

UNDERGRADUATE RESEARCH FAIR

THURSDAY, SEPTEMBER 19, 2019

4:30–6:30 P.M.

STUDENT LIFE CENTER BALLROOM

BREAKOUT SESSIONS

Breakout sessions will be held in the Lower Level Meeting Rooms 1 & 2, Student Life Center.

- 4:30 p.m.** **“Heart Poisoning: Medicine Unlike Any Other”**
Jacek Hawiger, M.D., Ph.D. (Biomedical Sciences)
- 4:30 p.m.** **Using Research to Prepare for Medical School**
Michelle Grundy, Ph. D. (Director, Health Professions
Advisory Office)
- 5:30 p.m.** **Engaging Research with a Social Science Lens**
Hannah Ingersoll (Ph.D. candidate, Sociology), Eric
Asen (Junior, Political Science and Economics), and
Erin Meyers (Ph.D. candidate, Law and Economics)
- 6:00 p.m.** **Get Involved: Student Organizations Promoting Research**
Matthew Xin (Scientific Immersion and Mentorship)

- 1 Grace Adcox '20
Political Science; Asian Studies

Social Network and Behavioral Economic Models of Refugee Studies
Mentor: Professor Jennifer Larson, Political Science
- 2 Nora Ait Boucherbil '21
Mechanical Engineering

Understanding Interface Integrity of Structural Li-Ion Batteries
Mentor: Professor Cary Pint, Mechanical Engineering
- 3 Zaynah Ajmal '21
Psychology

Young APP/PS1 Mice Are Susceptible To Subclinical Activity
Mentor: Professor Fiona Harrison, Diabetes, Endocrinology, and Metabolism
- 4 Md Emazuddin Alif '21
Mechanical Engineering; Mathematics

Model-based Assurance for Autonomous Vehicles
Mentor: Professor Gabor Karsai, Electrical Engineering and Computer Science
- 5 Zander Alley '20
Human and Organizational Development

“Nobody has assumed that I was smart from seeing me:” Undergraduate Black Men’s Negotiations of Masculinity and Academic Success in Mathematics Education
Mentor: Professor Luis Leyva, Teaching and Learning
- 6 Shruti Anant '21
Medicine, Health, and Society

Characterizing E Protein Interactions with MTG16 in Intestinal Cells
Mentor: Dr. Christopher Williams, Gastroenterology
- 7 Hannah Anderson '22
Physics; Mathematics

Modeling the Optimization of Gas Electron Multiplier Particle Detectors in an Argon CO₂ Mixture
Mentor: Professor Victoria Greene, Physics and Astronomy
- 8 Minna Apostolova '22
Biochemistry

Assessing Hepatocyte Differentiation Of Liver Ductal-Derived Organoids By Gene Expression
Mentor: Professor Mary Philip, Pathology, Microbiology, and Immunology
- 9 Camille Archer '20
Psychology

The Effect of Negative Parenting Styles on Youth Internalizing/ Externalizing Symptoms with Coping as a Mediator
Mentor: Professor Bruce Compas, Psychology and Human Development
- 10 Anastasia Astafyev '21
Neuroscience; Psychology

The Effects of Acute Diacylglycerol Lipase Inhibition on Alcohol Abstinence-Induced Affective Behaviors
Mentor: Professor Sachin Patel, Psychiatry
- 11 Yigit Atay '21
Computer Science

Denoising Optical Coherence Tomography Images Using Conditional Generative Adversarial Networks
Mentor: Professor Ipek Oguz, Computer Science and Computer Engineering
- 12 Sophie Baillargeon '20
Biomedical Engineering

Myosin IIA Generates Cortex Tension During Mitosis
Mentor: Professor Dylan Burnette, Cell and Developmental Biology

- 13 Aakash Basu '21
Neuroscience
- Characterizing The Role Of Heterosynaptic α 2A -Adrenergic Receptors In The Bed Nucleus Of The Stria Terminalis In Cellular And Behavioral Stress Responses**
- Mentor: Professor Danny Winder, Molecular Physiology and Biophysics*
- 14 Cameron Beard '20
Psychology
- Reducing The Effect Of Stress On Executive Control: Mindfulness As A Moderator**
- Mentor: Professor Judy Garber, Psychology and Human Development*
- 15 Karan Bhardwaj '22
Chemical Engineering
- Effect of Noisy Pulse EPR Data on Protein Structural Modeling**
- Mentor: Professor Jens Meiler, Chemistry*
- 16 Meghana Bhimreddy '21
Neuroscience
- Lectin-galC1 Regulation Of Synaptic Function At The Drosophila Glutamergic Neuromuscular Junction**
- Mentor: Professor Kendal Broadie, Cell and Developmental Biology*
- 17 Caroline Bodhya '20
Neuroscience, Spanish
- Modulation Of Mitochondrial Dynamics During Stem Cell Differentiation Into Neural Progenitor Cells**
- Mentor: Professor Vivian Gama, Cell and Developmental Biology*
- 18 Abigail Boldt '22
Biomedical Engineering
- Individualized Exercise In The AYA Cancer Survivor Population**
- Mentor: Dr. Jamie Renbarger, Pediatrics*
- 19 Allison Booher '21
Latin American Studies; Neuroscience
- Comparison of Public Emergency Medical Care in Two Latin American Countries of Different Economic Levels**
- Mentor: Professor Nicolette Kostiw, Latin American Studies*
- 20 Anna Borchers '20
Molecular and Cellular Biology
- Genotype-Specific Coinfections in T. Castaneum**
- Mentor: Professor Ann Tate, Biological Sciences*
- 21 Ezra Brody '21
Mechanical Engineering; Mathematics
- Developing Diagnostic Tools for Smart Batteries**
- Mentor: Professor Cary Pint, Mechanical Engineering*
- 22 Emily Butler '22
Neuroscience
- Early Drug Discovery Of Potential Anticonvulsant Agents: Synthesis Of 5-Methyl Enaminone Intermediate**
- Mentor: Professor Patrice Jackson-Ayotunde, Pharmaceutical Sciences*
- 23 Christina Byrd '20
Psychology
- The Impact of Parental Responsiveness in Depression and Huntington's Disease**
- Mentor: Professor Bruce Compas, Psychology and Human Development*
- 24 Caroline Carlson '21
Medicine, Health, and Society; Spanish
- Microvesicle-Induced Activation Of Fibroblasts Contributes To Breast Cancer Heterogeneity And Metastasis**
- Mentor: Professor Cynthia Reinhart-King, Biomedical Engineering*

