



## Friday, August 4, 2023

- 8:00 am Pre-meeting check-in (onsite @ Michelson Hall)  
 Zoom webinar: [https://usc.zoom.us/webinar/register/WN\\_2n2qTdpEQ8aZuRZeNLtOPQ](https://usc.zoom.us/webinar/register/WN_2n2qTdpEQ8aZuRZeNLtOPQ)
- 8:30 am Welcome [Recorded]  
 by Dean Amber Miller, USC Dornsife College of Letters, Arts and Sciences
- 8:32am Welcome  
 by Stephen Bradforth, Professor of Chemistry and Senior Advisor to the Dean for Research Strategy and Development
- 8:35 am BUGS Program Introduction  
 by Scott Fraser, Professor & Director, USC Bridge Institute
- 8:45 am Oral Presentations from **Group 1** (with Intros and Q&A) [9]
- 9:35 am Intros of BUGS Jrs in Poster **Group A** [20]
- 10:00 am Poster **Group A** Presentations @ MCB 3<sup>rd</sup> Floor Common Area
- 10:40 am Oral Presentations from **Group 2** (with Intros and Q&A) [9]
- 11:30 am Intros of BUGS Jrs in Poster **Group B** [21]
- 12:00 pm Poster **Group B** Presentations @ MCB 3<sup>rd</sup> Floor Common Area
- 12:30 pm **Group Photo / Lunch Break**
- 1:10 pm Oral Presentations from **Group 3** (with Intros and Q&A) [9]
- 1:50 pm Intros of BUGS Jrs in Poster **Group C** [21]
- 2:10 pm Poster **Group C** Presentations @ MCB 3<sup>rd</sup> Floor Common Area
- 2:45 pm Oral Presentations from **Group 4** (with Intros and Q&A) [11]
- 3:45 pm **Reception**
- 4:30 pm End Event-Day 1

## Saturday, August 5, 2023

- 8:00 am Pre-meeting check-in (onsite @ Michelson Hall)  
 Zoom webinar: [https://usc.zoom.us/webinar/register/WN\\_2n2qTdpEQ8aZuRZeNLtOPQ](https://usc.zoom.us/webinar/register/WN_2n2qTdpEQ8aZuRZeNLtOPQ)
- 8:30 am Oral Presentations from **Group 5** (with Intros and Q&A) [8]
- 9:15 am Intros of BUGS Jrs in Poster **Group D** [18]
- 9:40 am Poster **Group D** Presentations @ MCB 3<sup>rd</sup> Floor Common Area
- 10:20 am Oral Presentations from **Group 6** (with Intros and Q&A) [7]
- 11:00 am Intros of BUGS Jrs in Poster **Group E** [17]
- 11:30 pm Poster **Group E** Presentations @ MCB 3<sup>rd</sup> Floor Common Area
- 12:00 pm **Group Photo / Lunch Break**
- 12:45 pm Presentation to Arthur and Frances Peskoff (Trudi Berwin Fellowship support)
- 12:50 pm Comments by Arthur and Frances Peskoff
- 1:00 pm Oral Presentations from **Group 7** (with Intros and Q&A) [6]
- 1:30 pm Intros of BUGS Jrs in Poster **Group F** [10]
- 1:45 pm Poster **Group F** Presentations @ MCB 3<sup>rd</sup> Floor Common Area
- 2:25 pm Oral Presentations from **Group 8** (with Intros and Q&A) [7]
- 3:00 pm **Reception**
- 4:00 pm End Event

Friday, August 4<sup>th</sup>, 2023

**GROUP 1: ORAL PRESENTATIONS [8:45am – 9:35am]**

Facilitator 1: Dmitry Eremin; Facilitator 2: Lynne Cherchia

**Nicholas Kim** ● '26, Viterbi | Biomedical Engineering  
*PI: Andrei Irimia | Mentors: Anar Amgalan, Nahian Chowdhury, Nikhil Chaudhari*

*Mutual Information of SNPs and Brain MRI Intensities*

**Stella Kahl** ● '24, Viterbi | Biomedical Engineering  
*PI/Mentor: Jeremy Mason*

*Comparing Patient Liquid Biopsy Results to Stratify Cancer Type*

**Finn Cassady** ● '25, Dornsife/Viterbi | Biology/Computer Science  
*PI/Mentor: Don Arnold*

*Visualizing Synaptic Changes in Association with Memory Formation in Larval Zebrafish*

†**Stella Dziedzic\*** ● '25, Dornsife | Biology/Sci & Mgmt of Biotherapeutics  
*PI: Clay Wang | Mentors: Shu Yi Lin, Jennifer Shyong, Zoey Bowers*

*Manipulating mcrA in Filamentous Fungi for Discovery of Potential Bioactive Compounds*

**Thea Millam\*** ● '25, Dornsife | Biochemistry  
*PI: Clay Wang | Mentors: Jennifer Shyong, Shu Yi Lin, Zoey Bowers*

**Leila Mirsafian** ● '24, Davis | Human Development & Aging  
*PI: Mireille Jacobson | Mentors: Elizabeth Joe, Julie Zissimopoulos*

*Analyzing Diversity Reporting in Clinical Trials of Alzheimer's Disease Interventions*

**Sarah Relle\*** ● '24, Dornsife | Neuroscience/Sci & Mgmt of Biotherapeutics  
*PI: Dion Dickman | Mentor: Nancy Tran*

*Quantifying Unc13 levels in Unc13 mutants and ALS disease models*

†**Sunny Lee\*** ● '25, Dornsife | Neuroscience  
*PI: Dion Dickman | Mentor: Nancy Tran*

*Characterizing Synaptic Growth and Neurodegeneration in Unc13 Mutants and ALS Disease Models*

**Sara Wu\*** ● '24, Davis | Human Development & Aging  
*PI: Dion Dickman | Mentor: Nancy Tran*

*Optimizing Stathmin Reagents and Exploring the Interaction between Stathmin-mediated Neurodegeneration and Injury Signaling*

**GROUP 2: ORAL PRESENTATIONS [10:40am – 11:30am]**

Facilitator 1: Lynne Cherchia; Facilitator 2: Dmitry Eremin

†**Andrea Shehi\*** ● '25, Viterbi | Biomedical Engineering  
*PI: Biju Thomas | Mentor: Deepthi Nair*

*Ultrasound Stimulation of Retinal Organoids*

†**Anika Gupta\*** ● '25, Viterbi | Biomedical Engineering  
*PI: Deepthi Nair | Mentor: Biju Thomas*

