

COLLEGE OF SCIENCE DEPARTMENT OF BIOCHEMISTRY AND BIOPHYSICS

CATALYST

Extending our reach with new faculty

WINTER 2024



Oregon State
University

CATALYST

WINTER 2024

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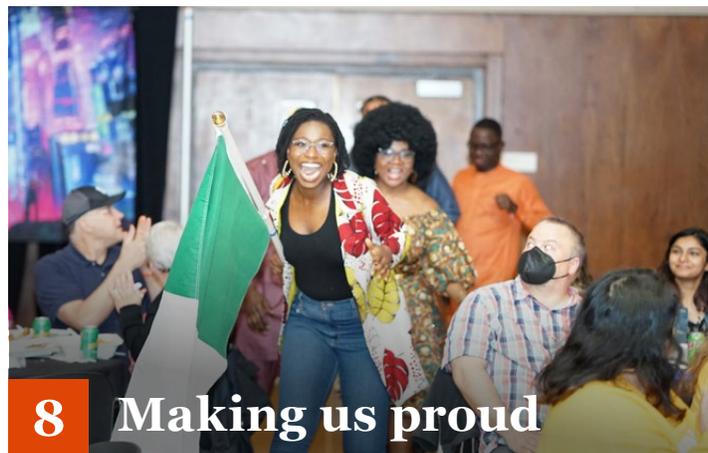


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On the cover —Alysia Vrailas-Mortimer and undergrad
Carmen Brown conduct research with flies in the laboratory.
Vrailas-Mortimer uses fruit flies to study aging and age-
related diseases.

From the Head

Elisar Barbar

Department Head

Greetings, faculty, students, alumni, and friends.

I am delighted to report that the state of our department is strong. We have been productive, persistent, pioneering, proactive, progressive, and, in short, phenomenal!

As you will read, we have welcomed in a new generation of faculty who hit the ground running. Alysia Vrailas-Mortimer has already received major funding from NSF, and with Nathan Mortimer, is building our first fly facility. Juan Vanegas has added strength in computational biophysics and artificial intelligence and Jessica Siegel taught her first class in neuropharmacology of drugs of abuse. Sarah Clark joined our faculty in September bringing in expertise in cryo-electron microscopy and mechanosensitive ion channels.

I am incredibly fortunate to preside over this change and growth of our department, as we are also



recruiting this year for two tenure track positions with research focus in cancer biology, neurodegenerative and infectious diseases.

We also celebrated the retirements of Joe Beckman, Tory Hagen and Andy Karplus and hosted symposia honoring the memory of distinguished physical biochemist Ken van Holde and the ongoing contributions of Chris and Kate Mathews. All events brought many alumni to campus from all over the world.

Our alumni are on a roll in winning the College of Science Young Alumni Awards! Tari Tan (B.S., 2008), was our awardee last year and Simon Johnson (B.S., 2009), is the awardee this year. As you go online to read more about our achievements, take a moment to admire our beautiful website that was launched and revamped last spring!

Lastly, as I read about the ongoing Russian invasion of Ukraine and the Hamas attack and Israel's siege and destruction of Gaza, I find it heartbreaking that escalating violence is still seen as the only solution. As I always tell our graduates, we are counting on you to advocate for the importance of fundamental science discoveries for a healthy planet and a peaceful and better society. It is because of you that we remain optimistic that the new generation will make better decisions.

I look forward to continuing our productive trend this year working together, taking risks, insisting, and persisting in revealing how life works and creating more just and peaceful solutions for the benefit of all.

A handwritten signature in black ink that reads "Elisar Barbar".



LAND ACKNOWLEDGEMENT: Oregon State University in Corvallis, OR is located within the traditional homelands of the Mary's River or Ampinefu Band of Kalapuya. Following the Willamette Valley Treaty of 1855 (Kalapuya etc. Treaty), Kalapuya people were forcibly removed to reservations. Today, living descendants of these people are a part of the Confederated Tribes of Grand Ronde Community of Oregon (<https://www.grandronde.org>) and the Confederated Tribes of the Siletz Indians (<https://ctsi.nsn.us>).



Kari van Zee accepts the Dar Reese Excellence in Advising Award from Oregon State University President Jayathi Murthy

Best and brightest

OUR TALENTED FACULTY

Dam proud of our lead advisor

Kari van Zee, senior instructor II, lead advisor and associate head, received the College of Science Distinguished Service Award. This award recognizes a faculty, staff member or student whose outstanding contributions helped to support and sustain the quality and effectiveness of the College. Examples of her dedication include hosting social events to help undergraduate seniors brainstorm for their future, organizing the department Dam Proud Day fundraising event, helping faculty adapt for students with disabilities and coordinating pandemic safety procedures. “Kari is the heart of the department in so many ways,” the nominators wrote.

