# What's New with BB (April 1, 2024 – June 30, 2024)

Dear BB Community,

I hope you have had some relaxing time after a very hectic term, enjoying the sun and the long warm days of summer. We are so lucky to live in Oregon where we receive excessive heat warning messages when the temperature climbs up to 3 digits for one day while this is the norm in many places of the country. I can't think of a better place to be in Summer than in Oregon even with the triple digit temperatures. Having said that I am still happy to share that with the Global Visiting Professorship that I received from the Technical University of Munich, I will spend part of this summer in Munich using their 1.2 GHz NMR and learning about RNA viruses.

Our hiring spree has again landed us a new tenure track hire in Dr. Maria Purice from the Fred Hutchinson Cancer Research Center with research interests in Neuroscience, Glia, and Aging. She will start in Jan 2025. Dr. Dan Liefwalker from OHSU with research interests in Epigenetics and Transcriptional Biology of Cancer has already joined the department in the Spring setting up lab space and submitting grant proposals. Dr. Ally Erlendson will join us in Sep 2024 as an instructor with grand ideas and goals to bring in national funding for education and training.

I had the great privilege to attend and speak at a retirement celebration for my postdoc mentor Professor George Barany, a very successful peptide chemist. At the symposium in Chicago, I reconnected with former fellow students and postdocs who I have not seen for 26 years and where we all were forced to contemplate what legacy we want to leave behind and the impact of our science, teaching, and mentorship.

A couple of our faculty have experienced profound grief for loss of close family members recently. I acknowledge their strength in marching through these losses with dignity and grace, and along with seeing my parents age, and more scaringly my colleagues, I am constantly reminded that life is short, and what we do with the opportunities we have matters.

In Chicago I had the wonderful opportunity to visit my very first undergraduate student who joined my lab helping me open boxes and making our first in the world LC8 and who I have not seen since he graduated in 2000! Reconnecting with our students is what I really love about this job. There is no job in the world like it where at the end of the day we make our amazing discoveries, publish our amazing papers, and sometimes get lucky and get our grants funded, but also have the parents of our students tell us that their daughters think of us as their second mothers, and their sons think the world of us.

June is the hardest time of the year for me and perhaps for all of us who work with students not only because of the preparations for end of the year activities from thesis presentations, graduation parties and ceremonies, and end-of-the-year celebrations, but mostly for saying goodbyes. I bid farewell to 3 amazing honors students who knew how to get the best out of college and now are headed to medical schools. Providing exceptional research opportunities and sending to the world exceptional students are what we strive for in this department and excel in.

As we say goodbye to a crop of students we loved dearly, the COVID crop, who we first met on zoom, we acknowledge that while we work hard to reveal how life works, with the goal of making life better, that one of the best ways of making it better is through developing the next generation of leaders who will be strong advocates for the importance of fundamental science for healthy people, a healthy planet and a better society. Once again, we are reminded that the beauty in our work is in the impact we leave, the memories we make, and in the lives we change.

Below I list some of our activities and successes this past term compiled by Kimberly. Enjoy reading and have a great Summer.

#### **Funded Grants**

**Sarah Clark's** proposal to the Medical Research Foundation of Oregon titled Architecture of C. elegans mechanosensory transduction complex was funded in the amount of \$50,000.

**Rick Cooley** (PI) and **Sarah Clark** (Co-PI) were awarded a RERF proposal for \$7458 to purchase a new Zeiss Stemi 508 Stereo Microscope and camera. The microscope and camera will be used for imaging and manipulating protein crystals, as well as imaging C. elegans nematodes. Matching funds to make this possible were provided from Ryan Mehl, the GCE4All Center, Elisar Barbar, and Afua Nyarko.

**Elisar Barbar** was awarded \$152,317 from the NIH to purchase an ITC as a supplement to Multiscale characterization of a unique class of duplex multivalent IDP systems.

**Elisar Barbar** was awarded a TUM Global Visiting Professorship 2024 from Technical University of Munich NAT-Chemistry School to cover the cost of a visiting professorship for up to three months.

## **Grant Proposals Submitted**

**Alysia Vrailas-Mortimer** was the lead PI on a proposal to the National Institute of Aging in the amount to \$1,880,273 for 5 years. Titled: Summer Healthy Aging Research Experience (SHARE) for Advancing Diversity in Aging Research.

**Alysia Vrailas-Mortimer** submitted a proposal to the Muscular Dystrophy Association titled Characterization of lamin mutations in CMT and muscular dystrophies in the amount of \$299,300.00 over three years.

**Alysia Vrailas-Mortimer** submitted a proposal to the NIH as part of a subcontract with Emory University titled Neuronal Mechanisms of Copper Transport and Toxicity in the amount of \$590,720.00 over five years.