*Use of transplantable grafts made from isolated purified photoreceptors derived from retinal organoids to repair damaged retina due to Age-related Macular Degeneration (AMD)*

**Darren Zhou** ● '26, Dornsife | Biological Sciences  
*PI: Dion Dickman | Mentor: Yu Xiong*

*Application of CRISPR/Cas9 and Polymerase Chain Reaction to Determine Pre-synaptic Effect on *Drosophila melanogaster**

**Vienna Gao** ● '25, Dornsife | Neuroscience, Mathematics  
*PI: Brian Dias | Mentor: Will Taylor*

*Examining Cellular Activity in Learning and Memory*

**Allison Chang\*** ● '25, Dornsife | Neuroscience, English  
*PI: Dion Dickman | Mentor: Jerry Chien*

*A CRISPR-mediated Genetic Dissection of the *Drosophila* voltage-gated Calcium Channel Subunits in Tonic and Phasic Neurons*

**Svara Shah**<sup>%</sup> ● '25, Dornsife | Human Biology, Health Innovation  
PI: Dion Dickman | Mentor: Elizabeth Loxterkamp

*Localization of the Auxiliary Glutamate Receptor Subunit Neto in Drosophila Melanogaster*

†**Shirley Liang**<sup>%</sup> ● '26, Mann | Biopharmaceutical Sciences, Cinematic Arts  
PI: Dion Dickman | Mentor: Elizabeth Loxterkamp

*Establishment of Novel Antibodies for Neto in Drosophila Melanogaster*

†**Mohitha Rapaka** ● '25, U of Texas at Austin | Human Biology  
PI: Vinay Duddalwar | Mentor: Dean Wallace

*mIF Analysis to Identify Angiogenesis Biomarkers in Clear Cell Renal Cell Carcinoma*

†**KayLynn Vroman** ● '24, Dornsife | Human Biology  
PI: Valery Fokin | Mentor: Kevin Vargas

*Investigating the Hydrolytic Stability of a Novel Naloxone Derivative*

### GROUP 3: ORAL PRESENTATIONS [1:10pm – 1:50pm]

Facilitator 1: Matt Colopy; Facilitator 2: Augusta Fernando

**Christian Chen**<sup>\*</sup> ● '24, Viterbi | Biomedical Engineering  
PI: Eun Ji Chung | Mentor: Noah Trac

*CCR2-targeted Micelles for Diagnosis of Lymph Node Metastases*

†**Sophia Chen**<sup>\*</sup> ● '25, Viterbi | Biomedical Engineering, Computer Programming  
PI: Eun Ji Chung | Mentor: Abby Lim

*Natural Killer Small Extracellular Vesicles in Severe COVID-19*

†**Ali Osouli**<sup>\*</sup> ● '24, Viterbi | Chemical Engineering (Nanotechnology)  
PI: Eun Ji Chung | Mentor: Yi Huang

*Development of Kidney Targeting Nanomedicine for Polycystic Kidney Disease*

**Benjamin Ahn** ● '24, Dornsife | Biochemistry  
PI/Mentor: Matthew Pratt

*Rescue of Neuropathy Causing Protein Mutations by O-GlcNAc*

**Caleb Dehn** ● '25, Dornsife/Thornton | Neuroscience/Music  
PI: Dion Dickman | Mentor: Rebecca Stark

*BLOC-1 Complex*

**Lily Zhang**<sup>%</sup> ● '24, Dornsife | Biochemistry  
PI: Irene Chiolo | Mentors: Nadejda Butova, Chiara Merigliano

*Role of Ulp1 in Heterochromatic DSB Repair*

**Yunan Wu**<sup>%</sup> ● '24, Dornsife | Biochemistry/Global Health  
PI: Irene Chiolo | Mentors: Chetan Rawal

*Role of Heterochromatin Protein 1 (HP1) in Heterochromatic DNA Double Strand Breaks Repair*

**Cathy Ma**<sup>%</sup> ● '25, Dornsife/Viterbi | Quantitative Biology/Computer Science  
PI: Irene Chiolo | Mentors: Jacob Miller, Chetan Rawal

*Quantitative Analysis of Double Strand Break Repair Pathways in Heterochromatin*

**Z] Seoyoung Chung** ● '24, Dornsife/Keck | Healthcare Studies  
PI: Charles McKenna | Mentors: Oskar Sundberg, Boris Kashemirov

*Synthesis of a Novel Theragnostic Probe for Improved Detection of Bone Diseases*

### GROUP 4: ORAL PRESENTATIONS [2:45pm – 3:45pm]

Facilitator 1: Augusta Fernando; Facilitator 2: Matt Colopy;

†**Jadynne Zane**<sup>\*</sup> ● '25, Viterbi | Biomedical Engineering, Computer Programming  
PI: Cristina Zavaleta | Mentors: Olga Eremina, Augusta Fernando

*Evaluating the Multiplexing Specificity and Sensitivity of Surface Enhanced Raman Spectroscopy Nanoparticle Flavors*

