



2022 Autumn Undergraduate Research Festival

Wednesday, November 2, 2022

Pomerene Hall

TDAI Ideation Zone

ugresearch.osu.edu



Message from the Office of Undergraduate Research & Creative Inquiry

Dear Students and Colleagues,

It is our great pleasure to welcome you to the Autumn Undergraduate Research Festival. Over four sessions, 113 undergraduates are presenting their research and creative endeavors. Under the direction of their research mentors, students carried out collaborative research projects to solve pressing local, statewide, national, and global issues.

We would like to extend a special thank you to our research mentors, volunteers, and visitors. Congratulations to our students on their research accomplishments. Have a wonderful day.

Sincerely,

The Undergraduate Research & Creative Inquiry Team





EVENT PROGRAM

SESSION 1

10:00-11:00AM

SESSION 2

12:00-1:00PM

SESSION 3

1:30-2:30PM

SESSION 4

3:00-4:00PM





SESSION 1

POSTER PRESENTATIONS

Poster 1: Isabelle Aguilar - Biomedical Engineering

Project Mentor: Dr. Jun Liu

"Entropy-Based Ultrasound Signal Processing Method Discriminates Between Keratoconus and Healthy Eyes"

Poster 2: Anju Anilkumar - Neuroscience

Project Mentor: Dr. Layla Unger

"Investigation and Analysis of Prediction-Based Models in Word Learning"

Poster 3: Shanvanth Arnipalli - Environmental Science

Project Mentor: Dr. Xin Feng

"Culturally Inclusive Coding Manual for Quantifying the Relationship Between Socialization Goals and Sources"

Poster 4: Nicolas Beckman - Neuroscience

Project Mentor: Dr. Jonathan Godbout

"Traumatic Brain Injury Induced Chronic Inflammation and Cognitive Impairment is Attenuated by Inhibition of the Type 1 Interferon Pathway"

Poster 5: Octavian Donca - Computer Science & Engineering

Project Mentor: Dr. Ayonga Hereid

"Real-Time Navigation for Bipedal Robots in Dynamic Environments"

Poster 6: Leena Etilib - Health Science

Project Mentor: Dr. Brian Foster

"Sclerostin Ablation Improves Alveolar Bone Healing Following Tooth Extraction"



SESSION 1

POSTER PRESENTATIONS

Poster 7: Sadaf Farsi - Health Sciences

Project Mentor: Dr. Mireia Guerau

"The Relationship Between Tissue Resident Memory T Cells and PRMT5 in Severe Asthma"

Poster 8: Jacob Gerken - Biology

Project Mentor: Dr. Rachelle Adams

"Effect of Coevolution on Venom Resistance in a Species of Fungus-Growing Ants"

Poster 9: Samuel Gill - Environmental Engineering

Project Mentor: Dr. Karen Dannemiller

"Microbial Deposition on Materials in the International Space Station"

Poster 10: Anvitha Gogineni - Neuroscience

Project Mentor: Dr. Tasha Posid

"Combating Stereotype Barriers in Healthcare: Insights for Designing an Implicit Bias Curriculum for Undergraduate Students"

Poster 11: Madelyn Johnson - Biology

Project Mentor: Dr. Thomas Cherpes

"EphrinA3 Mimic Agonist Peptide Regulates Epithelial Barrier Function in Progesterone-Treated Mice Through EphA2-Related Pathway"

Poster 12: Zarsha Khuhro - Psychology

Project Mentor: Dr. Emily De Los Reyes

"The 50-Meter Timed Test as a Simple, Efficient and Objective Measure of Gross Motor Function in CLN3 Disease: A Pilot Study"



SESSION 1

POSTER PRESENTATIONS

Poster 13: Zahra Khuhro - Neuroscience

Project Mentor: Dr. Tasha Posid

"Exploring Patient-Perceived Barriers and Stigmas to Seeking Healthcare for Urology vs. Non-Urology Patients"

Poster 14: Jevin Litwiler - Health Sciences

Project Mentor: Dr. Mireia Guerau

"The Effects of Protein Arginine Methyltransferase 5 (PRMT5) on Autophagy and Inflammasome Activation in Human Macrophages"

