

INTRODUCING THE SCHOLARS 2023-2024

ACHIEVEMENT REWARDS FOR COLLEGE SCIENTISTS SAN DIFGO CHAPTER

san-diego.arcsfoundation.org

ARCS MISSION

ARCS® Foundation, Inc. advances science and technology in the United States by providing financial awards to academically outstanding U.S. citizens studying to complete degrees in science, engineering and medical research.

WHO WE ARE

October 4, 1957 was a game-changer. On that date, Russia launched Sputnik, a 183-pound spaceship, roughly the size of a beach ball, into space. This surprise launch shocked the United States and forced it to rethink its place as the technological leader of the world. It also ushered in the Space Age and the Cold War. The Russian action touched all areas of America, including politics, patriotism, science, the military, and education. In response, the U.S. undertook an unprecedented push to educate Americans in science and math.

As part of that initiative, a group of women in Los Angeles saw the opportunity to make a difference by creating a partnership between science and society. Their goal was to re-establish and re-energize the technological superiority of the United States. They started the first ARCS Foundation chapter in September 1958. ARCS (Achievement Rewards for College Scientists) is a nationally recognized nonprofit organization founded and administered by women who support American leadership and aid advancement in science and technology, now comprised of 15 chapters across the nation.

In 1985, four San Diego women established ARCS Foundation San Diego: Karen Bowden, Karon Luce, Barbara McColl, and Pattie Wellborn. Thirty-nine years later, ARCS San Diego has provided over \$12.3 million in financial awards to the brightest STEM scholars at four local academic institutions. By investing in these scholars, we are securing a better future for America and the world.

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SAN DIEGO CHAPTER

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2023-2024 SCHOLARS SAN DIEGO CHAPTER

The San Diego chapter of ARCS began in 1985 and has grown from the original four founders to more than 100 members today. As we enter our 39th anniversary year, we have made awards totaling over \$12.3 million. Our academic partners are:

San Diego State University | Scripps Research University of California San Diego | University of San Diego

ARCS Scholars are selected by their institutions in recognition of their achievements and their exceptional promise to contribute significantly to their fields. Basic requirements have been established by ARCS® Foundation, Inc.: Scholars must be U.S. citizens, have at least a 3.5 GPA, and they must be enrolled full-time in academic degree programs in science, technology, engineering, math, and biomedical research. Awards are \$10,000, unrestricted, and renewable for three years. The San Diego chapter focuses on supporting students in doctoral programs, and the ARCS Scholars we have funded have a 98% graduation rate. For the 2023-2024 academic year, the San Diego ARCS chapter has awarded \$500,000 to 50 Scholars.



SUMMARY

ARCS Foundation - San Diego Chapter 2023-2024 Scholars

Navigate document by clicking on the Scholar NAME or click to the section by clicking on an INSTITUTION

SAN DIEGO STATE UNIVERSITY

Jason Lajos Baer – Cell and Molecular Biology
Luisjesus Santiago Cruz - Biology
Jessica Eileen Griffin - Marine Ecology
Ryan Hanscom - Biology
Tiffany Luong – Cell and Molecular Biology
Adrian Xavier Rivera - Structural Engineering
Jovan San Martin – Chemistry
Ashley Valentina Schwartz – Applied Mathematics
Laura Gilman Sisk-Hackworth - Microbiology
Lilith Astete Vasquez – Environmental Engineering
Isabel Alejandra White – Mathematics Education

SCRIPPS RESEARCH

Roger Justice Fleischmann III - Immunology Stephan Miguel Freeman - Chemistry Brett Michael Garabedian - Molecular Medicine Sergio Rodriguez Labra - Biomedical Sciences Garrett Lee Lindsey - Chemical Biology Colleen Ann Maillie - Structural and Computational Biology Michaela Medina - Cell Biology Kayla Elaine Nutsch - Biomedical Sciences Caroline Rose Stanton - Biomedical Sciences

UNIVERSITY OF CALIFORNIA SAN DIEGO

Anela Kanani Akiona - Marine Biology

Krista Patrice Balto - Chemistry Daniel Milgram Beaglehole - Computer Science and Engineering Laura Lynn Becerra - Electrical and Computer Engineering Alec Joseph Calac - Global Health Austin Joseph Carter – Geosciences Kellen James Cavagnero – Immunology and Microbiology Minerva Contreras - Neurosciences Wilfredo Gonzalez-Rivera - Bioinformatics and Systems Biology Rayyan Mohammed Gorashi - Bioengineering Sonya Renee Haupt - Biomedical Sciences Nathaniel Max Klevit Hopkins - Computer Science and Engineering Pratibha Jagannatha - Bioinformatics and Systems Biology Wade Truman Johnson - Nanoengineering Nishta Krishnan - Nanoengineering Sahana Kuthyar - Ecology, Behavior and Evolution Araz Majnoonian - Global Health Joshua Manalo Mesfin - Bioengineering Daniel Milshteyn - Chemistry and Biochemistry Chiaki Isabela Santiago – Neurosciences Consuelo Sauceda - Biomedical Sciences Angus Blacklaw Thies - Marine Biology Alisha Anish Ukani - Computer Science and Engineering

UNIVERSITY OF SAN DIEGO

Olivia Jade Weng - Computer Science and Engineering

Alicia Ann Van Enoo – Neurosciences Jessica Shen Yi Wan – Climate Sciences

Andrea Marie Correia – Nursing Oliver Mallillin Erece - Nursing Jennie Miko Lee – Nursing Tina Connie Smith - Nursing





SAN DIEGO STATE University

The San Diego State University doctoral programs here are offered jointly with either the University of California Davis, the University of California San Diego, the University of California Irvine, or the University of California Riverside as noted in the Scholars' profiles.





