VANDERBILT UNIVERSITY

Undergraduate Research Fair

Thursday, September 8, 2022
4:30–6:30 p.m.

SCHEDULE OF EVENTS

4:30–5 p.m. The Wond'ry: Where Research Meets Innovation + Design
Students will learn about the scope of science and innovation, how research creates real impact on the world around us and about how the Wond'ry cultivates student skill sets in this capacity.

4:30–5:30 p.m. Research Fair, Group A

5 p.m. Provost C. Cybele Raver's Remarks

5:30–6 p.m. Uniquely Your Path: How to Navigate Research in the Field of Higher Education
Professor Kelly Slay, assistant professor of higher education and public policy, Department of Leadership, Policy, and Organizations joins the Office of Experiential Learning & Immersion Vanderbilt to share the story of her journey to becoming a prominent researcher in the field of higher education. We will discuss what she is currently studying as well as recommendations she has for students who are also interested in pursuing research.

5:30–6:30 p.m. Research Fair, Group B

6–6:30 p.m. When Two Fields Become One: The ArtLab with Kendra Oliver and Helen Qian
Attendees will learn more about The ArtLab and the impactful ways the space is developing accessibility to science through art as well as the shared perspectives from both Oliver and Qian on the research conducted thus far and what it means to have a successful mentorship.

Presentations – Group A

Madeleine Amberg '22 Political Science; American Studies	**Understanding the Impact and Effectiveness of Politicians with Psychopathic Tendencies in the United States Senate** *Mentor: Professor Leah Rosenstiel, Political Science*	**Group: A** *4:30–5:30 p.m.*
Justin Badt '25 Neuroscience; Medicine, Health and Society	**Tracing Cortical Fibers Governing Fear Extinction Projecting to the Basolateral Amygdala** *Mentor: Professor Akiva Cohen, Anesthesiology and Critical Care, Children's Hospital of Philadelphia*	**Group: A** *4:30–5:30 p.m.*
Charu Balamurugan '25 Biological Sciences; Medicine, Health and Society	**Characterization of a Toxic Secondary Metabolic Gene Cluster in Penicillium Fungi** *Mentor: Professor Antonis Rokas, Biological Sciences*	**Group: A** *4:30–5:30 p.m.*
Jonah Barrett '23 Neuroscience	**Agreement Between Self and Caregiver Reports on Chronic Pain Symptoms in Autism** *Mentor: Professor Tiffany Woynaroski, Hearing and Speech Sciences*	**Group: A** *4:30–5:30 p.m.*
Olivia Benlevy '23 Molecular and Cellular Biology; Medicine, Health and Society	**5-HT (Serotonin) Plays a Proinflammatory Role in Pancreatic Injury** *Mentor: Professor Kathleen DelGiorno, Cell and Developmental Biology*	**Group: A** *4:30–5:30 p.m.*
Rishik Bethi '25 Neuroscience; Medicine, Health and Society	**Characterizing How Lesioning of Cocaine Activated Ensembles Affects Cocaine Related Behaviors** *Mentor: Professor Erin Calipari, Pharmacology*	**Group: A** *4:30–5:30 p.m.*
Priya Bhatt '24 Medicine, Health and Society	**The COVID-19 Experience: An Analysis of Ideology and Information Spread Through Social Media** *Mentor: Professor Jonathan Metzl, Medicine, Health and Society*	**Group: A** *4:30–5:30 p.m.*
Olivia Black '24 Chemical Engineering	**Proteomics of CFTR Mutant VX-445 Selective Responders** *Mentor: Professor Lars Plate, Chemistry*	**Group: A** *4:30–5:30 p.m.*
William Bostick '23 Psychology	**The Activation of NFKB in a Dual Luciferase Assay Model** *Mentor: Professor John Penn, Ophthalmology and Visual Sciences*	**Group: A** *4:30–5:30 p.m.*
Caleb Boyer '24 Neuroscience	**Investigating the Role of Age-Related Inflammation in Proteostasis and Lysosomal Dysfunction** *Mentor: Dr. Laura Dugan, Medicine*	**Group: A** *4:30–5:30 p.m.*
Jack Boylan '24 Biochemistry; Chemical Biology	**Anti-Cas9 Nanobody Development for Reduced Immunogenicity** *Mentor: Professor Benjamin Spiller, Pharmacology*	**Group: A** *4:30–5:30 p.m.*

Jingyi Chen '23 Human and Organizational Development; Mathematics	**District-Level Resource Allocation during the COVID-19 Pandemic: Understanding How Districts Leveraged Federal Stimulus Funds** *Mentor: Professor Christopher Candelaria, Public Policy and Education*	**Group: A** *4:30–5:30 p.m.*
Eric Connelly '25 Human and Organizational Development	**Investigating the Effects of Flame Retardants on Human Placental Development Using a Primary Human Cytotrophoblast Model and Transcriptomics** *Mentor: Professor Joshua Robinson, Obstetrics, Gynecology and Reproductive Sciences, University of California, San Francisco*	**Group: A** *4:30–5:30 p.m.*
Caitlin Cushing '23 Special Education	IV **Isolated or Integrated: Examining the Professional Networks of Special Education Paraprofessionals and Their Association with Self-Efficacy to Work with Students with Complex Communication Needs** *Mentor: Professor Elizabeth Biggs, Special Education*	**Group: A** *4:30–5:30 p.m.*
Ana Delgado '23 Child Studies; Spanish	IV **Complex Syntax Methods of Assessment: Relative Clauses** *Mentor: Professor C. Melanie Schuele, Hearing and Speech Sciences*	**Group: A** *4:30–5:30 p.m.*
Seema Dhungana '22 Neuroscience	IV **Development of a Cognitive Assessment Tool Using Unity3D** *Mentor: Professor Thilo Womelsdorf, Psychology*	**Group: A** *4:30–5:30 p.m.*
Sonakshi Dixit '23 Medicine, Health and Society	IV **Examination of Mechanical Cardiopulmonary Support in Ovine Models** *Mentor: Professor Courtney Peterson, Medicine, Health and Society*	**Group: A** *4:30–5:30 p.m.*
Joel Elasy '23 Neuroscience	IV **The Effect of Temperature on T Cell Metabolism and Immunological Function** *Mentor: Professor Jeffrey Rathmell, Pathology, Microbiology and Immunology*	**Group: A** *4:30–5:30 p.m.*
Sam Ellis '24 Chemical Engineering	**Dipeptidase 1 Is a Marker for Colorectal Cancer with Distinct Localizations Indicative of Survival** *Mentor: Dr. Robert Coffey, Medicine*	**Group: A** *4:30–5:30 p.m.*
Jasmin Elnaggar '24 Medicine, Health and Society	**Investigating the Crosstalk Between Nucleic Acid-Sensing Through cGAS/STING and Necroptotic Inflammatory Cell Death** *Mentor: Dr. Sandra Zinkel, Medicine*	**Group: A** *4:30–5:30 p.m.*
Jada Finley '24 Child Development	IV **Validity of a Clinician-Reported Outcome Measure in Rett Syndrome** *Mentor: Professor Sarika Peters, Pediatrics*	**Group: A** *4:30–5:30 p.m.*

