa Canales, “Concierto Caribeño”](#)

Table 11 – Ethnomusicology, Music Education: [Jeason Lopez – Chester, A Song of Tyranny and Revolution](#)

Table 12 – Nursing: [Alexis Groves & Faith O’Mahomy – Perceptions of Heart Healthy Behaviors in Homeless Women](#)

Table 13 – Dental Hygiene: [Trinity Gonzales, Abby Hawes, Hailey McClain – Sleep Apnea and Bruxism](#)

Table 14 – Dental Hygiene: [Selena Fitzjurls, Isabel Jamison, Abbie Morris, & Emily Nguyen – Laser Assisted Non-Surgical Periodontal Therapy](#)

Table 15 – Dental Hygiene: [Sarah Davis, Diana Guerrero, & Marisol Vasquez – Efficacy of Xylitol on Reduction of Streptococcus Mutans](#)

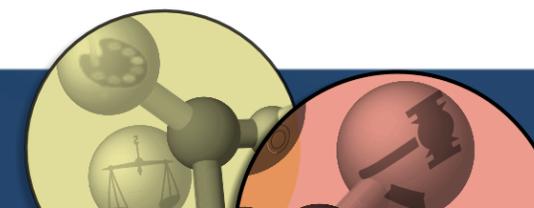
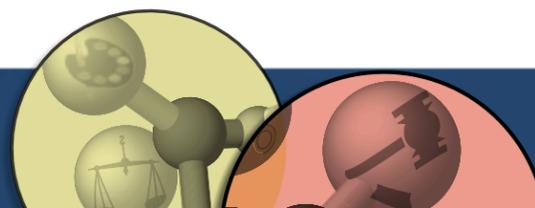
Table 16 – Dental Hygiene: [Jenny Dixon, Sarah Goyne, Brittany Mize, & Ashley Wilson – Look to the Future: A Periodontal Disease Vaccine](#)

Table 17 – Medical Sonography: [Hope Chronister & Chris Owens – Spina Bifida: Fetal Ultrasound Importance](#)

Table 18 – Medical Sonography: [Malorie Radley & Jaquie Thomas – Live Ectopic Pregnancy](#)

Table 19 – Medical Sonography: [Cindy Torres-Dodson & Courtney Young – Subclavian Steal Syndrome](#)

Table 20 – Medical Sonography: [Cambrie Keel & Emilee Rogers – Splenosis: A Case of Spontaneous Spleen Regrowth Following Splenectomy](#)



Library 122

Presentations in History, Arkansas History, and Finance

Noon Megan Sonnenmoser

12:30 Jerry Rico

1:00 Nicolas Thompson

Remember the Ladies, Black Men, and Indigenous Peoples: The Forgotten Memory of Women and Minorities During the American Revolution

Presented by Megan Sonnenmoser

Faculty Sponsor: Dr. Evan Rothera

Field of Research: History

The collective memory of the American Revolution includes patriots, loyalists, King George III, George Washington, the Marquis de Lafayette, and other assorted elite white men, but people often pay little attention to the roles and activities of white women and people of color. The spaces of colonial America were heavily gendered, classed, and raced. Some people felt that the freedom, liberty, and equality espoused during this turbulent time were only meant for elite white men. In this paper I argue that white women and people of color played critical roles for both the patriot and loyalist causes, even though their fights for their own rights, freedom, and equality extended far beyond the end of the American Revolution. Women sewed, made bullets, spied, and took care of troops. Enslaved Africans and indigenous people spied and fought for both sides. Their contributions were numerous and worth remembering, and I explore how all these different groups defied societal and cultural expectations to aid the war efforts. Their own rights were not guaranteed or part of the American Revolution, but white women and people of color proved they were ready to launch their own revolutions.

Megan Sonnenmoser, a senior history major with a minor in anthropology, is from Kansas City, Missouri. She plans to graduate in December of 2022, after which she plans to attend graduate school, hopefully at the University of Missouri. Her research interests are late 17th- to 18th-century America.

The Works of Rex Nelson and the Impact to Arkansas's History

Presented by Jerry Rico

Faculty Sponsor: Billy Higgins

Field of Research: Arkansas History

Rex Nelson is senior editor at the Arkansas Democrat-Gazette, a statewide newspaper based in Little Rock, Arkansas. Over a long period, he has authored numerous articles and features on the geography, people, places, and culture of his home state. This presentation follows up my personal interview with him and will provide selections of his publications that will demonstrate how Mr. Nelson's work has added significantly to the scholarship on Arkansas history.

Jerry Rico is a junior history major at the University of Arkansas - Fort Smith after transferring from National Park College in Hot Springs. He chose Mr. Rex Nelson as his subject for a paper on authors and their contributions for his course in Arkansas history.

The Effects of Pandemics on Stock Market Returns and Volatility

Presented by Nicholas Thompson
Faculty Sponsor: Dr. Jim Wollscheid
Field of Research: Finance

On Dec. 31, 2019, the World Health Organization (WHO) received word of a cluster of pneumonia cases in Wuhan, Hubei Province, China, identified as COVID-19. As COVID-19 progressed throughout the world, it created upheaval throughout various markets. For example, the S&P 500 stock market index declined from 3,386.15 on Feb. 19, 2020, to 2,237.40 on March 23; however, the S&P 500 reached a new all-time high of 3,395.06 on Aug. 18, 2020. This paper explores the issue by comparing past pandemics' stock market returns and volatility to COVID-19 by expanding the time period to one year, along with comparing to previous pandemics' returns. We postulate that the unprecedented government intervention through NPIs, government spending, increased unemployment benefits, and loans to companies along with quantitative easing will result in significantly higher financial returns and volatility in the stock market during COVID-19 compared to previous pandemics.

Nicholas Thompson is a 21-year-old senior pursuing a bachelor's degree in finance with a minor in applied statistics. He is a tutor of economics at the Gordon Kelley Academic Success Center. After graduating from UAFS, he plans on pursuing a master's degree in finance.

Library 202 Presentations in Nursing and Healthcare Administration

Noon Kain Suh

12:30 Alexis Kleman & Makayle Stone

1:00 Megan Hamerlein

Evidence-Based Practice in Typhoid Fever

Presented by Kain Suh
Faculty Sponsor: Jackie Cavner
Field of Research: Nursing

Typhoid fever is a life-threatening disease caused by the bacterium *Salmonella typhi*. Human beings are the only host who can support this pathogen. Typhoid spread through contaminated food and drinks, causing high fever, fatigue, abdominal pain, constipation, or diarrhea in the infected host. Factors such as poor sanitation, low literacy, and unsafe drinking water increase the disease's spread. Severe cases may lead to complications and even death. Typhoid is a serious public concern, especially in the underdeveloped and developing countries of Sub-Saharan Africa. Typhoid can also be seen in industrialized countries like the United States. The United States was able to eradicate this disease in its population, but due to the increasing population migration to and from typhoid-prone areas, there have been more reported typhoid cases within the territory. Under such conditions it is important for the health care provider to be aware of the disease, know preventive measures, the signs and symptoms, diagnosis, treatment options, and recommendations for their traveling patients. Also, this presentation will include patient teaching the nurse should provide to the population in these typhoid-prone areas and measures to acquire safe or purify drinking water.

Kain Suh is a 23-year-old nursing student who will graduate with a Bachelor of Science in Nursing in May 2022. She participated in the Myles Friedman Honor's Program during her college enrollment period. While attending the University of Arkansas - Fort Smith, she strived to be an exemplary student and achieve the goals she set for herself. As a future nurse, it is important for her to share the information she learned to promote the best patient care and outcome. She values the well-being of the population, and so decided to conduct research on typhoid fever. She has high hopes that, through this research, the population will gain more knowledge on the dangers of transmittable disease and will be willing to adhere to guidelines put in place for the common good.

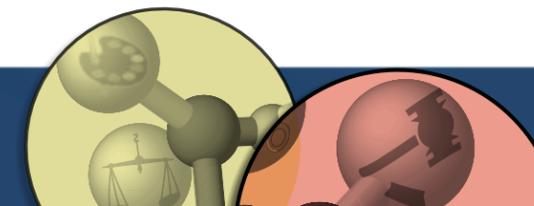
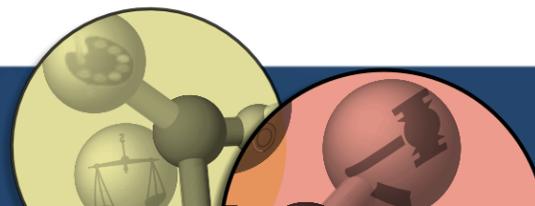
Vaginal Seeding: A Literature Review

Presented by Alexis Kleman and Makayle Stone
Faculty Sponsor: Jackie Cavner
Field of Research: Nursing

The human microbiota is composed of trillions of bacteria, archaea, protists, viruses, and fungi that all contribute to immunological defenses, digestion/food breakdown, the function of the brain-gut microbiome axis, and so on. The microbiome of infants born by Cesarean section are negatively impacted because of a lack of exposure to the beneficial microorganisms within the vaginal route of birth. These negative effects include asthma and allergies, celiac disease, diabetes, obesity, etc. Vaginal seeding is a procedure with the goal of combating these negative effects and introducing the Cesarean section born infant's microbiome to some of the beneficial microorganisms from the birthing canal using vaginal fluids. This strategy has been questioned regarding whether it is ethical, and whether it is truly beneficial to the child's microbiome from a long-term perspective, regarding the immune system, metabolic system, etc. We conducted a literature review with the goal of determining the efficacy and morality of this procedure.

Alexis Kleman is a 21-year-old second semester nursing student at the University of Arkansas - Fort Smith and will graduate in December of 2023. She has always strived to be the best student possible and has devoted her life to continued knowledge, education, and research with the goal to never stop learning new things. Since she was a child, Alexis has always aspired to work in health care with the goal of patient advocacy and safe treatment in mind. She began her college career with a fascination with microbiology and is now applying her biology background to her career in nursing and health care research. She has a focus on trauma, emergency, and internal medicine, which is why she and her research partner chose to research the influences of vaginal seeding on gut-bacteria growth and the infant microbiome. They have high hopes that their research will contribute to safer and more ethical treatment of newborns and their mothers.

Makayle Stone is a 21-year-old junior nursing student who will graduate from the University of Arkansas - Fort Smith in December of 2023. She is very appreciative of every opportunity given to her, and thoroughly enjoys expanding her knowledge. Microbiology has always been particularly interesting to her, but she was recently educated more about obstetrics, and this also piqued her interest. She knows that her duty as a nurse is to promote and advocate for the health in people of all ages within her scope of practice. These things combined are why she and her research partner have chosen the topic of vaginal seeding to research. Their goal is to find answers to some of the many questions surrounding this procedure, one of which being whether it truly benefits those involved or not.



Factors Associated with the Overutilization of Laboratory Testing

Presented by Megan Hemerlein
 Faculty Sponsor: Dr. Kyle Barlow
 Field of Research: Healthcare Administration

Laboratory testing is a well-established contribution to clinical decision-making; however, the overutilization of laboratory testing has been linked to unnecessary healthcare spending. The objectives of this study are threefold: 1) to identify laboratory tests or procedures that could be eliminated for cost-effectiveness, 2) to examine the effect that low utility laboratory procedures have on healthcare spending, and 3) to suggest quality initiatives to promote cost-savings. Previous research indicates common areas of concern in the laboratory to be duplicate testing, unnecessary ordering practices, and over-ordering assays. A review of hospital-associated ordering practices, laboratory expenditures, and quality initiatives reveals that many laboratory testing methodologies, panels, and procedures are over-utilized and could be modified. This research provides data-driven knowledge on the costs associated with laboratory testing and initiates future healthcare spending and organizational adjustments.

Megan Hemerlein is a student at the University of Arkansas - Fort Smith pursuing a master's degree in healthcare administration. Her undergraduate degree is in medical laboratory science, and she is a board-certified medical technologist. She served in the United States Air Force and is an active member of the Robert Jack VFW Post 1322. She hopes that her passion for quality care will directly contribute to the health and wellness of our local community and their families.

Library 203 Presentations in English

- Noon Chelsea McKim
- 12:30 Avreigh Watson
- 1:00 Melanie Bradley
- 1:30 Emilee Hatwig

Women and Keats: Feminism in Masculine Romanticism

Presented by Chelsea McKim
Faculty Sponsor: Dr. Lindsay Lawrence
Field of Research: English

Aware that he was dying of tuberculosis, John Keats wrote “Bright star, would I were stedfast as thou art” in 1819. The sonnet is widely speculated to be addressed to his lover, Fanny Brawne, as it is filled with phrases and intentions Keats had used in his letters to her. The 2009 release of *Bright Star*, Jane Campion’s biopic based on Andrew Motion’s *Keats*, focuses on his final years and his relationship with Fanny Brawne. While Keats’s poem is from a male point of view, Campion’s rendition is governed by the female gaze. The film is influenced by the historical context of the Romanticists and the feminist movement of the twentieth century, focusing on making women realistic and multifaceted. Campion effectively contrasts Keats’s one-dimensional lens through which he personifies Fanny, making the romanticized woman an authentic, multidimensional woman.

Distinctly stated in his sonnet, Keats seeks unchanged, immortal life and love with Fanny. Keats claims that his “bright star” is beloved and above all else; yet, he ignores her female distinctions and imposes his own metaphors onto her. Influenced by the work of Margaret Homans, this paper dissects Keats’s poem as seen through the feminist lens: representing woman as a one-dimensional muse, a silent object. Campion’s feminist reinvention of the narrative parallels the poetry of Keats while conflicting with nineteenth-century societal norms on gender and power.

Chelsea McKim is a junior at the University of Arkansas - Fort Smith where she is pursuing a B.S. in English with teacher licensure. She received recognition on the Dean’s List for the spring and fall semesters of the 2021 academic school year. Upon graduating she hopes to enter a Graduate program in English with a focus in literary criticism/theory and gender studies. Her long-term professional goal is to work in academia as a professor of English.

