Volume 8 Spring 2025

PERIODIC NEWS

CSUF DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

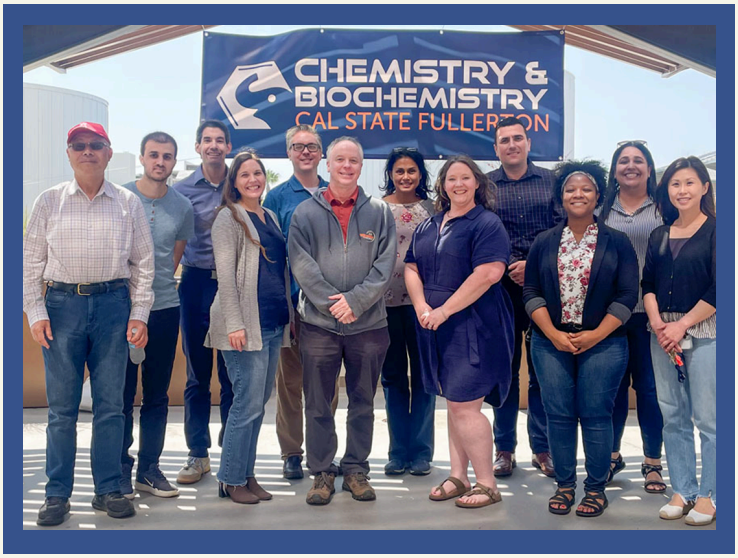


Message from the (Outgoing) Chair

Welcome to the eighth edition of the Periodic News, the official newsletter for the Department of Chemistry and Biochemistry at California State University, Fullerton!

The past year has seen a lot of movements and changes for our department. Towards the end of the 2024 Spring semester, our then-Department Chair Nick Salzameda was asked to fill the vacant Associate Dean position, which left a temporary gap in the department chair position. I was happy to oblige when contacted to see if I could provide my services to the Department and College for the fall semester. It has been a real pleasure being back on campus and helping the department through this transition, but in January it was time to hand over the reins to Dr. Niroshika Keppetipola, who will be leading the department for the foreseeable future.

Although I was back on campus for just part of the year, it was amazing to see all the progress the department has made in recent years and some of that is reflected in this Newsletter. You will read about the excellent new faculty members that were hired, the ongoing success of the SPARK



program, student and faculty awards, all the research accomplishments and output from our faculty members, a highly successful Alumni Night event, alumni updates, and many more things. It is clear to see that the department is doing well, and things are in place to provide continued success for faculty, staff and our students!

It has been my privilege to represent our department for the past several months. I hope you enjoy this newsletter as we continue to make 2025 another spectacular year!

- Dr. Peter de Lijser

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Dedication:



Dr. Maria Linder Nielson Endowed Graduate Fellowship

This edition is dedicated to the legacy of Dr. Maria Linder Nielson, whose profound impact on students and the field of chemistry continues to inspire. Her commitment to research and education lives on through the Maria Linder Nielson Endowed Graduate Fellowship, providing students with transformative research opportunities, mentorship, and resources to become future leaders and innovators.

In this issue, we highlight Dr. Linder's lasting influence through the voices of alumni and faculty who were shaped by her dedication to science and education. As we honor her legacy, we invite you to join us for Titans Give on Wednesday, March 12—a fundraising initiative to support this fellowship. Your contribution directly empowers students to tackle critical scientific challenges and advance their academic and professional careers.

UPDATES, NEWS & HIGHLIGHTS FROM 2024

Students and faculty from our department have been featured in the news during the past year for their many outstanding contributions and award-winning activities. What follows is a summary of these stories with links to the original reports.

Chemistry Research Experience Helps Students Find Materials to Combat Climate Change



In the fall of 2023, chemistry and biochemistry faculty members Allyson Fry-Petit and Joya Cooley ran a pilot of the course-based undergraduate research experience (CURE) in two lab sections of General Chemistry 2 to teach students resilience while engaging them in novel chemistry research. The CURE brings meaningful research experiences into teaching. The CURE engages students in scientific discovery in a genuine way, versus traditional teaching labs, which focus on making observations that are well-prescribed and lack novel discovery.

Read the full article here



Chemist Honored With 2024 Henry Dreyfus Teacher-Scholar Award

Dr. Michael Groves, an associate professor of chemistry and biochemistry at Cal State Fullerton, has been honored with the 2024 Henry Dreyfus Teacher-Scholar Award. As a computational chemist, Dr. Groves is dedicated to fostering the success of his students by engaging them in chemistry research early in their educational journey. The award was announced on December 16, 2024.

Read the full article here

CSUF's Energy and Sustainability Summit Paves the Way for a Greener Future



The CSUF Energy and Sustainability Summit highlighted significant contributions from students in the field of chemistry. Chemistry student Jordan Kennedy and biochemistry student Alexia Rodriguez presented their research on hydrogen fuel cells in Dr. Haan's lab, emphasizing the potential of green hydrogen as a renewable energy source for transportation vehicles and portable electronic devices. Their work underscores the importance of involving students in discussions about clean energy futures, as renewable energy solutions are crucial in mitigating environmental impact.

Read the full article here



$2.4 Million in Funding Awarded to Chemistry and Biochemistry Faculty

In 2023, eight faculty members in the Department of Chemistry and Biochemistry received external funding of a total of more than $2.4 million to support research with Cal State Fullerton students.

Read the full article here

Student Researchers Compete at 38th Annual CSU Research Competition



Eleven students, including six first-generation college students, represented Cal State Fullerton at the 38th Annual California State University Student Research Competition in San Luis Obispo.

Read the full article here



16 Students Receive Awards During CSUF Research Week

Issac Maldonado, a biochemistry major, is working with Niroshika Keppetipola, associate professor of chemistry and biochemistry, to determine the role of phosphorylation in PTBP2 splicing activity.