Poster 15: Elizabeth Morgan - Microbiology

Project Mentor: Dr. Justin North

"Assembly and Screening of Nitrogenase-Like Gene Clusters of Unknown Function for Volatile Organic Sulfur Reduction and Hydrocarbon Synthesis"

Poster 16: Mukund Nadimpally - Biomedical Engineering

Project Mentor: Dr. Julie Mansfield

"Assessing Protective Headgear Effectiveness at Reducing the Risk of Concussions"

Poster 17: Aditi Patel - Biochemistry

Project Mentor: Dr. Randee Hunter

"Sex-Differences in Bone Mineral Density in the Human Rib"

Poster 18: Sadie Potts - Chemistry

Project Mentor: Dr. Muthukumaran Venkatachalapathy

"Creating an Easily Modifiable Vector to Increase Protein Degradation Screening Efficiency and Accuracy"



SESSION 1

POSTER PRESENTATIONS

Poster 19: Hasan Pracha - Biomedical Science

Project Mentor: Dr. Steve Oghumu

"MIF Inhibitor CPSI-1306 as a Novel Immunotherapy Against Head and Neck Squamous Cell Carcinoma"

Poster 20: Shayaan Rasheed - Biology

Project Mentor: Dr. Renee Bouley

"PRMT5 Mutation Signatures in Cancer Cells"

Poster 21: Emily Scheib - Biochemistry

Project Mentor: Dr. Marcos Sotomayor

"A Catfish Inner Ear Protein Complex: What You Need to Hear About It"

Poster 22: Maria Seith - Chemistry

Project Mentor: Dr. Christine Thomas

"Redox Properties of a Bis(amido) Bis(phosphine) Iron(II) Complex"

Poster 23: Sydney Vitt - Environmental Engineering

Project Mentor: Dr. Natalie Hull

"UV Disinfection With a 222-nm KrCl Lamp Inactivates Planktothrix More Than a 254nm LP Lamp"

Poster 24: Heema Vyas - Biomedical Science

Project Mentor: Dr. James Cray

"Effects of In Utero and Post-Nasal Nicotine Exposure on Murine Palate Development"



SESSION 1

POSTER PRESENTATIONS

Poster 25: Jarrett Wilson - Biochemistry

Project Mentor: Dr. Jane Jackman

"Recognition of RNA Duplexes by the tRNA^{His} Guanylyltransferase"

Poster 26: Michaela Writesel - Biology

Project Mentor: Dr. Renee Bouley

"Investigating How L,D-Transpeptidases Promote Antibiotic Resistance in *Enterobacter Cloacae*"

Poster 27: Simon Yacoub - Biomedical Science

Project Mentor: Dr. Shahid Nimjee

"VWF Prevalence in Clot Samples From Arterial and Venous Disease"

Poster 28: Marie Walton - Zoology

Project Mentor: Dr. Robin Bagley

"Lepidopteran Species Diversity Present in Early Succession of a Prairie Restoration"

Poster 29: Blythe Dumerer - Mechanical Engineering

Project Mentor: Dr. Manoj Srinivasan

"Directional Dependence of Standing Stability: Experiments and Analysis"

Poster 30: Lucas Carter - Earth Science

Project Mentor: Dr. Matthew Saltzman

"Lithofacies and Nd Isotope Stratigraphy of the Knox Unconformity in the Central Appalachian Basin"



SESSION 2

POSTER PRESENTATIONS

Poster 1: Michael Abou-Elias - Neuroscience

Project Mentor: Dr. Gerry Carter

"Effects of Staph Infection on Behavior of Vampire Bats"

Poster 2: Alexandria Biondo - Materials Science & Engineering

Project Mentor: Dr. Heather Powell

"Burn Scar Healing Using Laser Therapy Techniques"

Poster 3: Alex Coyne - Health Sciences

Project Mentor: Dr. Brittany Hand

"Disability Discrimination in Kidney Transplantation: Comparing Transplant Rates and Outcomes Among Adults With and Without Intellectual and Developmental Disabilities"

Poster 4: Tyler Cronin and Rachel Toelke - Biology and Health Sciences

Project Mentor: Dr. Tasha Posid

"Barriers to Navigating the Medical Path: A Qualitative Focus Group Study of First-Generation Medical Students and Residents"

