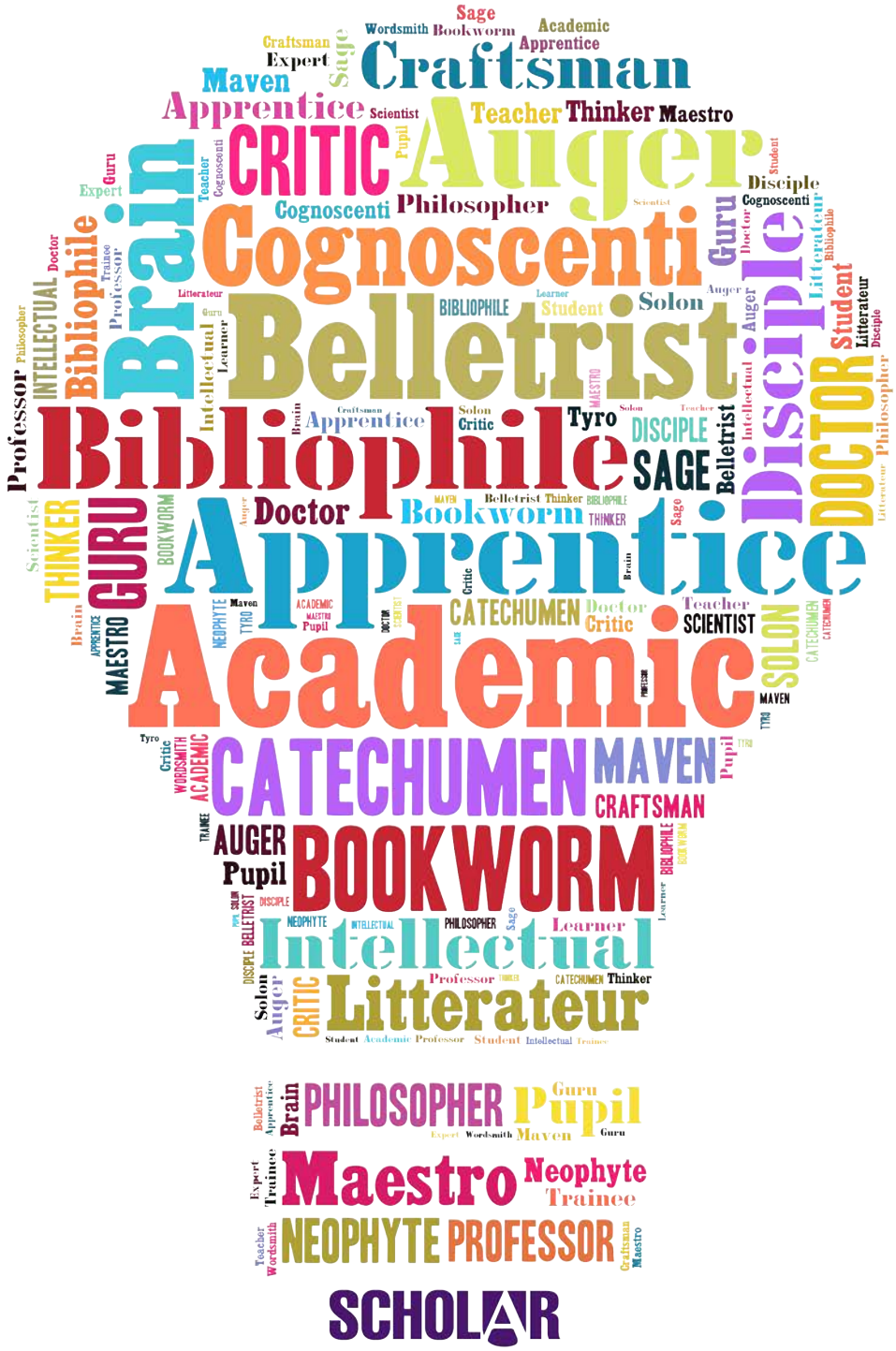


Student Scholar Day 2026

Thursday, April 16

AVILA UNIVERSITY

Welcome to Avila University 25th Annual

Student Scholar Day

April 16, 2026

2026 Student Scholar Day Committee Members

Kelsey Miles, Ph.D.
Dakota Shields, M.S.
Melinda G. Arnett, Ph.D.