Read the full article here

Chemistry Alumna Launches Into Space for Third NASA Mission

CSUF alumna and NASA astronaut Tracy C. Dyson launches March 21 to live and work on the International Space Station.

Read the full article here





Researchers Seek to Design Non-Opioid Treatment for Pain

Cal State Fullerton medicinal chemistry students Faye Yun and LeahB Duong are studying drug design and creating new chemical compounds.

Read the full article here

'Living laboratory' that is the Arboretum Expands Horizons

In the "Living laboratory" at the Arboretum and Botanical Garden, chemistry students engage in experimental learning through activities such as soil and groundwater testing. This hands-on approach extends to installing energy project exhibits and conducting capstone CHEM 492 sustainability projects, offering students real-world applications of their studies. The Arboretum serves as a "living laboratory," providing a unique educational environment that enriches students' learning experiences by integrating ecological principles with academic success and fostering student engagement and well-being.



Read the full article here



CSUF Achieves Record High With Nearly $58 Million in Grants and Contracts

Cal State Fullerton achieved a new record by securing nearly $58 million in grants and contracts during the 2023-24 fiscal year, surpassing the previous record of $46.1 million from the 2022-23 fiscal year. This marks the third consecutive year of increased funding for the university. Among the grants, $592,853 was awarded by the U.S. Department of Energy for a project titled “Understanding the Role of Chemical Pressure on Thermal Expansion Tunability in Earth-Abundant Materials,” led by Dr. Joya Cooley, an assistant professor of chemistry.

Read the full article here

Spotlight



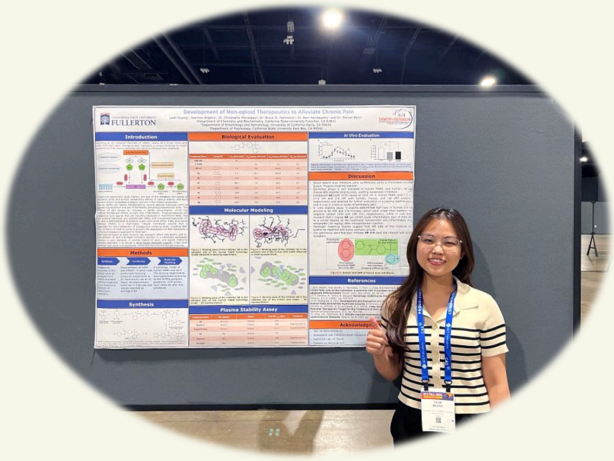
Paulina Dole is a current senior, graduating this Spring 2025 with her B.S. in Biochemistry. As a part of Dr. Stevan Pecic's research lab, she is exploring medicinal chemistry with a focus on developing therapeutic approaches for Alzheimer's disease and is a co-author in Dr. Pecic's published research paper. Paulina is also involved on campus as President of the Student Health Professions Association, President of the President Scholars Student Association, and Social Media Chair for the Chemistry and Biochemistry Club. Her career ambition is to attend medical school and become a healthcare professional, potentially specializing in anesthesiology.

Off campus, she volunteers in her community as Miss Yorba Linda 2024 within the Miss America Opportunity. She proudly champions her Community Service Initiative, "STEMpowered: Encouraging Our Youth in STEM" to inspire others to explore science, fostering curiosity and confidence.

With her title, Paulina has served at 150+ appearances, visited 18 classrooms, taught 1000+ students, partnered with PYL Unified School District's REACH Foundation, and is passionate about community engagement and mentorship. In her free time, she enjoys playing the piano – a skill she has cultivated since 5 years old and adventuring with family and friends.

From Miss Placentia Yorba Linda Little Sister to Teen Titleholder to now representing her hometown as Miss Yorba Linda, Paulina's 16 year pageant journey was inspired by her two older sisters, Kiannah and Karissa, both former titleholders. At Miss California 2024, she was recognized as a Top Twelve Semi-Finalist, earning two Preliminary Awards for Talent and for Health and Fitness. Through her involvement, she has earned thousands of dollars in scholarships for her education.

Leah Duong is a graduate student who joined Dr. Pecic's lab in Spring 2023, where she is pursuing her M.S. degree in Chemistry. She obtained a B.S. in Chemistry from CSUF in 2023. During her undergraduate studies, Leah worked under Dr. Curtis' supervision on research focused on the influence of flavoring compounds in electronic cigarettes. She also served as a Supplemental Instruction leader for three years, further developing her teaching and leadership skills. In her current research, Leah is working in the field of medicinal chemistry, focusing on the structure-activity relationships of dual inhibitors for treating chronic pain.



Since Spring 2023, she has also been a teaching assistant for the organic chemistry course. Leah was awarded the Mark Lackey Award for Graduate Teaching in Spring 2024. Looking ahead, Leah aspires to continue developing therapeutics for existing medical conditions, particularly in an industrial research and development setting.

WELCOME TO THE TEAM: **DR. KENNETH CHILDERS**



Dr. Kenneth Childers

We are thrilled to welcome Dr. Kenneth Childers to our esteemed faculty at Cal State Fullerton. Dr. Childers joins us with a wealth of experience and a passion for research that promises to inspire both students and colleagues alike.

Why Cal State Fullerton?

I chose Cal State Fullerton because it replicates everything I enjoyed in my postdoc at Western Washington University. In Washington, I learned the joy of exposing students to research early in their academic journey and showing how exciting protein biochemistry and structural biology are! Cal State Fullerton really embraces the philosophy of learning by doing. Students learn so much more by being in the lab and seeing how research is done. It always astonishes me that research like ours is done by students mostly in their twenties and Cal State Fullerton is no different - impressive research being done by stellar students. I also enjoy the SoCal weather and being close to my hometown (Tucson, AZ).

