

The University of Oklahoma  
Honors College  
proudly presents:

*35th annual*  
**Undergraduate  
Research Day**

*April 15th, 2023*  
*Lissa and Cy Wagner Hall*  
*Norman, Oklahoma*

# SESSION I (8:30 - 10:00)

## BIOMEDICAL ENGINEERING, ROOM 135

Judges: Prof. Tingting Gu and Prof. Hanjong Paik

- Joy Lambert with Prof. Jakob Townsend, "The Translation Regenerative Medicine Laboratory: Chondroinductive Peptides for Cartilage Regeneration"
- Isabella Lusk and Aiman Saleemi with Prof. Tahrima Rouf, "Fabrication of G-BN Nanocomposites for Labeling Breast Cancer Cells to Improve Cancer Imaging Techniques"
- Abigail McCollum and Hailey Christian with Prof. Tahrima Rouf, "Conjugation of GQD-HBN Nanocomposites and FA Receptors to Improve Breast Cancer Imaging Techniques"

## BIOLOGY, ROOM 140

Judges: Prof. Mojgan Padash and Prof. Andrea Prichard

- Rachel Barrett with Prof. Laura Stein, "It's Getting Hot in Here! How Short-term Heatwaves Impact Reproduction in Three-spined Stickleback"
- Brett Bogie with Prof. James Thompson, "Effects of Hyaluronic Acid on and In Vitro Scratch Wound Assay Model of Necrotizing Enterocolitis: Influence of Molecular Weight"
- Brooke Haden with Prof. Keng-Lou James Hung, "The Impact of Mowing on Symphyotrichum Populations and the Pollinators that Utilize These Plants"
- Gracie Hedgpeth with Prof. Daniel Becker, "Exploratory Pathogen Survey of Amphibian Blood Parasites in Eastern Oklahoma"
- Cameron Lang with Prof. Jeremy Ross, "Examining Sustainable Infrastructure in AZA-Accredited Zoos"

## HEALTH EXERCISE SCIENCE AND NUTRITIONAL SCIENCE, ROOM 145

Judges: Prof. Sarah Tracy and Nadine Sikora

- Kaelen Cunningham with Prof. Julie Ober Allen, "Short-Term Physiological and Psychological Effects of Ageism"
- Sydni Eagleton with Prof. Susan Sisson, "Dietary and Physical Activity Behaviors of Patients and Caregivers in a Pediatric Weight Management Clinic"
- Samantha Hopper with Prof. Julie Ober Allen "Stress-Related Health Disparities Among Childhood Trauma Survivors"
- Mikala Kiefer with Prof. Julie Ober Allen, "Fight or Flight in Older Adults and Adverse Health Outcomes"
- Maria Nolan and Natalie Keller with Prof. Hugo Pereira, "Sex Differences in Fatigability of the Hand Muscles in the Presence of Cognitive Stress"

## CHEMISTRY AND BIOCHEMISTRY, ROOM 235

Judges: Prof. Javeed Kittur and Kellye Sutton

- Lucy Coleman with Prof. Shanteri Singh, "Synthesis of Chemoselective Alkyl-pyrophosphate Analogs for Biocatalytic Drug Discovery"
- Felipe Avelino Ferreira with Prof. Christina Bourne "Mapping Interaction sites of PaeE toxin with ParD antitoxin and with DNA gyrase"
- Andrea Jones, with Prof. Susan Schroeder "TMV Infection Verification Using the RT-LAMP Method"
- Ifesinachi Nwatu with Prof. Robert Cichewicz, "Isolation and Identification of bioactive compounds from Xylobolus sp. with anti-biofilm activity"

## CHEMICAL, BIOLOGICAL AND MATERIALS ENGINEERING, ROOM 240

Judges: Prof. Kasun Gunasooriya and Prof. Jude Okolie

- Claudia Iribagiza with Prof. Michael S. Detamore "Refining the synthesis of fast-crosslinking, high stiffness cartilage hydrogels"
- Stephen Kooker with Prof. Reza Foudazi, "Foaming Properties of Per- and Polyfluoroalkyl Substances (PFAS) for Remediation Purposes"
- Adriana Landry with Prof. Michele Galizia, "Modified Polymer of Intrinsic Microporosity membranes for gas separation"
- Sarah Onyembe with Prof. Reza Foudazi, "Effect of Surfactent-Polymer Complexation in Precursor on Final Hydrogel Properties"

