



ARCS

ADVANCING
SCIENCE
IN AMERICA®



SAN DIEGO CHAPTER

ACHIEVEMENT REWARDS FOR COLLEGE SCIENTISTS



INTRODUCING THE SCHOLARS 2020-2021

2020-2021 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 continue to celebrate our 35th anniversary, we have made more than 1400 awards totaling well over \$10 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 and have at least a 3.5 GPA; they must be enrolled in academic degree programs in science, engineering, and medical research. Awards are unrestricted and merit-based. The San Diego chapter focuses on supporting students in doctoral programs, and the ARCS Scholars we have funded have a 98% graduation rate, compared with the national rate of 60% for graduate students in the sciences and engineering. Annual awards to Scholars range from \$5,000 to \$10,000.* For the 2020-2021 academic year, the San Diego ARCS chapter has awarded \$420,000 to 46 Scholars.

*In June 2020, the ARCS-San Diego Board voted to increase the full Scholar Award amount from \$7,500 to \$10,000 (Awards for Scripps Research remain at \$5,000 in accord with their request). For the academic year 2020-2021, any full award donation received at the \$7,500 level is still considered a full award and was augmented by ARCS-San Diego to fund the Scholars at the new award level of \$10,000.

SUMMARY

ARCS Foundation - San Diego Chapter 2020-2021 Scholars

All ARCS Scholars supported by the San Diego Chapter are enrolled in doctoral programs

Navigate document by clicking on the Scholar name or click to the section by clicking on an institution.

SAN DIEGO STATE UNIVERSITY

Amanda Therese Alker – Cell and Molecular Biology
Theresa Leigh Ute Burnham – Ecology
Mariel Manaloto Cardenas - Chemistry
Molly Elizabeth Clemens - Ecology
Roslynn Beatrice King – Geophysics
Lucas Aaron Luna - Biochemistry
Tiffany Luong – Cell and Molecular Biology
Kyle Evan Malter – Biological Sciences
Amelia Odine Stone-Johnstone - Mathematics Education
Nicholas Benjamin Williams - Chemistry

SCRIPPS RESEARCH

Lisa Marie Barton - Chemistry
Nathalia Romanio Gazaniga – Biomedical Sciences
Tucker Ryan Huffman - Chemistry
Anthony Nicholas Milin - Biomedical Sciences
Sophia Louise Shevick - Chemistry
Mia Shin - Biomedical Sciences
Nelson Ren Wu – Immunology
Leonard Heekyu Yoon - Chemical Biology

UNIVERSITY OF CALIFORNIA SAN DIEGO

Bryce Eric Ackermann - Biochemistry
Miriam Kathleen Bell - Mechanical Engineering
Laura Brown Chipman - Biological Sciences
Gabrielle Marie Colvert - Bioengineering
Bethanny Patricia Danskin - Neurosciences
Mickey Finn III - NanoEngineering
Mark Kalaj - Chemistry
Kevin Richard Kaufmann - NanoEngineering
Andrew Thomas Kleinschmidt - Chemical Engineering
Jenna Joaquin Lawrence - Mechanical and Aerospace Engineering
Chi-Wei Man - Biochemistry
Ryan Jared Marina - Biomedical Sciences
Nicole Patricia Mlynaryk - Neurosciences
Colman Arthur Moore - NanoEngineering
Jessica Yi-Jun Ng - Geochemistry
Victor Wingtai Or - Analytical and Atmospheric Chemistry
Jason Alexander Platt - Biophysics
Channing Joseph Prend - Physical Oceanography
Dimitrios Adrian Schreiber - Electrical Engineering
Samantha Lylah Sison - Cell and Molecular Biology
Matthew David Stone - Public Health - Health Behavior
Anthony Quoc Vu - Biomedical Sciences
Alexander Jeffrey Whitehead - Bioengineering
Jiarong Zhou - NanoEngineering

UNIVERSITY OF SAN DIEGO

Byron Batz - Nursing
Pedro Alonso Colio- Nursing
Ann Ozaze Lawani - Nursing
Brooke Haley Rakes - Nursing

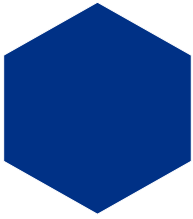


SAN DIEGO STATE UNIVERSITY

ARCS FOUNDATION, INC. | SAN DIEGO CHAPTER | SCHOLARS 2020-2021



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



AMANDA THERESE ALKER

San Diego State University / University of California San Diego

College of Sciences

Concentration: Cell and Molecular Biology

Specialization: Environmental Microbiology

Donor: Reuben H. Fleet Foundation Fund



Many bottom-dwelling marine animals, like corals and tubeworms, release their babies into the water column, where they swim in search of an environmental cue that indicates a suitable place to settle onto the seafloor and develop. Certain bacteria coating submerged surfaces can serve as this environmental cue. Amanda's research investigates a single probiotic marine bacterium and demonstrates that it can produce multiple different cues that influence the babies to settle down. Harnessing these bacteria as "environmental probiotics" may allow scientists to restore threatened ecosystems (like coral reefs) in the future.

