The University of Oklahoma Honors College proudly presents:

Undergraduate Research Day

Saturday, April 6th, 2019
Lissa and Cy Wagner Hall
Session I  9:00 - 10:15

Room 135 - Biology
Moderator: Will O’Donnell

Emily Huff with Prof. Ari Berkowitz, “Effects of Serotonin on Spinally-Generated Motor Patterns in Turtles”
Krishna Paidimarri with Prof. Ari Berkowitz, “Turtle Flexion Reflex Shows Wind-up”
Khuong Nguyen with Prof. Ari Berkowitz, “Dual-Projecting Interneurons and Turtles’ Scratch Motor Patterns”
Elise Hodges and Gautham with Prof. Heather Ketchum, “Flies on Drugs”
Mina Makvandi with Prof. Ashlee Rowe, “RNA Seq Analysis of Sensory Tissues: Grasshopper Mouse as a Model for the Evolution of Chemical Sensation and Pain Resistance”

Room 140 - Civil Engineering/Architecture
Moderator: Delcio Teixeira

Dillon Bruer, with Prof. Robert Nairn, “Identification of Possible Synergies between US EPA Superfund Needs and OU CREW Research Capabilities”
Thomas Cain with Prof. Scott Harvey, “Modeling, Characterizing, and Testing a Simple Negative Stiffness Device to Achieve Apparent Weakening”
Zachary Maggia with Prof. Daniel Butko, “Continued Summer Sound Lab Academic Research: Developing Faceted and Porous Lightweight Precast Concrete for Effective Acoustical Environments”
Pranav Mohan with Prof. Andres Cavieres, “Moving Failure Analysis to Early Stages of Design”

Room 145 - Biomedical Engineering
Moderator: Doug Gaffin

Advika Kamatar with Prof. Handan Acar, “Ovarian Cancer MMP-9 Expression in Spheroids”
Katherine Haddad with Prof. Handan Acar, “Internalization of Folate Receptor Targeting Nanoparticles into Ovarian Cancer Cell Lines”
Daniel Cheong with Prof. Han Yuan, “HD-DOT Imaging of the Human Motor Cortex”
Adaira Reid with Prof. Han Yuan, “Physiological Noises in fNIRS Signals Measured from the Visual Cortex”
Julia Tang with Prof. Han Yuan, “Towards Unraveling Spatiotemporal Dynamics of the Human Brain in the Era of Big Data”

Room 235 - Biochemistry
Moderator: Tanya Miller

Amy King with Prof. Susan Schroeder, “Differential Gene Expression in N. tabacum and S. lyopersicum in Response to TMV and STMV Infection”
Karina Flores with Prof. Laura-Isobel McCall, “Metabolomic Screening of the Effects of Carnitine During in vitro T. cruzi Parasite Infection”
Michaela Murphy with Prof. Robert Cichewicz, “Bioactive Natural Products Analysis in Complex Microbial Environment-Arrayed Fungi Co-fermentation”
Jennifer Pusavat with Prof. Charles Rice, “Potentiation of β-lactams Against Antibiotic Resistant Pseudomonas aeruginosa”
Johanna Masterson with Prof. Shanteri Singh, “Chemoenzymatic Diversification of Daptomycin, a Novel Lipoprotein Antibiotic”
Andrea Batchev and Abbigail Lange with Prof. Shanteri Singh, “Synthesis and Evaluation of Heterocyclic Pyrophosphates as Substrates for Aromatic Prenyltransferases”

Room 240 - Anthropology
Moderator: Rich Hamerla

Upuli DeSilva with Prof. Cara Monroe, “Identifying Prehistoric Residence Patterns in Central California: A Genomic Analysis”
Ian Miller with Prof. Thomas Fenn, “The Archaeological Site of Marandet, Niger, and Its Role in Ancient Trans-Saharan Trade Networks”
Jaycie Thaemert with Prof. Misha Klein, “Fake Accounts and Real Identities: An Ethnographic Approach to Finstas”
Mary Faith Flores with Prof. Brian M. Kemp, “Ancient Turkeys of Oklahoma Project”
Ella Parsons with Prof. Tassie K. Hirschfeld, “New Delhi’s Toxic Air Pollution in Context; Development, Urbanization and Public Health”

Room 250 - Russian Language and Literature
Moderator: Carolyn Morgan

Austin Coffey with Prof. Emily Johnson, “‘Young, Philosophical, and Therefore Cruel’: Self, Sophia, and Society in Crime and Punishment”
Elizabeth Penn with Prof. Emily Johnson, “Can Democratization Cause Corruption: A Case Study of the Russian Federation”
Jonathan Walls with Prof. Emily Johnson, “Translating the Unknown: Soviet Studies of Pamir Languages”
Aaron Brown with Prof. Emily Johnson, “Koryo-Saram: Of Both Worlds”
Room 135 - Biology  
Moderator: Will O'Donnell

Albert Musaelian with Prof. Douglas Gaffin, “Computational Exploration of the Feasibility of the Navigation-By-Scene-Familiarity Hypothesis.”