Research Focus

My research focuses on proteins that are important for our cardiovascular health and regulate when our blood needs to clot. In one project, we study protein which cause our blood vessels to dilate to improve blood flow. We are interested in studying how the structure of this protein changes when it becomes more active. When this protein is disrupted, blood flow is constricted and can lead to hypertension and cardiac stress. In another project, we study a group of proteins that help our blood clot and ow they interact together. People who lack specific clotting proteins can experience joint swelling and uncontrolled bleeding events. We are interested in studying several of these proteins, looking at how they interact together (protein-protein interactions) as well as with a lipid membrane. These results can help us redesign therapeutics for people diagnosed with blood clotting disorders such as hemophilia A or B. In both projects, we use a subfield of biochemistry called 'structural biology' which studies that the 3-dimensional atomic structures of proteins. This information allows us to study the fundamental relationship between protein structure and biological function.

Goals and Vision

My overarching goal over the next five years is to construct a research space that allows students to investigate questions that we come up with together and become independent scientists. I've always loved exposing young scientists to structural biology and the thrill of finding something new in a research lab. I would also like to branch out into more challenging research areas and push students to learn more complex biochemistry techniques, allowing us to collaborate with more labs on campus and in the surrounding area. Structural biology is a very collaborative science and I would love to build the lab into a space that works with others to answer lots of exciting biochemical questions!

Advice for Students

My biggest piece of advice would be to get involved on campus. Research is a great way to do that - talk to students in your class and ask them if they are in a research group. This might force you outside of your comfort zone, and that's a good thing! When I was in college, I struggled to talk to most students, partly due to transferring from a local community college. I joined my first research group in my junior year and learned about polymer chemistry. This allowed me to meet others who took the same classes I was taking and show me the excitement of working at a lab bench side-by-side. Inadvertently, this also makes for a perfect study group for classes! If I didn't take this first step, I'm not sure I would be where I am today.

Recent Highlights

I presented at a conference in San Diego last month on data that I collected in Washington and it was exciting to briefly mention that I am currently at Cal State Fullerton with a new group of students to investigate a similar project!

WELCOME TO THE TEAM: **DR. MICHAEL FERRACANE**



Dr. Michael Ferracane

We are delighted to introduce Dr. Michael Ferracane as a new faculty member at Cal State Fullerton. Dr. Ferracane brings a wealth of experience and a passion for peptide research that aligns perfectly with our university's commitment to undergraduate teaching and research.hy Cal State Fullerton?

I was in the faculty at another institution in Southern California before coming to CSUF. I enjoy living here and experiencing different things the region has to offer. I was particularly attracted to CSUF because of its commitment to undergraduate teaching and research, which I share. I didn't have the chance to mentor graduate students before, and I am excited for the opportunity to do so here at CSUF.

Research Focus

I'm interested in peptides and their use as chemicals tools or medicines. In one project, my students and I investigate glycoproteases, enzymes that are uniquely able to digest glycoproteins. Bacteria of the gut microbiome secrete glycoprotease enzymes to degrade glycoproteins involved in host immunity, likely facilitating bacterial colonization and infection. We are working to develop glycopeptide-based ligands that will aid our understanding of these enzymes and their role in bacterial pathogenesis.

In a second project, we are working to develop cyclic peptide-based opioids as improved pain and addiction treatments. In animal studies, cyclic peptides have been shown to treat pain with reduced overdose and addictive potential; interestingly, they are also able to block the rewarding effects of drugs of abuse. Right now, we are using standard approaches in medicinal chemistry to try and optimize the opioid activity and drug-like properties of this unique molecular scaffold.

Goals and Vision

I am excited to teach courses across the organic chemistry curriculum, and I'm planning to try some new (to me) approaches to keep things fresh and grow as a teacher. I also plan to continue working on research projects with undergraduate and graduate students, and I'd like the science and students from my lab to be regarded well. All of my previous research students have gone on to schooling or employment in chemistry or their field of interest, and I'm really proud of that.

Advice for Students

Your education is truly what you make of it. If you're involved in on-campus organizations, participating in research, meeting with faculty, and using the support service on campus, you're really going to have a meaningful college experience that helps you grow and jump-start your future educational or career pursuits.

Recent Highlights

I was able to publish three papers this past year.

WELCOME TO THE TEAM: **GLORIA GARCIA**



Please welcome Gloria Garcia, our new Administrative Support Coordinator in the Department of Chemistry & Biochemistry! Gloria first joined Cal State Fullerton as a student in 2004 and has built a longstanding connection with the university throughout her academic and professional journey. She is excited to be back at CSUF and looks forward to supporting our students and faculty.

Why Cal State Fullerton?

I came to Cal State Fullerton as a student in 2004 to pursue my education. I then became a student assistant and took on a permanent position with the department of Liberal Studies, Philosophy, and Women & Gender Studies. During my many years, I achieved my bachelor's degree and started my family. In 2019, I joined Cal State LA but eventually came back to Fullerton in 2024 and joined the Chemistry & Biochemistry family. I am a Titan and glad to be back. You can achieve many accomplishments well working at Cal State Fullerton. I'm looking forward to getting more involved on campus to help guide and support our students.

In my free time I love spending time with my two boys who are full of energy, watching movies and enjoy dinner nights out as a family.



Summer Program to Advance Research and Knowledge (SPARK)

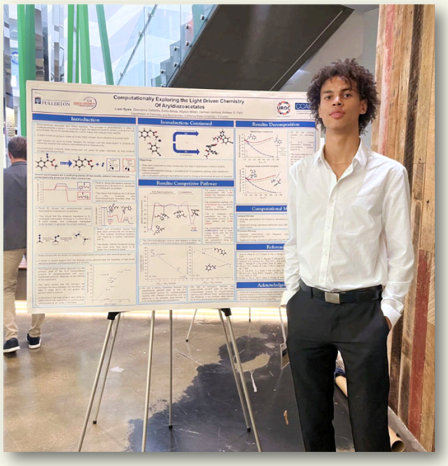
Students Only Need a "SPARK" to Become the Scientists of the Future!