Women Support Women: A Vindication for Protofeminists

Presented by Avreigh Watson
Faculty Sponsor: Dr. Lindsay Lawrence
Field of Research: English

Development of feminist theory continues to thrive in the 21st century, but naturally has deviated from its earliest forms. Protofeminism describes these original philosophies that establish current feminist theory, but the study of its dated aspects is often met with critiques formed from a modern value system. This original theory has therefore been divided into two categories: its positive calls for reform that are praised in modern society, and its patriarchal views that are now harshly rejected. To discuss protofeminist writers with modern considerations, however, analysis of the latter aspects should be investigated with a historic lens rather than an anachronistic judgment of their morality. This essay applies the former approach to protofeminist theory of women’s education with the context of two notable examples of the theory: Mary Wollstonecraft’s protofeminist publication “A Vindication of the Rights of Woman” and Maria Edgeworth’s morality novel “*Belinda*.” By exploring the deep intertextuality between these works, this paper reflects on the education of upper-class women and its effect on the “outdated” aspects of their calls for societal reform.

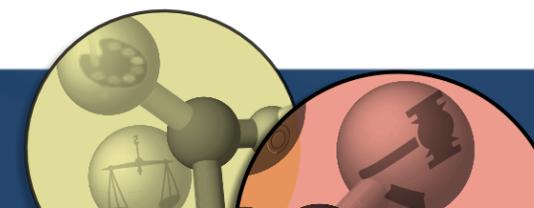
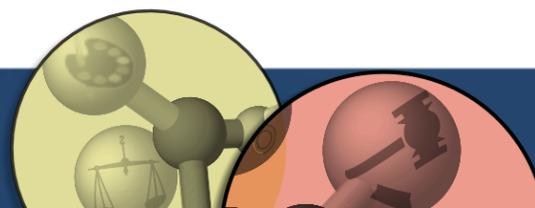
*Avreigh Watson is enrolled as an English major at UAFS and is a member of the Chancellor’s Leadership Council. She received the 2021 Florence Kahn Memorial Award from the National Federation of State Poetry Societies for her first chapbook, “Nicodemus” and currently acts as the editor of UAFS’s literary magazine *Applause*. Avreigh plans to attend graduate school to continue her literary studies and lifelong education. In the time she does not spend on academic writing, Avreigh may be found watching Marshall Mathieu’s favorite movies, learning choral music, and reading the poetry of Tony Hoagland.*

Plausability and Jane Austen

Presented by Melanie Bradley
Faculty Sponsor: Dr. Lindsay Lawrence
Field of Research: English

Although Jane Austen was writing the same types of novels as other well-known novelists of her time, such as Frances Burney and Maria Edgeworth, her writing style is in many ways new and different. Austen made distinct narrative choices that pull away from the common tropes found in the courtship novel, some of which include orphaned protagonists and wildly complex plots. By making the deliberate choice to give her characters realistic home lives, in realistic settings, within the bounds of a simple, realistic plot, Austen distinguished herself from her contemporaries whose plots are often more fantastic and theatrical. The amalgamation of Austen’s decisions and her dedication to consistency and realistic representations of the world give her novels a level of plausibility that make her work stand out amongst her peers and have contributed to their long-lasting popularity.

Melanie Bradley grew up in Fallon, Nevada, and moved to Fort Smith in 2012. She enrolled as an English major at UAFS as a transfer sophomore in fall 2019, completing her first semester with a 4.0. She was nominated for and accepted a position in the Myles Friedman Honors Program the following semester. She is working to publish her first manuscript and plans to attend graduate school. Melanie’s hobbies included watercolor painting, bookbinding, and collecting fountain pens. She is involved in a few small, cultivated community groups and participates yearly in National Novel Writing Month.



The Importance of Victorian Upper Class and Gender

Presented by Emilee Hatwig
 Faculty Sponsor: Dr. Lindsay Lawrence
 Field of Research: English

Oscar Wilde is renowned for his comedic examinations and general “poking fun” of upper class society, especially in his three act play “The Importance of Being Earnest.” When the play first debuted on Feb. 14, 1895, critics at the time found that the play, however funny it might be, lacked substance. However, more modern readers and playgoers alike may find that to be far from the case. The play, in the most humorous and satirical way possible, offers some insight into Victorian life and the roles that men and women were assigned to play.

According to Victorian society, women had very little agency over the majority of their lives, whereas men were expected to hold all of the power and responsibility in both the social and political spheres. Wilde’s characters Gwendolen and Cecily are expected to abide by the social rules and expectations of their time period, even if it is in direct disregard to their true feelings. Likewise, Jack and Algernon are constantly subverting the social norms for young, upper class men. Therefore, it is important to analyze the Victorian gender roles in order to understand the manner in which Wilde’s characters acknowledge the rules, yet refuse to wholeheartedly play by them.

In 2019 Emilee Hatwig graduated from UAFS with a Bachelor of Science in animation technology, cum honore, and an Associate of Applied Science in computer graphic technology - digital design. Since then she has returned to UAFS to pursue a Bachelor of Science in English with teacher licensure (7-12). She is scheduled to graduate in the fall semester of 2022. She can typically be found working as a tutor at the Writing Center or fulfilling her duties as secretary of the university’s Cultural Network. She is an alumna of the Myles Friedman Honors Program as well as a current member of the Alpha Sigma Lambda Honor Society, Kappa Delta Pi, and Future Educators Association Professionals. In what little spare time she has, Emilee can be found reading, writing, or baking.

Library 206 Presentations in English, Rhetoric & Writing, Colonialism, and Education

Noon Victoria Schmitt & Allen McCullers

12:30 Alina Chuong

1:00 Emily Clem

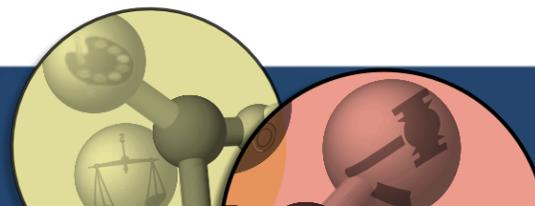
1:30 Holly Farrar

All Means ALL: Inclusion of Students with Low-Incidence Disability

Presented by Victoria Schmitt
 Faculty Sponsor: Dr. Janine Chitty
 Field of Research: Education

This action research study focused on the inclusion process of students with low-incidence disabilities into the general education setting, as well as the attitudes of general education educators towards inclusion. Research for this study examined inclusion practices starting in the 1970s, current inclusion practices, and attitudes towards inclusion from students, educators, and parents. There appears to be limited literature found on best practices for inclusion of students with special needs, thus prompting this action research topic to address the gap in research. This action research study addresses teacher attitudes through the use of surveys, interviews, and observations. Data were collected and analyzed using mixed methods approaches. The results of this study reflected a shift in teacher attitudes towards student inclusion increasing from 60 percent positive attitudes to 85 percent positive. This study prompted the development of a program for general education teachers to take a more active role in the process of monitoring student data through observation and engaging conversations about mastered skills that can be generalized in the general education classroom. This program is now being piloted by Fort Smith Schools in order to better include all students with special needs with general education peers.

Victoria Schmitt is a 2021 graduate of the UAFS Master of Education program with emphasis in curriculum and instruction. She previously graduated from the University of Central Arkansas (2014) with a Bachelor of Science in early childhood and special education. She currently is employed by Fort Smith Public Schools as an educator of students with special needs in the moderate self-contained classroom. She works with students on a variety of skills including academic, communication, motor, and daily living skills. Throughout her career in education, she has found that there are few programs that touch all the areas addressed in her classroom, thus motivating her to continue to work with students with special needs and further her research to find and create programs that best serve students with special needs.



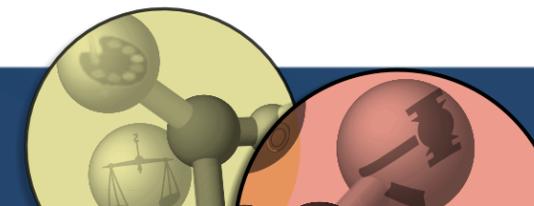
Reflections of the Teacher Apprenticeship Experience

Presented by Alina Chuong and Allen McCullers
 Faculty Sponsor: Dr. Monica Riley
 Field of Research: Education

The Teacher Apprenticeship Program has provided us with a once in a lifetime opportunity that only a few people experience: to become a classroom teacher while still being a college student. The experience has opened our eyes to the realities of teaching for which college does not prepare you. One example is the experience of teaching during a pandemic. We have been able to observe the effect that COVID-19 has had on students inside the classroom. As a result we have learned to monitor and adjust to ensure they can still be successful. Being a part of the program has also allowed us to see firsthand how important it is to build relationships with our students and be reflective of our teaching practices: two things that our professors have always stressed to us since becoming members of the School of Education at UAFS. We have experienced things that a traditional intern in the program would never experience. This includes building curriculum, professional development opportunities, and working at a PLC Model School. Being an apprentice has allowed us to grow as educators and has shown us what it truly takes to be a teacher. From being our students' biggest supporter when achieving their goals, to being their shoulder to cry on when facing adversities at home, this program has more than prepared us for the daily challenges that come with the territory of education.

Alina Chuong grew up in Fort Smith and has lived in the area her entire life. She began college at the University of Arkansas - Fort Smith in the fall of 2018 and will graduate with a degree in elementary education in the spring of 2022. She is involved in campus organizations such as KDP and FEAP. For her senior year at UAFS, she had the amazing opportunity to take part in the Teacher Apprenticeship Program. Instead of spending her last year of college attending classes, she has been spending it at Spradling Elementary as one of their teacher apprentices. The final few months of her college career have been spent learning and growing with her own group of third grade students. This unique experience changed her life and has shown her that there is nothing she would rather do than teach.

Allen McCullers is currently a senior at the University of Arkansas - Fort Smith majoring in elementary education. Before being selected for the apprenticeship program as part of a joint effort through Fort Smith Public Schools and UAFS's School of Education, he graduated from Muldrow (Oklahoma) High School in 2017, then attended Carl Albert State College and receive an associate degree in allied health. After transferring to UAFS in the fall of 2019, he had the opportunity to learn from some of the state's best elementary education instructors and spend his senior year participating in the aforementioned apprenticeship program. In this program teacher candidates are given the opportunity to teach their own class while still pursuing their college degree. Allen currently teaches at Spradling Elementary as a teacher apprentice and looks forward to graduating from UAFS in the spring of 2022.



Missing and Murdered Indigenous Women and Girls: From “Killers of the Flower Moon” to the Present

Presented by Emily Clem
 Faculty Sponsor: Dr. Ann-Gee Lee
 Field of Research: Rhetoric and Writing

In this presentation, which arose from a poster I made for Rising in the River Valley for my internship, I hope to highlight the important issue of the missing and murdered Indigenous women and girls in the United States. First, I will tie this to the Read This! program selection of “Killers of the Flower Moon” by David Grann and compare and contrast that to different modern-day stories. I will explore the injustices imposed upon the Indigenous people in the 1920s and identify some of the struggles of Indigenous people today. There is a misconception that all have an equal opportunity to seek justice under American law; however, as it was shown in the book, flaws in the system allow many abusers of Indigenous women to walk free. According to the Indian Law Resource Center, more than four in five Indigenous women will experience violence in their lifetime and many will never find justice. Because 97 percent of abusers are non-Native, tribes are unable to hold those offenders accountable and protect their women. This is not a problem of yesterday, so I wish to spread awareness of the continuous and present plight of Indigenous women and girls in America.

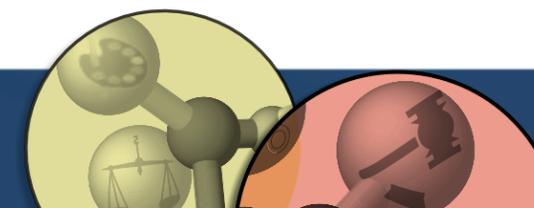
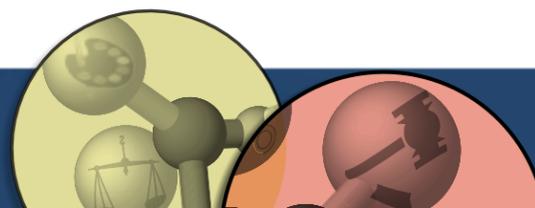
Emily was born in Fort Smith and has lived here for the majority of her life. Her major is rhetoric and writing with a minor in teaching English as a second language. She is a member of the Miles Friedman Honors Program and the Cultural Network student organization. After graduation she plans to attend Northern Arizona University to earn a master's degree in English literature. Emily's research interests include feminist literature, 20th-century American authors such as John Steinbeck and Maya Angelou, and outside of the canon. For fun Emily enjoys knitting and watching movies with family and friends.

Postcolonialism in M.T. Anderson's “Feed”

Presented by Holly Farrar
 Faculty Sponsor: Dr. Cammie Sublette
 Field of Research: English

The dawn of the industrial revolution was a major technological milestone that changed the world forever. The trade opportunities from this era necessitated the advent of new industries and machinery and yielded a consumer society. Due to this new consumer mentality, these advancements connected nations globally and generated rapid economic growth. Even though this era set the foundation for today's technologies and societal structure, this advancement is not without significant consequences. By applying postcolonial criticism to M.T. Anderson's “Feed,” we can isolate specific disadvantages and identify the dominant causes of humanity's demise to understand the societal relationships affected. This isolation affords us the opportunity to focus specifically on consumerism, alienation, and the decline of intelligence to reveal imperial ideologies hidden within. In Anderson's “Feed,” the result of colonialism is a consumerist mentality that creates both a power imbalance and portrays traditional classist inequalities that segregate society. The findings are striking because they show the contradiction of technological innovations and the unanticipated technological hegemony, which combined, cast light on the uncertainty of the future of humankind. Using this framework, we can explore how advancements in technology connect to postcolonialism in the destruction and decolonization of society in M.T. Anderson's “Feed.”

