PREPARING PROMISING SCHOLARS FOR GRADUATE EDUCATION IN SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SINCE 2000.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>UC LEADS OVERVIEW</td>
<td>2</td>
</tr>
<tr>
<td>KORET UC LEADS RESEARCH AND LEADERSHIP SYMPOSIUM</td>
<td>8</td>
</tr>
<tr>
<td>UC LEADS PROGRAM OUTCOMES</td>
<td>9</td>
</tr>
<tr>
<td>UC BERKELEY CAMPUS OUTCOMES</td>
<td>14</td>
</tr>
<tr>
<td>UC DAVIS CAMPUS OUTCOMES</td>
<td>15</td>
</tr>
<tr>
<td>UC IRVINE CAMPUS OUTCOMES</td>
<td>16</td>
</tr>
<tr>
<td>UC LOS ANGELES CAMPUS OUTCOMES</td>
<td>17</td>
</tr>
<tr>
<td>UC MERCED CAMPUS OUTCOMES</td>
<td>18</td>
</tr>
<tr>
<td>UC RIVERSIDE CAMPUS OUTCOMES</td>
<td>19</td>
</tr>
<tr>
<td>UC SAN DIEGO CAMPUS OUTCOMES</td>
<td>20</td>
</tr>
<tr>
<td>UC SAN FRANCISCO CAMPUS OUTCOMES</td>
<td>21</td>
</tr>
<tr>
<td>UC SANTA BARBARA CAMPUS OUTCOMES</td>
<td>22</td>
</tr>
<tr>
<td>UC SANTA CRUZ CAMPUS OUTCOMES</td>
<td>23</td>
</tr>
</tbody>
</table>
UC LEADS OVERVIEW

The University of California’s Leadership Excellence through Advanced Degrees (UC LEADS) program prepares promising students for advanced education in science, technology, engineering and mathematics (STEM). The program is designed to identify educationally or economically disadvantaged undergraduates enrolled at UC who are likely to succeed in graduate school, and to provide these students with undergraduate educational experiences that will prepare them to assume positions of leadership in industry, government and public service, and academia following completion of a doctoral degree.

Following a report of the UC Outreach Task Force in 1999, significant steps were initiated to strengthen the extent and quality of UC’s outreach resources to its graduate and professional programs. Thus, UC LEADS was proposed as a vehicle for investing in UC undergraduates as a strategy to enhance the diversity of the UC graduate student body. Focusing on the emergent societal human resource needs, the proposal to create UC LEADS was focused on undergraduates pursuing courses of study in science, mathematics, or engineering. The inaugural cohort of UC LEADS scholars was selected in the year 2000.

Each year, those chosen as UC LEADS scholars embark upon a two-year program of scientific research and graduate school preparation guided by individual UC faculty mentors. Scholars are provided with an excellent opportunity to explore their discipline, experience a research environment, and increase their chances for future study in their chosen field. Scholars gain valuable educational experience, the University develops a better prepared and more diverse graduate applicant pool, and ultimately, the State gets well-educated future leaders.
UC LEADS OVERVIEW

As part of the program, faculty mentors assist scholars in designing a plan of research and enrichment activities tailored to the individual interests and academic goals of the scholar.

This action plan includes:

- Academic year research
- Paid summer research experience
- Participation in the annual system-wide UC LEADS Research and Leadership Symposium
- Attendance at professional or scientific society meetings
- Travel to other UC campuses
- Academic enrichment activities, including preparation for the Graduate Record Examination (GRE)

From the inception of UC LEADS in 2000-01 through the 2014-15 cohort, 785 scholars have participated in the program. Given the importance of ensuring gender equity within STEM-based doctoral programs, it is notable that 389 (49.5%) of the 785 UC LEADS scholars are female. Also of note, 376 (48%) of scholars are from underrepresented minorities. Of the first 12 cohorts (649 students), 633 (98%) have earned their undergraduate degrees. Subsequently, 446 of these 633 students (70%) are either currently enrolled in graduate school or have already earned graduate degrees in a variety of doctoral and master’s programs. Moreover, twelve UC LEADS alumni are now serving as tenure-track faculty, including four within the UC system.