Recognizing an outstanding FRA

Zhen Yu received the Faculty Research Assistant Award for her impressive technical skills, willingness to learn and key mentorship. This award is given to an individual each year who has chosen a career as a faculty research assistant, senior faculty assistant or research associate and has a record of outstanding job performance and contributions. Joining Elisar Barbar’s laboratory at the start of the pandemic, Yu helped start new research on SARS-CoV2 nucleocapsid protein and viral RNA, an area new to herself and the lab. “She single-handedly transformed my lab that has never touched RNA to a lab that studies the largest pieces of RNA ever reported,” Barbar wrote.

Building leadership skills for women

The College of Science Gender Equity in Leadership award supports and provides funds for the advancement of the careers of female faculty in the College of Science. **Elisar Barbar** received this inaugural award to fund the development of workshops that support women faculty in science as their careers advance. Barbar organized the first “Women Leaders in STEM: Challenges and Rewards” panel on December 13. Guest speaker Angela Gronenborn, a member of the National Academy of Sciences and the head of the Department of Structural Biology at the University of Pittsburgh, opened the event with a talk on the status of women leaders in science.

SciRIS Awards

Associate Professors **David Hendrix** and **Colin Johnson**, along with **Claudia Maier**, professor of chemistry and **Patrick Reardon**, director of the Nuclear Magnetic Resonance Facility at Oregon State, received a SciRIS Stage 1 award to create a pipeline of computational and experimental methods for the prediction, identification and functional characterization of microproteins. Previously overlooked due to their small size, microproteins are now thought to play significant physiological roles including pathological roles in cancer progression.

Kenton Hokanson received a SciRIS III Award for his proposal “Accelerating neuroactive microbial compounds discovery with gut-brain chip technology.” The project will be funded for \$125,000 as a collaboration between Biochemistry & Biophysics (Kenton Hokanson), Biomedical Sciences (Kathy Magnusson & Pat Chappell), Microbiology (Maude David) and the company NeuroBiome LLC.

eMSion

University Distinguished Professor **Joe Beckman** appeared in Labmate Online regarding the acquisition of his company **eMSion** by Agilent Technologies. eMSion works on electron capture dissociation technology, known as the ExD cell. Used by mass spectrometers, it could alter the future of drug development.

DMPF Award

Associate Professor **Alysia Vrailas-Mortimer**, who studies Parkinson’s disease, received a grant from the College of Science Disease Mechanism and Prevention Fund for a project entitled “Why is a fly a good model

to study my grandmother’s tremors?” Similar to the SciRIS-ii, the fund is focused on assisting individual faculty efforts to establish research relationships with external partners for projects specifically related to health science. Using fruit flies, Vrailas-Mortimer’s goal is to determine how a stress response protein protects against Parkinson’s-associated iron-induced oxidative damage. Parkinson’s affects over one million people in the U.S. and her research could provide the basis for future therapeutic strategies.

Helen P. Rumbel Professorship

Fritz Gombart received the Helen P. Rumbel Professorship in Micronutrient Research from the Linus Pauling Institute. The award was created in 2011 through the generous estate gift of a friend of the Institute.

Dar Reese Excellence in Advising Award

Kari van Zee was selected as the 2023 recipient of the Dar Reese Excellence



Alysia Vrailas-Mortimer

in Advising Award by the Faculty Recognition and Awards Committee and was honored during an invitation only event on September 18.

She has not only achieved profound success as the biochemistry and biophysics (BB) lead advisor, but also as a pre-med advisor and BB undergraduate coordinator.

Van Zee is responsible for spearheading the modernization of the biochemistry and biophysics major. She additionally helped create the biochemistry and molecular biology major while helping secure national certifications for both the new major and the biochemistry and biophysics major.

Her peers credit her with going beyond implementing programmatic benefits for students as an advisor; she greatly prioritizes supporting them on an individual scale. She fosters an encouraging atmosphere through celebratory gatherings and the orientation class she both created and teaches. Her constant drive to go the extra mile when assisting students has left a lasting impression on many.



Joe Beckman

On the move

STUDENTS MAKING A DIFFERENCE



Back row: Sahana Shah, Abigail Pung, Rachel Pung, Kaitlyn Kim, Lydia Pung, Kayleana Green, Ruby Clark, Kari van Zee, Jake Roetcisoender. Front row: Alyssa Pratt, Lauren Dalton, Cat Vesely, Michelle Wambui

UNDERGRADUATE

Current senior **Sahana Shah** was featured in an Oregon State story about her efforts in creating physical spaces on campus for a Disability Cultural Center, and an International Student Center with university administration. See *Come as You Are* (beav.es/qTp) for the article!

