

29th Annual Westmont College

Student Research Symposium



WESTMONT

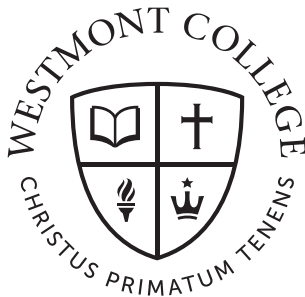
April 17, 2025
3:30-5:00 p.m.

*Winter Hall
Westmont College*

2025 Spring Research Symposium

April 17, 2025
3:30-5:00 p.m.

*Winter Hall
Westmont College*



One of the hallmarks of Westmont College's academic program is the opportunity for undergraduate students to work directly with faculty on research and scholarly projects. Work presented at the Student Research Symposium includes student work conducted during the past year, from the divisions of the Humanities, Social Sciences, and the Natural and Behavioral Sciences. The purpose of this symposium is to celebrate the noteworthy accomplishments of Westmont students.

With special appreciation for support from the Office of the Provost

PARTICIPANTS

Lauren Ahmann '25
Kinesiology
Poster #17, #18

Nash Garvey '25
Economics & Business
Poster #23

Alan Lopez '26
Chemistry
Poster #4

Melinda Amick '25
Chemistry
Poster #16

Kaiah Gloria '25
Psychology
Poster #13

Berit Lunstad '26
Physics
Poster #7

Johnathan Arrieta '25
Chemistry
Poster #4

Anthony Gose '26
Chemistry
Poster #29

Benjamin Mandani '27
Physics
Poster #7

Kennedy Burkett '26
Psychology
Poster #11

MaKenna Jacob '25
Chemistry
Poster #25

Roger Marcellin '26
Chemistry
Poster #6

Kylie Carter '25
Religious Studies
Poster #24

Mia Kenyon '26
Chemistry
Poster #22

Ainsley Martin '26
Engineering & Physics
Poster #19, #20

Sophia Chan '25
Chemistry
Poster #21

Christine Kim '25
Sociology
Poster #33

Emmie Matthews '25
Psychology
Poster #28

Abby Dickinson '26
Psychology
Poster #31

Sofia Latta '26
Psychology
Poster #14

Cara McGuffee '25
Chemistry
Poster #22

Kailey Hwang '27
Physics
Poster #30

Sierra Limbrick '25
Psychology
Poster #9

Miriam Melkonian '25
Chemistry
Poster #25

PARTICIPANTS

Ellie Muench '25
Kinesiology
Poster #17, #18

Britain Polk '26
Communication Studies
Poster #12

Gavin Stay '26
Engineering & Physics
Poster #20

Corban Muthiah '25
Biology
Poster #3

Luke Porter '27
Physics
Poster #10

Mason Ticas '26
Chemistry
Poster #4

Kathryn Ohara '25
Sociology
Poster #2

Sarah Remland '25
Psychology
Poster #26

Caleb Tobey '28
Chemistry
Poster #4

Izabella Olvera '25
Psychology
Poster #27

Sydney Richter '25
Sociology
Poster #5

Elizabeth Vousboukis '25
Kinesiology
Poster #17, #18

Christian Payne '28
Physics
Poster #30

Jessica Rosenfeld '26
Chemistry
Poster #22

Angelie Zambrano '25
Sociology
Poster #8

Jillian Pearson '25
Psychology
Poster #32

Dusty Schrader '25
Kinesiology
Poster #17, #18

Jackson Zerwas '26
Chemistry
Poster #4

Morgan Petersen '25
Sociology
Poster #34

Ande Siegel '25
Psychology
Poster #1

Alexandra Pilch '25
Kinesiology
Poster #17, #18

Emma Silver '25
Sociology
Poster #15

ABSTRACTS

1. The effect of positive and negative feedback on sports anxiety and athlete burnout with neuroticism as a moderator

Positive and negative feedback are crucial in the development of young athletes, with varying effects based on their personality types. Negative feedback, or criticism, can help identify areas for improvement, but can also trigger self doubt and fears of failure. This experiment hypothesized that athletes receiving negative feedback would perform worse on a processing speed task compared to those receiving positive feedback. This study also considered neuroticism as a moderator, suggesting that athletes with higher levels of neuroticism would perform worse after receiving negative feedback, and report increased competitive anxiety and burnout. In this experiment, participants completed self-report questionnaires about their sports involvement and personality, followed by a symbol search task. Results showed no significant interaction between neuroticism and feedback type on the cognitive task performance. However, the main effect of feedback type was significant, showing that negative feedback resulted in poorer performance. The results of this study highlight the importance of feedback in shaping athletic performance, highlighting the potential consequences for an athlete's mental well being.