THERESA LEIGH UTE BURNHAM

San Diego State University / University of California Davis

College of Sciences

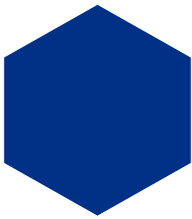
Concentration: Ecology

Specialization: Marine Fisheries Ecology and Management

Donor: Reuben H. Fleet Foundation Fund



Around the world, marine fisheries are threatened by increasing demand for seafood and warming oceans. Theresa's research focuses on improving management of the lucrative, but vulnerable, spiny lobster fishery in Southern California and Mexico. By gathering fishing data, biological characteristics, and genetic signatures from lobsters along the Pacific coast, Theresa aims to create modern, climate-ready solutions for the environmental problems faced by small-scale fisheries and the coastal communities that rely on them.



MARIEL MANALOTO CARDENAS

San Diego State University / University of California San Diego

College of Sciences

Concentration: Chemistry

Specialization: Asymmetric Catalysis in Medicinal Chemistry, Organic Chemistry

Donor: ARCS Foundation - San Diego Chapter / Robin Luby



Obtaining 'large-scale,' industry-standard quantities of enantiomerically pure (i.e. the correct conformational and stereochemical structure of) drug scaffolds represents a major challenge in drug discovery, as the traditional state of industry currently lacks time and cost-efficient processes. This is likely due to the current lack of catalytic, synthetic, and asymmetric methodologies amenable with medicinal chemistry efforts. Mariel started conducting graduate-level research under Dr. Jeffrey L. Gustafson at SDSU. She has since developed some of the desirable, general strategies to access pharmaceutically-relevant scaffolds.

MOLLY ELIZABETH CLEMENS

San Diego State University / University of California Davis

College of Sciences

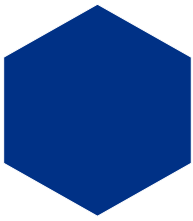
Concentration: Ecology

Specialization: Viticulture and AgroEcology

Donor: The Heller Foundation of San Diego



Molly's thesis is an interdisciplinary investigation of adaptations in vineyards, with the goal of sustainable agro-ecological solutions to the threats of climate change. She has modeled the phenological timing of hundreds of international grapevine varieties in response to climate change, and she reviewed in depth the impacts of elevated carbon dioxide on grapevine ecology. She is working on her last chapter at the Fondazione Edmund Mach in Italy on genetic transformations of grapevines using cutting edge CRISPR cas9 technology. These transformations developed grapevine with higher drought resistance.



ROSLYNN BEATRICE KING

San Diego State University / University of California San Diego

College of Sciences

Concentration: Geophysics

Specialization: Controlled-Source Electromagnetism

Donor: Legler Benbough Foundation



Roslynn is interested in the design, fabrication, and use of controlled-source electromagnetic instruments to study hazards and potential resources located on the continental shelf that have direct implications for human life. More specifically, she is interested in identifying and analyzing marine hydrocarbon seeps, fluid pathways, freshwater resources, and archaeological sites so as to reduce ambiguity in current climate models, manage groundwater resources in coastal communities, and aid in the current understanding of human migration pathways.

LUCAS AARON LUNA

San Diego State University / University of California San Diego

College of Sciences

Concentration: Biochemistry

Specialization: Molecular Mechanisms of Diseases

Donor: Drs. Mara and Larry Yarbarrando / ARCS Foundation - San Diego Chapter



Lucas investigates mechanistic questions at the intersection of biochemistry, cell biology, and medicine. He explores how altered enzyme activity impacts human health using kinetic, structural and cellular tools. He is involved in several projects regarding altered protein function and cellular metabolism. Currently, his research project focuses on studying hypermutated phenotypes of human DNA polymerase epsilon, frequently present in colorectal cancer. He will study how exonuclease domain mutations affect fidelity and processivity to further understand how DNA replication errors are created and propagated.



TIFFANY LUONG

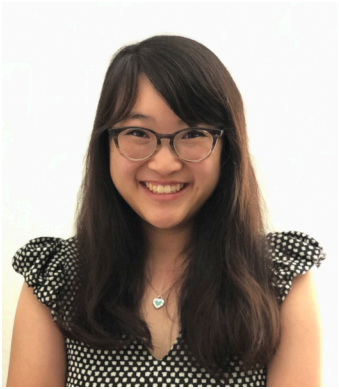
San Diego State University / University of California San Diego

College of Sciences

Concentration: Cell and Molecular Biology

Specialization: Phage Immunology

Donor: Hervey Family Fund Drs. Mara and Larry Ybarrondo / ARCS Foundation - SD Chapter



Bacteriophage (viruses that infect and kill bacteria) treatment currently lacks approval in the US, but when antibiotics fail to eradicate drug-resistant bacterial infections, the FDA can approve emergency phage treatment. During Tiffany's PhD research, she developed a phage production and purification method to produce high-quality clinically safe phage preparations for personalized patient treatment. This method addresses the current production bottleneck hampering access to phage therapy and standardizes the production of therapeutic phages to ensure patient safety. Her ongoing research will study the immunological interactions between phages and mammalian cells to ensure the safety of phage therapy.

KYLE EVAN MALTER

San Diego State University / University of California San Diego

College of Sciences

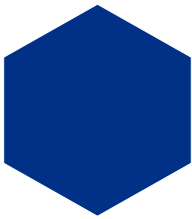
Concentration: Biological Sciences

Specialization: Host-Microbe Biology

Donor: Hervey Family Fund



Kyle's research aims to understand how bacteria directly affect animal development. Identifying the mechanisms that bacteria use to influence animal development could have a wide range of impacts on the scientific community, such as understanding more complex systems, including the human gut microbiome. To study this, Kyle uses a marine tubeworm which requires bacteria for growth and development. This required interaction has allowed him to find key bacterial proteins which control the tubeworm's development. Kyle's future work aims to understand how human gut bacteria contribute to health and development.



