2020 has been a year unlike any other -
In January we started the year with our CSUPERB 32nd Annual CSU Biotechnology Symposium with new sessions, including the “Alumni Panel Session” and “Active Bystander” session. Starting March, the COVID-19 pandemic disrupted our professional and personal lives. From that point, CSU campuses have mostly delivered instruction virtually, continuing into the fall. Furthermore, the social unrest instigated by police brutality has led to people engaging in protests that have not been seen in a long time; CSUPERB has focused on meeting the needs of our faculty and students during these extraordinary times.

In Spring 2020, CSUPERB recognized that faculty and students’ lack of access to their research laboratories, due to the COVID-19 pandemic shutdown, would have long lasting impacts. The Strategic Planning Council (SPC) approved setting aside funds to support a “COVID-19 Research Recovery Microgrant Program.” In June, we initiated a COVID-19 support group, among the biotechnology faculty, to discuss issues surrounding research laboratory restart and challenges with moving instructional activities online.

In July, we initiated programming to support antiracism with a webinar entitled “How to be an Antiracist Scientist,” attended by 199 individuals. In August, we had our “Prepare for Fall” webinar to support faculty as they continue with virtual instruction, during which faculty shared their expertise with mental health issues and best practices for virtual teaching. The CSUPERB CURES Network is hosting in September a Mini-Symposium on “Virtual Cures in Times of Crises”, to share successes and challenges of rapidly adapting CURES courses to a virtual environment.

CSUPERB pivoted its programming significantly in response to this year’s events to provide faculty and students support and forums for discussion of the many challenging events.

The 32nd Annual CSU Biotechnology Symposium featured a CSU Alumni Panel Session. The CSU Alumni included Alyssa Kim (The Boeing Company & San Diego State University), Kevin Pham (Novogene Corporation & CSU Fresno), Corey Vierra (BCD BioSciences & CSU Sacramento alum) (pictured) and Jim Cooper (Braid Theory & CSU Los Angeles alum), Ryoko Kawashima (Leukemia & Lymphoma Society & CSU Northridge alum), Matthew Kunicki (Pfizer & CSU Long Beach alum) and Stacey Abidayo (Zymergen and CSU Bakersfield alum) (not pictured).

2019/20 Program Highlights

• Since 1999 CSUPERB has made grants and awards to CSU faculty and students, totaling $14,719,246

• The 32nd Annual CSU Biotechnology Symposium at the Santa Clara Marriott drew 634 participants and featured 248 posters from 23 CSU universities, presenting discoveries from 179 CSU faculty-led research teams.

• This year CSUPERB made 103 grants and awards totaling $639,103 to 40 faculty and 57 students at 20 CSU campuses.
Letter from the Executive Director

Dear Colleagues and Friends:

It has been an unprecedented year in the history of CSUPERB given the change in leadership, the COVID-19 pandemic and the civil unrest in Spring and Summer 2020. I am honored to have been given the opportunity to lead CSUPERB.

Now, more than ever, the role of CSUPERB cannot be understated. In addition to the “normal” roles consisting of grant funding, biotechnology industry partnering and a source of biotechnology STEM education expertise, the professional community has stepped up to provide guidance and leadership. CSUPERB’s nimble response in these areas has allowed us to meet both faculty and student needs in these challenging times.

In Spring 2020, we surveyed CSUPERB-supported faculty and students to understand the impact of the COVID-19 pandemic on research and teaching. A predominant theme that emerged was the effect on our most vulnerable students. One faculty member stated:

“My first generation students are more stranded by this experience. Their families do not understand their academic lives. They are sometimes doubtful of their academic pursuits. These students rely heavily on the CULTURE of my lab, not just the content. They have friends and a support network that helps them normalize their goals in academia. When they are surrounded in only people who don’t understand their goals, I am worried it is slowly pushing them out of academia in the long run.”

Based on the survey results that were received, we started a COVID-19 online community. This group has been meeting every month since July and it has been a tremendous source of support.