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Presentations – Group A

Avery Fortier '24
Medicine, Health and Society; Asian Studies

Developing an Algorithm to Identify Psoriatic Arthritis Cases in Vanderbilt Electronic Health Records

Mentor: Dr. Paras Karmacharya, Medicine

Group: A
4:30–5:30 p.m.

Ralph Francois '25
Undeclared

Can I Sleep? Excessive Negative Thoughts Explain the Relationship Between Insomnia and Anxiety in College Undergraduates

Mentor: Professor Antonia Kaczkurkin, Psychology

Group: A
4:30–5:30 p.m.

Kayla Furney '24
Neuroscience

Designing a Quantitative Assay for the Study of Engulfment Receptor Signaling and Function: Applications to Jedi-1 in Microglia

Mentor: Professor Bruce Carter, Biochemistry

Group: A
4:30–5:30 p.m.

Aaron Guo '23
Biomedical Engineering

A Deep Learning-Based Image Segmentation Algorithm for Thermographic Monitoring of Low Cardiac Output Syndrome

Mentor: Professor Justin Baba, Biomedical Engineering

Group: A
4:30–5:30 p.m.

Genevieve Harvey '25
Neuroscience; Chemistry

Identification of Novel SCN5A Mutants Linked to Brugada Syndrome by Automated Patch Clamping

Mentor: Professor Andrew Glazer, Medicine

Group: A
4:30–5:30 p.m.

Sarah Hourihan '24
Biological Sciences; Music

Significant Song and Genetic Differences Between Subspecies of the Dark-Eyed Junco

Mentor: Professor Nicole Creanza, Biological Sciences

Group: A
4:30–5:30 p.m.

Connie Hu '22
Molecular and Cellular Biology; Medicine, Health and Society

Effectivity of University of Liberia College of Health Science Mentoring Workshop Determination via Survey Data Analysis

Mentor: Professor Elizabeth Rose, Pediatrics

Group: A
4:30–5:30 p.m.

Isabella Jackson '24
Psychology

Fear of the Unknown in Perfectionists Can Lead to Social Anxiety

Mentor: Professor Antonia Kaczkurkin, Psychology

Group: A
4:30–5:30 p.m.

Julius Jan '24
Cognitive Studies; Biochemistry; Chemical Biology

Catalyzing Enantioselective Reduction of Nitroalkenes

Mentor: Professor Jeffrey Johnston, Chemistry

Group: A
4:30–5:30 p.m.

Samantha Josephson '24
Biological Sciences; Medicine, Health and Society

Beneficial Effects of N-Acetyl Cysteine on Inflammation, Oxidative Stress, and Liver Fat Fraction in Children with Biopsy-Proven Steatohepatitis

Mentor: Professor Babu Balagopal, Obesity and Cardiovascular Research, Nemours Children's Health

Group: A
4:30–5:30 p.m.

Habeeb Kazimuddin '23 Neuroscience	**Examining Paramagnetic Rim Lesions as Biomarkers for Disease Progression and Characterization in Patients with Multiple Sclerosis** *Mentor: Dr. Francesca Bagnato, Neurology*	**Group: A** *4:30–5:30 p.m.*
Thomas Knight '24 Chemistry	**A Membrane Contactor Enabling Energy-efficient CO2 Capture from Point Sources with Deep Eutectic Solvents** *Mentor: Professor Piran Kidambi, Chemical and Biomolecular Engineering*	**Group: A** *4:30–5:30 p.m.*
Kirsten Koehler '24 Ecology, Evolution and Organismal Biology	**Re-evaluating the Paleoecology of the West Coast of South Africa through Dental Microwear Analysis of Bovids** *Mentor: Professor Larisa DeSantis, Biological Sciences*	**Group: A** *4:30–5:30 p.m.*
Shelby Kuehnle '23 Molecular and Cellular Biology	**Early Life RSV Infection Effects on Epithelial Cell Tight Junction Formations** *Mentor: Professor Dawn Newcomb, Medicine*	**Group: A** *4:30–5:30 p.m.*
Abisola Lawal '23 Chemistry	**Synthesis of Dipyridylarylmethane Ligand Derivatives for Iridium-Catalyzed Alkane C-H Borylation** *Mentor: Professor Nathan Schley, Chemistry*	**Group: A** *4:30–5:30 p.m.*
Vy Le '22 Neuroscience	**Assessing the Proteasome Assay of PMP22-Overexpressing Cellular Model of Charcot-Marie-Tooth Disease** *Mentor: Professor Bruce Carter, Biochemistry*	**Group: A** *4:30–5:30 p.m.*
John Paul Libanati '24 Biomedical Engineering	**Evolution and Christianity: A Match Made in Heaven** *Mentor: Professor Lenn Goodman, Philosophy*	**Group: A** *4:30–5:30 p.m.*
Wenlu (Rosa) Liu '24 Child Studies; Computer Science	**How Multiple-Choice Questions and Prior Knowledge Affect Children's Memory** *Mentor: Professor Lisa Fazio, Psychology and Human Development*	**Group: A** *4:30–5:30 p.m.*
Chuci (Lisa) Liu '25 Electrical Engineering	**Data Management I-24 MOTION** *Mentor: Professor Dan Work, Civil and Environmental Engineering*	**Group: A** *4:30–5:30 p.m.*
Natalie Loveridge '24 Molecular and Cellular Biology; Medicine, Health and Society	**The Role of the TcdA CROPs Domain in Clostridioides difficile Toxin Secretion** *Mentor: Professor Dana Borden Lacy, Pathology, Microbiology and Immunology*	**Group: A** *4:30–5:30 p.m.*
Gian Luca Lupica-Tondo '24 Engineering Science	**Melanoma Mutation Status Alters Lipid Metabolism and Ferroptosis Sensibility** *Mentor: Professor Ronan Talty, Dermatology, Yale University*	**Group: A** *4:30–5:30 p.m.*

