

2013 CSUPERB Report to the Doris A. Howell Foundation

CSU

The California State University

PROGRAM FOR EDUCATION AND RESEARCH IN BIOTECHNOLOGY (CSUPERB)

July 2013

CSUPERB's mission is to develop a professional biotechnology workforce by mobilizing and supporting collaborative CSU student and faculty research, innovating educational practices, and responding to and anticipating the needs of the life sciences industry.

Celebrating and Supporting Undergraduate Researchers



Just before the winter break each year, CSUPERB and the Doris A. Howell Foundation for Women's Health Research announce the new class of undergraduate Howell-CSUPERB Research Scholars. Together the Howell Foundation and CSUPERB recognize that research experience is critical to engaging, retaining and graduating students interested in women's health careers. The 2013 Howell Scholars were introduced during the 25th Annual CSU Biotechnology Symposium. Front Row, left to right: Laura McIntyre (San Diego State University), Erin Fletcher (San Diego State University), Jessica Keyes (CSU Long Beach), Kenya Covarrubias (CSU Fresno), Van Nguyen (CSU Fullerton). Back Row, left to right: Mandy Butler (Howell Foundation Board Member), Yuriy Slutskyy (CSU Sacramento), Laura Millbrandt (CSU Channel Islands), Charles Morduant (CSU Fullerton). Not pictured: Joshua Feng (CSU Long Beach), Ashley Moran (CSU Long Beach), Matthew Schroeder (CSU Fullerton), Alicia Zamudio Montes de Oca (San Diego State University). The 2013 class of Howell-CSUPERB Scholars will wrap up their research projects this summer.

This is a report to the Doris A. Howell Foundation for Women's Health Research (DAHf) Board on the Howell-CSUPERB Research Scholars' experiences and program outcomes. CSUPERB and the DAHF partnered in 1996 to support undergraduate research experiences on California State University campuses. **Between 2001-2013 we jointly awarded a total of \$361,355 to 129 CSU undergraduate scholars.**

Looking back over four years of final reports from Howell-CSUPERB Scholars (2008-2012), 98.2% either graduated or continued in their degree programs. This graduation rate is over three times greater than the average CSU science, technology, engineering and math (STEM) graduation rates.

The DAHF Board and the CSUPERB Presidents' Commission agreed to raise award amounts by \$500 to \$3500 this year. In addition scholar-mentor teams were asked to complete their research projects in eight months (January through August), rather than over 12 months as in past years.

Program Highlights

- Between 2001-2013 the Doris A. Howell Foundation for Women's Health Research and CSUPERB jointly awarded a total of \$361,355 to 129 CSU undergraduate researchers
- **Ellese Carmona** (San Diego State University, 2012 Scholar) - featured and honored as one of SDSU's distinguished graduates (2012); currently enrolled in doctoral program at Harvard.
- **Jazmin Tapia** (CSU Los Angeles, 2012 Scholar) – presented her work at five different scientific conferences, including an invited presentation at the Emerging Researchers National Conference in STEM in Washington, D.C.
- **Nicholas Vierra** (CSU Chico, 2012 Scholar) – presented his work at the CSU system-wide research conference and won first place in the biological sciences; currently enrolled in doctoral program at Vanderbilt University.
- **Erin Fletcher** (San Diego State University, 2013 Scholar) – following Ms. Carmona's path, Erin is headed to Harvard for doctoral work. Both CSUPERB-Howell Scholars worked with Professor Kelly Doran.
- **Tuyen Ngoc Tran** (CSU Long Beach, 2013 Scholar) – featured and honored as one of CSU Long Beach's distinguished graduates (2013), received Phi Beta Kappa membership and his poster was selected as the Thematic Best Poster (Theme: Lipids and Membranes) at the American Society for Biochemistry and Molecular Biology Annual Meeting in Boston.