AMELIA ODINE STONE-JOHNSTONE

San Diego State University / University of California San Diego

Center for Research in Mathematics and Science Education

Concentration: Mathematics Education

Specialization: Undergraduate Mathematics Education

Donor: Ingrid Benirschke-Perkins and Gordon Perkins



Amelia's research project aims to identify the impact that corequisite mathematics courses have on students intending to pursue majors in science, technology, engineering, and mathematics. A corequisite course is an instructional intervention where students are enrolled in a college-level course while simultaneously receiving academic support. The results from this research will help instructors and program coordinators design impactful support courses that will increase student retention, foster greater interest in the sciences, support students' educational growth, and prepare students for subsequent courses.

NICHOLAS BENJAMIN WILLIAMS

San Diego State University / University of California San Diego

College of Sciences

Concentration: Chemistry

Specialization: Renewable Energy

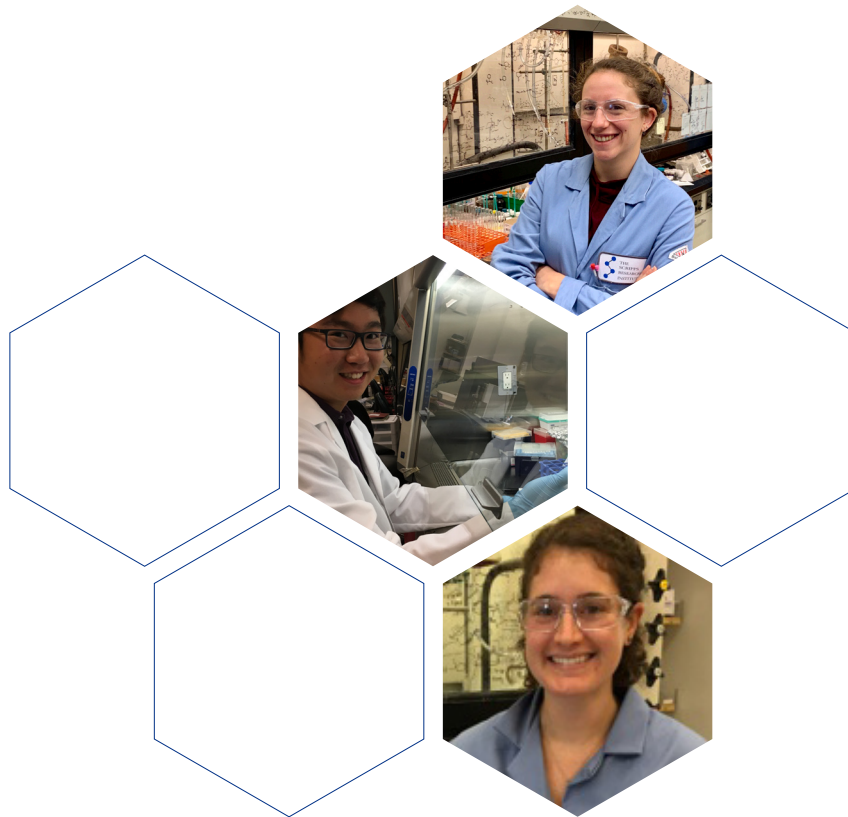
Donor: Virginia Lynch Grady Endowment

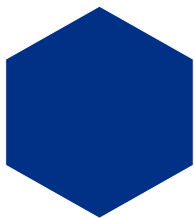


Nicholas is working on developing sustainable photoelectrochemical methods to generate hydrogen gas using semiconductor-organometallic hybrid materials to supply the growing hydrogen economy. This work has also developed methods of using surface sensitive techniques to observe catalyst decomposition. Additionally, he is using novel materials for electrochemical coenzyme regeneration. Coenzymes, which are used by enzymes to drive catalytic reactions, are costly and are one limitation to larger scale enzymatic catalysis. Being able to control recycle coenzymes in an efficient, scalable, and controllable manner would provide significant benefits in this field of catalysis.



Scripps Research





LISA MARIE BARTON

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Chemistry

Specialization: Organic Chemistry

Donor: Larry and Marti Showley / ARCS Foundation - San Diego



As a graduate student in the lab of Professor Phil Baran, Lisa's research focuses on the development of novel chemical transformations that aid in the synthesis of highly strained molecules. Rapid access to these motifs is useful to many different areas of organic chemistry, including the synthesis of pharmaceuticals, natural products and energetic molecules. The ability to access novel strained scaffolds, that would otherwise be very challenging to synthesize, will aid other chemists in their own research.

NATHALIA ROMANIO GAZANIGA

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Biomedical Sciences

Specialization: Immunology

Donor: Paul Bechtner Foundation / ARCS Foundation - San Diego



Nathalia utilizes high throughput drug screening methods to identify small molecule immunomodulators in the context of tumors. By being a part of both a chemical biology and an immunology lab, she can screen for small molecules and subsequently work to understand their mechanism in vitro and in vivo. Her project focuses on applying these small molecules to alter the balance of immune cell populations in the tumor microenvironment.