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Presentations – Group A

Zofia Luther '24
Computer Science; Mathematics

Towards Variance Optimization of Synthetic Trajectory Generation

Mentor: Professor David Hess, Sociology

Group: A
4:30–5:30 p.m.

William Lyon '23
Molecular and Cellular Biology

Zebrafish Retina Regeneration Research

Mentor: Professor James Patton, Biological Sciences

Group: A
4:30–5:30 p.m.

Anika Mahajan '24
Medicine, Health and Society; Spanish

Identifying Binding Attributes of Insulin-Binding B Cell Receptors

Mentor: Professor Rachel Bonami, Medicine

Group: A
4:30–5:30 p.m.

Samantha Mallahan '23
Biomedical Engineering

TSC2 Effects on Neural Rosette Lumen Size in Three-Dimensional Brain Organoids

Mentor: Dr. Kevin Ess, Neurology

Group: A
4:30–5:30 p.m.

Sean McHale '23
Computer Science; Applied Mathematics

A Decentralized Identity System for Accelerating Medical Communications within Rare Disease Communities

Mentor: Professor Peng Zhang, Computer Science and Electrical Engineering

Group: A
4:30–5:30 p.m.

Ethan Mesina '25
Neuroscience

An Analysis of the Heat Shock Response in Drosophila

Mentor: Professor Marco Gallio, Neurobiology, Northwestern University

Group: A
4:30–5:30 p.m.

Hannah Mikita '23
Voice; French

Opera Intensive in Italy

Mentor: Professor Tyler Nelson, Voice

Group: A
4:30–5:30 p.m.

Tom No '24
Molecular and Cellular Biology

Hyperoxia Increases Biomarkers of Renal Injury in a Mouse Model of Renal Ischemia and Reperfusion

Mentor: Dr. Frederic Billings, Anesthesiology

Group: A
4:30–5:30 p.m.

Hayden Paige '24
Medicine, Health and Society; Child Development

Hydrogel-based Arteriogenesis: Using Vascular Regeneration to Treat Critical Limb Ischemia

Mentor: Professor Ethan Lippmann, Chemical and Biomolecular Engineering

Group: A
4:30–5:30 p.m.

Elisa Park '24
Medicine, Health and Society; Political Science

Investigating Disparities in Academic Outcomes Among LGBTQ Students in Public Schools and Alternative Learning Centers: A Statewide Analysis

Mentor: Professor Kirsty Clark, Medicine, Health and Society

Group: A
4:30–5:30 p.m.

Gabriel Pongdee '24
Biochemistry and Chemical Biology; Chemistry

Investigations into the Modification of Antimicrobial Natural Product Chrysophaentin A

Mentor: Professor Gary Sulikowski, Chemistry

Group: A
4:30–5:30 p.m.

Kayla Prowell '23
Psychology

Hanging with Herbivores: A Survey of Dental Microware Analyses of Alaskan Bovids

Mentor: Professor Larisa DeSantis, Biological Sciences

Group: A
4:30–5:30 p.m.

Karen Pu '24 Computer Science	**IV Designing a Novel Influenza H3 Hemagglutinin Trimer to Improve Vaccine Efficiency** *Mentor: Professor Jens Meiler, Chemistry*	**Group: A** *4:30–5:30 p.m.*
Emily Qian '25 Molecular and Cellular Biology; Medicine, Health and Society	**Altered Corticostriatal Beta Power in Parkinson's Disease Correlates with Cognitive Impairment** *Mentor: Dr. Ciara Shaver, Medicine*	**Group: A** *4:30–5:30 p.m.*
Helen Qian '24 Neuroscience	**Altered Corticostriatal Beta Power in Parkinson's Disease Correlates with Cognitive Impairment** *Mentor: Dr. Sarah Bick, Neurological Surgery*	**Group: A** *4:30–5:30 p.m.*
Cheryl Quartey '25 Molecular and Cellular Biology	**IV Elucidating the Role of RORα in CD8+ T Cell Regulation of IFNγ** *Mentor: Professor Laura Solt, Immunology and Microbiology, University of Florida*	**Group: A** *4:30–5:30 p.m.*
Fateen Anam Rafid '23 Computer Science	**A Decentralized Identity System for Accelerating Medical Communications within Rare Disease Communities** *Mentor: Professor Peng Zhang, Computer Science*	**Group: A** *4:30–5:30 p.m.*
Jeevan Rajkumar '24 Chemistry; Spanish	**Chemotherapy Dose Reduction among Breast Cancer Patients in Vietnam** *Mentor: Dr. Xiao-Ou Shu, Medicine*	**Group: A** *4:30–5:30 p.m.*
Maia Regan '23 Medicine, Health and Society	**Cribriform-Morular Variant of Papillary Thyroid Carcinoma in a Pediatric Patient: A Retrospective Case Series** *Mentor: Professor Christine Finck, Surgery, Connecticut Children's Medical Center*	**Group: A** *4:30–5:30 p.m.*
Josh Scherer '24 Computer Science	**ATCMTD Architecture and RDS Analysis** *Mentor: Professor Daniel Work, Civil and Environmental Engineering*	**Group: A** *4:30–5:30 p.m.*
Ethan Sherman '24 Mathematics; Philosophy	**Knots in the Simple Hexagonal Lattice** *Mentor: Professor Marion Campisi, Mathematics and Statistics, San Jose State University*	**Group: A** *4:30–5:30 p.m.*
Charles Shissias '23 Biological Sciences	**IV Role of Mesenchymal Inflammation in Abnormal Lung Development** *Mentor: Dr. John Benjamin, Pediatrics*	**Group: A** *4:30–5:30 p.m.*
Sarah Siman '25 Chemical Engineering	**Understanding the Durability of Iron Oxide Silica Bonds in Anishinaabe Cliff Face Paintings** *Mentor: Professor Janet Macdonald, Chemistry*	**Group: A** *4:30–5:30 p.m.*