Ande Siegel '25

Brooke Laree Garmon '26

Evan Johnson '25

Dr. Gewnhi Park

Psychology

2. Examining the Relationship Between Religious Salience and Views on Racial Justice

This paper explores the relationship between religious salience and individuals' views on racial justice. Religious salience has been shown to influence various social attitudes, yet its impact on racial justice perspectives remains underexplored. Drawing from sociological theories of religion and race, this study examines correlations between religious salience and attitudes toward racial justice. Through quantitative analysis, this study analyzes survey data taken from 162 undergraduate students at a liberal arts college to examine correlations between religious salience and attitudes toward racial justice. The analysis reveals political identification and religious salience as key factors, with Democrats more supportive of policies like affirmative action, while highly religious individuals tend to oppose them. These findings aim to contribute to a deeper understanding of how religious beliefs intersect with social justice issues, providing valuable insights for religious leaders, members of the college's administration, and other advocates for racial equity.

Kathryn Ohara '25

Dr. Meredith Whitnah

Dr. Blake Kent

Sociology

Results would be evaluated by analyzing the differences in each participant's heart rate between every condition compared to the baseline and each other. The PANAS emotion scale would be graded and evaluated, then compared to each individual within conditions to verify that mood changes are occurring depending on the music being listened to.

ABSTRACTS

3. Limited effect of urbanization on stress, immunity, and reproduction in *Sceloporus occidentalis*

Urbanization has altered a multitude of ecosystems drastically, introducing various new stressors that have implications for the behavior, physiology, morphology, and overall fitness of wild species. We analyzed corticosterone levels, blood glucose levels, reproductive traits, and immunity in *Sceloporus occidentalis* across an urban gradient in Santa Barbara, CA. There are three possible trends: (1) urbanization has a positive effect associated with a decrease in baseline corticosterone and blood glucose levels, and an increase in immunity and reproductive success, (2) urbanization has no effect, and (3) urbanization has a negative effect. Our results revealed that blood glucose, immunity, clutch size, and clutch mass did not change significantly with urbanization. However, we found that in the spring, there is a negative correlation between corticosterone and urbanization while in the summer there is none. Ultimately, *Sceloporus occidentalis* shows very little physiological change in response to urbanization but seasonality may be a factor.

Corban Muthiah '25

Eric Reyes
Alexander Rurik
Noah Hareb

Dr. Amanda Sparkman
Biology

4. Mystery of the Enhanced Fluorescence Caused by the Passage of 1,6-Dichlorohexane Through a Biphenyl Adlayer on Al₂O₃

This semester's research has focused on the cause of a huge increase in the fluorescence intensity of biphenyl when 1,6-dichlorohexane was deposited below it as an underlayer. The amount of excitation light that was absorbed was monitored during the temperature ramp of the bilayer, consisting of 1,6-dichlorohexane as an underlayer with biphenyl overlayer. Several observations are noteworthy: a). Surprisingly, the amount of excitation light that was absorbed by biphenyl was much larger than expected just from its fluorescence. b). the 1,6-dichlorohexane desorbed about 10 K prior to the enhanced fluorescence, which can be interpreted to mean that the underlayer caused spatial isolation of the biphenyl in the overlayer. Hence, the observation would lead to the conclusion that the isolation of individual biphenyl molecules allows for efficient self-fluorescence in the absence of energy transfer, which would mean ~ 10 nm (Förster Radius). Since the end-to-end bond distance of 1,6-dichlorohexane is ~ 1 nm, it would not be unreasonable for the biphenyl isolation to occur when the 1,6-dichlorohexane desorbed. Our data also shows that this enhancement increases with 1,6-dichlorohexane:biphenyls coverages that level off at 0.5:1. In other words, the effect occurs with roughly one 1,6-dichlorohexane to 2 biphenyl molecules.

Johnathan Arrieta '25

Alan Lopez '26
Mason Ticas '26
Caleb Tobey '28
Jackson Zerwas '26

Dr. Alan Nishimura
Chemistry

ABSTRACTS

5. Navigating Gender and Religious Identities: Perceived Institutional Climate at Westmont Regarding Sexual Abuse and Its Influence on Student Trust in God, Religious Leaders, and Their Peers

Sydney Richter '25

Dr. Meredith Whitnah
Sociology

This study examines the ways in which third and fourth-year undergraduate students at a private, faith-based liberal arts college navigate their gender and religious identities by examining their perceptions of the institutional response to sexual abuse. This research is based on 15 qualitative interviews with 10 female and 5 male students, focusing on their perceptions of institutional responses to sexual abuse and the impact that has on students' trust in God, religious leaders, and their peers. This study found that students who perceived inadequate institutional responses to sexual abuse displayed the least trust in leadership, yet maintained trust in Scripture as liberation for survivors. Students communicated a dissonance between leadership words vs. action and how action was imperative in their development of trust in leadership. Additionally, Christian narratives centered around sexual encountered as sin further by the institution limited students comfortability in testifying to their experiences of sexual abuse.