Notable Quotes from 2012 Howell- CSUPERB Research Scholars

“For donors, I would just like to share that their contributions help our small labs so much. Before receiving the Howell scholarship, I had no idea that a microliter amount of antibody could cost hundreds of dollars. I've also learned that our mentors and PIs work very hard to get funding to do the research that benefits our society. The contributions largely help me, the other students, and of course my mentor continue to do what we find inspirational.” - *Stephanie Dreikorn (CSU Fullerton)*

“I find it exciting and beneficial that because of this project, we may have not only found a potential HCV inhibitor, but at the same time may have discovered a useful and effective anticancer agent!” - *Kelly Kivlahan (San Diego State University)*

“I think the money donated to the students and the labs really help spur the students into finding new things...and helps stimulate a growing interest in the research field.” - *Andrew Yale (CSU Fullerton)*

“My time as a Howell Scholar gave me the chance to spend more time working in a laboratory, which allowed me to develop my skills as a research scientist. During this time my desire to pursue a career in research flourished. As I move on to graduate school, I plan to enter a doctoral research lab that focuses on cancer.” - *Ellese Carmona (San Diego State University)*

“I think this is a VERY good program. It really helped me grow as a person. Mainly for me this experience has helped me to become a lot more organized. I have to plan my research weeks if not months in advance! I really liked going to [a scientific conference] and presenting my poster and learning about all of the other presenter's research projects. It also had great workshops that helped show me possible career paths.” – *anonymous student scholar*

PROGRAM DETAILS

This report is based on final reports and long-term reports from Howell-CSUPERB Scholars received as of July 15, 2013. Long-term reporting is done every other year; next scheduled survey of CSUPERB-Howell alumni is February 2014.

Program Goals: The Howell Foundation and CSUPERB make awards to student-faculty research teams to support mentored research experiences for undergraduate students. The sponsors hope for (1) increased retention and graduation rates and (2) stronger desire on the students' part to continue in women's health research, whether that means continuing on in graduate school, medical school, or a job in an organization addressing women's health issues. To address the second success metric, the final report surveys were expanded in 2012 to assess student attitudes. Based on the Scholars' final reports, the program is meeting both goals.

Application Rates: Since 2006 the Howell-CSUPERB Scholars program averages 26 applications (+/- 3) per year. The 2012 cohort (32) was above average and the 2013 applicant number (28) was average.

Demographics: Between 2006-2013 78 scholars from 20 CSU campuses were supported by DAHF and CSUPERB. 23% hail from San Diego State University. The ethnic backgrounds of Howell Scholars are diverse (50% are white, 25% are latina/o, 17% are asian/pacific islander, 8% report as other ethnicities), but not as diverse as the CSU student population (32% white, 29% latina/o, 17% asian/pacific islander, 12% other, 5% african american).

Award/Success Rates: Between 2006-2012, DAHF and CSUPERB made 11 awards per year. In 2013 we made 12 awards. On average the success rate (# awards ÷ # applications) is 44% - a number CSUPERB considers competitive.

Graduation Rates: All the Howell-CSUPERB Scholars who expected to graduate have done so. The remaining Scholars continue their studies and work toward graduation (= retention). Since 2006 only one student has withdrawn from the program. The Howell-CSUPERB Scholars are academically accomplished students unlikely to withdraw or fail to graduate.

Retention in Relevant Career Paths: Since 2009 we have asked Howell - CSUPERB Scholars about their future plans. 100% (44) students report they plan to follow research or medical careers.

Sponsored Student Reviews: 98.2% of Scholars (2008-2012) report being satisfied or very satisfied with the experience.

CSUPERB is quite pleased with these outcomes and is committed to continuing this impactful program to encourage more students to engage in women's health research.

Howell-CSUPERB Student Outcomes and Plans

CSUPERB partners with the Doris A. Howell Foundation for Women's Health Research to fund promising undergraduate student research projects in topics related to women's health. Together the Howell Foundation and CSUPERB recognize that research experience is critical to engaging, retaining and graduating students interested in careers in women's health. Oftentimes undergraduate research experiences offer students' their first opportunity to "feel like a scientist." Indeed 100% of the 2012 Scholars report their experience as Howell Scholars helped them decide what career path to take.

