



OFFICE OF RESEARCH AND SPONSORED PROJECTS



CALIFORNIA STATE UNIVERSITY
FULLERTON

ANNUAL REPORT 2019-20

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CSUF RESEARCH ENTERPRISE

PROVOST'S MESSAGE

Thank you for taking a moment to explore the questions we have asked and the answers we have found this last year. By stepping into this Office of Research and Sponsored Projects (ORSP) Annual Report, which you are about to do, you will surround yourself with the sights and sounds and qualities of mind conjured up by our faculty, staff, and students as they dig into knowledge. Whether by addressing society's grand challenges, adding to the core of foundational knowledge, or revising our ideas of what it is to be human, these projects demonstrate the reach of Titan research.

The teacher-scholar model, which is at the heart of transformational learning on our campus, relies upon the push and pull of investigation outside of the classroom and instruction inside the classroom. The 2019 CSU Systemwide Strategic Plan for Research outlines the vision for a CSU Education: *"The hallmark of a CSU Education will include research, scholarship, and creative activity as an integral experience to engage students, develop faculty, grow the economy and advance discovery and dissemination of knowledge."* Exposure to research shapes student experiences, helping students think critically and globally as problem solvers, training them to identify, hypothesize, and test solutions to real-world problems from multiple disciplinary perspectives.

Thus, the research accomplishments of our faculty are a key element of what facilitates a signature CSUF educational experience for our students. This last year's increase in proposals submitted and new awards granted to our faculty and research staff will, then, also enhance student learning.



They will allow more of our students to debate with their faculty about the latest scholarly advances in their fields. And they will enable more of our students to participate in research and creative activities directly, whether in classroom projects, capstone assignments, lab-based discoveries, or field experiences.

It's no surprise, then, that even as budgets tighten, we continue to invest in research infrastructure, especially in initiatives that support faculty development and grantsmanship.

Over the past year, ORSP has the Federal Research Grant Writing Mentorship Program to support early-career faculty in their grant writing activities, the ORSP Scholarly Publication Faculty Fellow to support scholars in manuscript review and submission the Faculty Travel Grants to ensure faculty can present their research at professional conferences. These programs are important steps towards increasing support for faculty to ask questions that make a difference and influence society for the better through that work. We will continue these efforts, and add new ones in the coming years, to ensure that our measurable impact on faculty success in scholarship continues. With this, we know, will also come new levels of student success within our colleges and well after graduation.

The COVID-19 pandemic has had a profound effect on our campus; faculty have had to adapt their teaching and research quickly, find new virtual ways to communicate, collaborate and engage with students, and conduct their research, scholarship, and creative activities remotely. Despite the real challenges this time has brought, faculty continue to move their research forward. Much of this is driven, as is so often true with our phenomenal faculty, by their desire to provide a transformative educational experience for our students and their commitment to having positive societal impacts.

I am grateful for all our faculty, staff, and students have done to move ideas forward during this challenging time and the myriad ways our ORSP team has facilitated that work. In the midst of the unknown, our Titan community continues to use their tools as scholars, artists, engineers, and scientists to expand the boundaries of the known world. And with that, let me encourage you to begin your own journey through that expanded landscape from this last year, in the pages ahead.

Best wishes,
Carolyn



Carolyn Thomas, Ph.D.
Provost and Vice President for Academic Affairs

AVP'S MESSAGE



From the desk of the Associate Vice President of Research and Sponsored Projects at California State University, Fullerton (CSUF), I invite you to read this second annual report of the Office of Research and Sponsored Projects (ORSP). All five units of the CSUF Research Enterprise – the Office of Grants and Contracts, Office of Research Development, Office of Research Compliance, Office of Sponsored Projects, and Office of Faculty-Student Research have been successful in engaging our faculty, students, and staff in extramural proposal development and submission, conducting high quality research and creative activities, publishing research findings in peer-reviewed journals and presenting at conferences and other professional venues.

In 2019-20, CSUF faculty and staff successfully broke many records related to scholarly and creative activities.

Based on the Web of Science™ database, CSUF faculty and staff published 640 scholarly articles in 2019, a record high at CSUF, and among the highest of the CSU campuses. Under the mentorship of 70 faculty members, over 160 CSUF student scholars disseminated their research and creative activity findings through 96 different posters oral presentations at the 2019 Southern California Conference on Undergraduate Research in San Marcos, California. Out of 9 virtual presentations our students made at the 34th Annual California State University Student Research Competition, 4 received 2nd place awards in their respective disciplines. Isaiah Colton Thompson, a senior double majoring in religious studies and history, and the only invitee from California, presented his research outcomes virtually at the highly prestigious 2020 Posters on the Hill event organized by the Council on Undergraduate Research (CUR).

Although the last quarter of 2019-20 was heavily affected by the COVID-19 pandemic, CSUF faculty and staff utilized this challenging time as an opportunity and submitted 245 extramural funding proposals totaling over \$75.6M, a 35% increase from 2018-19. Moreover, our faculty and staff were awarded a record high of \$31.5M in extramural funding – a 10% increase from 2018-19 - through 142 new and supplemental awards to advance knowledge, support students, and further innovation. Internally, ORSP provided nearly \$635,000 in seed funding through Jr-Sr and RSCA awards to 80 projects promoting faculty-student research and the pursuit of extramural funding opportunities. To support faculty development through the presentation of research at professional conferences, ORSP awarded 45 faculty members the inaugural Faculty Travel Grant.

Nine early career faculty members successfully completed the inaugural Federal Research Grant Writing Mentorship program offered by ORSP. Over two dozen of our early career faculty members utilized the services offered by the inaugural ORSP Scholarly Publication Faculty Fellow.

Our Office of Research Compliance, and the pertinent committees, were actively engaged in 2019-20 reviewing applications and approving 945 Institutional Review Board (IRB) and 39 Institutional Animal Care and Use Committee (IACUC) protocols for curricular, co-curricular, and sponsored research projects. To enhance the research compliance effort, CSUF has also begun establishing an Institutional Biosafety Committee (IBC).

Presented in this annual report are the CSUF ORSP activities during 2019-20 and some selected faculty-student research highlights. I am looking forward to more faculty-student research success in 2020-21. As the AVP for Research and Sponsored Projects, I extend my thanks to CSU and CSUF administrators, faculty, staff, funding agencies, students, and CSUF friends and family for their unconditional support during this challenging time of the COVID-19 pandemic. I look forward to your continued support of the ORSP mission to serve our communities locally, nationally, and globally through innovation, discovery, and transformative research.

Please visit our webpage (www.fullerton.edu/doresearch/) for more detailed information about the research enterprise.

A handwritten signature in black ink, reading "Binod Tiwari". The signature is fluid and cursive, with a horizontal line underneath the name.

Binod Tiwari, Ph.D., P.E.
Associate Vice President



Our Mission

The Office of Research and Sponsored Projects (ORSP) works with other units throughout the campus to seek external support for faculty research, creative activity, and institutional projects that support the educational and service mission of the university. Collaboration is sought across disciplines, departments, and community partners in preparing proposals to federal, state, and private agencies.

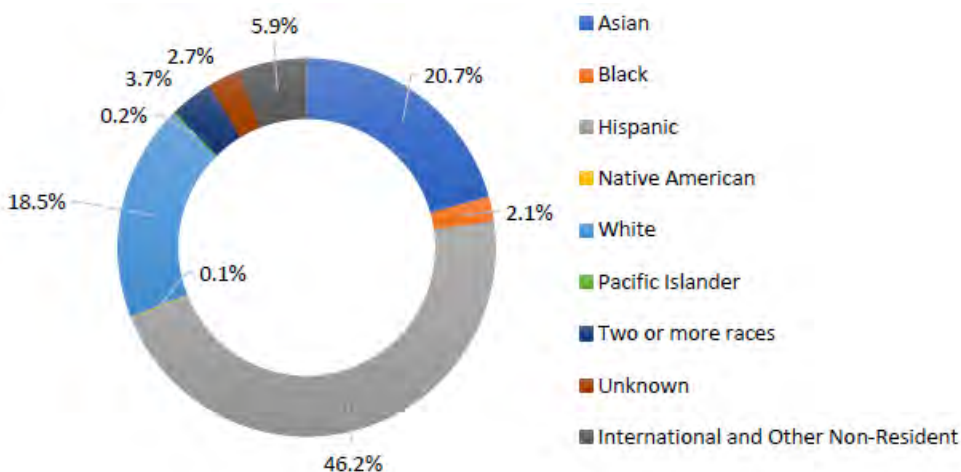
Strategic Plan

Related CSUF Goals	Related CSUF Strategy	ORSP Strategy
1. Provide a transformative educational experience and environment for all students.	1.3 Scale and institutionalize culturally responsive curricular/cocurricular High Impact Practices (HIPs).	1.1 Support the development and expansion of High Impact Practices (HIPs) with the focus of strengthening faculty professional development in research, scholarship and creative activities.
		1.2 Conduct an inventory of undergraduate research or other faculty-student mentoring opportunities and develop a model to consistently promote this experience across majors.
	1.8 Increase on-campus student employment, internships, and professional development opportunities.	1.3 Explore and pursue funding opportunities that encourage and support student employment, internships and professional development.
	1.9 Expand faculty-student mentoring opportunities, particularly during the last year of the undergraduate experience.	1.4 Identify, strengthen and support inter-disciplinary or trans-disciplinary research, scholarship or creative activities.
3. Recruit and retain a high-quality and diverse faculty and staff.	3.1 Conduct campus climate surveys and aggregate data on a regular basis. Report findings to the campus community.	3.1 Identify ORSP staffing needs and explore creative models to increase support capacities at the department and college level.
	3.8 Diversify and grow opportunities to promote faculty teaching, scholarly and creative activities, and support services to enhance the professional lives of faculty.	3.2 Provide and support professional development opportunities for faculty and staff that aim at developing their competencies in understanding and supporting the success of CSUF's diverse community.
4. Expand and strengthen our financial and physical capacity.	4.10 Define an overall university goal for revenue from self-support/entrepreneurial activities.	4.1 Identify goals for research and scholarly activity and explore models that encourage faculty pursuit of extramural funding.
	4.11 Develop appropriate financial models and business plans in each self-support/entrepreneurial program to realize net revenue targets.	4.2 Collaborate with campus partners to develop a sustainable self-support activity and revenue model.