# SESSION II (10:30 - 12:00)

## BIOMEDICAL ENGINEERING, ROOM 135

**Judges: Prof. Javeed Kittur and Kirsten Jefferys**

- Summer Edwards with Prof. Han Yuan, "Treatment-related Cognitive Impairment and Neurovascular Coupling in Cancer Patients"
- Dylan Garcia with Prof. Michael Detamore, "Degradation of 3D Printed Polycaprolactone-Hydroxyapatite Implant for Temporomandibular Joint Regeneration"
- Kayla Gorham with Prof. Michael Detamore, "Load Transmission of a Patient-Fitted Temporomandibular Joint Prosthesis"
- Sam Mentzer with Prof. Sarah Breen, "Hip Joint Brace for Improved Patient Outcomes During Athletic Activity"
- Quinn Smith with Prof. Han Yuan, "Investigating the test retest reliability of neurovascular coupling measured by fNIRS-EEG"

## BIOLOGY, ROOM 140

**Judges: Prof. Inga Leus and Prof. Tingting Gu**

- Brandon Cheveney with Prof. Barbara Safiejko-Mroczka, "Prophylactic Antibiotic Effects on Wound Healing and Gingival Fibroblast Behavior"
- Rami Hassan with Prof. Mojgan Padash, "Studying the underlying mechanism behind the rescue caused by the reduction of IKK $\beta$  in a Drosophila model of HPV18-induced cancer"
- Shyla Satterwhite and Raegan Buchanan with Prof. Heather Ketchum, "Seasonal Phenology of Blow Flies for Forensic Purposes"
- Megan Talbot with Prof. Heather Ketchum, "Curation of Blow Fly Species Collected in Oliver's Woods Nature Preserve"

## ENVIRONMENT, ROOM 145

**Judges: Prof. Jude Okolie and Prof. Andreana Prichard**

- Julia Manipella with Prof. Angela Person and Randy Pepler, "Exploring the Valley of Butterflies: A documentary film project in Rhodes, Greece"
- Attie Marshall with Prof. Randy Pepler, "The Greening of Evangelicals: Caring for Creation Instead of Subduing it"
- Nondumiso Mndzebele with Prof. Lauren Mullenbach, "Life stops when you have no electricity: The Socioeconomic and Environmental Implications of South Africa's Energy Crisis"
- Patrick Painter with Prof. Emma Colven, "Climate Change and It's Role in Rewriting the Human-Nature Relationship: A Case Study Analysis of Oyster-tecture in New York City, New York"
- Kaylee Tatum with Prof. Courtney Hofman, "A Cultural and Morphological Investigation of Ancient Bering Sea Bear Bones"

## CHEMISTRY, ROOM 235

**Judges: Prof. Indrajeet Sharma and Prof. Christina Bourne**

- Shaheer Aamir with Prof. Si Wu, "Top-down Proteomics and Protein Stability Analysis of the Mouse Brain Proteome"
- Joshua Anthony with Prof. Si Wu, "Evaluation of HeLa Cell Lysis and Protein Extraction"
- Kevin Gao with Prof. Si Wu, "Quantitative Top-Down Proteomic Profiling to Understand Mechanism of Action of Staurosporine in Cancer Cells"
- Ben Johnson with Prof. Si Wu, "Development of an automated spray-capillary CE-MS system for mass limited proteomics"
- Eli Johnson with Prof. Si Wu, "Evaluating sample preparation composition for Spray-capillary Hydrogen/Deuterium Exchange Mass Spectrometry"
- Oliver Wu with Prof. Su Wu, "Protein Thermal Depletion Coupled with Hydrogen-Deuterium Exchange Mass Spectrometry for Characterization of Protein-Ligand Interactions in Cell Lysate"

## CIVIL AND ELECTRICAL ENGINEERING, ROOM 240

**Judges: Prof. Hanjong Paik and Prof. Alisa Javadi**

- Alex Adkisson with Prof. Jay McDaniel, "Design and Development of a Low Cost, Size, Weight, and Power Inertial Navigation System"
- Mia Griffin with Prof. Philip Harvey, "On the effect of vertical flexibility in objects isolated on pendulum-type systems"
- Chaani Rao with Prof. Philip Harvey, "Modeling and Simulation of Digitally Designed Sculptures in Fusion 360"
- Sam Taylor with Prof. Robert Nairn, "Physical Classification of Iron Oxhydroxide Treatment Residuals for Reuse in Stormwater Treatment"
- Menziwokuhle Thwala with Prof. Philip Harvey, "Creep Characterization of Additive Manufacturing Materials"