Holly Farrar is a sophomore at the University of Arkansas - Fort Smith pursuing a B.S. in English with teacher licensure for grades 7-12. Holly is also a proud member of the 2020 and 2021 Dean's Lists and a recipient of the Jennings and Jeannette Stein Endowed Scholarship. As an inducted member of the National Society of Leadership and Success, a non-traditional student, and a first-generation college student herself, she has a special interest in sociocultural studies. Currently Holly is a tutor in training for the UAFS Writing Center and hopes to participate in the 2022 Summer Bridge program assisting underprepared first-year students with improving their composition skills. Upon completing her undergraduate studies, she intends to apply for graduate school to advance her abilities as a future educator.



Library 209

Presentations in Technology, Electrical Technology, and Control Engineering

Noon Aaron Tomlin, Yu-Cho Pang, & James Moore Jr.

12:30 Hayden Pittman & Ethan Owens

1:00 Cooper Black & Kalen Griffin

1:30 Ian Schweizer

Team Mini Hulk

Presented by Aaron Tomlin, Yu-Cho Pang, and James Moore Jr.

Faculty Sponsor: Dr. Kiyun Han

Field of Research: Technology

The purpose of this research project is to determine the viability of designing a microcontroller based, automated follow bot for use in a domestic setting.

After completing an analysis of the domestic market, Team Hulk has identified a need for an automated load-carrying cart that will follow the user without requiring any on-going direct input, allowing the user to transport heavy loads with only passive interactions. Although there are automated robots already in use in both industrial and laboratory settings, Team Hulk was unable to identify any equivalent device available for domestic use.

The proof of concept for this project will be accomplished by designing and building a scaled version of the end-product that fully implements and demonstrates all the communications and electrical design considerations required for a larger consumer market version.

This scaled version is mounted on the base of a conventional toy remote control vehicle, but the programming, communications and sensor technology will be centered around an Arduino microcontroller that is programmed to track and follow a user's cell phone through its incorporation of existing Bluetooth technology and Global Positioning Satellites (GPS).

After having had the privilege of serving in the Armed Forces for 25 years, Aaron Tomlin is now a non-traditional student pursuing a B.S. in electrical engineering technology with an expected graduation date of December 2022. While he gained a multitude of experiences and professional skills during his time in the military, his education at UAFL has allowed him to merge his real-world experiences with a solid academic foundation.

Yu-Cho Pang is an international student from Taiwan who has had a life-long interest in technology and electronics. In addition to his broad knowledge base, his unique background allows him to bring much needed unique perspective and experience to the team.

James Moore Jr. left his small Oklahoma community when he joined the U.S. Navy where he served 10 years and gained qualifications in the Engineering Department including interior communications and elevator and conveyor technology. After serving in the Navy, James then enlisted in the U.S. Army where he gained a background in human resources and as a paralegal. His education includes degrees in general studies and organizational leadership from UAFL as well as an A.A.S. in electronics technology. He expects to graduate with a Bachelor of Science in electrical engineering technology in December 2022.

The Design and Use Case of a Smart Key Cabinet

Presented by Ethan Owens and Hayden Pittman

Faculty Sponsor: Dr. Kiyun Han

Field of Research: Electrical Engineering Technology

Design and construct a smart keybox for everyday use. Product will allow its users to access keys kept within its locked casing upon presentation of a badge. A small screen will allow users to access an archive of keys taken and placed within the box prior to their query. This product will consist of a locked enclosure with a door or screen. Various hooks exist inside the enclosure to organize and keep the keys confined within it. Proximity sensors embedded behind each hook will be used to determine if the keys are present. Status of the keys will be recorded within a microprocessor on board the key enclosure. An RFID receiver will be placed on the front of the enclosure. This is for users to gain access to the box. A screen will give users the ability to access historical records of transactions at the keybox. This data will consist of times, users, and keys.

Ethan Owens is a senior in the electrical engineering technology program. He attended UAFS through the Western Arkansas Technical Center for his last two years in high school. His hobbies include PC building and photography.

Hayden Pittman is a senior in the electrical engineering technology program. He attended UAFS throughout high school through the Regional Workforce Grant. Hayden's hobbies include 3D printing and being outdoors.

Resonant Capacitive Coupling Using a Vacuum Tube Tesla Coil

Presented by Cooper Black and Kalen Griffin

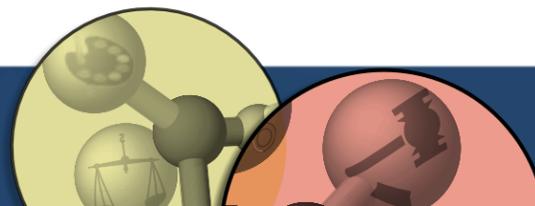
Faculty Sponsor: Dr. Kiyun Han

Field of Research: Electrical Engineering Technology

Through study and experimentation, this research will provide useful data concerning small scale wireless power transmission. Experiments will include the use of frequency transformers to help concentrate electrical energy. The utilization of wireless power transmission in small devices, such as laptops and cell phones, will have the potential to be remotely powered without the use of a wired connection. In an attempt to create the transmitting and receiving transformer, a Tesla coil will be used as a proof of concept. Concerning the present circumstance of the experiment, the price of high current, high voltage transistors, is outweighed by the lower cost and similar functions of a vacuum tube. The vacuum tube will allow the Tesla circuit to oscillate and transmit electrical power at a set frequency. A receiving tesla coil will be tuned to the exact same frequency and collect electricity from the main coil.

Cooper Black is a senior in the electrical engineering technology program. His hobbies are fishing, hobby electronics, computer building, and golfing. After completing his degree program, he plans to find employment as a robotics systems engineer.

Kalen Griffin is a junior in the electrical engineering technology program. His hobbies include PC building, hobby electronics, high voltage experimentation, volunteer VEX robotics coach, and growing the world's hottest peppers. With his degree he plans to work for a local electric utility to help power the world.



The Redesign and Implementation of the Coupler Controller

Presented by Ian Schweizer

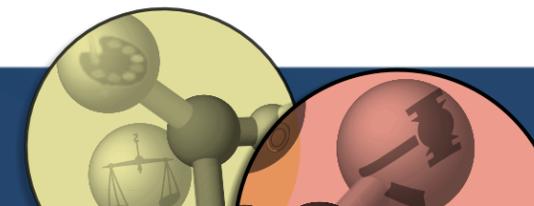
Faculty Sponsor: Dr. Kiyun Han

Field of Research: Control Engineering

The purpose of this project is to redesign the current controller system for ArcBest Technologies' Coupler controller. The Coupler is a forklift attachment that is used to move Flash Mobile Platforms. The current controller is a physical controller that connects to a Coupler and sends commands for different functions. The current controller is typically mounted on a forklift for the operator to use. However, the controllers can be removed and are often misplaced, and if multiple Couplers are present in a warehouse, it can be difficult to pair them to their corresponding controller. And, with the use of autonomous forklifts, having a physical controller to operate a Coupler is not reasonable.

The new controller system includes a new control board that actuates the hydraulics and electrical system and is mounted on the Coupler and will utilize a mobile app that connects to the Coupler via Bluetooth to send commands to the new board. The app will be utilized in two ways; on the tablets that are being implemented on the forklifts for those that still have human operators, and within the drive-by-wire system that the remote operators use to drive the forklifts. The new control board utilizes more efficient and reliable circuitry with a smaller footprint. This will help reduce costs in both manufacturing and down-time.

Ian Schweizer is a senior in the electrical engineering technology program and began attending UAFS through a concurrent course in high school. He enjoys spending time with his wife, playing disc golf with friends, 3D printing, and tinkering with electronics. Ian is currently working as an engineering intern at ArcBest Technologies Research and Development. He and his boss decided on this project because it utilizes several topics that he has studied and investigates a potential solution to a problem that needs to be solved.



Health Science 121 Presentations in Engineering, Geoscience, and Animation Technology

Noon Mason Sayers, Spencer Simpson,
Cassandra Bell, & Beau Nelson

12:30 Anthony Ming, Rebecca Martinez, Ben Philpot,
Rylynd Bullington, & Drew Montgomery

1:00 Jacob McLain

1:30 Michael Cruz

Intelligent Vehicle Challenge

Presented by Mason Sayers, Spencer Simpson, Cassandra Bell, and Beau Nelson
Faculty Sponsor: Dr. Kevin Lewelling
Field of Research: Electrical and Mechanical Engineering

A team of UAFS electrical and mechanical engineering students have entered a competition to design and construct an autonomous vehicle; this competition is known as the Intelligent Vehicle Challenge (IVC). This vehicle is designed to navigate a 60 ft. by 60 ft. course over ramps and make 90-degree turns autonomously on a \$500 budget. The State of Arkansas competition will be held April 15 at Mt. Petit Jean. The national competition will be held this summer in Ohio. Our IVC will use a camera and accelerometer to navigate the course. The IVC will use an in-house 3D printed base and microcontroller/motor drive boards. Each team member will give an overview of their part of the IVC project in this presentation.

Mason Sayers will graduate this May with a degree in electrical engineering.

Spencer Simpson will graduate this May with a degree in electrical engineering and be employed in Houston.

Cassie Bell will graduate this May with a degree in mechanical engineering.

Beau Nelson will graduate in May with a degree in mechanical engineering then be employed in Van Buren, Arkansas, as an engineer.

Lunar Terrain Vehicle

Presented by Anthony Ming, Rebecca Martinez, Ben Philpot, Rylynd Bullington, and Drew Montgomery
Faculty Sponsor: Dr. Kevin Lewelling
Field of Research: Electrical and Mechanical Engineering

A team of UAFS electrical and mechanical engineering students led by senior mechanical engineering student Anthony Ming is designing and constructing a lunar terrain vehicle (LTV) at UAFS. This LTV will be capable of carrying two astronauts with speeds up to 10 miles per hour on the lunar surface. The LTV design team is divided into four groups: frame, suspension, controls, and design. At this point in the process, the base frame has been designed and will be constructed within the next month. Plans have been made to transport the LTV to Johnson Space Center for testing when it is constructed and mobile. During this presentation each group leader will give an overview and update on their part of the LTV design and construction.

Anthony Ming will graduate in May and start working for NASA.

Rebecca Martinez is majoring in mechanical engineering and enjoys working on the LTV.

Ben Philpot is majoring in mechanical engineering and helping design the LTV.

Rylynd Bullington graduated from Greenwood (Arkansas) High School and is majoring in electrical engineering.

Drew Montgomery is a sophomore majoring in mechanical engineering.

Regional Perspective on Joints in the Mid-Pennsylvanian McAlester Formation, Arkansas

Presented by Jacob McLain
 Faculty Sponsor: Dr. Dave Mayo
 Field of Research: Geoscience

Regional joint systems in the mid-continent of North America are valuable indicators of the stresses applied during the Ouachita Orogeny, a continent-continent collision that culminated about 300 million years ago. Last year we presented the results of an investigation of joints in the sandstone members of the middle-Pennsylvanian McAlester Formation in the vicinity of Fort Smith, Arkansas, and interpreted those joints as a consequence of the Ouachita Orogeny. This presentation aims to put those findings in a regional context through comparison with joint systems found in late Paleozoic strata throughout Arkansas, eastern Oklahoma, eastern Kansas, and Missouri.

Jacob McLain is currently working on completing his bachelor's degree in geoscience and plans to pursue a master's degree. His interests include structural geology, planetary geology, seismology, volcanology, and sedimentary geology.

The use of Real-Time Rendering Through Game Engines Impact on the Movie Industry

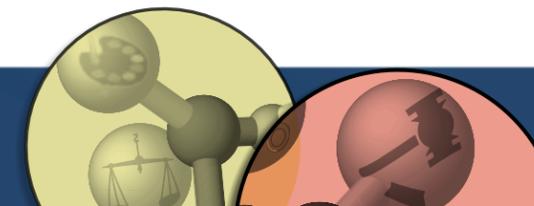
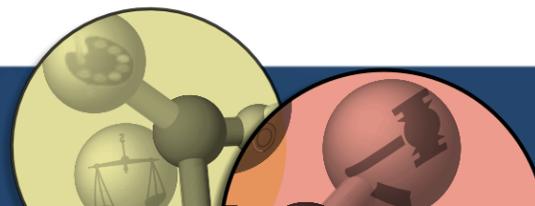
Presented by Michael Cruz
 Faculty Sponsor: Heath Cady
 Field of Research: Animation Technology

In the past few years, Real-Time rendering has become a more prominent and developed technology, one that can be primarily found within video game engines. As the technology has advanced, so has its use outside of the video game industry. In recent years some animated shorts and even full-length feature films have made use of game engines such as Unreal Engine and Unity for video production; specifically, to make use of the engines' capability of Real-Time rendering to achieve the look and feel of what they want in the film in less time. The amount of render-time when creating animations and film is extremely time-consuming, takes immense amounts of computing power, and costs money. By utilizing game engines to speed up the process, production companies have the opportunity to save both time and money.

Michael Cruz is a student at UAFS pursuing a degree in animation technology with hopes of a career as a 3D artist. As of right now, his main focus is on environmental lighting and texturing, but he has an interest in improving and learning more about all aspects dealing with the animation side of things. His biggest inspirations to pursue this degree have been various video games and movies, such as "Spider-Man: Into the Spider-verse." This movie in particular remains his favorite overall and was the big turning point in his life when he grew increasingly interested in learning how the film was created. If he were offered a job at a video game company or movie studio, he would have to spend months debating what he would prefer as he is genuinely interested in both equally.