CSUF Institutional Overview

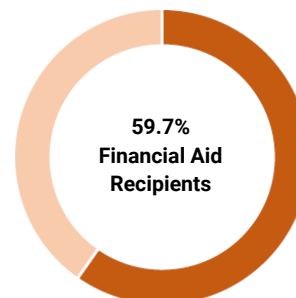
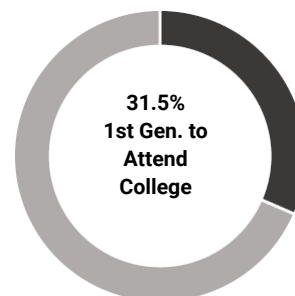
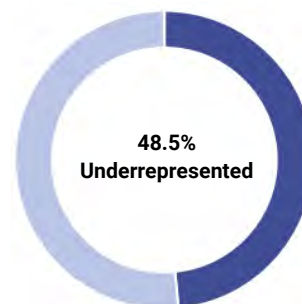
Student Enrollment

Fall 2020 State-Support



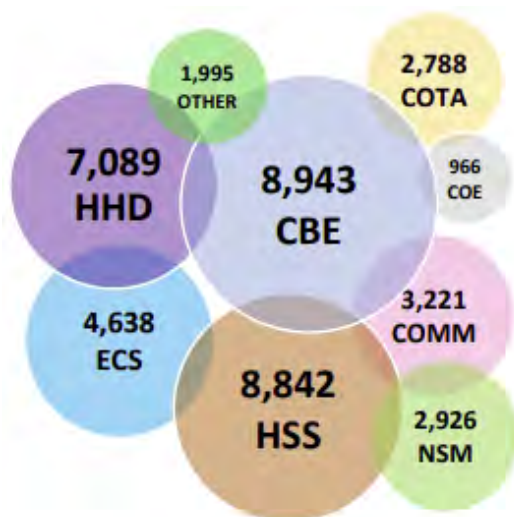
Accredited by the **WASC** Senior College and University Commission (**WSCUC**) & designated as an **Hispanic-Serving Institution (HSI)**.

Statistical Highlights



Number of Students Enrolled by College

Fall 2020 State-Support



41,408

Total Number of Students

36,330

Undergraduate Students

5,078

Graduate Students, Post-Bac & Other Students

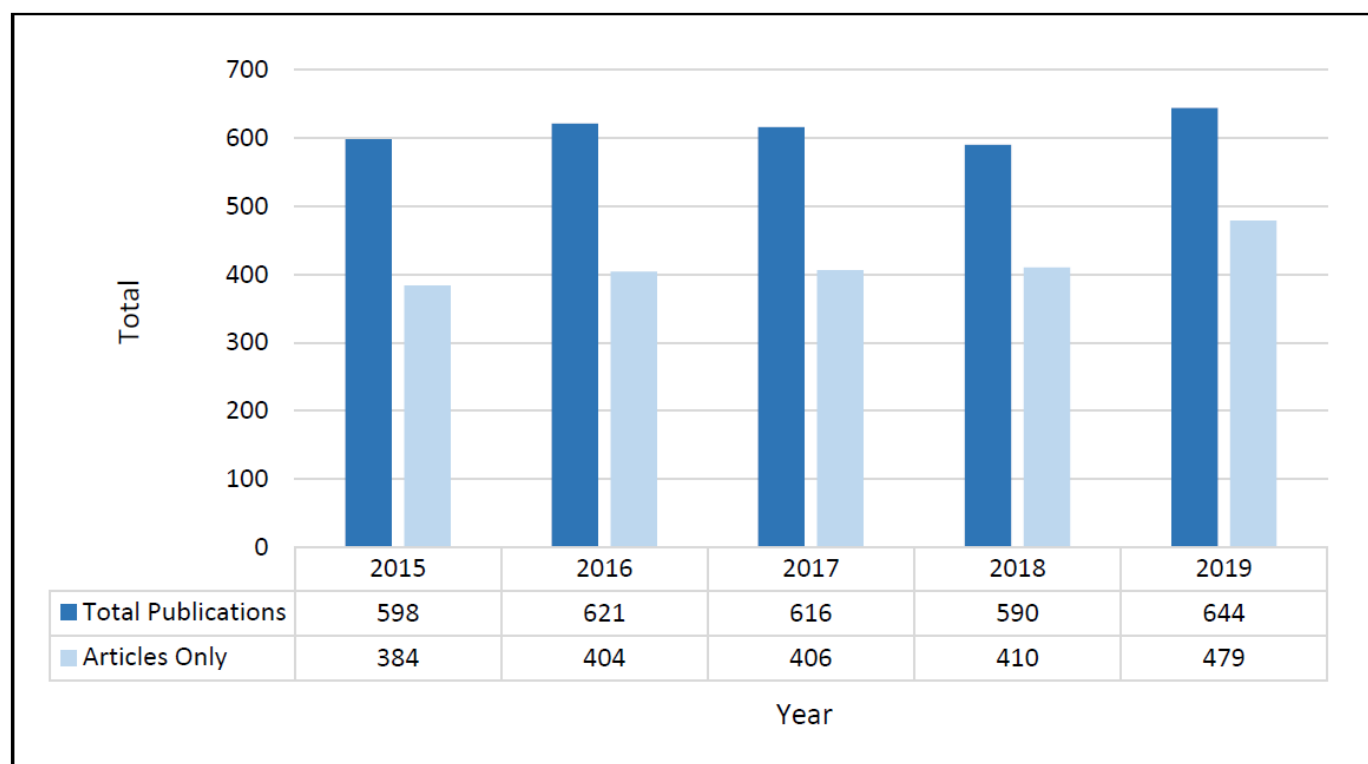


CSUF ranks No.4 in the nation for bachelor's degrees awarded to Hispanic students

Publication Record

CSU Fullerton produced a total of **644** Web of Science™ indexed publications in Calendar Year 2019, **one of the highest among the CSU campuses**. In the past 5 years, CSU Fullerton contributed a total of 3,069 Web of Science™ indexed publications*.