- 25 Chloe Champagne '22
Computer Engineering; Physics
Search for Single Heavy Neutrino Production via VBF Processes
Mentor: Professor Paul Sheldon, Physics and Astronomy
- 26 Anoop Chandrashekar '21
Molecular and Cellular Biology; Medicine, Health, and Society
Understanding Lower Urinary Tract Dysfunction Through Analysis Of Mouse Models Of Genetic Disease
Mentor: Professor Michelle Southard-Smith, Geriatric Medicine
- 27 Siqi Chen '20
Molecular and Cellular Biology; Mathematics; Medicine, Health, and Society
Branched Actin Is Required For Presynaptic Elimination In GABAergic Motor Neuron
Mentor: Professor David Miller, Cell and Developmental Biology
- 28 Emily Chen '20
Biochemistry
Study Of Interactions Between Beta' COPI Propellers And Linear Hexa-Ubiquitinated Protein
Mentor: Professor Todd Graham, Biological Sciences
- 29 Susmita Chennareddy '20
Neuroscience; Economics
Differential Expression Pattern Of HSPA6 In Rett Syndrome
Mentor: Professor Colleen Niswender, Pharmacology
- 30 Woong Jae Choi '21
Molecular and Cellular Biology; English
Testing Fragile X Syndrome Effects On Nociceptive Pain Sensitization In A Genetic Disease Model
Mentor: Professor Kendal Broadie, Cell and Developmental Biology
- 31 Robert Clark '21
Biological Sciences
Synthesis And Application Of A Trifunctional Small-Molecule Probe To Study Time-Resolved Protein-Protein Interactions
Mentor: Professor Lars Plate, Chemistry
- 32 Sara Conley '20
Neuroscience; Psychology
Protective Effects of Endocannabinoid Modulation on Negative Affect in Mice Undergoing Ethanol Withdrawal
Mentor: Professor Danny Winder, Molecular Physiology and Biophysics
- 33 Matthew Conn '20
Electrical Engineering; Mathematics
Acoustic Multifactor Authentication with Machine Learning
Mentor: Professor Yu Wang, Computer Science
- 34 Sara Conwell '20
Medicine, Health, and Society
Analysis of DNA Hotspots for de novo Telomere Addition in Yeast
Mentor: Professor Katherine Friedman, Biological Sciences
- 35 Oisharya Dasgupta '21
Neuroscience
Energy Availability is Related to Capillary Supply Constraints, Not Neuronal Demand in the Rat Brain
Mentor: Professor Suzanaerculano-Houzel, Psychology
- 36 Ariacella DelGrande '21
Psychology; Child Development
Probing Further into Low SES and Early Word Learning: Parent Interaction
Mentor: Professor Amy Booth, Psychology and Human Development

- 37 Yongjia Deng '20
Medicine, Health, and Society
- The Effect Of Energy Supplementation On Microbial Growth During Co-Infection**
Mentor: Professor Ann Tate, Biological Sciences
- 38 Rasul Dent '20
Spanish; Portuguese
- Agent-based Modeling Approach to International Organizations**
Mentor: Professor Emily Hencken Ritter, Political Science
- 39 Grace DePietro '21
Electrical Engineering
- Development Of A Low-Cost Amino Acid Sensing Device For Predicting Prediabetes In At-Risk Populations**
Mentor: Professor Christina Marasco, Biomedical Engineering
- 40 Kendall Derry '20
Biomedical Engineering
- Wearable Sensors to Monitor Bone Loading, Predict Probability of Stress Fracture, and Prevent Injury with Alerts**
Mentor: Professor Karl Zelik, Mechanical Engineering
- 41 Alice Ding '22
Biomedical Engineering; Mechanical Engineering
- Image Data-Driven Thermal Dose Prediction for Microwave Ablation Therapy**
Mentor: Professor Michael Miga, Biomedical Engineering
- 42 Andres Dones '22
Neuroscience
- Effects of Adipose Tissue on Melanoma Growth in vivo**
Mentor: Professor Tongyu Cao, Dermatology and Cutaneous Surgery
- 43 Seth Drey '21
Biochemistry; Spanish
- The Dual Pleckstrin Homology Domain Protein Opy1 Is Involved In Phosphoinositide Metabolism**
Mentor: Professor Kathleen Gould, Cell and Developmental Biology
- 44 Jennifer Du '22
Computer Science
- mGlu1 and M4 Receptor Activation Modulates Corticostriatal Signaling and Enhances Motor Learning**
Mentor: Professor Daniel Foster, Pharmacology
- 45 Edith Duncan '21
Medicine, Health, and Society
- Behavioral Effects of Novel M5 Muscarinic NAMs in Animal Models of Opioid Use Disorder**
Mentor: Professor Carrie Jones, Pharmacology
- 46 Wills Dunham '20
Medicine, Health, and Society
- Analgesic Techniques and Opioid Requirements Following Thoracic Surgery**
Mentor: Professor Miklos Kertai, Anesthesiology
- 47 Rachel Fan '22
Undeclared
- Comparing Traditional Statistics and Machine Learning Methods for Predicting Metabolic Syndrome Status from Social Factors**
Mentor: Professor Lauren Gaydosh, Medicine, Health, and Society
- 48 Ryan Fansler '20
Biochemistry; Chemical Biology
- Investigating the Protein-Protein Interactions of Dengue Virus Infection**
Mentor: Professor Lars Plate, Chemistry