Sara Kelley with Prof. Douglas Gaffin, “Do Inhibitory Neurons Function as Governors in Scorpion Peg Sensilla?”

Kristen Speer with Prof. Douglas Gaffin, “Investigation into Scorpion Detection of Infrared Irradiance”

Jenny Ji with Prof. Barbara Safiejk-Mroczka, “The Role of Pathogens in Oral Wound Healing”

Stephanie Maguire with Prof. Cameron Siler, “Resurrection of the Mindoro Slender Skink”

Room 140 - Petroleum/Aerospace/Industrial Engineering  
Moderator: Delcio Teixeira

Rahmat Ashari with Prof. Ahmad Ghassemi, “The Study of Subsurface Fractures: Stress Shadow, Fracture Spacing and Pressure in Multistage Fracturing”

Benjamin Basden with Prof. Christopher Dalton, “BAJA SAE Suspension Forces”

Rachel Penner with Prof. Yingtao Liu, “Fabricating Shape Memory Composites for Solar Sails”

Christopher Bourgeois with Prof. Shima Mohebbi, “Developing Holistic Indicators to Benchmark Readiness for Smart City Initiatives”

Andrew Calder with Prof. Shima Mohebbi, “Trust Layer as a Connected Autonomous Vehicle Security Component”

Mark Powers with Prof. Siddharth Misra, “Applications of Machine Learning in Processing Well Log Data”

Room 145 - Biomedical Engineering  
Moderator: Doug Gaffin

Melia Schaefer with Prof. Michael Detamore, “Generating Chondromimetic Mesenchymal Stem Cell Spheroids Via Hyposic Forced Aggregation”

Raed Hanoon with Prof. Michael Detamore, “Improving the Fracture Mechanics and Interfacial Strength of Biofabricated Patient-fitted Polymeric Temporomandibular Implants”

Josephine Hriscu with Prof. Michael Detamore, “A Chondroinductive Extracellular Matrix Derived ‘Off The Shelf’ Hydrogel For Cartilage Tissue Engineering”

Emily Thomas with Prof. Michael Detamore, “2D NMR Spectroscopy for Quantification of Peptide Conjugation in Biomaterials Designed to Facilitate Neuron Regeneration”

Osamah Mian with Prof. Michael Detamore, “Collagen I and Hyaluronic Acid-Based Bioinks to Produce Corneal Stromal-Like Constructs”

Room 235 - Biochemistry  
Moderator: Tanya Miller

Jiwon Kang with Prof. Si Wu, “Protein-Protein Interaction Characterization Using Differential HDX-MS”

Ibikari Legg-Jack with Prof. Indrajeet Sharma, “Rh(II)/Au(I) Catalyzed C-H Activation/Conia-ene cascade for the Synthesis of Spirocarbocycles”

Sabrina Ton with Prof. Indrajeet Sharma, “Metal Carbenoid Initiated Cascade Reactions for the Synthesis of Diverse Medium-sized Heterocycles”

Gianni Manginelli with Prof. Anthony Burgett, “Synthesis of OSW-1 Mimetics for the Development of ORP4 Precision Therapeutic Drugs”

Matthew Baier with Prof. Hibah Awwad, “Elevated Histamine and Histamine-3 Receptor Expression Following Traumatic Brain Injury in Rats”

Room 240 - Psychology/Religious Studies/ Women and Gender Studies  
Moderator: Rich Hamerla

Itzel Bernier with Prof. Mauricio Carvallo, “Culture of Honor on Mental Illness Stigma”

Adelle Sturgell with Prof. Robert Terry, “Effect of Learning Disabilities on Caregiver-Child Agreement on Trauma Measures and Symptoms”

Jonathan Gogolakis with Prof. Mauricio Carvallo, “The Role of Perceived Received Affection on Job Self Efficacy”

Joy Imagie-Douglas with Prof. Lupe Davidson, “If I Were a Boy”