5-Year CSUF Publication Record



644
TOTAL
PUBLICATIONS IN
CY 2019



3069
5 YEAR WEB OF
SCIENCE
PUBLICATIONS



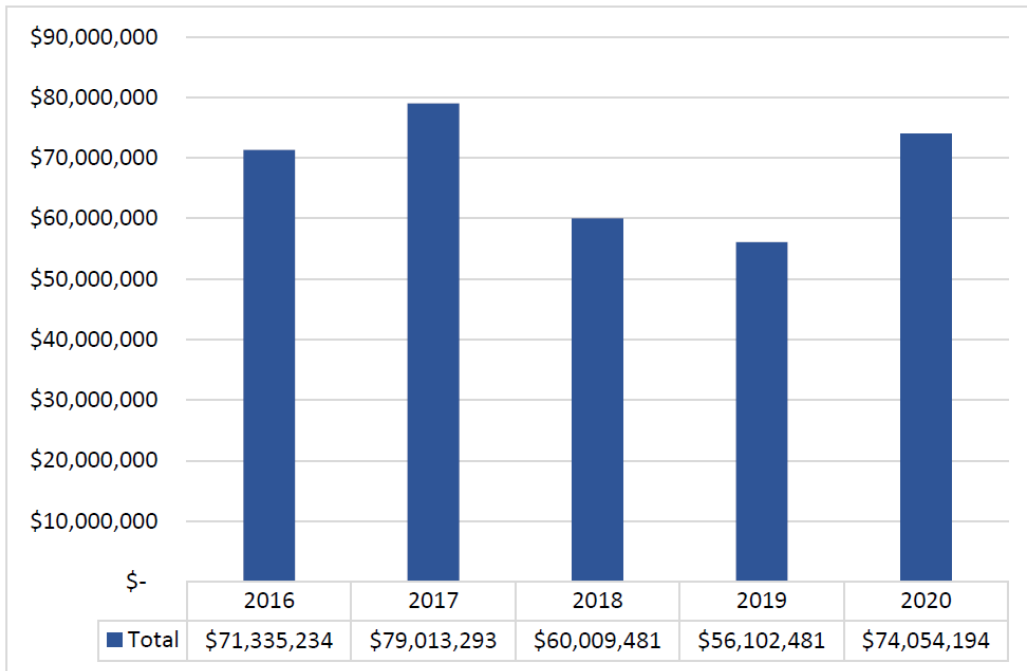
142
NUMBER OF AWARDS
IN
2019-2020



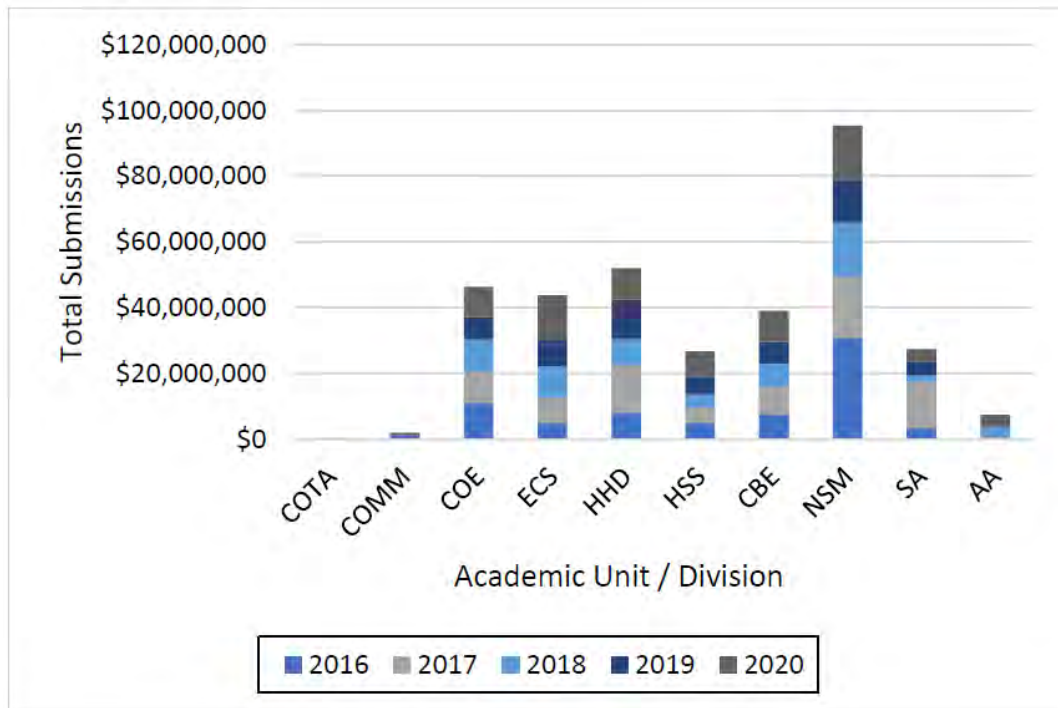
\$32M
TOTAL AMOUNT
AWARDED IN
2019-2020

2019-2020 Submission Snapshot

5-Year Submission by Fiscal Year



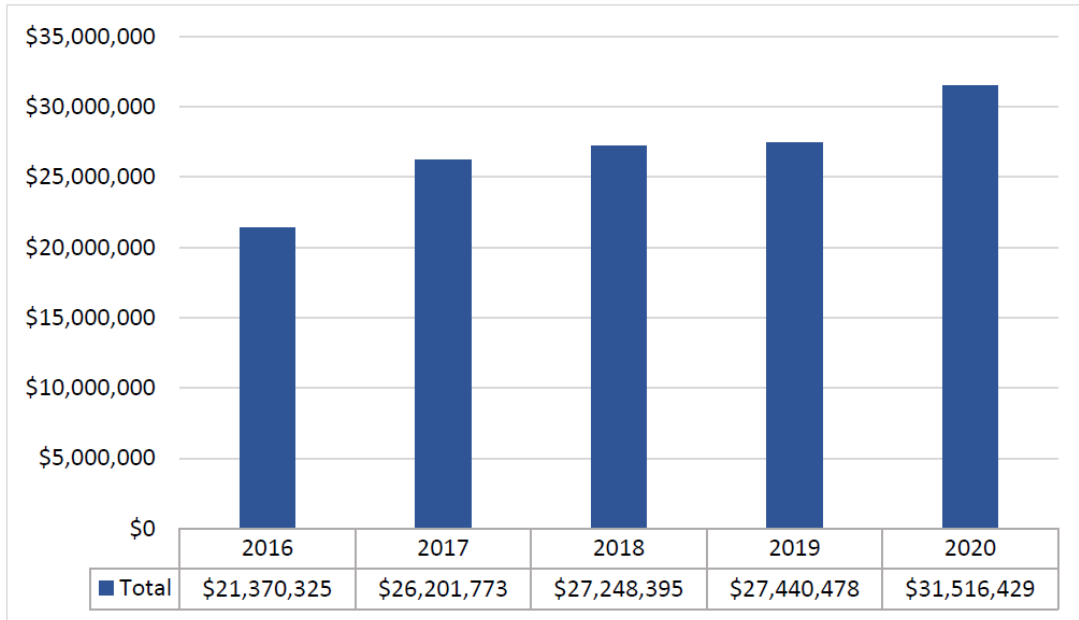
5-Year Submission Trend by College/Division



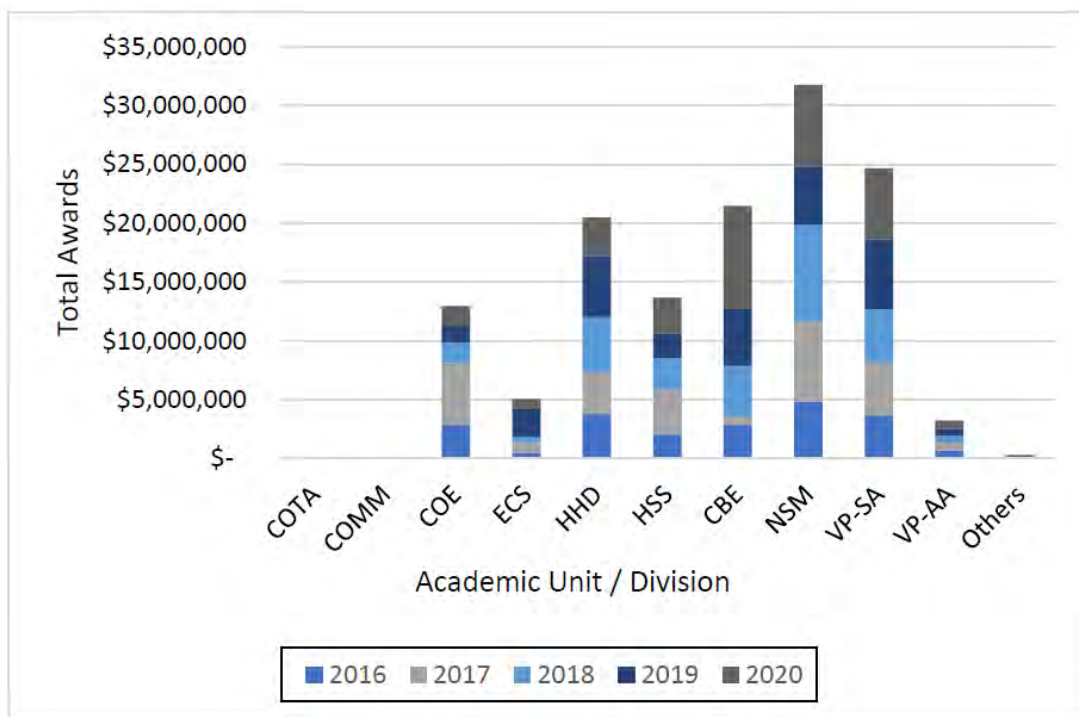
COTA	College of the Arts	LIBRARY	Pollak Library
COMM	College of Communications	CBE	College of Business and Economics
COE	College of Education	NSM	Natural Sciences and Mathematics
ECS	Engineering and Computer Science	EIP	Extension and International Programs
HHD	Health and Human Development	SA	Student Affairs
HSS	Humanities and Social Sciences	AA	Academic Affairs

2019-2020 Awards Snapshot

5-Year Awards by Fiscal Year

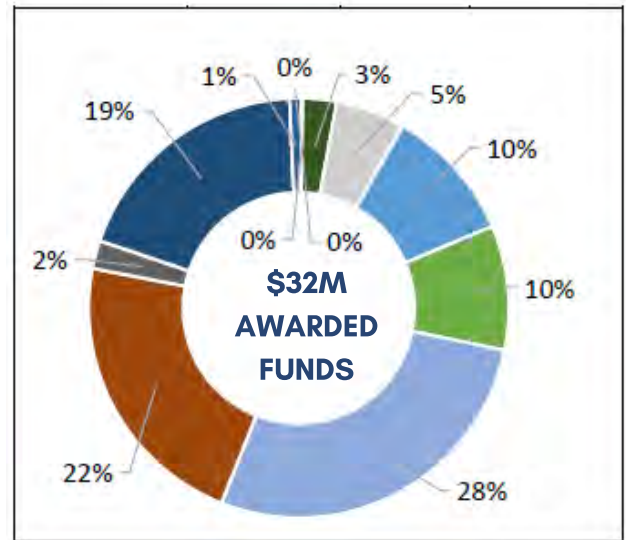


5-Year Awards Trend By College/Division

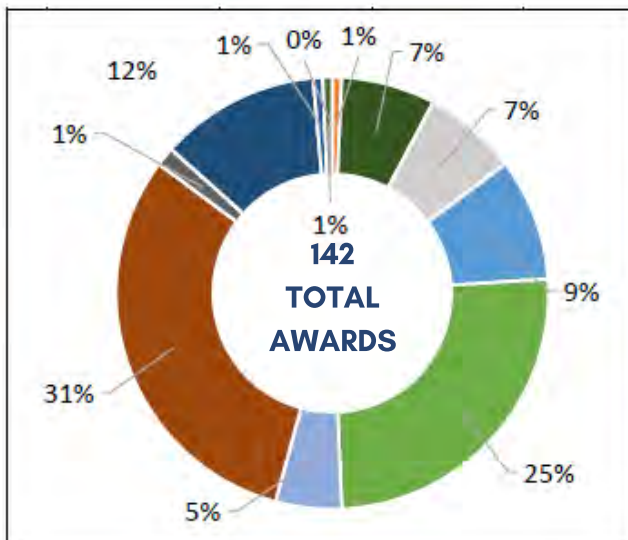


2019-2020 Awards Snapshot

Awarded \$ by College/Division

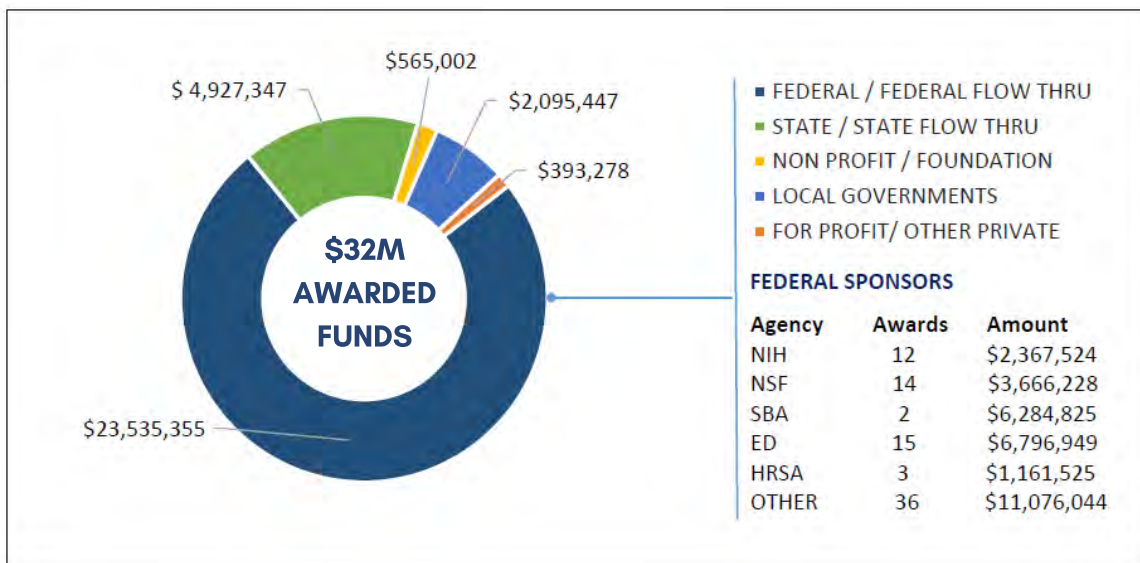


Awards by College/Division



COTA	0	\$
COMM	1	\$ 2,000
ECS	10	\$ 827,815
COE	10	\$ 1,684,132
HHD	13	\$ 3,268,131
HSS	36	\$ 3,027,242
CBE	7	\$ 8,751,634
NSM	44	\$ 6,944,484
AA	2	\$ 682,865
SA	17	\$ 6,020,385
ASI	1	\$ 288,624
UA	1	\$ 19,117

Funding by Sponsor Type



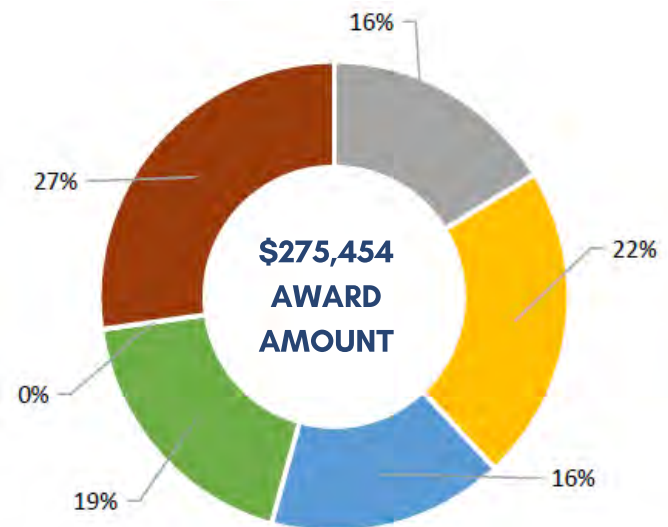
* NIH = National Institutes of Health, NSF = National Science Foundation, SBA = Small Business Administration, ED = Department of Education, HRSA = Health Resources and Services Administration.