- 49 Alexandra Feeley Lamb '22
Electrical Engineering; Mathematics
- A Noninvasive Method for Measuring Vitamin A**
Mentor: Professor Christina Marasco, Biomedical Engineering
- 50 David Fei-Zhang '20
Biological Sciences
- BCAR3 Partners With EGFR Tyrosine Kinase To Promote Colorectal Cancer Cell Migration**
Mentor: Dr. Christopher Williams, Gastroenterology
- 51 Jacob Fine '21
Mechanical Engineering
- Development of Nickel Hydroxide Based Linear Energy Harvesters**
Mentor: Professor Cary Pint, Mechanical Engineering
- 52 Michael Finn-Henry '22
Mechanical Engineering
- Geriatric Jetpack: a Fall Prevention Project**
Mentor: Professor Michael Goldfarb, Mechanical Engineering
- 53 Adrian Florea '22
Mechanical Engineering; Communication of Science and Technology
- Modular Design For Passive Solar Thermal Desalination**
Mentor: Professor Lin Shihong, Civil and Environmental Engineering
- 54 Charlotte Foley '21
Biochemistry; Chemical Biology
- A Grooming Analysis Of SAPAP3 Knockout Mice**
Mentor: Professor Daniel Foster, Pharmacology
- 55 Huizhi Fu '20
Political Science
- Ideological Hassling: Russian Foreign Influence Efforts in Europe**
Mentor: Professor Peter Schram, Political Science
- 56 Richard Fu '20
Neuroscience
- Effects of Positive Allosteric Modulation of the M1 Muscarinic Acetylcholine Receptor on Brain Neurochemistry and Cognitive Function**
Mentor: Professor Carrie Jones, Pharmacology
- 57 Robert Fuller '21
Medicine, Health, and Society
- The Role of Perceived Depression Etiologies in the Stigmatization Process**
Mentor: Professor Bianca Manago, Sociology
- 58 Caroline Gaggini '20
Secondary Education; History
- Core Motivations: Comparing How Teachers Talk About Their Decisions To Stay Or Leave**
Mentor: Professor Elizabeth Self, Teaching and Learning
- 59 Peter Gair '20
Trumpet Performance
- Investigation of Glaucoma Pathogenesis Using Animal Models**
Mentor: Dr. Rachel Kuchtey, Ophthalmology and Visual Sciences
- 60 Lakshmi Suryateja Gangavarapu '21
Economics; Neuroscience
- The Spatial Orientation of Production, Consumption, and Trade of Key Commodities from 1913 to 1918**
Mentor: Professor Mario Crucini, Economics

- 61 Kyle Gavulic '20
Medicine, Health, and Society; French
- Impacts of the Orlando Pulse Nightclub Shooting on Mental Health of Sexual Minority Populations**
Mentor: Professor Gilbert Gonzales, Medicine, Health, and Society
- 62 Nicole Gloudemans '22
Mechanical Engineering
- Multi-Camera Mount For Traffic Flow Analysis**
Mentor: Professor Daniel Work, Civil and Environmental Engineering
- 63 Addison Glover '20
Medicine, Health, and Society
- An Exploratory Analysis of the Associations Between Early Language Environment, Availability of Resources and Instability, and Infants' Language Ability**
Mentor: Professor Kathryn Humphreys, Psychology and Human Development
- 64 Kiana Guerrazzi '20
Molecular and Cellular Biology; Medicine, Health, and Society
- Investigating WDR5-Interacting Proteins in Cancer**
Mentor: Professor William Tansey, Cell and Developmental Biology
- 65 Ryan Guillen '21
Biochemistry
- Determining Zinc Affinity for Calprotectin Mutants**
Mentor: Professor Walter Chazin, Chemistry
- 66 Shubham Gulati '22
Biomedical Engineering
- Optimizing a Dimethylacrylamide Copolymer for Bone Matrix Drug Delivery**
Mentor: Professor Craig Duvall, Biomedical Engineering
- 67 Kameron Hagerla '21
Neuroscience
- Influence of Media Composition on in vitro Blood-Brain Barrier Function and Metabolism**
Mentor: Professor Ethan Lippmann, Biomedical Engineering
- 68 Blake Hanan '21
Biomedical Engineering
- In Vitro Dissolution of Mastergraft Ceramic Granules: Pilot Study**
Mentor: Professor Ian Dunkley, Mechanical and Materials Engineering
- 69 Emma Hart '20
Child Development; Public Policy Studies
- Parents' Adoption of Book Reading Tips for Child Executive Function Development**
Mentor: Professor Amy Booth, Psychology and Human Development
- 70 Lilly He '22
Neuroscience
- CD148 Q276P/R326Q Polymorphisms And Tumor Cell Growth**
Mentor: Professor Takamune Takahashi, Nephrology and Hypertension
- 71 Katelyn Henderson '20
Biomedical Engineering
- Development of Nonviral CRISPR Protein Delivery Method**
Mentor: Professor Craig Duvall, Biomedical Engineering
- 72 Ashley Hendricks '20
Neuroscience
- Epigenetic Adaptations in the Nucleus Accumbens Regulate Cocaine-associated Behavior**
Mentor: Professor Erin Calipari, Pharmacology