JASON LAJOS BAER

San Diego State University / University of California San Diego

College of Sciences

Concentration: Cell and Molecular Biology

Specialization: Microbial Ecology

Donors: The Reuben H. Fleet Foundation



Despite major advances in our understanding of coral reefs, we have not yet had much success in rebuilding these highly diverse and inter- connected ecosystems. For his PhD, Jason is designing, building, and deploying midwater structures called Coral Reef Arks as tools to pick apart the complexity of coral reefs and to help restore them. Jason is using these "mini-reefs" to create pockets of reef biodiversity that can help reseed the surrounding areas, as well as in-water laboratories to study reef processes and test new conservation tools.

Personal Interests: As with research, I prefer to spend most of my time in the field. I am an avid SCUBA and freediver, surfer, photographer, camper, and national park aficionado.

LUISJESUS SANTIAGO CRUZ

San Diego State University / University of California San Diego

College of Sciences
Concentration: Biology

Specialization: Cancer Biology

Donor: Legler Benbough Foundation



Ovarian cancer progression is stimulated by signals in the tumor-microenvironment from surrounding cells and tissues. Luis is researching how an immune cell population known as macrophages in the tumor-microenvironment enhance ovarian cancer progression through the secretion of a protein known as TWEAK, which increases post-chemotherapy. He hopes to identify the macrophage population responsible for TWEAK secretion to find better cell-based immunotherapy by elucidating the role of specific immune cells in cancer progression and relapse.

Personal Interests: I spend most of my free time relaxing at home and going on mental health walks.



JESSICA EILEEN GRIFFIN

San Diego State University / University of California Davis

College of Sciences

Concentration: Marine Ecology

Specialization: Coastal Marine Community Dynamics

Donor: The Heller Foundation of San Diego



Jessica is a marine ecologist whose research focuses on the conservation of coastal marine ecosystems, which are rapidly degrading due to climate change, invasive species and pollution. Jessica studies California seagrass beds, which perform vitally important ecosystem services, such as carbon sequestration and providing habitat for many fishes and invertebrates. Jessica's research addresses three threats to eelgrass survival: invasive species, eutrophication (addition of nutrients to the water), and climate change, and will provide insight on how to preserve these ecosystems under the stress of global change.

Personal Interests: In my free time I enjoy hiking, traveling, and reading.

RYAN HANSCOM

San Diego State University / University of California Riverside

College of Sciences
Concentration: Biology

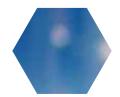
Specialization: Behavioral Ecology

Donors: Helga S. Moore/ARCS Foundation - San Diego Chapter



Ryan's research centers on understanding how temperature influences shortgrass prairie ecosystems. He utilizes advanced accelerometry technology to study the foraging behaviors of rattlesnakes and kangaroo rats, both keystone species in this habitat. By attaching miniaturized accelerometer devices to these animals, Ryan has developed machine learning models capable of detecting their activity, cryptic behaviors, and even foraging activities in the wild. This pioneering research offers valuable insights into how climate change may affect ecosystem stability and predator-prey interactions in the natural world, bridging the gap between theory and practical field experimentation.

Personal Interests: As with my research, I prefer to spend most of my time in the field whether that is hiking, fishing, kayaking, wildlife photography, birding, herping (searching for amphibians or reptiles), and more!



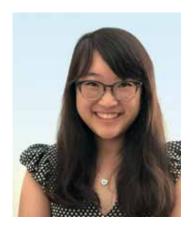
TIFFANY LUONG

San Diego State University / University of California San Diego

College of Sciences

Concentration: Cell and Molecular Biology Specialization: Bacteriophage Biology

Donor: Hervey Family Fund



Antibiotic-resistant bacterial infections are a growing concern worldwide. Due to their ability to infect and kill bacteria, there has been renewed interest in harnessing bacteriophages, phages for short, as an alternative treatment against antibiotic resistance. Currently, phage therapy can only be approved by the FDA as an emergency treatment. During Tiffany's PhD research, she developed a method to produce high-quantity clinically safe phage preparations for personalized emergency patient treatment. Her ongoing research focuses on the rational design of phage combinations and their translational use.

Personal Interests: Some of my interests and hobbies include piano, tabletop role-playing games, mahjong, food & travel, video games, science fiction and fantasy literature.

ADRIAN XAVIER RIVERA

San Diego State University / University of California San Diego

College of Engineering

Concentration: Structural Engineering
Specialization: Non-Destructive Evaluation

Donor: Donald C. and Elizabeth M. Dickinson Foundation



Adrian's research is focused on analyzing manufacturing imperfections in aluminum honeycomb sandwich composites. The impact of this research will increase the understanding of how imperfections affect the material performance of aluminum honeycomb cores, allowing engineers to better identify potential failure of future aerospace structural designs. Furthermore, the tools used to construct finite element models of honeycomb core materials can be used for design optimization, improving the reliability and performance of fracture critical structures.

Personal Interests: I have played tennis at a collegiate level (Division III) and continue to play in local tournaments. I also have a great love of food, especially tacos.



JOVAN SAN MARTIN

San Diego State University / University of California San Diego

College of Sciences

Concentration: Chemistry
Specialization: Photocatalysis
Donor: Hervey Family Fund



Jovan specializes in the design of new perovskite photocatalysts that use renewable energy in the form of visible light to drive chemical reactions. Perovskites are effective materials for solar cell technology and Jovan aims to repurpose such materials for enhanced photochemical reactions. His work has shown perovskites can produce a variety of organic compounds that can be the scaffold for future pharmaceutical drugs. Since perovskites are cheap, quick to produce, recyclable, and powered by renewable energy, Jovan's work can lower both the economic and environmental cost of producing pharmaceutical drugs.

Personal Interests: In my free time I like to exercise, write poetry, and make my friends laugh.