Health Science 124 Presentations in Music History, Women's Studies, Musicology, Media Communication, and Global Complexities

- Noon Jaymz Vance & Nikita Wemmerus
- 12:30 Melissa Hayden
- 1:00 Jillian Rose
- 1:30 Brittany Morris



Digital Discoveries: Six Lost Works by Anna Amalia, Duchess of Saxen-Weimar-Eisenach Uncovered in Archduke Rudolph's "Musikalien Register Nr 9"

Presented by Jaymz Vance and Nikita Wemmerus
 Faculty Sponsor: Dr. Stephen Husarik
 Field of Research: Music History

A newly digitalized catalog of music by Beethoven's only composition student, Archduke Rudolph, has opened up access to musical treasures for musicologists worldwide. Archduke Rudolph spent his entire lifetime assembling a collection of music from early 19th century Austria that eventually grew in size to over 16,000 items. At his passing in 1831, Musikalien Register Nr 9 and all musical scores associated with it were bequeathed to the Gesellschaft der Musikfreunde Archiv in Vienna, Austria as the centerpiece of their collection. A recent digital transcription of this catalog revealed over seventy-five women composers from among the 2,400 entries. One of the most conspicuous entries is Anna Amalia – Duchess of Saxen-Weimar who was noted for her performance abilities, compositional skills and support of the arts. Apart from her many musical achievements and philanthropic contributions, the Duchess left an uncertain trail of compositions, only a few of which are certifiably authentic. Comparing entries in the digitalized Musikalien Register Nr 9 and a comparable catalog (Musikliebhaberin und Mäzenin / Sandra Dreise-Beckmann. – Schneverdingen: Wagner, 2004) located in the Anna Amalia Bibliothek, Weimar, Germany, this UAFS research has located six original manuscripts by the duchess and possibly identified a seventh Stabat Mater attributable to her that now enlarge the repertory of her known works.

Jamyz Vanz, from Fort Smith, is a music composition major in the UAFS Bachelor of Arts program with a minor in philosophy. He is particularly interested in the aspect of transcendence offered by music preservation projects and how the art of Anna Amalia reaches across time to new audiences due to scholarship behind the scenes.

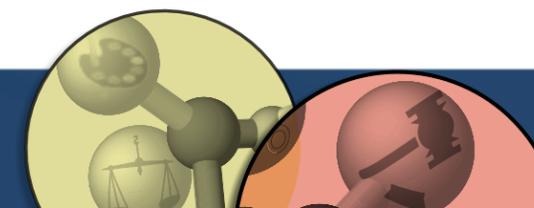
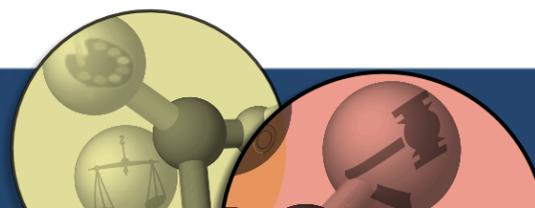
Nikitka Wemmerus, from Howe, Oklahoma, is a psychology major interested in music therapy. Her interest in the music of Anna Amalia revolves around the composer's skill and philanthropy towards the arts. "This research has motivated me to become generally more open to music, not just to the music of today."

Conductor, Composer, Philanthropist: The Life of Emma Roberto Steiner

Presented by Melissa Hayden
 Faculty Sponsor: Dr. Alexandra Zacharella
 Fields of Research: Women's Studies, Musicology, Performance, Music Education

Born in Baltimore in 1856, Emma Roberto Steiner's first music lessons were on the piano, taught to her by her mother, an excellent amateur pianist. Steiner learned how to play other musical instruments, and by age 11, she had composed a grand opera, "Aminaide." Steiner's father was a military colonel and forbade her from performing or attending music school. Years later, seeking freedom, Emma got her first job as the assistant music director under E. E. Rice, and began touring as a conductor. Steiner continued to compose and founded one of the first female-led opera companies in the United States. After experiencing failing eyesight and financial hardship, Emma traveled to Alaska to pan for gold. Steiner found tin instead, which allowed her to continue her work and start additional projects giving lectures advocating for Alaska. Throughout her career, Steiner conducted over 6,000 performances. Emma's final project was a home for aging and disabled musicians. This paper will discuss Steiner's unlikely career as a female conductor, as well as the hurdles she faced throughout her career because of her gender. This paper will also examine Steiner's surviving compositions and anecdotes of her tenacious and unflinching personality.

Melissa Hayden is an instrumental music education major at the University of Arkansas - Fort Smith. She is currently a member of the UAFS Wind Ensemble and flute choir and has served as the NAfME secretary for the student chapter of the music educators' organization. She is currently the historian and has served as past treasurer for Kappa Kappa Psi-Lambda Kappa Chapter Band Service Fraternity. She was the UAFS instrumental music librarian and is an academic outline writer for study.com. She graduated high school with highest honors and was a member of the New York Cattaraugus All County Band for five years and a New York All State band member.



“Are We Going to Prom or Hell?": A Rhetorical-Cultural Analysis on “Heathers”

Presented by Jillian Rose
 Faculty Sponsor: Dr. Nicki Stancil
 Field of Research: Media Communication

There have been many attempts to capture a vivid, realistic, and accurate portrayal of the US American girl’s high school experience. However, Heathers is one that can’t be topped. The storytelling and visuals of this 1989 black comedy will be analyzed from both a rhetorical and cultural theoretical approach to build toward a critical analysis of the film as a whole. This cult film unconventionally addresses dark themes such as bullying, suicide, and teen violence through comedic dialogue and vibrantly colored wardrobe and scene design. This approach created controversy among viewers and critics when it was released yet has created inspiration for other filmmakers. From a theoretical perspective, the heavy uses of symbolism, clustering, stereotyping, and othering show how well every aspect of the film were thought through to convey the film’s messages surrounding its themes. The rhetorical approach of this analysis provides insight on the many clever uses of colors and clusters, but the cultural portion dives deeper into the narrative, examining how the social hierarchies and ideology of high school culture affects the story and its characters. Heathers (1989) remains one of the greatest commentaries on the high school experience to date and this critical analysis attempts to examine and explain why.

Jillian Rose, originally from Tahlequah, Oklahoma, is currently in her junior year of earning her B.A. in media communication with a focus in media production/writing and a minor in business - marketing. She is in the NuMedia student organization on campus, was in Gamma Phi Beta as secretary, and is currently on the Dean’s List. After graduating she plans to pursue a career as a social media specialist.

Various Complexities from Around the World

Presented by Brittany Morris
 Faculty Sponsor: Dr. Kristin Tardif
 Field of Research: Global Complexities

What are natural resources? Commodities of nature, useful for economic prosperity. Today the basic needs for human life are fulfilled through materials found in nature. We manipulate these natural resources to produce whatever is needed for humanity. These resources include air, water, soil, coal, plants, and animals. The earth’s ever-growing population, and industrialization has forced consumers to over utilize these natural resources impacting our environment worldwide. This short film project brings awareness to a variety of issues around the world that have been created due to exploitation of these natural resources. I will be covering a wide span of topics related to the impact on these natural resources.

I chose this project because I want to create a healthy living environment that meets the social, economic, and cultural needs of communities around the global, all while ensuring virtue and welfare for future generations to come. It is important to work together so that we can manage the environment in such a way that we achieve a balance between the needs of humankind and nature.

Brittany Morris grew up in Sallisaw, Oklahoma, and graduated from Sallisaw High School. She received an Associate of Science in allied health from Carl Albert State College. Today she is working toward completing a Bachelor of Science in organizational leadership. With this degree she hopes to broaden her leadership skills, lead more efficiently, and prepare for complex community, various cultural, and executive problems in present-day leadership positions.

Health Science 133 Presentations in Computer Science and Electronics

- Noon Julton Sword
- 12:30 An Le, Adrian Cuevas, and Fernando Estrada
- 1:00 Josue Martinez and Austin Figueroa
- 1:30 Isaiah Russell, Angie Palacios, & Devin Turley

Deep-Seeker: Autonomous Robotic Path-Recognition Network

Presented by Julton Sword

Faculty Sponsors: Andrew Mackey and Israel Cuevas

Field of Research: Computer Science

Autonomous vehicle technology is an expanding area of research that has the potential to revolutionize many areas of industry. Public transportation, commodity transportation, surveying, and search-and-rescue are but a few of the areas that stand to benefit from the significant improvements that this technology can provide. In this project, we propose a deep learning convolutional neural network model that is capable of discerning pathfinding information by leveraging techniques from the fields of computer vision and artificial intelligence.

Julton Sword is a student in the computer science department at the University of Arkansas - Fort Smith where he specializes in data science and artificial intelligence and minors in mathematics. His academic areas of interest include artificial intelligence, natural language processing, machine learning, data science, deep learning, and computer vision. He is currently an active member of the UAFS Artificial Intelligence Research Lab.

Keep It Clean, Don't Be Mean: Multimodal Intent Classification

Presented by An Le, Adrian Cuevas, and Fernando Estrada

Faculty Sponsors: Andrew Mackey and Israel Cuevas

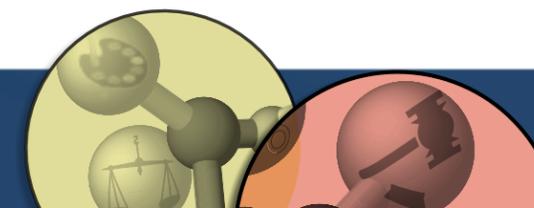
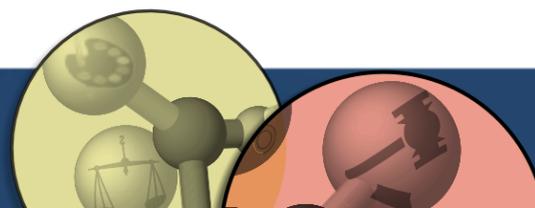
Field of Research: Computer Science

Social media platforms allow individuals, groups, and organizations to interact with a wide audience that transcends geographic borders. One popular method of interacting with other users involves posting content comprised of both visual imaging and textual data. These features are non-deterministically individual, where the true intent of the posting can only be derived jointly. One situation where the identification of intent is critical is in the automatic classification of hate speech in an online environment. Content that advocates, incites, promotes, or justifies violence and discrimination against individuals or groups is categorized as hate speech. Social media platforms now face the difficult challenge of algorithmically identifying content with a dangerous social impact. Recent advancements in the fields of artificial intelligence, machine learning, and natural language processing have demonstrated the ability to classify various forms of emotional sentiment to facilitate the moderation of online content. In this project, we expand upon previous work and design a deep neural network that is capable of jointly learning the visual linguistic features to determine the intent of social media content.

An Le is a student in the computer science department at the University of Arkansas - Fort Smith where he specializes in data science and artificial intelligence and minors in mathematics. His academic areas of interest are in artificial intelligence, natural language processing, machine learning, and data science. He is currently an active member of the UAFS Artificial Intelligence Research Lab.

Adrian Cuevas is a student in the computer science department at the University of Arkansas - Fort Smith where he specializes in data science and artificial intelligence and minors in mathematics. His academic areas of interest are in artificial intelligence, natural language processing, machine learning, and data science. He is currently an active member of the UAFS Artificial Intelligence Research Lab.

Fernando Estrada is a student in the computer science department at the University of Arkansas - Fort Smith where he specializes in data science and artificial intelligence and minors in mathematics. His academic areas of interest are in artificial intelligence, natural language processing, machine learning, and data science. He is currently an active member of the UAFS Artificial Intelligence Research Lab.



Automatic Sentiment Aggregation of Social Media

Presented by Josue Martinez and Austin Figueroa
 Faculty Sponsors: Andrew Mackey and Israel Cuevas
 Field of Research: Computer Science

Social media influences the lives of many individuals daily. Given its widespread adoption, many situations arise where a large number of users are involved in social media streams and the exact sentiment of a reaction from the audience is unknown due to the rapid exchange of messages. Our goal for this work is to propose a method of interval-based text analysis to extract the sentiment or topicality from a predefined set of classes. We first introduce a method of projecting text into a latent space. These vector space representations are used to train our machine learning model capable of automatically classifying each document by using natural language processing and artificial intelligence techniques.

Josue Martinez is a student in the computer science department at the University of Arkansas - Fort Smith where he specializes in data science and artificial intelligence. His academic areas of interest include artificial intelligence, natural language processing, and machine learning. He is currently an active member of the UAFS Artificial Intelligence Research Lab.

Austin Figueroa is a student in the computer science department at the University of Arkansas - Fort Smith where he specializes in data science and artificial intelligence. His academic areas of interest include artificial intelligence, natural language processing, and machine learning. He is currently an active member of the UAFS Artificial Intelligence Research Lab.