**Ingus Stegis**<sup>\*</sup> ● '25, Viterbi | Biomedical Engineering  
PI: Cristina Zavaleta | Mentor: Pegah Bagheri

*Fabrication of SERS NPs for Targeted Therapies*



# Bridge UnderGrad Science

## Summer Research Program

<p>†<b>Matt Zacchary Blanco*</b> ● '25, Viterbi   Biomedical Engineering  <i>PI: Cristina Zavaleta   Mentor: Alex Czaja</i></p>	<p><i>A Topographic Raman Imaging Approach for Surgical Margin Assessment</i></p>
<p><b>Tristan Mitchell</b> ● '24, Dornsife   Biochemistry  <i>PI: Cornelius Gati   Mentors: Ravi Yadav, Zenia Motiwala, Saif Khan</i></p>	<p><i>Expression and Purification of the Mu Opioid Receptor in Complex with G Proteins for Cryo-EM Studies</i></p>
<p><b>Thien Nguyen</b> ● '24, Dornsife   Human Biology  <i>PI: Justin Schaal   Mentors: Michael Selsted, Dat Tran</i></p>	<p><i>Exploring the Therapeutic Potential of Engineered Analog Peptides of Rhesus <math>\theta</math>-Defensin</i></p>
<p>†<b>Catcher Salazar</b> ● '26, Dornsife   Biochemistry  <i>PI: Leonardo Morsut   Mentor: Josquin Courte</i></p>	<p><i>Cellular Engineering of synNotch-Inducible LOX Expression for Synthetic Elongation</i></p>
<p><b>Ayaka Sato</b> ● '25, Dornsife   Biological Sciences  <i>PI: Pinchas Cohen   Mentor: Hiroshi Kumagai</i></p>	<p><i>The Effect of Mitochondrial Microprotein MOTS-c on Immobilization-Induced Skeletal Muscle Atrophy.</i></p>
<p><b>Lucia Zhang</b> ● '26, Dornsife   Biological Sciences  <i>PI: Michael "Doc" Edge   Mentors: Tina Lasisi, Ferial Ouerghi</i></p>	<p><i>Assessing Linkage Disequilibrium Scores Near the CODIS Forensic Genetic Loci.</i></p>
<p><b>Mateo Xia</b> ● '25, Dornsife   Biochemistry, Applied Analytics  <i>PI: Zhongwei Li   Mentors: Megan Schreiber, Carrie Zhang, Biao Huang</i></p>	<p><i>Generation of Fluorescent Reporters to Aid in the Capture of Synthetic Kidney-competent Human Nephron Progenitor Cells</i></p>
<p><b>Nick Huang</b> ● '26, Dornsife   Biochemistry, Stem Cell Biology, Eastern Languages and Culture  <i>PI: Vadim Cherezov   Mentor: Aleksey Raskovalov</i></p>	<p><i>Molecular Movie of Receptor Activation</i></p>
<p><b>Justin Wang</b> ● '25, Dornsife   Biochemistry, Computational Biology and Bioinformatics  <i>PI: B��r��nice Benayoun   Mentor: Min Hoo Kim</i></p>	<p><i>Single-Cell Exploration of Ovarian Aging Across Vertebrates</i></p>

Friday, August 4<sup>th</sup>, 2023

**GROUP A: POSTER PRESENTATIONS [10:00am – 10:30am]**

Facilitator 1: Dmitry Eremin; Facilitator 2: Lynne Cherchia

**Riya Agrawal** ● '24, Moorpark High School (CA)  
*PI: James Boedicker | Mentor: Adam Krieger*

*Aggregation and Surface Response of Wild Strains*

**Krish Patel** ● '24, Brophy College Preparatory (AZ)  
*PI: James Boedicker | Mentor: Adam Krieger*

**Anjani Bodar** ● '24, Yorba Linda High School (CA)  
*PI: Valery Fokin | Mentor: Joshua Ibs*

*Utilization of Polyunsaturated Fatty Acids in Amphiphilic Dendrimers for Lipid Nanoparticle Vaccine Delivery*

**Suhani Desai** ● '25, Yorba Linda High School (CA)  
*PI: Jahan Dawlaty | Mentors: Anwesha Maitra, Anuj Pennathur*

*Electric Fields Inside Micelles*

**Karina Hiranandani** ● '24, Yorba Linda High School (CA)  
*PI: Daryl Davies | Mentor: Nina Kirmiz*

*Dihydromyricetin (DHM) Increases Lipid Clearance and Mitochondrial Function in Mice Exposed to Long Term Ethanol Consumption*

**Sarah Chen** ● '25, University High School (CA)  
*PI: Daryl Davies | Mentor: Nina Kirmiz*

*The Effects of Dihydromyricetin on Bile Acid Levels in Mice Exposed to Chronic Ethanol Consumption*

**Mason Hong** ● '26, La Salle College Preparatory High School (CA)  
*PI: Francesco Cutrale | Mentor: Le Trinh*

*Spectral Autofluorescence: Towards Quantitative Pathology*

**Hannah Chuabanlue** ● '24, Troy High School (CA)  
*PI: Thomas Lozito | Mentor: Darian Gamble*

*Cartilage Formation in Re-regenerated Lizard Tails*

**Sitka Crump** ● '27, John Marshall High School (CA)  
*PI: Thomas Lozito | Mentor: Darian Gamble*

*Effects of Osteoclast Depletion on Lizard Tail Regeneration*

**Etan Lerner** ● '26, Shalhevet High School (CA)  
*PI: Dion Dickman | Mentor: Joshua C Martinez*

*Increasing Excitability of Motor Neurons at the Drosophila Neuromuscular Junction to Examine Function Plasticity*

**Noah Moon** ● '24, Granada Hills Charter High School (CA)  
*PI: Brian Lee | Mentor: Roberto Martin Del Campo Vera*

*Analysis of High Gamma Waves in the Hippocampus During Fixation and Go Phases*

**Brian Phan** ● '23, Troy High School (CA)  
*PI: Michael Campbell | Mentor: Morgan de los Reyes*

*DNA Sequencing of Various Populations for Genetic Variants on the MCM6 Gene that Could Cause Lactase Persistence*

**Myles Warren** ● '24, Cate School (CA)  
*PI: Moh El-Naggar | Mentor: Karla Abuyen*

*Electrochemical Characterization of Bacteria from the Human Oral Microbiome*

**Christopher Wong** ● '24, South Pasadena High School  
*PI: Clay Wang | Mentors: Jennifer Shyong, Shu Yi Lin*

*Genetically Modifying Penicillium rubens by Manipulating mcrA to Enhance Production of Secondary Metabolites for Anti-cancer Therapeutics*

**Henry Popolizio** ● '25, NewRoads School (CA)  
*PI: Steve Kay | Mentors: Tia Tyrsett Kuo, Yuanzhong Pan*

*Cancer Cell Proliferation in Relation to Clock Proteins*

**Diya Sreedhar** ● '25, Troy High School (CA)  
*PI: Serghei Mangul | Mentors: Nitesh Sharma, Cecilia Liu*

*Metagenomic Analysis and Development of Comprehensive Gene Sequences for Bacteria across Public Genomic Databases*

**Johanna Lee** ● '24, Gretchen Whitney High School  
PI: Takeshi Saito | Mentor: Lucas Yoshida

*Host Response to Hepatitis Delta Virus Infection*

**Suhan Rapaka** ● '26, Wakeland High School  
PI: Amir Goldkorn | Mentor: Daniel Bsteh

*The Effects of ATM and AMPK Inhibitors on Bladder Cancer Cells Treated by Cisplatin*

**Shaunak Kapur** ● '24, Seven Lakes High School (TX)  
PI: Serghei Mangul | Mentors: Yu Ning Huang

*Assessing the Completeness of Immunogenetics Databases across European Populations*