ASHLEY VALENTINA SCHWARTZ

San Diego State University / University of California Irvine

College of Sciences

Concentration: Computational Science Specialization: Computational Toxicology

Donor: Robin Luby



Environmental contaminants that pose a threat to the health and well-being of society are continually emerging, and high-throughput biological testing helps to characterize that risk. Ashley's research focuses on building mathematical and computational toxicology models to improve chemical safety assessment by leveraging available public data and creating an alternative to extensive animal testing. Ultimately, she hopes to shed light on the way environmental pollutant exposures can impact our health and development.

Personal Interests: In my free time, I enjoy walking and hiking with my dog, traveling to new places, and reading.



LAURA GILMAN SISK-HACKWORTH

San Diego State University / University of California San Diego

College of Sciences

Concentration: Microbiology

Specialization: Microbiome-Host Interactions

Donor: Ellen Browning Scripps Foundation



You probably remember puberty as a time of immense and confusing changes, but you might not know that the microbes in your gut were changing with you. Laura's research focuses on how the physiological changes that we experience during puberty, like soaring hormone levels and metabolic shifts, affect which microbes live in our gut and what they do there. Knowing how puberty shapes the gut microbiome will help us better understand microbiomerelated diseases that emerge during puberty, like polycystic ovary syndrome and type I diabetes.

Personal Interests: I spend my free time reading novels, playing piano, and hiking around San Diego.

LILITH ASTETE VASQUEZ

San Diego State University / University of California San Diego

College of Engineering

Concentration: Environmental Engineering

Specialization: Sustainable Onsite Sanitation Systems and Contaminants of Emerging Concern

Donor: Hervey Family Fund



Across the globe, 3.6 billion people living in vulnerable and disadvantaged communities lack access to improved facilities for the storage and treatment of fecal waste. To reduce these numbers, sanitation systems that are economically sustainable while minimizing impacts to human and environmental health must be further explored. Lilith's research contributes to these efforts through the study of fundamental processes and translatable real-world technologies for sanitation applications ranging from short-term encampments of unhoused or displaced people to long-term use at the household scale. Lilith also studies removal of pharmaceuticals from onsite sanitation systems and antibiotic resistant bacteria and genes in decentralized wastewater in Brazil.

Personal Interests: I enjoy learning to cook international foods and speak new languages and collecting random (seemingly useless until they're not!) facts.



ISABEL ALEJANDRA WHITE

San Diego State University / University of California San Diego

College of Sciences

Concentration: Mathematics Education

Specialization: Algebraic Reasoning and Technology

Donor: The Reuben H. Fleet Foundation

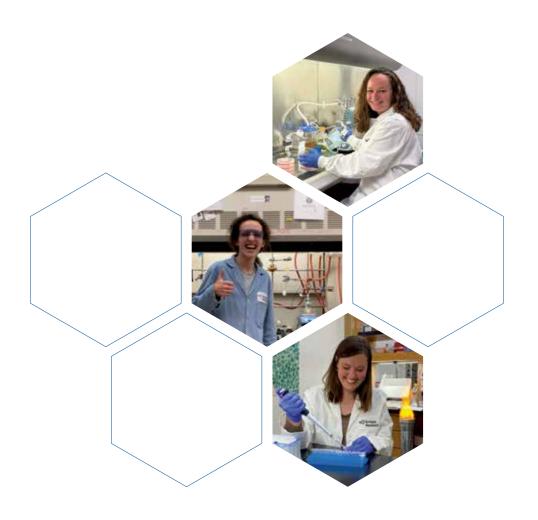


Algebra serves as a gatekeeper to more advanced courses in secondary mathematics. At the same time, mathematics education has experienced rapid changes since the COVID-19 pandemic, highlighting a need for novel digital technology. Isabel is working on a research project that seeks to understand how students learn complex algebra topics through the using instructional mathematics videos featuring students in dialogue. Through her research, she aims to better equip educators support students' algebra learning in a digital world.

Personal Interests: I enjoy singing in choir, Latin dancing, and going to the movies.



Scripps Research





ROGER JUSTICE FLEISCHMANN III

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Immunology Specialization: T Cell Biology

Donors: The Paul Bechtner Foundation / ARCS Foundation - San Diego Chapter



Justice investigates the factors which provoke and inhibit immune rejection of cellular transplants. His research revolves around genetically engineering donor-derived white blood cells to eliminate tumors, while also designing them to safely persist inside the patient. By studying the biology of these cells, Justice will produce novel strategies to transplant various types of cells, reduce the economic burden of cell therapy, and improve access to cell therapy.

Personal Interests: I enjoy surfing, rock climbing, gardening, dance, DEI and STEM education, contemporary art, traveling, cooking, Dungeons and Dragons, interior design, and my dog.interior design, and my dog.

STEPHAN MIGUEL FREEMAN

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Chemistry

Specialization: Organic Chemistry

Donors: Drs. Mara and Larry Ybarrondo/ARCS Foundation - San Diego Chapter



The natural products found in the bark of the Galbulimima tree are rich with medicinal potential. Extracts of this bark are employed in traditional Papuan medicine for their pain-relieving and hallucinogenic properties. Stephan is undertaking a chemical synthesis of some Galbulimima alkaloids that broadly induce depressant effects in mammals. Evidence suggests that Galbulimima alkaloids target central nervous system receptors; this synthesis will enable a rigorous investigation into these alkaloids' biochemical target(s) and may uncover a valuable collection of central nervous system-active natural products.

Personal Interests: I love the piano! When I'm not at the lab, I'm working on Ravel's Gaspard de la nuit – one of my favorite pieces ever written.