# SESSION III (1:00 - 3:00)

## COMPUTER SCIENCE AND PHYSICS, ROOM 135

Judges: Prof. Alisa Javadi and Prof. Brian McSkimming

- Anjani Gautam with Prof. Thirumalai Venkatesan, "Fabrication of Memristive Devices"
- Sean Nguyen with Prof. Sina Khanmohammadi, "Multilayer Network Analysis of Brain Signals in Detecting Alzheimer's Disease"
- Tyler Roman with Prof. Habibi Golnaz, "Towards the Design and Implementation of Scalable Collaborative Simultaneous Localization and Mapping (SLAM) on OU's Underground Tunnels"
- Michael Yu with Prof. Sina Khanmohammadi, "Genetic Predisposition to Alcoholism Significantly Alters the Functional Connectivity of the Brain"
- Yuki Zheng with Prof. Golnaz Habibi, "Design and Implementation of Visual Navigation for Underground Vehicles"

## MICROBIOLOGY/PLANT BIOLOGY, ROOM 140

Judges: Prof. Justyna Adamiak and Prof. Carolyn Morgan

- Averi Bates with Prof Susan J. Schroeder, "The Analysis of transcriptions and nanopore sequencing data to determine the role of RNA in virus-host interactions"
- Joshua Cuzzo with Prof. Carolyn Ibberson, "Profiling Virulence of Polymicrobial Infection within a Preclinical CF Model"
- Lane McCoy with Prof. Carolyn Ibberson, "Elucidating the Mechanisms of Antibiotic Tolerance During Co-Infection of Staphylococcus aureus and Streptococcus agalactiae in Chronic Wounds"
- Saadia Nazir and Ahmed Hussan with Prof. Krithi Sankaranarayanan, "Ceftriaxone and ciprofloxacin resistance in the gut microbiomes of hunter-gatherer, subsistence farming, and urban industrial populations Development and PLGA Nanoparticle Encapsulation"
- Agnes Rebekah Ureta with Prof. Carolyn Ibberson, "Interactions between S. aureus and H. influenzae in CF infection"
- Salma Waheed and Pierce Harvell with Prof. Qin Wei "Temperature, Salinity, and pH Characterization of Nitrobacter Vulgaris"

## REPRESENTATION AND COMMUNICATION, ROOM 145

Judges: Prof. Jane Wickersham and Sweta Mahato

- Ahmed Abdelaziz with Prof. Samer Shehata, "Authoritarianism Camouflaged in Media"
- Kristina Aleksanyan with Prof. Afshin Marashi, "Nationalizing Violence: The Effects of the 1915 Genocide on Modern Armeniana National Identity"
- Bryton Chain with Prof. Jennifer Davis "A Creole Monarchy: Henry Christophe and the Development of Caribbean Political Ideology"
- Alyssa McGlamery, with Prof. James Cane Carrasco "Understanding the Changing Tides of Public Perception: My Experiences as an Intern for the National Cowboy and Western Heritage Museum"
- David Sanchez with Prof. Ben Kempel "The 1989 Olympic Festival: Oklahoma's Proving Grounds"
- Heather Utt with Prof. Emily Johnson "The Language of Suffering:Ludmila Petrushevskaya"

## PERCEPTION AND ANALYSIS, ROOM 235

Judges: Prof. Brian Johnson and Prof. Javeed Kittur

- Aylin Ak with Prof. Michael J. Wenger, "The Sequential categorization identification paradigm: A New paradigm for combined inferences"
- Jasmine Heidary and Shreya Lingamallu with Prof. Lauren Ethridge, "Evaluation of the electrophysiological impact of parenting style on young adult self-perception"
- Alleese Eldridge, Lucy Dismore, PK Kaya, Cassie Pierce, and Kerynn Eckenrode with Prof. Nahual Telleria "Getting a College Degree Piece"
- Sean Keuny with Prof. Tiziana Proietti, "On the Use of Plastic Number-Based Proportion Indexes to Study the Effect of Tectonic Spatial Proportion on Human Behavior"
- Marinne Morgan with Prof Michael J. Wenger, "Neural correlates of iron status and smoking cessation: ERP evidence from the Iowa Gambling Task"
- Gabrielle Sublett with Prof. Jessica Cerezo Romano, "What you don't know about antidepressants: Effects of SSRI medication on bone health"