TUCKER RYAN HUFFMAN

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Chemistry

Specialization: Organic Synthesis

Donor: Reuben H. Fleet Foundation Fund



Tucker's research is currently focused on the chemical synthesis of a biologically active fungal natural product that has exhibited anticancer activity. Access to this material will allow both investigations into its use as a therapeutic agent and studies into how this molecule kills cancer cells. Because of the complexity of the target molecule, Tucker is exploring new reactions that allow the natural product to be made quickly from much simpler, less expensive starting materials.

ANTHONY NICHOLAS MILIN

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

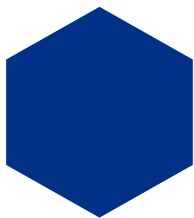
Concentration: Biomedical Sciences

Specialization: Phase Separation in Biology

Donor: : Helga Moore / ARCS Foundation – San Diego Chapter



Each year in America, nearly 1.7 million adults develop sepsis, nearly 270,000 Americans die as a result of sepsis, and 1 in 3 patients who die in hospitals have sepsis. Recent research has identified the growth-arrested state of bacteria as essential to understanding pathogenesis, yet its physiology remains poorly understood. Early investigations point towards liquid-liquid phase separation as one potential starvation protection mechanism for bacteria. By deciphering the physical basis of phase separation and the proteins/molecules that regulate this process, we hope to contribute to the future development of novel antibiotics.



SOPHIA LOUISE SHEVICK

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Chemistry

Specialization: Organic Chemistry

Donor: Virginia Lynch Grady Endowment



Sophie's current project is the synthesis of a natural product (originally isolated from mushrooms) that targets the kappa opioid receptor (KOR). Sophie plans to make this same natural product in the lab, using commercially available starting materials. A synthetic route to this natural product will provide enough material for biological study, while also allowing for deep-seated changes to be made to the chemical scaffold. In the process, Sophie hopes to learn about chemical reactivity while synthesizing this tool to study opioid pharmacology. There is potential for this molecule to serve as a starting point for a non-addictive pain medication.

MIA SHIN

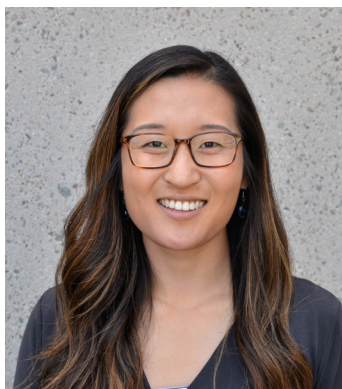
Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

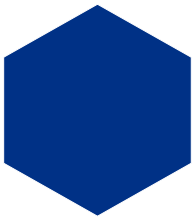
Concentration: Biomedical Sciences

Specialization: Biophysics and Structural Biology

Donor: Peggy Hanley and Hamp Atkinson



For her graduate studies, Mia is using state-of-the-art electron microscopes to solve the structures of proteins that regulate mitochondrial health. By understanding the structure of these essential proteins, she is looking to understand the mechanism of how they work in the cell to maintain health and how they are dysregulated in the context of human disease, as well as to consider potential therapeutic strategies for neurodegenerative diseases such as Alzheimer's and Parkinson's.



NELSON REN WU

Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Immunology

Specialization: Vaccine Design

Donor: Laurie and Michael Roeder



Malaria is an ancient tropical disease caused by parasites carried by mosquitoes. While insecticide-treated nets and anti-malarial drugs have largely contributed to a decline in malaria cases, increasing drug resistance by malaria parasites necessitates the development of an effective vaccine. The most advanced vaccine for malaria is the RTS,S/AS01 vaccine approved for use in select African countries, but that is only partially effective. Nelson's research seeks to apply computational modeling to design and screen more effective vaccine candidates.