**Jerry Zhang** ● '27, South Pasadena High School (CA)  
PI: Gangning GL Liang | Mentor: Hongtao Li

*DNA Methylation of ONECUT2 in Prostate Cancer*

## GROUP B: POSTER PRESENTATIONS [12:00pm – 12:30pm]

Facilitator 1: Lynne Cherchia; Facilitator 2: Dmitry Eremin

**Ramisa Ferdawsy** ● '24, Van Nuys High School (CA)  
PI: David Tran | Mentors: Adam O'Dell, Dongjiang Chen, Son Le, Tianyi Liu, Nathan Thai

*Nuclear Envelope Disruption By Tumor Treating Fields to trigger immune response in Glioblastoma*

**Michelle Nguyen** ● '25, Temple City High School (CA)  
PI: David Tran | Mentors: Adam O'Dell, Dongjiang Chen

*PTGER3 regulates Tumor Treating Fields Resistance in Glioblastoma Cells*

**Isabella Nuñez** ● '24, California High School (CA)  
PI: Leanna Wise | Mentor: William Stohl

*Exploring Reproductive Health Experiences in SLE and RA/JIA: a Survey-based Study*

**Krish Gangal** ● '24, Irvington High School (CA)  
PI: Vinay Duddalwar | Mentor: Steven Cen

*Segment Anything Model on Prostate Cancer Bone Metastases*

**Reyansh Gangal** ● '26, Irvington High School (CA)  
PI: Zhipeng Lu | Mentor: Wilson Lee

*Computational Analysis of RNA-Mediated Host-Virus Interactions*

**Adrienne Jung** ● '26, Van Nuys Senior High School (CA)  
PI: David McKemy | Mentor: Chenyu Yang

*Identifying Cold Sensation Differentiation: Profiling Spinal Cord Neurons Based on Distribution and Excitatory/Inhibitory Neuronal Types using IHC*

**Maggie Ruan** ● '25, Oak Park High School (CA)  
PI: Peter Yingxiao Wang | Mentor: Jiaxin Katie Cui

*Heat Ultrasound-Triggered Display of Artificial Antigens on Tumor Cells for Increased T-Cell Attacking Efficacy and Accuracy*

**Carolyn Kang** ● '24, Taipei American School (Taiwan)  
PI: Clay Wang | Mentors: Jennifer Shyong, Shu-Yi Lin

*Generating a Natural Product Library by Genetically Manipulating mcrA in Marine Penicillium rubens to Discover Bioactive Compounds Against Alzheimer's Disease*

**Hugo Herrero-MacKenzie** ● '25, UWC South East Asia (Singapore)  
PI: Clay Wang | Mentors: Jennifer Shyong, Shu Yi Lin

*A Heterologous Expression Platform in Aspergillus nidulans for the Elucidation of Cryptic Secondary Metabolism in a Human Pathogen Aspergillus fumigatus*

**Rehan Wani** ● '25, Valencia High School (CA)  
PI: Neda Jahanshad | Mentor: Kevin Low

*Exploring Correlations between Age of Onset and Parkinson's Disease Progression using Linear Regression*

**Christopher Robertson** ● '24, Harvard Westlake School (CA)  
PI: Le Trinh | Mentor: Emily Shaw

*Assessing the Effectiveness of HaloTag for Imaging in Live Zebrafish Embryos*

**Medha Singamsetty** ● '24, Monta Vista High School (CA)  
PI: Le Trinh | Mentor: Emily Shaw

*Testing Effectiveness of SnapTag System in Zebrafish Embryos*

**Neo Phuchane** ● '23, Reseda Charter High School (CA)  
 PI: Leonardo Morsut | Mentor: Zoe Shappell

*Cloning Constitutive PCAD and Doxycycline-Inducible Mucin Plasmids to Investigate effects on Cell-Cell Adhesion in Morphogenesis*

**Rita Mei** ● '25, Diamond Bar High School (CA)  
 PI: Dong Song | Mentor: Wenxuan Jiang

*Effect of Transcranial Magnetic Stimulation on the Rat Hippocampus Shown in Delayed-Nonmatch- to-Sample Performance*

**Yeou Chyng Julia Pei** ● '23, South Pasadena High School (CA)  
 PI/Mentor: Jason Junge

*NADH-enzyme Fluorescent Lifetime Standards*

**Ronin Tsai** ● '26, La Canada High School (CA)  
 PI: Brian Lee | Mentor: Roberto Martin Del Campo Vera

*Beta-Band Power vs. Frequency During Movement Fixation and Execution in the Human Hippocampus*

**Isabel Cantor** ● '25, Half Hallow Hills High School East (NY)  
 PI: Scott Fraser | Mentor: Lynne Cherchia

*Developing STAT5A Fluorescent Protein Fusions to Investigate the Effects of Prolactin-mediated JAK-STAT Signaling on Pancreatic Beta Cell Proliferation.*

**Emily Chang** ● '26, Woodbridge High School (CA)  
 PI: Xianrui Cheng | Mentors: Ling Jin, Betty Liu

*Spatial Relationship Between Active RhoA and Microtubule Bundles in the Division Plane During Cytokinesis*

**Tiancheng Dong** ● '24, Northwood High School (CA)  
 PI: Beiyun Zhou | Mentor: Yixin Liu

*Alveolar Epithelial Type 2 Cells in 3-D Culture*

**Dewdunu Udagedara** ● '25, Long Beach Polytechnic High School (CA)  
 PI: Lindsey Schier | Mentor: Ahyun Jung

*Linking Licking Data of Sugar Preferences in Mice to Fiber Photometry Calcium Imaging*

## GROUP C: POSTER PRESENTATIONS [2:10pm – 2:40pm]

Facilitator 1: Matt Colopy; Facilitator 2: Augusta Fernando

**Kiane Lu** ● '24, Huntington Beach High School (CA)  
 PI: Tyler Mason | Mentor: Jeremy Morales

*Effects of Long Covid on Patients' Mental Health and Eating Disorders*

**Mia Valderrama** ● '24, Girls Academic Leadership Academy (CA)  
 PI: Hussein Yassine | Mentors: Ashley Sanchez, Qiulan Ma

*Processing Human Samples from Living and Post-mortem Patients for Alzheimer's Research*

**Jason Mo** ● '24, Newark Academy (NJ)  
 PI: Dong Song | Mentor: Wenxuan Jiang

*Assessing the Acute Effects of transcranial magnetic stimulation (TMS) on spatial learning and memory in rats performing the Barnes Maze task*