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Presentations – Group A

Nicholas Skoufis '24 Computer Science; Mathematics	**Impact of Community-Level Social Determinants of Health on Weight Loss Outcomes after Bariatric Surgery** *Mentor: Professor You Chen, Biomedical Informatics*	**Group: A** *4:30–5:30 p.m.*
Yunah Song '24 Cognitive Studies and Child Development	**Vocal Temporal Dynamics of Parent-Child Interactions in Autism throughout a Parent-Coaching Program: An Exploratory Study** *Mentor: Professor Miriam Lense, Otolaryngology-Head and Neck Surgery*	**Group: A** *4:30–5:30 p.m.*
Bryca Song-Weiss '23 Earth and Environmental Science	**Assessing beach system changes and anthropogenic signatures along the RI south shore** *Mentor: Professor John P. Walsh, Coastal Resources Center/Geological Oceanography*	**Group: A** *4:30–5:30 p.m.*
Harrison Stuart '23 Economics; Medicine, Health and Society	**Discrimination and Distress: Oaxaca-Blinder Decomposition of Sexual Minority Mental Health Disparities** *Mentor: Professor Gilbert Gonzales, Medicine, Health and Society*	**Group: A** *4:30–5:30 p.m.*
Karry Su '23 Biological Sciences; Medicine, Health and Society	**Chronic Condition Prevalence and Medicare Utilization: A State-by-State Data Analysis** *Mentor: Professor Laura Keohane, Health Policy*	**Group: A** *4:30–5:30 p.m.*
Jiachen Sun '24 Biochemistry and Chemical Biology; Medicine, Health and Society	**Sleep Deprivation and Rebound in Drosophila melanogaster** *Mentor: Professor Susan Harbison, Systems Genetics, National Heart, Lung and Blood Institute*	**Group: A** *4:30–5:30 p.m.*
Mason Tevrucht '23 Biology	**Examining the Gene Expression Rhythms of the Honey Bee Forager Circadian Clock** *Mentor: Professor Doug McMahon, Biological Sciences*	**Group: A** *4:30–5:30 p.m.*
Vanessa Torano '23 Child Development; Psychology	**The Experiences and Unmet Need of Caregivers of Child with Medical Complexities - A Qualitative Study** *Mentor: Professor Jessika Boles, Psychology and Human Development*	**Group: A** *4:30–5:30 p.m.*
Sidney Vafaie-Partin '24 Biological Sciences	**Tau Propagation in Micro-Fluidic Devices** *Mentor: Professor Ethan Lippmann, Chemical and Biomolecular Engineering*	**Group: A** *4:30–5:30 p.m.*
Arianna Valenti '23 Neuroscience	**Microglial Iron Load in a Model of Alzheimer's Disease** *Mentor: Professor Alyssa Hasty, Molecular Physiology and Biophysics*	**Group: A** *4:30–5:30 p.m.*
Laura Vaughan '25 Undeclared	**Testing Hyperinflation Data Against Makochekanwa's Model (2007)** *Mentor: Professor Wayne Tarrant, Mathematics, Rose-Hulman Institute of Technology*	**Group: A** *4:30–5:30 p.m.*

Laura Wan '24 Neuroscience; Medicine, Health and Society	**The M4 mAChR Antagonist VU6028418 Blocks the Effects of the M4 mAChR Positive Allosteric Modulator VU0467154 on Sleep-Wake Architecture in Young Mice** *Mentor: Professor Carrie Jones, Pharmacology*	**Group: A** *4:30–5:30 p.m.*
Jiahe Wang '24 Psychology	**Quantifying Burnout in Child Life Specialists and Trainees** *Mentor: Professor Jessika Boles, Psychology and Human Development*	**Group: A** *4:30–5:30 p.m.*
Nora (Yinuo) Wang '24 Psychology; Medicine, Health and Society	IV **The Experiences and Unmet Needs of Caregivers of Children with Medical Complexities — A Qualitative Study** *Mentor: Professor Jessika Boles, Psychology and Human Development*	**Group: A** *4:30–5:30 p.m.*
Greyson Wintergerst '25 Biomedical Engineering	**CKDSense: A Device for Simultaneous Evaluation of Albumin-to-Creatinine Ratio and Sediments in Urine for At-Home Monitoring of Chronic Kidney Disease** *Mentor: Professor Audrey Bowden, Biomedical Engineering*	**Group: A** *4:30–5:30 p.m.*
Isabella Wynocker '24 Electrical Engineering	**Random Telegraph Noise and Radiation Response in 80 nm Charge-Trapping NAND Memory Devices with SiON Tunneling Oxide** *Mentor: Professor Enxia Zhang, Electrical Engineering and Materials Science*	**Group: A** *4:30–5:30 p.m.*
Andrew Xue '24 Neuroscience	IV **Neural Correlates of Sensory Hypersensitivity in Tourette's Syndrome** *Mentor: Professor Sasha Key, Hearing and Speech Sciences*	**Group: A** *4:30–5:30 p.m.*
Steven Yang '23 Psychology	IV **The Role of Statement Attributes in the Effects of Repetition on Belief** *Mentor: Professor Lisa Fazio, Psychology and Human Development*	**Group: A** *4:30–5:30 p.m.*
Nina Yao '23 Biochemistry; Chemical Biology	IV **Developing a Bioreactor to Study the Use of Human Renal Tubule Epithelial Cells in Treating Kidney Disease** *Mentor: Dr. William Fissell, Medicine*	**Group: A** *4:30–5:30 p.m.*
Phoebe Young '24 Cognitive Studies; Neuroscience	**Neural Adaptations in the Insular Cortex following Abstinence from Chronic Ethanol Exposure** *Mentor: Professor Danny Winder, Molecular Physiology and Biophysics*	**Group: A** *4:30–5:30 p.m.*
Zhixin (Helen) Zhang '23 Cognitive Studies; Neuroscience	**How Reward Responsiveness Moderates Stress in Predicting Depression** *Mentor: Professor Autumn Kujawa, Psychology and Human Development*	**Group: A** *4:30–5:30 p.m.*