In 2023, with support from the Dean's office, the department launched the Summer Program to Advance Research and Knowledge (SPARK) to introduce first-time freshman to scientific research. In the summer of 2023, faculty in the department hosted 9 freshmen to participate in summer research. The program was a great success and to provide additional funding to continue the program in future years, the Department participated in a Fundraising program in the fall of 2023, which raised over $11k! SPARK was continued in summer 2024 with a new group of six first-time freshmen, again earning praise from both student participants and faculty mentors. A fundraiser in the fall of 2024 raised nearly $13k in part because of winning the Elephant race and earning a spot (again) in the **Top 10 Challenge!** These funds will allow SPARK to continue and grow in the years ahead.



SPARK was developed to allow freshmen to gain research experience, build a community and increase their confidence to persist in the major. Although it will take several years to fully realize its potential and see the effects, early signs are very promising. Student feedback is overwhelmingly positive – undergraduate Liam Ryals (who worked in the research lab of Dr. Andrew Petit in the 2023 SPARK) mentioning that "It boosted my confidence in both conducting research and effectively communicating scientific concepts."

Liam has continued his research and told our Newsletter that "beyond the technical skills, the program also helped me build strong relationships with faculty, which have motivated me to strive for academic excellence. These connections have inspired me to seek out more summer research opportunities and pursue graduate school." Dr. Andrew Petit confirms the positive contributions of Liam and indicates that "Within the next 6 months, [Liam] will be a co-author on a paper where we develop a mechanistic understanding of the blue-light driven chemistry of aryldiazoacetates."



In addition to these activities, Liam has also had an opportunity to present his research at the Southern California Theoretical and Computational Chemistry Conference held at University of San Diego where he was one of two undergraduate students to earn an award for their poster! Liam is now a McNair Scholar, and he plans to pursue graduate school in the future.



Similar stories are heard from other students, including Elsie Calderon, who was selected for the 2023 SPARK and has continued to do research in Dr. Paula Hudson's research group since that time. She mentions that "the SPARK program affected my knowledge in chemistry, and I truly believe that this research has helped me see how the lessons I've learned in class can be used to find new discoveries in the real world.

I had struggled academically my freshman year and … questioned whether I had chosen the right major. After joining I've realized how much I enjoy doing research and science, and didn't want to give up yet. My grades have improved so much ever since I've been in the SPARK program".

After only two years in existence, SPARK has made a very significant impact on students and faculty in our department and these positive experiences provide strong support for continuing and growing SPARK in the years to come. Support from donors during our fundraising events has been incredible and is essential to continue these efforts – thank you!

AWARDS & RECOGNITIONS

Professor & Mrs. Ting K. Pan Memorial Scholarship
Manuel Beruman

Kenneth L. Goodhue-McWilliams Award for Outstanding Community Service
Paulina Dole

Advancing in STEM Scholarship
Trianna Lopez

Wegner Family Scholarship
Michelle Le, Alex Salgado and Adriana Rodriguez

Glenn and Takeshi Nakaya Scholarship
Shelton Miller

Dr. Andrew and Kay Montana Endowed Scholarship in Chemistry
Maximillian Chau and Aline Vu

Brad van Mourik Interface of Computers with Chemistry Award
Jasmine Magaña

Phil Berriman Research Excellence with Instrumentation Award
Dennis Nguyen

Glorya Welch Scholarship
Karina Cerda

Glenn Nagel Scholarship
Elise Calderon

Noorani Family Scholarship
Liam Ryals

James Sternberg Scholarship
Sandro Rodrigo Vasquez

Coppel Graduate Science Award
Cassandra Yuan

American Chemical Society Award
Alexander Hobrath

American Institute of Chemists Award
Dominic Milla

Maria Linder Nielson Endowed Graduate Fellowship
Manuel Beruman

Lyle Wallace Service Award
Andres Hernandez

Mark Lackey Award for Graduate Teaching
Dennis Nguyen



FACULTY & STAFF

Outstanding Research
Dr. Michael Groves

Outstanding Untenured Faculty Member Award
Dr. Joya Cooley

Outstanding Contributions to Student Success
Dr. Allyson Fry-Petit

Outstanding Instructor
Dr. Mehdi Jalali-Heravi

Staff Excellence Award
Mika Perez

Zhangjie Li Award
Dr. Julia Chan, Dr. Joya Cooley, Dr. Niroshika Monerawila Keppetipola, Dr. Stevan Pecic, Dr. Andrew Petit

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Faculty Updates

Dr. Stevan Pecic earned tenure and was promoted to Associate Professor.

Dr. Niroshika Monerawila Keppetipola was promoted to Professor.

Alumni Night 2025



Our **2024 Alumni Night** was a resounding success, bringing together past and present members of the CSUF Chemistry and Biochemistry community for an evening of camaraderie and celebration. Hosted at Bootlegger's Brewery in downtown Fullerton on Friday, October 18th, the event drew an incredible 85 attendees—including 3 Emeriti, 13 faculty members, 3 staff members, 20 guests, and 46 alumni!

This year's turnout exceeded our previous record, and we are especially grateful to the 22 alumni who generously donated in support of our department. Attendees ranged from graduates of 1969 to Spring 2024, creating a truly multigenerational reunion filled with shared memories, laughter, and inspiring stories.

The Chemistry and Biochemistry Department remains dedicated to mentoring and equipping students with the knowledge and skills for successful careers in science. We can't wait to build on this momentum and make Alumni Night 2025 even bigger and better. See you next year!