**Ryan Zhu** ● '24, Loyola High School (CA)  
 PI: Chao Zhang | Mentor: Yida Li

*Development of Fluorogenic Styrene Probes for Cell Imaging*

**Ava Varu** ● '24, Girls Academic Leadership Academy (CA)  
 PI: Bruna Martins-Klein | Mentor: Ziyuan Chen

*Anxiety Effects on Cognitive Control and Ability to Regulate Emotions*

**Mikayla Yamamoto** ● '24, San Francisco University High School (CA)  
 PI: Rita Barakat | Mentor: Jason Zevin

*Exploring the Relationship between Language and Executive Functioning.*

**Sophia Bleau** ● '24, Palisades Charter High School (CA)  
 PI: Paul Seidler | Mentor: Angela Albanese

*Quantifying Inhibition of Proteasomal Activity by Tau Fibrils*

**Jiayue (Abby) Geng** ● '25, San Marino High School (CA)  
 PI: Paul Seidler | Mentor: Angela Albanese

*Investigating Proteasome Activity Recovery by Tau Fibril Disaggregants*



<p><b>Ethan Chang</b> ● '25, Troy High School (CA) PI: Zhen Zhao   Mentor: Tenghuan Ge</p>	<p><i>The Impact of GPR4 in Traumatic Brain Injury and Blood Brain Barrier Connection</i></p>
<p><b>Michelle Fan</b> ● '24, Canyon Crest Academy (CA) PI: Zhen Zhao   Mentor: Tenghuan Ge</p>	<p><i>Advancing Drug Discovery for Neurodegenerative Diseases: A High-Throughput Screening Pipeline Targeting Mitochondrial Dysfunction in Patient-Derived Neurons</i></p>
<p><b>Maxwell Lee</b> ● '24, Harvard-Westlake (CA) PI: Zhen Zhao   Mentor: Tenghuan Ge</p>	<p><i>Analysis of Transmembrane diffusion across the Blood-Brain-Barrier using a 3-D Organ Chip Model</i></p>
<p><b>Elvis Lin</b> ● '24, Diamond Bar High School (CA) PI: Arie Warshel   Mentor: Mojgan Asadi, Matt Colopy</p>	<p><i>Using Electrostatic Forces to See Which Drug is Most Efficient for Sars Cov-2</i></p>
<p><b>Roy Lin</b> ● '24, Diamond Bar High School (CA) PI: Arie Warshel   Mentor: Mojgan Asadi, Matt Colopy</p>	<p><i>The Binding Affinity of Bruton Tyrosine Kinase(BTK)</i></p>
<p><b>Shibani Bansal</b> ● '26, West Ranch High School (CA) PI: Wendy Mack   Mentor: Naoko Kono</p>	<p><i>Blood Inflammation Markers and Cognition in Post-Menopausal Women</i></p>
<p><b>Christopher Deng</b> ● '24, San Marino High School (CA) PI: Kate White   Mentor: Janielle Cuala</p>	<p><i>Using Fluorescence Lifetime Imaging to Investigate Cellular Metabolism</i></p>
<p><b>Gio Kim</b> ● '24, Troy High School (CA) PI: Gage Crump   Mentor: Tuo Shi</p>	<p><i>Cartilage-specific col2a1a Enhancer Drives Hair cell-specific atoh1a Reporter Expression in Zebrafish Cartilage</i></p>
<p><b>Mia Kang</b> ● '25, Palo Verde High School (NV) PI: Ranna Nash   Mentor: Melissa Lopez</p>	<p><i>Utilizing Artificial Intelligence for Auto-contouring in Radiation Therapy and Oncology</i></p>
<p><b>Athena Rem</b> ● '24, Malibu High School (CA) PI: Assal Habibi   Mentors: Ellen Herschel, Priscilla Perez, Alison Wood</p>	<p><i>Binaural Beats in Improving Mood in Patients with Mild to Moderate Cognitive Impairment</i></p>
<p><b>Natalie Zhou</b> ● '24, Diamond Bar High School (CA) PI: Paul Bogdan   Mentors: Xiongye Joshua Xiao</p>	<p><i>Employing Genetic Similarities to Predict Characteristics of Microbes</i></p>
<p><b>Alexander Do</b> ● '25, Thomas Jefferson High School for Science and Technology (VA) PI: Megan McCain   Mentor: Stephanie Do</p>	<p><i>Photopatterning of Methacrylated Ligands for Spatial Control of SynNotch Receptors</i></p>
<p><b>Sasha Sengelmann</b> ● '23, Gabrielino High School (CA) PI: Thomas Lozito   Mentor: Darian Gamble</p>	<p><i>Validating Hedgehog-Responsive Chondrogenic Lizard Blastema Cells</i></p>
<p><b>Kaitlyn Hong</b> ● '25, Westridge School (CA) PI: Jennifer Phan   Mentor: Kurt Hong</p>	<p><i>The Utility of Cross-Sectional Imaging in Predicting Etiology of Abnormal Liver Tests in Early Post-Liver Transplant Patients</i></p>

Saturday, August 5<sup>th</sup>, 2023

**GROUP 5: ORAL PRESENTATIONS [8:30am – 9:15am]**

Facilitator 1: Matt Colopy; Facilitator 2: Augusta Fernando

<p><b>Alara Berkmen</b> ● '26, Viterbi   Biomedical Engineering (Molecular-Cellular) PI: Maral Mousavi   Mentors: Mona Abdemonem, Abdulrahman Alshami</p>	<p><i>Developing Prussian Blue-Modified Enzymatic Laser-Induced Graphene Sensors for Biomarker Detection</i></p>
<p>†<b>Amir Arya</b> ● '24, Dornsife   Computational Neuroscience PI: Marcelo Coba   Mentor: Ilse Flores</p>	<p><i>Investigating the Role of SYNGAP1 Mutations in Neuronal and Astrocytic Function in Intellectual Disability Pathogenesis</i></p>
<p>†<b>Rachel Osei Nsafoah</b> ● '25, Dornsife   Health &amp; Human Sciences, Global Health PI: Melissa Wilson   Mentors: Raina Pang</p>	<p><i>Reproductive and Perinatal Epidemiology</i></p>
<p><b>Sage Wheeler</b> ● '24, Dornsife   Chemical Engineering, Biochemical Emphasis, English Literature PI: Megan McCain   Mentors: Nina Maxey</p>	<p><i>Fabricating Patterned Cell Cultures to Quantify Myometrial Contractile Forces for the Study of Uterine Disorders</i></p>
<p>†<b>Adith Swarup</b> ● '25, Dornsife   Neuroscience, Economics PI: Spencer Kellis   Mentors: Brian Lee</p>	<p><i>Hippocampal Gamma Band Modulation During Movement</i></p>
<p><b>Joshua Senior</b> ● '25, Dornsife   Biological Sciences PI: Mara Mather   Mentor: Andy Kim</p>	<p><i>Mechanisms of Attentional Control and Suppression In Aging</i></p>
<p><b>Tomás Delgado Manea*</b> ● '25, Dornsife   Quantitative Biology, Tech Commercialization PI: John Tower   Mentor: Gary Landis</p>	<p><i>Identifying mifepristone receptors in Drosophila</i></p>
<p><b>Qian Yan*</b> ● '26, Dornsife   Biological Sciences, Anthropology PI: John Tower   Mentor: Gary Landis</p>	<p><i>Identifying mifepristone receptors in Drosophila</i></p>