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Presentations – Group A

Haipeng (Hayley) Zhang '24
Mathematics

A Decentralized Identity System for Accelerating Medical Communications within Rare Disease Communities

Mentor: Professor Peng Zhang, Computer Science and Electrical Engineering

Group: A
4:30–5:30 p.m.

Yang Zhou '24
Molecular and Cellular Biology; Medicine, Health and Society; Neuroscience

Investigation on the Molecular Mechanism of Combined Immunotherapy and RAS/PI3K/RAF Inhibition in Melanoma

Mentor: Professor Ann Richmond, Pharmacology

Group: A
4:30–5:30 p.m.

Presentations – Group B

Leen Alabdalla '24 Neuroscience	**The effect of aB-crystallin phosphomimetic mutants on zebrafish lens** *Mentor: Professor Hassane Mchaourab, Molecular Physiology and Biophysics*	**Group: B** *5:30–6:30 p.m.*
Madison Albert '24 Biomedical Engineering; Mathematics	**Deep Learning and Optimization Algorithms to Model and Compensate for Errors in Radiofrequency Transmit Amplifiers for Magnetic Resonance Imaging** *Mentor: Professor Will Grissom, Biomedical Engineering*	**Group: B** *5:30–6:30 p.m.*
Rosana Alfaro '24 Biomedical Engineering	**Swellable Microneedles for Capture and Rapid Detection of Lyme Disease Spirochete from Tick Bites** *Mentor: Professor Frederick Haselton, Biomedical Engineering*	**Group: B** *5:30–6:30 p.m.*
Alexa Betjemann '24 Medicine, Health and Society; Molecular and Cellular Biology	**Understanding Lipid Handling Mast Cells in Weight Cycling** *Mentor: Professor Alyssa Hasty, Molecular Physiology and Biophysics*	**Group: B** *5:30–6:30 p.m.*
Jayden Capella '24 Medicine, Health and Society	**Determining Which Cell Type Secretes Osteopontin in the Intestines of Mice** *Mentor: Professor Danyvid Olivares-Villagomez, Pathology, Microbiology and Immunology*	**Group: B** *5:30–6:30 p.m.*
Abigail Carr '25 Undeclared	**Regulation of Behavior in Response to Negative Affective States Associated with Alcohol Abstinence** *Mentor: Professor Erin Calipari, Pharmacology*	**Group: B** *5:30–6:30 p.m.*
Ori Chalom '24 Biomedical Engineering	**Local Reprogramming of Tumor-Associated Macrophages with Nano-in-Cryogel Biomaterials** *Mentor: Professor Todd Giorgio, Biomedical Engineering*	**Group: B** *5:30–6:30 p.m.*
Ethan Chi '23 Molecular and Cellular Biology; Architecture and the Built Environment	**The Nuclear Receptor Steroidogenic-Factor-1 Induces Accumulation of Nuclear Phosphoinositides** *Mentor: Professor Ray Blind, Medicine*	**Group: B** *5:30–6:30 p.m.*
Minjin Choi '22 Neuroscience	**Expression of Rat M5 Muscarinic Acetylcholine Receptor mRNA in Midbrain Dopamine Neurons Retrogradely Labeled from Dopaminergic Forebrain Regions** *Mentor: Professor Carrie Jones, Pharmacology*	**Group: B** *5:30–6:30 p.m.*
Sophia Chung '24 Cognitive Studies; Neuroscience	**Intermittent Stimulation of the Nucleus Basalis Improves Working Memory in Aged Monkeys** *Mentor: Professor Christos Constantinidis, Biomedical Engineering*	**Group: B** *5:30–6:30 p.m.*
Lauren Corliss '24 Biological Sciences; Chemistry	**The Role of Fibrin in Inflammatory Osteoporosis** *Mentor: Dr. Jonathan Schoenecker, Orthopaedic Surgery*	**Group: B** *5:30–6:30 p.m.*