Poster 5: Margaret Dahlstrom - English

Project Mentor: Curator Caitlin McGurk

"Teaching Queer Literacy and History to High Schoolers with Comics"

Poster 6: Siddarth Dasari - Biomedical Science

Project Mentor: Dr. Shyam Bansal

"Exosomes Mediate Immune Activation post-Myocardial Infarction"



SESSION 2

POSTER PRESENTATIONS

Poster 7: Alexa Detwiler - Welding Engineering

Project Mentor: Dr. Boyd Panton

"The Study of Hybrid Hyperfill Welding"

Poster 8: D. Sophia Ensey - Chemistry

Project Mentor: Dr. Christopher Hadad

"Synthesis of Amide Phenol Derivatives as Therapeutics for Organophosphorus-Aged Acetylcholinesterase"

Poster 9: Celine Ertin - Biomedical Engineering

Project Mentor: Dr. Samir Ghadiali

"Fibroblast Extracellular Matrix Remodeling: Differences in Idiopathic and Normal Pulmonary Fibrosis"

Poster 10: Emily Fresenko - Neuroscience

Project Mentor: Dr. Em Harrington

"Impact of Age on Oligodendrocyte Properties in an Immune Mediated Demyelination Model"

Poster 11: Judy Garzanich - Chemical Engineering

Project Mentor: Dr. Umit Ozkan

"APXPS Analysis of Doped Carbon-Based ORR Catalysts"

Poster 12: Andrew Gotschall - Biomedical Science

Project Mentor: Dr. Daniel Gallego-Perez

"Pancreatic β Cells Derived from Fibroblasts using Non-viral Cell Reprogramming Methods"



SESSION 2

POSTER PRESENTATIONS

Poster 13: Emily Heeralal - Biochemistry and Molecular Genetics

Project Mentor: Dr. Christopher Callam

"Resurrection of Organophosphorus-Aged Acetylcholinesterase & Reactivation of Butyl Cholinesterase via Alkylated Quinone Methide Precursors"

Poster 14: Lauren Masters - Molecular Genetics

Project Mentor: Dr. Jay Hollick

"Comparing pI1-CML52a and pI1-CML52b Expression Levels in Zea Mays"

Poster 15: Owen Meadows - Biomedical Science

Project Mentor: Dr. Amanda Toland

"Investigating the OCA2 Gene and its Role in Skin Cancer Detection"

Poster 16: Kamorah Ryhlick - Biology

Project Mentor: Dr. Lerma Jeremy

"Designing a CRISPR/Cas 9 Pipeline to Investigate Putative Genetic Modifiers of Duchenne Muscular Dystrophy (DMD)"

Poster 17: Clara Rykaczewski - Finance

Project Mentor: Dr. Megan Roberts

"Nicotine Information Disclosures in Popular Electronic Cigarette Brands Used by Adolescents and Young Adults "

Poster 18: Ryan Schuetter - Health Sciences

Project Mentor: Dr. Kristine Yoder

"The Effect of Oxidative Damage on PFV Integration"



SESSION 2

POSTER PRESENTATIONS

Poster 19: Liam Shanahan - Biochemistry

Project Mentor: Dr. Chistopher Hadad

"Reactivation of Organophosphorus-Inhibited Butyrylcholinesterase by Quinone Methide Precursors"

Poster 20: Anna Springer - Biology

Project Mentor: Dr. Steve Oghumu

"Ibrutinib Inhibits HNSCC Growth and Metastasis in In Vitro and In Vivo Models"

Poster 21: Cecilia Yeckley - Evolution & Ecology

Project Mentor: Dr. Michael Weintraub

"Iron's Role in Oxidative Dynamics of Lake Erie Wetland Soils"

Poster 22: Isabella Gonclaves - Biomedical Science

Project Mentor: Dr. Noah Weisleder

"Significance of Cell Membrane Repair in Parkinson's Disease"

Poster 23: Hariharan Kannan - Biochemistry

Project Mentor: Dr. Marcos Sotomayor

"A Biophysical Exploration of the Ion Channel Known to Mediate Hearing"