Alumni Night Crowdfunding

In October 2024, the department launched a crowdfunding campaign to support undergraduate research, and thanks to our amazing alumni, emeriti, faculty, and staff, we raised over $11,000 from 101 donors! Your generous contributions will directly support the Summer Program to Advance Research and Knowledge (SPARK) 2025, providing students with valuable research opportunities.

We deeply appreciate your support—thank you for investing in the future of scientific discovery and innovation at CSUF!



CLICK HERE TO STAY IN TOUCH!

Alumni Spotlights



From Biochemistry to Computational Biology

Kate Da Silva: Discovery and Growth

In 2023, Kate Da Silva, a promising young scientist, graduated with a Bachelor of Science in Biochemistry from California State University, Fullerton (CSUF). During her time at CSUF, she worked in the lab of Dr. Linder, focusing on a critical aspect of Wilson's Disease (WD), a genetic disorder that prevents the body from removing excess copper. This research was pivotal in understanding how small copper carriers (SCC) help maintain copper homeostasis by secreting copper in urine, a mechanism previously unknown. The lab's groundbreaking work extended to various cell lines, including Normal Rat Kidney Cells and Human Colon Cells. Kate's project aimed to determine if the Human Breast Cancer Cell Line (PMC42) also secreted copper, a study inspired by copper's role in neural development and its presence in breast milk.

Now, Kate is pursuing a PhD in Mathematical, Computational, Systems Biology at the University of California, Irvine (UCI). She aspires to master -omic approaches to explore the molecular foundations of diseases, integrate multi-omics data to identify biomarkers, and uncover potential therapeutic targets. Reflecting on her journey, she shared, "I once believed I wasn't smart enough to pass the mathematics required for a STEM degree, yet here I am pursuing a PhD in a math-related field." Her fondest memory of CSUF involves the invaluable guidance received during office

hours discussions with professors, which helped shape her aspirations. "Those conversations were instrumental in giving me the confidence to pursue my goals," she recalls. Additionally, her role as a Supplemental Instruction (SI) leader for calculus was particularly rewarding, as it allowed her to help students overcome their fears of math and develop confidence in their problem-solving abilities.

To current and future students, Kate offers this advice: "You are your own worst enemy. If you want to do something, go for it; you never know where you will end up. Motivation and persistence go much further than a GPA, so don't let self-doubt hold you back. Believe in your ability to grow, and trust that hard work and determination will open doors you never thought possible." Kate Da Silva's journey from biochemistry to computational biology underscores the transformative power of education, mentorship, and self-belief, illustrating how passion and perseverance can lead to unexpected and rewarding paths.

From Student to Educator

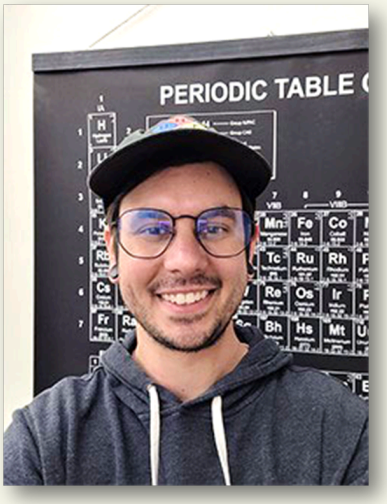
Dr. Macy Shen: Inspiration and Legacy



Dr. Macy Shen, a distinguished alumna of the Department of Chemistry and Biochemistry at California State University, Fullerton (CSUF), exemplifies the profound impact that dedicated educators like Dr. Maria Linder can have on their students. Dr. Shen's journey through academia and her current contributions to education highlight her commitment to inspiring future generations. Dr. Shen's impressive academic credentials include a Ph.D. in Nutritional Sciences from the University of Wisconsin, Madison, achieved in 2013, preceded by a Master of Science in Chemistry in 2009 and a Bachelor of Science in Biochemistry in 2002, both from CSUF! Her academic pursuits at CSUF were marked by significant research achievements, including building high-resolution crystal structures of the c-fragment of tetanus toxin heavy chain under the guidance of Prof. Katherine Kantardjieff and serving as a teaching/research assistant for Dr. Barbara Gonzalez.

Reflecting on her transformative experiences in Dr. Linder's classes, Macy shares, "Those classes changed my life! The class was so engaging and interesting. Her lectures were concise and lasting. The knowledge I gained from her stayed with me for good." Dr. Linder's mentorship was instrumental in Dr. Shen's development as an educator, as she co-instructed CHEM 445 with Dr. Linder, gaining invaluable support and confidence. Dr. Shen fondly remembers the vibrant and passionate faculty at CSUF, stating, "Their exuberance was infectious, and it instilled in me a deep desire to learn and achieve." Today, Dr. Shen continues to make a significant impact as a lecturer at CSUF, teaching CHEM 111, a nutrition and health course initiated by Dr. Linder. Dr. Shen considers it a privilege to carry forward this legacy, emphasizing, "The kindness that Dr. Linder had towards me, and all her other students is like a ripple effect. I would always treat my students with kindness as well."

Looking ahead, Dr. Shen is committed to continuing her teaching endeavors, aiming to inspire more students to "fall in love with chemistry through learning about nutrition." Her advice to students is to "be proactive about learning," highlighting the supportive environment at CSUF where faculty members are eager to help.
In a heartfelt tribute to her mentor, Dr. Shen expresses her gratitude for the deep understanding of biochemistry she gained under Dr. Linder's guidance. "This nutritional biochemistry class she taught made me appreciate biochemistry. Those biochemical pathways are not cold chemistry reactions [...] I started to appreciate that every little biochemical pathway was essential in maintaining our health!" Dr. Macy Shen's journey is a testament to the enduring influence of Dr. Linder's teaching and mentorship, showcasing the power of education to inspire and transform lives. Her ongoing dedication to education continues to reflect the values and passion instilled in her by Dr. Linder, ensuring that this legacy of knowledge and inspiration lives on.