6. Photocatalytic Reduction of Perchlorate Using Iridium-Labeled Dendrimers

Roger Marcellin '26

Dr. Stephen Contakes
Chemistry

This project is centered on the preparation of iridium-based light-sensitive complexes with electron transfer pathways through which perchlorate, a harmful inorganic groundwater pollutant with abundant confirmed release sites nationwide, can be reduced into the harmless chloride anion. The first part of this project consisted of the multistep synthesis of these compounds, beginning with the synthesis of their precursor, which needed to be converted into a usable form. This photoreactive molecule was coupled with a dendrimer in different ratios, which provided the electron transfer pathway necessary to reduce substrates like perchlorate. The reduction ability of these compounds was assessed through spectroscopy, and it was demonstrated that perchlorate and the photocatalyst-dendrimer conjugate interacted in a way that was consistent with perchlorate reduction. Future research directions include investigation of whether these molecules can serve as effective detection mechanisms for other inorganic pollutants.

7. Call Me Variable: Stars That Just Can't Commit

Benjamin Mandani '27
Berit Lunstad '26

Dr. Jennifer Ito
Physics

Variable stars fill the night sky and are characterized by the way in which they change brightness over time. In this observational study, AN Lyn of the high amplitude Delta Scuti class of variable stars is analyzed with photometry performed at the Westmont Observatory. The processes of photometry can be broken down into data collection and light filtration, image calibration and bias collection, and light curve analysis. This analysis can tell us about the modes of pulsation of the star which yields quite interesting results. Previous analysis shows that this star could be a three body system.

ABSTRACTS

8. "Time to Get Ready for Love": How views of sex impact relationship satisfaction

Angelie Zambrano '25

Dr. Meredith Whitnah
Sociology

Despite recent developments in gender and sexual equality, women are still defined by sex whether that be through their portrayal of purity and/or their portrayal of promiscuity. The purpose of the current study is to look deeper into women's views of sex and relationship satisfaction. Using purposive snowball sampling to find 15 women in their 20's who were interviewed on their relationship experiences and views of sex, it was found that a majority felt they had to have sex. Reasons for their views included (a) having sex to evade conflict, (b) having sex to maintain a relationship, (c) having sex as a duty to a partner. Moreover, women often reported feeling trapped in between a double standard that requires them to be paradoxically pure and promiscuous. The findings of this study offer a deeper understanding to how women feel about the place of sex in their lives and the societal pressures that inform their feelings.

9. Cardiac Vagal Tone Moderates the Effect of Race on Attentional Orienting

Sierra Limbrick '25

Dr. Gewnhi Park
Psychology

This study examines how racially identifiable stimuli influence attentional orienting, and whether cardiac vagal tone (CVT), indexed by heart rate variability, moderates this effect. Participants completed a spatial cueing task where Black and White facial cues preceded a target. Implicit racial biases were assessed using the Inclusive Racial Association Task, and CVT was measured. Based on existing research on attentional negativity bias, it was predicted that racial outgroup stimuli would elicit faster attentional engagement and slower disengagement. Individuals with higher CVT are expected to exhibit more controlled attentional patterns in response to racially outgroup facial cues, while those with lower CVT may show faster engagement and delayed disengagement with outgroup faces. These findings aim to reveal how physiological regulation may shape or mitigate bias in attentional processes.

Keywords: Cardiac Vagal Tone, Racial Outgroup, Attentional Orienting, Implicit Bias, Heart Rate Variability

10. Pointing Toward Prehistoric POLARBEARS

Luke Porter '27

Dr. Jennifer Ito
Physics

The POLARBEAR experiment is a telescope array located in the Atacama Desert in Chile that does research into the Cosmic Microwave Background (CMB) and the beginning of our universe. To do this research effectively the position in the sky that the telescope is pointing needs to be known precisely. However, due to a variety of factors such as detector position, structural flexing, and the telescope's position on Earth, there is some systematic error in the encoded pointing position, leading to the necessity of the creation of a pointing model. All of these things must be accounted for in the pointing model in order to correctly reconstruct the true place in the sky that the telescope is pointing. My project throughout the year has been to create this model to accurately represent CMB data.

ABSTRACTS

11. Effects of Binaural Auditory Stimulation on Sleep Latency

Kennedy Burkett '26

Sleep is a fundamental part of life, aiding in restoration, memory consolidation, cognition, and more. Although sleep is crucial to life, many people express sleep concerns, especially regarding sleep latency. The goal of the present study was to replicate past findings, focusing specifically on sleep, in order to continue investigating the debated topic of the effects of auditory stimulation, specifically binaural beats, on sleep latency. The participant went to bed wearing the sleep band each night, alternating between a control audio and an experimental audio. The findings of this study do not support the use of binaural beat brain stimulation as a way to decrease sleep latency. No one method works for everyone though, so this may help some but not others, and this calls for more research on this topic and on other aspects of sleep.

