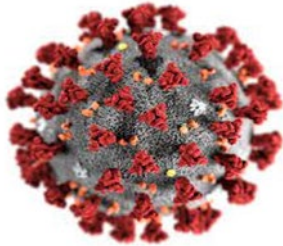


2020/2021 Annual Report

September 2021

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



And Then Came the Pandemic...

The year 2020 was unprecedented in modern history with the COVID-19 pandemic. Like everything else, CSUPERB's work was exemplified by holding the 33rd annual symposium in January 2021 virtually as we focused on meeting the needs of our faculty and students during these extraordinary times.

The Strategic Planning Council (SPC) approved funds to support a COVID-19 Research Recovery Microgrant Program. In 2021, CSUPERB launched the COVID-19 Post Pandemic Faculty Support Program for research programs that have been explicitly disrupted by the COVID-19 pandemic. We also launched the Graduate Research Restart Program to support graduate students whose work were interrupted.

CSUPERB has continued our anti-racism efforts through the *Eradicating Racism programming*. Following the "How to be an Anti-Racist Scientist" webinar in July 2020, we held 3 CSUPERB Safe Spaces for the CSUPERB community to talk openly about their anti-racism journey and to provide support for those who experience racism. We continued our anti-racism efforts with our "Diversity and Inclusion in Sciences" plenary at the 33rd Annual Symposium in January 2021. In the Spring 2021 semester, in partnership with CSU COAST, we hosted a conversation on power and structural racism in STEM with Dr. Terrell Morton from the University of Missouri-Columbia for professional development of CSUPERB faculty, staff and administrators. In July 2021, we invited Dr. Marie Bernard from the NIH to teach us about DEI program implementation at the national level. We leave this year looking forward to strategically incorporating DEI efforts at CSUPERB.

CSUPERB I-Corps™ programs continue to advance. In July 2021, we held the 2021 BIO I-Corps™ program virtually over 2 weeks with 90 participants from HBCUs. CSUPERB is currently hosting the Fall 2021 CSU I-Corps Cohort with 5 teams across the CSU. This year we moved to a hybrid program with in-person sessions and will end the workshop with final presentations at the 34th Annual Symposium. We will report on these outcomes in the following year.

CSUPERB pivoted its programming significantly in response to the past year's events to provide faculty and students support and forums for discussion of the many challenging developments and we plan to continue providing support in this respect.

2020/2021 Program Highlights

- Since 1999 CSUPERB has made grants and awards to CSU faculty and students, totaling \$15,604,662.

- The 33rd Annual CSU Biotechnology Symposium was held virtually in January 2021 and drew 686 participants and featured 130 posters from 23 CSU universities represented by 95 research groups and 36 external partners.

- This past year CSUPERB made 160 grants and awards totaling \$896,916 to 99 faculty And 61 students at 19 CSU campuses.

2020 – 2021 CSUPERB Leadership

Presidents' Commission

Soraya M. Coley, Chair
California State Polytechnic
University, Pomona

Gayle E. Hutchinson
CSU Chico

Tom Jackson, Jr.
Humboldt State

Robert S. Nelsen
CSU Sacramento

Mary A. Papazian
San José State

Adela de la Torre
San Diego State University

Strategic Planning Council

Katherine McReynolds, Chair
CSU Sacramento

Math Cuajungco
CSU Fullerton

Matthew Escobar
CSU San Marcos

Paula Fischhaber, Deputy Chair
CSU Northridge

Tomas Gomez-Arias, Dean
CSU Stanislaus

Michael Goldman
San Francisco State University

Jennifer Lillig-Whiles
Sonoma State University

Michael Kaufman, Dean
San José State University

Monica Lounsbury, Dean
CSU Long Beach

Bori Mazzag
Humboldt State University

Christopher Meyer, Dean
CSU Fresno

Sastry Pantula, Dean
CSU San Bernardino

Jeffrey Roberts, Dean
San Diego State University

Aparna Sreenivasan
CSU Monterey Bay

Koni Stone
CSU Stanislaus

Miri VanHoven
San José State University

www.calstate.edu/csUPERB

Ikhide G. Imumorin, PhD
Executive Director

Introducing New Executive Director, CSUPERB



Education

BS Federal U Technology, Owerri, Nigeria (1989)
MS Federal U Technology, Akure, Nigeria (1995)
PhD Texas A&M University, College Station (2000)
Postdoctoral, University of Maryland, Baltimore (2001 - 2002)