OBJECTIVES

The UC LEADS program identifies, encourages, and trains undergraduates who have potential for leadership as graduate students and as future leaders committed to address the educational and economic factors leading to underrepresentation of domestic minorities in the STEM fields. The UC LEADS program provides students with the tools that prepare them to meet California’s continuing scientific, economic, and social challenges. UC LEADS scholars are empowered with research experience, advanced educational credentials and leadership skills. They prepare themselves to earn PhD’s in STEM fields offered by the University of California. UC LEADS scholars, as future leaders, will be:

- Able to function with vision and sensitivity in a diverse society to lead others in creating an environment that meets the needs of a diverse workforce.
- Able to assist the state through the creation of new knowledge, industries, and the development of a technically competent workforce.
- Ready to assist in preparing future generations of students in the STEM fields at the University of California.
- Able to provide leadership in addressing the underrepresentation of domestic minorities in STEM fields.
- Able to assume future leadership roles in industrial, governmental, and academic positions.
UC LEADS OVERVIEW

SELECTION

The UC LEADS program identifies students who have:

- Experienced educational barriers to their academic progress, or who express a commitment to address the barriers that prevent students from underrepresented groups from participation in graduate academic programs.
- Experienced situations or conditions that affected their ability to advance in a STEM field (e.g. the absence of a role model in the STEM field, absence of a family member who received a four-year college degree or graduation from high school with poor financial or curricular support).
- Leadership potential to address the issues of underrepresentation in the STEM fields.
- The potential to gain the personal and multicultural competency skills necessary to address the needs of a diverse state and global community through science and technology.

ELIGIBILITY

To be eligible for selection, applicants must be:

- Enrolled in a UC undergraduate degree program in Science, Technology, Engineering or Mathematics.
- Educationally and/or economically disadvantaged.
- Interested in research (students do not have to have previous research experience).
- Seasoned UC sophomores or eligible transfer students. Since this is a two-year program, UC LEADS scholars will need to be available to spend one summer performing research at their home campus and then a second summer performing research at another UC campus.
- Intent to pursue a PhD in a STEM field.
- In good academic standing in an undergraduate degree program with a minimum GPA of 3.0.
- Able to demonstrate potential for success in a graduate program.
- Citizens or permanent residents of the United States or AB540 eligible students.
UC LEADS OVERVIEW

PROGRAM COMPONENTS

UC LEADS achieves its important objectives by providing faculty mentoring, experiential learning in summer and academic-year research programs, involvement in professional and scientific societies, exposure to the UC graduate environment, and participation in key academic enrichment programs, including leadership development activities.

- Undergraduate Mentorship Experience: Scholars are matched with UC faculty members who serve as mentors. These mentors assist the scholars in developing a structured research plan. UC Campus Program Coordinators also counsel UC LEADS scholars about educational plans and help them to prepare for the challenges of graduate school. Scholars also have the opportunity to participate in professional and/or scientific society meetings.

- Academic Year Research: Scholars participate in an organized research program during each academic year, under the direction of the faculty mentor.

- Campus Academic Enrichment and Leadership Development Opportunities: Scholars participate in academic enrichment programs providing special training in areas critical to academic and professional success, such as scientific writing, preparing and making academic presentations, and development of research-related skills. By the end of the second summer, scholars have participated in Graduate Record Examination (GRE) preparation training activities and during the second academic year of the program scholars prepare a graduate academic admission application and an appropriate fellowship application. Campus coordinators assist scholars in developing leadership skills through participation in supervised experiential learning opportunities (e.g. occasions to lead or mentor scholars within or outside the program) or workshops (e.g. time management, communication, modes of working with and promoting diversity, course-work success).
UC LEADS OVERVIEW

- Summer Research Program Experience: UC LEADS Scholars participate in two summer research experiences. The first takes place on the Scholar’s home campus as they work full time on a research project during the summer (40 hours/week receiving a minimum summer stipend of $3,000). The second summer research experience occurs at another UC campus. Scholars work full time on a research project during the second summer (40 hours/week). They receive a minimum summer stipend of $3,000 and housing or housing compensation.