Dr. Ronald See
Psychology

12. Overcoming Barriers to Sustainable Fashion in Australia: Insights from Clothing Producers and Consumers

Britain Polk '26
Communication Studies

Despite growing awareness of fashion's environmental impact, sustainable practices face significant adoption challenges in Australia, where the majority of clothing is imported and fast fashion remains dominant. This study aimed to identify and analyze the key barriers preventing both producers and consumers from fully engaging in sustainable fashion practices in Australia. The study employed a mixed-methods approach combining qualitative and quantitative data collection. Eight in-depth interviews were conducted with Australian-based fashion label owners and industry experts. Additionally, 92 surveys were administered to consumers across various retail locations and online platforms. Analysis revealed three primary barriers to sustainable fashion adoption: financial, educational, and logistical challenges. While these challenges are daunting, interviews reveal positive solutions and suggestions to keep sustainability at the core of the situation. Producer insights suggest successful strategies including year-round basics production, strategic cost allocation, and direct manufacturer relationships.

Ruth Rosenhek, M.S.
Lismore, Australia

13. The Heart of Social Cognition: How Cardiac Vagal Tone Modulates Social Cognition

Kaiah Gloria '25
Milania Gregory '26
Kennedy Burkett '26
Brogan Braaten '27

The present study investigates if cardiac vagal tone - a psychophysiological indicator of self-regulation- modulates social cognition task performance. Participants were instructed to identify the emotional valence of words when presented with words of positive and negative valence superimposed on in-group (white) and outgroup (black) faces. Their accuracy during trials and heart rate variability (HRV) were analyzed. The in-group incongruence effect was seen through participants performing less accurately when negative words were superimposed on in-group faces. Cardinal vagal tone modulates performance, evident through participants with higher resting HRV performed more accurately when negative words were superimposed on in-group faces compared to participants with low HRV.

Dr. Gewnhi Park
Psychology

ABSTRACTS

14. Motherhood's Lasting Impact: The Role of Reproductive History in Alzheimer's Disease

Sophia Latta '26

There is increasing evidence that women's reproductive history affects cognitive health during aging and contributes to risk factors for Alzheimer's disease (AD). Parous women have significantly lower levels of estrogen compared to nulliparous women, with this difference persisting post-menopause and potentially placing multiparous women at higher risk for AD. Based on data collected from neuropsychological evaluations completed at an outpatient neurology clinic, the current study explores the relationship between the number of children and cognitive functioning in women, including risk for developing AD.

Dr. Steven Rogers
Psychology

15. The New Risk Culture: How Political Polarization Contributes to Social Boundary-making

Emma Silver '25

The article examines the relationship between political polarization and social boundary-making among undergraduate students attending a liberal arts college on the West Coast. Exploring the political beliefs and perceptions of college students allows for a greater understanding of how political polarization and sociopolitical boundaries are shaped at the societal, collegiate, and interpersonal levels. Utilizing qualitative semi-structured interviews, participants were asked about their perceptions of the political sphere, their understanding of their political beliefs, and views of differing beliefs. The research demonstrates a hesitancy to deliberate about political beliefs, stemming from self-protection and a fear of judgement, as well as a strong connection in applying Christian faith principles to political beliefs and sociopolitical interaction. The findings are significant to the study of political polarization regarding emerging research on young adults, and ties to the 2024 presidential election in which there was a significant intersection between religious and political beliefs.

Dr. Meredith Whitnah
Sociology

16. Computational Study of Substituents on Neighboring Group Stabilized Oxenium Ions

Melinda Amick '25

Aryloxenium ions (or aryloxylium ions) are hypovalent oxygen cations that are a potential source of electrophilic oxygen. They are stabilized through resonance with an adjacent aromatic ring, leading to mixtures of O- and C-functionalization products. A promising alternative approach to stabilizing the aryloxenium ions is through the coordination of a Lewis basic neighboring group. This computational study systematically investigates the effect of a diverse set of electronic substituents on i) the aryloxenium ring and ii) a pyridine neighboring group (NG) on the formation and stability of the NG-coordinated aryloxenium ion. The electronic substituents studied were methoxy, nitro, N,N-dimethylamine, methyl, and trifluoromethyl. Data were collected at the B2PLYPD3/def2-TZVPP//B3LYP/6-31G(d) level of theory with a PCM solvent model. For most of the substituents, the NG-coordinated aryloxenium ion is more stable than the uncoordinated (or resonance-stabilized) aryloxenium ion with modest variation in the energetics. Electron-donating groups in the para-position of the aryloxenium ions tended to stabilize the uncoordinated aryloxenium more than other positions, specifically when

Dr. Brandon E. Haines
Chemistry

ABSTRACTS

NME2 is substituted. In addition, electron-withdrawing groups in the ortho-position and meta-position of the pyridine NG tended to weaken the stability of the NG-coordinated aryloxenium ion the most. This destabilization is likely due to the pyridine neighboring group's over-stabilizing effect. These findings increase our knowledge of the role of substituents in affecting the stability of aryloxenium ions. Preliminary data on the applications of these findings to the C-H insertion reactivity of oxenium ions show that the energy barriers are far too high to occur. Thus, we are looking for new models to exploit the electrophilicity of these NG-coordinated aryloxenium ions with different neighboring groups and nucleophiles.