Special Thanks to:
Maintenance Staff for room set-up and tear-down
Great Western Dining Services staff
ITS for technical support
Avila Faculty for student mentorship and encouragement

AVILA UNIVERSITY

SPECIAL THANKS
from
The Committee, Faculty, Students, and Guests

AVILA UNIVERSITY
EDUCATION WITHOUT LIMITS

POSTER PRESENTATIONS
(Judging by Committee Members)

Whitfield Conference Center
Noon – 1:00 p.m.

ORAL PRESENTATIONS

Whitfield Conference Center
1:00 – 2:20 p.m.

1:00 **Spread Too Thin: Barriers School Social Workers Face Supporting Students**
Micaela Carter

1:20 **Creative Assignments as Inclusive Pedagogy for Neurodivergent Students**
Mary Kate Pugh

1:40 **Why Can't Our Children Read?**
Kennedy Yoder

2:00 **Turning Cassava Waste into Fuel: Enzymatic Starch-to-Glucose Conversion**
Malcolm Goswell

KEYNOTE SPEAKER

Whitfield Conference Center
2:30 – 3:00 p.m.

Bailey Saldana, PhD
Visiting Assistant Professor Criminology and Justice Studies

AWARDS CEREMONY

Whitfield Conference Center
3:00 – 3:30 p.m.

Disciplines in higher education have different formats for presenting research and scholarship. You will notice that in the sciences (e.g., biology, kinesiology, psychology, education), scholars present research using a basic scientific approach: presentation of hypothesis, interventions or application, and results. Their research is usually presented with a power point and discussion. In disciplines such as history or English, scholar will present their research by reading a paper. Performance scholars will actually perform their presentation. All presentation styles and formats are valid and should be respected.

Poster Presentations/ Judging

Whitfield Conference Center
Noon – 1:00 p.m.

Using Competitive Molecular Recognition with β-Cyclodextrin for Ibuprofen Analysisn

Nicolas Garza, Ethan Jenkinson, Earl Jones
Faculty Mentor: Dr. Lida Khalafi

Ibuprofen is able to form host–guest inclusion complexes with β-cyclodextrin (β-CD) due to the presence of the hydrophobic cavity of the cyclodextrin molecule. In this work, a spectrophotometric method for determination of ibuprofen is described based on competitive inclusion complexation with phenolphthalein under basic conditions. Phenolphthalein in alkaline solution shows an intense pink coloration. However, when it is included inside the β-CD cavity, the color is suppressed and the phenolphthalein–β-CD complex becomes colorless. After addition of ibuprofen to this system, competitive binding takes place. Ibuprofen has affinity toward the β-CD cavity and displaces phenolphthalein from the inclusion complex, forming a new ibuprofen–β-CD complex. As a consequence, free phenolphthalein is released back into solution and its characteristic color is restored, resulting in an increase of absorbance. The change in absorbance measured by UV–visible spectroscopy is proportional to the concentration of ibuprofen, allowing quantitative analysis through calibration with standard solutions. The proposed approach was successfully applied to the determination of ibuprofen in pharmaceutical tablet formulations, demonstrating that competitive molecular recognition with β-cyclodextrin provides a simple and effective analytical strategy.

Analysis of Ibuprofen via Competitive Complexation with β-Cyclodextrin

Kaylee Lynn, Setareh Soureshjani
Faculty Mentor: Dr. Lida Khalafi

Ibuprofen, due to the hydrophobic cavity present in the β-cyclodextrin (β-CD) molecule, is able to form host–guest inclusion complexes with β-CD. In this work, determination of ibuprofen by a spectrophotometric method is described, using competitive inclusion complexation with phenolphthalein under basic conditions. In alkaline solution, phenolphthalein shows an intense pink coloration; however, when included inside the β-CD cavity, the phenolphthalein–β-CD complex becomes colorless because the color is suppressed. After ibuprofen is added to the system, competitive binding takes place. Ibuprofen has affinity toward the β-CD cavity and forms a new ibuprofen–β-CD complex by displacing phenolphthalein from the inclusion complex. As a consequence, free phenolphthalein is released back into the solution, restoring its characteristic color and producing an increase in absorbance. The absorbance change measured by UV–visible spectroscopy is proportional to the ibuprofen concentration, which allows quantitative analysis through calibration with standard solutions. This proposed approach was successfully applied to pharmaceutical tablet formulations for the determination of ibuprofen, demonstrating that competitive molecular recognition with β-cyclodextrin provides an effective and simple analytical strategy.

