

# MARC NEWS

Maximizing Access to Research Careers Fall 2017, Issue #3



SAN DIEGO STATE UNIVERSITY

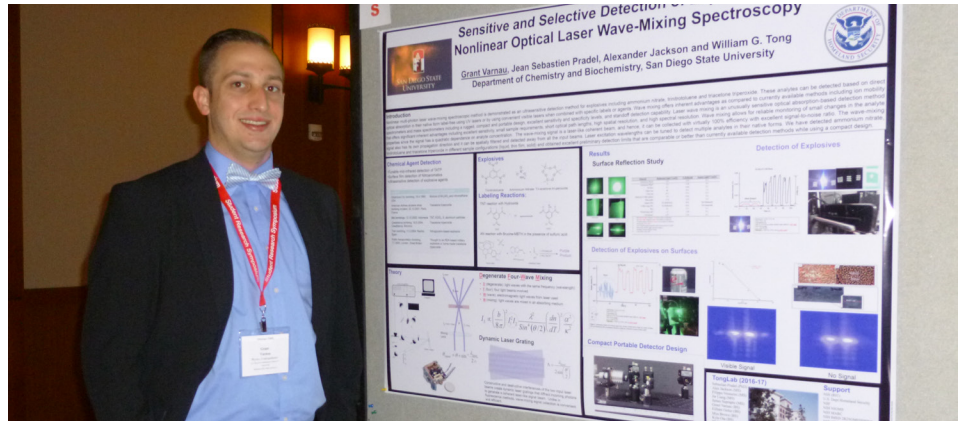


## Message from the Director

To enhance the diversity of the NIH workforce, a national Diversity Program Consortium (DPC) has been established to develop, implement, and evaluate innovative approaches to research training and mentoring. With an emphasis on mentoring, the goal of this program is to engage diverse students and faculty and facilitate their success. The National Institutes of Health has become increasingly aware of the fact that mentorship is critical and can take many forms. One mentoring effort that has developed out of the DPC is the [National Research Mentoring Network \(NRMN\)](#).

NRMN is a nationwide consortium of biomedical professionals and institutions collaborating to provide trainees across the biomedical and behavioral sciences with evidence-based mentorship and professional development. The website allows its users to develop a profile and get matched to mentors with similar interests across the United States. The website also holds regular webinars on career and professional development, grant writing and biomedical research. The SDSU MARC program has developed a official collaboration with the NRMN and MARC scholars are required to sign up for NRMN mentoring. The additional mentors and the programming provided by NRMN will contribute to our scholars' success as they matriculate into doctoral level programs. Mea Songco, one of our MARC scholars has already been matched with a virtual mentor she "loves meeting with" and has already given her "great advice" catering to her needs. Having multiple experienced and successful mentors guiding our students in a chosen field is a wise decision that can facilitate MARC student success.

Cathie Atkins, Program Director & PI



## Grant Varnau College of Sciences Outstanding Senior

Graduating senior Grant Varnau grew up tinkering and fixing cars around the house with his dad. He said these experiences developed his passion for engineering, and after taking a physics class in high school he was hooked. So much so that he graduated in May with a bachelor's degree in physics and a minor in interdisciplinary studies from Weber Honors College. He spent a summer at Texas A&M conducting research in the nuclear engineering department and the summer after that at Vanderbilt University with the Applied Optical Physics group. Grant is one of 10 students from SDSU to receive the 2017 Quest for the Best award, and was the College of Sciences Outstanding Graduating Senior. In the fall he will start a doctoral program in chemical physics at the University of Arizona. We congratulate Grant and express our appreciation to his mentor, William Tong and his lab team for the support and guidance they provided Grant.

To read about Grant and other SDSU Standouts, click on this link: [http://newscenter.sdsu.edu/sdsu\\_newscenter/news\\_story.aspx?sid=76754#TOP](http://newscenter.sdsu.edu/sdsu_newscenter/news_story.aspx?sid=76754#TOP)

## In this Issue

Message from the Director .....	1
Outstanding Senior .....	1
Coming Attractions .....	1
Achievement, Awards & Fellowships .....	2
2017 Graduates .....	2
Program Publications .....	2
Pre-MARC Highlights .....	3
Mentor Highlights .....	3
Training Opportunities .....	3
Alumni Corner .....	3
First Year in a Ph.D. Program .....	4
Events .....	4

## Coming Attractions

- Undergraduate Research Symposium, SDSU, San Diego, CA..... October 13, 2017
- SACNAS National Conference, Salt Lake City, Utah ..... October 19-21, 2017
- ABRCMS National Conference, Phoenix, Arizona ..... November 1-4, 2017
- Current Ph.D. Panel Event, SDSU, San Diego, CA ..... December 8, 2017
- Post Ph.D. Panel Event, SDSU, San Diego, CA ..... March, 2018

The SDSU Maximizing Access to Research Careers Undergraduate Student Training in Academic Research (MARC U\*STAR) is a pre-doctoral research training program that seeks to prepare and assist underrepresented undergraduates who wish to pursue graduate studies leading to a Ph.D. or M.D./Ph.D. program in the biomedical or behavioral sciences. The program is funded by a 3-year continuation grant (5T34GM003803) by the National Institutes of Health, General Medical Sciences (NIH/NIGMS).