From Fullerton to Berlin

Marcus Marracci: A Journey in Chemistry

Marcus Marracci, a 2019 graduate with a B.S. in Chemistry from CSUF, has always had a passion for exploring the intricate world of chemical reactions. During his undergraduate years, Marcus honed his research skills in Dr. Andrew Petit's research group, where he delved into computational chemistry. His work focused on employing density functional theory and multireference wavefunction methods to study photoinitiated cyclization reactions of oximes and unraveling nonradiative relaxation pathways of nitro and nitroso aromatics after photoexcitation.

After earning his bachelor's degree, Marcus pursued a Ph.D. in physical chemistry at the University of California, Irvine. Reflecting on his journey, Marcus recently shared an exciting milestone: "I have just completed my Ph.D. and am heading to the Fritz-Haber Institute in Berlin to investigate photochemistry at the air-water interface using time-resolved photoelectron spectroscopy."

Marcus fondly recalls his time at CSUF, particularly the moments spent engaging in thought-provoking conversations with Dr. Petit. "My fondest memories of my time at CSUF were the chats I had with Dr. Petit about a wide variety of concepts in physical chemistry and getting to see the wide breadth of research available in my future," he shared.

For current and future students, Marcus offers sage advice: "It is always worth it to take the time to chase your dream and prepare yourself for the tasks ahead to chase said dream. It doesn't matter how long you take; it matters how you arrive."

As Marcus embarks on this next chapter of his career in Berlin, he exemplifies the power of perseverance and passion in achieving one's dreams. The Department of Chemistry and Biochemistry is proud to celebrate his accomplishments and looks forward to his future contributions to the field.

ALUMNI UPDATES

Shahanara Begum, M.S., 2012
Shahanara is a Quality Control Supervisor at NHK Labs, Inc., ensuring top-quality standards in the industry.

Christopher Bunye, B.A., 2017
Christopher works in Research and Development at Behr Paint, contributing to innovative coatings. In his free time, he enjoys attending conventions and cosplaying.

Alyana Carrell, B.S., 2023
Alyana is currently pursuing a Master's degree at CSUF.

Laurence Fakinos, B.S., 1984
Laurence is a Physician specializing in Obstetrics & Gynecology. He is married with 5 kids and 7 grandkids—four of whom he personally delivered!

Jacob Garcia, B.S., 2020
Jacob is a chemistry teacher in South Los Angeles and is pursuing a Master's in Chemistry to become a community college professor. "My students got the highest chemistry interim scores on the largest Charter School District in Los Angeles!"

Melanie Hernandez, B.S., 2010
Melanie is a Forensic Scientist III (Toxicology) at the Orange County Crime Lab.

Anna Hockensmith, B.S., 2015
Anna started as a laboratory technician at the Los Angeles County Sanitation Districts (LACSD) and is now a Senior Chemist in Client Services (Senior Project Manager). "I have two kids now (a 2-year-old and a 4-year-old)."

Sayali Kanitkar, B.S., 2022
Sayali is a Compliance Investigator at Takeda while pursuing an M.S. in Biotechnology & Bioinformatics at CSU Channel Islands.

Kathreen Longtin, B.S., 2014
Kathreen is the head of a medical research laboratory.

Kamron Lotfi, B.S., 2018
Kamron is a Regional Site Manager at Johnson & Johnson Innovative Medicine, overseeing Phase 3 prostate cancer clinical trials. "I have successfully recruited and retained patients, helped with trial design, and worked in leadership roles. I earned my Master's in Pharmaceutical Sciences from Chapman University."

Pejman Naraghi-Arani, B.S. & M.S., 1992
Pejman Naraghi-Arani serves as a senior advisor and subject matter expert for the Biomedical Advanced Research and Development Authority (BARDA), providing guidance on novel diagnostics, vaccines, therapeutics, and devices.

Emily Uyen Nguyen, B.S., 2023
Emily is a first-year student doctor at Western University of Health Sciences, College of Optometry. "I took a gap year to work in optometry and later got accepted into WesternU. I recently completed my first semester, participated in vision screenings for children, and continue learning new skills."

Mara Milhander, B.S., 2023
Mara works at CSUF with Project RAISE as a Program Assistant and will begin her Ph.D. in Chemistry at UCI fall 2024.

Michelle Petrie, B.S., 2000
Michelle is an Anesthesiologist. "I enjoy sailing and traveling."

Michael Ritter, B.A., 1987
Michael has been an Emergency Physician at Mission Hospital and CHOC Children's Hospital for 28 years. In addition, he is proud to report, "Married, 4 kids, 3 grandkids."

Cheyanne Rose, B.S., 2023
Cheyanne is a Lab Associate in the Hematology Department at Quest Diagnostics and has been accepted into CSULA's Clinical Lab Science graduate program. "I recently moved back to Northern California but miss SoCal! I love hiking and snowboarding with my old German shepherd."

Stephanie Salvador, B.S., 2021
Stephanie completed an M.S. in Biotechnology at UCI ('23) and is a Microbiologist at Applied Medical in Rancho Santa Margarita, CA.

Stephanie Sauceda, B.S., 2022
Stephanie works at Axonics, a medical device company, as a Complaint Management Specialist. "I enjoy archery."

Larry Sepulveda, B.A., 2009
Larry has been a high school chemistry teacher for 13 years and serves as the department chair. "I still play jazz guitar and piano, from my days in the CSUF jazz program."

Danielle Torres, B.S., 2022
Danielle serves in the Army Reserves as a Transportation Officer and works as a Lab Technician at an ultra-pure chemical company. She will begin a Medical Lab Scientist program at Baylor Scott & White in 2024. "I love running in the rain, reading, and listening to live music."