- Scientific Research and Presentations: In addition to the Koret UC LEADS Research and Leadership Symposium and their summer presentation, Scholars are encouraged to present their work at national or regional scientific meetings.

FUNDING

The ten UC campuses receive an annual total funding allocation of $458,000 from the State of California as part of the Student Academic Preparation and Educational Partnerships (SAPEP). In addition, individual UC campuses provide matching funds and in-kind support. The University of California’s SAPEP programs seek to raise student achievement levels generally and to close achievement gaps between groups of students throughout the K-20 pipeline so that more educationally disadvantaged students are prepared for postsecondary education, to pursue graduate and professional school opportunities, and to achieve success in the workplace.

The UC LEADS program also receives support from the Koret Foundation to fund the annual UC LEADS Research and Leadership Symposium.

The University of California experienced major budgetary challenges during the 2004-2005 fiscal year, which resulted in a reduction in funding, which led to a decrease in the overall number of UC LEADS scholars served. Whereas the average number of entering participants in UC LEADS averaged 67 students during its first 4 years of existence (2000-2004), the average number of entering participants dropped to 47 students throughout the next 11 years (2004-2015).
UC LEADS OVERVIEW

CAMPUS PROGRAM COORDINATORS

Each UC LEADS campus program is administered by coordinators charged with the responsibility for providing leadership in the development, planning, implementation, and assessment of effective recruitment and retention strategies. Each coordinator operates under the auspices of his/her respectively assigned campus department (e.g., Graduate Division, Graduate Studies, etc.) and supports and enhances the system-wide goal of preparing talented undergraduate scholars for enrollment and success at the graduate level.

EXECUTIVE STEERING COMMITTEE

The UC LEADS Executive Steering Committee oversees the policies, procedures, best practices and direction of the program on a statewide level. The role of Chair and Statewide Director for UC LEADS is currently housed at UC Santa Barbara. Two alternating faculty representatives and two coordinators from Northern and Southern California also serve staggered terms and are integral members of the leadership team. The 2015-2016 Executive Steering Committee members are:

Carol Genetti, Chair and Dean of Graduate Division, UC Santa Barbara
Christian Villaseñor, UC LEADS Statewide Director and Assistant Dean of Graduate Division, UC Santa Barbara
Rudy Ortiz, Northern California Faculty Representative, UC Merced
Olivia Graeve, Southern California Faculty Representative, UC San Diego
Julia Clark, Northern California UC LEADS Coordinator Representative, UC San Francisco
Christopher Murphy, Southern California UC LEADS Coordinator Representative, UC San Diego
All UC LEADS Scholars participate in the system-wide annual Koret UC LEADS Research and Leadership Symposium. The event features:

- All scholars presenting their research results and methodologies with feedback from their colleagues, graduate students, and faculty members.
- An interactive team building workshop where scholars explore group dynamics, leadership, and problem solving strategies.
- Opportunities to network with fellow scholars, UC LEADS alumni, graduate students, graduate program administrators, and faculty members.
- Scientific and academic presentations by leaders in the STEM fields of study, covering such topics as diversity in science, leadership in academia and industry, laboratory ethics, financing graduate education, and balancing family and graduate school.
- Presentations by national leaders in government, business, or industry addressing issues of leadership in an increasingly diverse STEM environment.
- Opportunities to learn about mentoring future generations of students who may face obstacles to participation in higher education similar to those that they may have experienced.