17. Faith, Fertility and Knowledge: Evaluating Reproductive Health Awareness among Young Adults

Despite the critical role of reproductive health (RH) in overall well-being, research on women's health remains disproportionately underfunded and understudied. The CDC has recorded that fertility rates are dropping dramatically by 2% each year. Moreover, a significant gap exists in validated instruments assessing reproductive health knowledge, particularly regarding the menstrual cycle, nutrition, and fertility. Furthermore, there has been minimal research done in regard to knowledge of women's health and RH in individuals with a faith-based background. This study aims to develop a comprehensive reproductive health knowledge questionnaire focusing on the menstrual cycle, nutrition, and fertility utilizing a cross-sectional, mixed methods design. Participants (n=500) ranging from 18-25yr. will be recruited from faith-based organizations, secular institutions, and online platforms to ensure a diverse sample. After informed consent, participants will complete a 15-20 min questionnaire. The questionnaire (MARHQ, Menstruation and Reproductive Health Questionnaire) will consist of 25 questions: 16 questions related to women's health including menstruation, nutrition and RH: of these 16, three relate to women only as they pertain to tracking of the menstrual cycle, three are faith related, and six are demographic. Understanding RH is essential for informed decision-making, yet many individuals demonstrate knowledge gaps, which impacts pregnancy planning and recognition of menstrual irregularities as potential health indicators. A validated tool will enable researchers and healthcare providers to assess knowledge gaps systematically, guiding targeted educational interventions and policy decisions. This study addresses the urgent need for a standardized, evidence-based RH knowledge assessment, contributing to improved health literacy and outcomes.

Lauren Ahmann '25
Ellie Muench '25
Alexandra Pilch '25
Dusty Schraeder '25
Elizabeth Vousboukis '25

Dr. Jada Willis
Kinesiology

ABSTRACTS

18. Optimizing Athletic Performance: Implementing a Sports Nutrition and Performance Program at a Private NCAA Division II Institution

The implementation of a performance sports nutrition program at a private NCAA Division II institution is essential for optimizing student-athlete health/performance/ recovery and recruiting in the NIL era. Adequate nutrition is a critical component of athletic success, directly influencing energy availability, muscle synthesis, hydration, and injury prevention. Despite the well-established benefits, many collegiate athletic programs lack structured nutritional support, particularly at the Division II level.

This project aims to assess DII student athletes, staff and coaches, knowledge of nutrition and sports nutrition in order to develop a comprehensive sports nutrition program utilizing the Athlete Nutrition Development Approach (ANDA, developed by Iwasa-Madge and Sesbreno in 2022). Briefly, ANDA provides a theoretical model developed to aid practitioners in servicing decisions through the athlete development process through a three-tiered approach to sport nutrition service delivery. Tier 1, our primary focus at the moment, addresses the determinants of eating behaviors. As such, our program will use the platform for evaluating athlete knowledge in sports nutrition questionnaire (PEAKS-NQ). Briefly, this 15-min questionnaire is a rapid and valid tool that assesses: 1) general nutrition, which assesses understanding of food groups and nutrients; and 2) sports nutrition, which examines comprehension of training, competition and recovery nutrition, strategies for changing body composition, and specialized athlete issues such as supplement risk. This assessment has a total of 90 items: 10 surrounding food groups, 36 items surrounding nutrition, and 14 items surrounding applied sports nutrition. Our goal is to look at a population of 275 students, 125 athletes, 125 regular students, and 25 coaches or staff, through a cross-sectional design. We will use these results to provide the students of this institution with their specific needs as we start our sports nutrition program.

Lauren L. Ahmann '25
Ellie J. Muench '25
Alexandra C. Pilch '25
Dusty Schraeder '25
Elizabeth A. Vousboukis '25

Dr. Jada Willis
Kinesiology

19. Into the Wild West: A Coincidence Study of ^{76}As Transitions

With limited experimental investigation, the exotic arsenic isotope ^{76}As offers a valuable opportunity to explore nuclear structure in the "Wild West" region on the neutron-rich side of stability. Using data from a 2019 fusion-evaporation experiment at Florida State University, coincidence gating techniques were used to isolate ^{76}As transitions from contaminant nuclei such as ^{75}Se . Energy-level transitions were investigated through mutual coincidences, spin-parity considerations, and comparisons with the intensity patterns and level structure of the neighboring isotope ^{78}As . This approach confirmed portions of the existing level scheme and suggested candidates for new transitions. The analysis contributes an independent verification of the published ^{76}As structure and offers insight into the systematic behavior of neutron-rich odd-odd nuclei.

