SIMONS SUMMER RESEARCH PROGRAM

POSTER PRESENTATIONS, AUGUST 2019

Programs for Research & Creative Activity
Stony Brook University

Student Presenter(s)	Project Title	Mentor(s)
Eric Bae *William A. Shine Great Neck South HS (NY)*	Adapting Biotin-Mediated Protein Labeling for Identifying the Mycobacterial Cell Surface Proteome	**Dr. Jessica Seeliger** *Pharmacological Sciences*
Anuva Banwasi *Palo Alto Senior HS (CA)*	Simulation of Bulk Tumor Mixture Data and Evaluation of Cell Deconvolution Methods for Pancreatic Ductal Adenocarcinoma	**Dr. Richard Moffitt** *Biomedical Informatics*
Jagdeep Bhatia *Watchung Hills Regional HS (NJ)*	3D Pose Estimation Algorithm with Adaptive Parameter Optimization	**Dr. Romeil Sandhu** *Biomedical Informatics, Computer Science*
William Borges *Roslyn HS (NY)*	Nanostructured Cellulose-Sulfate for Ammonium Removal/Recovery from Water and the Use of Ammonium-Adsorbed Scaffolds as Fertilizers	**Dr. Benjamin Hsiao** *Chemistry*
Teodora Bratu *Bergen County Academies (NJ)*	Correlation Between Binding of gC1qR and cC1qR by C1q and Astrocyte Mediated Synaptic Pruning	**Dr. Berhane Ghebrehiwet** *Medicine*
Derek Chen *Herricks HS (NY)*	Simulating Nanoscale Imaging of Scattering-Type Scanning Near-Field Optical Microscopy through the Discrete Dipole Approximation	**Dr. Mengkun Liu** *Physics & Astronomy*
Samantha Chen *Hunter College HS (NY)*	Design, QSAR, and Synthesis of Novel Antifungal Agents Targeting Fungal Sphingolipids Synthesis	**Dr. Iwao Ojima** *Chemistry, Institute for Chemical Biology & Drug Discovery*
Rhea Cho *Holy Trinity Episcopal Academy (FL)*	*Yersinia pseudotuberculosis* Suppresses Stat4 Phosphorylation in γδ T Cells	**Dr. Brian Sheridan** *Molecular Genetics & Microbiology*
Lily Coffin *Farmingdale Senior HS (NY)*	Utilizing Computational Methods to Examine the Feasibility of Sustaining a Microbial Ecosystem on Mars	**Dr. David Green** *Applied Mathematics & Statistics*
Eddie Dai *Olathe North HS (KS)*	Investigating Neuromesodermal Progenitor Development and Differentiation Using *Danio rerio* Single Cell Sequencing Data	**Dr. Benjamin Martin** *Biochemistry & Cell Biology*
Neha Dalia *Eastlake HS (WA)*	Producing Synthetic Medical CT Scans through a Generative Adversarial Network	**Dr. Klaus Mueller** *Computer Science*
Arushi Dogra *Del Norte HS (CA)*	The Role of C1q and CD4+ T-cells in the Pathogenesis of Systemic Lupus Erythematosus (SLE)	**Dr. Berhane Ghebrehiwet** *Medicine*
Shirleen Fang *Aragon HS (CA)*	NEMF Mutation Effects on Nuclear Pore Transport Proteins in ALS Patients	**Dr. Roger Sher** *Neurobiology & Behavior*
Alyssa Fong *East Meadow HS (NY)*	Analysis of APOBEC3 Hotspots in the Domains of Select Human Herpesvirus Immediate Early Proteins	**Dr. Thomas MacCarthy** *Applied Mathematics & Statistics*