2019-20 Intramural Grant Overview

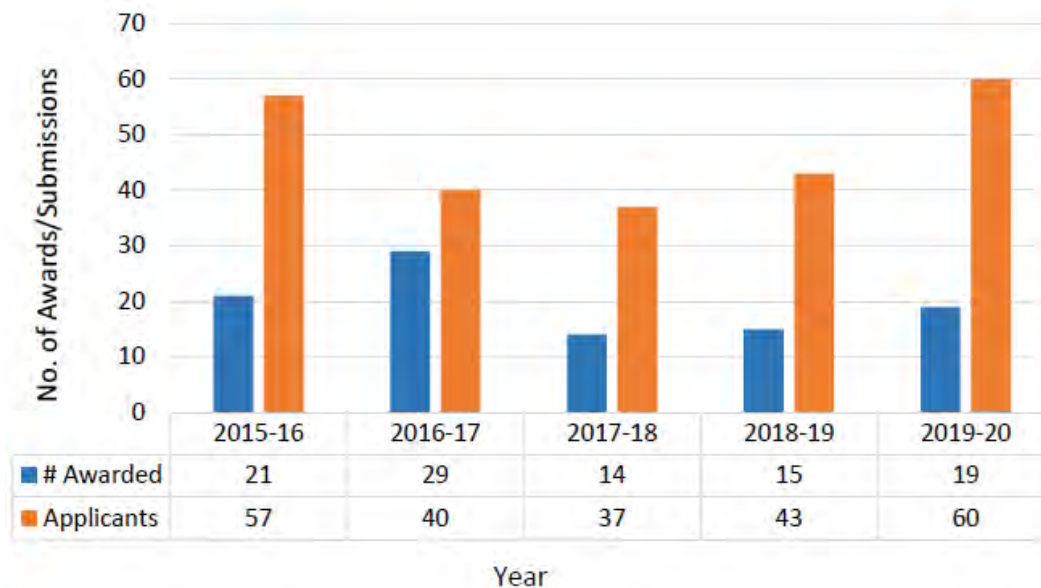
The Office of Research and Sponsored Projects through the Faculty Research Committee (FRC), supports faculty scholarship with competitive intramural funding intended to stimulate and support faculty research and creative activities, and to assist faculty in successful competition for external funding. This support takes the form of two awards: **Research Scholarship and Creative Activity Incentive (RSCA) grants** which provide up to \$15,000 per award, and **Junior/Senior Intramural grants** which provide up to \$5,000 or 1 assigned time (3 Weighted Teaching Units).

FY 2019-20 RSCA Incentive Grants Awards

	COLLEGE	# OF AWARDS	AWARD AMOUNT (\$)
	COE	3	\$44,879
	ECS	4	\$59,837
	HHD	3	\$44,897
	HSS	4	\$50,912
	CBE	0	\$0
	NSM	5	\$74,929

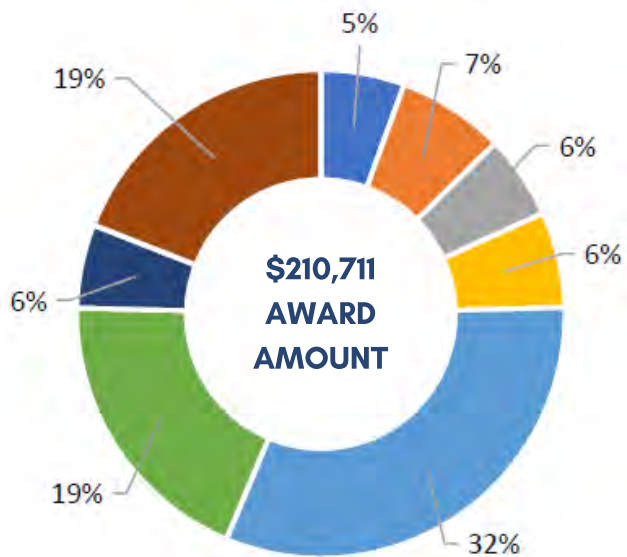


5-Year RSCA Incentive Grants Awards



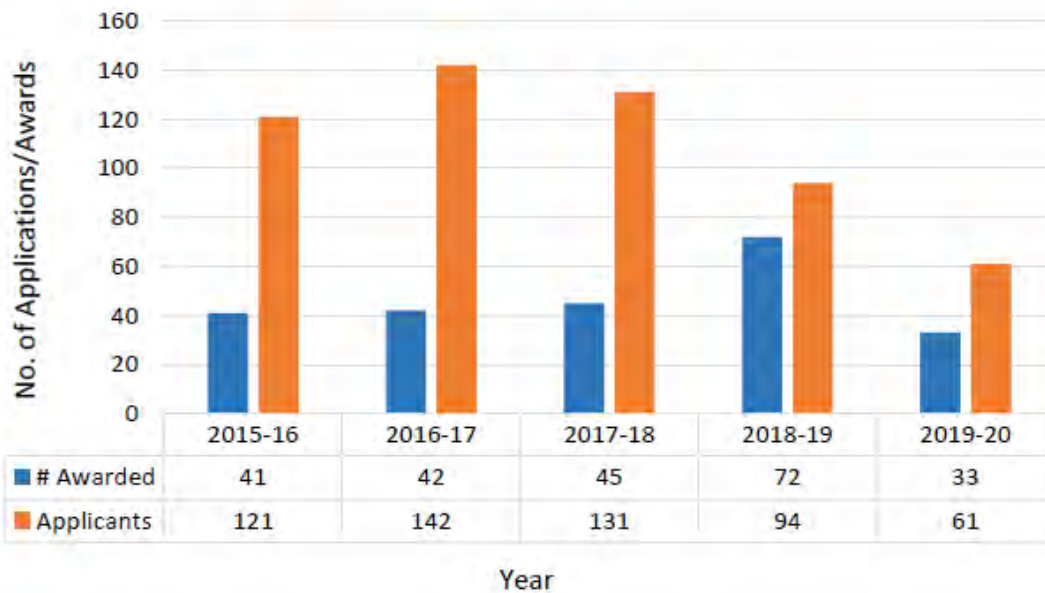
**IN 5 YEARS
\$1.120M & 98 Awards**

FY 2019-20 Junior/Senior Intramural Grant Awards



COLLEGE	# OF AWARDS	AWARD AMOUNT (\$)
COTA	2	\$11,693
COMM	3	\$15,000
COE	2	\$11,693
ECS	2	\$13,386
HHD	10	\$66,930
HSS	6	\$40,158
CBE	2	\$11,693
NSM	6	\$40,158

5- Year Junior/Senior Intramural Grant Awards



**IN 5 YEARS
\$1.323M & 283 Awards**

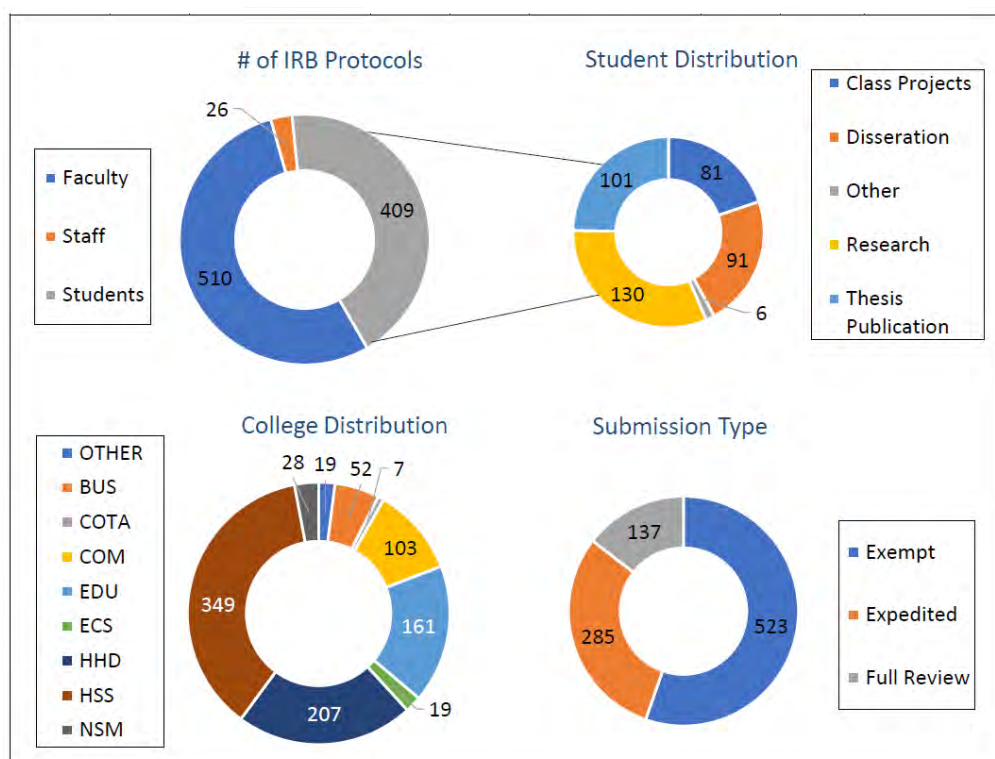


Research Compliance

The Compliance Office is tasked with ensuring that research at CSUF is conducted safely, ethically and legally. The Office facilitates the meeting of this goal by coordinating the University's Institutional Review Board (IRB), Institutional Animal Care and Use Committee (IACUC), and programs for Responsible Conduct of Research (RCR).