Ainsley Martin '26
Josef Bingener '25
Ethan Camp '27

Dr. Robert Haring-Kaye
Physics

ABSTRACTS

20. "Image Analysis of the Dynamics of Reusable Launch Vehicle

Reusable rockets like SpaceX's Falcon 9 have transformed space exploration by reducing cost and broadening mission opportunities. This study investigates the Falcon 9 booster's return trajectory using only publicly available telemetry data. Time, speed, and altitude information were extracted from footage of the January 2, 2024 live-streamed launch and were used to reconstruct the vehicle's descent through kinematic equations and graphical analysis. Newton's Laws and drag force modeling were then used to isolate engine thrust and estimate flow rates during re-entry and landing. The analysis revealed that only 8.6% of the rocket's total launch fuel was expended on the return phase, highlighting the efficiency of the system. Unlike previous studies that rely on proprietary data or sophisticated computational models, this work presents an accessible methodology that enables broader public engagement with spaceflight dynamics.

Ainsley Martin '26

Gavin Stay '26

Abigail Lingel '26

Dr. Douglas Fontes
Engineering

21. Ortho-arylation of Aryl Carbonates

Carbon-aryl bonds are one of the most prevalent bond types in drug synthesis; however, the common approaches for C-C bond formation rely on harsh conditions and multi-step reactions. Approaching C-C bond formation through carbon-hydrogen (C-H) activation allows for lower temperatures, safer solvents, and a one-step reaction. This research investigates C-H activation with carbonate directing groups for ortho-arylation reactions.

Sophia Chan '25

Skylar Jones '26

Cara McGuffee '25

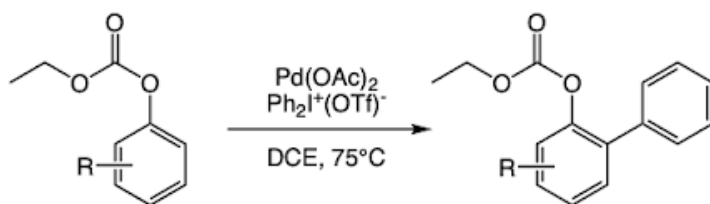
Mia Kenyon '26

Mariyan Popov '24

Jordan Ogawa '24

Braden Chaffin '23

Dr. Amanda Silberstein
Chemistry

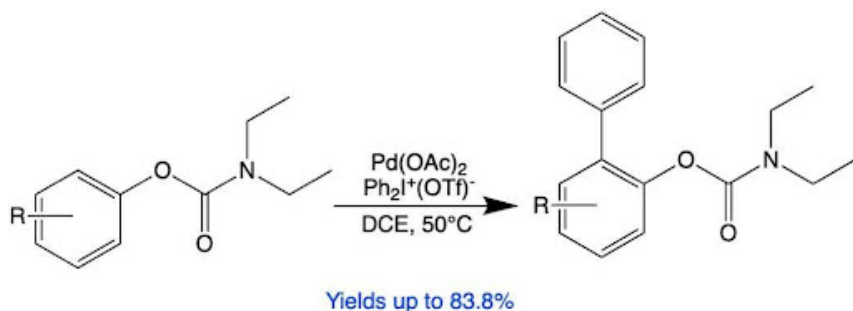


Yields up to 82%

ABSTRACTS

22. The Development of Carbamate-Directed Ortho-Arylation

Carbon-aryl (C-aryl) bonds are an integral type of bond in drug synthesis today, yet the common approaches to forming these bonds require multiple steps and/or harsh conditions. The use of C-H activation as a novel approach allows for more optimal conditions such as lower temperatures, safer solvents, and a single-step reaction. The use of directing groups in C-H activation reactions has proven useful in forming the new bond in a desired position. This research investigates carbamate-directing groups in ortho-arylation C-H activation reactions.



Mia Kenyon '26

Cara McGuffee '25

Jessica Rosenfeld '26

Sophia Chan '25

Skylar Jones '26

Dr. Amanda Silberstein
Chemistry

23. Kiss, and Bow, and Shake Hands: A Liberal Arts and Experiential Learning Approach to Global Leadership Competency

A comprehensive understanding of global leadership requires cultural adaptation, anthropological insight, and an exploration of intellectual inheritance. In today's complex world, global executives must take a multifaceted approach to international challenges. While much of the existing literature on leadership narrowly focuses on managerial oversight or cultural customs, this research draws from sociology, anthropology, philosophy, and related fields to provide a holistic perspective on global leadership. By integrating library research with experiential data, this study highlights the essential role of a liberal arts model of education and hands-on learning in developing the cultural competence and strategic adaptability needed for effective international leadership.

Nash Garvey '25

Dr. Gayle Beebe
Economics & Business

ABSTRACTS

24. Augustine, Bartolome de las Casas, and Contemporary Catholics: Church/State Separation and Christian Nationalism in the United States

Kylie Carter '25

In an article titled Christian Nationalism Cannot Save the World, theologian and editor-in-chief of Christianity Today, Russell Moore, commented that "Christian nationalism is liberation theology for white people." While liberation theology has been criticized and critiqued by Catholics and Protestants alike, Moore's claim is interesting and perhaps even confusing. Liberation theology, a Catholic movement inspired by the Latin American theologian Gustavo Gutierrez in the 19th century, advocates for the liberation of the poor and oppressed and teaches about the church's role in such liberation. In practice, Christian nationalism, which aims to infuse Christianity into American politics, is quite different from liberation theology. While one advocates for the poor and oppressed, the other insists that theologically conservative values should affect the American political sphere. By exploring the work of St. Augustine and Bartolome de Las Casas, who influenced Gustavo Gutierrez, my research compares and contrasts liberation theology and Christian nationalism.