Conferences

The Department was well represented at the American Society of Biochemistry and Molecular Biology's **Discover BMB** 2023 Conference in Seattle, with a record number of undergraduate students presenting posters and a grad recruiting table. **Michelle Wambui** and **Kaitlyn Kim** received ASBMB Student Chapter travel

awards. Dam Proud Day 2022 funds supported group travel and stay at the Green Tortoise Youth Hostel.

The **Volcano Conference** is an annual chemical biology conference hosted by the University of Washington and attended by students, postdocs and faculty from Pacific Northwest universities. **Abi Pung** (BMB '23), a current Mehl Lab research assistant, describes the Volcano Conference as unique, with its relaxed structure allowing scientists to showcase their work across multiple fields of research in a supportive yet constructive environment.

Maya Livni's (BMB '23) research mentored by Maude David (Microbiology), on the "Influence of

commercial probiotic intervention on *Apis Mellifera* (honey bee) health and mortality" was recognized at the CAS Career Fair & Student Showcase with a Student Poster Award. In the David Lab, Livni assisted in research on gut microbiota and the gut-microbiome-brain axis, covering projects on various gut metabolites and behavior in mice, as well as cell culture work examining Inflammatory Bowel Disease on a gut chip.

LIFE Scholars Fellowship

Chaz Kayser (A. Mortimer Lab) attended the Summer LIFE Scholars Program and worked with a Center for Healthy Aging Research faculty member to develop research skills and an understanding of opportunities in science and research.

GRADUATE

Congratulations!

Jesse Howe was awarded a Biophysical Society Travel Grant.

Moriah Mathis and **Patrick Allen** were both awarded inaugural Genetic Code Expansion Fellowships.

Cat Vesely was awarded an ASBMB 2023 Graduate Student Travel Award and a Protein Society Young Investigator Travel Award.

Into the labs

Congratulations to our second-year Ph.D. students on successfully navigating their first year and joining labs.

Patrick Allen joined the Mehl lab and received a GCE Fellowship to conduct protein crystallography research. From Santa Clarita, CA, Allen graduated from the University of

California Santa Barbara with a degree in biochemistry.

Nicholas Bretz came with Nathan Mortimer to Oregon State from Illinois. He did his undergraduate degree in molecular biology and his masters in biotechnology at Illinois State University.

From Denver, CO, **Sarah Louie** attended the University of Colorado Denver for a B.S. in Integrative Biology and an M.S. in Biochemistry/Cell Biology. They have now joined the Cooley Lab and are conducting GCE research. Last year, Louie was awarded the Chris and Kate Mathews Fellowship.

Mukhtar Idris, who completed his undergraduate degree in biochemistry at the University of Ilorin, Nigeria, and his master's degree in bioinformatics at the University of Science and Technology of China, joined the Barbar Lab where research interests span protein design and structural biology.

Mahya Payazdan completed both her undergraduate degree and master's in molecular genetics, at Shahid Chamran University of Ahvaz in Khuzestan, Iran. She joined the Gombart Lab and was awarded the 2023-2024 Marion T. Tsefalas and Caron & Donald Reed Graduate Fellowship.

Kristen Snitchler hails from Northern Virginia, receiving her B.S. in Biochemistry at Stevenson University. She joined the Nate Mortimer Lab where her current research project focuses on how the biophysical

properties of Amyloid Beta contribute to Alzheimer's disease pathogenesis.

Michael Youkhateh received his B.S. in Biochemistry from Central Connecticut State University. He joined the Nate Mortimer Lab.

Welcome new graduate students

Ian Noonan graduated with a B.S. in cannabis biology and chemistry from Colorado State University-Pueblo. He is fascinated with synthetic biology and its application within the biotechnology industry.

Cameron Call received his B.S. in Biochemistry from Idaho State University and is interested in studying the science of aging.

Joline Nguyen, originally from Vietnam, has been living in Washington State since moving to the U.S. She earned her B.S. in Chemistry from the University of Washington, Bothell, and is interested in studying proteins.

Hannah Long grew up in Wamego, KS, and attended Kansas-State University for Biochemistry and Microbiology and a Chemistry minor. Her research interests are still broad, but she is particularly interested in protein engineering, immunology, and biophysics.

Samrin Shahnaz completed her undergraduate degree in biology and biochemistry from the University of Northern Iowa.