Protocols Reviewed/Approved* for FY 2019-2020

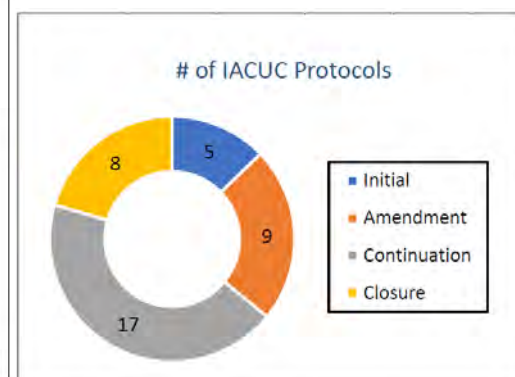
IRB Protocols



Total Protocols

IRB	945
IACUC	39

IACUC Protocols



* The number of IRB protocols listed above consists of all Initial, Modification and Renewal notices submitted to the Compliance Office for review. Some protocols may have been submitted more than once during the fiscal year for review. There is a total of 548 distinct studies.

FACULTY SCHOLARLY PUBLICATION SERVICES



The majority of those faculty were assistant or associate professors preparing publications to support their application for tenure and promotion. Most of those manuscripts are still under review at leading peer-reviewed journals, but two of the articles on which Dr. Lane consulted have already been accepted for publication. “It’s been a pleasure,” Lane says, “to read and engage with the research of talented faculty across our campus. I’m grateful for the opportunity to play even a small part in helping to bring their work to publication.”

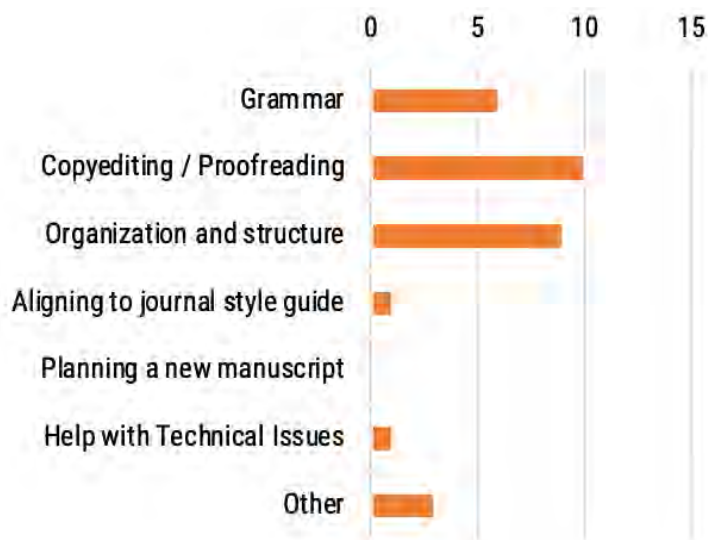
In future semesters, the SPFF will continue supporting faculty across the university in achieving their publication goals. Through targeted outreach to department chairs, new faculty, and those approaching tenure or promotion reviews, the ORSP hopes to provide the SPFF’s services and support to even more scholars across the university. The ORSP also plans to regularly survey faculty who have worked with the SPFF to identify areas for improvement and expansion.

In 2020, the Office of Research and Sponsored Projects named **Dr. Carrie Lane** the Inaugural **Scholarly Publication Faculty Fellow (SPFF)**. Dr. Lane, a Professor of American Studies, whose interdisciplinary research spans the humanities, social sciences, and business, is an experienced author and editor who earned her PhD from Yale University and BA from Princeton University.

The SPFF role was created to continue and expand CSUF’s excellent record of publishing high-quality, peer-reviewed scholarship. The SPFF works with faculty across the university to revise article manuscripts for submission or resubmission to peer-reviewed academic journals. SPFF support includes: providing feedback on readability, organization, and technical issues (grammar, punctuation, etc.); revising manuscripts to adhere to journal style guide and maximum word or page lengths; and guiding and supporting scholars through the peer review process.

In her first six months as SPFF, Dr. Lane worked on twenty-three manuscripts with fifteen faculty representing fifteen different departments across seven of CSUF’s eight colleges.

Most Valuable Services according to Faculty



Highlight: Student Research & Creative Activities

In the 2019-2020 academic year, the Office of Research and Sponsored Projects (ORSP) and Dr. Terri Patchen, Student Creative Activities and Research (SCAR) Faculty Fellow, supported various student activities. These activities include: the Southern California Conferences for Undergraduate Research (SCCUR) – fall, 2019; Student Research Competition (SRC) – spring, 2020; Outstanding Student Scholarly and Creative Activities (OSA) Award – spring, 2020; and Posters on the Hill (POH) – spring, 2020.



2020 Student Research Competition (SRC)

In its 34th year, SRC promotes excellence in undergraduate and graduate scholarly research and creative activity by recognizing outstanding student accomplishments throughout the 23 campuses of the California State University system. Since 2014, CSUF has had from two to six of our finalists win awards at research presentations competition.

In 2020, 46 students presented at the CSUF on-campus event, with 10 finalists advancing to the CSU systemwide competition, held virtually for the first time. The ten finalists were mentored by Dr. Patchen to develop and record their research presentations, before participating in a live Zoom Q & A session in front of judges from their disciplines.

2020 CSUF Student Research Competition (SRC) **by College**

Arts (COTA)	1
Business and Economics (CBE)	1
Communications (COM)	5
Education (COE)	0
Engineering/Computer Science (ECS)	14
Health/Human Development (HHD)	7
Humanities/Social Science (HSS)	8
Natural Science/Mathematics (NSM)	10



Highlight: Student Research & Creative Activities

Four CSUF finalists took home awards at the CSU systemwide event



2nd Place – Elizabeth Hitch, Undergraduate, Biological Science, NSM

"Determining the role of linker regions in Polypyrimidine Tract Binding Protein 2 neuronal splicing regulation"
Faculty Mentor: Dr. Niroshika Keppetipola

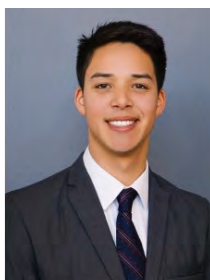
2nd Place – Amber Myers, Graduate, Biological Science, NSM

"Characterizing the source and function of lipid droplet accumulation in fly macrophages"
Faculty Mentor: Dr. Catherine Brennan



2nd Place – Dylan Serpas, Graduate, Psychology, HSS

"Group cognitive rehabilitation for community-dwelling survivors of traumatic brain injury"
Faculty Mentor: Daniel Ignacio, M.S.



2nd Place – Larissa Smulders, Graduate, Biological Science, NSM

"Boosting cancer therapy by blocking a protein's travel to the cell surface"
Faculty Mentor: Dr. Nikolas Nikolaidis



The following students participated in the Competition and deserve recognition for their tremendous efforts:

Edwin Aguilar, Graduate, Chemistry & Biochemistry, NSM

"Exploring the limits of promiscuity of microbial RFAP synthase, a potential target for anti-obesity drug treatment"

Faculty Mentor: Madeline E. Rasche

Abdulmohsen Aleissa and Abdallah Almodhyan, Undergraduates, Mechanical Engineering, ECS

"Wildfire-averting forecast and early response system: Numerically estimating fire behavior for streamlined wildfire suppression"

Faculty Mentor: Sagil James

Samir Mulgaonkar, Graduate, Mechanical Engineering, ECS

"Reducing automobile greenhouse gas emissions using generative design process and additive manufacturing"

Faculty Mentor: Sagil James

William Terry, Undergraduate, Mathematics, NSM

"Quotients of matrix spaces"

Faculty Mentors: Matthew Rathbun and Alfonso Agnew

Jordan Thompson, Undergraduate, Chemistry & Biochemistry, NSM

"Investigation of amino acid and dipeptide inhibitors for botulism"

Faculty Mentor: Nicholas Salzameda

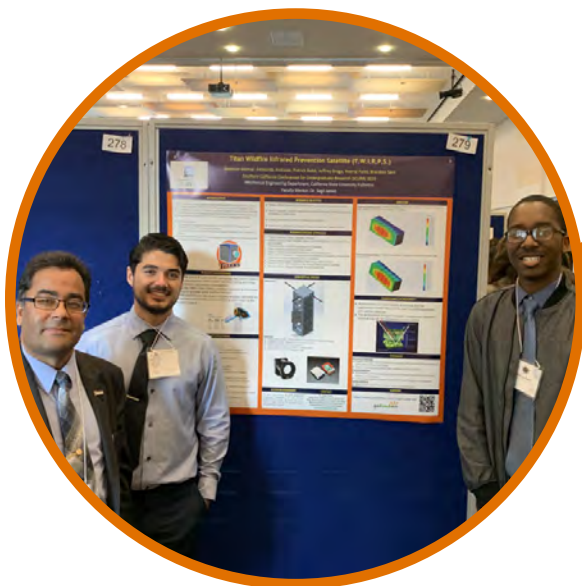
Highlight: Student Research & Creative Activities

2019 Southern California Conferences for Undergraduate Research (SCCUR)

The SCCUR conference specializes in showcasing the work of undergraduate students across all disciplines and serves as a friendly venue for undergraduates to present their scholarly and/or creative work in a poster session or 10-minute oral presentation, interact with peers in a scholarly setting, and develop presentation skills. Undergraduates from more than 50 colleges and universities participate. In fall, 2020, ORSP supported the highest number of CSUF undergraduates in recent memory, with 89 undergraduates registering to attend. The majority of CSUF undergraduate participants were from three colleges: NSM, ECS, and HSS.

2019 SCCUR Conference CSUF Undergraduate Student Attendees by College

Arts (COTA)	1
Business and Economics (CBE)	0
Communications (COM)	2
Education (COE)	2
Engineering/Computer Science (ECS)	26
Health/Human Development (HHD)	9
Humanities/Social Science (HSS)	18
Natural Science/Mathematics (NSM)	31



Highlight: Student Research & Creative Activities

2020 Outstanding Student Scholarly and Creative Activities (OSA) Awards

The OSA Award recognizes excellence in student participation in research or creative activities and is presented to one undergraduate and graduate student per college. For the College of Education, the award is presented to one masters and one doctoral student. All current CSUF students are eligible. Students must be nominated by a faculty member (within or outside of their own college). Non-nominating faculty serve as reviewers. Awards are presented to students each year on SCAR Day.

In 2020, 15 students won awards out of 23 undergraduate and 24 graduate student nominations.