BRETT MICHAEL GARABEDIAN

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Molecular Medicine Specialization: Glycoimmunology

Donor: The Reuben H. Fleet Foundation



Brett uses chemistry and protein engineering to empower our immune system against diseases including chronic infection and cancer. His work focuses on the dense layer of sugars (glycans) that populate the cell-cell synapses formed between white blood cells and diseased cells. By tailoring these interactions using chemical biology tools, Brett is developing novel therapies of disease that will advance the field of "glycoimmunology" and broadly benefit patient outcomes in the clinic.

Personal Interests: SciComm, cooking, guitar, gardening, and prospecting for minerals.

SERGIO RODRIGUEZ LABRA

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Biomedical Sciences

Specialization: Translational Neuroscience

Donor: Toby Eisenberg



Alzheimer's disease is the most common form of dementia worldwide and is still not well understood. Sergio's research seeks to address a critical need in the field, that is, the lack of adequate pre-clinical models. By innovating stem cell-derived human brain organoid-based models to better reproduce the progression of Alzheimer's disease, Sergio's efforts focus on uncovering new disease mechanisms and more reliably testing promising new drugs in development as potential treatments for the disease.

Personal Interests: Volunteer with Cientifico Latino as co-director of a mentorship program for underrepresented minorities serving more than 100 STEM graduate students nationwide.



GARRETT LEE LINDSEY

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Chemical Biology
Specialization: Chemical Proteomics
Donor: The Reuben H. Fleet Foundation



In the Cravatt lab, Garrett uses the application of Activity-based Protein Profiling (ABPP) to discover and functionally annotate proteins that contribute to human diseases, such as cancer. His research focuses on developing small molecules that target novel proteins to suppress pro-tumorigenic transcriptional networks. Currently, he is studying the mechanism of small molecules that modulate the RNA-binding protein, NONO. Studying these small molecules could provide a way forward for drugging the NONO protein for cancer therapy and more specifically treatment resistant forms of prostate cancer.

Personal Interests: I stay active through weightlifting, hot yoga, or practicing my golf swing at a driving range.

COLLEEN ANN MAILLIE

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Integrative Structural and Computational Biology

Specialization: Protein Engineering

Donor: Dorothy Georgens



Colleen combines protein engineering, computational design, and structural biology to understand how immune receptors transmit signals across cellular membranes. She is developing de novo transmembrane proteins to target Toll-like receptors. This class of immune receptors form a critical first line of defense against bacterial and viral infections and play a vital role in autoimmune diseases, cancers, and sepsis. Her research aims to provide a novel therapeutic targeting strategy and a way forward to better arm our immune systems against infections and disease.

Personal Interests: I enjoy beach volleyball, surfing, good coffee, CrossFit, mornings at the dog beach, and coaching high school field hockey.



MICHAELA MEDINA

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Cell Biology

Specialization: Quantitative Cellular Biology and Biophysics

Donor: ARCS Foundation - San Diego Chapter



Michaela uses light microscopy, electron microscopy, and biochemical techniques to investigate how mitochondria sense and adapt to cellular stress. Her work focuses on how mitochondrial membranes remodel in a variety of different cellular contexts to gain a greater understanding for how these processes are regulated. Her goal is to understand how dysregulation of mitochondrial dynamics results in unhealthy mitochondrial populations that are a hallmark of neurodegenerative diseases, metabolic diseases, and cancer.

Personal Interests: I am an avid music lover especially K-pop and the South Korean band BTS. I enjoy learning languages, reading, hiking, and traveling.

KAYLA ELAINE NUTSCH

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Biomedical Sciences Specialization: Chemical Biology

Donor: ARCS Foundation - San Diego Chapter



In her research, Kayla has performed a high-throughput drug screen to identify small molecules that inhibit the interaction between two proteins, YAP and TEAD, which regulate cell growth, organ size, and regeneration. This association of YAP and TEAD is often hyperactivated in human cancers driving cellular proliferation, metastasis, and chemotherapy resistance. Her work has uncovered small molecules that have been used to elucidate the unique regulation of TEAD and further developed them into pre-clinical candidates for novel cancer therapeutics.

Personal Interests: I enjoy painting, hiking with my dog, yoga, exploring local breweries with my husband, reading, cooking, traveling, and experimenting in mixology.



CAROLINE ROSE STANTON

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Biomedical Sciences
Specialization: Chemical Biology

Donor: Donald C. and Elizabeth M. Dickinson Foundation



Caroline's graduate research focuses on understanding the regulation of the NLRP3 inflammasome, a protein complex closely tied to sterile inflammation in numerous diseases including gout, rheumatoid arthritis, multiple sclerosis, and stroke. To accomplish this goal, she has performed a high-throughput screen to identify new compounds which inhibit NLRP3 and is determining the mechanism of action of these compounds to establish new ways by which NLRP3 is regulated. This allows her to identify potential new drug targets to reduce NLRP3 activity and inflammation.

Personal Interests: Classical singing including art songs and opera, walking on the beach, reading, and baking.

UC San Diego







ANELA KANANI AKIONA

University of California San Diego

Scripps Institution of Oceanography

Concentration: Marine Biology Specialization: Coral Reef Ecology

Donor: Kenneth and Marjorie Blanchard/ARCS Foundation - San Diego Chapter



Anela studies what determines species distribution on coral reefs, which are under threat from climate change. She uses data from scuba surveys to model how emerging interventions might make reef ecosystems in the Maldives, an island nation which relies heavily on coral-related tourism, more resilient as global temperatures rise. Her research seeks to bridge the gap between conservationists, managers, and scientists as the Maldivian government works to build their national coral conservation strategy.

Personal Interests: I enjoy scuba diving, hiking, going to the beach, reading, cooking, and fostering dogs.