LEONARD HEEKYU YOON

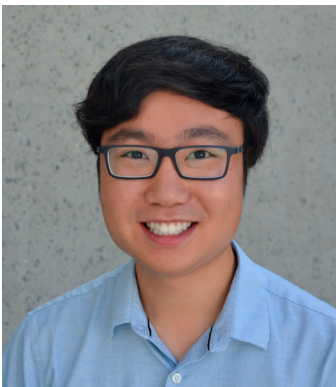
Scripps Research

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Chemical Biology

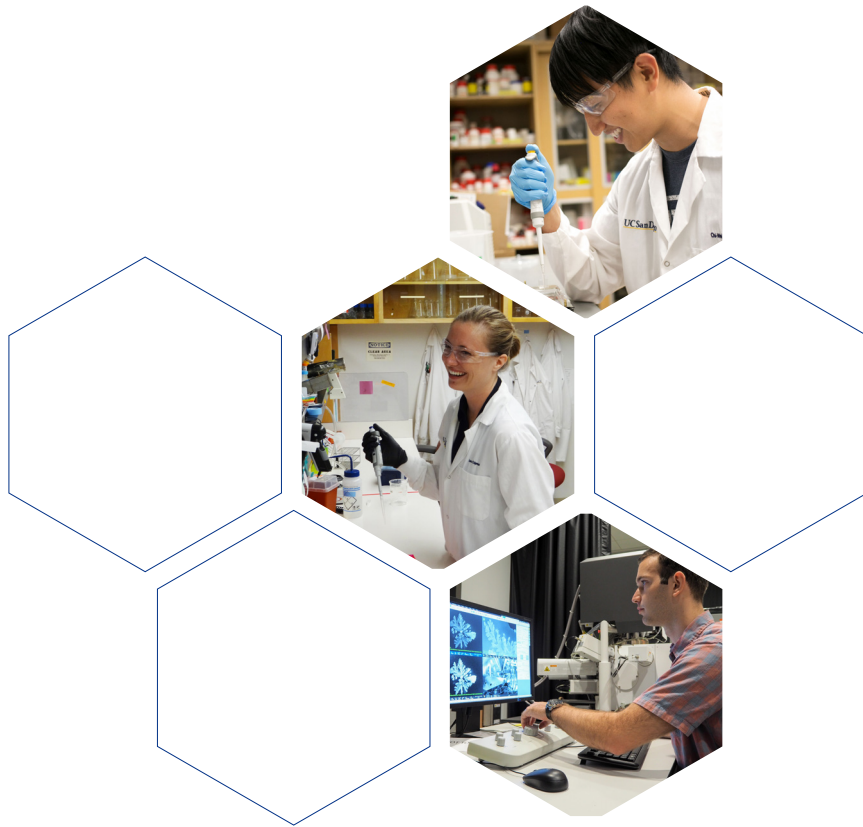
Specialization: Molecular Medicine

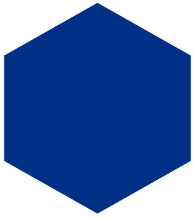
Donor: Karen and Robert Bowden



In the Kelly lab, I am following up on a high-throughput screen that yielded small molecule autophagy activators. After discovering transcriptional and translational targets of these small molecules using RNA-Seq and MS/MS, I aim to synthesize more potent and selective analogs that can ameliorate neurodegenerative disease phenotypes in mammalian cell models. In the Dawson lab, I am attempting to synthesize a D-space Fyn SH2 superbinder for phosphotyrosine-containing substrates. I aim to inhibit overactivated signaling pathways found in various cancers using the superbinder, which will be less susceptible to proteolysis in cells.

UC San Diego





BRYCE ERIC ACKERMANN

University of California San Diego

Division of Physical Sciences

Concentration: Biochemistry

Specialization: Structural Biology

Donor: Lambert Foundation for Education at Union Bank



Bryce studies the mechanisms of DNA compaction within human cells. He aims to describe the structure of the molecules involved in this process by developing the use of superconducting magnets to harness the innate magnetic properties of atoms. While genome sequencing has been extremely valuable, it is the 3-D structure of the genome that determines how DNA is expressed. The development of this technology will both provide insight into DNA organization and equip researchers with an unparalleled tool to study the molecular details of drugs and disease.

MIRIAM KATHLEEN BELL

University of California San Diego

Jacobs School of Engineering

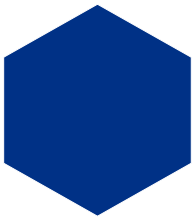
Concentration: Mechanical Engineering

Specialization: Computational Neuroscience, Computational Biophysics

Donor: Reuben H. Fleet Foundation Fund



Miriam uses computational and mathematical tools to investigate the biophysics behind various biological phenomena in neurons and other cell lines. Most of her current projects focus on the shape-function relationship of dendritic spines, small protrusions on neurons that are centers of synaptic communication. Dendritic spines are known to have different shapes that are characteristic of aging, disease, and learning. Therefore, studying how these various shapes relate to dendritic spine and neuronal function provides valuable insight into underlying neural principles that can help combat various neurological diseases and conditions.



LAURA BROWN CHIPMAN

University of California San Diego

Division of Biological Sciences

Concentration: Biological Sciences

Specialization: RNA Regulation of Aging

Donor: Lambert Foundation for Education at Union Bank



Laura's research focuses on how aging is regulated on a molecular level. She studies how a small non-coding RNA molecule that is a fundamental regulator of gene expression, the microRNA, can regulate aging to increase or decrease lifespan. MicroRNAs act as the traffic cops of genetic information, with the ability to block gene expression. Laura wants to know how this regulation connects to organismal aging

GABRIELLE MARIE COLVERT

University of California San Diego

Jacobs School of Engineering

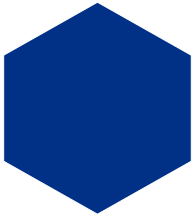
Concentration: Bioengineering

Specialization: Cardiovascular Imaging

Donor: Ellen Browning Scripps Foundation



The development of minimally invasive transcatheter procedures as alternatives to open-heart surgery demands new imaging techniques. Recent advances in noninvasive imaging have supported the success of these procedures by providing the exact size and location of cardiac pathologies and surrounding anatomy. Using noninvasive imaging, Gabrielle is developing novel methods for evaluating cardiovascular function beyond static anatomical measurements. These tools will improve diagnosis and prevention of cardiac events, enable patient stratification for transcatheter interventions, and yield new understanding of how diseases and implanted cardiac devices alter and restore normal function.



BETHANNY PATRICIA DANSKIN

University of California San Diego

School of Medicine

Concentration: Neurosciences

Specialization: Systems Neuroscience

Donor: Hervey Family Non-Endowment Fund



Making a decision based on internal representation of value is a critical component of animal behavior, from a bee foraging between flower patches to complex human behaviors like economic choice or gambling. In interacting with the world, we need to weigh alternative choices with the expected value of outcomes. Bethanny's research uses cutting-edge neurobiological techniques to characterize the encoding of decision by neurons in the brains of awake, behaving mice.