2020 Outstanding Student Scholarly and Creative Activities Award (OSA) Winners

COTA Vikki Brown, Undergraduate, 5th year Nominating Faculty: Andy Fedak, Joshua Smith, Geoffrey Lovelace Victoria Snow, Graduate, Masters Nominating Faculty: Hyun Sook Kim	COB Carina Truong, Undergraduate, 3rd year Nominating Faculty: Chiranjeet Kohli Panhia Vang, Graduate, Masters Nominating Faculty: Daoji Li	COM Diana Tran, Graduate, Masters Nominating Faculty: Ying-Chiao Tsao
COE Whitney Anderson, Graduate, Masters Nominating Faculty: Carolina Valdez Aida Cuenza-Uvas, Graduate, Ed.D. Nominating Faculty: Dawn R. Person	ECS Levi Randall, Undergraduate, 3rd year Nominating Faculty: Ankita Mohapatra Chary Vielma, Graduate, Masters Nominating Faculty: Doina Bien	HHD Mathew Trevino, Undergraduate, 5th year Nominating Faculty: Austin Nation Eric Shumski, Graduate, Masters Nominating Faculty: Derek Pamukoff
HSS Isaiah Colton Thompson, Undergraduate, 3rd year Nominating Faculty: Jochen Burgtorf Carolina Jaime, Graduate, Masters Nominating Faculty: John Patton		NSM Jasmine Camero, Undergraduate, 5th year Nominating Faculty: Bogdan Suceava, Roberto Soto, Nicholas Brubaker Melisaa Chamber, Graduate, Masters Nominating Faculty: Vali Memeti

In 2020, 15 students won awards out of 23 undergraduate and 24 graduate student nominations.

Highlight: Student Research & Creative Activities

2020 Council on Undergraduate Research (CUR) 24th Annual Posters on the Hill (POH)

POH is a CUR hosted event that provides an opportunity for U.S. Congress members and their congressional staff to see the impact of the undergraduate research and education programs they support legislatively, firsthand. Nothing demonstrates the value of undergraduate research more effectively than the words and stories of the student participants themselves. This is a prestigious event, and like SRC, CUR has a rigorous evaluation process. To apply, students submit a research abstract in one of CUR's discipline divisions: arts and humanities, biology, chemistry, engineering, geosciences, health sciences, mathematics/computer science, physics/astronomy, psychology, and social sciences. In 2020, Isaiah Colton Thompson, HSS, was accepted to present at POH, which hosted a virtual poster session on Twitter in lieu of the in-person event normally held in Washington D.C. The CSUF News Center published a news item heralding Thompson's research and acceptance at the event. In addition to this year, CSUF students were selected to present at POH in 2015, 2016, and 2017.

POH Winner from CSUF, 2020

Isaiah Colton Thompson

"Lessons from the Finkenwalde Seminary (1935-1937): The Rejection of Racism in Nazi Germany"

Faculty Mentor: Jochen Burgtorf

Division: Arts and Humanities



Isaiah Colton Thompson

Isaiah Colton Thompson's senior thesis on Bonhoeffer and the lessons from Finkenwalde Seminary was selected for display at the Council on Undergraduate Research's annual "Posters on the Hill" event, a virtual poster session on Tuesday, April 21 at 9 a.m. on Twitter.

"I was surprised and incredibly pleased that my poster was selected," Thompson said. "Sixty projects were selected, from across the nation, out of 400 applications. The point of the event is to demonstrate the research being performed in universities across the country and encourage further funding for these programs." Thompson's project was the only one selected from the state of California for this honor.

Federal Research Grant-Writing Mentorship Program

COHORT 1 SELECTED

Nine (9) CSUF Faculty were selected as the 1st Cohort for the Inaugural Federal Research Grant Writing Mentorship Program (FRGWMP). The program, announced in Fall 2019 supports faculty in developing the grantsmanship skills needed to submit a proposal to a federal granting agency.

During Spring and Summer 2020, faculty attended targeted workshops put on by ORSP to help them hone their research idea(s), develop a concept paper, gather peer feedback, communicate with prospective Program Officers, and draft a competitive and persuasive proposal. In addition to receiving feedback from their peers, Cohort participants were assigned Mentors - CSUF senior faculty with a history of successful federal grant submissions and awards - to advise them on their academic and research goals.

FACULTY SELECTED

Dr. Hannah Fraley, Assistant Professor, School of Nursing
Dr. Pratanu Ghosh, Associate Professor, Department of Civil and Environmental Engineering
Dr. Sarah Grant, Assistant Professor, Division of Anthropology
Dr. Jessica Jaynes, Assistant Professor, Department of Mathematics
Dr. Maria Koleilat, Associate Professor, Department of Public Health
Dr. Ankita Mohapatra, Assistant Professor, Computer Engineering Program
Dr. Lidia Nuno, Assistant Professor, Division of Politics, Administration, and Justice
Dr. Adam Roberts, Assistant Professor, Department of Psychology
Dr. Yuying Tsong, Associate Professor, Department of Human Services

FACULTY MENTORS

Rachel Fenning, Ph.D.
Nina Robson, Ph.D.
Matthew Kirby, Ph.D.
Sam Behseta, Ph.D.
Jason Baker, Ph.D.
Nina Robson, Ph.D.
Natalie Tran, Ph.D.
Math Cuajungco, Ph.D.
Jason Baker, Ph.D.



The program was invaluable. It provided structure and support for what can feel like, at times, an overwhelming process; working alongside other committed colleagues was not only motivating, but inspiring. I really appreciated how it cultivated a community of writers, fostered accountability and facilitated my own self-reflection about my professional development and long-term research goals.



- Adam Roberts

Dr. Rachel Fenning:

Improving Participation in Dental Care and Oral Health Outcomes for Underserved Children with ASD

Overall project goals and expected outcomes:

Dental care is one of the most frequent unmet healthcare needs of children with autism spectrum disorder (ASD), who are disproportionately at risk for poor oral health and related health problems. Disparities are exacerbated for children from families with low income and racial or ethnic minority status. To address existing research and service gaps, our team developed a new parent training intervention designed to improve daily dental care and oral health outcomes in underserved children with ASD. We specifically engaged children and families that are historically underrepresented in research, including families with Medicaid eligibility and children with ASD who also have an intellectual disability. We tested our intervention program's efficacy in comparison with an educational Dental Toolkit in a randomized clinical trial.

Intellectual Merit - How the project advances science and your discipline:

Interventions to support dental care in children with ASD have predominantly focused on increasing dental office visit participation. Our intervention instead focused on leveraging work with parents to improve children's daily health behaviors (dental hygiene), which may have more comprehensive and long-lasting preventive effects given the close association between dental hygiene, oral health, and overall health and well-being. To our knowledge, our intervention is the first to demonstrate improvement in both dental hygiene and oral health in children with ASD through a randomized clinical trial, the type of stringent test needed to advance standards of care.

Broader Impacts - The impact the project has had or expected to have on the target population, the campus community, CSUF students, and/or society as a whole:

The development of new interventions and rigorous evaluation of existing treatments will contribute to improved quality of life for individuals with ASD and their families. The beneficial impacts of our parent training dental intervention suggest the viability of this approach for addressing critical unmet dental needs in children with ASD. Further study is needed to replicate and disseminate our initial findings.

Role of the project on fostering student success:

As project Co-PI, Dr. Rachel Fenning has been involved in overseeing all aspects of project development and implementation, including student involvement. This multi-site project has involved students from several universities at the undergraduate, graduate, and post-doctoral levels. CSUF undergraduate students were actively involved in data collection activities, including providing observational ratings of children's behavioral responses during dental office visits. CSUF students have also been involved as co-authors on conference abstracts and manuscripts that are currently under review and in preparation.

Vitalness of community partners to the success of your project:

As part of the Autism Intervention Research Network on Physical Health (AIR-P), the dental project is a collaboration among several

universities and hospital-affiliated sites, including CSUF, University of California-Irvine, Nationwide Children's Hospital, and Massachusetts General Hospital, as well as our California community-based dental partner, Health Smiles for Kids of Orange County. Each collaborating partner played a pivotal role in ensuring the success of this large, multi-year, randomized clinical trial. Drawing upon community-based programs and related

connections were especially critical in facilitating our outreach to families.

Accomplishments and outreach activities that have resulted from the project in addition to faculty–student collaboration:

We have presented project data at several conferences, and we have multiple manuscripts co-authored with students currently under review (*student).

Dr. Rachel Fenning:

Mindfulness and Parent Stress Reduction: Improving Outcomes for Children with ASD

Overall project goals and expected outcomes:

Parents of children with ASD are at elevated risk for high parenting stress levels, which may adversely affect parenting behaviors and child outcomes. Despite urgent calls to action, interventions to reduce parenting stress in families of children with ASD have received relatively limited attention, even less so in underserved and underrepresented populations where clinical needs are more significant. This study compares Mindfulness-Based Stress Reduction (MBSR) to Psychoeducational Support to test the effect of stress-reduction interventions for families of preschoolers with ASD.

How the project advances science and your discipline - Intellectual Merit:

Existing research suggests that MBSR may represent a promising approach to reducing stress in parents of children with a range of developmental needs. However, the efficacy of MBSR has not yet been established for families of children with ASD, despite the heightened needs of this population. In addition to employing a rigorous test of MBSR using a randomized controlled design, our project

extends this work to families from underserved and underrepresented backgrounds. Our study will also enable us to examine how and why parenting stress may affect other aspects of parenting behavior and child functioning.

The impact the project has had or expected to have on the target population, the campus community, CSUF students, and/or society as a whole - Broader Impacts:

Our ongoing study of MBSR will position us to evaluate the utility of this widely employed intervention for families of young children with ASD. Results have the potential to inform decisions regarding family-based interventions for this population. Collectively, our work in these areas demonstrates the feasibility of engaging intervention for families of young children with ASD. Results have the potential to inform decisions regarding family-based interventions for this population. Collectively, our work in these areas demonstrates the feasibility of engaging underrepresented families in research and highlights the imperative of doing so. This research also provides insight into avenues for optimizing interventions for underserved populations.

Role of the project on fostering student success:

A key element of this collaborative grant between Dr. Cameron Neece at Loma Linda University (LLU) and Dr. Rachel Fenning at CSUF centers upon fostering opportunities for student mentorship. CSUF undergraduates have been actively involved since the project outset, attending weekly meetings, assisting with laboratory data collection, and providing direct support to children and families participating in intervention groups. Additionally, CSUF's Dr. Jason Baker has lent his expertise in observational coding to support the training and supervision of CSUF undergraduates and LLU graduate students in rating parent and child behaviors that will serve as key indices of intervention outcome. As data collection draws to a close over the next year, CSUF students will figure prominently in plans for scholarship and dissemination activities. Indeed, preliminary project data will serve as a foundation for a CSUF undergraduate's honors thesis, and CSUF undergraduates are currently preparing an abstract submission for a national research conference.