KRISTA PATRICE BALTO

University of California San Diego

Department of Chemistry and Biochemistry

Concentration: Chemistry

Specialization: Inorganic Synthesis and Materials Chemistry

Donor: Wally Schirra Memorial Endowment Fund



Krista's research focuses on the creation of unique, highly reactive metal-based materials. Once created, Krista determines what these materials are capable of; some aid in the creation of organic molecules or polymers, like plastics, while others are capable of gas and liquid separations for industrial purposes.

Personal Interests: I enjoy weightlifting, surfing, running, trying new restaurants, and traveling.



DANIEL MILGRAM BEAGLEHOLE

University of California San Diego

Jacobs School of Engineering

Concentration: Computer Science and Engineering

Specialization: Machine Learning

Donor: Beyster Family Foundation



One of the biggest mysteries in the study of deep learning is why neural networks are able to perform well at test time (i.e., on data that was not used for learning). Daniel's work demonstrates that neural networks achieve this remarkable test performance by learning a particular statistic that is specific to the given dataset (a phenomenon known as feature learning). Daniel has shown how this mechanism can explain a variety of "intelligent" behaviors in deep learning, including the emergence of edge detectors in networks used for vision tasks. Further, Daniel demonstrated that the mechanism of feature learning identified in his work can be implemented in a simple, fast, and interpretable method that gives state-of-the-art performance on tabular data.

Personal Interests: Research is my passion, but I am also an avid Brazilian Jiu Jitsu practitioner. I also enjoy playing guitar, learning to surf, and reading philosophy.

LAURA LYNN BECERRA

University of California San Diego

Jacob School of Engineering

Concentration: Electrical and Computer Engineering

Specialization: Medical Devices and Systems Donor: ARCS Foundation - San Diego Chapter



Laura's research focuses on flexible sensor systems and haptic materials (which convey information via sense of touch) for physiological measurements. Her sensors are used to measure breathing activity in humans, as well as to prevent scar tissue from radiation treatments in the throats of cancer patients. She also investigates materials and their properties to create a desired touch sensation in humans, such as moisture or temperature. This is used for developing realistic technology to be used in surgical training simulations, virtual doctor visits, and virtual reality platforms, among other applications.

Personal Interests: I enjoy salsa and bachata dancing, baking, and spending time with friends and family.



ALEC JOSEPH CALAC

University of California San Diego

Herbert Wertheim School of Public Health and Human Longevity Science

Concentration: Global Health

Specialization: Medicine and Public Health Donor: Lambert Foundation for Education



Alec is an MD/PhD Candidate at UC San Diego School of Medicine and Herbert Wertheim School of Public Health and Human Longevity Science. He works collaboratively with the Global Health Policy and Data Institute on research projects integrating social media, health technology, health policy, and Tribal public health. He currently serves as the National President of the Association of Native American Medical Students. In 2022, he was named a 40 Under 40 Leader in Minority Health by the National Minority Quality Forum and was also chosen to participate in the White House Leaders in Health Equity Roundtable Series.

Personal Interests: Homemade ice cream, indoor rock climbing, mentoring youth, exploring craft breweries, and checking out new coffee shops.

AUSTIN JOSEPH CARTER

University of California San Diego

Scripps Institution of Oceanography

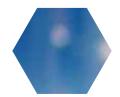
Concentration: Geosciences Specialization: Geochemistry

Donor: The Reuben H. Fleet Foundation



Austin studies the chemistry, shape, and concentration of mineral dust (fine-grained particles of rock) trapped in polar ice. He drills cores of ice on the East Antarctic Ice Sheet, carefully separates the dust, and measures its properties. These small, solid impurities can provide insight into how the conditions on the Earth's surface and the flow of air may have changed through time. By understanding how the environment has changed in the past, his research aims to better project how the environment will change in the future.

Personal Interests: I enjoy listening to music, exploring the beach, and making paper crafts.



KELLEN JAMES CAVAGNERO

University of California San Diego

Department of Dermatology

Concentration: Immunology and Microbiology

Specialization: Inflammation and Infectious Disease

Donor: Dr. Patricia Judd



Kellen's mission is to better understand the immune system in order to more effectively prevent and treat infectious disease, autoimmunity, allergy, and cancer. Specifically, his research focuses on defining what happens after initial exposure to an inflammatory stimulus. Prior to starting his PhD, Kellen made significant contributions to the field of allergic airway disease under the mentorship of Dr. Taylor Doherty. Now, as a PhD student under the mentorship of Dr. Richard Gallo, his work is changing how we think about skin and gut infectious and inflammatory diseases.

Personal Interests: I enjoy spending time with friends and family and outdoor activities like surfing, hiking, and scuba diving.

MINERVA CONTRERAS

University of California San Diego

School of Medicine

Concentration: Neurosciences

Specialization: Molecular Neurobiology

Donor: ARCS Foundation - San Diego Chapter



The brain can modify its connections in response to experience, this is known as plasticity. During development, the brain's ability to respond to experience by making new connections, strengthening, or eliminating old ones, is high. As one gets older, this ability decreases. This explains why learning a new language is easier when one is young, for example. Minerva studies the mechanisms by which astrocytes, a type of non-neuronal cell, regulate plasticity in response to experience. She also hopes to elucidate therapeutic targets for neurodevelopmental diseases where plasticity alterations are hallmarks.

Personal Interests: When not in the lab, you may find me outdoors enjoying this beautiful San Diego weather with my wife and dogs. I love hiking, camping, going to the beach, and snorkeling.



WILFREDO GABRIEL GONZALEZ-RIVERA

University of California San Diego

Jacobs School of Engineering

Concentration: Bioinformatics and Systems Biology

Specialization: Precision Medicine

Donor: Ellen Browning Scripps Foundation



As a biomedical informatics PhD student at UC San Diego, Wilfredo is applying his multidisciplinary skills in genetics, genomics, and social sciences to study the influence of ancestry on the associations between genetic variation and complex traits, with a focus on admixture populations. Considering a patient's genetic variants can ultimately allow for the development of personalized treatments, which has the potential to positively impact worldwide health. Wilfredo's mission is to mitigate health disparities between individuals of underrepresented and diverse populations such as, Hispanic/Latinx communities with the vision of innovating medical utility of genetic information for all.