### Future and Past Symposia

- **UC Santa Barbara**
  - March 10, 2018
- **UC Los Angeles**
  - March 11, 2017
- **UC Davis**
  - March 5, 2016
- **UC Merced**
  - March 21, 2015
- **UC Riverside**
  - March 22, 2014
- **UC Santa Cruz**
  - March 1-2, 2013
- **UC San Diego**
  - February 3-4, 2012
- **UC Berkeley**
  - March 3-4, 2011
- **UC Irvine**
  - April 30-May 1, 2010
- **UC Davis**
  - March 8-9, 2009
- **UC Santa Barbara**
  - March 1-2, 2008
- **UC Los Angeles**
  - March 3-4, 2007
- **UC Santa Cruz**
  - March 4-5, 2006
- **UC San Francisco**
  - March 4-5, 2005
- **UC Los Angeles**
  - February 28-29, 2004
- **UC San Diego**
  - March 1-2, 2003
- **UC Riverside**
  - March 1-3, 2002
- **UC Davis**
  - March 9-11, 2001
UC LEADS has served as a benchmark for undergraduate research and pre-doctoral preparation. The program was developed to encourage UC undergraduates in STEM fields to continue their studies and pursue advanced degrees in science, technology, engineering and mathematics. Over the past 15 years, the UC LEADS program has mentored scores of Scholars, preparing them for graduate study through in-depth experiential learning and encouraging them to consider a broad range of career options in academia, government, and community-based organizations. The following historical program data demonstrate the beneficial impact that the UC LEADS program has provided to 785 current and former participants during the 2000-2015 service range. The UC LEADS program is mandated by the UC Office of the President to collect, process, analyze, and disseminate essential statistical data to internal and external stakeholders. Scholar data is collected by respective campus Coordinators and maintained at the UC LEADS statewide office at UC Santa Barbara.

The following tables provide a detailed representation of the various demographic, educational attainment, and academic/professional outcomes achieved by our UC LEADS Scholars during the 2000-2015 programming cycle.

Enrollment in the UC LEADS program has averaged 47 new students per programming year during the last decade. Enrollment varies by campus as detailed in the individual campus profile pages in the next section.
UC LEADS PROGRAM OUTCOMES

An analysis of demographic data in terms of ethnicity during the 2000-2015 service range provides insight into the large cadre of California residents who have benefited from the UC LEADS program:

- Mexican American (MA) - 28% (n=220)
- Asian (A) – 23% (n=184)
- White/Caucasian (WH) - 13% (n=106)
- African American (AA) - 10% (n=78)
- Other Hispanic/Latino (OS) - 9% (n=70)
- Unknown/Declined to State (U)- 8% (n=60)
- Filipino/Pacific Islander (FA/PI)- 6% (n=45)
- East Indian/Pakistani (EI) - 2% (n=14)
- American Indian (AI)- 1% (n=8)

Demographic data in terms of gender during the 2000-2015 service range highlight the positive impact that UC LEADS has with respect to equity. UC LEADS has served 396 male students (50.5%) and 389 female students (49.5%) throughout its 15-year history. In order to address the long-standing crisis of too few women in STEM disciplines, UC LEADS continues to operationally recruit and serve this critical population.
UC LEADS PROGRAM OUTCOMES

There are a total of 633 UC LEADS Scholars (98% of participants) who have attained their undergraduate degrees in the first 12 entering year cohorts.

UC LEADS scholars have been successful in earning undergraduate degrees in addition to entering graduate school. Of the students who completed their undergraduate degrees by the end of Spring 2015, 70% have gone on to graduate school, of which 20% are currently enrolled and 50% have already completed a graduate program. There is a third subpopulation of students (30%) who either chose to terminate their educational plans or are classified as “unknown” within our data files.
Of the 633 students graduating in the first 12 cohorts, 446 (70%) went on to pursue graduate study. 207 of 446 (47%) enrolled in a UC graduate program. 239 of 446 (53%) enrolled in graduate programs outside of the UC.

**UC LEADS Graduate School Enrollment**

The total number of UC graduate students (207) represented include the following:

- PhD in STEM field: N=103 (50%)
- Masters: N=69 (33%)
- Medical School: N=16 (8%)
- Other Professional School: N=14 (7%)
- Law School: N=4 (2%)
- Other Doctoral Program: N=1 (0%)

**Non-UC Graduate School Enrollment**

The total number of non UC graduate students (239) represented include the following:

- PhD in STEM field: N=104 (44%)
- Masters: N=82 (34%)
- Medical School: N=26 (11%)
- Other Professional School: N=22 (9%)
- Other Doctoral Program: N=4 (2%)
- Law School: N=1 (0%)
UC LEADS PROGRAM OUTCOMES

Fulfilling the initial programmatic vision for enhancing UC graduate degree attainment, many UC LEADS scholars have enrolled in a variety of UC graduate programs.