# SESSION III Cont. (1:00 - 3:00)

## AEROSPACE AND MECHANICAL ENGINEERING, ROOM 240

**Judges: Prof. Tingting Gu and Prof. Christina Bourne**

Tanner Cabaniss with Prof. Chung-Hao Lee,, “Development of a Patient-Specific Endovascular Device for Intracranial Aneurym Therapeutics via Indirect 3D-Printing”

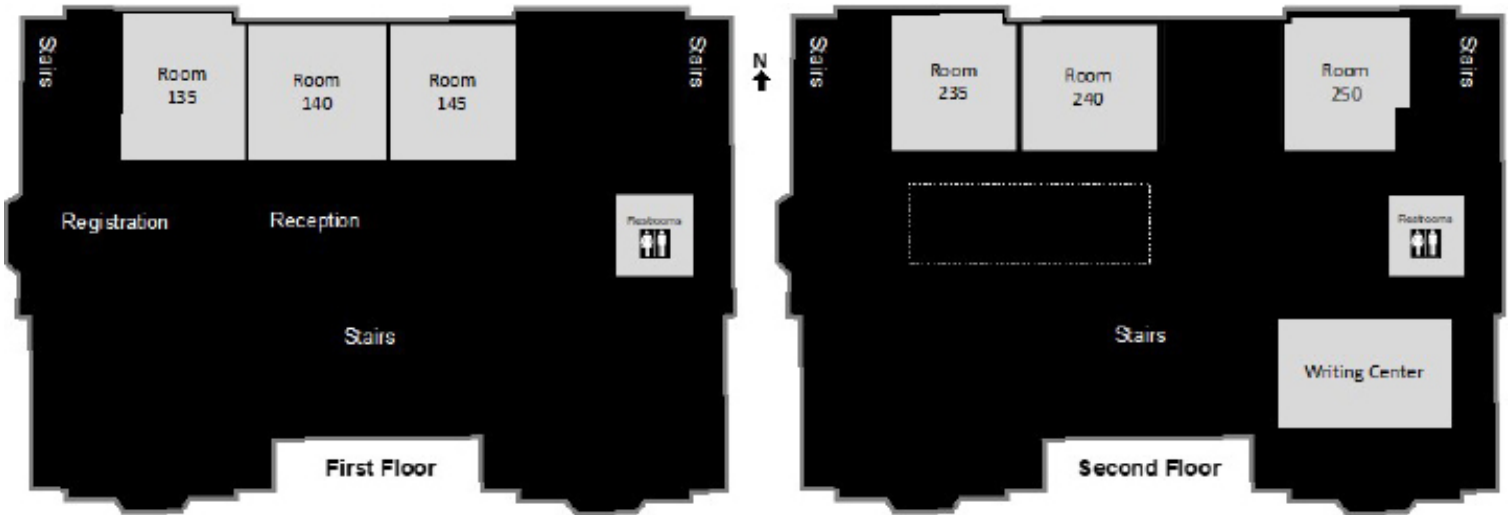
Caylin Nimmo with Prof. Yingtao Liu, “Ultra-stretchable Nanocomposite Embedded 3D Printing”

Bryant Pelkey with Prof. Dong Zhang, “Battery System Modeling for Lithium Ion Batteries”

Michelle Williams with Prof. Dong Zhang, “Measuring Lithium-ion Battery State of Health using strain gauge sensors”

Ryan Young and Jaden Norman with Prof. Chung-Hao Lee, “Right Heart Simulator for Tricupid Valve Analysis”

# Lissa and Cy Wagner Hall



The Honors College gives special thanks to the Office of the Provost for supporting the Undergraduate Research Opportunities Program. The Honors College also gives special thanks to Phi Beta Kappa for providing funding for awards. Undergraduate research day would be impossible without the time and effort of the individuals listed below who served as judges:

Justina Adamiak	Brian McSkimming
Christina Bourne	Jude Okolie
Tingting Gu	Mojgan Padash
Kasun Gunasooriya	Hanjong Paik
Alisa Javadi	Andreana Prichard
Kirsten Jefferys Brian	Indrajeet Sharma
Johnson	Nadine Sikora
Javeed Kittur	Kellye Sutton
Inga Leus	Sarah Tracy
Sweta Mahato	Jane Wickersham
Carolyn Morgan	