Personal Interests: I am interested in exploring the world around me and looking for nice coffee shops to enjoy reading or coding.

RAYYAN MOHAMMED GORASHI

University of California San Diego

Jacobs School of Engineering Concentration: Bioengineering

Specialization: Biomaterials and Sex-specific Disease Modeling

Donor: ARCS Foundation - San Diego Chapter



Rayyan's research leverages biomaterial tools to better understand sex differences in heart valve disease. Current treatments are limited to pharmaceutical drugs or invasive, total valve replacement procedures. Drug treatments are often ineffective for females due to an incomplete understanding of female-specific disease mechanisms. Rayyan utilizes biomaterials to create physiologically relevant disease models to study sex-specific mechanisms. More broadly, Rayyan seeks to understand the sex differences in heart valve disease progression to create more equitable treatment options for both male and female patients.

Personal Interests: I enjoy nature/landscape and portrait photography, surfing, working out, video games, and spending time with family.



SONYA RENEE HAUPT

University of California San Diego

Health Sciences

Concentration: Biomedical Sciences

Specialization: Immunology

Donors: Timkin-Sturgis Foundation/ARCS Foundation - San Diego Chapter



Sonya is researching novel technology to be used in HIV (human immunodeficiency virus) vaccines. She evaluates the immune response in model organisms to project what vaccination strategy will create broadly-neutralizing antibodies in humans. Her first project is developing a helper T cell epitope tag that can work across all human HLA types to boost germinal center education of antibody responses. Her second project is modeling how vaccines benefit from different components administered in each dose to progressively coach cells to evolve better neutralizing antibodies. Although HIV vaccines are not effective yet, she hopes that her contribution may help her see an approved HIV vaccine in our lifetime.

Personal Interests: I enjoy mentally challenging exercise and connecting with others. I have found such with ultimate frisbee and outdoor rock climbing.

NATHANIEL MAX KLEVIT HOPKINS

University of California San Diego

Jacobs School of Engineering

Concentration: Computer Science and Engineering

Specialization: Theoretical Computer Science

Donor: Kathryn Crippen Hattox Endowment



From measurements of the largest galaxies to the smallest proteins, scientists now record more data in a day than they can possibly handle in a lifetime. This has led to a modern-day scientific revolution, where data-hungry machine learning techniques are used to attack age-old problems like protein folding. These applications, however, require data annotated by people, which is prohibitively expensive for applications like computer-assisted medical diagnosis. Max's research focuses on the theory behind how easily-accessible raw data combined with a few enriched annotations can significantly reduce otherwise infeasible labeling costs.

Personal Interests: In my free time I sing acapella and barbershop music and enjoy pretty much every form of game.



PRATIBHA JAGANNATHA

University of California San Diego

Jacobs School of Engineering

Concentration: Bioinformatics and Systems Biology

Specialization: RNA Biology

Donor: Virginia Lynch Grady Endowment



The central dogma of biology states that RNA converts information stored as DNA sequences, a process called transcription, into proteins, a process called translation. RNA isoforms result from the same DNA sequences being transcribed into different RNA sequences. RNA isoforms are essential for proper functioning of neurons, highly regulated cells of the nervous system, and help support its unique morphology. Using computational and experimental approaches and third generation sequencing, Pratibha studies the relationship between RNA isoforms and translation in the context of normal cellular processes and disease development in neurons.

Personal Interests: I enjoy singing, dancing, painting, and watching documentaries. I also enjoy participating in outreach and mentoring programs.

WADE TRUMAN JOHNSON

University of California San Diego

Jacobs School of Engineering Concentration: Nanoengineering

Specialization: Immune Engineering and Biomaterials

Donors: Kurt Benirschke Family/ARCS Foundation - San Diego Chapter



Wade's research focuses on the development of nanoscale biomaterials to control flares in patients with chronic autoimmune diseases. The standard of care treatment for inflammatory flares is corticosteroids. Unfortunately, these treatments do not prevent flare recurrence, are associated with potent side effects, and reduce the body's natural ability to fight off infections and cancer. The biomaterials Wade develops are designed to prevent flare-ups by inducing a protective immune cell subset in a targeted area without systemically hampering the body's immune system to fight off disease.

Personal Interests: I spend my time outside as often as possible, whether that be backpacking, sailing, or golfing.



NISHTA KRISHNAN

University of California San Diego

Jacobs School of Engineering Concentration: Nanoengineering

Specialization: Immunology and Drug Delivery

Donor: The Reuben H. Fleet Foundation



Nishta's research focuses on cell membrane-coating nanotechnology, in which cell membrane is derived from live cells and coated onto the surface of synthetic nanoparticulate cores. In particular, Nishta is developing the next generation of these nanoparticles via genetic modification of the source cells. By introducing proteins onto the nanoparticle surface, she can integrate new capabilities and better address challenges in cancer therapy. She uses these genetic engineering approaches to develop nanoparticles with enhanced functionalities including improved targeting to disease sites, enhanced cellular entry, and superior biointerfacing capabilities.

Personal Interests: I enjoy board games, learning aerial skills and eating otter pops!

SAHANA KUTHYAR

University of California San Diego

Division of Biological Sciences

Concentration: Ecology, Behavior, and Evolution

Specialization: Microbial Ecology

Donor: ARCS Foundation - San Diego Chapter



Sahana studies how ecological and evolutionary factors impact the ability of animal-associated commensal microbes to prevent pathogen colonization. She uses domestication as a framework to explore how genetics and local ecology shape these phenomena. Her research seeks to understand under which contexts the gut microbiome of domestic animals defends against infectious disease. Her work will permit us to develop microbially minded interventions to manage infections and improve the productivity of animal rearing.