Optimizing Laboratory Procedures for an Antimicrobial Spice Project

Elena Moore
Faculty Mentor: Lindsay Beardall

Food-born illnesses cause symptoms such as, diarrhea, vomiting, abdominal pain, fever, and dehydration. If the infection is severe then damage to the liver, nervous, muscular, digestive, and/or

reproductive system can occur. These illnesses can be fatal to elderly people or those who are immunocompromised (cancer patients or children). Well known food-borne illnesses have been associated with pathogens like Bacillus cereus, E. coli, Penicillium notatum, Pseudomonas fluorescens, Saccharomyces cerevisiae, and Staphylococcus aureus. For thousands of years, spices have been used for medicine or food preservation. In ancient cultures (Egypt, Sumerian, China) they have used garlic, cloves, and cinnamon to help prevent food spoilage and illness. In the Middle Ages spices were also known for their preservation and medicinal properties. A kit from Carolina Biologic called "Spicy Inhibitor Kit" was utilized for this experiment. The goal was to see if this kit provided a more successful student experience than a lab with a procedure written from research articles on the antimicrobial properties of spices. Efficacy was improved by the kit through better qualitative data collection but did not provide an advantage for quantitative data as with the original experiment.

Analysis of Mutated groE Promoter at 37°C and 40 °C

Setareh Soureshjani, Mia Zaragoza
Faculty Mentor: Katie Burgess

Misfolded proteins play a crucial role in endocrine disorders and many other diseases. Stress may induce proteins to misfold. Stress activates the groE promoter which induces the expression of the chaperone system that refolds misfolded proteins. The major question being asked is "Will RNA polymerase bind to a mutated promoter to activate chaperone activity?" The hypothesis is that by mutating the groE promoter, RNA polymerase and promoter binding weakens, reducing chaperone activity and gene expression. The mutated promoter was created by changing a single Cytosine nucleotide at the -14 site to a Thymine. This mutation is located in the -10 region of the promoter, previously identified to be important in gene expression. The experimental design compares the wild-type promoter and the mutated promoter by cloning them both into pClone with the AmpilCP Blue Chromoprotein reporter. BsaI overhangs were added to both promoters to allow Golden Gate Assembly ensuring that the promoters will clone into the pClone plasmids. DNA sequences for both the wild-type groE and mutated groE promoters were annealed, diluted, and plated on LB + ampicillin plates, then incubated at 37°C or 40°C . After incubation, the promoters were then transformed into bacteria. Promoter activity will be measured by observing the intensity of the blue color produced, which indicates the level of gene expression, and then further analyzed by both RNA and protein investigation.

Single-Base Pair Deletion in a Heat Shock Promoter Affects Gene Expression

Racquel Ayers, Estrella Garcia, Ashleigh Wolff
Faculty Mentor: Dr. Katie Burgess

Promoters are short DNA sequences that regulate genes. Heat-shock promoters (HSP) turn genes on when temperatures increase. Altering the temperature affects whether the HSP is "turned on", affecting transcription of DNA. Deletion of the -35 thymine is expected to decrease gene expression. Golden Gate Assembly was used to insert wild-type and mutant-type heat shock promoters into the pClone plasmid. pClone contains AmilCP Blue chromoprotein as a reporter of promoter activity. The recombinant plasmids were transformed into E. coli cells and plated on

LB agar containing ampicillin. After overnight incubation at 37 , no reported activity was seen. However, when incubated at 40 , we observed both wild-type and mutant colonies with AmilCP Blue chromoprotein colonies. The wild-type colonies demonstrate darker chromoprotein reporter expression than the mutant colonies. Further experimentation will quantify blue chromoprotein and RNA levels between promoter types at both temperatures.

