

# Duke

UNDERGRADUATE  
RESEARCH SUPPORT  
OFFICE



**2023**  
**VISIBLE**  
**THINKING**





# WELCOME

As the Director of the Undergraduate Research Support (URS) Office, I would like to welcome you to the 2023 Visible Thinking Undergraduate Research Symposium!

Throughout the year, the URS Office promotes undergraduate research in collaboration with faculty, community, and campus partners and offers programming to help students identify research opportunities and make the most of their experiences. The office also provides funding for assistantships, conference attendance, and supplies for independent studies.

Each year, in partnership with Duke's Trinity College of Arts & Sciences, URS hosts this symposium to celebrate and showcase the research that our undergraduates are involved in across campus. I encourage you to engage with the student presenters to learn more about their projects and research experience – they will be eager to share it with you!

Thank you for joining us at the Visible Thinking Undergraduate Research Symposium, and I hope you will see Duke's rich environment where students are encouraged to explore their curiosities and engage in meaningful scholarly inquiry.

Sincerely,  
Jessica R. Harrell, Ph.D.  
Director, URS

# WHAT IS URS?

## Mission

The Undergraduate Research Support Office (URS) encourages and facilitates students and faculty engaging in meaningful research via mentor-mentee relationships through training, programming, opportunities, and funding.



## Leadership

**Director:**  
Jessica Harrell, PhD.  
**Program Coordinator:**  
Leah Wills, M.Ed.  
**Student Support:**  
Randi Jennings

## Visit our website!



## Join our Listserv!



## Follow Us!

IG: @duke\_urs

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# SCAN TO ACCESS

## 2023 ABSTRACT BOOK

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Please scan the QR code for full abstracts of the students' research projects. They are listed by subject area and then alphabetically by last name.



# MAP



11

9

7

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3

1

10

8

6

4

2

1: Creative Arts, Humanities, and Physical/Quantitative Sciences

2: Physical/Quantitative Sciences

3-6: Behavioral Sciences and Health/Clinical Research

5-11: Biological Sciences and Social Sciences



Entrance/Check In

# PRESENTER

## SCHEDULE



# 10:30

### STAND 1

Chaya Brennan Agarwal - Agua es vida/Water is Life

Lily Levin - Then & Now: My Ancestral History and Jewish Diaspora Identity

### STAND 2

Katherine Franz - Metal Catalyzed Oxidation of Sequential Histidine Containing Peptides

### STAND 3

Sua Cho - Effects on Status Striving: Self-Perceived Value, Self-Esteem, and Personality Traits

Bentley Choi - Evaluation of Video-Assisted HPV Education in Government-Supported Clinics in Western Kenya

Julia Davis - Using Video and Handheld Technology to Enhance Responsive Caregiving and Early Childhood Development

### STAND 4

Nikhita Gopisetty - Lived Experiences of Young Adults with Type 2 Diabetes in Mysore District, South India

Anna Greenleaf - Stressed People Don't Pay It Forward: Detrimental Effects of Stress on Generalized Reciprocity

Sahith Kudravalli - Utilization of antiviral therapy for patients with hepatitis B-related hepatocellular carcinoma

Sara Mehta - Investigating Gastrointestinal Symptoms and Dietary Restraint Among Young Adults

Kevin Sheng - Mechanisms of Tumor-Mediated Endothelial Cell Proliferation Independent of VEGF

### STAND 5

Annabelle Feibel - Home Video Analysis of Affect and Attention at 12 months in Autism and ADHD

Alyssa Nelson - Social Mechanisms of Emotion Regulation in Adult Depression

Katherine Zhong - Behavioral differences in Dictator Games with money vs. experiences

### STAND 6

Katherine Burkman - Evaluating how bone marrow stroma impacts drug resistance development in acute myeloid leukemia

Ryan D'Cunha - Engineering Multi-sensing Biosensor Bacteria with Molecular Biology and Computational Methods

# PRESENTER

# SCHEDULE



# 10:30

## STAND 6 (cont.)

Megan Gerges - Can I Still Trust You? Late Trust Violations Hinder Subsequent Cooperation

Peyton Thompson - Developing Viral Transsynaptic Tracing for Interneuron Transplantation in a Seizure Model

Benjamin Wallace - How Suspicion 911 Calls in New Orleans Reshape Our Understanding of the Power Threat Hypothesis

How Suspicion 911 Calls in New Orleans Reshape Our Understanding of the Power Threat Hypothesis

Anna Zolotor - Using Social Risk Associations Between Child Health and Neighborhood Social Vulnerability

## STAND 7

Julia Caci - Characterizing mitotic defects in brain-metastatic lung cancer

Kiran Sundar - Gender Transgressed: Trans vs. Cisgender Felt Pressure, Gender Typicality, and Mental Health

Rachel Washart - Executioner caspases restrict mitochondrial RNA-driven Type I IFN induction during apoptosis

## STAND 8

Sofia Guerrero - A novel link between mitochondrial energy metabolism and ubiquitin conjugase Rad6