Anthony Truong, B.S., 2018
Anthony is an Optometrist at Kaiser Permanente, Santa Rosa. "Graduated in 2024 with a Doctorate of Optometry from SCCO."

Corey Weinheimer, B.S., 1992
Corey is a Principal Engineer at Intel Corporation. "I love fishing in the ocean on my kayak."

Faculty Spotlight:

Dr. Allyson Fry-Petit | Associate Professor





Innovative Research in Solid-State Chemistry
My solid-state chemistry group is interested in studying oxygen transport membranes, ceramic materials that pass oxygen through the bulk via lattice mediation. These have broad uses, but one important one is the generation of hydrogen, which is useful as an alternative fuel source. We are working to understand their structure under operating conditions above 800 °C and often strongly reducing conditions. To do this we are not only studying the structures but developing new methods to do so.

Engaging Students in Active Learning
I believe in students doing chemistry to learn chemistry. To do that, I have incorporated active learning into all of my courses. Most recently, I led the redevelopment of the general chemistry II labs to engage students in a course-based undergraduate research experience (CURE) focused on oxygen transport membra.

Advice for Aspiring Chemists
I would advise students interested in research careers to get out of their own heads! esearch careers to get out of their own heads! Try the hard thing! Apply for that experience or position you don't think you can get! Take that opportunity that you are presented with! If you do not like one specific experience, find a different one! I had 4 different research projects before I found the right fit in graduate school!

Interdisciplinary Research and Collaboration
My work intersects with physics, materials, science, and engineering. Interdisciplinary work is key to all of the research I have ever done. I value this as it makes for a richer, more comprehensive understanding of any problem!

Embracing Emerging Technologies
Operando exploration of materials is the next frontier of materials chemistry. As a field, we now have the means to probe material systems under the extreme conditions and fast timescales they operate. These advancements are only made possible by computing and data science advancements, again, strong interdisciplinary interactions!

Passion for Art and Creativity
Art is really important to me! From attending concerts to painting watercolors, keeping my mind engaged in creative endeavors makes me a better scientist and educator!



Faculty Spotlight:

Dr. Michael Groves | Associate Professor





Exploring New Frontiers in Chemistry
I am a computational chemist who specializes in new materials and chemical reactions on surfaces. I also build computational tools using machine learning to discover the structure of new materials. Applications range from chemical synthesis, energy, pharmaceutical synthesis, and next-generation electronic devices. I'm always interested in discussing collaborative opportunities where everyone benefits.

Innovative Teaching Approaches
I try to organize the topics in my classes to revolve around a couple of major topics so students can keep in mind the big picture idea that we are discussing. I stress in class that we should always be building intuition on the world around us as any specific calculations that are performed are quickly forgotten. I am also a big fan of the flipped classroom model and active learning so that there are opportunities for students to talk to each other as well as have opportunities for me to talk one-on-one with students in class. I want the course to represent a community of learners where everyone feels comfortable to engage with each other to develop an understanding of the course topics.

Guidance for Aspiring Chemists
Think about the topics that you are exposed to in your classes and get involved in other activities outside of the classroom that center on those topics. There are lots of internships and research experiences available to probe what you are truly interested in so you can figure out what you want to do once you graduate. These will also help you build your resume so that when you are looking for your next thing post-graduation, you have a body of work that sets you apart from the other applicants.

Interdisciplinary Opportunities
Chemistry is the central science and intersects with many other fields. Just within the department there are many opportunities to collaborate with colleagues. In addition, my research program collaborates with professionals working at several other institutions from a variety of fields.

Embracing Emerging Technologies
Artificial Intelligence/Machine Learning is a compelling technology that should accelerate the pace of discovery. AI/ML is a tool like any other but it is pulling together lots of data from a variety sources. What this technology is doing is having folks think about the data they are generating and then helps group together inputs and outputs so that meaningful trends can be discovered. The difference from before is the scale, amount of data and ease of use that these newer tools boast means that more people and larger data sets can be pulled together.

Beyond the Lab
As a proper Canadian, I play recreational hockey. When I first moved to SoCal I was expecting to play mainly with other Canadians, however, I've been surprised to find that there is a lot of local development of players. The Wayne Gretzky trade to LA really built the game here!

Thank You and Best Wishes!



The CSUF Chemistry and Biochemistry Department extends our deepest gratitude and best wishes for success to three dedicated members who have embarked on the next stage of their professional and personal journeys: **Pablo Lozano, Cristina Lee, and Peter de Lijser!**

In April 2025, our Department's Information Technology Specialist, Pablo Lozano, accepted a position at the University of California Irvine's School of Medicine. Cristina Lee, our cherished Administrative Support Coordinator, is now the Graduate Program Specialist at Chapman University's School of Pharmacy. Lastly, Dr. Peter de Lijser graciously came out of retirement to serve as Interim Chair of the Chemistry and Biochemistry Department for the Fall 2024 semester. We look forward to welcoming Dr. de Lijser back to Southern California in summer 2025, where he plans to continue his retirement adventures.

We are profoundly grateful to Pablo, Cristina, and Peter for their energy, expertise, and dedication. We wish them the very best for success and happiness in the next stages of their professional and life journeys.

We are profoundly grateful to Pablo, Cristina, and Peter for their energy, expertise, and dedication. We wish them the very best for success and happiness in the next stages of their professional and life journeys.





RESEARCH UPDATES - FACULTY PUBLICATIONS

Rocco, D.; Morales, E.; Delfin, T.; Truong, J.; Ju, J.; Curtis, D.B. **The Impact of Fireworks on Selected Ambient Particulate Metal Concentrations Associated with the Independence Day Holiday**. Atmosphere. 16(1), 17 (2025).