MICKEY FINN III

University of California San Diego

Jacobs School of Engineering

Concentration: NanoEngineering

Specialization: Organic Haptics

Donor: Reuben H. Fleet Foundation Fund



Current virtual reality environments grant ersatz immersion using display screens and speakers but tend to neglect the sense of touch. Mickey's current project utilizes dense arrays of microfabricated electrodes that are designed to be contacted by the finger pads and safely energized in ways that convey movement and/or surface texture. Previous work in electrotactile haptics employed fewer electrodes that were comparatively large with inadequate explanation of how people perceive them. Mickey intends to provide a more definitive understanding of this through human subject testing and statistical methods common in the biological sciences.



MARK KALAJ

University of California San Diego

Division of Physical Sciences

Concentration: Chemistry

Specialization: Materials and Inorganic Chemistry

Donor: Virginia Lynch Grady Endowment



Mark's work focuses on the design of materials that protect soldiers and civilians from chemical warfare agents. Current materials used to protect soldiers from these harmful chemicals involve porous carbons that function simply as adsorbents. Mark's work is concentrated on designing novel materials that can chemically degrade chemical warfare agents and adsorb them. The materials being used in his research are inherently crystalline solids known as metal-organic frameworks. Mark's work also centers on tailoring these solid materials with flexible polymers for their incorporation in protective textile fibers.

KEVIN RICHARD KAUFMANN

University of California San Diego

Jacobs School of Engineering

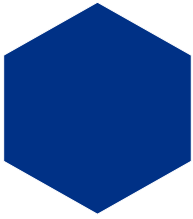
Concentration: NanoEngineering

Specialization: Machine Learning

Donor: Timkin-Sturgis Foundation



Kevin is researching the application of artificial intelligence to material design, discovery, and analysis. His research efforts are reducing the time and money spent searching for materials with enhanced properties by aiding researchers in selecting the best candidate elemental compositions. After synthesizing these candidates, complete characterization is the next hurdle in material development. Kevin is developing advanced machine learning algorithms capable of characterizing many aspects of the material with little to no a priori knowledge required.



ANDREW THOMAS KLEINSCHMIDT

University of California San Diego

Jacobs School of Engineering

Concentration: Chemical Engineering

Specialization: Materials Simulation and Design

Donor: Laura Mateo/Lakeside Foundation / ARCS Foundation – San Diego



Andrew's research focuses on modeling special types of plastics which can be used for solar cells and other electronic materials. These plastics could be used to create affordable solar cells soft enough to be worn on human skin or hard enough to be embedded into roadways. By modeling these materials, their electronic and mechanical behavior can be predicted before testing, allowing for more rapid technological advances.

JENNA JOAQUIN LAWRENCE

University of California San Diego

Jacobs School of Engineering

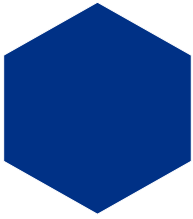
Concentration: Mechanical and Aerospace Engineering

Specialization: Biological Fluid Mechanics

Donor: Wally Schirra Memorial Endowment



Jenna studies the flow of cerebrospinal fluid in the central nervous system, both the overall flow characteristics and the small-scale features of the flow. She uses a combination of theoretical fluid mechanics, numerical simulations, and magnetic resonance imaging to investigate these flows. These results help inform her work on intrathecal drug delivery, in which medication is injected to the lumbar region of the spinal canal with the intent of delivering the medication to locations along the spinal canal or to the brain.



CHI-WEI MAN

University of California San Diego

Division of Physical Sciences

Concentration: Biochemistry

Specialization: Immunotherapy

Donor: Kathryn Crippen Hattox Endowment



Chi-Wei's research focuses on using molecular and cellular engineering to enhance cells to better fight cancer. Immunotherapy is a technique which has gained popularity over the past couple of years due to its success in combating blood-borne cancers such as leukemia; however, immunotherapy still struggles with eradicating solid tumors. One reason for this is the immunosuppressive microenvironment of the tumor. Chi-Wei uses a technique called directed evolution to engineer novel proteins to help immunotherapies remain active in tumor microenvironments and enhance their efficacy.

RYAN JARED MARINA

University of California San Diego

School of Medicine

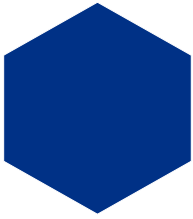
Concentration: Biomedical Sciences

Specialization: Genetics and Genomics

Donor: LaVerne Briggs



Ryan's research project aims to understand the underlying molecular mechanisms of the neurodegenerative disease Amyotrophic Lateral Sclerosis (ALS). Trained as an RNA biologist, Ryan is seeking to identify how mutations within a particular class of proteins, called RNA-binding proteins (RBPs), contribute to disease susceptibility later in life. His research revolves around using a combination of induced pluripotent stem cell (iPSC) technologies and bioinformatic approaches to determine causative pathways contributing to neuron degeneration.



NICOLE PATRICIA MLYNARYK

University of California San Diego

School of Medicine

Concentration: Neurosciences

Specialization: Systems Neuroscience

Donor: Toby Eisenberg



When faced with a decision, we often compare the value of each option and then choose the one that seems most rewarding. Keeping track of value information is very important, but how the brain actually does this remains unclear. To study this, Nicole records the activity of thousands of neurons in a mouse's brain while the animal performs a decision-making task. Using circuit tracing techniques, she can identify the specific neural pathways that encode value, and observe how they communicate with other brain areas to guide our choices.