- 73 Dana Herman '22
Chemical Engineering; Spanish
Understanding the Spectrum Model of Macrophage Polarization
Mentor: Professor Marjan Rafat, Chemical and Biomolecular Engineering
- 74 Zhongtian Hu '20
Mathematics; History
A General-Purpose Algorithm For Discrete Riesz Energy Optimization On A Manifold
Mentor: Professor Douglas Hardin, Mathematics
- 75 Chengxin (Yuki) Hu '20
Special Education; Cognitive Studies
Intervention Fidelity, Student Behavior and Student Outcomes
Mentor: Professor Christopher Lemons, Special Education
- 76 Yuki Hu '20
Special Education; Cognitive Studies
Evaluating Reading Intervention Delivered by Para-Educators
Mentor: Professor Christopher Lemons, Special Education
- 77 Alyson Hughes '21
Political Science
Investigating Eclipsing Binaries in the Open Cluster Blanco 1
Mentor: Professor Keivan Stassun, Physics and Astronomy
- 78 Elizabeth Huh '21
Neuroscience
The Effect of Finger Loop Mutations on Arrestin-1 Interactions with Rhodopsin
Mentor: Professor Vsevolod Gurevich, Pharmacology
- 79 Jonathan Hung '21
Chemical Engineering
A Novel Pairwise Residue Constraints Protocol In ROSETTA Using Direct Coupling Analysis
Mentor: Professor Jens Meiler, Chemistry
- 80 Yoanna Ivanova '21
Biomedical Engineering
Evaluating the Role of Irradiated Fibroblasts in Recurrent Triple Negative Breast Cancer
Mentor: Professor Marjan Rafat, Chemical and Biomolecular Engineering
- 81 Grace Jennings '21
Computer Engineering
Decentralized Optimization of Vehicle Route Planning
Mentor: Professor Janos Sztipanovits, Electrical Engineering
- 82 Brigitte Jia '22
Neuroscience
The Role Of Cardiac Natriuretic Peptide Receptors In Exercise-Mediated Skeletal Muscle Energy Expenditure
Mentor: Professor Sheila Collins, Cardiovascular Medicine
- 83 Skylar Johnson '20
Medicine, Health, and Society
Choroid Plexus And Arterial Compliance Feedback: Glymphatic Flow Implications
Mentor: Professor Manus Donahue, Neurology
- 84 Mohammad Kabir '20
Electrical Engineering
High-Speed Data Modulation Using Hybrid Silicon-Vanadium Dioxide Waveguide
Mentor: Professor Sharon Weiss, Electrical Engineering

- 85 Emre Kanli '20
Electrical Engineering
- Gallium Oxide (Ga₂O₃) Power MOSFETs as an Emerging Wide-Bandgap Semiconductor Device**
Mentor: Professor Ronald Schrimpf, Electrical Engineering
- 86 Srivishnu Kasturi '21
Medicine, Health, and Society
- Regulation of Wnt/ β -catenin Signaling by Tankyrase and Naked2 in Colon Cancer Cells**
Mentor: Professor Robert Coffey, Cell and Developmental Biology
- 87 John Kerr '20
Biomedical; Electrical Engineering
- Adding A Toe Joint To A Passive Prosthesis: Biomechanical Implications In A Population Of Transtibial Lower Limb Prosthetic Device Users Across A Variety Of Loco-Motor Tasks**
Mentor: Professor Karl Zelik, Mechanical Engineering
- 88 Uzair Khan '22
Medine, Health and Society
- Emotional Reactivity of the Autonomic Nervous System in Childhood Stuttering**
Mentor: Professor Robin Jones, Hearing and Speech Sciences
- 89 Sonia Kim '21
Neuroscience
- Neural Localization of Behavioral Sensitization**
Mentor: Professor Eugenia Gurevich, Pharmacology
- 90 John Kim '20
Neuroscience
- Car-Z, a Structural Analog of Highly Prescribed Antipsychotics, is a Potent Disruptor of Cholesterol Biosynthesis**
Mentor: Professor Ned Porter, Chemistry
- 91 Catherine Kim '20
Mathematics; English
- Twitter IRA Dataset: Russian Trolls according to Twitter**
Mentor: Professor Jennifer Larson, Political Science
- 92 Hannah Knight '20
Chemical Engineering
- Neuroinflammation and the Blood-Brain Barrier**
Mentor: Professor Ethan Lippmann, Biomedical Engineering
- 93 Brian Koh '21
Medine, Health and Society
- Post Discharge T&A Pain Management**
Mentor: Director Amber Greeno, Trauma
- 94 Anvitha Kosaraju '22
Computer Science
- Inverse Design for Multilayer Metasurfaces**
Mentor: Professor Jason Valentine, Mechanical Engineering
- 95 Nikhil Kothari '20
Neuroscience; Cognitive Studies
- Recognition and Induction of Apoptotic Debris by Engulfment Receptor Jedi**
Mentor: Professor Bruce Carter, Biochemistry
- 96 Logan Kouba '20
Biological Sciences
- Measuring Thyroglobulin Protein Degradation and Secretion to Characterize Protein Quality Control of Disease-Associated Mutants**
Mentor: Professor Lars Plate, Chemistry and Biological Sciences