## Achievements, Awards, & Fellowships

**Eric R. Gonzalez**, MARC graduating senior in Biochemistry, received the prestigious NSF Graduate Fellowship. Eric was one of 2,000 recipients chosen from 13,000 applicants, and one of 726 undergraduate seniors. Applicants represented a wide range of scientific disciplines from all over the country. He also received an Honorable Mention for the Ford Fellowship. Congratulations Eric! You make MARC and SDSU proud.

**Rifqi Affan** received the Provost's Award for Outstanding Poster Presentation for his research presentation entitled "High-intensity (binge) is Associated with Altered Neural Oscillations in Young Adults" at the 2017 SDSU Student Research Symposium. Rifqi is a psychology major and conducts research with Dr. Ksenija Marinkovic at the Spatio-Temporal Brain Imaging Lab.

**Madison Kennedy** received the Undergraduate Research Excellence Award for her research presentation entitled "The Characterization of the Receptor Tyrosine Kinase Tie2" at the 2017 SDSU Student Research Symposium. Madison is a Biochemistry major and conducts research with Dr. Christal Sohl where they use "kinetic, structural, and cellular tools to address how altered enzyme impacts human health".

## Introducing the 2017 MARC Graduates

Well, they did it. They accomplished a milestone in their lives - their undergraduate graduation. This is a major step in their academic journey, but for them there will be another graduation, the one from their doctoral programs. Our graduates are headed to different programs and universities across the country where they will contribute to leading research, discovery and academics. We are proud and offer our heartfelt congratulations to our graduates!

**Eric R. Gonzalez** (BS: Biochemistry) worked with his mentor, Christal Sohl, on the molecular mechanisms of isocitrate dehydrogenase mutations. In fall 2017 he will start the chemistry and chemical biology doctoral program at the University of California, San Francisco. Read interview with Eric at: [http://newscenter.sdsu.edu/sdsu\\_newscenter/news\\_story.aspx?sid=76822](http://newscenter.sdsu.edu/sdsu_newscenter/news_story.aspx?sid=76822)

**Alexandra (Alex) Mallory** (BS: Aerospace Engineering) worked with her mentor, Satchi Venkataraman, on the automatic analysis of composite test specimen in ABAQUS. In fall 2017 she will start the aeronautics and astronautics doctoral program at Purdue University.

**Grant Varnau** (BS: Physics) worked with his mentor William Tong on multi-photon nonlinear laser methods for sensitive detection of chemical/biological agents. In fall 2017 he will start the chemical physics doctoral program at the University of Arizona.



## Program Publications

Matteo, D.A., Grunseth, A. J., **Gonzalez, E.R.**, Anselmo, S.L., **Kennedy, M.A.**, Moman, P., Scott, D.A., Hoang, A., & Sohl, C.D. (2017). Molecular Mechanisms of Isocitrate Dehydrogenase 1 (IDH1) Mutations Identified in Tumors: The Role of Size and Hydrophobicity at Residue 132 on Catalytic Efficiency. *Journal of Biological Chemistry*, 292(19) 7971-7983. . <http://dx.doi.org/10.1074/jbc.M117.776179>.

## Pre-MARC Highlights

Pre-MARC is a program developed for freshmen and sophomores to reinforce awareness, interest and motivation for STEM disciplines through (1) a first year seminar, (2) a mentoring experience with an Institutional Research and Academic Career Development Award (IRACDA) postdoctoral fellow, and (3) an opportunity to participate in a 6-week summer science enrichment program. Pre-MARC also establishes a pipeline to the MARC program.

Congratulations to the following pre-MARC students for their acceptance to the MARC program.

**Jade Johnson** was accepted to MARC fall 2016. She is a chemistry major working with Dr. Andrew Cooksy.

**Jeremea Songco** was accepted to MARC fall 2016. She is a psychology major working with Dr. Claire Murphy.

**Sara Torres Robles** was accepted to MARC in June 2017. She is a biochemistry major working with Dr. Tom Huxford.

## In Research

**Rebecca Townsley** (chemistry) began conducting research with Dr. Christopher Harrison in spring 2016, and presented their work on "measuring metal complexation capacity of unknown fulvic acid substances via capillary electrophoresis" at the SDSU 2017 Student Research Symposium in March. Way to go Rebecca!