Patrick Allen



Sarah Louie



Michael Youkhateh

CONGRATULATIONS!

CURE and SURE Awardees

Thirteen students received Cripps (CURE) and Summer (SURE) Undergraduate Research Experience scholarships, which provide paid summer research with a faculty mentor.

CURE scholars included Autumn Ditzel (Freitag Lab), Sydney Blurton (Hokanson), Kai Zwink (Vanegas), Mark McLaughlin (Barbar), Carmen Brown (A. Mortimer), and Donovan McAfee (Mehl). **SURE** Scholars included Kendra Anderson (Freitag Lab), Yaya Kiss (Johnson), Misgana Merid (Hokanson), Kendall Evanchak (N. Mortimer), Francisco Hernandez (A. Mortimer), Alyssa Garcia (Barbar), and Hung Nguyen (Mehl).

WIC Award

Undergraduate student **Samuel Basset** was nominated by the Department and won a WIC Culture of Writing Award.

JP Travel Awards

Thanks to the ongoing generosity of Joel Peterson, our students are attending conferences and showcasing their research.

Mathew Frischman (BMB '23), Society for Neuroscience Annual Conference November 2022 in San Diego

Alyssa Schroeder (BMB '24) and **Sophie Fischer** (BMB '23), American Chemical Society 2023 'Crossroads of Chemistry' Indianapolis Conference

Samuel Bassett (BB '23), American Society of Mass Spectrometry conference May 2023 Houston, Texas

Jessica Ewton (BB '23), Society for Neuroscience Oregon chapter meeting, June 2023



Alysia Vrailas-Mortimer

Welcome

INTRODUCING OUR NEW FACULTY

This was a year of many changes. As we have celebrated the retirement of many beloved BB faculty, we have also welcomed new faces that have enhanced our strength in teaching while broadening the scope of the department's research.

Jessica Siegel, Associate Dean of Academic and Student Affairs

Siegel moved from Minneapolis, MN, and started full-time at OSU in June 2022 as the Associate Dean of Academic and Student Affairs in the College of Science and Associate Professor in the Department of Biochemistry and Biophysics. Previously Jessica Siegel was an assistant professor at Sewanee: The University of the South and an



Jessica Siegel

associate professor and director of the First Year Experience at the University of St. Thomas, two undergraduate liberal arts schools. Jessica Siegel's research is undergraduate-led and focused on educating and training undergraduate students. Her work examines the behavioral and neurobiological effects of methamphetamine and ketamine in a mouse model.

Alysia Vrailas-Mortimer,
Associate Professor

Alysia Vrailas-Mortimer's research focuses on understanding how we age and how aging leads to diseases like Parkinson's disease, Charcot-Marie-Tooth disease and muscular dystrophy. She is particularly interested in how genes interact with each other during aging and how these genes interact with environmental factors like pesticides and heavy metals to promote diseases of aging. She uses the fruit fly *Drosophila melanogaster* to study this question because flies are remarkably like us and have many of the same symptoms of aging and disease as us.

In September, Alysia Vrailas-Mortimer received a \$500K Research Coordinated Network-Undergraduate Biology Education grant from the National Science Foundation titled "Connecting Curriculum: A Fly-CURE Network."

Last winter, her proposal entitled "Why is a fly a good model to study my grandmother's tremors?" was selected by the College of Science for an award of \$10,000 under the Disease Mechanisms and Prevention Fund Award.

Nathan Mortimer, Associate Professor

Nathan Mortimer's research is focused on understanding signal transduction



Nathan Mortimer

pathways, which enable cells to respond to stimuli through changes to the cells' physiological or biochemical state. These signaling pathways play important roles in organismal development, tissue growth and homeostasis, neurological function, and the immune response to pathogen infection. Signal transduction pathways are tightly regulated, with cells employing both positive and negative regulators which act to fine-tune the duration and strength of the signaling event. Deregulated cell signaling is linked to defects in cell function and ultimately contributes to the pathogenesis of many diseases.

His venom biochemistry and molecular lab uses the *Drosophila*-parasitoid wasp system. In this system, parasitoids transfer venom proteins into their *Drosophila* hosts during infection to manipulate host signaling. The lab has found that venom proteins target conserved signal transduction pathways, and so by characterizing the molecular interactions between host and parasite, they hope to better understand pathway regulation and identify novel signaling regulators among parasitoid venoms.

Juan Vanegas, Associate Professor

Vanegas' research interests include understanding the function of mechanosensitive proteins such as ion channels, mechanical properties of lipid membranes and other biomolecules, and lipid protein interactions. His lab uses and develops many high-performance computing tools including molecular dynamics simulations, density functional theory, and continuum mechanics to understand structure-functional relationships across many biological lengths and timescales.