- 97 Frederick Kudlata '20
Neuroscience
- Roles of Specific Neural Pathways in the Recovery of Spinal Cord Injuries in Monkeys**
Mentor: Professor Jon Kaas, Cell and Developmental Biology
- 98 Ashwin Kumar '22
Computer Science; Neuroscience; Applied Mathematics
- Creation and Analysis of a Pediatric Spinal Cord Database**
Mentor: Professors Bennett Landman and Seth Smith, Electrical Engineering, Computer Science, and Biomedical Engineering
- 99 Keshav Kundassery '21
Biomedical Engineering; Neuroscience
- Localizing Epilepsy with EEG Waves**
Mentor: Dr. Dario Englot, Neurological Surgery
- 100 Malia Latimer '20
Computer Science
- Evaluating Weather and Seasonality as Risk Factors for Suicidality**
Mentor: Professor Colin Walsh, Biomedical Informatics
- 101 Gawon Lee '20
Cognitive Studies; History of Art
- The Memory of Facial Features During Conversation: How Well Do You Remember Your Partner?**
Mentor: Professor Sarah Brown-Schmidt, Psychology and Human Development
- 102 Justin Lee '20
Neuroscience
- The Role of EPAC in RPE Cells**
Mentor: Professor Irina Kaverina, Cell and Developmental Biology
- 103 Sung Jin Lee '22
Neuroscience; Clarinet Performance
- Tracking Circadian Locomotion in Earthworms with Near-Infrared Auto-fluorescence**
Mentor: Professor Carl Johnson, Biological Sciences
- 104 Jesse Li '21
Mechanical Engineering; Piano Performance
- A Prospective, Single Center Study on Modulating Music Volume in the Operating Room**
Mentor: Professor Joseph Schlesinger, Anesthesiology
- 105 Judy Li '21
Neuroscience
- Apolipoprotein \hat{I} • Genotype And Brain Health In Aging Adults**
Mentor: Professor Angela Jefferson, Neurology
- 106 Aodong Liu '20
Chemistry
- Structural Prediction Of The CNIH1-AMPA Protein Complex**
Mentor: Professor Jens Meiler, Chemistry
- 107 Yupeng Liu '20
Neuroscience; Medicine, Health, and Society
- Associating Atypical Multisensory Integration with Eye-gaze Patterns in Children with Autism**
Mentor: Professor Tiffany Woynaroski, Hearing and Speech Sciences
- 108 Kevin Liu '22
Biochemistry; Spanish
- In Vitro Optimization of TRAIL Coated Liposomes and Chemo Resistance Sensitization**
Mentor: Professor Michael King, Biomedical Engineering

- 109 Danielle Liu '20
Biomedical Engineering
- Optimizing Endosomolytic Polymeric Emulsions for Intracellular Nucleic Acid Delivery**
Mentor: Professor Craig Duvall, Biomedical Engineering
- 110 Ja Shen Lo '20
Neuroscience; Spanish
- The Utilization of RNA Single-Cell Sequencing to Distinguish Different Subsets of Cerebellar Inhibitory Interneurons**
Mentor: Professor Chin Chiang, Cell and Developmental Biology
- 111 Allen Luna '20
Biomedical Engineering
- Investigating the Effect of Obesity on the Decellularization Efficiency of Rat Livers**
Mentor: Professor Aylin Acun, Department of Surgery
- 112 Ted Maertens '20
Ecology, Evolution, and Organismal Biology; Studio Art
- White-Lipped Peccary Effects on Forest Structure and Diversity**
Mentor: Professor Maria Jorge, Earth and Environmental Sciences
- 113 Maya Martin-Gonzalez '20
Neuroscience; Piano Performance
- Hierarchical Processing as the Tie between Musical Rhythm and Grammar**
Mentor: Professor Reyna Gordon, Otolaryngology
- 114 Emily Micciche '21
Cognitive Studies
- Brain-to-Brain coupling: How Information is Transferred from Teacher to Student**
Mentor: Professor Uri Hasson, Neuroscience
- 115 Rachel Miles '20
Oboe Performance
- Impact of Lithium Cobalt Phosphate Nanoparticle Crystalline Structure on Trout Gill Epithelial Cells**
Mentor: Professor Galya Orr, Biological Sciences
- 116 Asia Miller '22
Biological Sciences; Molecular and Cellular Biology
- Characterizing the Microbiome of Nasonia**
Mentor: Professor Seth Bordenstein, Biological Sciences
- 117 Megan Mitchell '20
Biological Sciences
- Effect of Mode of Speciation on Passerellidae Song Divergence**
Mentor: Professor Nicole Creanza, Biological Sciences
- 118 Sophia Moak '20
Mechanical Engineering
- Design of a Macro X-Ray Fluorescence System for Cultural Heritage**
Mentor: Professor Emeline Pouyet, Scientific Studies in the Arts
- 119 Stephanie Molitor '21
Biomedical Engineering
- Adding an Artificial Gastrocnemius to a Powered Ankle Prosthesis**
Mentor: Professor Karl Zelik, Mechanical Engineering
- 120 Elsa Mueller '20
Biology; Anthropology
- Genomic Variation in Puerto Rican Afro-descendants Illustrates Diverse Histories of African Diasporic Populations**
Mentor: Professor Jada Benn Torres, Anthropology