Poster 24: Natalia Mendonca - Biomedical Engineering

Project Mentor: Dr. Natalia Higueta-Castro

"Decoupling Vasculogenic Cell-Based and Extracellular Vesicle Therapy for Alzheimer's Disease"



SESSION 2

POSTER PRESENTATIONS

Poster 25: Lillyanna Quillin and Kush Doshi - Microbiology and Biochemistry

Project Mentor: Dr. Matthew Sullivan

"Efficient vs. Inefficient Infection Dynamics Within a Model Marine System"

Poster 26: Aiden Zelakiewicz - Astronomy & Astrophysics and Physics

Project Mentor: Dr. Scott Gaudi

"A Near-Infrared Extinction and Reddening Map Towards the Galactic Bulge Using UKIRT"

Poster 27: Nicolas Raffaele - Chemical Engineering

Project Mentor: Dr. Nicholas Brunelli

"Enhancing Hydrophobicity of Zeolite MFI to Increase its Catalytic Performance in the Alcohol Ring Opening of Epoxides"



SESSION 3

POSTER PRESENTATIONS

Poster 1: Rafia Baig - Pharmaceutical Sciences

Project Mentor: Dr. Diana Kang

"Optimization of Lipid Nanoparticles for mRNA Delivery"

Poster 2: Isaiah Boateng - Biomedical Science

Project Mentor: Dr. Ann Kathrin Einfeld

"Investigating the Impact of Novel Fusion Genes on Biologic Health Disparities
Among Black Acute Myeloid Leukemia Patients"

Poster 3: Daniel Boyea - Astronomy and Physics

Project Mentor: Dr. James Johnson

"Carbon Production in Galaxies"

Poster 4: Lucas Carter - Earth Science

Project Mentor: Dr. Paolo Gabrielli

"Preliminary Analyses of Trace Elements in Single Particles from Surface Snow
Deposited in the Urban Environment of Columbus, Ohio"

Poster 5: Amani Djouadi - Pharmaceutical Sciences

Project Mentor: Dr. Carlos Castro

"Delivery of DNA Origami Cancer Vaccine Using Alginate Particles"

Poster 6: Fayme Gandhi - Chemical and Biomolecular Engineering

Project Mentor: Jessica Winter

"DNA Caged Micelles for Reversible Fluorescence Labeling"



SESSION 3

POSTER PRESENTATIONS

Poster 7: Siyuan Gong - Chemistry

Project Mentor: Dr. David Nagib

"An Investigation of the Tolerance of Protecting Group-Free Remote Desaturation"

Poster 8: Elizabeth Guilfoyle - Biomedical Engineering

Project Mentor: Dr. Natalia Higuera-Castro

"Transdifferentiation of Pancreatic Ductal Cells into β -like Cells Using Functionalized Extracellular Vesicles"

Poster 9: Katie Hutchison - Evolution and Ecology

Project Mentor: Dr. Reed Johnson

"Toxicology of Microplastics in the Diet of Honeybee Larvae"

Poster 10: Amanda Jay - Biology and Molecular Genetics

Project Mentor: Dr. Genevieve Kendall

"Engineering an FGFR4 Knockout Zebrafish Model to Study Genetic Cooperation in Rhabdomyosarcoma"

Poster 11: Kaitlin Khammanh - Architecture

Project Mentor: Dr. Iman Ansari

"The Visual Realm of Architectural Representation"

Poster 12: Miranda Kinsell - Public Health

Project Mentor: Dr. Megan Roberts

"Flavor Preferences Among Adolescent and Young Adult E-Cigarette Users"



SESSION 3

POSTER PRESENTATIONS

Poster 13: Naa Dromo Korley

Project Mentor: Dr. Lourdes Negron-McDaniel

"The Addition of a Health Equity Chapter in a Health Literacy Guidebook"

Poster 14: Hayat Mekonen - Public Health

Project Mentor: Dr. Kamilah Dixon

"Self-Advocacy Education: An Approach to Addressing Racial and Ethnic Discrimination in Obstetric Care"

Poster 15: Ethan Pozy - Biomedical Engineering

Project Mentor: Dr. Andre Palmer

"Photocatalytic Synthesis of a Novel Polydopamine-Coated Acellular Mega-Hemoglobin as a Potential Oxygen Therapeutic"