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Presentations – Group B

Jiulin Dai '23 Child Development; Ecology, Evolution and Organismal Biology	**Exploring the Relation Among Word Reading Skill, Anxiety Symptoms and Working Memory** *Mentor: Professor James Booth, Psychology and Human Development*	**Group: B** *5:30–6:30 p.m.*
Cree Diggs-Brown '24 Medicine, Health and Society	**Predicting Postsecondary Success** *Mentor: Professor Bethany Rittle-Johnson, Psychology and Human Development*	**Group: B** *5:30–6:30 p.m.*
Joel Douglas '24 Medicine, Health and Society	**Cell-free Hemoglobin Initiates Lung Microvascular Endothelial Activation and Increases Leukocyte Adhesion** *Mentor: Dr. Lorraine Ware, Medicine*	**Group: B** *5:30–6:30 p.m.*
Esha Draksharam '24 Biochemistry and Chemical Biology; Medicine, Health and Society	**The Role of Arsenic in Colon Carcinogenesis: Implications for Ferroptosis Sensitization** *Mentor: Professor Hemant Roy, Department of Medicine*	**Group: B** *5:30–6:30 p.m.*
Nikkie Dutta '24 Cognitive Studies; Medicine, Health and Society	IV **Is There Evidence That Language Exposure in Infancy Influences Early Childhood Behavioral Outcomes and Mental Health?** *Mentor: Professor Kathryn Humphreys, Psychology and Human Development*	**Group: B** *5:30–6:30 p.m.*
Omotayo Fasan '24 Medicine, Health and Society	**Sexual Risk Behavior and Service Use at the Intersection of Gender and Sexuality** *Mentor: Professor Kelly Taylor, Public Health, University of California, San Francisco*	**Group: B** *5:30–6:30 p.m.*
Sawyer Fleishman '24 Medicine, Health and Society	IV **Assessing Demyelination Metabolism through the CSF and Lymph Nodes in Multiple Sclerosis** *Mentor: Professor Seth Smith, Radiology and Radiological Sciences*	**Group: B** *5:30–6:30 p.m.*
Keegan Fong '23 Mechanical Engineering	**Analysis of High Occupancy Toll (HOT) Lanes** *Mentor: Professor Janey Camp, Civil and Environmental Engineering*	**Group: B** *5:30–6:30 p.m.*
Sarah "Elizabeth" Gatti '25 Biomedical Engineering	**Fabrication of Magnetically Tunable Erythrocyte Based Micromotors** *Mentor: Professor Jamel Ali, Biomedical Engineering, Florida State University / Florida A&M*	**Group: B** *5:30–6:30 p.m.*
Erica Guelfi '24 Biomedical Engineering	IV **The CAD Margin: A Novel Communication Tool for Delivery of Frozen Section Results** *Mentor: Dr. Michael Topf, Otolaryngology*	**Group: B** *5:30–6:30 p.m.*
Rachel Haselkorn '23 Neuroscience	**Organization of Cortical Connections of Complex Movement Domains in the Squirrel Monkey Brain** *Mentor: Professor Jon Kaas, Psychology*	**Group: B** *5:30–6:30 p.m.*

Marina He '24 Molecular and Cellular Biology; Chemistry	**Construction of Immune-scFv Phage Display Library for Developing Function-Blocking Anti-TSP1 Antibodies** *Mentor: Dr. Takamune Takahashi, Medicine*	**Group: B** *5:30–6:30 p.m.*
Callie Hilgenhurst '23 Earth and Environmental Sciences	**Characterizing Microplastic Pollution in Mammoth Cave** *Mentor: Professor Jessica Oster, Earth and Environmental Sciences*	**Group: B** *5:30–6:30 p.m.*
Isaac Howard '23 Biology	IV **Fission Yeast's Gas Family of Proteins are Important for Cell Wall Integrity** *Mentor: Professor Alaina Willet, Cell and Developmental Biology*	**Group: B** *5:30–6:30 p.m.*
Rincon Jagarlamudi '25 Undeclared	**A FMRP-Dependent Pathway for the Glial Phagocytosis of Brain Neurons** *Mentor: Professor Kendal Broadie, Neurobiology*	**Group: B** *5:30–6:30 p.m.*
Kleio Jiang '23 Psychology	**The Interaction Between Recall and Recognition in the Induced Forgetting Paradigm** *Mentor: Professor Ashleigh Maxcey, Psychology*	**Group: B** *5:30–6:30 p.m.*
Weixi Kang '23 Chemistry; Law, History and Society	**The Ability of Ferroptosis Inhibitors and Related Compounds to Directly Reduce Hydroperoxides and Endoperoxides and to Serve as Reducing Co-Substrates for the Peroxidase of Cyclooxygenase-2** *Mentor: Professor Lawrence Marnett, Biochemistry and Chemistry*	**Group: B** *5:30–6:30 p.m.*
Laith Kayat '23 Neuroscience; Medicine, Health and Society	**The Role of Mitophagy in Regulating B Cell Activation** *Mentor: Professor Daniel Goldstein, Microbiology and Immunology, University of Michigan*	**Group: B** *5:30–6:30 p.m.*
Lily Kim '23 Biochemistry and Chemical Biology	**Investigating the Interaction Between HCoV-229E Nsp3 and the COG Complex** *Mentor: Professor Lars Plate, Chemistry*	**Group: B** *5:30–6:30 p.m.*
Min Joo Kim '24 Biochemistry and Chemical Biology	IV **Metabolic Stress Response to Staphylococcus aureus infection in macrophages** *Mentor: Professor Henrique Serezani, Medicine*	**Group: B** *5:30–6:30 p.m.*
Samantha Knoblauch '24 Medicine, Health and Society; Neuroscience	**Chemical Activation of Piezo1 to Enhance TRAIL-induced Apoptosis in Glioblastoma Cells** *Mentor: Professor Michael King, Biomedical Engineering*	**Group: B** *5:30–6:30 p.m.*
Amanda Kouaho '23 Medicine, Health and Society; Molecular and Cellular Biology	**Single Cellular Analysis of Myeloid Cells Associated with Glioblastoma Cell Subtypes** *Mentor: Professor Jonathan Irish, Cell and Developmental Biology*	**Group: B** *5:30–6:30 p.m.*