**GROUP 6: ORAL PRESENTATIONS [10:20am – 11:00am]**

Facilitator 1: Augusta Fernando; Facilitator 2: Matt Colopy;

<p><b>Kenneth Nguyen</b> ● '25, Dornsife   Quantitative Biology, Health Care Studies, Connected Devices and Making PI: Mike Bienkowski   Mentor: Terri Stephen</p>	<p><i>Machine Learning Quantification of Alzheimer's Disease Pathology within Human Post-mortem Tissue</i></p>
<p><b>Emmett Liljegren</b> ● '25, Dornsife   Human Biology, Spanish PI: Peter Kuhn   Mentor: Elizabeth Qi</p>	<p><i>Liquid Biopsy Analysis of Invasive Lobular Carcinoma</i></p>
<p><b>Stephen Nishi</b> ● '25, Dornsife   Human Biology, Healthcare Studies PI: Zhen Zhao   Mentor: Tenghuan Ge</p>	<p><i>The Role of GPR4 on Blood-Brain Barrier Maintenance</i></p>
<p><b>Xiaoyuan Zhu</b> ● '26, Dornsife   Cognitive Science PI/Mentor: Stephen Read</p>	<p><i>Introducing Executive Function to Computational Motivated Decision-Making Model</i></p>
<p><b>Jonathan Fan</b> ● '25, Dornsife   Cognitive Science, Healthcare Studies PI/Mentor: Lindsey Schier</p>	<p><i>Contributions of Glucose Transceptors to Taste</i></p>
<p><b>Garrett Goodrum</b> ● '26, Dornsife   Biological Sciences PI/Mentor: Samuel Andrew Hires</p>	<p><i>Optimization of GPCR-based Fluorescent Sensors for Large-scale Multiplexed in vivo Imaging of Neuromodulation</i></p>



### GROUP 7: ORAL PRESENTATIONS [1:00pm – 1:30pm]

**Connor Morgan** ● '25, Dornsife | Biochemistry  
PI: Susan Forsburg | Mentor: JiPing Yuan

*The Characterization of Topoisomerase II-191 in Schizosaccharomyces pombe in Response to Replication Stress*

†**Serena Ndjuissi Pawa** ● '25, Dornsife | Biochemistry, Marketing  
PI/Mentor: Andrew Gracey

*Determination of the effects of Carbohydrate Metabolism Pathways on Cellular Viscosity.*

**Luyi Wang** ● '25, Dornsife | Neuroscience, Science Health and Aging  
PI: Dion Dickman | Mentor: Jiawen Chen

*Interrogating synaptic physiology using GCaMP8f-based quantal analysis and electrophysiology at the Drosophila neuromuscular function*

†**Avinash Chauhan** ● '25, Dornsife | Quantitative Biology, Classical Perspectives  
PI/Mentor: Kathryn Smith

*The Impact of the COVID-19 Pandemic on Children with Special Health Care Needs*

†**Chris Rincon** ● '24, Viterbi | Chemical Engineering (Biochemical)  
PI: Noah Malmstadt | Mentor: Lucia Dalle Ore

*Utilizing Fluorescently-Labeled GUVs as a Platform for Investigating Peptide-Bilayer Interactions*

### GROUP 8: ORAL PRESENTATIONS [2:25pm – 3:00pm]

**Rohan Bhawe** ● '25, Dornsife | Biochemistry, Applied Analytics  
PI/Mentor: Oscar Aparicio

*Investigating the Effects of Fkh1-dsm on Replication Origin Activation using Quantitative BrdU Immunoprecipitation (QBU)*

**Ryan Higa** ● '25, Dornsife | Biochemistry, Foundations in Regulatory Science  
PI: Peter Chung | Mentor: Dante Mueller

*Site-Specific Phosphorylation of Tau Constructs 1-4 to Form AD-like Paired Helical Fragments*

**Hui Tung Jennifer Law** ● '23, Viterbi | Biomedical Molecular-Cellular Engineering  
PI: Megan McCain | Mentor: Anastasia Svetlova

*Flexible Electronics for Organ-On-A-Chip Applications*

**Monica Rodriguez** ● '25, Dornsife | Quantitative Biology, Cultural Competence in Medicine  
PI: Peter Kuhn | Mentor: Mike Schmidt

*Correlating Copy Number Status with Gene Expression in Cell Lines*

**Lydia Park** ● '25, Dornsife | Computational Neuroscience, Health Care Studies and Artificial Intelligence  
PI/Mentor: Hyungjin Eoh

*The Role of Trehalose Metabolism in Mycobacterial Multidrug Resistance Development*

**Noah Rubio Moreno** ● '24, UCLA | Linguistics and Psychology  
PI: Scott Fraser | Mentors: Peter Luu, Thai Truong

*Neural Basis of Number Sense in Zebrafish*

†**Ethan Hamid** ● '25, Dornsife | Chemistry  
PI: Travis Williams | Mentors: Jesse T Yen, Andy Y Chang