The Vanegas Lab was awarded a full allocation to use the Anton 2 specialized supercomputer at the Pittsburgh Supercomputer Center for their project on the mechanical and chemical activation of the angiotensin II type 1 receptor. Anton 2 is a unique supercomputer donated by DE Shaw Research to run very long molecular dynamics simulations.

Learn more about our new faculty:
beav.es/qTG



Juan Vanegas

Making us proud

ALUMNI AND FRIENDS

Ebunoluwa Morakinyo participates in the 2022 African Student Association 'Africa Night', holding the Nigerian flag.

Dam Proud

Last year the Biochemistry & Biophysics Excellence Fund raised \$5,250 from 33 gifts on Dam Proud Day. This fund helps provide valuable training opportunities to undergraduate students who otherwise would not financially be able to participate. Contributions to the 2022 BB Excellence Fund helped nine undergraduate students attend the American Society for Biochemistry and Molecular Biology conference in Seattle and present their research on a national level. Students have also received support from this fund for research fellowships and need-based scholarships.

Kari van Zee, Lauren Dalton, Kate Shay and the Biochemistry Club helped create stories for social media to highlight the importance of participating in professional education opportunities. One highlight featured Jenna Beyer, a BB graduate from 2019 who is now a graduate student at the University of Pennsylvania. Van Zee and Dalton bumped into Beyer at the 2023 ASBMB conference. It was a full circle moment, as Beyer attended her first ASBMB conference in 2019. She said it was a great opportunity to present her research and get familiar with trending scientific research topics, which helped with her graduate school applications.

One fundraising event featured four successful alumni at different stages in their career who credit their time in BB – and undergraduate research in particular – as the major launch of their scientific career: biotech industry alumnus **Peter Hsu** (BB '07 and Chemistry Ph.D. at UW '13), currently Principal Scientist and group leader at Genentech; recent alumna **Jenna Beyer** (BB '19), nearing the finish line of her Ph.D. graduate program at UPenn; and physicians **Omar Rachdi** (BB '14) and **Taylor Bundy** (BB '15), both graduates of the College of Osteopathic Medicine of the Pacific (D.O. '21). Our goal is to continue to create an environment so that every BB student can have a similar story.



Scholarships make all the difference

There are eight biochemistry-specific scholarships available to students in our department. For the students who receive them, these scholarships open doors to research, travel and other hands-on experiences to prepare them for their careers.

“It’s kind of difficult to study if you have to think about money. Thanks to this scholarship, I was able to focus on my classes. I am forever grateful,” said **Dourice Goune Goufack** ('22). Thanks to the generosity of alumni and friends of the department, we are able to help our students reach their highest potential.

NEWLY MINTED

Undergraduate spotlights

Being a Beaver stretched **Ebunoluwa Morakinyo** to develop her passions inside and outside of the lab. She is taking a gap year before pursuing a career as a physician-scientist. In the upcoming year, she will work with Dr. Carsten Bonnemann in his National Institutes of Health lab under the National Institute of



Alyssa Pratt

Neurological Disorders and Stroke. The Bonnemann Lab investigates childhood neuromuscular and neurogenic disorders, developing cutting-edge gene therapies for these diseases.

Biochemistry and molecular biology graduate **Alyssa Pratt** first met her mentor Dave Hendrix when she was touring Oregon State during her senior year of high school and worked in his lab throughout college. She will start a Ph.D. program in computational biology this fall.

Graduate students

Rachel Franklin (Mentor: Joe Beckman) successfully defended a Ph.D. thesis titled: “Revealing sequences and modifications of intact proteins using electron fragmentation.” She is now a research scientist at Agilent (formerly with e-MSion) in Corvallis collaborating with BB faculty to use native mass spectrometry to profile post-translational modifications on proteins and protein complexes.

Phillip Zhu (Mentor: Rick Cooley) successfully defended a Ph.D. thesis titled: “Elucidating the Effects of 14-3-3 Post-Translational Modification

Congratulations to the following scholarship recipients for the 2022-23 and 2023-24 academic years. We greatly appreciate the generous support of our donors who have made these awards possible.