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Presentations – Group B

Jenna Lee '24 Medicine, Health and Society	**Synthesis of Muscle Extracellular Matrix (ECM) Hydrogels for Bioengineering Applications** *Mentor: Professor Shay Soker, Regenerative Medicine, Wake Forest Institute of Regenerative Medicine*	**Group: B** *5:30–6:30 p.m.*
Rachel Lee '22 Medicine, Health and Society; Anthropology	**Embodiment and Black Travel in Puerto Rico** *Mentor: Professor Gabriel Torres, Anthropology*	**Group: B** *5:30–6:30 p.m.*
Adaline Leong '25 Computer Science	**Formula Web** *Mentor: Professor Daniel Balasubramanian, Computer Science*	**Group: B** *5:30–6:30 p.m.*
Sophie Li '23 Molecular and Cellular Biology	**Integrating 3D Technology into the Head and Neck Surgical Pathology Intraoperative Workflow** *Mentor: Dr. Michael Topf, Otolaryngology - Head and Neck Surgery*	**Group: B** *5:30–6:30 p.m.*
Maxwell Lichtenfeld '23 Cognitive Studies; Medicine, Health and Society	**The Laminar Distribution of Inhibitory Cell Types in the Canonical Microcircuit of Macaque Cortex and Its Implications for Hierarchical Information Processing** *Mentor: Professor Andre Bastos, Psychology*	**Group: B** *5:30–6:30 p.m.*
Erica Lin '24 Molecular and Cellular Biology	**T Cell Infiltration in Murine Mammary Tumors Treated with Radiation Therapy** *Mentor: Professor Marjan Rafat, Chemical and Biomolecular Engineering*	**Group: B** *5:30–6:30 p.m.*
Lauren Link '25 Medicine, Health and Society	**Formulating Size-Discrete PLGA Nanoparticles to Prevent Uterine Contractility in Preterm Labor** *Mentor: Professor Todd Giorgio, Biomedical Engineering*	**Group: B** *5:30–6:30 p.m.*
Daniel Little '24 Computer Science; Mathematics	**Applying Clustering Techniques to UAV Time Series Data** *Mentor: Professor Janos Sztipanovits, Engineering*	**Group: B** *5:30–6:30 p.m.*
Tierah Macon '24 Chemistry	**The Role of Pou4f3 Mutations in Vestibular Dysfunction** *Mentor: Professor Michelle Sulikowski, Chemistry*	**Group: B** *5:30–6:30 p.m.*
Anna McGovern '23 Medicine, Health and Society	**Diet-Driven Distinct Amino Acid Profile Drives Susceptibility to S. Tm Gastroenteritis** *Mentor: Professor Mariana Byndloss, Pathology, Microbiology and Immunology*	**Group: B** *5:30–6:30 p.m.*
Kai Mehra '24 Human and Organizational Development; Mathematics	**Games on Graphs** *Mentor: Professor Robert Bell, Mathematics, Michigan State University*	**Group: B** *5:30–6:30 p.m.*
Asya Miles '23 Child Studies; Medicine, Health and Society	**Transition Experiences of Black Youth with Autism** *Mentor: Professor Elizabeth Biggs, Special Education*	**Group: B** *5:30–6:30 p.m.*

Neeraj Namburu '24 Medicine, Health and Society	**RNA Sequence Analysis of Differential Gene Expression in Mice Retinas Treated with TNF and IL-1B** *Mentor: Dr. Dolly-Ann Padovani-Claudio, Ophthalmology and Visual Sciences*	**Group: B** *5:30–6:30 p.m.*
Ashruta Narapareddy '22 Medicine, Health and Society	**Altered Interoceptive Sensibility in Adults with Chronic Tic Disorder** *Mentor: Dr. David Isaacs, Neurology*	**Group: B** *5:30–6:30 p.m.*
Isabelle Newman '23 Medicine, Health and Society	**Teaching Core Competencies in the Premedical Curriculum** *Mentor: Professor Michelle Grundy, Medical Education and Administration*	**Group: B** *5:30–6:30 p.m.*
Samuel Oyerinde '23 Child Development; Medicine, Health and Society	**Transition Experiences of Black Youth with Autism** *Mentor: Professor Elizabeth Biggs, Special Education*	**Group: B** *5:30–6:30 p.m.*
Dongyong (Leo) Park '24 Child Development; Neuroscience	**Neuronal Cell Type Classification at the Isoform Resolution** *Mentor: Professor Tao Tan, Neuroscience, Baylor College of Medicine*	**Group: B** *5:30–6:30 p.m.*
Siraphob Phipathananunth '23 Computer Science; Mathematics	**Analyzing Formal Specifications with Mutations** *Mentor: Professor Chandra Nandi, Engineering*	**Group: B** *5:30–6:30 p.m.*
Mayaank Pillai '24 Computer Science; Mathematics	**Real-Time Clinician Guidance Pipeline for 3D Bladder Reconstruction** *Mentor: Professor Audrey Bowden, Biomedical Engineering*	**Group: B** *5:30–6:30 p.m.*
Neelesh Raj '25 Chemical Engineering	**Investigating the Effects of Radiation Damage on Perilipin Expression and Lipolysis in 3T3-L1 Adipocytes** *Mentor: Professor Marjan Rafat, Chemical and Biomolecular Engineering*	**Group: B** *5:30–6:30 p.m.*
Brina Ratangee '25 Medicine, Health and Society; Neuroscience	**Examining the Relationship between Area Deprivation Index and Alzheimer's Disease-Associated Cognitive Decline** *Mentor: Professor Marissa Gogniat, Neuropsychology*	**Group: B** *5:30–6:30 p.m.*
Varun Reddy '22 Medicine, Health and Society; Neuroscience	**NFAT Inhibition Reduces Retinal Vascular Leakage in a Mouse Model of Diabetic Retinopathy** *Mentor: Dr. Irina De la Huerta, Ophthalmology and Visual Sciences*	**Group: B** *5:30–6:30 p.m.*
Savannah Rogers '23 Medicine, Health and Society; Neuroscience	**The Neural Correlates of Social Motivation in Adults With Autism** *Mentor: Professor Sasha Key, Hearing and Speech Sciences*	**Group: B** *5:30–6:30 p.m.*