Vitalness of community partners to the success of your project:

Our mindfulness project builds upon a long history of collaboration between Dr. Cameron Neece at LLU and Drs. Rachel Fenning and Jason Baker at CSUF. In addition to these cross-campus and on-campus collaborations, engagement with community partners has been vital to our success in reaching families throughout the southern California region. Close collaboration with community partners has also promoted our continued awareness of, and attentiveness to, community dynamics and needs.

Accomplishments and outreach activities that have resulted from the project in addition to faculty–student collaboration:

Data collection for this project is currently ongoing. Preliminary data have been submitted for presentation, and related manuscripts are in preparation.

Dr. Pratanu Ghosh:

Emerging Service Life Model for Nations' Transportation Infrastructure

Overall project goals and expected outcomes:

Bridge failures can be catastrophic, both in terms of human life and economic loss. The aging infrastructure system, namely bridges and pavements, affects both the security and the performance of the nation's transportation system.

According to the infrastructure report card, 25% of the USA's bridges are either structurally deficient or functionally obsolete, and approximately \$70 billion is needed to address their rehabilitation and retrofit.

One of the major causes of deterioration of concrete bridges is the corrosion of the reinforcement, which weakens the concrete's strength and threatens the structural integrity of the overall infrastructure system. This project investigates the formulation of a robust service life model of concrete structures through (i) evaluating durability by applying wireless smart sensors technology data, and (ii) improving the current service life model of concrete bridge decks by utilizing comprehensive Structural Health Monitoring (SHM) data for reliable prediction of the corrosion initiation and the propagation time.

This project's major goal is to design and implement a next-generation concrete technology protocol to evaluate the health condition of bridges and identify the options for mitigating the corrosion. This project aims to address a national-scale infrastructure challenge by reliable prediction of the remaining functional service life of concrete bridges caused by chloride-induced corrosion. The proposed research plan is expected to result in numerical tools that will enable the direct completion of lifecycle asset information, determination of formwork removal time, optimization of concrete curing. This proposed research will also help to submit a proposal for external funding to different government and private agencies. In addition, the research findings can be published in peer-reviewed journal/conferences addressing the nations' priority research need.

Intellectual Merit: How the project advances science and your discipline

The main research question is to assess whether incorporation of smart concrete technology will result in techniques for monitoring and evaluating strength and durability parameters in civil infrastructure that are better than the existing ones, as well as in the following aspects: (a) Novel framework of a robust service life modeling software by utilizing emerging SHM data.

Currently, most existing service life models primarily focus on the corrosion initiation stage, and they lack novel SHM data. Additionally, very limited research has been documented for computation of the corrosion propagation time or remaining service life for high-performance concrete (HPC) materials. This model's intellectual merit will rely on the incorporation of the propagation stage and inclusion of environment-friendly HPC to extend the service life remarkably compared to the current life cycle of bridge decks. Further, this service life model will focus on a novel stochastic simulation-based reliability assessment (SBRA) to demonstrate the user-friendly capability and handling of various uncertainties in-situ bridge deck field condition. This will be the first important step to create a new paradigm in meeting 21st century sustainable and durable infrastructure efforts;

(b) Precise evaluation of the state of concrete infrastructure by addressing costs, improved safety, sustainability: Increasing the concrete's durability, and considerably minimizing rehabilitation costs by accurate information of structural health condition. The major contribution is to create recommendations and tools to assist infra-structure agencies and bridge owners in making informed decisions regarding optimal bridge deck preservation actions with robust predictions for bridges' service life in a corrosive environment and create broad opportunities for educational activities.

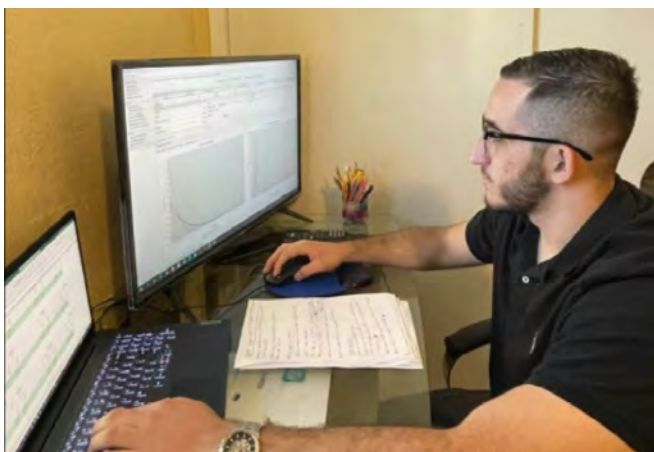
Broader Impacts: Impact the project has had or expected to have on the target population, the campus community, CSUF students, and/or society as a whole

As the U.S. infrastructure continues to deteriorate, concrete infrastructure rehabilitation and design jobs are projected to grow faster in the next decades. The national civil engineering workforce lends a sense of urgency to increase awareness of robust service life modeling techniques as a research and training focus area. CSUF is designated as a Hispanic Serving Institution (HSI). This will help underrepresented students, including Latinos, the nation's fastest-growing student population. Through this cutting-edge research, civil engineering students can become successful in modern infrastructure-related construction practice, contribute to the economy of California and the nation.

In addition, this project will attract women to pursue civil engineering and aspire to their careers in construction-related jobs through hands-on research experience and fulfill authentic STEM engagement. Further, the proposed research activity will involve students to develop a state-of-the-art concrete materials research program, publish research results in high-quality journals disseminated through collaboration with industry, and develop a new undergraduate course to nurture the general appeal of life cycle cost analysis, rehabilitation and retrofit technique of nations infrastructure system.

Role of the project on fostering student success:

This research project will create an integrated teaching and research area that will not only convey my knowledge in the civil infrastructure area but also trigger students' learning interests and inspire their thoughts. This proposed research activity in the civil infrastructure area is based on understanding the industry's needs and the needs of civil engineering students. This research will achieve the university's mission by attracting



Caption: Dr. Ghosh's student researcher, Hothaifa

undergraduate and graduate students in the civil engineering program through active involvement in laboratory investigation and numerical analysis to pursue their degrees with a scholarly research project. In addition, this opportunity provides our student's hands in activity for our students to engage in advanced numerical analysis. Through this cutting-edge research, civil engineering students can become

successful in modern infrastructure-related construction practice, contribute to the economy of California, the nation and become world-class civil engineers.

Vitalness of community partners to the success of your project:

I have established strong research collaboration with faculties in Europe for the development of a robust service life modeling software. In addition, I have developed a significant connection with several companies in California for a donation of materials for my future research. Recently, one industry partner has shown great interest and commitment for logistical support to provide close industry oversight and expertise in the development and execution of the service life model. They will provide feedback to project teams and will be instrumental in providing the broad oversight in guiding the scope of the model, selection of various appropriate high-performance concrete mixtures, application and incorporation of non-destructive surface and bulk electrical resistivity testing data, and facilitating transforming research results into user-friendly software.

Accomplishments and outreach activities that have resulted from the project in addition to faculty–student collaboration:

Preliminary results have been showcased at the SCCUR 2019 conference. Recently, my students have submitted an abstract for research presentation at the National Council of Undergraduate Conference (NCUR) in spring 2021.

Dr. Stevan Pecic:

Development of dual Soluble Epoxide Hydrolase/Fatty Acid Amide Hydrolase Inhibitors as a Promising Therapeutic Strategy for the Treatment of Acute and Chronic Pain

Overall project goals and expected outcomes:

We aim to develop dual soluble epoxide hydrolase/fatty acid amide hydrolase inhibitors that will be used as a promising novel therapeutic strategy in pain management. The compounds we propose to the study represent a completely

novel, nonopioid, starting point in pain management research. Because this class has different biological targets from existing analgesics, it represents an opportunity to solve long-standing problems that have been linked to the existing therapies in pain management.

How the project advances science and your discipline - Intellectual Merit:

These small molecules are designed to increase the levels of anti-inflammatory metabolites, epoxyeicosatrienoic acids, and antinociceptive endocannabinoids by inhibiting the enzymes responsible for their metabolism and degradation. We aim to demonstrate that the designed dual inhibitors are effectively inhibiting simultaneously, both enzymes and are metabolically stable with the potential to become new treatments for acute and chronic pain. Such molecules will be valuable to study as pain management therapeutics with predictably superior clinical profiles as compared to current opioid and nonopioid drugs.

The impact the project has had or expected to have on the target population, the campus community, CSUF students, and/or society as a whole - Broader Impacts:

According to the Centers for Disease Control and Prevention, 50.0 million Americans, and over 1.5 billion people worldwide experienced some type of pain. The most common over-the-counter drugs known as nonsteroidal anti-inflammatory drugs (NSAIDs) are aspirin, Tylenol, and ibuprofen. NSAIDs are only efficient in treating mild-to-moderate pain. On the other hand, the most effective analgesic drugs currently used to treat moderate-to-severe pain are opioid agonists, which interact with opioid receptors and lead to pain relief. Treatment with opioids has extreme precautions because people can build tolerance and yearn for a deadly dosage increase. According to the Centers for Disease Control and Prevention, every day, 130 Americans die from an opioid overdose.

Role of the project on fostering student success:

My plan is to establish a strong research program

at California State University Fullerton, developing a productive approach for mentoring students, and creating a high-quality environment for student research. Students working in my lab are exposed to three high-impact learning experiences, including medicinal chemistry lab techniques that are integral parts of the modern pharmaceutical and biotech industries. Secondly, students will become familiar with scientific data analysis. Third, students present their research at regional, national, and international conferences. These three experiences will prove invaluable to students as they transition to a workforce or secondary education that requires sophisticated lab skills, the ability to analyze data, and the ability to communicate effectively.



Caption: Dr. Pecic and student researchers

Vitalness of community partners to the success of your project:

On this project, I directly collaborate with Dr. Bruce D. Hammock and his group from UC Davis. Professor Hammock is a pioneer and world-renowned scientist in the field of lipid metabolism. His research has been continuously funded for over 25 years by the NIH, NSF, and DoD. We have shared an excellent professional collaboration since my time as a postdoctoral and research scientist associate at Columbia University Medical Center, which resulted in several publications.