Academic & Research Positions

Adjunct Professor of Genetics & Genomics, School of Biological Sciences, Georgia Institute of Technology, Atlanta, GA
Professor of Biological Sciences & Director of Research & International Linkages, First Technical University, Ibadan, Nigeria
Program Leader, International Programs, Cornell University, Ithaca, NY
Visiting Professor of Biotechnology, Covenant University, Ota, Nigeria
Visiting Associate Professor of Animal Biotechnology, Federal University of Agriculture, Abeokuta, Nigeria
Assistant Professor of Genetics, Spelman College, Atlanta, GA
Assistant Professor of Genetics, Valdosta State University, GA

Industry & Entrepreneurial Positions

Co-founder & CEO, African Biosciences, Inc.
Managing Partner & CEO, Nubialand Consulting, LLC

Dear Colleagues and Friends:

It is my pleasure to become the new Executive Director of CSUPERB effective June 1, 2021. I am excited to join this wonderful organization that has been on the forefront of biotechnology education and research in the California State University, since its humble beginnings in 1987. It has been a challenging time to take the helm in the wake of the COVID-19 pandemic, but the role of CSUPERB has become more important, with most of the tools to fight the pandemic derived from the knowledge and skills of biotechnology. CSUPERB continues its role in providing grant funding, biotechnology industry partnering, and a source of biotechnology STEM education expertise to the community. The COVID-19 pandemic has prompted new initiatives as CSUPERB's response to address new challenges facing our faculty and students in these challenging times.

In Spring 2020, we had surveyed CSUPERB-supported faculty and students to understand the impact of the COVID-19 pandemic on research and teaching. Based on the survey results we initiated a COVID-19 online community last year that we hope continues to thrive. In addition, we began some new programming to address the impact of COVID-19 pandemic. This spawned three specific programs to address challenges of the pandemic. The **COVID-19 Research Recovery Microgrant Program (CRRMP)**, **COVID-19 Post Pandemic Faculty Support Program (CPPFSP)** and **Graduate Student Research Restart Grants (GSRRG)**. Indeed, the first set of applications for CPPFSP are under review while the first set of GSRRGs were awarded recently.

Our 34th annual symposium is holding virtually again from January 12 – 15, 2022 in response to the pandemic. This decision was made based on the on-going situation with the intention to return back to in-person meetings in January 2023. We look forward to welcoming everyone to the virtual symposium with planning in high gear.

A handwritten signature in black ink, reading "Ikhide G. Imumorin". The signature is fluid and cursive, written in a professional style.

Ikhide G. Imumorin, PhD
Executive Director

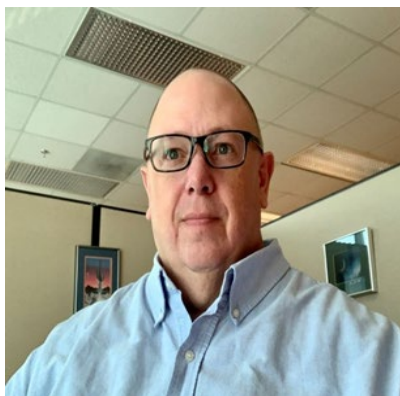
CSUPERB – Origins, Role, Mission and Vision

Created in 1987 as a system-wide program, the California State University (CSU) Program for Education and Research in Biotechnology (CSUPERB; www.calstate.edu/csuperb/) mission is to provide vision, leadership and support for biotechnology education and research throughout the CSU to promote biotechnology and economic development in California. The strategic goals of CSUPERB are to promote innovative biotechnology education and research across the CSU system, provide leadership in training California's biotechnology work force, enable CSU faculty and undergraduate, graduate and returning students to advance their careers and become leaders in biotechnology sectors in California and across the nation, extend and develop relationships with regional and industrial partners, and expand general education across the CSU and California to enhance understanding of biotechnology issues, challenges and opportunities.