**Amy Igarashi** (Astronomy) is part of a radio astronomy research team at U-Penn conducting research this summer for the Hydrogen Epoch of Reionization Array (HERA) project.

**Bryan Hayes** (Mathematics) is part of a research team led by Dr. Samuel Shen of the Climate Informatics Lab at SDSU. This summer they are analyzing climate data in an effort to better predict changes in the weather. Bryan received this opportunity through the National Oceanic Atmospheric Administration (NOAA). Congratulations!

## On to Graduate School

**Duyen Trang** after completing her master's in psychology from SDSU, is headed this fall 2017 to UC Riverside to start a doctoral program in psychology.

**Savannah Sawaged**, after conducting research with Dr. Kathleen McGuire from the Biology Department, she is on her way this fall 2017 to Cedar Sinai to start her doctoral program on Translational Medicine.



## MARC Mentor Highlights

### Dr. William Tong



**William Tong**, Distinguished Professor of Chemistry & Biochemistry, Department Chair, MARC faculty mentor, and recipient of the 2017 SDSU Faculty Diversity Award, leads a group of graduate and undergraduate students working with novel laser detection methods that can detect the smallest trace of chemicals. Research in his lab has contributed to medical breakthroughs.

Dr Tong and his team have developed new nonlinear laser methods for chemical analysis with zeptomole-level ( $10^{-21}$  mole) or sub-parts-per-quadrillion level detection sensitivity. The patented laser wave-mixing methods can distinguish biomolecules as well as small isotopes. These methods yield hyperfine profiles, or atomic fingerprints, and hence, unambiguous isotope information from both stable and radioisotopes. Hence, they are able to use stable isotopes as biotracers instead of radioactive biotracer isotopes.

Laser wave mixing offers comparable or better detection sensitivity levels for biomolecules as compared to fluorescence-based methods, and yet this method can detect both fluorescing and non fluorescing molecules with excellent sensitivity levels. This allows biomolecules to be detected in their native form without using tags or labels. They can achieve this level of sensitivity because the laser probe is very small (picoliter) and it can be positioned precisely inside the analyte (e.g., a single bio cell). The input laser beams create dynamic laser gratings at the atomic or molecular scale and the resulting nonlinear optical effect produces a strong signal beam that shoots out of the analyte. Their laser methods produce a strong coherent laser-like signal beam that is easy to detect with excellent signal-to-noise ratios. This small probe allows detection of devices such as microarrays, chip-based electrophoresis systems, microfluidic devices, and other capillary-based systems that are suitable for studying mechanisms and dynamics of chemical and biological processes.

Excellent sensitivity detection promise many applications for this laser wave-mixing methods such as early detection of diseases (Parkinson's, Alzheimer's, cancer), better design of cleaner drugs, more sensitive detection of pollutants and chemicals both inside the human body and in the environment, remote standoff detection of chemical/biological agents, and even authentication of paintings and art objects.

## Training Opportunities

Summer research at other universities around the country, provide our MARC scholars the opportunity to experience life outside of SDSU, as well as provide a gateway to graduate education at these universities. We look forward to learning about their experiences this summer when they return to campus. Here's where they are this summer.



**Rifqi Affan**, psychology, is working this summer at UCSD in the Department of Cognitive Science working with Dr. Brad Voytek.

**Elena Arroyo**, Physics, is working this summer at the University of Colorado, Boulder with Dr. Loren Hough.

**Daniel Delgado**, Environmental Engineering, is working this summer at the University of Washington, St. Louis in the Energy, Environmental and Chemical Engineering Department with Dr. Young-Shin Jun.

**Jade Johnson**, Chemistry, is working this summer at the University of Montana with Dr. Edward Rosenberg.

**Madison Kennedy**, Biochemistry, is working this summer at the Mayo Clinic with Dr. Joseph Loftu.

**Jeremea (Mea) Songco**, psychology, is working this summer at Center for Sensorimotor Neural Engineering group at the University of Washington with Dr. David Gire.

## Alumni Corner



**Richard Virgen-Slane, Ph.D.** got his first research experience at SDSU in the laboratory of Jacques Perrault, Ph.D. After graduating from SDSU, he earned his Ph.D. from the University of California, Irvine, in the span of four years. His dissertation work, carried out in the Laboratory of Bert L. Semler, Ph.D., provided the solution to a 34-year old mystery of picornavirus molecular biology, in addition to identifying a novel drug target for the common cold. He then accepted an NIH T32 postdoctoral research fellowship (funded through UCSD) in the laboratory of Carl F. Ware, Ph.D. at the Sanford-Burnham-Prebys (SBP) Medical Discovery Institute (SBP) in La Jolla, CA where he invented a unique method of identifying novel regulatory mechanisms that control inflammation. Currently he is still at SBP, where he participates in an on-going collaboration with the pharmaceutical company, Boehringer Ingelheim, which aims to develop new drugs for treating autoimmune diseases. His goal is to transition into an independent research position by demonstrating his unique use of molecular biology and computational methods to progress biomedical research. For the last two years Richard has also been a member of the MARC program Advisory Board Committee. We are very proud of Richard and send him our best wishes for a successful future.