Dr. Jana Mullen
Dr. Blake Kent
Dr. Alastair Su
Religious Studies

25. Synthesis and Characterization of WT and Mutant ALS SOD1 Peptides

MaKenna Jacob '25
Miriam Melkonian '25

Superoxide dismutase 1 (SOD1) is a metal-binding dimeric protein that aggregates in familial cases of amyotrophic lateral sclerosis (ALS). ALS is a neurodegenerative disease that targets motor neurons. The amyloidogenic core (residues 28-38) of SOD1 has been previously identified as a region of importance for SOD1 mediated toxicity. With the occurrence of metal depletion, this region has been shown to form an oligomer structure consisting of antiparallel β -sheets (1). Five mutations in this region have been recognized and associated with the gain of a toxic function in motor neurons, potentially by formation of the aforementioned oligomer. The wildtype and mutant SOD1 (28-38) peptides were made using solid phase synthesis and purified using HPLC. The samples were subjected to incubation with shaking over a one week period, and CD was used to determine the secondary structure of the peptides in solution. Surprisingly, only one of the peptides displayed β -sheet secondary structure by CD and fibrils by TEM after one week of incubation with shaking. IM-MS experiments reveal that all of the mutants promote higher order peptide oligomers.

Dr. Kristi Cantrell
Chemistry

ABSTRACTS

26. The Effect of Perception of Injustice and Victim or Bystander perspective on Prosocial Behavior

This study examines if and when injustice can foster prosocial behavior. First, participants read a narrative depicting justice or injustice from a victim or observer's perspective. They are then asked to volunteer time for a helping task; the amount of time they volunteer acts as a measure of their prosocial behavior. We hypothesized that justice status would have a stronger effect on prosocial behavior than perspective, such that participants who read the unjust narratives would display more prosocial behavior than those who read the just narratives. Furthermore, we expected that this effect would be more pronounced in the observer perspective condition than the victim perspective condition. However, the results showed no significant interaction between justice status and perspective. Additionally, there were no main effects of either justice status or perspective, indicating that exposure to injustice or justice from either perspective may not affect prosocial behavior. Potential methodological limitations are discussed.

Sarah Remland '25

Miriam Griffin '27

Benjamin Morales '26

Dr. Gewnhi Park

Psychology

27. The Effect of Religious Priming and Imagery on Prosocial Behavior

Past literature has shown that religious symbols tend to invoke behavioral responses that correspond to characteristics of one's religion (Carvak, 2013). This experiment examines the effect of the two types of religious priming on prosocial behavior. Priming occurred at two levels: implicit using pictures, and explicit, using narratives. Participants were primed both implicitly using pictures (e.g., either religious or non-religious pictures) and explicitly using narrative (e.g., religious or neutral narrative). Their prosocial behavior was measured using the computerized economic decision game called the Dictator Game. In the Dictator Game, participants were presented with two options of how they would distribute money to themselves and an anonymous participant. I expect that explicit religious priming would be most effective in fostering prosocial behavior. So, I hypothesize that participants who are exposed to religious pictures and a religious narrative would show a higher level of prosocial behavior on the Dictator Game compared to other conditions.

Izabella Olvera '25

Dr. Gewnhi Park

Psychology

ABSTRACTS

28. How Sex Moderates the Effects of Auditory Stimuli on the Physiological Fear Response

Emmie Matthews '25

During a state of fear or heightened stress, the body has a physiological reaction characterized by increased heart rate and heightened electrodermal activity. The effect of different types of auditory stimuli on physical responses (e.g., heart rate and electrodermal activity were tested), using sex as a moderator. In addition to using sex as an independent variable, participants will be exposed to three different conditions of auditory stimuli (control, neutral, and scary/horror). During the exposures of these stimuli, physical fear will be measured as the dependent variable using the means given above. We hypothesize that the horror movie music will provoke a higher physiological fear response, compared to the neutral or control stimuli. Women will also exhibit an increased physiological response in comparison to men in the fear provoking condition. Preliminary analysis revealed that, there is statistical significance between electrodermal activity in the control condition compared to the fear provoking condition.