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Neha Goel *Ardsley HS (NY)*	Modeling Nonlinear Dendritic Responses to Paired Synaptic Inputs	**Dr. Braden Brinkman** **Dr. Joshua Plotkin** *Neurobiology & Behavior*
Ashley Guo *Palo Alto HS (CA)*	Metabolic Regulation in Neuronal Morphogenesis	**Dr. Shaoyu Ge** **Dr. Qiaojie Xiong** *Neurobiology & Behavior*
Sagar Gupta *Stockdale HS (CA)*	The Effect of Human-Associated Disease Mutations on the Cellular Roles of Vps13 in *Saccharomyces cerevisiae*	**Dr. Aaron Neiman** *Biochemistry & Cell Biology*
Shivansh Gupta *Neuqua Valley HS (IL)*	An Algorithm to Denoise Networks of Instructions for Malware Analysis	**Dr. Romeil Sandhu** *Biomedical Informatics, Computer Science*
Liana Haigis *Mamaroneck HS (NY)*	HIV-1 gp41-3S-Induced Surface NKp44L Expression as a Novel Target for Pancreatic Cancer Therapy	**Dr. Berhane Ghebrehiwet** *Medicine*
Theresa Haupt *Commack HS (NY)*	Mechanism of Outer Membrane Vesicle and Tube Formation in *Francisella*	**Dr. David Thanassi** *Molecular Genetics & Microbiology*
Carrie Hsu *Herricks HS (NY)*	Development of a Frustrated Total Internal Reflection Biosensing System for Noninvasive Terahertz Imaging and Detecting Cell Growth	**Dr. Hassan Arbab** *Biomedical Engineering*
Miguel Hulyalkar *South Side HS (NY)*	Utilizing Terahertz Imaging and Machine Learning for Medical Diagnostics	**Dr. Hassan Arbab** *Biomedical Engineering*
Siddarth Ijju *Cherry Creek HS (CO)*	Longitudinal Multiple Sclerosis Segmentation and Change Detection with Deep Learning	**Dr. Minh Hoai Nguyen** *Computer Science*
Sunay Joshi *Bergen County Academies (NJ)*	A Geometric Model for Pseudopodia Growth During Platelet Activation	**Dr. Yuefan Deng** *Applied Mathematics & Statistics*
Dana Karson *Hunter College HS (NY)*	Synthesis and Purification of Key Intermediate, 9-iododoxycycline, a Versatile Coupling Handle for Astrocyte-Targeted Probes	**Dr. Scott Laughlin** *Chemistry*
Nithin Kavi *Acton Boxborough Regional HS (MA)*	Equivalence Relations Between Closed Curves on Surfaces	**Dr. Moira Chas** *Mathematics*
Kirsten Knowles *Wellington C. Mepham HS (NY)*	Comparing Extreme Precipitation and Snow Event Cyclones	**Dr. Edmund Kar-Man Chang** *School of Marine & Atmospheric Sciences*
Alexander Kwon *Sage Hill School (CA)*	Effect of Microbubbles on Ultrasound Image Enhancement of Model Soft Tissue via Scanning Confocal Acoustic Navigation	**Dr. Yi-Xian Qin** **Dr. Wei Lin** *Biomedical Engineering*
Stephanie Lin *Smithtown HS West (NY)*	Artificial Intelligence Detection of Axillary Lymph Node Metastasis on MRI	**Dr. Tim Duong** *Radiology*

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Kyle Onghai *Earl L. Vandermeulen HS (NY)*	Enhancing the Versatility of a Scanning Confocal Acoustic Navigation System with Photoacoustic Tomography and High-Frequency Ultrasound	**Dr. Yi-Xian Qin** **Dr. Wei Lin** *Biomedical Engineering*
Nithin Parsan *William P. Clements HS (TX)*	An *in vivo* Investigation of Chromatin Remodeling in Cellular Invasion	**Dr. David Q. Matus** *Biochemistry & Cell Biology*
Rishabh Rout *John P. Stevens HS (NJ)*	Exploring Gene Expression Deconvolution Methods for Prediction of Pancreatic Ductal Adenocarcinoma	**Dr. Richard Moffitt** *Biomedical Informatics*
Rishi Shah *Stockdale HS (CA)*	Opposing Effects of αcC1qR and Recombinant cC1qR on Pancreatic Cancer Pathogenesis	**Dr. Berhane Ghebrehiwet** *Medicine*
Gina Singh *The Pembroke Hill School (KS)*	Developing a Biochemical Assay to Measure the Binding of Histones to the DEFY Motif of a Histone Chaperone Protein	**Dr. Ed Luk** *Biochemistry & Cell Biology*
Ethan Sontarp *Commack HS (NY)*	Modeling Uranium Uptake in Fossilized Teeth and Bones: Insight into Potential for Long-term Uranium Waste Storage in Phosphates	**Dr. Troy Rasbury** *Geosciences*
Leo Takemaru *Ward Melville HS (NY)*	Role of the Novel ESCRT-III Recruiter CCDC11 in HIV-1 Budding	**Dr. Carol Carter** *Molecular Genetics & Microbiology*
Giuseppina Than *Earl L. Vandermeulen HS (NY)*	Accessibility of the macroH2A1.1 Nucleosome	**Dr. Dongyan Tan** **Dr. Vladyslava Sokolova** *Pharmacological Sciences*
Louis Viglietta *Commack HS (NY)*	Role of Neutral-Sphingomyelinase-2 in Doxorubicin induced DNA Damage Response Pathway	**Dr. Yusuf Hannun** *Cancer Center*
Evan Wang *Unionville HS (PA)*	Investigating the Effects of Cross-linkers in Flow-Assisted Assembly of Nanocellulose Materials via Rheo-optical Techniques	**Dr. Benjamin Hsiao** *Chemistry*
Melissa Woo *Greenwich HS (CT)*	Discovery of Novel Molecular Therapeutics for the Most Lethal Subtype of Pancreatic Cancer	**Dr. Luisa Escobar Hoyos** **Dr. Kenneth Shroyer** *Pathology*
Brandon Wu *Cupertino HS (CA)*	An Automated Method to Functionally Map Sparse Dendritic Synaptic Connectivity	**Dr. Joshua Plotkin** *Neurobiology & Behavior*
Skyler Wu *Del Norte HS (CA)*	Surfactant-Assisted Modifications of RO Membranes to Evaluate Filtration Performance	**Dr. Benjamin Hsiao** *Chemistry*
Janice Yang *Dougherty Valley HS (CA)*	Convolutional Neural Network Prediction of Breast Cancer Patient Response to Neoadjuvant Chemotherapy from Axillary Lymph Node MRIs	**Dr. Tim Duong** *Radiology*
Alice Yeh *BASIS Independent Silicon Valley (CA)*	Elucidating Nanopore-Based Long-Read Sequencing Limitations by Investigating RNA Sequence and Structure Level Features	**Dr. Robert Patro** *Computer Science*