Given the civil unrest and inequities that were highlighted by the incidents in Spring 2020, CSUPERB is committed to supporting faculty and students in continuing their paths as antiracists. CSUPERB hosted the “How to be an Antiracist Scientist” webinar. We distributed a survey and the main takeaway is that this conversation is something people are wanting to engage in from different perspectives: some people want to talk about their experience with racism and microaggressions, while others want training and practice on how to be antiracist.

Howell-CSUPERB Scholars conduct CSU faculty-mentored undergraduate research in their 3rd or 4th year of college. Every other year CSUPERB tracks down Howell-CSUPERB Research Scholars to update “last known status” of our alumni. After 20 years of data, we can trace career trajectories of CSU alumni as they enter graduate and medical schools, accept jobs in biotechnology and pharmaceutical companies, and begin practicing as physicians and become assistant professors. Together with the Doris Howell Foundation we have awarded $642,855 to undergraduate researchers (2000-2020).

We continue to support faculty and students to lead in biotechnology.
32nd Annual CSU Biotechnology Symposium Summary

CSUPERB celebrated its 32nd Annual CSU Biotechnology Symposium January 16-18, 2020, at the Santa Clara Marriott.

The symposium brought together 634 students, faculty members, and administrators. Presentations included a plenary session with biotechnology industry leaders, Course-based Undergraduate Research Experiences (CURES) session, Active Bystander Training, CSU student award finalists’ talks, Becoming a Resilient Scientist training and CSUPERB-funded faculty short talks. Students attended GRFP writing, career networking, and graduate school information sessions. The two poster sessions featured 248 posters from 179 groups working at all 23 CSU campuses and with 75 external partners. The detailed program is available online (https://www.csuperb.org/symposium/2020-program/) and you can visit the symposium photo gallery to look back on all sessions.

A highlight of the Symposium was the workshop entitled, “Becoming a Resilient Scientist”, facilitated by CSUPERB SPC member Dr. Math Cuajungco (CSU Fullerton) and Dr. Diana Azurdia who serves as the Director for Recruitment and Inclusion for Graduate Programs in Bioscience at UCLA. The session began with some basic information on inclusion and confidence issues that are common among STEM students, especially women and students from underrepresented backgrounds. Both facilitators spoke about their personal experiences with developing resilience and the audience participated in a lively interactive discussion. The topic of resilience resonated significantly with both students and faculty, and we therefore expect to continue this thread with future follow up programming.

Anonymous Student Voices from the Post-Symposium Survey

“It was such an amazing experience in every way. It made me aware of the many options I have, in terms of job and school, with the degree I will soon be receiving from my CSU. I’ll also remember how genuine all the faculty [were] and how they are so willing to help you succeed. It felt so heartwarming that people are being supportive of the work we do.”

“I will definitely remember the connections I made throughout the conference, especially since this is the first time I have met a significant number of other first-generation/minority scientists presenting their work.”

“I mostly remember the advice given to me and others during the networking sessions, as well as various projects presented that I found interesting.”

“I have met many people across California and talked about their careers. I really enjoyed the talk and that would be something I won’t forget.”

“I go to CSULA, and have had Dr. Porter as a professor. It was pretty cool to hear her colleagues talk about her, and her accomplishments. It was heartwarming.”

“I will remember the outstanding posters given at all of the poster sessions, as well as the great biotechnology networking session and conversation session.”

“I could present my research and heard the feedbacks and some advice from many students and professors. Also, I could learn from other graduate students and professors while they were presenting their research.”

“Seeing all the dogs right before the morning symposium was so memorable and absolutely brightened the rest of my day! Academically speaking though, it was amazing to see the other posters being presented and learn about research similar to my own.”

“Meeting students from different Cal States and finding common ground on our passion for science.”
2020 CSU Biotechnology Symposium Awards

ANDREOLI FACULTY SERVICE: Dr. Edith Porter, Professor of Biological Sciences, CSU Los Angeles. Dr. Porter was honored for her work in mentoring students, most of them under-represented minorities, into the pipeline-to-careers in biotechnology, her extensive publication record, and her levels of service and productivity are remarkable. Dr. Porter was also the recipient of the 2020 Award for Education by the American Society for Microbiology.