CSUPERB provides grants and awards (totaling \$896,916 in AY20/21), organizes the annual CSU Biotechnology Symposium (annual budget \$330,000, but for the year in the report our budget was reduced to \$68,224 (with \$65,514 spent) due to the transition to a virtual meeting and to cope with the systemwide 10% budget cut that has been restored), sponsors industry-responsive curriculum, and serves as a liaison between the CSU and government, regional and biotechnology industry partners, including philanthropic partners. Within the CSU, CSUPERB promotes biotechnology workforce development by supporting innovative coursework, real-world research experiences, and core resources for students and faculty across all 23 CSU campuses. The program involves students, faculty and administrators from life sciences, physical sciences, health sciences, engineering, agriculture, business and computer science departments and divisions across the system, including the Chancellor's Office. Grants, awards, payouts, and reimbursements are made to faculty and programs on all 23 campuses across the system.

CSUPERB is administered and managed by an Executive Director, based at San Diego State University (SDSU), who reports to the CSU Chancellor through a six-person Presidents' Commission. The Program Office at SDSU is staffed by an Administrative Support Coordinator, two Administrative Analysts, and Student Program Assistant. The Program Office is advised and supported by a Strategic Planning Council and a Faculty Consensus Group consisting of biotechnology faculty and deans from all CSU campuses. Altogether, nearly 1,000 CSU students, faculty, deans, and administrators interact with the CSUPERB program office yearly.

Meet the CSUPERB Team...



James Schmitt, Program Coordinator

James Schmitt serves as the Program Administrator for CSUPERB. He brings deep experience to this position. As our Program Manager, he is responsible for the administration of and ongoing analysis, evaluation and reporting for CSUPERB's system-wide faculty-based education and research programs where he oversees all program financial and accounting operations for grants, awards, across the CSU system, regulatory compliance with federal, state, and philanthropic funding entities, program office equipment acquisitions, campus inventory responsibilities and provides budget control.

James has B.A. in Political Science and History from University of New Mexico.

SAVE THE DATE!
The 34th Annual CSU Biotechnology Symposium
January 12 - 15, 2022 virtually!



Tyson Gadd, Program Analyst

Tyson Gadd serves as Administrative Analyst (Systems and Database Specialist) for CSUPERB. In this role, he manages the database/SharePoint platform for data warehousing that supports ongoing data collection, systems research, planning, development, maintenance, administration, and event planning for our symposium. He also maintains and update CSUPERB Program SharePoint and WordPress websites.

Tyson earned his bachelor's in Business Administration with focus on marketing from Eastern Michigan University, Ypsilanti, MI.



Pamela Branger, Administrative Coordinator

Pamela Branger is the Administrative Support Coordinator at CSUPERB. In her principal role as assistant to the Executive Director, she provides coordination for myriad administrative duties including managing the schedule, calendar, and travel for Executive Director, maintaining CSUPERB Governance Roster and organizing appointments and elections and overseeing offsite logistics for peer grant review and Strategic Planning meetings and various other support to the annual symposium including coordinating registration, speaker and volunteers.

Pam was educated at Mesa Community College.



R. Christine Montgomery, Student Program Specialist

R. Christine Montgomery is the Student Program Specialist for CSUPERB. She provides support to serves as project lead for many student grant/award programs and communicate with, survey, and evaluate students, faculty mentors, facilities, and activities. Christine recently began to lead our anti-racism efforts, hosting webinars and lectures as well as facilitating important conversations around the topics of racism and diversity for the CSU's biotechnology faculty and students.

Christine received her MS in Criminal Justice from San Diego State University.