Personal Interests: I enjoy running, dancing, and generally being outdoors.



ARAZ MAJNOONIAN

University of California San Diego

Herbert Wertheim School of Public Health and Human Longevity Science

Concentration: Global Health

Specialization: Gender-Based Violence Prevention

Donors: Dr. Patricia Judd/ARCS Foundation - San Diego Chapter



Araz is conducting pioneering research to evaluate domestic violence support services nationwide in Armenia. Her study, the first of its kind in the country, adopts a participatory approach involving survivors of violence, domestic violence support center staff, and partner organizations to assess the impact and accessibility of these services. By generating evidence-based insights and recommendations, her research aims to enhance support for survivors and inform policy and practice. Her work contributes to the global fight against gender-based violence, offering valuable lessons for low and middle-income countries.

Personal Interests: I advocate for indigenous rights and cherish outdoor adventures: hiking, camping, and traveling.

JOSHUA MANALO MESFIN

University of California San Diego

Jacobs School of Engineering Concentration: Bioengineering

Specialization: Tissue Engineering and Bioinformatics

Donor: The Reuben H. Fleet Foundation



Josh's research focuses on utilizing and understanding the effects of injectable therapeutic biomaterials to treat the heart after a heart attack. After a patient undergoes a heart attack, there are very few treatments to prevent scar tissue that forms around the heart, which can lead to eventual heart failure and death. By using a therapy that can molecularly mediate the heart tissue and prevent scarring, Josh hopes to fully understand how these biomaterials mechanistically work via pre-clinical heart attack models, improve upon these biomaterials, and ultimately bring these treatments to the clinic.

Personal Interests: I enjoy traveling, baking, and cooking. I'm also a fan of board/video games and finding things I haven't tried.



DANIEL MILSHTEYN

University of California San Diego

Physical Sciences

Concentration: Chemistry and Biochemistry

Specialization: Lipid Biochemistry and Biophysics

Donor: ARCS Foundation - San Diego Chapter



Daniel studies the regulation of negatively curved lipids in cell membrane dynamics and environmental adaptation. His primary research focuses on the biophysical roles of cholesterol in mitochondrial fission driven by multi-organelle contacts. In addition, he collaborates with scientists from the Extreme Biophysics Research Coordination Network to understand the roles of lipids in adapting model organisms to survive in deep-sea or high-pressure environments. Daniel is training in interdisciplinary approaches including super resolution live-cell microscopy, membrane biophysics, and synthetic biology to understand the implications of lipid composition across scales from cell membranes to organismal physiology and disease.

Personal Interests: In my free time, I enjoy listening to music, getting lost in nature, and roller skating.

CHIAKI ISABELA SANTIAGO

University of California San Diego

Division of Biological Sciences

Concentration: Neurosciences

Specialization: Cellular and Molecular Neurosciences

Donor: Elizabeth Taft



Chiaki's thesis project aims to understand the molecular mechanisms that drive experience-dependent circuit plasticity in the mammalian brain. The animal brain extracts salient information from its environment, generating memories and behavioral adaptations that allow it to survive in a complex world. This is done through the activity of excitatory and inhibitory neurons that are organized into synaptically connected circuits. Chiaki studies how experience, through the execution of activity-dependent gene expression, regulates the connections between excitatory and inhibitory neurons, and how these processes relate to animal behavior and disease states.

Personal Interests: I love spending time in nature - playing volleyball, disc golf, surfing, or exploring our beautiful national parks.



CONSUELO SAUCEDA

University of California San Diego

School of Medicine

Concentration: Biomedical Sciences

Specialization: Microbiome, Host-Microbe Interaction

Donors: The ResMed Foundation/ARCS Foundation - San Diego Chapter



Previously overlooked, the human gut has become a central focus in the study of many diseases as it holds a rich reservoir of microbes that play key roles in digestion and host immune defense. A tip in the balance of microbial abundance has been connected to many diseases, such as inflammatory bowel disease. As part of her ongoing mission, Consuelo Sauceda is focused on understanding how gut microbes contribute to disease severity in hopes of finding a targeted therapeutic. Using state-of-the-art technology, Consuelo aims to find proteins produced by gut microbes that may be leading to gut barrier dysfunction.

Personal Interests: I love spending time with friends and family. I also love to dance and teach choreography in my spare time.

ANGUS BLACKLAW THIES

University of California San Diego

Scripps Institution of Oceanography

Concentration: Marine Biology

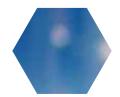
Specialization: Physiology of Symbiosis

Donor: Carlos and Sharon Arbelaez



Angus studies the healthy physiology of corals, the animals responsible for building coral reef ecosystems. These habitats support thousands of species, provide food for millions of humans, drive global tourism, and protect coastlines from storm damage and erosion. Alarmingly, coral populations are declining rapidly due to climate change not only threatening ecological biodiversity but endangering the food supply and livelihoods of local communities. Angus' research focuses on (1) characterizing healthy coral biology (2) understanding why coral populations are declining, and (3) identifying coral species suitable for conservation efforts to rebuild degraded coral reef ecosystems.

Personal Interests: I love to rock climb, cook, spearfish, explore national parks, start (and maybe finish) DIY projects, and maintain close friendships.