Portable Solar Water Heater

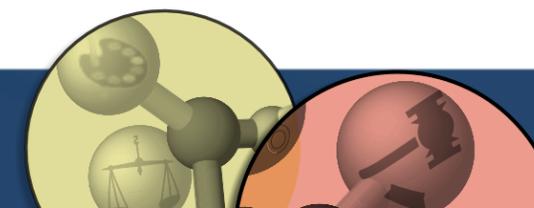
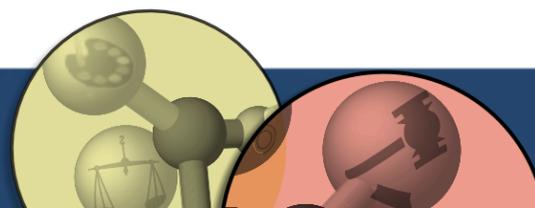
Presented by Isaiah Russell, Angie Palacios, and Devin Turley
 Faculty Sponsor: Dr. Kiyun Han
 Field of Research: Electronics/Electricity

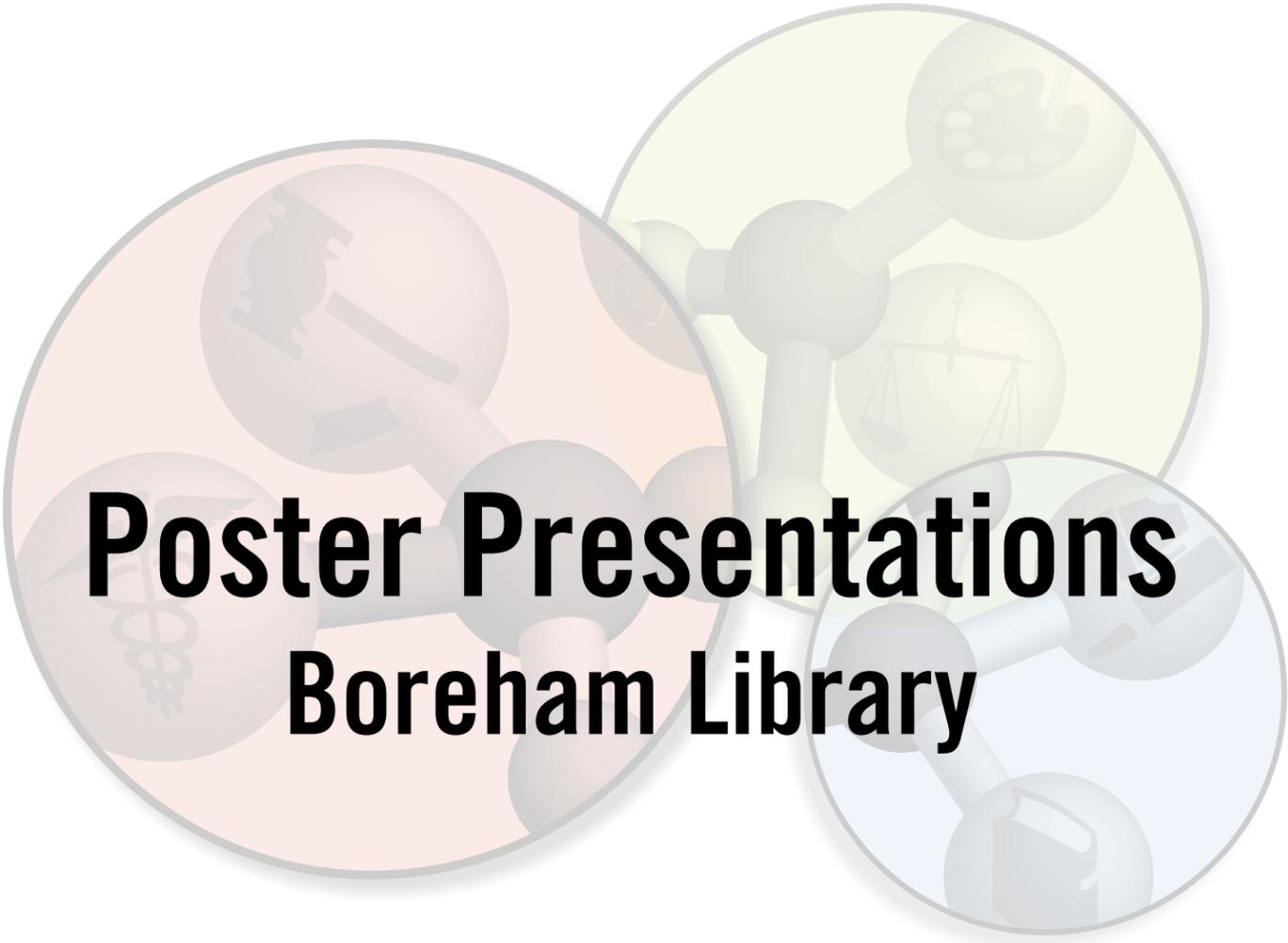
There are many people who like to camp or travel to places that are off the grid so they can adventure and explore to their hearts content. In these places there typically isn't power, so our team has decided to design something that will serve as piece of equipment that will make these trips just a little more comfortable. This is piece of equipment is called a Portable Solar Water Heater. This device will heat water to 150 degrees Fahrenheit for uses such as making hot beverages like coffee, cleaning dishes, washing hands, and any other use for medium to small amounts of water that you may need. With this device, traveling off the grid will be a more comfortable and fun experience while still keeping the experience an "off-the-grid" experience.

Isaiah Russell is a senior at UAFS majoring in electronics engineering technology. He hopes to graduate with his bachelor's degree this year. He is a first-generation student and will be the first in his family to graduate college. He works part time at night and goes to classes during the day. After graduating he wants to get an apprenticeship and work somewhere in the Fort Smith area until he can get off the ground financially and maybe work in another area at another place that pays a little more. In a few years, he wants to be an experienced technician and licensed electrician.

Angie Palacios is a senior at UAFS and hopes to graduate this fall with an electrical engineering technology degree. She is the first in her family to attend college. She is a non-traditional student attending classes during the day and working full time on first and occasionally second shifts in order to complete her degree. She currently work as a biomedical technician I at GE Healthcare servicing and maintaining Mercy's medical equipment. She sees herself becoming a field engineer within GE in the next few years and maybe even moving states while still working for GE Healthcare.

Devin Turley is currently a summer semester away from graduating with a degree in electrical engineering technology. He has yet to get any experience in the field, but has roughly four-and-a-half years of education.





Poster Presentations Boreham Library

The Effect of SLC24A4 on Amelogenesis

Presented by Hannah Smith

Faculty Sponsor: Dr. David McClellan

Field of Research: Biology

Table 1

Tooth enamel is primarily composed of minerals such as hydroxyapatite (a crystalline calcium phosphate) and a protein matrix. Enamel functions as a protection to the softer dentin, a collagen-based tissue found immediately under the enamel. This strong enamel layer protects teeth from damages incurred by everyday use and dental carries. The formation of enamel, or amelogenesis, is involved in the process of tooth development which occurs well before the tooth erupts out of the gums. Not all enamels are made equally; some individuals have imperfections in the enamel that cause discoloration or structural malformations. A specific X-linked genetic anomaly called Amelogenesis Imperfecta is the most common enamel abnormality. The wide range of controlling genes, each of which can express mutations with different symptoms such as discoloration ranging from yellow to brown, loss of enamel strength resulting in cracking and/or tooth sensitivity, and even bone loss in the jaw. These symptoms leave the individual with a predisposition to develop carries, despite perfect dental care. The SLC24A4 gene encodes a member of the potassium-dependent sodium/calcium exchanger protein family and has an influence on the symptoms of Amelogenesis Imperfecta. Due to the fact that amelogenesis occurs before tooth eruption, little is known of how mutations in SLC24A4 may alter the overall mechanism of the encoded protein. Comparing normal SCL24A4 gene sequences on the basis of expression across a variety of species with the physicochemical implications of known mutations may increase our understanding of the impact SCL24A4 mutations have on amelogenesis.

Hannah Smith is a junior biology student at the University of Arkansas - Fort Smith. She is a member of the Myles Friedman Honors Program and plans to attend dental school after obtaining her biology degree.

Dictyostelium Discoideum as a Host - Microbe Model for Screening Drug-Like Therapeutic Candidates (DLTCs) for Anti- Virulence Properties

Presented by Danielle Randolph and Joshua Thammathong

Faculty Sponsors: Dr. Sandhya Baviskar, Dr. Jeffery Shaver, Roger Lightner, Dr. Souvik Banerjee, and Dr. Sayo Fakayode

Field of Research: Biology

Table 2

Antibiotic resistance is one of the biggest threats to our health as it reduces our ability to treat infectious diseases. Many of the available antibiotics are ineffective because they target few bacterial processes such as protein synthesis and cell membrane functions. Thus, there is a need for searching anti-virulence drugs that do not kill the host and bacterial pathogen, but disrupt the production of virulence factors that damage the host. Recently, Dictyostelium has been used as a biomedical model for studying the targets and mechanisms of action of known and novel drugs. Dictyostelium is a bacterivorous, soil-dwelling amoeba, and its growth and development is affected by pathogenic microorganisms. The Dictyostelium host- microbe model system is suitable for preliminary screening of anti- virulence agents because it is simple, reproducible, robust, and easy to manipulate compared to many non-mammalian and mammalian models. To characterize the effects of Drug-Like Therapeutic Candidates (DLTCs), we will use cell proliferation and starvation induced-assays and to evaluate the anti-virulence properties, Dictyostelium developmental virulence and anti-virulence assays will be used. The results of this study can be further validated in mammalian models.

Danielle Randolph is a senior Myles Friedman Honors student at the University of Arkansas - Fort Smith. She attended high school in Waldron, Arkansas, graduating at the top of her class in 2018. She is graduating this May with her bachelor's in biochemistry, and she will be attending the Arkansas College of Osteopathic Medicine beginning in July. Being born and raised in this area has greatly contributed to her overall desire to help others, especially in those communities where medical access is limited.

Joshua Thammathong is a local to Fort Smith and is currently a senior chemistry student at the University of Arkansas - Fort Smith. He is currently in the process of acquiring his prerequisites for graduate school, as he is considering pursuing medical school to become a physician. He spends his time conducting research with numerous faculty members, working at a local pharmacy, and spending time with his family. Joshua sees his future self continuing to help those in his community any way that he can, specifically in those meaningful positions that can bring about the most impact.

Testing of Quinazolinone-Based Drug Candidates as Treatments for Antibiotic Resistant Bacterial Infections

Presented by Kairy Galvez

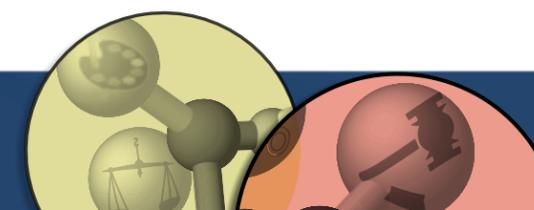
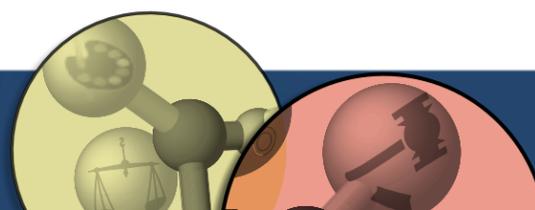
Faculty Sponsors: Roger Lightner, Dr. Jeff Shaver, Dr. Souvik Banerjee, Dr. Sandhya Baviskar, and Dr. Sayo Fakayode

Field of Research: Biology

Table 3

Quinazolinone-based scaffolds have been studied as potential treatments of resistant bacteria. Most antibiotic resistant bacterial infections are attributed to ESKAPE bacteria, including Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa, and Enterobacteriaceae species. The goal is to design, synthesize and evaluate the efficacy of 2,3-disubstitued-quinazolinone (DSQZNE) based drugs targeting pathogenic bacteria with Dictyostelium discoideum, a ground-dwelling amoeba that feeds on bacteria, used as a model eukaryotic host. To determine the antibacterial properties of each drug candidate, we utilize traditional disk diffusion assay and minimum inhibitory concentration (MIC) determination tests. The lowest concentration of the drug candidate that inhibits the growth of the bacterium is the MIC. Test results are utilized to determine which drug candidates exhibit antimicrobial properties against safe standard (Staphylococcus epidermidis, Escherichia coli, and Pseudomonas aeruginosa) and pathogenic bacteria (Methicillin-resistant S. aureus (MRSA) and P. aeruginosa). Promising antimicrobial drug candidates are advanced to pathogen-Dictyostelium system testing.

Kairy Galvez was born in Springdale, Arkansas, and currently lives in Rogers, Arkansas. Kairy graduated from Rogers Heritage High School in 2020 with her Associate of Science. She will be graduating in December 2022 with her Bachelor of Science in biology with a concentration in biomedical professions and a minor in Spanish. At UAFS Kairy volunteered regularly at the Dave Stevens Lion Pride Pantry and is vice president of the Biology Club. She has been doing research since spring 2021. After graduation her goal is to further her degree to become a physician assistant, and she is interested to work in either surgery or dermatology.



The Effects of Biochar on Turf Grass

Presented by Bryan Elam, Paul Gambill, and Logan Perez

Faculty Sponsor: James Brandli

Field of Research: Biology

Table 4

This semester we have taken charcoal typically used for agricultural purposes, and inoculated it with an aerobic fish emulsion made up of microorganisms and various plant nutrients. From the biochar collected from the inoculation, it was filtered into four different particle sizes to quantify the size of charcoal used, and then remixed to form a homogenous mixture of particle sizes. With the homogenous mixture completed, the biochar was applied to half of the containers of grass to see if it assists in grass(fodder) production. Each fodder sample used in this research will be grown in 275-gallon chemical totes and the treatment given to each tote is randomized, with six being used with biochar treatment and six being used without. Each tote will receive the same amount of light, water, and care to ensure accurate and unbiased results. Once growth has been initiated, the grass will be cut at scheduled times to simulate the grazing of livestock herbivory, or hay cutting. Finally, the dry matter that is accumulated after allowing the cut grass to dry will be calculated. This will simulate hay drying after tedding and before baling, and give us results as to if the inoculated biochar had a direct correlation to the growth of the fodder.

Bryan Elam is a senior at the University of Arkansas - Fort Smith pursuing a degree in biology with a concentration in biomedical professions. His interests include regenerative farming, holistic medicine research, and sustainable agriculture. He hopes to use this project as an opportunity to continue research with aquaponics.

Paul Gambill is a sophomore at the University of Arkansas - Fort Smith pursuing a biology major. While in school Paul has worked in biology research focusing on regenerative and sustainable agriculture as well as research in the field of experimental chemistry. When not at school, Paul works on a farm helping take care of horses and growing a market-style garden during the summer. He also owns a lawn care business that operates year-round. After school he plans to attend dental school. Paul plans to use this research experience in order to improve his understanding of the world around him, specifically the interactions between organisms in an agricultural setting and how these interactions can be modified to be more sustainable.

Logan Perez is a sophomore biology major at the University of Arkansas - Fort Smith. He hopes to attend graduate school for either veterinary medicine or a Ph.D. in ecological research. In his spare time outside of school, he works as a vet technician and ranch hand for a beef cattle farmer. Whilst growing up in Van Buren, Arkansas, these opportunities were abundant, as he has always been surrounded by agricultural endeavors. He considers himself to be hard working, honest, and most importantly, driven to succeed in all his personal goals. He thoroughly enjoys school and each opportunity he is given to step outside and study the world's organisms. He plans to use these passions and experiences to help form his successful future upon completion of his bachelor's at UAFS.