SAVE THE DATE!
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Highlights from the Program Office

- New Executive Director joined CSUPERB, effective June 1, 2021.
- President Tom Jackson, Jr. of Humboldt State joined the Presidents' Commission.
- CSUPERB Reauthorization approved by the Chancellor's Office for 5 years.
- FY 2021-2022 budget approved for CSUPERB.
- New COVID-19 related programming to support faculty and students through the COVID-19 Research Recovery Microgrant Program, COVID-19 Post Pandemic Faculty Support Program and Graduate Research Restart Program.
- 34th CSUPERB symposium continues virtually in January 2022.

33rd Annual CSU Biotechnology Symposium Summary

CSUPERB held its 33rd Annual CSU Biotechnology Symposium on January 7-10, 2021 virtually due to the pandemic.

The symposium brought together 676 students, faculty members, and administrators. Presentations included familiar events like the plenary session with biotechnology industry leaders, Course-based Undergraduate Research Experiences (CURES) session, CSU student award finalists' talks, and CSUPERB-funded faculty short talks. Students attended GRFP writing, career networking, and graduate school information sessions. The poster sessions featured 130 posters from 20 CSU campuses. The detailed program is available online (<https://www.calstate.edu/impact-of-the-csu/research/csuperb/symposium/Pages/default.aspx>) with access to poster and recordings of symposium sessions.

A major highlight of the 2021 symposium was the alumni panel featuring Janelle Muranaka, Vice President of Operations, Meissa Vaccines; Hector Aguilar-Carreno, Associate Professor of Microbiology & Immunology, Cornell University; Heather Latham, Quality - Design Assurance Engineer, Vyair Medical Devices; Sergio Ita, ProSci, Inc. and Christopher Petro, Staff Scientist in Infectious Diseases, Regeneron Pharmaceuticals, Inc. These alumni who have gone on to successful careers were a great inspiration to our students and faculty and represent tangible evidence of the impact of CSUPERB programming in the CSU.

Of note were sessions to address inequity, diversity, and inclusion through faculty workshop on **Student Voice and Choice: How CUREs Develops Student Agency**, the plenary & awards session on **Diversity and Inclusion in Sciences** and the California Community College & CSU networking session on **Insight into Biotechnology Workforce Trends**.

These will continue to receive attention in the mission and programming of CSUPERB.

SAVE THE DATE!
The 34th Annual CSU Biotechnology Symposium
January 12 – 15, 2022 virtually!

Some Recent CSUPERB Awardees

Faculty - COVID-19 Research Recovery Microgrant



Ana Almedia

Dr. Ana Almeida was awarded a small COVID-19 Research Recovery Microgrant of \$1,500 for a project on *Kalanchoe adans*, a plant that can clonally reproduce through the formation of plantlets along the notches of leaf margins because they have lost the ability to effectively undergo sexual reproduction. With little known about the molecular mechanisms underpinning plantlet development on leaf margins, identifying, and understanding these genes and gene regulatory networks will uncover the evolution of clonality. Supporting a new investigator grant from CSUPERB entitled "Dissecting the molecular mechanisms underlying the evolution of asexual reproduction in the genus *Kalanchoe*", this emergency COVID-19 grant will allow for the collection of preliminary data through supporting the initiation and reengagement of the graduate student Bharti Parihar

Graduate Student - Graduate Student Research Restart Grant Program



Jose Flores

Jose Flores is graduate student of Electrical and Computer Engineering at Cal State Northridge received \$5,000 Graduate Student Research Restart Grant for a project titled "Implantable motor controller for intravascular ventricular assist devices". Working with John Valdovinos as faculty mentor, Jose is working to develop a fully implantable motor controller that receives wireless power from an internal antenna and that communicates with an external application to drive an intravascular blood pump at various speeds. Part of a larger NIH funded research project, this specific subproject aims to develop a motor controller circuit that can be minimized to allow for implantation via cardiac catheterization procedures.