Accomplishments and outreach activities that have resulted from the project in addition to faculty–student collaboration:

So far, this project yielded one publication: "Development of Multitarget Inhibitors for the Treatment of Pain: Design, Synthesis, Biological Evaluation, and Molecular Modeling Studies," published in *Bioorganic Chemistry* in October 2020. This work was presented by a student from my lab, Ms. Coral Garcia, at The Annual Biomedical Research Conference for Minority Students (ABRCMS) in November 2020. I also presented this project at the Virtual Winter Eicosanoid Conference on October 15,

2020. Working in my lab are exposed to three high-impact learning experiences, including medicinal chemistry lab techniques that are integral parts of the modern pharmaceutical and biotech industries. Secondly, students will become familiar with scientific data analysis. Third, students present their research at regional, national, and international conferences. These three experiences will prove invaluable to students as they transition to a workforce or secondary education that requires sophisticated lab skills, the ability to analyze data, and the ability to communicate effectively.

Dr. Kenneth Van Bik:

Collaborative research: Using the structure of verbal complexes to assess linguistic relationships

Overall project goals and expected outcomes:

This award attempts to document as many as four endangered Tibeto-Burman languages spoken in Chin State, Myanmar, which up to now have only been recorded in fragmentary wordlists. At the completion of this project, we expect to expand our understanding of the development of tone and other aspects of tonal phenomena, sound changes, and the position of these languages in the larger Tibeto-Burman language family by examining the structure of verbal complexes.

How the project advances science and your discipline - Intellectual Merit:

This project advances our understanding of natural processes of change that human languages undergo. It also contributes to the study of language change that informs, confirms, or disputes theories of population movement and contacts—that is, it provides insights into prehistory as well as how language change proceeds more generally.

The impact the project has had or expected to have on the target population, the campus community, CSUF students, and/or society as a whole - Broader Impacts:

The broader impacts of this project include the capacity-building in linguistics and language documentation in Myanmar and materials support for community language preservation and revitalization goals. It also includes training graduate students at CSUF, one of the Hispanic-Serving Institutions.

Role of the project on fostering student success:

Three students have been involved so far in the project as Research Assistants. Two of them are now in their Ph.D. program. Below are the narrations of their experiences. Student-1 I worked for Dr. Kenneth Van Bik as a research assistant from January to May 2020. I would specifically work for around 5 hours a week. Initially, Dr. Van Bik trained me on how on following Leipzig Glossing Conventions. From then, we would work together on glossing, and then I would do my own portion of work for a few

hours. Once we moved to remote working, I completed the work from home with Dr. Van Bik's feedback throughout the process. I would start to pick up patterns quickly as we worked together on glossing the transcriptions of Lai and Lamtuk. Sometimes I would encounter a glossing convention I was not familiar with, and Dr. Van Bik was extremely helpful in teaching me what those conventions meant. This experience was instrumental in my admission to a Ph.D. at the University of California, Santa Barbara. I was able to learn more about glossing, transcribing recordings of including medicinal chemistry lab techniques that are integral parts of the modern pharmaceutical and biotech industries. Secondly, students will become familiar with scientific data analysis. Third, students present their research at regional, national, and international conferences. These three experiences will prove invaluable to students as they transition to a workforce or secondary education that requires sophisticated lab skills, the ability to analyze data, and the ability to communicate effectively. transcriptions of Lamtuk with Dr. Kenneth Van Bik allowed me to experience a core aspect of linguistics that would have been missing from my education otherwise. Hearing the Lamtuk stories and learning more about the different fables while working on the project, particularly Gompui le Photo ("The Bear and the Rabbit"), was one of my favorite parts. Involvement in this project solidified for me that I am in the correct field, and I look forward to being involved in more linguistic research in the future.

Accomplishments and outreach activities that have resulted from the project in addition to faculty–student collaboration:

Conference presentations: 1. Van Bik and Karimi. Computational Reconstruction of Proto-Central Chin Tones. The 53rd. Conference of International Conference on Sino-Tibetan

Languages and Linguistics (ICSTLL53), University of North Texas, TX (Digital Conference). David Peterson (co-PI in the project). transcriptions of Lamtuk with Dr. Kenneth Van Bik allowed me to experience a core aspect of linguistics that would have been missing from my education otherwise. Hearing the Lamtuk stories and learning more about the different fables while working on the project, particularly Gompui le Photo ("The Bear and the Rabbit"), was one of my favorite parts. Involvement in this project solidified for me that I am in the correct field, and I look forward to being involved in more linguistic research in the future.

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Caption: Dr. Van Bik with Lamtuk Villagers

CSUF RESEARCH ENTERPRISE

Under the directive of the Provost, ORSP is led by an Associate Vice President (AVP) for Research and Sponsored Projects. Over XXX staff work in five (5) distinct areas to support campus research, scholarship and creative activities.

Office of Research Development (ORD)

ORD assists faculty in identifying funding sources for their research and creative activity; promotes institutional programming and collaborative grant development; and provides guidance, training, and assistance in preparing high quality, competitive proposals.

Office of Grants and Contracts (OGC)

OGC assists with proposal preparation, review, and submission to external funding agencies; ensures compliance with agency requirements; reviews grant awards and serves as lead in the issuance, review, and negotiation of contracts, subcontracts, and related agreements.

Office of Sponsored Programs (OSP)

OSP oversees the post-award administration of grants and contracts awarded to the university through the CSU Fullerton Auxiliary Services Corporation. Services include invoicing and grant accounting, submission of required reports (e.g, effort reporting), maintaining records of compliance, handling audits, and negotiation of the University's indirect cost agreement.

Office of Research Compliance (ORC)

ORC ensures university-wide compliance with federal, state, local, and funding agency policies and regulations that involve research and creative activities, including use of human and animal subjects and policies regarding conflict of interest and responsible conduct of research.

Faculty-Student Research

In coordination with the Faculty Fellow, promotes and expands opportunities for faculty-student research and creative activities that increase student engagement, learning and success; Identifies and provides resources needed to support student scholars and faculty mentors and enhances campus student research climate; Organizes on-campus events including CSU Student Research Competition (SRC) and Student Creative Activities and Research (SCAR) Day; Increases student participation in off-campus student research competitions (SCCUR, NCUR, CUR Posters on the Hill).

Research Enterprise Professional Development Retreat

The Office of Research and Sponsored Project hosted a retreat for the Research enterprise on December 13, 2019. The event started with a welcome address by **Dr. Binod Tiwari, Associate Vice President for Research and Sponsored Projects**.



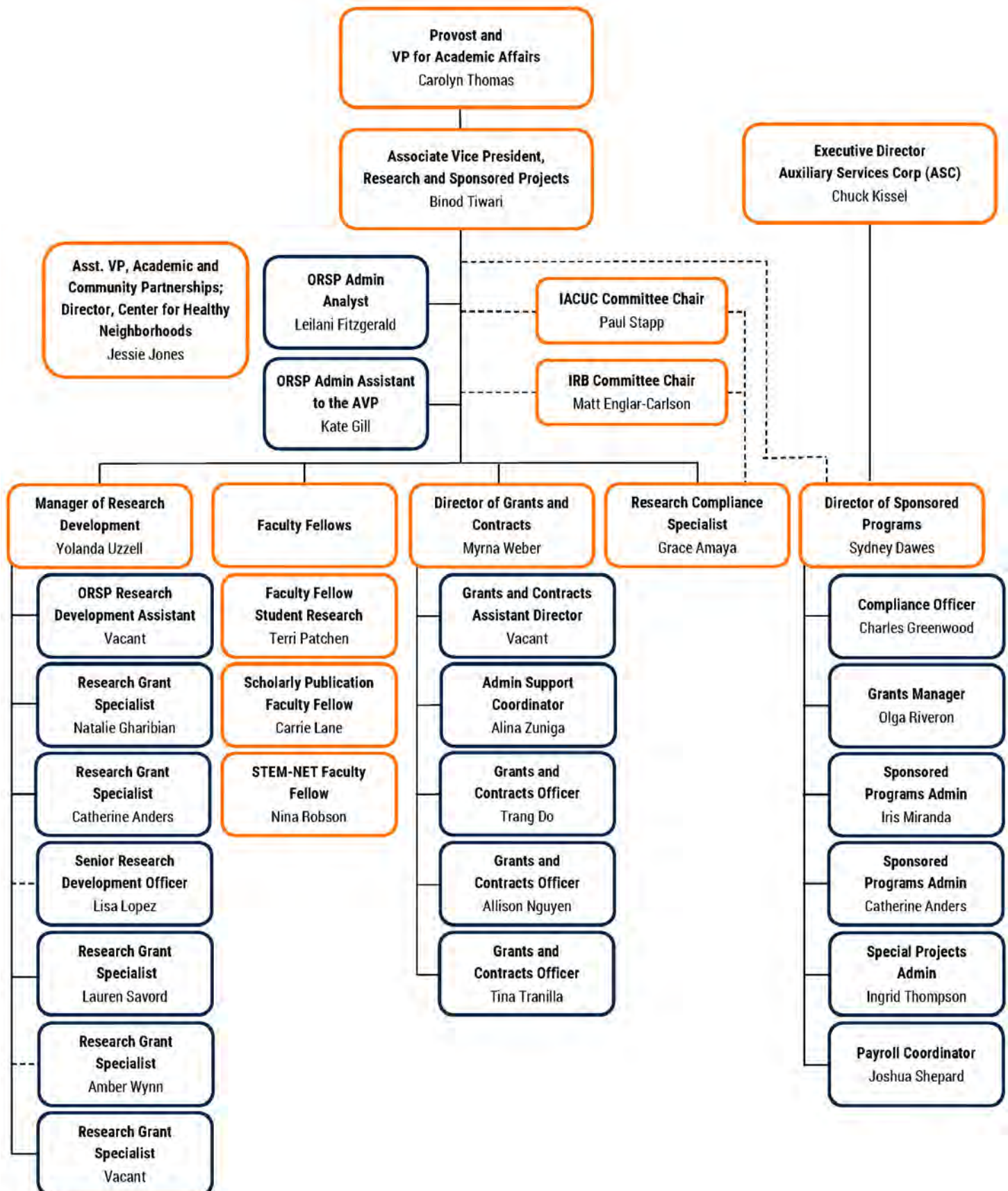
Dr. Michael J. Scott, Associate Vice President for Research and Sponsored Programs at San Francisco State University, delivered the keynote presentations at the event. In his keynote presentation, Dr. Scott introduced the research and sponsored project office structure at the San Francisco State University and



presented in detail the annual submissions for and awarded extramural grant projects for several academic units and colleges. **With well-supported data, he demonstrated how spending seed money to support early career faculty members in the STEM field could significantly grow total research grant dollars on campus.** The retreat was followed by lunch with the **ORSP staff**.



Research Enterprise Personnel



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