Quantitative Structural Activity Relationship (QSAR) Analysis of Drug-Like Therapeutic Candidates against Resistant Bacterial Infections

Presented by Harmeet Chohan

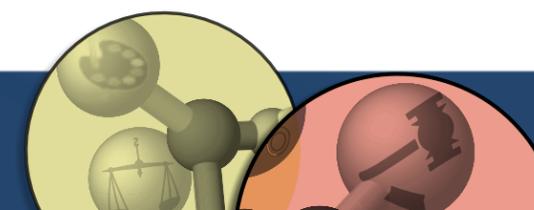
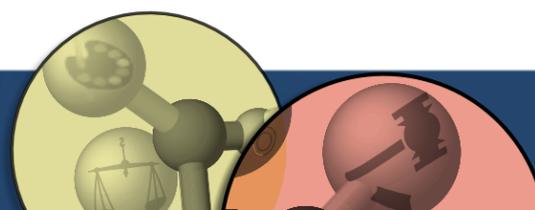
Faculty Sponsors: Dr. Sayo O. Fakayode, Dr. Jeffery Shaver, Roger Lightner, and Dr. Souvik Banerjee

Field of Research: Chemistry

Table 5

Rapid screening of potential drug candidates is a challenge in rational drug design. Quantitative structural activity relationship (QSAR) analysis and computational studies have proven efficient and low-cost for fast screening and pattern recognitions of drug-like therapeutic candidates (DLTC) with remarkable accuracy. This study utilized QSAR, Principal Component Analysis (PCA), PLS regression, and computational studies to evaluate the binding affinity of a set of DLTCs on dihydrofolate reductase (DHFR) from *Streptococcus aureus* S1 and penicillin binding protein 2x (PBP 2X) from *Streptococcus pneumoniae* co-crystal structures. The result of the analysis showed interesting pattern recognition based on DLTC's QSAR and binding affinities with DHFR and PBP 2X binding sites. In addition, DLTCs binding energies with DHFR and PBP 2X were modeled and validated with independent samples. The PLS predicted DLTCs binding energies with DHFR and PBP 2X of validated samples with impressive accuracy ≥ 96 percent. Ongoing study includes molecular dynamic simulation and biological evaluation of top leading DLTCs against resistant bacterial infections.

Harmeet Kaur Chohan is an Indian citizen born and raised in the Philippines. After she graduated from high school in 2018 from De La Salle University – Dasmariñas, she came to the United States to pursue a college degree. She is pursuing a Bachelor of Science in chemistry and is currently in her senior year. She started research with Dr. Mohammad Halim in her sophomore year and continued with Dr. Sayo Fakayode. She also did summer internships at the Food and Drugs Administration (FDA) and the University of Arkansas, Fayetteville. Harmeet has been accepted into a chemistry Ph.D. program at Purdue University where she will pursue graduate studies after graduation. Outside of school and work, Harmeet loves to sketch realistic portraits and loves to dance the Bhangra and Giddha.



A Comparative Analysis of Dolomitized Carbonate Samples Taken from the Engadine Group

Presented by Johnny Pruitt
Faculty Sponsor: Dr. Maurice Testa
Field of Research: Geoscience

Table 6

This project investigates two sets of Silurian aged dolomitized carbonate samples that have been collected from Knoll Reefs that are part the upper portion of the Bush Bay Formation and algal matt material that is part of the Rockview Formation. Both formations are part of the Engadine Group in the Hiawatha National Forest. Dolomitization alters the chemical structure of the carbonate rocks when magnesium is introduced through ground water. Magnesium replaces much of the calcium which mechanically and chemically alters the rocks properties and is also known to break down and dissolve fossilized remains that were originally preserved in the rocks. Though both reefs are temporally and spatially similar, there is a difference in the amount of fossilization preserved between the two sites. The samples were analyzed with an X-ray powder diffraction (XRD) and compared to a magnesium/calcium calibration curve, where a percentage of magnesium to calcium is determined. Determining the ratio of magnesium will help understand diagenetic events, and whether both areas experienced them simultaneously or as separate events entirely.

Johnny Pruitt is currently pursuing a bachelor's degree in geoscience with an environmental concentration and a minor in GIS with an anticipated graduation date of May 2023. After attending the Geological Society of America's annual conference in October 2021, he became inspired to further his education past a bachelor's degree in order to advance his career aspirations and research opportunities. After graduating from UAFS, he plans to pursue a thesis Master of Biological Sciences with a heavy concentration of environmental geology research.

Identification of Geothermal Calcium Carbonate Rocks from Magnet Cove, Arkansas

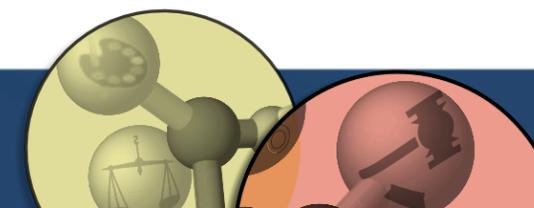
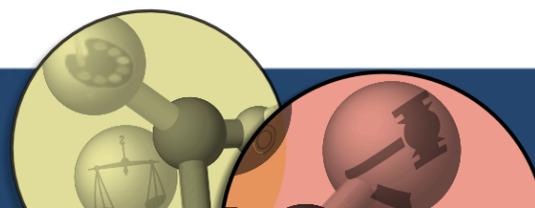
Presented by Ross Metcalf and Cassandra Huggins
Faculty Sponsor: Dr. Maurice Testa
Field of Research: Geoscience

Table 7

Geothermal activity such as hot springs are known to precipitate calcium carbonate (CaCO_3) minerals, producing rocks such as tufa, travertine, and carbonatite. The precipitation of calcium carbonate is caused by the reduction of carbon dioxide CO_2 , which is less soluble in warmer waters. Geothermal heating of water in natural springs drives this precipitation of calcium carbonate in areas of Arkansas including Magnet Cove. Several geologic reports of Magnet Cove claim the presence of carbonates stemming from the geothermal processes of the region; however, the identification of the carbonate material varies among the reports, including tufa, travertine, and carbonatite. Tufa is formed when carbonate minerals precipitate out of water. Travertine is formed by the evaporation of spring waters. Carbonatite, unlike the other two, is a rare igneous rock rich in calcium carbonate. The goal of this project is to perform petrographic and X-ray powder diffraction analysis on core samples taken from Magnet Cove. The goal of this project is to better understand the carbonate rocks chemistry and formation history.

Ross Metcalf is a geoscience major at the University of Arkansas - Fort Smith. After he graduates in 2024, he plans to attend graduate school with a focus in paleontology.

Cassandra Huggins is pursuing a bachelor's degree in environmental geoscience with a double minor in geographic information systems and chemistry from the University of Arkansas - Fort Smith. She plans to attend graduate school, specializing in planetary volcanology. Her career goal is to work for NASA



Investigation of a Recent Landslide in Fort Smith, Arkansas

Presented by Alex Burns, Payton Karr, Andrew Edmonds, and Mariah Thomas

Faculty Sponsor: Dr. Dave Mayo

Field of Research: Geoscience

Table 8

A landslide was recently recognized on a northwest-facing slope in a remote section of the City of Fort Smith Landfill. With a surface area of about 25,000 m² (7 acres) and a head scarp 200 meters long, the landslide severely damaged an unpaved private road, and the emergent toe of the landslide plowed into a forested area pushing trees into a semi-horizontal position and killing many of them. Historical aerial images and weather records were used to estimate the age and duration of movement of the landslide. Head-to-toe topographic profiles were generated from aerial imagery recently acquired via drone specifically for this project. These profiles are being used to determine the depth of the failure surface and the total volume of slide debris. Other than the unpaved road, there are no manmade structures on the slide, but the slide surface is conspicuously clear of trees compared to surrounding areas, which remain densely forested. We hypothesize that the removal of trees, the construction of the road, and record-high rainfall in 2006, 2008, and 2009 combined to trigger the slope failure.

Alex Burns is a geoscience major with a GIS minor from Greenwood, Arkansas. Alex is interested in petroleum geology, sedimentary geology, and GIS. With no definite post-graduation plans, he is hoping to apply to several different graduate programs and investigate different job opportunities to compare options.

Payton Karr is from Sallisaw, Oklahoma. She is working on her bachelor's in geoscience and plans to attend graduate school in the fall of 2023.

Andrew Edmonds is a geoscience major from Van Buren, Arkansas. He is interested in geological engineering, sedimentary geology, and hydrogeology. He would like to further his education through a graduate program and is still considering his options for graduate schools.

Mariah Thomas is a geoscience major and GIS minor, and plans to build a career around her GIS skills.

Determining the Impact of Surfactant Type and Concentration on Microplastic Recovery

Presented by John Turco and Matt Neal

Faculty Sponsors: Dr. Jordan Mader and Dr. Maurice Testa

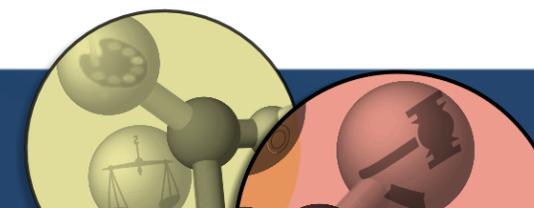
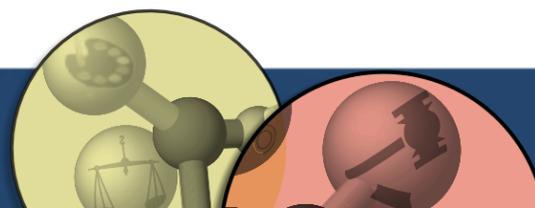
Field of Research: Environmental Geochemistry

Table 9

Microplastics are defined as either synthetic solid particles or polymers smaller than five millimeters. These particles are insoluble in water, which allows them to accumulate in water sources. Their size allows them to be ingested by wildlife such as fish and other food sources that leads to bioaccumulation up the food chain. Additionally, microplastics can act as vectors to heavy metals, increasing the concentration of these toxins in those exposed. A novel methodology for collecting and analyzing microplastics within water samples was developed by UAFS undergraduate researchers. This project focuses on refining initial results and expanding the understanding of the concentration effect of surfactant (Tween 80 or Span 80) on microplastic recovery and removal from water samples. A standardized mixture of the most common commercially used plastics has been purchased for this project. Varying concentrations of surfactant (0.1, 0.5, and 1 v/v percent) were tested to determine the outcome on sample aggregation and recovery.

Jon Turco is pursuing a degree in geoscience from the University of Arkansas - Fort Smith. He is extremely passionate about everything that involves geoscience and research. After UAFS he plans to pursue his Ph.D. in Karst geology. His hope is to track the flow of microplastics through cave environments.

Matt Neal is a geoscience major at the University of Arkansas - Fort Smith. He is an amazing student who motivates his teammates and is not afraid to take on a challenging project. After UAFS he plans to pursue his master's degree in environmental geology.



Marisa Canales, Concierto Caribeño

Presented by Leslie Rosa

Faculty Sponsors: Dr. Alexandra Zacharella

Fields of Research: Ethnomusicology, Performance, Entrepreneurship

Table 10

Marisa Canales (b. 1959) started her musical career in the place she called home, Mexico City, Mexico. As she grew older, she later furthered her studies at the Philadelphia College of Performing Arts, now known as the University of the Arts. Canales studied under Adeline Tomasone, who was at the time the principal flautist of the opera and Philadelphia orchestra. Canales went on to graduate with honors, with a Bachelor of Music degree.

Canales currently has a successful solo career and brings to the world of instrumental music her music productions and collaborative commissions. Some of her collaborations include working with guitarist Juan Carlos Laguna. Together they commissioned Lalo Schifrin to compose Concierto Caribeño and premièred with the London Symphony. This poster will explore Canales vibrant career and her contributions to new music, music for the wind repertoire genres and her role in the commission of “Concierto Caribeño”

Leslie Rosa is a senior music education instrumental major at the University of Arkansas - Fort Smith. She performs with the UAFS Wind Ensemble and Clarinet Choir and has served as a member of NAFME. Leslie has a private clarinet studio where her students have found great success in region and all state bands and honor bands. She currently works at Harvest Time Academy as a preschool teacher and has served as president of the youth group at Iglesia Cristiana Ríos de Agua Viva while also serving as a member of the worship team. In her free time, she enjoys reading and drawing.

“Chester”: A Song of Tyranny and Revolution

Presented by Jeason Lopez

Faculty Sponsor: Dr. Alexandra Zacharella

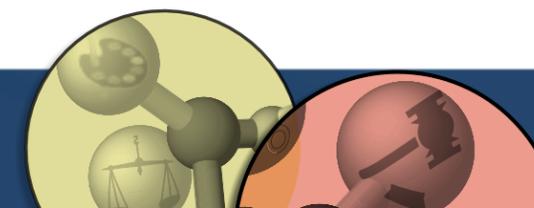
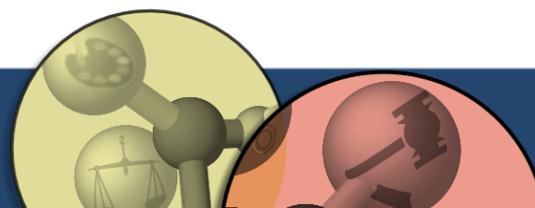
Fields of Research: Wind Band, Ethnomusicology, Music Education, Humanities

Table 11

“Chester” by William Billings (1746-1800), the first American choral composer, is a patriotic anthem composed during the American Revolutionary War. “Chester” became such a popular song throughout New England that it was adapted by other composers in their own pieces of music. Later, American composer William Schuman (1910-1992) set “Chester” as the third movement of his New England Triptych for orchestra, later arranged for wind ensemble as “Chester Overture For Band.”

This poster will explore the transformation of the original anthem by Billings into Schuman’s lively adaptation. This poster will also discuss the development of the theme of “Chester” through time, that has inspired an exciting and unique rendition of the beloved anthem. The origin and meaning of “Chester” with its undertones of social injustice and political strife remains relevant more than 240 years later.