*NMR Relaxometry for Cardiovascular Research*

**Saturday, August 5<sup>th</sup>, 2023**

**GROUP D: POSTER PRESENTATIONS [9:40am – 10:10am]**

<b>Lena Peresztegi</b> ● '26, Palos Verdes High School (CA) <i>PI: Janos Peti-Peterdi   Mentor: Audrey Izuhara</i>	<i>Novel Regulation of Kidney Function by Gastrointestinal Hormones</i>
<b>Anna Peti-Peterdi</b> ● '24, Palos Verdes High School (CA) <i>PI: Gina Gyarmati   Mentor: Audrey Izuhara</i>	<i>The Role of CCN1 in Kidney-Brain Crosstalk</i>
<b>Beatrice Sun</b> ● '24, Glen A Wilson High School (CA) <i>PI: Janos Peti-Peterdi   Mentor: Gina Gyarmati</i>	<i>Angiogenic Effects of CCN1 in the Kidney</i>
<b>Cassidy Cheng</b> ● '24, Orange Lutheran High School (CA) <i>PI: Le Trinh   Mentor: Francesco Cutrale</i>	<i>3D Mapping of Zebrafish Heart Development</i>
<b>William Corry</b> ● '24, Palos Verdes High School (CA) <i>PI: Karrune Woan   Mentor: Hittu Matta</i>	<i>CD38 Identifies a Subset of Natural Killer Cells with Differential Phenotype and Function</i>
<b>Hannah DeMerit</b> ● '25, Flintridge Preparatory School (CA) <i>PI: Hussein Yassine   Mentor: Bilal Kerman</i>	<i>Alteration of the Intracellular Trafficking in Alzheimer's Disease by Apolipoprotein E</i>
<b>Mira Emamaullee</b> ● '24, San Marino High School (CA) <i>PI: Young-Kwon Hong   Mentor: Brandon Nakashima</i>	<i>The Impact of vGPCR Expression in Lymphatic Vessels on Vessel Identity and Density</i>
<b>Claire Lee</b> ● '26, La Cañada High School (CA) <i>PI: Young-Kwong Hong   Mentor: Sophia Zhao</i>	<i>Investigating the Morphology of the Uterine Lymphatic Vasculature in Gestation</i>
<b>Matthew Heur</b> ● '26, La Cañada High School (CA) <i>PI: Brian Lee   Mentor: Roberto Martin Del Campo Vera</i>	<i>Spectral Analysis of Low Gamma Frequency Band During Arm Reaching Movement.</i>
<b>Julianna Lee</b> ● '24, Nevada State High School (NV) <i>PI: Adam Leventhal   Mentor: Alyssa Harlow</i>	<i>Tracking Substance Use and Mental Health in Adolescents</i>
<b>Josephine Sibert</b> ● '24, Lees Summit High School (MO) <i>PI: Rusty Lansford   Mentors: Jasmine Cinseros, David Huh</i>	<i>Intravital Heart Imaging in Quail</i>
<b>Kaitlyn Sulivan-Pascual</b> ● '24, Flintridge Preparatory School (CA) <i>PI: Adam Frank   Mentor: Ruibei Li</i>	<i>Predicting Symptom Course in Individuals with Obsessive-Compulsive Disorder Using Data from Mobile and Wearable Technology</i>
<b>Anson Chau</b> ● '24, Alhambra High School (CA) <i>PI: Fabien Pinaud   Mentors: Liying Wu, Dai Zhai, Markeville Bautista, Hannah Hartman</i>	<i>Examining SUN1 as a Protein Under Circumstances of Mechanical Stress</i>
<b>Minh Nhat Nguyen</b> ● '24, West High School (CA) <i>PI: David Tran   Mentor: Son Le</i>	<i>Developing a Deep Neural Network Capable of Conducting Virtual Genes Manipulation Experiments</i>
<b>Jake Wong</b> ● '25, South Pasadena High School (CA) <i>PI: Ray Goldsworthy   Mentor: Sam O'Connell</i>	<i>Comparing Sound Localization and Voice Discrimination in Noise of Elderly Bimodal and Bilateral Cochlear Implant Users</i>

**Ain Evelyn Lee** ● '24, The Buckley School (CA)  
PI: Maral Mousavi | Mentor: Victor Ong

*Optimizing Geometry of Flexible Temperature Sensors*

**GROUP E: POSTER PRESENTATIONS [11:30am – 12:00pm]**

**Gavin Huang** ● '25, Conestoga High School (PA)  
PI/Mentor: Andrea Belz

*Large Language Models (LLM) in STEM Education*

**Tamar Koren** ● '27, Windward School (CA)  
PI: Arie Warshel | Mentors: Mojgan Asadi, Matt Colopy

*Understanding the Mechanics of ITK Inhibition*

**Christina Sun** ● '24, Westridge School for Girls (CA)  
PI: Xiaowu Gai | Mentor: Alex Markowitz

*Understanding the Potential of AI in Clinical Testing: Opportunities and Considerations*

**Arihant Boli** ● '24, Notre Dame Secondary School (Canada)  
PI: Hyungjin Eoh | Mentor: Juhyeon Lim

*Role of Internal Carbon Mobilization in Optimal Regrowth of Dormant Mycobacterium Tuberculosis*

**Lyla Brugger** ● '27, Pacific Palisades High School (CA)  
PI: Gage Crump | Mentor: Ryan Roberts

*Generating Zebrafish Transgenics using Mouse Tendon Enhancers*

**Kaitlyn Byer** ● '25, Orange County School of the Arts (CA)  
PI: Michael Press | Mentors: Ivonne Villalobos, Simon Davenport, Morgan Weatherred

*Immunohistochemical and H&E Testing of Breast Tumor Biomarkers Estrogen and Progesterone Receptor to Evaluate Malignancy*

**Cayden Chang** ● '24, La Cañada High School (CA)  
PI: Francesco Cutrale | Mentor: Jason Junge

*Enhancing Development of Image Analysis Tools with GPT-4*

**Kaley Chung** ● '23, Cypress High School (CA)  
PI: Ray Goldsworthy | Mentor: Sam O'Connell

*Generating Timbre for Multiple Instruments Through Auditory Nerve Models and Its Relevance to Cochlear Implants*

**Anish Deshpande** ● '25, Redmond High School (WA)  
PI: Lindsey Schier | Mentor: Ahyun Jung

*Automatic Facial Feature Detection and Taste Reactivity Evaluation Using DeepLabCut.*

**Rayhan Mahamed** ● '25, Arcadia High School (CA)  
PI: Lindsey Schier | Mentor: Ahyun Jung

*Automatic Facial Feature Detection and Taste Reactivity Evaluation Using DeepLabCut*

**Reed Dietrick** ● '25, Westridge School for Girls (CA)  
PI: Alexandra Kovach | Mentor: Anne Louit

*Comparison of Novel Expanded Flow Cytometry Assay for Minimal/Measurable Residual Disease (MRD) in B-Lymphoblastic Leukemia (B-ALL) with Gold Standard Assay*

**Jonathan Dong** ● '24, La Salle College Preparatory (CA)  
PI: Weiming Yuan | Mentor: Lingxi Qiu

*Role of Nedd4 E3 Ligases in the Downregulation of CD1d and the Inhibition of NKT Cell Function*