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Presentations – Group B

Leonard Saizan '24 Medicine, Health and Society	**Developing A Diagnostic Clinical Prediction Score to Predict Treatment of Tracheostomy-Associated Bacterial Respiratory Infections (bTARTIs) in Pediatric Patients** *Mentor: Dr. Christopher Russell, Los Angeles Children's Hospital - Clinical Pediatrics*	**Group: B** *5:30–6:30 p.m.*
Saksham Saksena '25 Undeclared	**Phylogenetic Examination of Proteins Involved in Exogenous Fatty Acid Metabolism in Gram-Negative Bacteria** *Mentor: Professor David Giles, Biology, Geology and Environmental Science, University of Tennessee at Chattanooga*	**Group: B** *5:30–6:30 p.m.*
Mary Screws '23 Medicine, Health and Society; Neuroscience	**The Effect of Aging on the Integrity of Cholinergic Circuitry and Sleep/Wake Architecture** *Mentor: Professor Carrie Jones, Pharmacology*	**Group: B** *5:30–6:30 p.m.*
Audrey Scudder '23 Psychology	**Mind the NIH-Funding Gap: Structural Discrimination in Physical Health–Related Research for Cognitively Able Autistic Adults** *Mentor: Professor Tempest A. Meridian McDonald, Neurology*	**Group: B** *5:30–6:30 p.m.*
Amelia Shaddinger '23 Child Development; Neuroscience	**Rumination and Fatigue Moderate the Link Between Depression and Negative Partner Communication** *Mentor: Professor Brian Wymbs, Psychology, Ohio University*	**Group: B** *5:30–6:30 p.m.*
Yufan "Fiona" Shan '23 Biochemistry; Chemical Biology	**Fission Yeast Casein Kinase 1 (CK1) Homologs are Important for Double Strand Break Repair** *Mentor: Professor Kathy Gould, Cell and Developmental Biology*	**Group: B** *5:30–6:30 p.m.*
Gabriella Shayani '22 Biological Sciences	**Elucidating the Role of Myofibroblast Senescence in Cardiac Repair post Myocardial Infarction** *Mentor: Dr. Young-Jae Nam, Cardiology*	**Group: B** *5:30–6:30 p.m.*
Ahmad Shiraz '24 Economics; Computer Science	**Expression and Purification of Bacterial Sialyltransferases to Probe Binding Properties of Alpha 2,6 Sialoglycans** *Mentor: Professor Tina Iverson, Pharmacology*	**Group: B** *5:30–6:30 p.m.*
Anastasia Shostak '23 Chemical Engineering	**Investigating the Normal Tissue Radiation Response Using Extracellular Matrix Hydrogels** *Mentor: Professor Marjan Rafat, Chemical and Biomolecular Engineering*	**Group: B** *5:30–6:30 p.m.*
Athira Sivadas '23 Biochemistry and Chemical Biology; Medicine, Health and Society	**Examining PFKL Filament Formation with Site-Specific Crosslinking** *Mentor: Professor Lars Plate, Chemistry*	**Group: B** *5:30–6:30 p.m.*

Mariana Smith '23 Mechanical Engineering	**Foldable Laparoscopic Omnidirectional Wrist for Effective Robotic Surgery** *Mentor: Professor Robert Webster, Mechanical Engineering*	**Group: B** *5:30–6:30 p.m.*
Richard Song '25 Computer Science	**Age Differentially Modulates the Impact of Heart Rate and Respiration on the fMRI BOLD Signal** *Mentor: Professor Catie Chang, Electrical and Computer Engineering*	**Group: B** *5:30–6:30 p.m.*
Debbie Wang '24 Neuroscience; Chemistry	IV **Understanding Proliferation Marker Expression in Tuberous Sclerosis Complex Astrocytes** *Mentor: Professor Diana Neely, Pediatrics*	**Group: B** *5:30–6:30 p.m.*
Wonder Wei '24 Biological Sciences; Ecology, Evolution and Organismal Biology	**Reconstructing the Dietary Ecology of Lynx Throughout Time** *Mentor: Professor Larisa DeSantis, Biological Sciences*	**Group: B** *5:30–6:30 p.m.*
Emma Wheat '23 Biomedical Engineering	**Food System Monitoring: Towards a Field-Deployable Swine 3-plex PCR Assay for Differentiation of Foot and Mouth Disease Virus from Senecavirus A** *Mentor: Professor Frederick Haselton, Biomedical Engineering*	**Group: B** *5:30–6:30 p.m.*
Kwan Nok Adrian Wong '24 Cognitive Studies	**Age-Related Differences in Visuomotor Adaptation** *Mentor: Professor Iain Gilchrist, Neuropsychology, University of Bristol*	**Group: B** *5:30–6:30 p.m.*
Veronica Wrobleski '22 Biological Sciences; Secondary Education	IV **Toxicity of Yeast Encapsulated Photosensitive Insecticides (YEPSI) on Anopheles gambiae and Aedes aegypti Mosquito Larvae** *Mentor: Professor Julian Hillyer, Biological Sciences*	**Group: B** *5:30–6:30 p.m.*
Fiona Wu '24 Neuroscience; Medicine, Health and Society	**Investigating Fusiform Face Area Development in Differentiating Risks of ASD Infants** *Mentor: Professor Carissa Cascio, Psychiatry and Behavioral Sciences*	**Group: B** *5:30–6:30 p.m.*
Yisu Yang '24 Cognitive Studies	IV **White Matter Microstructural Metrics are Sensitively Associated with Staging Along the Alzheimer's Disease Continuum** *Mentor: Professor Derek Archer, Neurology*	**Group: B** *5:30–6:30 p.m.*
Michelle Yin '23 Biological Sciences	IV **Mutation Accumulation of Lactobacillus Sp.** *Mentor: Professor Megan Behringer, Biological Sciences*	**Group: B** *5:30–6:30 p.m.*
Xianduo Zhao '24 Electrical Engineering	**Bias-Temperature Instabilities in AlGaN/GaN HEMTs** *Mentor: Professor Enxia Zhang, Electrical Engineering and Materials Science*	**Group: B** *5:30–6:30 p.m.*

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Presentations – Group B

Gabija Zilinskaite '23
Violin Performance; Psychology

Do Children Use Music For Emotion Regulation?

Mentor: Professor Reyna Gordon, Otolaryngology - Head and Neck Surgery

Group: B
5:30–6:30 p.m.

The Vanderbilt Undergraduate Research Fair is sponsored by the Office of Experiential Learning and Immersion Vanderbilt, the Vanderbilt Undergraduate Summer Research Program, the Office of the Provost and the Littlejohn and Goldberg Families.

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