UC LEADS scholars have also entered non-UC graduate programs. The top three institutions in this category are Stanford University (30 students), the University of Southern California (13 students), and the Massachusetts Institute of Technology (11 students).
“UC LEADS was critical for developing my academic career in many ways. First, the program expanded my network by introducing me to persons who would be instrumental in guiding and mentoring me to the professoriate. My first faculty mentor introduced me to a wide variety of faculty at many institutions, including working closely with one that would later become my post-doc advisor. Secondly, it provided years of training of professional skills to enable me to be a competitive applicant for graduate school. Through LEADS I participated in many undergraduate poster competitions and student research conferences, increasing my network and exposure while building confidence speaking about science in public. I learned what it meant to be an academic, and how to meet and discuss my future with potential advisors. Lastly, and most critically, in the program I understood what graduate school actually was, and how to apply. I learned to leverage my strengths to get acceptance into competitive programs and how to apply for funding from competitive fellowships. Through workshops that I have taken in LEADS I learned how to write fellowship proposals, and was awarded the NSF Graduate Research Fellowship. Without this training and professional development, it is certain that I would have lacked the confidence to even apply to graduate school, let alone become a professor at the University of California.”
“Without my early exposure to the world of graduate school through UC LEADS, I would have never known about what it is to be a researcher and how to pursue a career as a scientist. The program gave me an opportunity to work in a lab when I had no prior experience, but an enthusiasm for learning. It also provided a community of other like-minded individuals who became an important support group. We helped bolster each other as we struggled with our research and ultimately decided on what we wanted to do next. I owe many of my academic and professional successes to my training through UC LEADS.”
“Being involved with UC LEADS gave me the funding and resources to pursue independent research as an undergrad. I knew I wanted to be a researcher and this opportunity gave me the freedom to pursue what I want with the professor I wanted to do research with. Research is a long but rewarding process. No matter which career you will pursue, research gives you the tools to problem solve and think critically.”

*This page reflects updates to data for five students, which occurred after the initial printing of this report.*
“Participating in UC LEADS fast-tracked my nascent academic career. By providing financial support to participate in research activities I had the opportunity to work on several research projects and gain valuable experience prior to graduation. The opportunities for mentorship by a professor and multiple grad students, participation in research conferences (multiple) and skills-building workshops like presentation techniques and GRE training were invaluable. As a result, I was accepted into a top 5 graduate program in my field with full funding (straight out of college). I maintain relationships with many of the graduate students and professors I met while doing the fellowship who are important scholars in my field. These relationships continue to support my career (I’ve been invited to give talks, participate in conference symposiums, etc.). The other valuable result from UC LEADS participation is that now (as a tenure-track professor) I make an effort to find funded positions for undergraduate research assistants. I’ve supported 4 students in this manner over the last year, all from traditionally disadvantaged backgrounds.”
“I view my involvement in the UC LEADS program as one of the biggest impacts on the trajectory of my academic and professional career. I was one of a handful of scholars that had the unique experience of participating in the UC LEADS program at UC San Francisco while pursuing an undergraduate degree at UC Merced. For two full years, I was immersed in the academic research environment of the University of California system. I conducted exciting and ground-breaking research at the UC Merced, UC San Francisco and UC San Diego campuses, presented research findings in academic formats at conferences across California and the United States and built a strong professional network of university faculty who would prove instrumental in my acceptance into the Bioengineering doctoral program at UC Riverside. It was at the 2009 UC LEADS Symposium at UC Davis that I met UC Riverside Professor of Bioengineering Dr. Victor Rodgers, who encouraged me to apply to their newly formed Bioengineering Interdepartmental Graduate program. I spent the next five years putting my UC LEADS knowledge and experience to work earning my Ph.D. in Bioengineering. Near the end of my graduate school tenure, I was offered an incredible position as a Biomedical Systems Engineer at Acutus Medical, Inc., a venture-backed medical device startup company focused on developing breakthrough technology for the treatment of complex cardiac arrhythmias. I fondly reflect on the profound impact UC LEADS had on my undergraduate career, acceptance into graduate school, completion of my Ph.D. in Bioengineering and beginning of my professional career in the medical device industry.”
“Participating in the UC LEADS program as an undergraduate certainly contributed to my success as a blossoming researcher. Spending a summer at UC Berkeley allowed me to develop a relationship with my summer mentor that still exists today. As a faculty member I have had the opportunity to mentor several undergraduates in the UC LEADS program and help guide them to their current positions in graduate school. Such experiences are priceless. The best advice I can give current UC LEADS scholars is to work hard, be tenacious in your research, and use the resources handed to you.”