## First Year in a Ph.D. Program

Beginnings are tough. It takes a while until you get the hang of the situation, and the first year of a Ph.D. program is no exception. We asked our alumni if there was any advice they wished someone would have told them about the first year in a Ph.D. program, and although programs vary, there were common themes.

**Graduate Classes** are HARD, and you can come to doubt yourself and your intelligence. This can take a toll emotionally. One of the alumni felt “stupid” and another suffered from “impostor syndrome”. It can be an adjustment and even classmates who seem like they have it all together are working harder than they’ve ever worked before. So “reach out to anyone and everyone”. “Create fellowship with the people in your classes, regardless of their research” and “don’t alienate yourself.”

There’s going to be heavy demands on your time, so **time management** becomes key. Two things stand out from the comments of our alumni. One, better utilize all available time. For example, one of our alumni said, “I had to plan experiments in between classes and learn to read for assignments during waiting periods”. A second common theme from several alumni was to narrow your focus during the first year to the essentials, “don’t volunteer, don’t join any clubs, don’t go to conferences, just focus on your coursework and maybe some research”. Another distraction commonly mentioned was being a TA or GA in an area unrelated to their research or academic interests - avoid if possible.

Even with the focus on finding as much time for your studies as possible, it was mentioned by multiple alumni that taking a break from studies was important to **avoid mental exhaustion**. “I am here to tell you that you’ll actually be more productive and produce better work if you are well rested and give yourself a break”, said an alumnus. Also, **developing a support system** of fellow students, friends, family, and mentors is extremely important for maintaining perspective “my boyfriend and friends were integral in helping me stay positive and bringing my spirits up when I’d had a bad day with research and classes”.

From the topics touched upon above, your first year in a Ph.D. program can be hard, but take comfort in knowing that it’s hard for everyone - so take care of yourself and stay positive. To read the alumni comments in full, please [click here](#).

## Events

### Post Ph.D. Panel

The 12th annual Post Ph.D. panel was held March 17, 2017 with the support from the SDSU President’s Leadership Fund. The seven-member panel included six SDSU alumni who shared with over 75 students the challenges and pitfalls to avoid during and after graduate school. Panelist spent the first hour addressing questions from the group. During the second hour the panel separated into discipline-specific groups to allow students to address more specific questions. This year’s panel were.

**Veronica Casas** earned her Ph.D. in Biology from the UCSD/SDSU Joint Doctoral Program, and is currently an Instructor in the Biology Dept. and Director of the SDSU STEM Start Program.



**Sofie Champassak** earned her Ph.D. in Clinical Health Psychology from the University of Missouri-Kansas City. She is currently a Postdoctoral Fellow at the San Diego VA Hospital.

**Jeremiah Keyes** earned his Ph.D. in Biochemistry & Molecular Biology from the Wake Forest University. He is currently an IRAC-DA postdoctoral Fellow at UCSD.

**Diana Lozano** earned her Ph.D. in Physiological Optics & Vision Science from the University of Houston College of Optometry. She is currently a Post-doctoral Research Fellow at Oregon Health & Science University.

**Aurora Ramos Nunez** earned her Ph.D. in Developmental, Cognitive & Behavioral Neuroscience from the University of Houston. She is currently a Postdoctoral Research Fellow at Rice University and Baylor College of Medicine.

**Denisse Tiznado** earned her Ph.D. in Clinical Health Psychological from the University of Missouri-Kansas. She is currently a Psychology postdoctoral Fellow.

**John Tolli** (1995-1997) earned his Ph.D. in Biological Oceanography from the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in Oceanography. He is currently a Professor of Biology at Southwestern College.

#### PROGRAM STAFF:

**Cathie Atkins, Ph.D.**

*PI and Director, Associate Dean for Academic & Faculty Affairs  
Professor of Psychology*

**Stanley Maloy, Ph.D.**

*Co-PI, Dean College of Sciences  
Professor of Biology*

**Thelma Chavez**

*MARC Program Coordinator*

**Maribel Calderon-Olson**

*Data Coordinator*

#### FOR INFORMATION, CONTACT:

Thelma Chavez, MARC Program Coordinator  
SDSU College of Sciences, GMCS 322B  
San Diego, CA, 92182-1016

Phone: 619-594-7195 | Email: [thelma.chavez@mail.sdsu.edu](mailto:thelma.chavez@mail.sdsu.edu)  
<http://www.sci.sdsu.edu/marc/>



If you prefer not to receive MARC News, please send an e-mail to Thelma Chavez.