Chris and Kate Mathews fellowship
2023 Sarah Louie

Woodstock Scholarship
2022-2023 Kayleana Green (BMB) and Ebunoluwa Morakinyo (BMB)
2023-2024 Kaitlyn Kim (BMB) and Auria Lee (BMB)

Karen Nickel Biochemistry/Biophysics Scholarship
2022-2023 Kaelin Spring (BB)
2023-2024 Rhand Wood (BMB) and Shyla Streeter (BMB)

Berge Chandler Scholarship
2022-2023 Jessica Ewton (BB)

Donald L. McDonald Scholarship
2022-2023 Sahana Shah (BB)
2023-2024 Naomi Ford (BB)

Kevin & Indira Champions of Undergrads Fund
2022-2023 Bereket Berhanu (BMB)
2023-2024 Katyayani Karlapati and Estifanos Berhe

Mary Hutchins Hohner Scholarship
Maria Reyna (BMB)

Biochemistry/Biophysics Scholarship/Fellowship Fund
2022-2023 Avery Ingram (BB), Ari Lauthner (BB), Zenaida Tygart (BB), Coranna Akdemirbey (BMB)
2023-2024 Barivure Tee (BMB) and Liam Robinson (BMB)

Honoring Distinction in Biochemistry and Biophysics
New Scholarship in 2023-2024
Yaya Kiss (BB)



Dourice Goune Goufack



ANNUAL SUPPORT

BIOCHEMISTRY & BIOPHYSICS DONORS

The Honor Roll recognizes Biochemistry & Biophysics annual supporters who have made outright gifts or pledge payments totaling \$250 or more between January 1, 2022, and December 31, 2022.

Marilyn A. & Ronald Bolstad
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 Margaret R. MacDonald '79

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 Grace Y. Sun '66
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 Science Foundation

Kari L. & Pieter J. van Zee '95
 Carollee Woodstock '81

In Memoriam:
 George J. Ikeda '60

Thank you! Every attempt has been made to ensure the accuracy of these lists. However, if you notice an error, please contact:

Pam Powell
 Director of Stewardship
 OSU Foundation
 541-214-4735
 Pam.Powell@osufoundation.org



Lillian Padgitt-Cobb

Using Genetic Code Expansion.” Phillip is a postdoctoral fellow at OHSU in the Reichow lab using cryo-EM to study molecular machines.

Ally Erlendson (Mentor: Michael Freitag) successfully defended her Ph.D. thesis on “Effects of Dis2 on chromatin-mediated silencing in *Fusarium graminearum*” and is now a postdoctoral researcher in Michael Freitag’s lab at OSU. She is studying how defects in the formation of heterochromatin alter gene expression.

Lillian Padgitt-Cobb (Mentor: David Hendrix) successfully defended a Ph.D. thesis titled: “Towards Resolving Functional and Evolutionary Mysteries of the Large and Heterozygous Genome of Hop (*Humulus Lupulus*) and the Cannabaceae Family Using

Genomic Data Science.” Lillian joined the Michael Lab at the Salk Institute as a postdoctoral fellow in 2022. She received the NSF PRFB “Plant Genome Postdoctoral Research Fellowship” to study the regulation of metabolic pathways in the glandular trichomes of hemp (*Cannabis sativa*) flowers.

Amber Vogel (Mentor: Afua Nyarko) successfully defended a Ph.D. thesis titled: “Strength in Numbers: How Multivalent WW-PPXY Interactions Regulate Cell Signaling.” Vogel is currently a postdoctoral researcher in the Hill Lab at the University of Utah using biophysical approaches to develop novel insulin therapeutic lead compounds that display improved properties.



Tari Tan

Aidan Estelle (Mentor: Elisar Barbar) defended successfully his thesis titled “Specificity, Allostery, and Multivalency in Binding to the Hub Protein LC8.” Aidan Estelle is currently a postdoctoral researcher in Lewis Kay’s lab at the University of Toronto using novel NMR methodologies to investigate biological complexes.

Ruben Riordan (Mentors: Viviana Perez & Kathy Magnusson) successfully defended their thesis titled: “The Role of Cellular Senescence in the Development of Alzheimer’s Disease.” Ruben Riordan is currently a postdoctoral researcher in the Kraemer lab at the VA Puget Sound and University of Washington investigating the molecular mechanisms of neurodegenerative diseases associated with aging.

Where are they now?

Tari Tan (BB ’08) gave a seminar talk titled “From Synapses to Students: Mapping Connections in Neuroscience” to the BB Department on Friday, October 21.