- 121 Dinh Chuong (Ben) Nguyen '20
Chemical Engineering
Exploring Stereocomplexed Hydrogels As Polymer Nanoparticle Depots For Immunotherapy
Mentor: Professor John Wilson, Chemical Engineering
- 122 Ashley Nmoh '20
Medicine, Health & Society
Cancer Management in Kenya- Awareness and the Struggles Patients Face to Access Treatment, Care & Support
Mentor: Professor Steve Wandiga, Epidemiology
- 123 Cerie Ock '20
Biomedical Engineering
An Accessible In Vivo Bone Tumor Model for Breast Cancer
Mentor: Professor Julie Rhoades (Sterling), Pharmacology
- 124 Mateusz Odziomek '22
Biomedical Engineering
STING Agonists as an Immunotherapy for Metastatic Bone Disease
Mentor: Professor Julie Rhoades (Sterling), Pharmacology
- 125 Kayla Ortiz '21
Biological Sciences; Art History
Optimization of Purification and Crystallization of Staphylococcus aureus Methionine Sulfoxide Reductase Proteins
Mentor: Professor Dana Borden Lacy, Pathology, Microbiology, and Immunology
- 126 Marcell Paguaga '21
Molecular and Cellular Biology
Circadian Rhythmicity of Mitochondrial Temperature Gradients
Mentor: Professor Carl Johnson, Biological Sciences
- 127 Ujwala Pamidimukkala '21
Neuroscience; Medicine, Health, and Society
APOE E2 and Cardiovascular Health
Mentor: Professor Angela Jefferson, Neurology
- 128 Steve Park '20
Chemistry
Integrin-Targeting Multifunctional Gold Nanoparticles for Enhanced Radiation Therapy
Mentor: Professor David Cliffl, Chemistry
- 129 Deborah Park '22
Biochemistry; Computer Science
Spline-Based Machine Learning on Graphs
Mentor: Professor John Ward, Mathematics
- 130 Akshar Patel '20
Biomedical Engineering
Resolving The Role Of Lhx2 In The Neurogenic Output Of Retinal Progenitor Cells Using Single Cell RNA Sequencing
Mentor: Professor Edward Levine, Cell and Developmental Biology
- 131 Michael Nwauche '19
Computer Science
Modeling Distributional Uncertainty in Autonomous Driving
Mentor: Professor Abhishek Dubey, Computer Science
- 132 Sagar Patel '21
Chemical Engineering; Biomedical Engineering
Curcumin Micelles: A Promising Way to Deliver Curcumin to Cancer Cells
Mentor: Professor Michael King, Biomedical Engineering

- 133 Olivia Pembridge '22
Molecular and Cellular Biology
- CRISPR Knockouts As A Study Method For Protein Trafficking In Zebrafish**
Mentor: Professor Thomas Clements, Biological Sciences
- 134 Amaury Perez '20
Electrical Engineering
- Transdermal Metabolic Rate Sensor**
Mentor: Professor Christina Marasco, Biomedical Engineering
- 135 Megan Phillips '20
Molecular and Cellular Biology; Medicine, Health, and Society
- The Evolution Of DNA Mismatch Repair Genes In Budding Yeasts**
Mentor: Professor Antonis Rokas, Biological Sciences
- 136 Jared Plotkin '21
Neuroscience
- An Investigation of the Pancreatic Hormone Amylin in Regulating Cocaine Induced Behaviors**
Mentor: Professor Brad Grueter, Anesthesiology
- 137 Taylor Pothast '21
Human and Organizational Development; Computer Science
- Decentralized Optimization of Vehicle Route Planning—A Cross-City Comparative Study**
Mentor: Professor David Hess, Environmental Sciences
- 138 Jonathan Powles '20
Mechanical Engineering
- Tuning Spray Characteristics Using an Open Ultrasonic Droplet Generator**
Mentor: Professor John Meacham, Mechanical Engineering and Material Science
- 139 Juliana Qin '21
Molecular and Cellular Biology; Philosophy
- Mapping Polyclonal Antibody Responses to HIV-1 Vaccine Candidates**
Mentor: Professor Ivelin Georgiev, Infection, Immunology and Inflammation
- 140 Sweeya Raj '20
Neuroscience
- Sensory Project in Infants/Toddlers with Down Syndrome**
Mentor: Professor Tiffany Woynaroski, Hearing and Speech Sciences
- 141 Abinaya Ramakrishnan '22
Medicine, Health, and Society; Biological Sciences
- Predicting Platelet Counts And Acute Kidney Injury After Cardiac Surgery**
Mentor: Professor Miklos Kertai, Anesthesiology
- 142 James Ro '21
Neuroscience; Medicine, Health, and Society
- Pro-Inflammatory Properties Of Paneth Cells In Small Intestinal Inflammation**
Mentor: Professor Ken Lau, Cell and Developmental Biology
- 143 Karla Rodriguez '22
Chemistry; Spanish
- The Use of Cobalt, Nickel, Titanium, and Tungsten in Molybdenum Based Alloys to Obtain Specific Densities Through the Press and Sinter Process**
Mentor: Mr. Gary Rozak, Research and Development
- 144 Christina Rogers '20
Clarinet Performance
- Characterizing Facial Chorea In Patients With Huntington's Disease**
Mentor: Professor Antje Mefferd, Hearing and Speech Sciences