Undergraduate Student - 2020 Presidents' Commission Scholar



Michaelangelo Marcellana

Michaelangelo Marcellana was a recipient of CSUPERB Presidents' Commission Scholar Award in the amount of \$8,000 for the project titled, "Sex-based differences in fungal immune defense in *Drosophila melanogaster*." Working at Cal State Fullerton with Parvin Shahrestani, his project is to better understand the differences between the fungal immune defenses or male and female fruit flies using an imaging assay under a fluorescence stereomicroscope to record fungal dispersion along the exterior and examine how grooming patterns between males and females impacts immune defense. Through this study, he is learning basics of transformation using molecular genetic tools as well as advanced microscopy.

SAVE THE DATE!
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Measuring CSUPERB Impact

The impact of CSUPERB is mostly visible through successful grants by faculty using preliminary data from seed awards received from CSUPERB. These can be a critical source of support especially to young or junior faculty. Others include collaborations amongst faculty and with industry as well as career opportunities for students that result from networking platforms created by CSUPERB programming.

Recent Selected Awards won by Faculty funded by CSUPERB

Name	Project	Institution	Amount
Mercer, Frances	Using the CRISPR/Cas9 genetic engineering system to investigate the role of antibody receptors in human immune-cell killing of the parasite <i>Trichomonas vaginalis</i>	California State Polytechnic University, Pomona	\$441,000 NIH
Radlauer, Madalyn	Catalysis Within Polymers: Synthetic Systems to take Enzyme-Inspired Chemistry to an Industrial Scale.	California State University, San José	\$439,500 NIH
Kram, Karin	Characterizing the Role of a Regulatory Gene in Adaptation to a Heterogeneous Environment	California State University, Dominguez Hills	\$753,010 NSF
Rasche, Madeline	Learning Through discovery: Empowering Lower Division Chemistry/Biochemistry and Mechanical Engineering Students to Engage in Cross-Disciplinary Bioengineering Research	California State University, Fullerton	\$300,000 Governor's Office of Planning & Research
Cohen, Susan	Roles for the RNA-binding protein Rbp2 in the circadian clock mechanism in cyanobacteria	California State University, Los Angeles	\$736,369 NSF
Brooks, Cory	Characterization of a humanized MUC16 specific antibody for cancer immunotherapy	California State University, Fresno	\$420,000 NIH
Tian, Fangyuan	Using Metal Organic Framework Film as a Drug-Eluting Stent Coating	California State University, Long Beach	\$442,500 NIH

The return of investment of CSUPERB funds is outstanding and supports the overall mission and vision to support faculty and catalyze research and innovation across the CSU. Since 2016, **30 faculty members** from **15 campuses** have reported external grants totaling **\$10,412,588**.

SAVE THE DATE!
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Strategic Plan Update and Looking Towards the Future...

The 2018-2021 CSUPERB Strategic Plan identifies three priorities:

- 1) expand experiential biotechnology learning opportunities across the CSU;
- 2) innovate biotechnology education; and
- 3) partner with the life science industry.

To address these priorities simultaneously, CSUPERB has relied on support, advocacy and resources from the CSU, external partners, and policy makers. Priorities and cross-cutting themes for 2018-2021 are: 1) raising the visibility of the CSU's impactful biotechnology community, 2) deepening efforts to improve undergraduate biotechnology-related education, and 3) providing biotechnology career resources to faculty mentors and students. The Presidents' Commission especially encouraged CSUPERB to 4) lead boldly in advancing integrative, inter-disciplinary education, and team research. CSUPERB needs to remain vibrant, maintain its intellectual focus and energy, and have access to and remain aligned with system-wide CSU decision-making. CSUPERB's impact will depend on collaborative partnerships, alumni networks, faculty volunteerism, administrative support, and campus engagement. CSUPERB will continue to champion experiential education, make seed investments in faculty-driven academic programs and research projects, and remain open to new ways of thinking within the university and the surrounding life sciences ecosystem.