CSUPERB FACULTY RESEARCH AWARD: Dr. Vas Narayanaswami, Professor of Biochemistry at CSU Long Beach, is also a Fellow of the American Heart Association (FAHA) and a member of Women’s Leadership Committee (WLC) of the Arteriosclerosis, Thrombosis & Vascular Biology (ATVB).

GLENN NAGEL UNDERGRADUATE STUDENT RESEARCH AWARD: Jacob Parres-Gold (CSU Los Angeles) investigates the molecular processes in the development of Parkinson’s disease (PD) in the Yixian Wang group.

CRELLIN PAULING STUDENT TEACHING AWARDS: Alex Ku (CSU Fullerton) and Felix Munoz (San Diego State University). Mr. Ku taught chemistry laboratory courses. Mr. Munoz taught the Physics lower division and the electricity and magnetism lab.

DON EDEN GRADUATE STUDENT RESEARCH AWARD: Tyler Powell (CSU Los Angeles) studies antimicrobial peptides against a Tuberculosis pathogen in the NIH-funded Edith Porter group. Quite a year for the Porter lab!
Dr. Susan M. Baxter served as the CSUPERB Executive Director from 2007 to 2020. Her contributions are too numerous to list as she grew and nurtured the organization with relationships inside the CSU with the California biotechnology industry, as well creating important connections throughout the country and world. In April 2020, the CSUPERB Leadership Award was renamed the Susan M. Baxter Leadership Award. President Soraya Coley of California State Polytechnic University, Pomona and Chair of the CSUPERB Presidents’ Commission presented the first Susan M. Baxter Leadership Award to Dr. Baxter during the virtual April 2020 Strategic Planning Council (SPC) meeting. We think we were able to surprise her!

CSUPERB PI Profile

Alberto Cruz (CSU Bakersfield, 2018 New Investigator grantee) is a computer scientist interested in new methods of predicting crop diseases. Specifically, Dr. Cruz developed an app with collaborators to identify Grapevine Pierce Disease (PD), amongst others, to help farmers recognize and report disease earlier and more independently. Dr. Cruz received a CSUPERB New Investigator grant which allowed him to recruit and support four students who otherwise would not have had an opportunity to join a transdisciplinary research group. All four students have now graduated and secured professional positions within the biotechnology industry. One specific student shared with Dr. Cruz that the opportunity to join his research group meant more than the intellectual and experiential learning. This particular student was homeless with his wife and child and had been living out of their car. The salary support provided by Dr. Cruz’s CSUPERB funding allowed him to stabilize their lives, complete his degree and ultimately join California’s biotechnology workforce. In terms of other ways CSUPERB has helped Dr. Cruz, he states “[following my award] I was a part of CSUPERB’s grant review and that that whole thing is actually almost as valuable as the funding itself. When I got the CSUPERB funding, I was still very much a junior faculty and I’d reviewed journal papers, I’d been on committees for conferences to review those papers, but I’d never actually been a part of a grant review. I feel like that really helped me be a better grant writer. Just to understand the process of how a grant is reviewed through that sort of system. I did that remote thing in 2020 and we did the in person one earlier, in 2019. I love being a part of it. I did it twice.”
Since 2014, the NSF grant funded CSU I-Corps program has been providing CSU faculty, students and staff with biotechnology entrepreneurship education and ideation courses. This year, the COVID-19 pandemic forced CSU campuses to move toward virtual instruction and CSUPERB programming was not immune to this. This summer, after much reorganizing and planning, CSUPERB hosted two virtual CSU I-Corps Cohorts (CSU I-Corps 2020 August Sprint and BIO 2020 I-Corps Workshop) bringing our total number of CSU I-Corps cohorts to 15.

As mentioned above, the CSU I-Corps Program was able to deliver the first virtual CSU I-Corps August Sprint. Instead of the original three in-person days in June, we stretched out the course over two weeks in early August to accommodate the virtual setting and it was a success. This year we had a record number of 8 teams participate across the CSU!