- 145** Evan Rothchild '20
Biomedical Engineering; Mathematics
Generative Models of Brain Networks
Mentor: Professor Mikail Rubinov, Biomedical Engineering
- 146** Faith Rovenolt '20
Ecology, Evolution, and Organismal Biology
The Impact of Coinfection on Host Coexistence and Competition
Mentor: Professor Ann Tate, Biological Sciences
- 147** Katherine Rule '20
Human and Organizational Development
Undocumented and Cost Burdened: Immigrant Housing Access in Nashville, TN
Mentor: Professor Kimberly Bess, Human and Organizational Development
- 148** Erik Sanchez '21
Neuroscience; Medicine, Health, and Society
The Effect Of Neonicotinoids On Insect Circadian Behavior
Mentor: Professor Douglas McMahon, Biological Sciences
- 149** Oliver Sandreuter '20
Public Policy
Understanding Gender Equality in Education : A Comparative Analysis in Nepal, Jordan, and Chile
Mentor: Professor Dominique Somda, Anthropology
- 150** Neal Sarkar '21
Computer Science
Modeling and Optimization of a Longitudinally-Distributed International Energy Network
Mentor: Professor Himanshu Neema, Computer Science
- 151** Louis Schatzki '20
Physics
Designing Passive Microfluidic Pressure Relief Valves and Fluidic Capacitors
Mentor: Professor John Wiskwo, Physics
- 152** Maxwell Schulman '21
Political Science
Are Wave-Election Legislators as Effective as non-Wave Legislators in U.S. Congress?
Mentor: Professor Alan Wiseman, Political Science
- 153** Joshua Seabaugh '20
Physics
Toward a Methodology to Discover Z' Bosons in the Compact Muon Solenoid (CMS) Experiment at the CERN Large Hadron Collider
Mentor: Professor Paul Sheldon, Physics and Astronomy
- 154** Pedro Seber E Silva '21
Chemical Engineering
Evaluation Of The Efficacy And Specificity Of Novel Inhibitors Of The RSK Kinase
Mentor: Professor Deborah Lannigan, Pathology, Microbiology and Immunology
- 155** Benjamin Sexton '20
Chemistry; Human and Organizational Development
Structural Reassessment of the 2:1 Adduct of Methylglyoxal and Deoxyguanosine
Mentor: Professor Carmelo Rizzo, Chemistry
- 156** Carly Shafer '22
Chemical Engineering
The Synthesis and Characterization of Thermoresponsive Films
Mentor: Professor Kane Jennings, Chemical and Biomolecular Engineering

- 157 Ruiy Shah '20
Cognitive Studies
- Supporting Children's Learning with Interactive, Dialogic eBooks**
Mentor: Professor Georgene Troseth, Psychology and Human Development
- 158 Nicholas Shaub '21
Chemistry; Chemical and Biomolecular Engineering
- Determining how changes in the extracellular matrix after radiation therapy alter tumor cell invasion**
Mentor: Professor Marjan Rafat, Chemical and Biomolecular Engineering
- 159 Elijah Sheridan '22
Physics; Mathematics
- Physics-Informed Machine Learning: Using Function Learning Networks for Multiscale Modeling**
Mentor: Professor Michael Murillo, Computational Mathematics
- 160 Tiffany Shields '20
Chemistry; Medicine, Health, and Society
- Veratridine Binding in SCN5A**
Mentor: Professor Jens Meiler, Chemistry
- 161 Matthew Shou '21
Molecular and Cellular Biology
- The Role of Arginine Metabolism on Pancreatic Islet Alpha Cell Proliferation**
Mentor: Professor Danielle Dean, Molecular Physiology and Biophysics
- 162 Miranda Shum '20
Piano Performance
- pH-responsive gene expression in Helicobacter pylori**
Mentor: Dr. Timothy Cover, Infectious Diseases
- 163 Walter Siv '20
Neuroscience
- The Role of Glutamine Metabolism in Amino Acid-Stimulated Alpha Cell Proliferation**
Mentor: Professor Danielle Dean, Diabetes, Endocrinology, and Metabolism
- 164 Thomas Skacel '21
Biomedical Engineering
- Measurement of the Diffusivity of Oxygen Through a SEBS Polymer for Organ-On-a-Chip Applications**
Mentor: Professor Lisa McCawley, Biomedical Engineering
- 165 Casie Slaybaugh '21
Engineering Science; Medicine, Health, and Society
- Lung Regeneration through Inhalation of Extracellular Matrix Nanoparticles**
Mentor: Professor Rebecca Heise, Biomedical Engineering
- 166 Levy Sominsky '20
Molecular and Cellular Biology
- Elucidation Of The Role Of Cytochrome Bd-I And Other Terminal Oxidases In Biofilm Development**
Mentor: Professor Maria Hadjifrangiskou, Infection, Immunology and Inflammation
- 167 Alexander Stephens '21
Mechanical Engineering
- Localized Electrophoretic Deposition of Carbon Nanostructures**
Mentor: Professor Cary Pint, Mechanical Engineering
- 168 Joy Stewart '20
Political Science
- Push or Pull: Analyzing the Complex Factors that Drive Migration**
Mentor: Professor Emily Hencken Ritter, Political Science

- 169 Sarah Saxton Strassberg '21
Biological Sciences; Medicine, Health,
and Society
- Specialization in Human Populations: A Computational Perspective**
Mentor: Professor Nicole Creanza, Biological Sciences
- 170 Heng Sun '22
Biomedical Engineering
- Cell Proliferation Cycle and Local Cell Migration in Human Breast Cancer Cells**
Mentor: Professor Cynthia Reinhart-King, Biomedical Engineering
- 171 Zhuoxin Sun '20
Mathematics
- Feature Selection**
Mentor: Professor Wei Chen, Mechanical Engineering
- 172 Jennifer Tat '21
Neuroscience; Spanish
- Defining the molecular mechanisms underlying sex differences in female addiction vulnerability**
Mentor: Professor Erin Calipari, Pharmacology
- 173 Amelia Taylor '21
Chemistry; Biological Sciences
- Quantification Of 10 Amino Acids In Human Plasma Using LC-MS/MS: Applications In The Prediction Of Prediabetes**
Mentor: Professor John McLean, Chemistry
- 174 Donovan Taylor '21
Biochemistry
- Developing Predictive Models for Major Depression and Bipolar Disorder via Random Forests**
Mentor: Professor Lea Davis, Medicine
- 175 Anteneh Tebeje '21
Chemical Engineering
- Attachment of Copper(I)-Dependent Antibacterial Drugs to Peptide Nanosponges**
Mentor: Professor Stefan Bossmann, Chemistry
- 176 Harrison Thomas '20
Biomedical Engineering
- Human Milk Oligosaccharides to Restore Infant Microbiome Equilibrium**
Mentor: Professor Steven Townsend, Chemistry
- 177 Julia Thomas '21
Medicine, Health, and Society
- Intestinal Dysbiosis Links Western-style High-fat Diet, Inflammation, and Atherosclerosis**
Mentor: Professor Mariana Byndloss, Pathology, Microbiology, and Immunology
- 178 Ana Torres '21
Molecular and Cellular Biology
- Exploring Phagocytosis in Tribolium Beetles**
Mentor: Professor Ann Tate, Biological Sciences
- 179 Kathryn Ufford '20
Biomedical Engineering
- Joint intensity fusion with normalized cross-correlation metric for cross-modality MRI synthesis**
Mentor: Professor Ipek Oguz, Computer Science and Computer Engineering
- 180 Caleb Van Geffen '21
Computer Science
- Data Driven Methods For Effective Micromobility Parking**
Mentor: Professor Dan Work, Civil and Environmental Engineering