CSUPERB is responding to the above priorities through new programming and deepening existing programs. We are focusing attention on industry partnership with the theme of the 34th annual symposium as *Strengthening Academic-Industry Partnership for Biotechnology Workforce Development in California*. This on-going strategic priority of partnership with the life science industry will increase academic-industry engagement to provide internships for students, joint research projects with faculty and more support. Some existing and new companies that include Abbott Laboratories, Amgen, Genentech, Gilead Sciences, VWR, and industry groups like Biocom California and California Life Sciences Association where the new Executive Director may be taking over board positions previously occupied by Susan Baxter.

Some initiatives to support the on-going strategic plan include:

CSUPERB Student Placement Portal (CSPP)

Develop CSPP for students to be matched with internships, summer jobs and coop opportunities.

CSUPERB Industry Advisory Group (CIAG)

Create CIAG to provide industry perspective input to the work of CSUPERB.

CSUPERB Biotech Industry Support Fund (CBIS)

Set up a sustainable fund with donations from industry to support CSUPERB biotech workforce development in California.

CSUPERB Collaborative Matching Program (CCMP)

Matching program for faculty and students working in biotechnology across the CSU system to find each other and develop joint or collaborative projects.

SAVE THE DATE!
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January 12 – 15, 2022 virtually!

California State University Program for Education and Research in Biotechnology (CSUPERB)

Annual Report
Academic Year
2020-2021

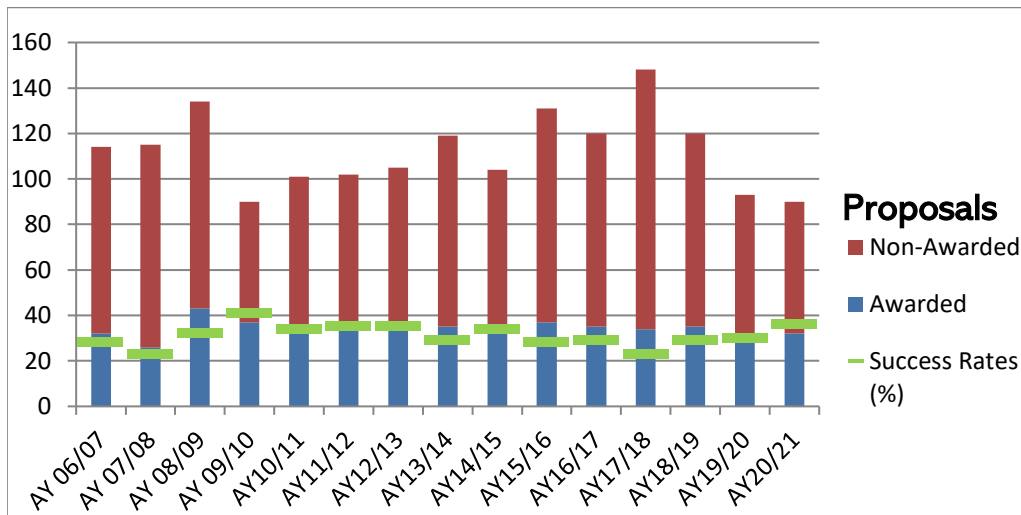
Annual Expenditures FY 2020-21		Expenses (\$)	Balance (\$)	
	Salaries & Office Operations	468,196	43,996	Activities of NSF Grant supporting CSU I-Corps were delayed by the pandemic and so much the funds have been moved to 2022.
	Program Operations & Outreach	100,513	102,416	
	Symposium	65,514	2,710	
	Grants & Awards	767,668	80,067	
	CSU I-Corps™ Grant (NSF) 2/1/18-1/31/22	2,785	208,950	
	Total Expenditures:	1,404,675	437,139	