Jeason Lopez is a senior instrumental music education major at the University of Arkansas - Fort Smith. He is currently a member of the UAFS Wind Ensemble, Athletic Band, Brass Ensemble, Flute Choir, Leonis Chamber Singers, and Men’s Chorus. He has served as the vice president and president of NAFME at UAFS and now serves as the president of the Lambda Kappa chapter of Kappa Kappa Psi, a band service fraternity. Jeason has participated in the Arkansas All-Region Bands and has been a member of the College Band Directors National Association Arkansas Intercollegiate Band and CBDNA Southwestern Intercollegiate Honor Band. He is also involved in the UAFS Campus Activities Board as the Culture Committee leader, the current vice president of the Black Student Association, TRIO STEM Program, Kappa Delta Pi Honor Society, and was a music tutor through the Academic Success Center for the UAFS Department of Music and Theatre.



Perceptions of Heart Healthy Behaviors in Homeless Women

Presented by Alexis Groves and Faith O'Mahony

Faculty Sponsor: Dr. Patricia Conard

Field of Research: Nursing

Table 12

The research regarding cardiovascular health, including predisposition and risk behaviors, among homeless women is deficient. A typical study emphasizes the effect of cardiovascular disease among women or the effect the condition of being homeless has on the overall health of an individual. However, few focus on the bridge between these concerns. This qualitative, phenomenological study was conducted to examine the perceptions and prioritization of heart healthy behaviors among homeless women in Fort Smith, Arkansas. This study selected participants, women ages 18 and older, using voluntary participant flyers. These women represented a diversity of ages and ethnicities. After the completion of eligibility screening, demographic information, and consent form, participants were interviewed by the research team. The responses were later coded and analyzed, and patterns were identified. In total 10 homeless women were interviewed. Key findings included a lack of consistent healthy food and drink options as well as a limited encouragement for establishing healthy habits (exercise, eliminating risk factors, healthcare, etc.). However, despite being homeless, the participants exhibited awareness regarding their health and a desire to improve. The results of this study validated the need for nursing-led interventions among homeless women to promote quality of life.

Keywords: perceptions; heart healthy; homeless; women

Alexis Groves is a senior II nursing student. She graduated from Greenwood (Arkansas) High School and is currently a member of the Myles Friedman Honors Program, Student Nurses Association, To the Smalls Organization, and Cub Camp. Through these registered student organizations she has had the opportunity to build connections within the University of Arkansas - Fort Smith and the surrounding community. When she is not participating in university events, she enjoys reading, outdoor activities, and traveling.

Paul Gambill is a sophomore at the University of Arkansas - Fort Smith pursuing a biology major. While in school Paul has worked in biology research focusing on regenerative and sustainable agriculture as well as research in the field of experimental chemistry. When not at school, Paul works on a farm helping take care of horses and growing a market-style garden during the summer. He also owns a lawn care business that operates year-round. After school he plans to attend dental school. Paul plans to use this research experience in order to improve his understanding of the world around him, specifically the interactions between organisms in an agricultural setting and how these interactions can be modified to be more sustainable.

Faith O'Mahony is a senior I nursing student. She graduated from Greenwood (Arkansas) High School and is a member of the Myles Friedman Honors Program and Student Nurses Association. These organizations give her the opportunity to lead and serve her community and school. When she is not studying, she loves to spend time with her family and friends, go to sporting events, and dog sit.

Sleep Apnea and Bruxism

Presented by Trinity Gonzalez, Abby Hawes, and Hailey McClain

Faculty Sponsor: Dr. Bonnie Branson

Field of Research: Dental Hygiene

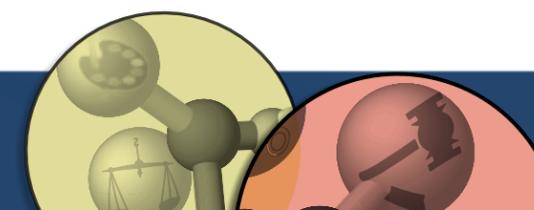
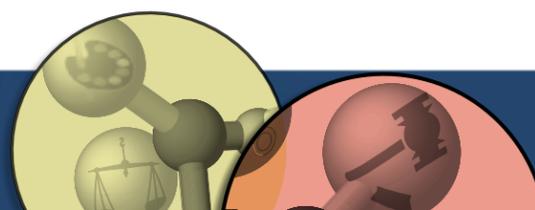
Table 13

Sleep apnea is a condition in which breathing starts and stops during sleep. There are multiple types of sleep apnea: obstructive sleep apnea, central sleep apnea, and complex sleep apnea. Obstructive sleep apnea is the most common type. The purpose of this research is to determine if a patient with sleep apnea experiences more bruxism than a patient without sleep apnea. According to the Journal of Conservative Dentistry, bruxism is characterized by clenching and grinding of the teeth. Bruxism is a parafunctional habit that may cause a person to experience pain of the masticatory muscles, attrition of the teeth, and temporomandibular joint disorders. The correlation between obstructive sleep apnea and bruxism tend to go unnoticed due to the fact that the patient is asleep and unaware. Since it is hard for patients to recognize sleep apnea, it is important for the dental clinician to notice the clinical signs within the oral cavity. These can include but are not limited to: enlarged tori, high malampati score, poor sleep, supine sleep position, obesity, hypertension, morning headache, orofacial pain, and bruxism. This presentation will focus on the correlation between bruxism and the airway obstruction caused by sleep apnea.

Trinity Gonzales is a senior dental hygiene student at the University of Arkansas - Fort Smith. Trinity is from Farmington, Arkansas. She is a historian for the Student American Dental Hygienists' Association (SADHA) at UAFS and a member of Gamma Phi Beta sorority, First Generation Students Association, and Cub Camp. Trinity was awarded the Arkansas Academic Challenge, Adelyn and Albert Pansze, and the University of Arkansas - Fort Smith Academic Distinction scholarships. She has been involved in the Fort Smith community with Girls Inc., Lions Heart Community Outreach, and the Arkansas Blood Institute. She is passionate about creating strong relationships with her patients and educating the community about oral health and hygiene. Upon graduation she plans to move to Northwest Arkansas to practice dental hygiene in an office near her hometown.

Abby Hawes is a senior dental hygiene student at the University of Arkansas - Fort Smith. She is from Rogers, Arkansas and is a member of the Student American Dental Hygienists' Association (SADHA). Abby was awarded the Academic Excellence and AR Academic Challenge - Traditional scholarships. Abby is a part of Gamma Phi Beta-Zeta Phi sorority at UAFS and has served as a Cub Camp counselor for three years. She has volunteered her time at Girls Inc.- Fort Smith, Girls on the Run in Northwest Arkansas, and LionHeart Community Outreach. After graduating she plans to work in Northwest Arkansas to be closer to her family. She is excited to continue patient education and developing relationships with her future patients.

Hailey McClain is a senior dental hygiene student at the University of Arkansas - Fort Smith. She is from Talihina, Oklahoma, but currently resides in Fort Smith. Hailey is a current member of the Student American Dental Hygienists' Association (SADHA), Cub Camp, and Delta Gamma. She was also a member of the UAFS cheer program for three years and placed top three twice at the National Cheer Competition in Florida. Hailey has been awarded an Academic Excellence Scholarship for four years, University of Arkansas - Fort Smith Cheerleading Scholarship for three years, and the Gordon Kelly Healthcare Scholarship for two years. She was also involved in many community service activities throughout her college career including LionHeart Community Outreach and volunteering at the Oklahoma School for the Blind in Muskogee. After graduation she plans to continue developing relationships with her patients and educating them on the importance of oral health.



Laser Assisted Non-Surgical Periodontal Therapy

Presented by Selena Fitzjurls, Isabel Jamison, Abbie Morris, and Emily Nguyen

Faculty Sponsor: Dr. Bonnie Branson

Field of Research: Dental Hygiene

Table 14

Periodontal disease is a chronic epidemic that is present in our society. It is an infection of the oral cavity that can cause the destruction of soft and hard tissues that support the teeth. In addition to this, untreated periodontal disease can be linked to other systemic health conditions. Non-surgical periodontal therapy (NSPT) is the treatment of choice for individuals that suffer from periodontitis. The bacterial load found in chronic periodontitis consists of several types of bacteria in high amounts; diode lasers have been researched to reduce this total bacterial load. The purpose of this research is to evaluate laser-assisted periodontal therapy (LAPT) with a diode laser as an NSPT adjunct as compared to NSPT alone. The research includes a review of literature from respected, peer-reviewed journals to gather information. The research will also discuss other uses of lasers such as the treatment of aphthous ulcers, dentinal hypersensitivity, whitening, treatment of herpetic lesions, temporomandibular disorders (TMD) therapy, etc. As dental professionals, it is vital to advance our education and practices to best treat our patients. The effects of using diode lasers along with NSPT are prominent enough to consider the widespread use in dental practices.

Selena Fitzjurls is a senior in the dental hygiene program at the University of Arkansas - Fort Smith. She is from Ozark, Arkansas, and is the treasurer of the Student American Dental Hygienists' Association (SADHA) at UAFS. She was awarded the Arkansas Academic Challenge, Ozark Academic Booster, Rotary Club, Mercy Hospital Turner Memorial, OAYO, Carl Vandenburg Memorial, and Mabel and Loyd Hobbs Memorial scholarships. Upon graduation she plans to stay in Arkansas to practice dental hygiene in her hometown while working towards her master's degree in dental hygiene. She plans to eventually become a dental hygiene instructor because of her passion for education to promote the profession and work toward expanding the parameters of dental hygiene.

Isabel Jamison is a 20-year-old senior dental hygiene student at the University of Arkansas - Fort Smith. She was raised in the town of Nashville, Arkansas, and currently acts as the secretary for the Student American Dental Hygiene Association (SADHA) on campus. She is a member of the Phi Theta Kappa international honor society for students and recipient of the Arkansas Challenge and Neal R. Pendergraft Endowed scholarships. She finds satisfaction working with her patients to help them achieve the smile that they desire. She enjoys spending her free time with her family and friends. When she graduates college, she plans on staying and practicing dental hygiene in in the state of Arkansas.

Abbie Morris is a senior at the University of Arkansas - Fort Smith. She is vice president of the Student American Dental Hygiene Association (SADHA). She is newly married and resides in Cecil, Arkansas. She has a strong connection to the foster care community; her parents have been foster parents since she has graduated high school. She has been active in serving the foster community's oral health care needs through the dental hygiene clinic at UAFS and with SADHA. Upon graduation she plans to work in Arkansas while also pursuing her master's degree in healthcare administration at UAFS. She plans to pursue education in the field of dental hygiene.

Emily Nguyen is a 22-year-old senior dental hygiene student at the University of Arkansas - Fort Smith. She is from Van Buren, Arkansas, and has a passion for community outreach. She is a member of the Student American Dental Hygienists' Association (SADHA) and the National Society of Leadership and Success. She has been on the university's Dean's List since 2017 and is a recipient of the Arkansas Academic Challenge, Sebastian County Academic, and the Sebastian County Academic Book scholarships. Upon graduation she plans to stay in Arkansas to practice dental hygiene in her hometown.

Efficacy of Xylitol on Reduction of Streptococcus Mutans

Presented by Sarah Davis, Diana Guerrero, and Marisol Vasquez

Faculty Sponsor: Dr. Bonnie Branson

Field of Research: Dental Hygiene

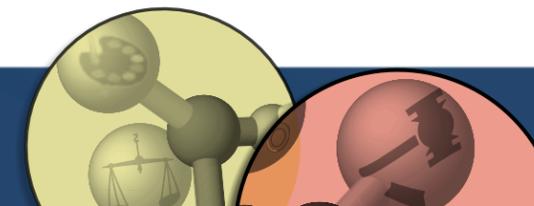
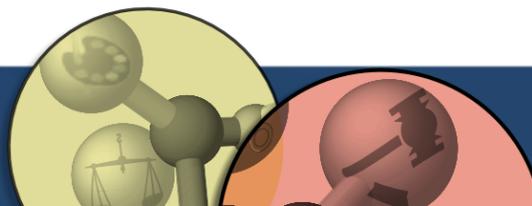
Table 15

A sugar alcohol is derived naturally from foods and can also be found in plant products. Xylitol is a type of sugar alcohol, also known as a polyol, that has been widely studied regarding its effects in reducing the prevalence of dental caries (cavities). Xylitol is a white, crystalline substance that tastes sweet like sugar, but does not cause tooth decay. It is also a five-carbon sugar that is used in "sugar-free" mints, candies, and chewing gum. Evidence-based research findings have suggested that the use of xylitol products can reduce the formation of dental caries by neutralizing salivary pH, preventing plaque biofilm formation and maturation, and decreasing the incidence of gum disease, such as gingivitis and periodontitis. Like any other sweetener, mineralization is produced by increasing the salivary flow. The purpose of this research was to evaluate the ongoing discussion regarding the efficacy of xylitol as an anticariogenic agent. This presentation is based on research findings from peer-reviewed journals evaluating the effectiveness of xylitol products on the reduction of Streptococcus mutans in adults. The forms of xylitol products discussed within the presentation are both chewing gum and mouthrinse. This presentation will provide recommendations on the best use of xylitol products.

Sarah Davis is a senior dental hygiene student at the University of Arkansas - Fort Smith. After graduation and obtaining licensure, she will start her first job as a registered dental hygienist at a dental office in Rogers, Arkansas. She is originally from Fayetteville, Arkansas, and is excited to bring her career home with her to Northwest Arkansas. Sarah has been recognized for her academic achievements, making the Chancellor's List and the Dean's List for several terms throughout her college career at both the University of Arkansas, Fayetteville and UAFS. Traveling and visiting new places are her favorite activities, and she hopes to travel to new destinations throughout her life. In her free time, Sarah loves going on hikes with her doberman pinscher Leo, cooking, and spending time with family and friends.

Diana Guerrero was born in Salinas, California, but has moved to different places such as Rogers, Arkansas, and Mexico. She has been living in Fort Smith since the age of 8. Diana is Chicana, a Mexican American who is bilingual. She has been a recipient of the John and Kim McFarland Health Science Endowed, Mollie Wilson Women's Financial Series, the Academic Excellence, Arkansas Academic Challenge, and the LULAC National Scholarship Fund scholarships. Diana is also an athlete; she loves to play sports as a hobby, especially soccer. She is currently the president of the Soccer Club at UAFS and works at a family business called Moreno's Bakery on the weekends. After graduation Diana will stay in Fort Smith to practice dental hygiene.