**Dulce Hernandez** ● '24, Alliance Piera Barbaglia Shaheen Health Services Academy High School (CA)  
PI: Dong Song | Mentor: Huijing Xu

*Analysis of Place-Cell Activities in the Hippocampus*

**Jeremy Hsieh** ● '25, Polytechnic School (CA)  
PI: Andrea Armani | Mentor: Kylie Trettner

*Advancing Tissue Culture Analysis: A Novel Machine Learning Algorithm for Cellular Viability*

**Oliver O'Donnell** ● '27, Palisades Charter High School (CA)  
PI: Amy Merrill-Brugger | Mentor: Audrey Nickle

*Investigating Suture Fusion of Bent Bone Dysplasia Syndrome Through Mouse Models.*

**Ravi Prabhune** ● '24, Evergreen Valley High School (CA)  
PI: Fabien Pinaud | Mentors: Liying Wu, Dai Zhai, Markeville Bautista, Hannah Hartman

*Purifying Emerin for Single Molecule Imaging*

**Prabodh Rao** ● '24, Gretchen Whitney High School (CA)  
 PI: Surya Prakash | Mentor: Alexander Knieb

*Monofluoromethylation of Acyl Chlorides: Direct Synthesis of Monofluoromethylketones (MFMK) with Fluorobis(phenylsulfonyl)methane (FBSM)*

**Saya Rutgers** ● '25, Palisades Charter High School (CA)  
 PI: Don Arnold | Mentor: Emily Liman

*ATLAS- A Method For Anterograde Transsynaptic Tracing From Genetically Determined Neurons*

**GROUP F: POSTER PRESENTATIONS [1:45pm – 2:15pm]**

**Nicholas Scurry** ● '24, Crean Lutheran High School (CA)  
 PI: Giorgia Quadrato | Mentor: Tuan Nguyen

*Culturing iPSC and Characterization of Human Brain Organoids by Immunohistochemistry*

**Manyaa Bhatia** ● '24, Rick Reedy High School (TX)  
 PI: Ray Goldsworthy | Mentor: Sam O'Connell

*Implementation of Cochlear Implant Speech Processor in MATLAB*

**Allison Fong** ● '25, Temple City High School (CA)  
 PI: Keigo Machida | Mentor: Simran Mehta

*Mitochondrion-Nucleus PDH1 Transfer Drives Epigenetic NANOG Reprogramming of Tumor-Initiating Cells in Hepatocellular Carcinoma*

**Eric Li** ● '24, Canyon Crest Academy (CA)  
 PI: Liya Xu | Mentor: Jeremy Mason

*Comparison of Extracellular Vesicle Subpopulations Among Congenital and Adult Glaucoma via Aqueous Humor*

**Yin Grace Tang** ● '23, Gabrielino High School (CA)  
 PI: Lindsey Schier | Mentor: Ahyun Jung

*Oral Digestion Contributions to the Hedonic Appeal of Sugar in Mice*

**Brian Wong** ● '24, Arcadia High School (CA)  
 PI: Steve Kay | Mentors: Yuanzhong Pan, Tia Kuo

*In vitro Model to Test Efficiency of Anti-cancer Drug Candidates and Their Synergistic Effects*

**Vincent Villanueva** ● '24, Alliance Marc & Eva Stern Math & Science School (CA)  
 PI: Zhipeng Lu | Mentor: Kongpan Li

*Generation of Plasmid Vectors for Fluorescence Reporter Assay*

**Samuel Wong** ● '24, La Cañada High School (CA)  
 PI: Tin Than | Mentor: Sanda Win

*Imaging Analysis of 3D Culture of Human Hepatoma Cells*

**Sean Wong** ● '24, La Cañada High School (CA)  
 PI: Sanda Win | Mentor: Tin Than

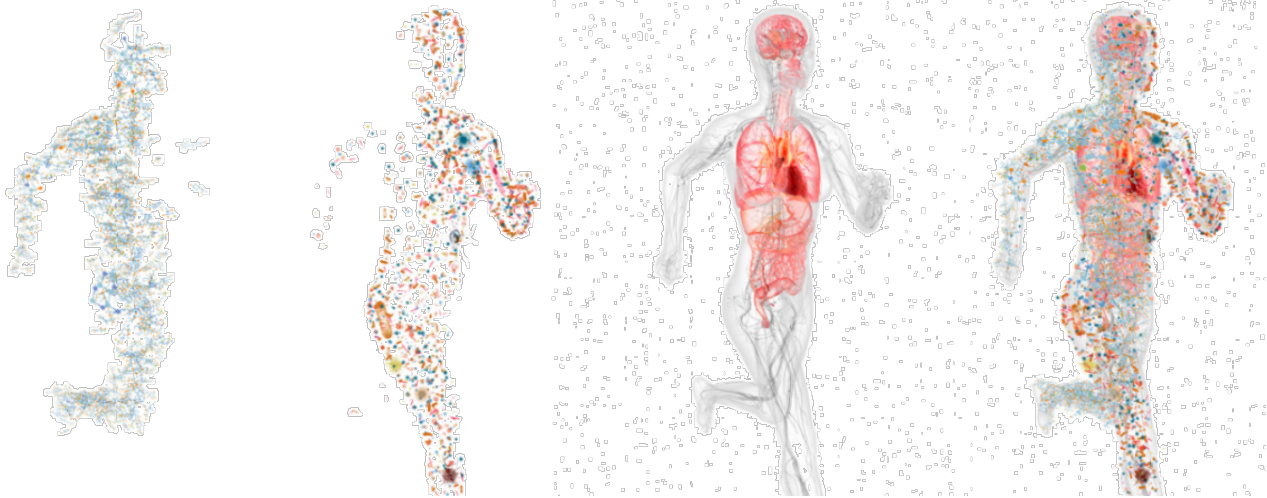
*DNA Methylation of Sab Gene and its Correlation to the Progression of NASH*

**Lisa Zhang** ● '25, South Pasadena High School (CA)  
 PI: Peter Qin | Mentor: Difei Wu

*EPR Study of DNA Mini-Circle Topology*

***Our sincere thanks to...***

- *The students, faculty, mentors and colleagues for their support and participation in the 2023 BUGS Summer Research Program.*
- *All of the program's volunteers for their efforts in organizing and facilitating this year's activities.*
- *Dr. Arthur & Mrs. Frances Peskoff for establishing the Trudi Berwin Student Support Fund which supported undergraduates (names starred (\*) in the program) with research stipends during their summer research activities.*
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- *The Baugh Foundation for their support of the overall BUGS/BUGS Jr program.*
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