ALUMNI SPOTLIGHT
Vincent LaVallo, PhD
(Cal Tech)
Assistant Professor of Chemistry
UC Riverside
“The UC LEADS program made a tremendous impact on my research career. I did not have any prior exposure to scientific research before becoming a UC LEADS scholar. Being a scholar helped me to approach potential research mentors, so that I could start to gain research experience. I was fortunate to join the lab of Julian Schroeder at UC San Diego for two academic years and one summer and work on a variety of projects that were both computational and experimental. For my second summer as a scholar, I worked with Todd Lowe at UC Santa Cruz on a project that was my first introduction to RNA biology. I was hooked. Fast-forward 12 years later, I started an Assistant Professor position at UC Santa Cruz where my lab focuses on understanding how cancer cells disrupt the regulation of RNA splicing. My research and professional development all started with the UC LEADS program.”
"The UC LEADS program provided me the opportunity to work very closely with a prominent academic physician (Dr. Rubenstein) who successfully ran a developmental neuro-biology laboratory. Here I worked very closely under Dr. Hevner, a post-doc in his laboratory who had finished a residency in neuro-pathology. Dr. Hevner is now at University of Washington and also the PI of his own laboratory. Both of these men had MD and PhD degrees and were able to help counsel me on my future career path (medicine). That summer made a difference in my professional advancement. I completed a project related to developmental axonal pathways and though the project did not lead to a publication, it provided me the opportunity to design/develop a research hypothesis, learn bench/wet lab skills, and interpret results to create a presentation. In addition to the hard skills acquired during the summer, it was a great opportunity to network, and get real-life experience as to what it means to be an academic physician. Though I do not currently perform basic science research, the experience during UC LEADS contributed to my decision to pursue medicine as a career and stay in academic medicine once out of training (I am Director of Neurocritical Care at Boston Medical Center and Assistant Professor of Neurology and Neurosurgery at Boston University School of Medicine).”
“Participating in UC LEADS, especially having two summer research opportunities, one at UCSB and one at UCI, was the highlight of my college years. Before I started the first summer research, I wanted to be an astronomer but I did not have any real research experience. The two-summer research time allowed me to explore and discover my love for hands-on table-top experiments that subsequently led to my pursuit of research in quantum science both in graduate school and forming my own research group. My current academic path was unexpected before I participated in UC LEADS.”
UC SCNTA CRUZ CAMPUS OUTCOMES

ALUMNI SPOTLIGHT
Sheila Semaan Clark, PhD
(University of Wisconsin)
Product Manager
Thermo Fisher Scientific
San Francisco, CA

“UC LEADS has actually had a great impact for me. I had already joined a lab at the time I became a UC LEADS scholar because I wanted to have more lab experience and I also had to take summer school. Being a part of UC LEADS allowed me to focus more on research-related work, rather than just lab upkeep. I got important training in how to present my scientific findings by giving poster presentations and it opened up a whole new world of research. I also made some great friends! The most important impact that UC LEADS had, however, was I truly believe it allowed me to gain acceptance into a top-tier graduate school, the University of Wisconsin-Madison. I remember attending a conference that UC LEADS sent me to in New Orleans and making contact with a Professor in the Biomolecular Chemistry program there. She wrote down my name and told me she would look out for my application. Lo-and-behold, I was accepted to UW Madison and I believe that this interaction from the UC LEADS conference was instrumental in my acceptance.”
Acknowledgements are due to Michele Johnson, Chelsea Lonergan, Christian Villaseñor, and Henry Covarrubias for their efforts in preparing this report.
UC BERKELEY
UC DAVIS
UC IRVINE
UC LOS ANGELES
UC MERCED
UC RIVERSIDE
UC SAN DIEGO
UC SAN FRANCISCO
UC SANTA BARBARA
UC SANTA CRUZ
UNIVERSITY OF CALIFORNIA