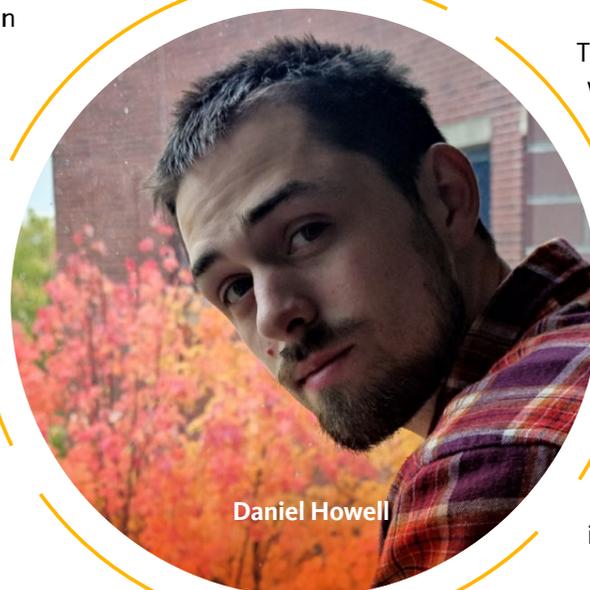
Sara Codding (Ph.D. ’16, currently postdoc at the University of

Maryland) received a K99 award in the fall of 2022. Sara Codding was also awarded both a Paul F. Cranfield postdoctoral fellow award from the Society of General Physiologists and the Biophysical Society travel award in 2020.

Alumnus **Nathan Jespersen** (Ph.D. ’19) and his wife Michelle (M.S. ’17), now have a baby girl, Elliana. Nathan Jespersen just published a paper in *Nature Communication* and is wrapping up his postdoc time in Sweden.

Fulbright Awards

Daniel Howell (BB ’22) has been selected for a Fulbright U.S. Student Award to conduct research at the Max Planck Institute in Marburg Germany. His research efforts will be centered around a new-to-nature metabolic pathway called the TaCo pathway, which uses novel enzymes to circumvent inherent inefficiencies in natural CO₂ fixation. Improvements in carbon fixation show promise to drive down the cost of biofuels and biological carbon sequestration, and



Daniel Howell



Scout Osborne

some of these technologies can find application in making faster-growing, climate-resilient crops. He is excited to work with large-scale enzyme engineering and synthetic biology tools, and connect with leaders in this exciting field.

This fall, **Scout Osborne** (BMB ’21) will begin a Fulbright research grant in Honduras to evaluate diagnostic methods for endemic viral infections, such as dengue and Zika fever. He is interested in these neglected tropical diseases since they target the most vulnerable members of our global society. In 2024, he will join the M.D.-Ph.D. program at Case Western Reserve University to train to become a physician-scientist in infectious diseases.



News

UPDATES FROM THE DEPARTMENT

Grants

Elisar Barbar received \$60,000 from NSF to supplement her EAGER: Structure and Assembly of SARS-CoV2 nucleocapsid phosphoprotein N grant. Her project “Multiscale characterization of a unique class of duplex, multivalent IDP systems - Administrative Supplement to Support Undergraduate Summer Research Experiences” was also funded for \$18,000.

Colin Johnson received two grants for his project entitled, “Characterization of the deafness associated hair cell protein otoferlin.” He received \$50K grants from the American Hearing Research Foundation and the Medical Research Foundation of Oregon.

David Hendrix had three projects funded. First, he is the lead PI of the proposal titled “Collaborative Research: Ideas Lab: Discovery of Novel Functional RNA Classes by Computational Integration of Massively-Parallel RBP Binding and Structure Data” that has been granted five-year new NSF funding. His lab will receive \$1,042,995. His R01 on “Integrative Transcriptomics” that combines secondary structure and protein-coding potential will also be funded. And finally, his application “Artificial intelligence and art integration for the prediction and visualization of RNA 3D structures” was selected as an awardee for 2023 Research Advancement Seed Funds and was awarded \$50,000 as part of his Valley Biohealth Fellowship.

Kate Shay was awarded an Ecampus Research Fellowship in the amount of \$22K for her proposal titled, “Contextual and intentionally designed community-building activities in upper-division online Biochemistry courses.”

Afua Nyarko received an award of \$52,436 from the Research Equipment Reserve Fund for her proposal on Acquisition of a Bio-Rad NGC Quest 10 Plus Protein Purification System.

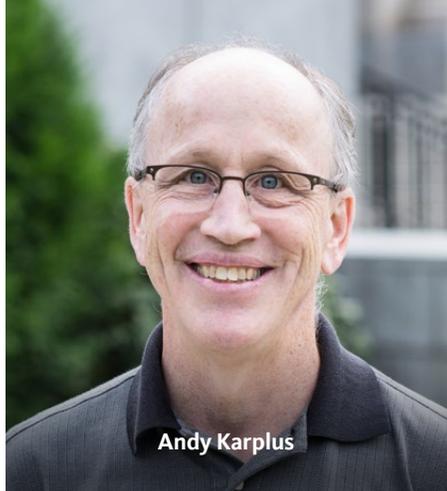
Kensal van Holde Symposium and Celebration

In May 2023, colleagues, friends and family celebrated **Kensal van Holde’s** biochemistry legacy. Former students, postdoctoral fellows and colleagues worldwide participated.