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Christopher Yoon *Columbia Grammar & Preparatory School (NY)*	Entropy Regularization in Distributed Reinforcement Learning	**Dr. Ji Liu** *Electrical & Computer Engineering*
Rebecca Zhang *Ward Melville HS (NY)*	Genetic Variation for Sexual Dimorphism in *Drosophila melanogaster*	**Dr. John True** *Ecology & Evolution*
Sophie Zhang *High Technology HS (NJ)*	Developing a Microporous Hydrophobic Membrane from Hydrophilic Cellulose for Membrane Distillation	**Dr. Benjamin Hsiao** *Chemistry*
James Zheng *Garden City HS (NY)*	Microbiome Composition and Environmental pH Modulate the Behavioral Effects of Sertraline (Zoloft®) in Larval Zebrafish (*Danio rerio*)	**Dr. Howard Sirotkin** *Neurobiology & Behavior*
Lucy Zou *East Brunswick HS (NJ)*	The Design and Computational Analysis of Novel Boronic Acid-Containing Combretastatin Derivatives for Tumor Vasculature Disruption	**Dr. Iwao Ojima** *Chemistry, Institute for Chemical Biology & Drug Discovery*

Also featuring
Independent High School Research participant(s):

Isha Brahmbhatt *Ardsley HS (NY)*	Removal of Rare Earth Metal Ions from Contaminated Water by Sustainable Carboxycellulose Nanofibers Derived from Agave through Nitro Oxidation Process	**Dr. Benjamin Hsiao** *Chemistry*

Acknowledgements

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Karen Kernan, Director, Simons Summer Research Program
Brian Frank, Staff Assistant

About the Simons Summer Research Program

The Simons Program enables academically talented high school students to come to Stony Brook University for a summer to engage in scientific research. Simons Fellows work with distinguished faculty mentors, learn laboratory techniques and tools, become part of active research teams, and experience life at a research university. Today's reception recognizes the students and the faculty with whom they work. The Simons Program is supported by the Simons Foundation and individual faculty grants, and is administered by Programs for Research and Creative Activity.

For more information, call 631.632.7114.
Simons Summer Research Program website:
http://stonybrook.edu/simons

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FACULTY MENTORS, 2019

Dr. Hassan Arbab, *Biomedical Engineering*

Dr. Braden Brinkman, *Neurobiology & Behavior*

Dr. Carol Carter, *Molecular Genetics & Microbiology*

Dr. Edmund Kar-Man Chang, *School of Marine & Atmospheric Sciences*

Dr. Moira Chas, *Mathematics*

Dr. Yuefan Deng, *Applied Mathematics & Statistics*

Dr. Tim Duong, *Radiology*

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