Poster 16: Deondray Radford - Biology

Project Mentor: Dr. Brittany Hand

"A US National Update of Health Condition Prevalence Among Autistic Adults"

Poster 17: Noah Reardon - Psychology

Project Mentor: Dr. Layla Unger

"Eye Tracking Reveals What is Learned During Incidental Exposure to Categories"

Poster 18: Peyton Roth - Biochemistry

Project Mentor: Dr. Steve Oghumu

"Ionizing Radiation Reduces Head and Neck Squamous Cell Carcinoma Cell Viability and is Associated with Predictive Tumor Specific T Cell Responses"



SESSION 3

POSTER PRESENTATIONS

Poster 19: Jose Segura-Bermudez - Biomedical Science

Project Mentor: Dr. William Schwartzman

"Hispanic Health Promotion and Outreach Initiative in Central Ohio"

Poster 20: Jack Webb - Biomedical Engineering

Project Mentor: Dr. Gunjan Agarwal

"Iron Uptake and Storage in Cells"

Poster 21: Jian Teng Yan - Electrical Engineering

Project Mentor: Dr. Khalil Waleed

"Analysis of Infrared Pixel Topologies and Noise Canceling Solution"

Poster 22: Jonathan McHenry - Chemistry

Project Mentor: Dr. Hannah Shafaat

"Investigating the Substrate Binding Pocket in the Heterobimetallic Mn/Fe R2lox Protein"

Poster 23: Dhruv Venkataraman - Computer Science & Engineering

Project Mentor: Dr. Raghu Machiraju

"Creating an Extensible Dashboard to Track Opioid Data in Southeastern Ohio"



SESSION 4

POSTER PRESENTATIONS

Poster 1: Nick Lai-Quong - Biology

Project Mentor: Dr. Thomas Cherpes

"In Vitro Expansion and Testing of Human MAIT Cells Function"

Poster 2: Gabrielle Adams - Chemistry

Project Mentor: Dr. Zachary Schultz

"Evaluating the Role of Polysulfur in the Atmosphere of Venus"

Poster 3: Shanvanth Arnipalli - Environmental Science

Project Mentor: Dr. Ouliana Ziouzenkova

"Iron Deficiency Anemia: Efficacy and Limitations of Nutritional and Comprehensive Mitigation Strategies"

Poster 4: Melike Baspinar - Speech and Hearing Science

Project Mentor: Dr. Laura Wagner

"Investigating 5- to 9-Year-Old Children's Descriptions of Routine Tasks"

Poster 5: Dax Begeny - Astronomy and Physics

Project Mentor: Dr. Anil Pradhan

"Spectra Data for the GEANT4-EXO Program"

Poster 6: Emma Bolkovac - Biomedical Science

Project Mentor: Dr. Julianna Nemeth

"Factors Associated with the Procurement of Tobacco Among Youth Experiencing Homelessness"



SESSION 4

POSTER PRESENTATIONS

**Poster 7: Avery Brewer - Sustainable Plant Systems - Plant
Biosciences and Philosophy**

Project Mentor: Dr. Jess Cooperstone

"A Quantitative Exploration of Wounding-Induced Changes to Tomato Steroidal
Glycoalkaloid Profiles in Diverse Tomato Fruits"

Poster 8: Mitchell Button - Chemistry

Project Mentor: Dr. Bern Kohler

"Stabilizing the Ortho-Semiquinone Radical via Metal Chelation"

**Poster 9: Landon Chase - Environmental Science (Molecular Sciences
Specialization)**

Project Mentor: Dr. Manuel Garcia-Perez

"Systems Dynamic Modeling to Evaluate the Feasibility of Biochar Production in
Washington State"

Poster 10: Vanessa Chilcoat - Biochemistry

Project Mentor: Dr. Karen Goodell

"Diversity and Distribution of the Asilidae of Ohio"

Poster 11: Dalia Einstein - Neuroscience & Psychology

Project Mentor: Dr. Jasmeet Hayes

"Investigating the Mediating Role of the Effect of Chronic Stress on Working
Memory"