COLMAN ARTHUR MOORE

University of California San Diego

Jacobs School of Engineering

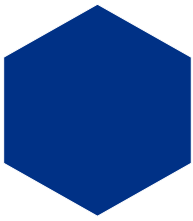
Concentration: NanoEngineering

Specialization: Molecular Imaging

Donor: Donald C. and Elizabeth M. Dickinson Foundation



Colman studies the intersection of nanoengineering and biomedical imaging to develop new strategies for probing disease. He is currently focused on applications in which therapeutic progress has been slow, such as Alzheimer's disease and periodontal disease. In both cases, pathogenesis is not well-defined and pre-symptomatic detection is difficult. He is currently developing a pathogen-sensitive imaging agent for ultrasound-based imaging of periodontal disease. In tandem, he is applying a novel analytical technique for measuring the nanoscale size distributions of self-aggregating proteins, research that has implications for a variety of neurodegenerative disorders.



JESSICA YI-JUN NG

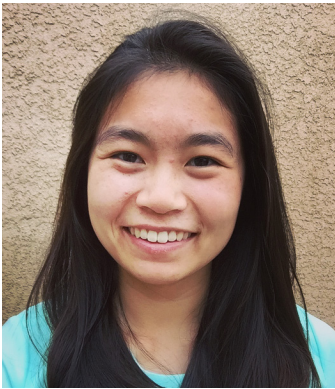
University of California San Diego

Scripps Institution of Oceanography

Concentration: Geochemistry

Specialization: Noble gas paleoclimatology

Donor: Sharon and Carlos Arbelaez



Jessica's research project is in the Andean Highlands of Chile and Argentina, where lithium mining for electric vehicle batteries and other renewable energy technologies is stressing extremely limited water resources. She measures gases dissolved in the groundwater—water that rained or snowed thousands of years ago and accumulated in closed basins—to understand how the level of groundwater has changed over time, with the goal of quantifying the impact of recent lithium mining.

VICTOR WINGTAI OR

University of California San Diego

Division of Physical Sciences

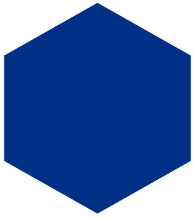
Concentration: Analytical and Atmospheric Chemistry

Specialization: Environmental Surface Chemistry

Donor: Ellen Browning Scripps Foundation



Humans spend a large portion of their time in indoor spaces, but our understanding of these indoor environments is limited due to the overwhelming diversity of indoor spaces. Victor studies how common surfaces, such as windows and painted walls, influence indoor air quality. Substances emitted during indoor activities like cooking and cleaning stick and remain bound on these surfaces. These materials can partake in chemical reactions which alter the chemical makeup at the surface and can impact what compounds come off the surfaces back to room air.



JASON ALEXANDER PLATT

University of California San Diego

Division of Physical Sciences

Concentration: Biophysics

Specialization: Neuroscience/Artificial Intelligence

Donor: Legler Benbough Foundation



Jason is exploring the boundaries between physics, neuroscience and computer science in order to build more biologically-realistic neural networks. He is taking as his model system the insect—specifically the locust—olfactory pathway, a network which has evolved to identify chemical constituents in odors rapidly and accurately, and for which there is enough known biologically to use as a basis for machine learning. Biologically based artificial intelligence programs hold the promise of being able to learn much faster than current systems, while being robust to noise and adversarial attacks.

CHANNING JOSEPH PREND

University of California San Diego

Scripps Institution of Oceanography

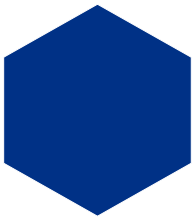
Concentration: Physical Oceanography

Specialization: Air-sea Interaction

Donor: ARCS Foundation – San Diego / Toby Eisenberg



Channing studies the exchange of heat and carbon dioxide between the ocean and atmosphere, which regulates the global climate system. He uses measurements from autonomous robotic floats, as well as satellite data and numerical models, to research how ocean circulation contributes to patterns of biological productivity and carbon uptake in the Southern Ocean, which surrounds Antarctica. This region plays an outsized role in the global ocean circulation and carbon cycle, and thus, studying these processes is crucial to improving climate models and future climate projections.



DIMITRIOUS ADRIAN SCHREIBER

University of California San Diego

Jacobs School of Engineering

Concentration: Electrical Engineering

Specialization: Medical Robotics

Donor: **Beyster Family Foundation**



Dimitri's research focuses on the development and clinical translation of general-purpose Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) guided needle-placement robots. These environments are challenging to work within due to their combination of a confined working area while simultaneously requiring high manipulation dexterity. Dimitri is beginning clinically relevant tests of his highly dexterous CT compatible needle driving robot and developing an MRI compatible version of this system. This project's goal is to increase patients' standard of care, allowing earlier treatment with less pain while increasing consistency for procedures that require intraoperative imagery.

SAMANTHA LYLAH SISON

University of California San Diego

School of Medicine

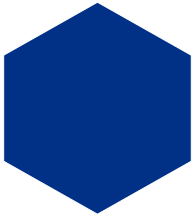
Concentration: Cell and Molecular Biology

Specialization: Neurobiology and Stem Cell Biology

Donor: **Dottie Georgens**



Sammi's research project aims to understand the molecular mechanisms underlying Huntington's disease, a progressive neurodegenerative disorder that leads to motor and cognitive problems and eventually death. With a background in stem cell biology and neuroscience, Sammi uses induced pluripotent stem cells from people with Huntington's disease to study the genetic pathways that may be contributing to neurodegeneration in the brain. By using this system, she hopes to identify therapeutic targets for the potential treatment of people with Huntington's disease.