Number/Amount

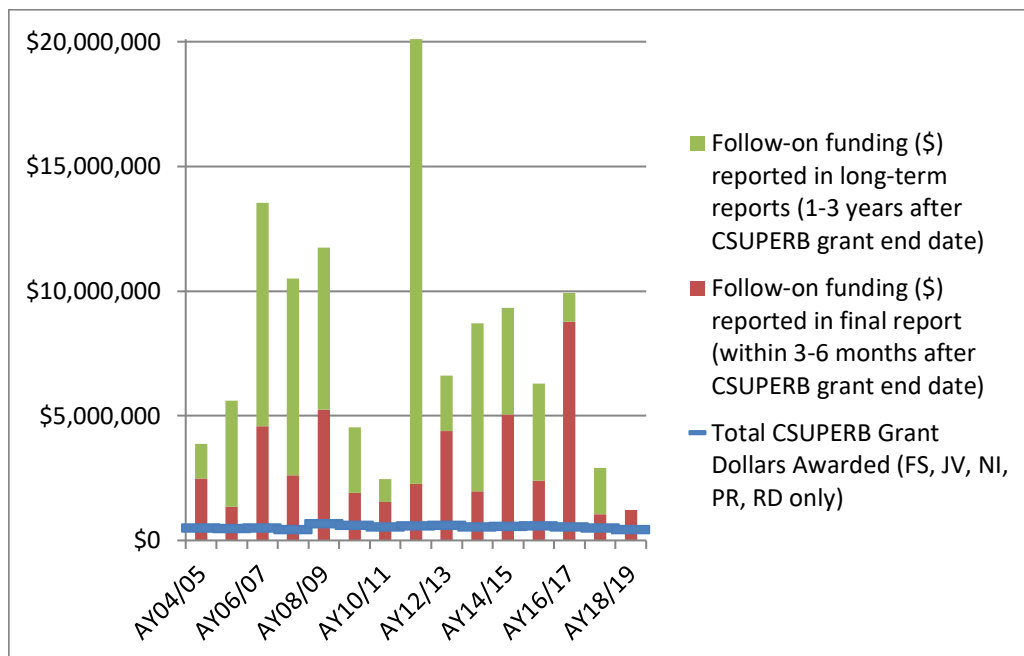
The Grants and Awards Issued by Program (Number of Awards/Total Awards)		Number/Amount
	Faculty-Student Collaborative Research Grants	28/\$414,206
	Industry Partnership Initiative (IPI)	2/\$30,000
	Curriculum Development Grants	3/\$44,993
	Pandemic Relief Grants	85/\$253,601
	Travel Grants (Faculty & Student)	15/\$21,616
	Howell-CSUPERB & Presidents Commission Research Scholar Awards	21/\$123,000
	Symposium Awards	6/\$9,500
	CSU I-Corps™ (Faculty & Student)	0/0
	Total Expenditures:	160/\$896,916