Van Holde joined the brand-new Department of Biochemistry and Biophysics, bringing expertise with ultracentrifugation, CD and other biophysical techniques. His centrifuge is still in use today! A major achievement was his role in determining that DNA is wrapped around the nucleosome’s core particles like “beads on a string,” leading to his National Academy of Sciences election.

While being an excellent experimentalist, Ken was also a dedicated educator and beloved mentor, authoring the definitive work on the early work on DNA-proteins complexes, called simply “Chromatin,” and a monograph on “Oxygen and the Evolution of Life.” With Christopher K. Mathews, he co-authored a widely used Biochemistry textbook.

Kayla Jara presents ‘Building Proteins’ at OMSI’s Meet a Scientists Program.



Andy Karplus



Tory M. Hagen



John Ridenour

MacKenzie Wilson Tribute

The BB Department honors the memory of **MacKenzie Wilson**, BMB Class of 2025, and an Oregon State University Air Force ROTC cadet from Eagle River, Alaska. MacKenzie died June 24, 2022 during a training exercise in Idaho. MacKenzie is remembered for her positive energy, passion for life, and service to our community.

Outreach

Our **Biophysical Society** student chapter represented OSU at the Oregon State Fair last August, showcasing a successful biophysics booth with visitors of all ages. Activities included DNA collection from strawberries, making elephant toothpaste, playing with fluorescent molecules and creating giant bubbles.

Last spring, **Kayla Jara** presented "Building Proteins" at OMSI's Meet a Scientist program. The activity invites museum-goers to build their own proteins and protein complexes out of everyday craft supplies. Jara used real-life protein examples from her Ph.D. work in Elisar Barbar's lab, attracting over 300 guests to the activity tables.

Kari van Zee was invited to participate in the Fall 2022 cohort of the Career Champions Program! She was part of a cohort of teaching faculty working to learn and develop tangible ways to incorporate career connections into the classroom.

Fond farewells

Distinguished Professor **Joe Beckman**, a leader in the study of neurodegeneration, has spent more than 30 years investigating the cause and cure for amyotrophic lateral sclerosis, also known as Lou Gehrig's disease. He also founded e-MSion, INC., a start-up that entered into a co-marketing agreement with a leading manufacturer of analytical scientific instruments in 2019. Beckman served as a principal investigator at the Linus Pauling Institute and director of OSU's Environmental Health Science Center.

University Distinguished Professor **Andy Karplus** earned a reputation as one of the best structural biologists in the world. He has solved the structure and illuminated the function of several biomedically important proteins and has published work in the world's top journals. An award-winning teacher and mentor, his students have been successful in industry and academia. He started his faculty career at Cornell before joining Oregon State in 1999.

Professor **Tory M. Hagen**, over his career at Oregon State University's Linus Pauling Institute and the Department of Biochemistry and Biophysics, distinguished himself in the field of aging research. With Hagen's retirement, he leaves behind a significant scientific legacy and a profound impact on students, researchers and the broader community. Over his 25-year career at OSU, Tory's lab delved into the

role of micronutrients in modulating mitochondrial function through changes in thiol redox status, revealing how age-related redox perturbations adversely affect organism allostasis over the lifespan.

In November, post-doctoral Research Associate **John Ridenour** moved to to begin a new job at the Oklahoma Medical Research Foundation. He is currently interested in understanding how chromatin and chromatin-associated factors contribute to the recruitment and activity of core transcriptional machinery. In Michael Freitag's lab, John used filamentous fungi as a model to study mechanisms of chromatin-mediated gene silencing.

In December, post-doctoral Research Associate **Mareike Moeller** of the Freitag Lab, gave two invited seminars during her trip to Australia. One was at ANU in Canberra, part of a conference where she explored her future lab for a second postdoc, and the other at the University of Sydney. She received the prestigious Marie Sklodowska-Curie Global Postdoctoral Fellowship. She will conduct chromatin-related work in the lab of Benjamin Schwesinger at Australian National University in Canberra, Australia, and the international Global Rust Reference Center near Copenhagen, Denmark. She will continue her chromatin work on "rust fungi," global pathogens of cereal crops. Mareike's proposal ranked in the top 20 out of around 1,000 life-science-related applications received.



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