We encourage CSU faculty to identify students who show great promise as researchers and encourage them to apply for this program. Each year a Request for Applications (RFA) is issued in late summer; applications are due in early October. DAHF- and CSUPERB-affiliated professionals review applications. Awards are announced in early December so that work can start in January. The great majority of Howell-CSUPERB scholars graduate and go on to apply successfully for graduate degree programs and industry jobs. To get an idea of the range of previously funded projects, see the CSUPERB grants database at our website (<http://www.calstate.edu/csuperb/grant-abstracts/type.shtml#howell>)

Figure 1. Student Outcomes, Howell-CSUPERB Scholars (2008-2012/13, n=57)

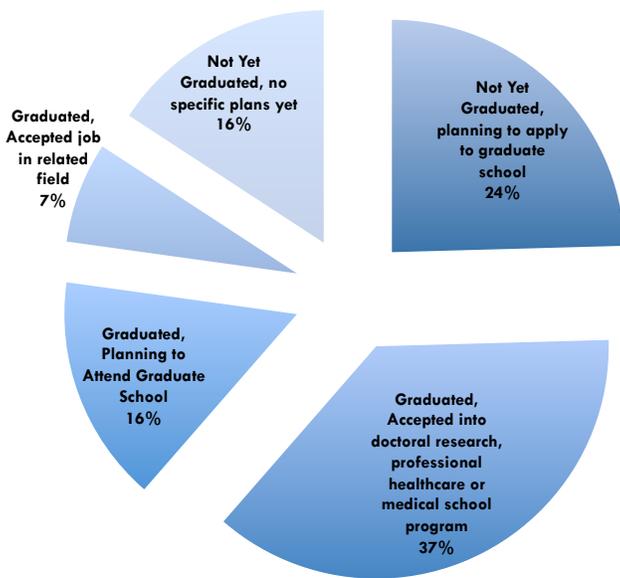


Figure 2. Last Reported Status, Howell-CSUPERB Scholars (2008-2012/13, n=57)

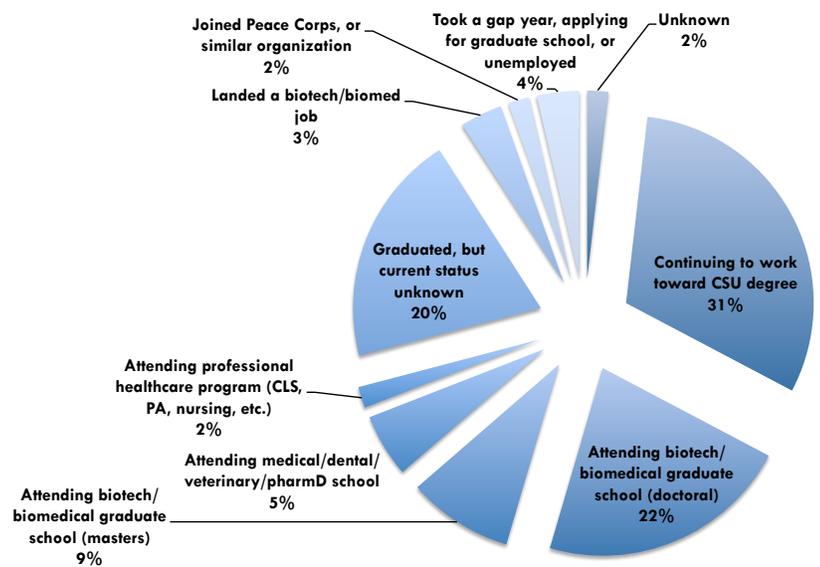
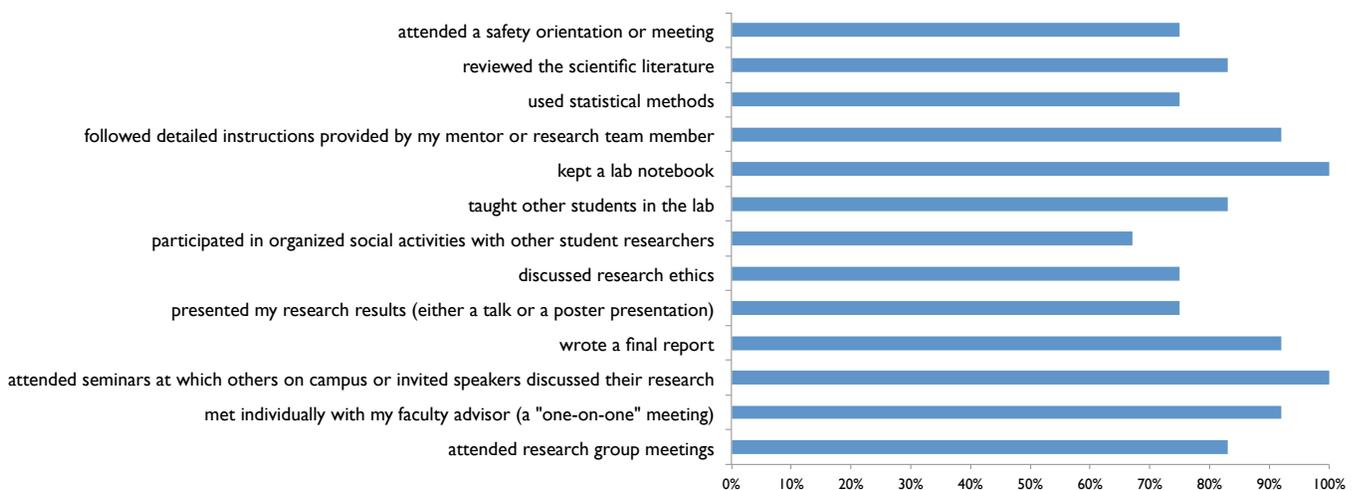