MATTHEW DAVID STONE

University of California San Diego / San Diego State University

School of Medicine

Concentration: Public Health - Health Behavior

Specialization: Tobacco Regulatory Science

Donor: Kenneth and Marjorie Blanchard



Matthew's research uses choice-based preference tasks, sensor technology and ecologically driven data to investigate the impact that graphic warning labels affixed to cigarette packaging have on consumer health perceptions, thoughts of quitting, and behavioral outcomes among daily smokers. His research also focuses on identifying product characteristics of e-cigarettes that can be altered in order to protect youth and mitigate the harms of vaping. Combined, this high-impact research aids in reducing the global health burden of tobacco-related morbidity and mortality.

ANTHONY QUOC VU

University of California San Diego

School of Medicine

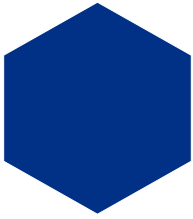
Concentration: Biomedical Sciences

Specialization: Genetics and Genomics

Donor: Hervey Family Non-Endowment Fund



Anthony's research focuses on understanding how stress granules may contribute to neurodegenerative diseases. Stress granules are transient clumps of protein and RNA that form inside the cell when exposed to environmental stresses. These assemblies protect their molecules from damage and help the cell survive. Importantly, abnormal formation and clearance of stress granules may impact cell survival and are implicated in the pathogenesis of neurodegeneration. Through experimental methods, his goals are to identify components that contribute to stress granule biology and to determine how misregulation of key genes may contribute to disease progression.



ALEXANDER JEFFREY WHITEHEAD

University of California San Diego

Jacobs School of Engineering

Concentration: Bioengineering

Specialization: Regenerative Medicine and Tissue Engineering

Donor: [Reuben H. Fleet Foundation](#)



Alex studies how the immune system regulates how the heart heals after a heart attack. He also studies how certain animals can regenerate their hearts, and if we can use similar processes to heal human hearts. He uses large datasets to decipher how protein composition of the heart changes with age and in instances of disease. By combing data-driven approaches and molecular biology techniques, he hopes to identify drug targets to improve outcomes of heart attack patients.

JIARONG ZHOU

University of California San Diego

Jacobs School of Engineering

Concentration: NanoEngineering

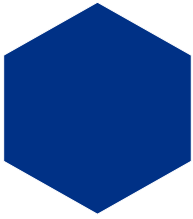
Specialization: Vaccine Development

Donor: [Donald C. and Elizabeth M. Dickinson Foundation](#)



Jiarong's research focuses on leveraging tiny particles for the development of vaccines against both infectious diseases and cancer. Vaccines are the safest and most effective means of fighting against infections. By introducing the foreign substances into the immune system in a safe manner, our immune cells can be taught to fight against the pathogens and cancerous cells. Jiarong is currently utilizing cell membrane-coated nanoparticles to create personalized vaccine formulations for individual patients.





BYRON BATZ

University of San Diego

Hahn School of Nursing and Health Science

Concentration: Nursing

Specialization: Home Based Palliative Care

Donor: [Beyster Family Foundation](#)



Byron is studying how caregiving affects the health of those in the role of caregivers. This is important as not many programs currently exist that provide caregiving support, especially in the home environment.

PEDRO ALONSO COLIO

University of San Diego

Hahn School of Nursing and Health Science

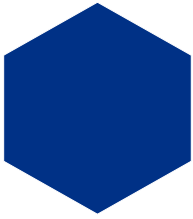
Concentration: Nursing

Specialization: Cardiology & Emergency Medicine

Donor: [Beyster Family Foundation](#)



Pedro Colio's research project is geared towards identifying the incidence and prevalence of hypertrophic cardiomyopathy in one of the most underserved counties in Southern California. A research project like this will be highly beneficial for science and members of this community. Pedro hopes to identify any particular trends or determinants of health associated with this condition. If any trends are found, they could potentially be used for early screening and management among certain individuals.



ANN OZAZE LAWANI

University of San Diego

Hahn School of Nursing and Health Science

Concentration: Nursing

Specialization: Cardiopulmonary Nursing and Palliative Care

Donor: [Beyster Family Foundation](#)



My research seeks to understand patients' lived experience, perceptions and misconceptions about transitioning to Palliative Care. Results from this research will help nurses become better educators for patients with chronic illnesses and enlighten nurses about ways to reduce the barriers that hinder successful transition. I am hopeful that in the future, this will encourage the inclusion of Palliative Care in the nursing curriculum and ensure a solid foundation for nurses from every background to meet the needs of patients, relating to appropriate communication about quality of life issues, not if, but when the need arises.

BROOKE HALEY RAKES

University of San Diego

Hahn School of Nursing and Health Science

Concentration: Philosophy of Nursing

Specialization: Neonatal Outcomes

Donor: [Reuben H. Fleet Foundation Fund](#)



As a nurse working in the Neonatal Intensive Care Unit (NICU) for 7 years I am passionate about improving outcomes for pregnant/post-partum women, infants, and their families. The clinical questions and challenges I have observed at the bedside have compelled me to obtain a research doctorate. My research focuses on infants with suspected Hypoxic-ischemic encephalopathy (HIE), a type of neurological dysfunction resulting in devastating long-term neurological morbidity and/or mortality. Through my research, I hope to improve infant outcomes by generating new knowledge related to HIE identification, treatment initiation, and management.