Promoter Mutations and their Effects of Lac Operon Expression

Nicolas Garza, Maxwell Sturgeon
Faculty Mentor: Dr. Katie Burgess

Gene expression is essential for cells to go from genetic information to protein. Mutations in the lac operon promoter affect gene expression in E. coli. Modified promoter sequences were designed, including the TAT and TGA mutations created by our group. The complementary DNA sequences were annealed to form double-stranded DNA and cloned into a pClone plasmid using Golden Gate Assembly with the enzymes BsaI and T4 ligase. The recombinant plasmids were then introduced into competent E. coli through heat-shock transformation. Successful cloning and promoter activity were indicated by AmpilCP blue, a reporter of the promoter's activity. All plates produced a large number of colonies, indicating successful transformation. Reporter measurements were collected from colonies to compare promoter activity. The two studied mutations demonstrated high promoter activity. Analysis is ongoing to quantify protein and RNA levels. Preliminary results suggest that small changes in promoter DNA sequences can alter gene expression levels without completely disrupting transcription. Overall, this experiment demonstrates how synthetic biology techniques such as promoter annealing, molecular cloning, and bacterial transformation can be used to study gene regulation.

Common Mental Health Stressors of Latinx College Students

Madison Lopez
Faculty Mentor: Dr. Jordan Wagge

Trying to understand the mental health stressors a Latinx college student may experiences is important. Some of these stressors include depression and anxiety, stress, and even the amount of loneliness they might be feeling. Knowing what contributes to these students' mental health can help Mental Health Professionals (MHPs) gain knowledge on how to address these problems from a cultural stance. Learning more about other cultures and what contributes to their struggles with mental health allows MHPs to apply that to their own clients when they begin to show struggles of the same issues. The literature presented helps paint a picture of what stressors contribute to the struggle of mental health in Latinx college students

Autistic Students and Higher Education Transition

Claire Barker
Faculty Mentor: Dr. Jordan Wagge

Students with autism spectrum disorder face many challenges during their transition to higher education. Autism Spectrum Disorder (ASD) begins early in development and involves social and communication challenges alongside repetitive or restricted behaviors that create lifelong differences in social interaction, communication, and behavioral patterns that can impact everyday functioning (DSM-5). According to the Centers for Disease Control and Prevention (CDC), Autism and Developmental Disabilities Monitoring Network, as of 2022, 1 in 31 eight-year-old children in the U.S. were identified with ASD (CDC, 2025). A 2024 review found that, as of 2020, the post-secondary graduation rate of autistic students was only about 41% compared to nearly 62% of the general population (Wolpe, 2024). With rising ASD diagnosis rates, university enrollment is expected to increase, and the existing gaps in retention and graduation rates represent a significant access and equity issue. Institutions must strengthen academic and social support to capture students' full potential and future success in society.

Oral Presentations

Whitfield Conference Center
1:00 – 2:20 p.m.

1:00 p.m.
Spread Too Thin: Barriers School Social Workers Face Supporting Students

Micaela Carter
Faculty Mentor: Dr. Debra Olson-Morrison

This study examines the barriers school social workers face when supporting students' mental health and behavioral needs in schools. A mixed-methods survey was completed by 17 school social workers across Kansas, Missouri, and Minnesota. Participants reported that limited time, large caseloads, and challenges with parent buy-in were the most common barriers to providing consistent support for students. Participants also identified several supports that helped them be more effective in their roles, including supportive administrators, collaboration with teachers, Social and Emotional Learning (SEL) programs, and community partnerships. These findings highlight the important role school social workers play in promoting student well-being and strengthening relationships between schools, families, and communities. By identifying the challenges professionals face when trying to meet students' needs, this research emphasizes the importance of strengthening school-based mental health supports so that students have the opportunity to succeed both academically and socially.

1:20 p.m.
Creative Assignments as Inclusive Pedagogy for Neurodivergent Students

Mary Kate Pugh
Faculty Mentor: Dr. Jordan Wagge

As neurodivergent student enrollment in higher education grows, instructors face the challenge of designing learning environments that uphold academic excellence while supporting diverse cognitive styles. Traditional assessments, such as standardized, timed exams and papers, often do not serve all learners equally, limiting some students' ability to fully demonstrate their understanding. This literature review examines creative assignments as an evidence-based approach to inclusive pedagogy in college classrooms, synthesizing research across the scholarship of teaching and learning, creativity, and inclusive higher education to explore how multimodal, neurodiversity-affirming practices can better serve all learners. Across studies, creative assignments such as podcasts, visual projects, and storytelling deepen conceptual learning, increase motivation, and foster a sense of belonging. These benefits are especially prominent for neurodivergent students but also extend to the broader student population. This presentation highlights how creative assignments serve as both engaging instructional strategies and structural supports for cognitive diversity, while keeping learning goals clear and assessment consistent and inclusive. By prioritizing creativity as central to inclusive pedagogy, this work empowers educators and advances conversations about equity, belonging, and each student's potential in higher education.