Cierra Harrison - Spastin-loss in Drosophila and the effect on axon length and neuronal sensitivity

## STAND 9

Lucas Humayun - Refining CRISPR-Cas epigenetic regulation in primary T cells

Emily Sandberg - A new enrichment apparatus to encourage suspensory postures during foraging in ruffed lemurs

## STAND 10

Michael Sheyner - Smelling Fats: Addressing how the olfactory system perceives fatty acids and CD36's role

# PRESENTER

## SCHEDULE



# 11:30

### STAND 1

Chen Shi - ESPs: a new cost efficient sampler for expensive posterior distributions

### STAND 2

Joe Laforet Jr. - A novel molecular model for the identification of nanoparticle forming drug-excipient pairs

Aaron Petty - Identification of E. Coli Protein-Copper Binding Sites Using His H/D Exchange-Mass Spectrometry

### STAND 3

Annika Agrawal - American-Born "Confused" Desi?: An Exploration of Indian-American Biculturalism & Bilingualism

Alexis Bamfo - Friendship Quality and Mental Health: Bidirectional Associations Over Time

### STAND 4

Ana DeCesare - A Survey of Parental Beliefs: Children's Technology Use in the Digital Age

Fatima Massare Somers - Art, Fear, & Healing in Medicine: Exploring Health Literacy & Empowerment Through Visual Art

### STAND 5

Peter Banyas and Sourodeep Bhattacharya - Autonomous Blood Pressure Regulation for Hypertensive Crises: a Software Approach

Ryan Spangler - Xeno-proliferative Response in Highly Sensitized NHPs: Implications for Xenotransplantation

Ella Zanatti Trovarelli - Friends Coming to the Table: Helpful and Harmful Peer Actions for Eating Disorder Recovery

### STAND 6

Daniella Galtes - Deletion of  $\beta$ -arrestins abolishes the innate immune response in CVB3 myocarditis

Nicole Izquierdo - Latinx: Race or Ethnicity?

Khilan Walker - Game On: Stopping Athletics from Being the Sole Path for Black Male Success



# PRESENTER

# SCHEDULE



# 11:30

## STAND 7

Elizabeth Boger - Identifying and Characterizing Inhibitors of Plasmodium Heat Shock Protein 70

Melany Fuentes - Exploring the Role of AI Photo Analyzers in the Reification of Racism

Chloe Hicks - Identifying Novel GPCR Signaling Partners with Proximity Labeling

## STAND 8

Davina Le - Characterization of Fibrosis in Diaphragm of a Novel Mouse Model of Duchenne Muscular Dystrophy

Kaitlyn Lewars - The Impact of Age on Ozone Responses in Rodents

## STAND 9

Julia Lin - Novel protein for mechanistic control of B cell development

Ethan Ong - Next-gen stealth polymer for biofilm-resistant orthopedic implant coatings

## STAND 10

Maya Provençal - The Effects of "We" Framing and Group Participation on Young Children's Sense of Commitment

Huiyin Zhou - Nowhere/NowHere: Chinese diasporic feminism(s), proximity, and political translation

## STAND 11

Sasha Bacot - UVC-induced PINK-1 mitophagy activation and mtDNA mutation accumulation design in *C. elegans*

Alexandra Bennion - Qualitative and Quantitative Characterization of Tumor Microenvironment in Novel Murine Model

Sophia Cox - Urban Legacies: Exploring how demographics, canopy cover, and land use affect ground arthropods

# PRESENTER

# SCHEDULE



# 12:30



## STAND 1

Maya Ghanem - Queer Muslim Environmental Futurisms: Introspection, Liminality, Paradox, and Healing

Lisa Zhao - Denial and mistrust in the Sunderland cholera epidemic, 1831-1832

## STAND 2

Pranav Charvu - ATLAS Transient Survey Light Curve Release and Analysis

Xander Wilcox - Spin Polarized Charge Transport in Stable Organic Radical Polymer Wrapped SWNT Superstructures

Justin Zhang - Towards a 1,3-Aminodifunctionalization of Cyclopropanes

Jesse Zhang - Geodesic Complexity of Convex Polyhedra

## STAND 3

Elissa Harris - Investigating Children's Evaluations of the Permissibility of Gossip

Connor Haughey - Evaluating risk for adolescent anxiety: Sensory over-responsivity and brain volume differences

## STAND 4

Janis Zhu - Courtroom Cognition: Guilty Bias or Response Bias?