Brittney Patton with Prof. Marie Dallam, “Holy Shit,’ Pussy Riot and Religion”

Tiffanie Vo with Prof. Geoffrey Goble, “The Subjugation of Tibet Women’s Bodies”

Room 250 - Ancient and Modern Languages  
Moderator: Carolyn Morgan

Logan Gray with Prof. Paulo Moreira, “Reading Between the Lines: ‘Calice’ and the Brazilian Military Dictatorship”

Emily Wellham with Prof. Marcia Haag, “The Phonology of Arabic Loanwords in Nobiin”

Katy Felkner with Prof. Samuel J. Huskey, “Servius: An Object-Oriented Approach”

Adam Hines with Prof. Andrew Porwancher, “Ralph Waldo Emerson & Oliver Wendell Holmes Jr: The Subtle Rapture of Postponed Power”

Carr Caleb with Prof. Samuel J. Huskey, “How Artificial Intelligence Is Bringing Life to Ancient Greek Prose”

Room 135 - Biology
Moderator: Will O'Donnell

Garrett Eakers with Prof. David Hambright, “A Molecular-Genetic Approach to Enumerating Cyanobacteria”
Thomas Portier with Prof. JP Masly, “Genetic Dissection of Planar Cell Polarity Pathway During Evolution of Novel Trait”
Faith Wolfard with Prof. David S. Durica, “Examination of Y-Organ Gene Expression During Manipulations Used to Induce Molting”
Katerina Ozment with Prof. Ellen Welti, “Acridid Abundance and Diversity on Bison Grazing Lawns”
Lisa Ratliff with Prof. Hayley Lanier, “Establishing a Historical Foundation for White Nose Syndrome in the Tri Colored Bat Species of Oklahoma”

Room 140 - Electrical Engineering/Computer Science
Moderator: Delcio Teixeira

Savannah Pate with Prof. Paul Moses, “Measurements of DC Bias in Three-Phase Three-Leg Transformers”
Alexander Pham with Prof. Hjalti Sigmarsson, “Continuously Tunable Substrate Integrated Waveguide Bandpass Filter Actuated by Liquid Metal”
Katy Felkner with Prof. Amy McGovern, “Teaching Computer Vision Using Drones”
Eric Gaskell with Prof. Chad Davis, “Computer Vision for Robotic Localization”
Alan Lee with Prof. S. Lakshmivarahan, “Topology and Models of Complex Networks”
Kaleb Neal with Prof. Milos Savic, “Elementary Results in Convergent Tetrative Analysis”

Room 145 - Biomedical Engineering
Moderator: Doug Gaffin

Grace Duginski with Prof. Chung-Hao Lee, “Investigation of the Effect of Freezing on the Mechanical Response of Atrioventricular Heart Valve Leaflets”
Yung Te Tsai with Prof. Chung-Hao Lee, “Application of Artificial Neural Networks to Determine the Relationship Between the Atrioventricular Heart Valve Leaflet’s Mechanics and Microstructure”
Emily May and Amanda Phillips with Prof. Rachel Childers, “3D Printing an Improved Upper Limb Prosthesis Using 3D Scanning and Mechanical Characterization”

Room 235 - Linguistics
Moderator: Marcia Haag

Robyn Kolozvari with Prof. Mark Norris, “Comparison of Nominal and Verbal Person Markers”
Lynden Hoge with Prof. Mark Norris, “Plural Marking in Numeral Noun Constructions”
Chase Carter with Prof. Mark Norris, “Gender in Languages Without Gender Concord”

Room 240 - Political Science/Economics
Moderator: Rich Hamerla

Ananya Bhaktaram with Prof. Abhishek Ghosh Moulick, “Residential Segregation: A Story of Health Inadequacies”
Muhammad Ata with Prof. Gregory Burge, “Labor Mobility Patterns of Oklahoman Undergraduate Students”
Session IV  2:45 - 4:00

Room 135 - Biology/Microbiology
Moderator: Will O'Donnell

Margaret Zwick with Prof. Ingo Schlupp, “Examining Female Guppy Mate Choice Using Video Stimuli”

Ritu Kulkarni with Prof. Larry Weider, “The Effects of Phosphorus and Predator Kairomones on Parental and Hybrid Members of the Daphnia pulex Complex”

Emily Gutierrez with Prof. Brad Stevenson, “Increasing Drug Discovery Potential and Impacts of Structure on Cultivatable Diversity in a Mixed Community”