When compared to last years in-person Summer Sprint, our learning outcomes for the virtual course were equal to, or better. Participants noted on their final reports that the course met or exceeded their original expectations. A couple of high points of the virtual program were that participants did not have to travel to learn biotechnology commercialization and they were able to connect with a broader network of professionals during customer discovery. In fact, 100% of participants were able to grow their biotechnology/industry network during 2020 August Sprint.

Last, over 80% of participants felt that they could see themselves “working on biotechnology commercialization teams in the future.” We are currently making “Go/No-go” decisions for teams that are interested in moving on the national I-Corps Teams program. Go teams!
**California State University Program for Education and Research in Biotechnology (CSUPERB)**

### Annual Expenditures AY 19-20

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries &amp; Office Operations</td>
<td>$477,542</td>
</tr>
<tr>
<td>Program Operations &amp; Outreach</td>
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<tr>
<td>Symposium (including Symposium Awards)</td>
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</tr>
<tr>
<td>Grants &amp; Awards</td>
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</tr>
<tr>
<td>CSU I-Corps™ Grant (NSF)</td>
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<tr>
<td><strong>Total Expenditures:</strong></td>
<td><strong>$1,625,214</strong></td>
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This year’s expenditures included the NSF Type II Site Grant supporting CSU I-Corps. The grant at $100,000 per year began February 1, 2018. This year most I-Corps activities were moved to summer term.

### Grants and Awards Issued by Program (Number of Awards / Total Award Dollars)

<table>
<thead>
<tr>
<th>Type of Grant</th>
<th>Number / Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty-Student Collaborative Research Grants</td>
<td>25 / $374,000</td>
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<tr>
<td>Curriculum Development Grants</td>
<td>3 / $45,000</td>
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<tr>
<td>Travel Grants (Faculty &amp; Student)</td>
<td>44 / $64,603</td>
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<tr>
<td>Howell - CSUPERB &amp; Presidents’ Commission Research Scholar Awards</td>
<td>25 / $146,000</td>
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<tr>
<td>Symposium Awards</td>
<td>6 / $9,500</td>
</tr>
<tr>
<td><strong>Total Grants and Awards:</strong></td>
<td><strong>103 / $639,103</strong></td>
</tr>
</tbody>
</table>

CSUPERB received 384 proposals, applications and nominations from all 23 campuses this year; awards were made to 20. The CSU I-Corps™ biotechnology entrepreneurship program is made possible by an NSF grant active through January 2022.

### Competitive CSUPERB Funding by CSU Campus AY 19-20

This chart summarizes CSUPERB financial support in the form of competitive grants, awards, and symposium expenses (in dollars, $) by campus. 20 campuses won grants and awards this year; 23 campuses were represented at the 32nd Annual CSU Biotechnology Symposium.

Additional dollars requested reflects campus applications and proposals that were not funded and symposium registrations that could not be accommodated. The grey bars indicate unmet campus and faculty interest in CSUPERB programs from CSU biotechnology groups.

Explore the grants database at: [https://csuperb.org/grants/database/](https://csuperb.org/grants/database/)

California State University Program for Education and Research in Biotechnology (CSUPERB) www.calstate.edu/csuperb
Overall success rates (number of awards made + number of proposals received, reported as a percentage) are shown by academic year for the seed grant programs. For the last three years, an average of 27% proposals were funded. New Investigator applications represented 79% of all seed grant proposals received this year.

29% of seed grant-funded faculty (AY 17/18) won external, follow-on funding within one year of completing CSUPERB-supported project. The averaged financial return-on-investment in PIs funded 2010-2018 is 1338%, based on reports received as of July 1, 2020. Follow-on funding represents an expansion of student research and experiential learning opportunities across the CSU.

The Presidents’ Commission Scholars (PCS) Program funds summer research experiences for 1st- and 2nd-year students who are not part of another training program and have no research experience. 96% of PCS students (2012-2018, n=94) graduated or are continuing students. This student success metric is indistinguishable from the Howell-CSUPERB Scholars program, which funds academically-accomplished 3rd or 4th year undergraduate researchers.

At least 89% of CSUPERB-funded undergraduates (2000-2020, n=797) graduated or continued in CSU degree programs.