Figure 3. What I did as a Howell-CSUPERB Scholar (2012, Students Self-Reporting)





Each year Howell-CSUPERB Scholars have the opportunity to talk about their research projects at Howell Foundation Luncheons in La Jolla, California. Scholars all hope they have the opportunity to meet Dr. Doris Howell and the fortunate ones report it as a highlight of their experience in the program! In Spring 2013 Erin Fletcher (left) met Dr. Howell (center) while attending a DAHF luncheon with her San Diego State University mentor, Dr. Kelly Doran (right). Ms. Fletcher, a senior at San Diego State, studied microbial populations present in oral cavities of patients at UC San Diego hospitals. Ms. Fletcher and Dr. Doran hypothesize that they might see significant variations in microbial population by disease group. They hope their work might lead to better, non-invasive screening methods to improve early detection of pancreatic cancer.



The 2012 Howell-CSUPERB Scholars were announced at the 24th Annual CSU Biotechnology Symposium (Santa Clara, CA). Left to right: Jazma Tapia (CSU Los Angeles), Nicholas Vierra (CSU Chico), Ellese Carmona (San Diego State University), Stephanie Diekhorn (CSU Fullerton), Angela Beal (Cal Poly Pomona), Luigi Basilio (CSU Fullerton), Tuyen Ngoc Tran (CSU Long Beach), President Rollin Richmond (Humboldt State University & CSUPERB Presidents' Commission Chair) and Skai Krisans (Doris A. Howell Foundation Board member). Not pictured: Kelly Kivlahan (San Diego State University), Yu-Huey Lin (Cal Poly Pomona), Kristine Miller (San Jose State University) and Andrew Yale (CSU Fullerton). Howell-CSUPERB Research Scholars work on projects with CSU faculty mentors during the spring academic term and, usually, during the summer. Howell-CSUPERB Scholars are usually juniors and seniors, but we've funded promising sophomores as well.

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Please find the complete Howell-CSUPERB program information on the CSUPERB website:
<http://www.calstate.edu/csUPERB/awards/howell-about.shtml>

Find us (along with more photos of Howell Scholars and Mentors) on Facebook (www.facebook.com/csUPERB) or subscribe to the CSUPERB blog (<http://www.csUPERB.org/blog>) to keep up with developments related to the 26th Annual CSU Biotechnology Symposium January 9-11, 2014, at the Santa Clara Marriott. Mark your calendars!