## STAND 5

Elaijah Lapay - The Impact of COVID-19 On Hunger Relief Organizations and Latina Communities In North Carolina

## STAND 8

Madison Griffin - The Impact of Tidal Variation on Invertebrate Diversity and Biomass in Seagrass Ecosystems

Xeno Hu - Identification of a covalent inhibitor to probe ubiquitination in the malaria parasite

Isabella Larsen - Play by the Rules: Three-Year-Olds' Normative Understanding of their own Games

Rebecca Li - ASD-relevant mutations in Kdm6b affect its role as a chromatin regulator in brain development

# PRESENTER

# SCHEDULE



# 12:30

## STAND 9

Brooke Bier - How Income and Educational Levels Impact Patient Choice of Doctor: A Systematic Review

Ashley Lo - Finding an Ideal Dose and Incubation Period of Entinostat to Maximize Transfection Efficiency

Katherine LoBue - An Evaluation of the Durham DEAR Program: Comparing Participant and Staff Perspectives

Mihir Patel - Genetic Regulation of STIM1 Gene in Human and Mice Muscle

Jonathan Pertile - Energetics, behavior, & pregnancy: Cortisol correlates in lemurs with varied life-history paces

## STAND 10

Isabel Colon - What is the function of human acid sphingomyelinase (SMPD1) during the Plasmodium liver stage?

Kate Silver - Investigating Molecular Mechanisms of Toxicity of GenX and PFOA using *C. elegans*

Arushi Sivasankar - Introduction of lipids into hyaluronic acid-based hydrogels

Megan Stone - Muscarinic Cholinergic Influence on Cortical Interneuron Excitability

Eric Wang - Total Synthesis of Novel Antiausterity Agents against PANC-1 Human Pancreatic Cancer Cell Line

Jeffrey Zhang - Dock-2 acts as a positive regulator for mast cell degranulation

Lucy Zhang - Developing an Oligonucleotide Therapy for Alzheimer's Disease

# PRESENTER

## SCHEDULE



# 1:30

### STAND 1

Audrey Costley - Cajun, Créole, and CODOFIL : Language Policy and Planning in Louisiana

Diego Diaz - Optimizing over-expression & purification of MenB, protein sensitive to Cu-induced precipitation

Sean Gao - Multiple Modes of Zinc Binding to Histatin 5 Revealed by Buffer-Independent Thermodynamics

Sophia Kuhn - Preparation of Thiol-Containing Benzoxazoles for Metallo-Beta-Lactamase Inhibition

Dennis Tang - A Model Theoretic Approach To Natural Language Inference

### STAND 2

Isa Williams - Elucidating the Impact of Copper on GAPDH Activity and Secondary Structure

### STAND 3

Michael Blue - Breaking Bad: Creativity and Organic Chemistry

Ishika Gupta - Body image in women with PCOS: The relationship between PCOS, Eating Disorders, & Body Mindset

Amber Smith - Cross-Cultural Adaptation of Scales Measuring Stigma related to HPV, HIV, and Cervical Cancer

### STAND 4

Alyssa Guthrie - Reframing Error Reduces Learning Deficits From Prediction Error in High Anxiety Individuals

Reika Shimomura - Analysis of the application of resonance in organic chemistry

### STAND 5

William Hayes - Developing a skin cancer prevention resource for migrant farmworkers in North Carolina

Alissa Rivero - Why Students Hate Group Projects: Understanding Psychological Barriers to Collaborative Work

Sofia Silvana - Dissociating the Effects of Processing Fluency from Aesthetic Experience in Visual Art Viewing

# PRESENTER

# SCHEDULE



# 1:30

## STAND 6

Sarah Kelso - Population Survey of *Necturus punctatus* in a Perennial Stream within the Duke Forest

## STAND 7

Meredith Huston - Proteomic effects of Acute Intermittent Hypoxia in the medulla of a Pompe mouse model

Jason Liang-Lin - Investigating Small Molecule Modulators of  $\beta$ -arrestin and their Potency on T-cell Activation

Zachary Pracher - Novel CRISPR technologies to investigate immune cell specification in the sea urchin embryo

Sarah Zimmerman - Asset-Based Approaches and Multilingual Learner Parent-Teacher Relationships

## STAND 8

Katherine Long - CRISPR Screen Reveals Microenvironment-Specific Radiosensitizing Factors in Glioma Models

Grace Sorensen - Identifying Novel Interactors of UFL1 During Flavivirus Infection

## STAND 9

Haipei Yao - A high throughput minibrain production platform for childhood brain tumor drug testing

## STAND 11

Jason McBane - The effects of mitochondrial damaging reagents on membrane potential and mitophagy induction, with implications in neurodegeneration

Kishen Mitra - Engineering Patient-Specific Menisci Using 3D Bioprinting

Taylor Nguyen - Inducing synthetic lethality using MYC-driven hypertranscriptional activity and BET inhibition

Preston Nibley - Cu-Catalyzed Oxidation of the Disordered C-Terminal Tail of Histone H2A Occurs Through a Histidine-Dependent Mechanism

Rashad Rahman - CAV1 and Mechanotransduction in Pig Trabecular Meshwork Cells



# COMMUNITY ENGAGED RESEARCH

Throughout the symposium, you will see the symbol below to indicate students that met the 4 criteria for Community Engaged Research (CER):

1. There were conversations with the community on the purposes of the CER.
2. There was a collaboration in the design of the project with a community partner.
3. There was collaboration in the implementation of the project with a community partner.
4. There will be public dissemination of the results of the CER.





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