Avery NG, Childers KC, McCarty J, Spiegel PC. Atomistic Mechanism of Lipid Membrane Binding for Blood Coagulation Factor VIII with Molecular Dynamics Simulations on a Microsecond Time Scale. J. Phys. Chem. B, In-press. (2025).

Avery NG, Young IR, Lu S, Vaughan JD, Korus PS, Richardson TN, Childers KC, Smirnov SL, Spiegel PC. **Biophysical characterization of blood coagulation factor VIII binding to lipid nanodiscs that mimic activated platelet surfaces**. Journal of Thrombosis and Haemostasis, In-press. (2024).

Childers KC, Vaughan J, McGill J, Davulcu O, Lollar P, Doering CB, Coxon CH, Spiegel PC. Structural basis for inhibition of coagulation factor VIII reveals a shared immunogenic hot-spot on the C1 domain. Journal of Thrombosis and Haemostasis, 22(9): 2449-2459. (2024).

Ponce, C.; Razon, A. D.; Chao, J.; Nakagawa, S. K.; Peterson, M. M.; Roque, A. Y.; Vanderpool, M. A.; Ferracane, M. J.; Olson, L. E. **Impact of an over-the-counter "sleep lotion" on salivary melatonin levels and sleep quality: a randomized controlled trial.** Neuroendocrinol. Lett. 45, 167-172 (2024).

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Weng, X; Gonzalez, M; Angelia, J; Piroozmand, S; Jamehdor, S; Behrooz, AB; Latifi-Navid, H; Ahmadi, M; Pecic, S. **Lipidomics-driven drug discovery and delivery strategies in glioblastoma**. Biochimica et Biophysica Acta (BBA) - Molecular Basis of Disease. 1871 (3), 167637 (2025).

Mafi, S; Dehghani, M; Khavtati, B; Abidi, H; Ghorbani, M; Jalai, P; Whichelo, R; Salehi, Z; Markowska, A; Reyes, A; Pecic, S; Los, M; Ghavami, S; Nikseresht, M. **Targeting PERK and GRP78 in Colorectal Cancer: Genetic Insights and Novel Therapeutic Approaches**. European Journal of Pharmacology. 176899 (2024).

Carr, D; Chin, C; Chacon, T; Heravi, MK; Gonzalez, M; West, R; Morisseau, C; Hammock, BD; Pecic, S; Kandasamy, R. **4-phenyl-thiazole-based dual inhibitors of fatty acid amide hydrolase and soluble epoxide hydrolase do not alleviate orofacial inflammatory pain in female rats**. BBA Advances. 6, 100119 (2024).

Angelia, J; Duong, L; Yun, F; Mesic, A; Yuan, C; Carr, D; Gunari, S; Hudson, PK; Morisseau, C; Hammock, BD; Kandasamy, R; Pecic, S. **Quinolinyl-based multitarget-directed ligands with soluble epoxide hydrolase and fatty acid amide hydrolase inhibitory activities: Synthetic studies and pharmacological evaluations.** Heliyon. 10 (11) (2024).

Shojaeian, A; Naeimi Torshizi, SR; Parsapasand, MS; Amjad, ZS; Khezrian, A; Alibakhshi, A; Yun, F; Baghaei, K; Amini, R; Pecic, S. **Harnessing exosomes in theranostic applications: advancements and insights in gastrointestinal cancer research**. Discover Oncology. 15, 162 (2024).

Azusada, T; Baybay, E; Chi, J; Dole, P; Gonzalez, N; Jaramillo, E; Nguyen, T; Pivaral, A; Rodriguez, G; Zavala, J; Zayed, H; Gaspar, A; Andino, S; Nguyen, K; Nguyen, H; Hudson, PK and Pecic, S. **One-Step Microwave Enhanced Synthesis, Biological Evaluation and Molecular Modeling Investigations of Donepezil Analogs as Acetylcholinesterase Inhibitors**. Results in Chemistry. 7, 101226 (2024).

Gomez, T., Luciano, C., Nguyen, T., Villafañe, S., Groves, M. **Student success and experience in a flipped, senior physical chemistry course spanning before and after the COVID-19 pandemic**. Chem. Educ. Res. Pract. 26, 210-230. (2025).

Nguyen, T; Chan, J.; Ha, J.; Umekwe-Odudu, U.; Villafane, S. **Development and Implementation of Chemistry Mindset Modules in Two General Chemistry Courses at a Hispanic-Serving Institution: An Exploratory Study**. Chem. Educ. Res. Pract. 25, 544-559. (2024).

RESEARCH UPDATES - GRANTS

Awardee	Grant Name	Award Awarded to CSUF
Dr. Joya Cooley	Understanding the role of chemical pressure on thermal expansion tunability in earth-abundant materials	$592,852
Dr. Michael Ferracane (PI)	Synthesis, Structural Analysis, and Characterization of Opioid Cyclic Tetrapeptides	$249,311
Dr. John Haan (PI)	Community Benefits Grant: Financial support for Climate Impact Assessment Interns at CSUF Arboretum	$20,000
Dr. Stevan Pecic (PI)	Instrumentation Supplement for Designed Multiple Ligands as Non-opioid Analgesics for Treating Chronic Pain	$63,572
Dr. Stevan Pecic (PI)	Designed Multiple Ligands as Non-opioid Analgesics for Treating Chronic Pain	$586,838
Dr. Stevan Pecic (Co-PI)	Acquisition of Instrumentation Cluster for Enhancing Multidisciplinary STEM Research and Curriculum in Biomedical Engineering	$378,274
Dr. Sachel Villafañe (PI)	Collaborative Research: “Collaborative Research: Supporting chemistry students’ science practice self-efficacy	$197,819
Dr. Sachel Villafañe (Co-PI)	Collaborative Research: An Investigation of Synergistic Effects of Discipline-based Growth Mindset and Effective Learning Strategies Interventions in Gateway Chemistry Courses	$133,963