ALISHA ANISH UKANI

University of California San Diego

Jacobs School of Engineering

Concentration: Computer Science and Engineering
Specialization: Internet Measurement and Web Privacy
Donor: Donald C. and Elizabeth M. Dickinson Foundation



Alisha's research focuses on using Internet traffic data to improve the performance and reliability of critical infrastructure like large-scale data centers, which power vital web services in healthcare and education. She has created a method to identify network outages at Google using network availability data. Alisha plans to build and leverage large-scale measurement systems to make web service infrastructure more reliable and thus better serve the public.

Personal Interests: I enjoy reading fiction, interior design, and spending time with my dog. I also like to play tennis, lift weights, and play acoustic guitar.

ALICIA ANN VAN ENOO

University of California San Diego

Neurosciences Graduate Program

Concentration: Neurosciences

Specialization: Developmental Neuroscience, Stem Cell Biology

Donor: Hervey Family Fund



Alicia's research is aimed at understanding the molecular mechanisms underlying abnormal neurodevelopment in autism spectrum disorders (ASD). She uses patient-derived and CRISPR engineered stem cells to create 3-D cortical organoids, nicknamed "mini brains". By studying how these mini brains develop in a dish, Alicia hopes to gain a better understanding of what goes wrong during fetal brain development in ASD patients. These studies will provide the much-needed groundwork necessary to identify novel therapeutic targets for the potential treatment of ASD.

Personal Interests: In my free time, I enjoy going to the beach, exploring new restaurants, and snowboarding.



JESSICA SHEN YI WAN

University of California San Diego

Scripps Institution of Oceanography

Concentration: Climate Sciences

Specialization: Climate Geoengineering

Donor: Laura Mateo/Lakeside Foundation



Jessica studies how climate geoengineering proposals might alleviate climate change impacts. Her research focuses on a type of geoengineering called marine cloud brightening, which cools the planet by adding sea salt particles to the lower atmosphere to form brighter marine clouds. She uses computer models of the Earth to simulate how different scenarios of marine cloud brightening could be leveraged for climate risk mitigation. As temperatures continue to rise, Jessica's research on climate geoengineering is becoming increasingly important as one proposal in the portfolio of innovative climate solutions.

Personal Interests: I am a professional ultimate frisbee player and college coach. I also enjoy hiking, disc golfing, baking, and painting.

OLIVIA JADE WENG University of California San Diego

Jacobs School of Engineering

Concentration: Computer Science and Engineering

Specialization: Hardware-software Codesign Donor: ARCS Foundation - San Diego Chapter



Many scientific applications require neural networks (NNs) to operate correctly in safety-critical or high radiation environments, including automated driving, space, and high energy physics. For example, physicists at the Large Hadron Collider want to deploy a model to filter their experimental data at a high data rate (~40TB/s) in a high radiation environment. Thus, the model's hardware must be both efficient and robust. However, efficiency and robustness are often in conflict with each other. Olivia's research explores this tradeoff to look for robustness in both NN hardware and software and have them work together.

Personal Interests: I regularly attend the theater.









ANDREA MARIE CORREIA

University of San Diego

Hahn School of Nursing and Health Science

Concentration: Nursing Specialization: Pediatrics

Donor: Beyster Family Foundation



Healthcare-related workplace violence perpetrated by patients and caregivers has steadily increased. Numerous studies have been conducted to understand the prevalence and cause. However, fewer studies have been done within the realm of pediatrics. Andrea plans to explore factors contributing to workplace violence in pediatric settings. Such an understanding can eventually lead to improved preventative measures for pediatric healthcare organizations.

Personal Interests: My interests include reading, traveling, and spending time with family and friends.

OLIVER MALLILLIN ERECE

University of San Diego

Hahn School of Nursing and Health Science

Concentration: Nursing

Specialization: Surgical & Medical Oncology

Donor: Beyster Family Foundation



Oliver is investigating the efficacy of the Critical Care Pain Observation Tool (CPOT) for assessing pain in nonverbal patients outside ICU settings. This follows the retirement of the Checklist of Non-observable Pain Indicators (CNPI) in Oliver's organization, in line with The Joint Commission's recommendations. The research seeks to fill a gap in understanding whether CPOT can effectively prompt interventions for pain management in nonverbal patients, particularly those with conditions like dementia. Although CPOT is widely used in critical care settings for intubated or sedated patients, its effectiveness in guiding interventions for nonverbal patients in different hospital settings is the focal point of Oliver's study.

Personal Interests: I am passionate about artistic expression through drawing and video editing. I am devoted to mentoring novice nurses for their growth and success.



JENNIE MIKO LEE

University of San Diego

Hahn School of Nursing and Health Science

Concentration: Nursing

Specialization: Maternal Health Disparities

Donor: Beyster Family Foundation



Jennie's research is aimed at improving maternal outcomes with reduced rates of morbidity and mortality due to maternal hemorrhage, the leading cause of maternal morbidity. Her research project is focused on disadvantaged people, exploring the relationship between social determinants of health and maternal mortality by investigating social and economic variables of access to healthcare and health disparities that correlate with maternal mortality.

Personal Interests: I enjoy spending time with family, training jiu-jitsu, bodyboarding, running, playing guitar and fishing in Alaska and the Eastern Sierras.

TINA CONNIE SMITH

University of San Diego

Hahn School of Nursing and Health Science

Concentration: Nursing
Specialization: Pediatrics

Donors: Laurie and Michael Roeder/ARCS Foundation - San Diego Chapter



As the literacy gap between healthcare workers and patients grows, nurses must help provide healthcare information realistically. For this reason, Tina's research is focused on the health literacy of parents of acutely sick children so that she can start to tackle the difficulties of the health literacy gap. Her entire bedside career has been dedicated to one of the most vulnerable populations, pediatric patients, and by increasing parents' and caregivers' health literacy she aims to improve the lives of her patients, both current and future.

Personal Interests: I enjoy traveling, baking, and finding new restaurants. I am also a huge sports fan. The Los Angeles Angels are my favorite team.