Dr. Gewnhi Park
Psychology

29. A Computational Study of Stereoselective C–B and C–H Bonds Functionalization of PolyBorylated Alkenes

Anthony Gose '26

Alkenes are essential functional groups, but synthesizing them stereoselectively is still a challenge. To address this problem, the Masawara group developed a synthetic method to selectively functionalize polyborylated alkenes. This research investigates the mechanistic pathways and selectivity in C–B and C–H bond functionalization steps of their method using density functional theory (DFT) calculations. We also explore the outcomes of coupling reactions with different substrates, examining that the amount of potassium carbonate affects the formation of Z- or E- α -borylalkenyl Rh intermediates. Detailed DFT analyses of transition states indicate that the Z-pathway is kinetically favored compared to the E-pathway due to release of steric build-up in the anionic substrate and better catalyst-substrate interactions. In addition, we show that C–H functionalization in aryl alkene substrates is energetically feasible through a 1,4-Rh transfer pathway as consistent with experimental results.

Dr. Brandon Haines
Chemistry

30. Star Wars: The Return of the Variable Star

Kailey Hwang '27
Christian Payne '28

Variable stars follow a pattern of changing luminosity over a certain time period. This change in luminosity can be due to either fluctuations in radius, internal forces, or other celestial bodies passing in front of the star. Delta Scuti stars are a class of variable star found within the transition region between main sequence and subgiant stars and often have asymmetrical light curves as well as a shorter period. High amplitude Delta Scuti (HADS) stars are variable stars that have an amplitude greater than 0.1. Studying variable stars allows for advancement in asteroseismology which utilizes the pulsations of a star to study the structure of the interior. Organizations like AAVSO, which runs a database combining variable star data from astronomers all around the world, also record this data to create standard candles (references for distances of stars). Variable star research also furthers understanding of stellar evolution.

Dr. Jennifer Ito
Physics

ABSTRACTS

31. Improved Mood to Improved Memory: The Cognitive Impact of Antidepressants in Alzheimer's Disease

Abby Dickinson '26

There is growing evidence that suggests antidepressants influence the cognitive functioning of individuals with Alzheimer's disease (AD). Depressive symptoms, a hallmark feature of AD, often exacerbate cognitive decline, leading to the common prescription of antidepressants to treat mood disorders in this population. However, the impact of antidepressants on cognition remains debated. Using data from neuropsychological evaluations conducted at an outpatient neurology clinic, this study examines the effects of antidepressants on cognitive performance in AD patients, exploring potential cognitive improvements and impairments.

Dr. Steven Rogers
Psychology

32. Political Involvement Moderates the Effect of Emotional Response to Political Stimuli

Jillian Pearson '25

Politics seem to be a more polarizing topic today than ever before. Social media and news outlets illicit fear to encourage the growing distinction between the two parties, which has resulted in a considerable contempt between the two American political parties. Previous studies have shown that greater knowledge and attitude extremity lead to more emotional response to political stimuli. More specifically, the present study examined whether political involvement would moderate the effect of congruency of political views on emotional arousal, as measured by heart rate (HR). It was hypothesized that people that were more actively engaged in politics would experience greater emotional arousal than those who were not; specifically in terms of incongruent political stimuli. I am also interested in the role of political party. The findings of this study could provide helpful information about the role political engagement plays in physical responses to political messages.

Dr. Gewnhi Park
Psychology

Keywords: politics, emotional arousal, political engagement, political rhetoric

33. How the Korean American church influences Korean American Christians negotiation of identity

Christine Kim '25

This study explores how the Korean American church functions as a social, cultural space that may help second-generation Korean Americans (SGKAs) balance the complexities of multicultural identities, which is in contrast to the preservation of cultural and ethnic values church offers first-generation immigrants. Through in-depth interviews with 15 Korean American Christians who attended a Korean American Church in Orange County, this research captures experiences in the Korean church and how individuals balance their heritage with an American upbringing. The findings suggest (1) SGKAs experience belonging and cultural reaffirmation in Korean church, which can sometimes serve more as a social space than a religious one, (2) SGKAs navigate feeling more American or Korean, often sensing alienation from both communities, and (3) church provides space where these boundaries are acknowledged and negotiated. This study provides insight into the role of ethnic churches in cultural continuity and identity negotiation within minority communities.

Dr. Meredith Whitnah
Sociology

ABSTRACTS

34. Women's Embodied Experience of Christian Modesty and Purity Culture

Morgan Petersen '25

This study examines how messaging from Christian institutions (i.e. churches, schools, etc.) shapes the views women have of their own gender, clothing, and body. Through 15 in-depth interviews with students at a private Christian liberal arts college, we explore the nuances of women's embodied experiences of the religious norms and narratives that were communicated to them in these Christian environments. The results suggest both overlap and divergence between individuals' identity and the institutional messaging they received. The findings showed that Christian messaging about women's modesty and purity had directly impacted the way women felt the church had reinforced the sexual objectification of their bodies, experienced shame around their bodies and sexuality, and negatively impacted their view of men's sexuality. This study has practical implications for Christian institutions, including churches, schools, and families.

Dr. Meredith Whitnah
Sociology



WESTMONT

OFFICE OF THE PROVOST

955 La Paz Road

Santa Barbara, CA 93108

westmont.edu

(805) 565-6000