1:40 p.m.
Why Can't Our Children Read?

Kennedy Yoder
Faculty Mentor: Dr. Sue Ellen McCalley

Two approaches for teaching reading have been debated by literacy experts for decades. These approaches, though very different in style, work towards the same goal of teaching students to read. The debate is whether one approach is better than the other or if they are both equally effective. The ongoing debate does not hinge upon a lack of evidence, but rather a lack of change in literacy instruction in K-12 public schools. Reading is the foundation of everything. Every subject in school requires some degree of reading and this extends into the world outside of school. Everyone must learn to read, and the instructional approach does matter.

2:00 p.m.
Turning Cassava Waste into Fuel: Enzymatic Starch-to-Glucose Conversion
Malcolm Goswell
Faculty Mentor: Dr. Kelsey Miles

Cassava is a widely used food source across Africa, Asia, and Latin America and ranks fifth in global starch production. Its extensive use generates significant agricultural waste, particularly in the form of inedible cassava peels. This biomass has gained increasing attention as an underutilized resource with strong potential as a feedstock for bioethanol production, offering a more sustainable and economically viable alternative to conventional crops. A key step in bioethanol synthesis is the enzymatic hydrolysis of starch into fermentable sugars such as glucose. This study focuses specifically on this conversion step by investigating the efficiency of enzymatic starch breakdown from cassava. Cassava starch was treated with different enzymes, including α-amylase and β-amylase, under controlled conditions. The resulting glucose production was quantified and compared across treatments to evaluate enzyme effectiveness. The findings contribute to optimizing the starch-to-glucose conversion process, supporting the broader use of cassava peel waste as a renewable resource for bioethanol production.

Keynote Speaker

Whitfield Conference Center
2:30 - 3:00 P.M.

Bailey Saldana, PhD
Visiting Assistant Professor
Criminology and Justice Studies

Dr. Bailey Saldana is a visiting assistant professor and program coordinator for the Criminology and Justice Studies program. She joined AU in Fall 2025. Dr. Bailey earned her doctorate in Criminology and Criminal Justice from Southern Illinois University, her masters from the University of Missouri-St. Louis, and her bachelor's from the University of Central Missouri. Her research and teaching interests include violent and sexual victimization, inequality, and multi-methodological research.

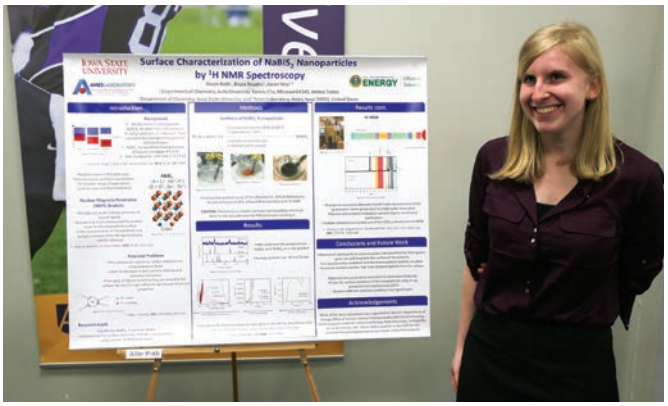
Dr. Bailey Saldana will cover her experiences with social science research at different levels of education, highlighting both her introduction to research and the different projects on which she has worked. She will discuss her past and current research projects, the different forms that they have taken, and the ways we can create research that is meaningful to our lives.

Awards Ceremony and Closing

Whitfield Conference Center
3:00 - 3:30 P.M.

Winners for Oral/Performance and Poster Presentations will be announced.

Participants from past Student Scholar Days



STUDENT SCHOLAR DAY GOALS

- Promote and encourage student contributions to scholarly activity across the campus.
- Recognize and reward outstanding student achievements and scholarly activity.
- Promote interdisciplinary academic interaction among students and faculty.
- Reinforce the breadth of learning that characterizes a quality formal education.
- Support the institution's educational efforts regarding the importance of communication skills.
- Enhance community awareness of the high level of scholarship at Avila University.

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