Poster 12: Jacob Hale - Chemical Engineering

Project Mentor: Dr. Bhavik Bakshi

"Life Cycle Assessment of Biofuel Production from Macrocystis Pyrifera Utilizing
Depth-cycling Techniques"



SESSION 4

POSTER PRESENTATIONS

Poster 13: Jackson Hise - Mechanical Engineering

Project Mentor: Dr. Joseph Heremans

"Coupling Mixed Mass Relations and Charge Transport Through an Onsager Reciprocity"

Poster 14: Tyler Jensen - Aerospace Engineering

Project Mentor: Dr. Kiran D'Souza

"Blade Tip Rub Cooling"

Poster 15: Conner Johnson - Sustainable Agriculture

Project Mentor: Dr. Rattan Lal

"Interactions Between Organic Carbon, Management Methods, and Field Hydraulic Properties in an Ohio Soil Series"

Poster 16: Pete Jordanides - Biomedical Science

Project Mentor: Dr. Steve Oghumu

"PI3Ky Inhibitor Potentiates Anti-PD-L1 Immunotherapy Against Head and Neck Squamous Cell Carcinoma"

Poster 17: Meghan Kessinger - Medical Anthropology

Project Mentor: Dr. Hunter Randee

"The Influence of Body Size on Bone Quality Assessment Technologies"

Poster 18: Hailey Main - Chemistry

Project Mentor: Dr. Chistopher Callam and Christopher Hadad

"Synthesis and Screening of Phenol Substituted Quinone Methide Precursors as Potential Resurrecting Agents for Aged Acetylcholinesterase"



SESSION 4

POSTER PRESENTATIONS

Poster 19: Ayush Mehra - Human Nutrition

Project Mentor: Dr. James Oñate

"Sensorimotor BOLD Response Decreases Over the Course of Rehabilitation Following Anterior Cruciate Ligament Reconstruction: A Case Report"

Poster 20: Nathan Meyer - Molecular Genetics & Biochemistry

Project Mentor: Dr. Jay Hollick

"Characterizing rmr10, a Novel Factor Involved in Paramutation Blade Tip Rub Cooling"

Poster 21: Celeste Miller - Food Sciences & Technology

Project Mentor: Dr. Rafael Jimenez-Flores

"Milk Fat Globule Membrane Enhances Neurotransmitter Synthesis of Lactic Acid Bacteria"

Poster 22: Erin Miller - Biology

Project Mentor: Dr. Sharon Amacher

"Investigating the Role of Macrophages and Macrophage-Related Signaling in DMD"

Poster 23: Grant Mirka - Aerospace Engineering

Project Mentor: Dr. Darren Drewry

"LES Simulation with PALM"

Poster 24: Noah Morris - Environmental Engineering

Project Mentor: Dr. Daniel Gingerich

"Assessing the Economic Impact of Wind Energy in Ohio"



SESSION 4

POSTER PRESENTATIONS

Poster 25: Arefa Motiwala - Aerospace Engineering

Project Mentor: Dr. Randall Mathison

"Wide-Angle Infrared Camera System for High Temperature Monitoring"

Poster 26: Colton Olexa - Psychology

Project Mentor: Dr. Julianna Calabrese

"The Moderating Effect of Household Chaos on Relations Between Media Use and Social Development in Middle Childhood"

Poster 27: Rachel Pomeranets - Neuroscience

Project Mentor: Dr. Jill Rafael-Fortney

"Analysis of Fibrosis in a Mouse Model of Duchenne Muscular Dystrophy Cardiomyopathy with Impaired Contractile Function"

Poster 28: Liza Ryutov - Chemistry

Project Mentor: Dr. David Nagib

"Synthesis of β -amino Alcohols via N-HVI-Mediated C-H Amination"

Poster 29: Riley Stein - Chemistry

Project Mentor: Dr. Hannah Shafaat

"Experimental Insights on the Mechanism of Nickel-Substituted Rubredoxin"

Poster 30: Riley Summers - Health Sciences

Project Mentor: Dr. Catherine Quatman-Yates

"Leveraging Quality Improvement Methods to Build an Evidence-Based Toolkit for Providing Trauma-Informed Care"



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