- 181 Nilai Vemula '22
Physics
Gene Co-expression Network Analysis of Pancreatic Beta Cells Influenced by Excitotoxicity and Overnutrition
Mentor: Professor Mark Magnuson, Molecular Physiology and Biophysics
- 182 Christia Victoriano '21
Biomedical Engineering
Point-of-Care Influenza Diagnosis in Developing Countries using Adaptive RT-PCR
Mentor: Professor Rick Haselton, Biomedical Engineering
- 183 Zhixiang Wang '21
Computer Science
Augmented Reality Mirror for Medical Imaging Outreach
Mentor: Professor Bennett Landman, Electrical Engineering
- 184 Gavin Ward '20
Chemistry
Using Multiplexed Biomarkers To Detect Bacterial/ Viral Infections Using Human Blood
Mentor: Professor David Wright, Chemistry
- 185 Michael West '20
Cognitive Studies
Modification of Reward Processing and Its Application in Depression
Mentor: Professor Autumn Kujawa, Psychology and Human Development
- 186 Camille Westlake '21
Medicine, Health & Society; Molecular and Cell Biology
Common Anti-Parasitic Drug Disrupts the Microbiome
Mentor: Professor Peggy Kendall, Allergy, Pulmonary, and Critical Care
- 187 Andrew Whitten '20
Chemical Engineering; Chemistry
Development of a Fluorescence Sensor for Tracking Heme Insertion into Proteins
Mentor: Professor Lars Plate, Chemistry
- 188 Benjamin Wong '22
Human & Organizational Development; Cell and Molecular Biology
Generation Of Gene Editing Reporter Cell Lines Using CRISPR/Cas9
Mentor: Professor Craig Duvall, Biomedical Engineering
- 189 Nicole Wright '22
Chemistry; Neuroscience
Allostery vs. Function: Exploring the Interactome of Apoptosis-Inducing Factor
Mentor: Professor Chris Brosey, Molecular and Cellular Oncology
- 190 Matthew Xin '20
Molecular and Cellular Biology
Autotaxin Is A Potential Therapeutic Target In CNS Autoimmunity
Mentor: Professor Amy Lovett-Racke, Microbial Infection and Immunity
- 191 Yiruo Xu '21
Earth and Environmental Sciences
Investigating The Utility Of Stalagmite Calcium Isotope Rainfall Proxy Under Different Settings
Mentor: Professor Jessica Oster, Earth and Environmental Sciences
- 192 Puxin Xuanyuan '21
Chemistry; Philosophy
Investigating the Bioactivity of Hypogean Secondary Metabolites
Mentor: Professor Brian Bachmann, Chemistry

- 193** Jiasheng Yan '20
Economics; Mathematics
- The Distance Domatic Numbers of Two-dimensional Grid Graphs**
Mentor: Professor Alexander Cameron, Mathematics
- 194** Chris Yankah '21
Mechanical Engineering
- Phase Field Damage Model for Simulating Mixed-Mode Fracture of Brittle Materials**
Mentor: Professor Ravindra Duddu, Civil and Environmental Engineering
- 195** Jane Yao '21
Medicine, Health, and Society;
Economics
- Anecdotes in Conversation: How Story-telling Affects Memory**
Mentor: Professor Sarah Brown-Schmidt, Psychology and Human Development
- 196** Ulysses Yu '20
Computer Science; Mathematics
- Probabilistic Generation of Autonomous Vehicle Simulations**
Mentor: Professor Xenofon Koutsoukos, Computer Science
- 197** Kevin Zhai '21
Computer Science; Physics
- CPS Network Simulations with Variable Fidelity**
Mentor: Professor Himanshu Neema, Computer Science
- 198** Xinmeng Zhang '21
Computer Science; Mathematics
- Provider Activities in Electronic Health Record Systems are Associated with Prolonged Length of Stay**
Mentor: Professor You Chen, Biomedical Informatics
- 199** Chong Zhao '20
Engineering Science; Cognitive Studies;
Mathematics
- Electrical Stimulation of Lateral Temporal Cortex Affect LTM or VWM**
Mentor: Professor Geoffrey Woodman, Psychology
- 200** Ruisi Zhong '21
Neuroscience; Computer Science
- Correlation of Inflammation with Cytokine Markers in Patients with Major Depression**
Mentor: Dr. Laura Dugan, Geriatric Medicine
- 201** Mandy Zi '20
Mathematics; Computer Science
- AI and Visual Thinking**
Mentor: Professor Maithilee Kunda, Electrical Engineering and Computer Science

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