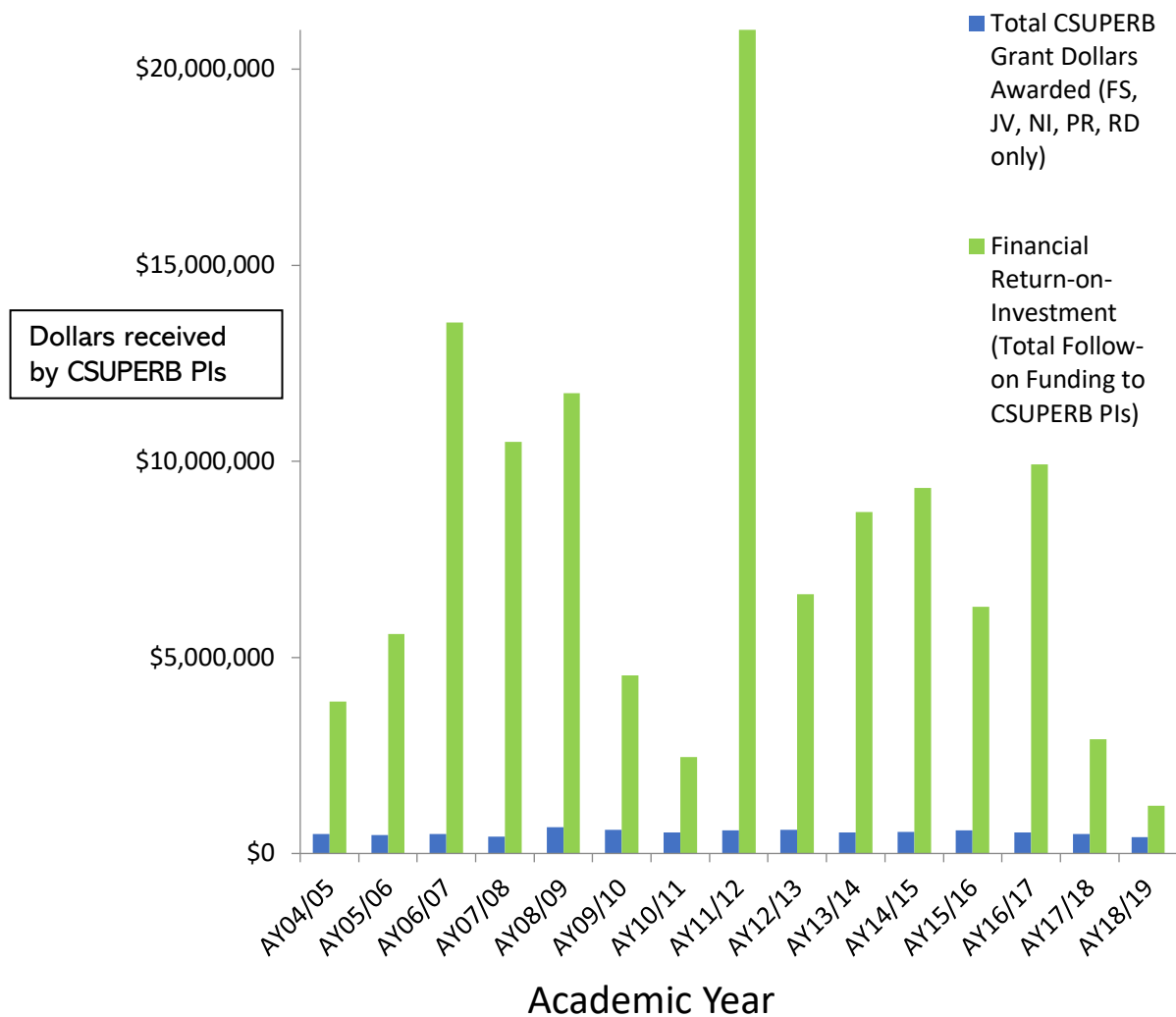
- The annual budget for the symposium is \$330,000 for the in-person years, but for the year in the report our budget was reduced to \$68,224 (with \$65,514 spent) due to the transition to a virtual meeting and to cope with the systemwide 10% budget cut in FY 2019-20.
- The grants and awards number for the year came in at \$896,916. Note that the number in the Fourth Quarter Financial Report is \$767,668 because the financial report only shows only the dollars sent to campuses during the fiscal year and some of the grants were awarded during 20/21 but still pending campus approvals like IRB and IACUC before we could send out funding.
- We do not record the travel grants in the financial reports until the awardees go on their trips and their campuses claim the reimbursement funds from us.
- In addition, we also pulled back over \$14,428 in funding where faculty members did not expend their entire grants by their end dates.

CSUPERB Program Trend Data - At a Glance



Competitive CSUPERB Grant Program Success Rates: Number (#) of proposals awarded, # of unfunded proposals and success rates (AY 06/07 through AY 20/21). Average success rate across all proposal is 33%.





CSU faculty members funded by CSUPERB are successful at winning external, follow-on funding. The averaged financial "return-on-investment" in PI's funded 09/10-18/19 is a remarkable 1,246%, based on final and long-term reports received as of July 1, 2021 (\$5,444,4677 from CSUPERB returned \$73,283,390). One of CSUPERB's strategic aims is to increase the number of biotechnology researchers in the CSU system. Follow-on funding represents an expansion of student research opportunities.