Emily Eix with Prof. Paul Lawson, “Comparison of Lactic Acid Bacteria Diversity in Cow Milk from Mongolia, Switzerland and Austria”

Garret Morton with Prof. Rakhi Rajan, “Development of an in vivo Assay for Directed Evolution of Type II-A CRISPR Adaptation”

Room 140 - Geology/Meteorology/Physics
Moderator: Delcio Teixeira

Courtney Milledge with Prof. Michael Soreghan, “Shell Bed Variation of Lake Tanganyika”

Emma Bachman with Prof. Andrew Elwood-Madden, “The Effect of Euxinic Conditions on the Weathering of Plagioclase Feldspar Minerals”

Matthew Bray with Prof. Steven Cavallo, “The Relationship Between Tropopause Polar Vortices and Mid-Latitude Severe Weather Outbreaks”

Connor Bruce with Prof. David Parsons, “Understanding and Eliminating Forecast Busts in Global Numerical Weather Prediction”

Claire Riggs with Prof. Ferah Munshi, “MARVEL-ous Dwarfs: How Galaxy Simulations Contribute to Our Understanding of Physics”

Dzuy Nguyen and Ben Schenkel with Prof. Dave Parsons, “A Climatology on Extratropical Transition Characteristics”

Room 145 - Biomedical Engineering
Moderator: Doug Gaffin

Cortland Johns with Prof. Chung-Hao Lee, “Data-Driven Computational Modeling of Heart Valve Function”

Colton Ross with Prof. Chung-Hao Lee, “An Investigation of the Contributions of the Porcine Atrioventricular Heart Valve Leaflet Microstructure to Organ-Level Mechanical Behaviors”

Paige Welch with Prof. Rong Z. Gan, “3-D Finite Element Model of the Chinchilla Ear for Modeling Sound Transmission from Ear Canal to Cochlea”

Kelly Bye with Prof. Michele Galizia, “Celazole PBI Membranes”

Room 145 (continued)


Abby Baukus and Jacob Filer with Prof. Matthias Nollert, “Bioreactor for Cuff Tendon Tissue Engineering”

Room 240 - Health and Exercise Science
Moderator: Rich Hamerla

Maria Nolan with Prof. Zoe Sherinian, “The Effects of Probiotics on Stress and Depression”

Caitlin Givens with Prof. Elizabeth Risch, “Effect of Group Therapy on the Completion of Trauma-Focused Cognitive Behavioral Therapy Services”

Cynthia Belardo with Prof. Janet Allen, “Menstrual Cups for Women’s Empowerment in Lucknow, India”

Haley Lewsey with Prof. Michael Bemben, “Racial/Ethnic Differences in Bone Mineral Density, Muscle Mass and Strength, and Fat Mass in Young Women”

Urvi Patel with Prof. Michael Bemben, “Assessment of Bone Free Lean Body Mass (BFLBM), Fat Mass, Muscle Strength in Individuals with Different Physical Activity Levels”

Marylelly Chavez, Elise Hodges, Julia Oehlers, and Allen Pau with Prof. Marshall Cheney, “College Perceptions on JUULS”

Madison Sanford with Prof. Michael Bemben, “The Relationship Between Hand Dominance and Hand Grip Strength and Fatigability”
The Honors College appreciates the Office of the Provost for supporting the Undergraduate Research Opportunities Program. We also thank Phi Beta Kappa and Phi Kappa Phi for sponsoring awards for distinguished undergraduate research.

Established in 1897, the Honor Society of Phi Kappa Phi recognizes and honors excellence in all academic disciplines. Membership is by invitation only to the top 10 percent of seniors and graduate students and 7.5 percent of juniors. Faculty, professional staff, and alumni who have achieved scholarly distinction also qualify. The Society’s mission is “To recognize and promote academic excellence in all fields of higher education and to engage the community of scholars in service to others.”

Phi Beta Kappa is the nation’s oldest and most widely known academic Honor Society. Phi Beta Kappa (ou.edu/pbk/) has celebrated and advocated excellence in the liberal arts and sciences since 1776 and sponsors activities such as Undergraduate Research Day in order to advance studies in the humanities, the social sciences, and the natural sciences.

We sincerely appreciate the dedication of our alumni and members of the Honors College Board of Visitors for their support of Undergraduate Research Day:

Steve Barghols - Mary Brett - Susan Chambers - Marsha Funk - Doug Gaffin - John Kenney - Cynda Ottaway
David Postic - Travis Ruddle - John and Shyla Slay - Ralph Thompson