Marisol Vasquez is a senior in the dental hygiene program at the University of Arkansas - Fort Smith. She is from Heavener, Oklahoma, where she has spent her whole life, and is a member of the Alpha Lambda Delta National Honor Society. She was awarded two UAFS Foundation scholarships: the Laurie Mason Scholarship and Ruth Martin Scholarship. Marisol is a first-generation college student and the oldest of three siblings. She enjoys helping others by educating patients on quality access to dental care. During her free time, she likes to spend time with her family and friends, bake delicious treats, and hike outdoors. After graduation she plans to work in the River Valley area before moving to a different state later in the future.



Look to the Future: A Periodontal Disease Vaccine

Presented by Jenny Dixon, Sarah Goyne, Brittany Mize, and Ashley Wilson
 Faculty Sponsor: Dr. Bonnie Branson
 Field of Research: Dental Hygiene

Table 16

Periodontal disease is a chronic progressive disease that destroys the periodontium in the oral cavity if left untreated. Periodontal disease has been proven to be a multi-bacterial disease. There are over 700 species of pathogens involved in the initiation and progression of periodontal disease. Porphyromonas gingivalis is a major pathogen of concern that has been identified to contribute to the continual destruction of the periodontium. Human subject trials have not been approved by the Federal Drug Administration (FDA). Therefore, the purpose of this research is to present the most recent animal trial findings for a vaccine against P. gingivalis to help decrease the progression of periodontal disease. There are currently animal trials being conducted with many discussions of possibilities for future human trials approval. This research reveals statistics about the efficacy of the vaccine as seen in these multiple animal trials. This presentation will explore the route of administration and assess the need for immune intervention to halt disease progression. As a dental professional, it's important to be aware of not only the most recent evidence-based practices, but also be aware of upcoming scientific interventions that could be ground-breaking for patient care.

Jenny Dixon is a senior in the dental hygiene program at the University of Arkansas - Fort Smith. Prior to being accepted into dental hygiene, she worked for 20 years as a registered dental assistant in general dentistry, pedodontics, orthodontics, oral surgery, and with a cosmetic dentist. Through the years she has expanded her knowledge by pursuing extended functions for her RDA license including radiographs, coronal polishing, nitrous certification, and a Dental Assisting Anesthesia National Certification Exam (DAANCE) license. Most recently she has worked with a dentist specializing in temporomandibular joint disorders and enjoyed learning how to help patients be more comfortable with their condition. Jenny joined the dental hygiene program to further her dental knowledge and because she especially enjoys one-on-one time with her patients. In her free time, she loves being with her family. After graduation Jenny looks forward to having time for traveling.

Sarah Goyne is a senior in the dental hygiene program at the University of Arkansas - Fort Smith. She is from North Little Rock, Arkansas, but has been a Fort Smith resident since June 2018. She is a member of the Alpha Lambda Delta national honor society and enjoys spending time with her family, cooking, and being outdoors. After graduation Sarah plans to practice dental hygiene in the River Valley area and volunteer in Arkansas to provide treatment to those who do not have access to dental care.

Brittany Mize is a senior at the dental hygiene program at the University of Arkansas - Fort Smith. She had been a member of the Arkansas dental community since 2012, working as a certified dental assistant. Her pursuit to be a dental hygienist began when she realized she could do more for her patients and help them establish a sense of coherence about their oral health. Outside of the program, she enjoys a relaxing evening out by a fire with her husband Ryan and occasionally backpacking/hiking when time allows. After graduation she plans to work as a traveling hygienist in Arkansas and engage in community outreach programs.

Ashley Wilson is a senior dental hygiene student at the University of Arkansas - Fort Smith. She was born in Fort Smith and moved to Pocola, Oklahoma, where she grew up. She plans to see where the road takes her as far as where she will live after dental hygiene school. Ashley loves the engagement with patients that come to the hygiene clinic at UAFS. She finds educating the patients and seeing them create healthy habits as very rewarding. In the very few moments of free time she has, she spends time with her family and her dog Peanut.

Spina Bifida: Fetal Ultrasound Importance

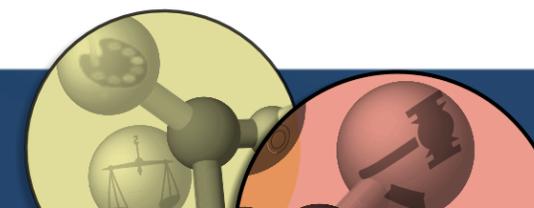
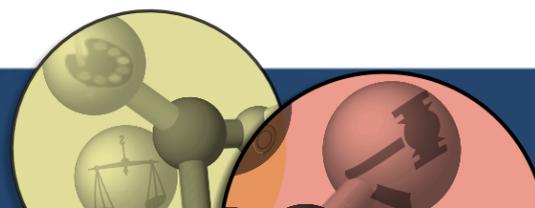
Presented by Hope Chronister and Chris Owens
 Faculty Sponsors: Brandy Weidman and Alisa Cole
 Field of Research: Diagnostic Medical Sonography

Table 17

Spina Bifida is a broad term used to describe a range of neurodevelopmental disorders characterized by incomplete closure of the spinal column. During fetal growth, a neural tube (that will become the baby's brain, spinal cord, and surrounding tissues) will form in early pregnancy and close after the 28th day of conception. There are several forms of defects that fall under this term, and outcomes can vary from little impact on the individual to lifetime complications. Typically, this can be caught in early pregnancy during a routine fetal ultrasound exam, and can even be treated, in some cases, before birth. Treatment options depend upon early detection, thus making ultrasound and proper training vitally important. In this case study, a newborn female was examined and found to have a spina bifida defect at the base of the spine that went undetected during the pregnancy.

Hope Chronister was born and raised in Fort Smith along with her seven siblings. She graduated high school in 2017 and then completed an associate degree in radiography at the University of Arkansas - Fort Smith in 2021. Most of her time is spent working at the hospital or studying as she completes a bachelor's degree in diagnostic medical sonography. In her free time (which is rare), she likes to complete puzzles with her husband, play with her dog, or spend time with friends and family.

Chris Owens is 42 years old, and he attends the University of Arkansas - Fort Smith majoring in diagnostic medical sonography. He lives in Red Oak, Oklahoma, and has worked for Choctaw Nation Health Services Authority in the medical imaging department for almost 12 years. Chris is certified in radiography, computed tomography, and magnetic resonance imaging. He has three children and three grandchildren, and he tries to occupy as much of their time as he can. He has been married for 15 years to his amazing wife, and they enjoy traveling to whatever last-minute getaway they can find in a spur of the moment "let's go" getaway. In his limited spare time, he enjoys small woodworking projects that tend to get started and not as often finished.



Live Ectopic Pregnancy

Presented by Malorie Radley and Jaquie Thomas
 Faculty Sponsors: Brandy Weidman and Jodi Callahan
 Field of Research: Diagnostic Medical Sonography

Table 18

An ectopic pregnancy is an extrauterine pregnancy. This occurs when an egg is fertilized and implanted outside of the uterus. Ectopic pregnancies may be seen in any location of the pelvis and the abdomen. These pregnancies are diagnosed using beta hCG levels and sonography. An abnormally high beta hCG level can indicate an ectopic pregnancy. Our case is on a 38-year-old female who presented to the emergency room with an abnormal increase in her beta hCG level within four days. Ultrasound was then utilized to determine that the embryo implanted in the right fallopian tube. This case was missed on a previous ultrasound exam. Ectopic pregnancies are idiopathic but are believed to be linked to some conditions such as: hormonal factors, genetic conditions, or damaged fallopian tubes. This patient has a history of ectopic pregnancies and spontaneous abortions. Live ectopic embryos are not life sustaining because the embryo is unable to grow outside of the uterus. An ectopic pregnancy is an emergent situation and must be removed with medication or, as in this case, a surgical procedure.

Malorie Radley is a registered radiologic technologist currently working at Johnson Regional Medical Center while she continues her education in the University of Arkansas - Fort Smith Bachelor of Science in Imaging Science in diagnostic medical sonography program. Malorie recently got engaged and is in the process of building a house and planning her wedding. Most of her time consist of working, studying, playing with her newborn niece, and planning for her future.

Jaquie Thomas is a diagnostic medical sonography student at the University of Arkansas - Fort Smith. She works at Baptist Health in the CT department. When she is not working or studying, she likes to read and also enjoys being outside when the weather is nice. She is from a small town about two hours away from Fort Smith, so when she has a weekend off, she likes to go home and visit her family.

Subclavian Steal Syndrome

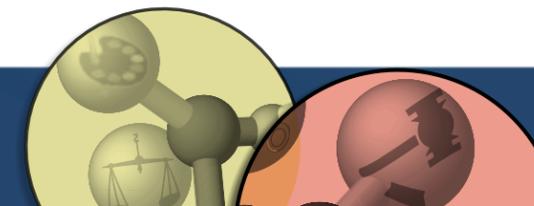
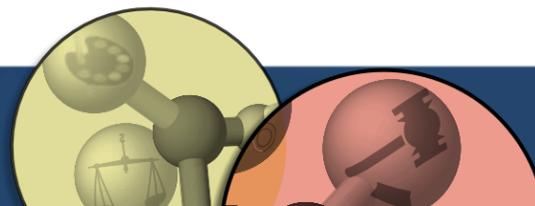
Presented by Cindy Torres-Dodson and Courtney Young
 Faculty Sponsor: Brandy Weidman
 Field of Research: Diagnostic Medical Sonography

Table 19

Retrograde flow in the vertebral arteries is often caused by stenosis or occlusion of the subclavian artery, also known as Subclavian Steal Syndrome. This can affect the posterior circulation of the brain, as well as circulation in the upper extremities. Retrograde vertebral arteries can present asymptomatic and are usually found incidentally. Symptomatic patients most commonly report neurological symptoms such as vertigo, dizziness, hearing loss, blurred vision, and syncope. A 76-year-old female patient presented with dizziness, asymmetrical brachial artery pressures, and a history of cerebrovascular accident (CVA). During a carotid Doppler exam, the patient was diagnosed with retrograde flow of the left vertebral artery. The radiologist recommended a computed tomography angiogram to further evaluate and identify the severity of the stenosis. Subclavian Steal Syndrome may require medical intervention depending on the severity of symptoms. Treatments can include lifestyle changes, medications, and surgery.
 Keywords: retrograde, duplex ultrasound, subclavian steal

Cindy Torres-Dodson is an Army veteran who lives in Pocola, Oklahoma, with her husband Justin and their two boys Aden and Benjamin. She graduated from Carl Albert State College 2012 with an A.A.S. in radiologic technology, and in 2014 she completed her computed tomography certification. In her free time, she enjoys trying new restaurants, reading, traveling, running, and anything Disney.

Courtney Young lives a busy life, and she wears many different hats including wife, mother, student, and employee. She graduated from the University of Arkansas - Fort Smith radiography program in May 2021 and is currently enrolled in the university's diagnostic medical sonography program. Courtney works at Johnson Regional Medical Center as a radiologic technologist. She has two children, ages 8 and 9-months, as well as two sisters who work in the medical field. Her husband and parents are extremely supportive, and she recognizes that she would not be where she is today without them. Courtney's family is very close, and their time together is always full of love and laughter. She loves working in radiology, but she looks forward to finishing her ultrasound degree and starting her dream career.



Splenosis: A Case of Spontaneous Spleen Regrowth Following Splenectomy

Presented by Cambrie Keel and Emilee Rogers

Faculty Sponsor: Brandy Weidman

Field of Research: Diagnostic Medical Sonography

Table 20

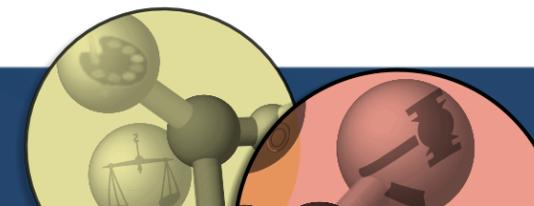
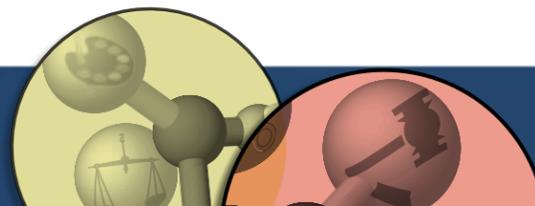
Splenosis is a condition in which there is a regrowth of splenic tissue following a splenectomy. Research has shown that splenosis is a fairly common occurrence and happens in up to 66% of traumatic splenectomy cases. Splenic tissue can repopulate and grow anywhere in the body, but it is most commonly found in the abdominal cavity. Studies have shown that patients that have a presence of splenic tissue post splenectomy experience a decrease in post surgical complications. Splenosis is usually asymptomatic and found as an incidental finding. In this case study, a middle aged man was imaged as an outpatient in a hospital setting. He presented with a superficial palpable abdominal mass that had been present for a few months. The patient had previously undergone a splenectomy and has an extensive surgical history. Upon review by the radiologist, the mass was deemed to be the product of splenosis.

Cambrie Keel is originally from Coweta, Oklahoma, but she has lived in Fort Smith for the past five years. When she is not doing homework, she enjoys sewing, cooking, and playing video games. She works at Premier Pediatrics doing x-ray and lab, and one of her biggest supporters is her dog Nugget, who loves stealing snacks and sleeping through their study dates.

Emilee Rogers is from Alma, Arkansas. She graduated from Van Buren (Arkansas) High School in 2018. Currently she is a diagnostic medical sonography student at the University of Arkansas - Fort Smith. Emilee graduated from the UAFS radiography program in May in 2021 and has worked at Baptist Health Urgent Care as a radiographer ever since. When she is not studying or working, she enjoys spending time with friends and family.

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