**Sarah Clark** submitted a proposal to the Medical Research Foundation of Oregon titled Architecture of C. elegans mechanosensory transduction complex in the amount of \$50,000.

Claudia Maier was the lead PI, **Ryan Mehl** was a PI on this proposal titled: Understanding senescent cell function based on molecular characteristic to the W.M. Keck Foundation in the amount of \$1,797,425.00 over three years.

**Kenton Hokanson** along with Heidi Kloefkorn from Biological Engineering as the lead PI submitted a proposal to NIH titled Sleep effects on the pain chain from joint to brain, for \$376,010.00 over 3 years.

#### **Professional Service**

Nate Mortimer was a Grant Panelist, Oregon Partnership for Alzheimer's Research

**Nate Mortimer** led a professional development session on using functional genomics research in the classroom at the Genomics Education Partnership Workshop, held at Washington University in St. Louis on June 19.

#### **Publications**

From the Barbar Group

Stuwe H, Reardon PN, Yu Z, Shah S, Hughes K, **Barbar EJ**. 2024 May 7. *Phosphorylation in the Ser/Arg-rich region of the nucleocapsid of SARS-CoV-2 regulates phase separation by inhibiting self-association of a distant helix*. J Biol Chem.300(6):107354. doi: 10.1016/j.jbc.2024.107354. Online ahead of print. PMID: 38718862 PMCID: PMC11180338

From the Cooley Group

Kapitonova AA, Perfilova KV, Cooley RB, Sluchanko NN. 2024 Jun 15. *Phosphorylation code of human nucleophosmin includes four cryptic sites for hierarchical binding of 14-3-3 proteins*. J Mol Biol 436(12):168592. doi: 10.1016/j.jmb.2024.168592. Epub 2024 May 1. PMID: 38702038 DOI: 10.1016/j.jmb.2024.168592

From the *Cooley/Mehl* Groups

Allen MC, Karplus PA, **Mehl RA**, **Cooley RB**. *Genetic encoding of phosphorylated amino acids into proteins*. Chem Rev. 2024 May 22;124(10):6592-6642. doi: 10.1021/acs.chemrev.4c00110. Epub 2024 May 1. PMID: 38691379.

From the *Franco* Group

**Logan IE**, Nguyen KT, Chatterjee T, Manivannan B, Paul NP, Kim SR, Sixta EM, Bastian LP, Marean-Reardon C, Karajannis MA, Fernández-Valle C, Estevez AG, Franco MC. *Selective Nitration of Hsp90 Acts as a Metabolic Switch Promoting Tumor Cell Proliferation*. 20240. Redox Biology, https://doi.org/10.1016/j.redox.2024.103249.

From the *Vanegas* Group

Leverant CJ, Richards D, Spoerke ED, Alcala R, Jiang YB, Percival SJ, **Vanegas JM**, Rempe SB. *Nanoconfinement of carbon dioxide within interfacial aqueous/ionic liquid systems*. Langmuir 2024 May 21;40(20):10615-10622. doi: 10.1021/acs.langmuir.4c00542. Epub 2024 May 8.PMID: 38716958

#### **Faculty Talks**

**Alysia Vrailas-**Mortimer gave a talk titled "A New Model to Study the role of Iron in Parkinson's Disease" at OSU's College of Science Research Showcase on May 21st.

**Ryan Mehl** was a panelist in the AI and research panel representing integrated health and biotechnology priority research areas at the OSU's College of Science Research Showcase.

Ryan Mehl and Dan Liefwalker presented to the American Cancer Society during their site visit to OSU on April 25th.

**Nate Mortimer** attended the *Biology of Neurodegeneration* seminar series at Oregon Health Science University on May 31st, and gave a talk "APP and Amyloid Beta are Required for the *Drosophila* Immune Response to Parasite Infection".

**Nate Mortimer** gave a talk "Functional and Comparative Genomics of Parasitoid Wasp Venom" at the Genomics Education Partnership Workshop, at Washington University in St. Louis on June 19.

**Alysia Vrailas-Mortimer** gave an invited talk "What can a fruit fly teach us about Parkinson's Disease" at the 47th Annual OSU Gerontology Conference in Corvallis, OR on May 31st.

**Alysia Vrailas-Mortimer** gave an invited talk "Imposter Syndrome: Feeling like a Fraud" at the Academy for Lifelong Learning, Issues and Ideas Strand on May 16

**Alysia Vrailas-Mortimer** gave an invited talk "How and Why We Age: Using Fruit Flies to Answer Age-Old Questions" at the Academy for Lifelong Learning, Science Strand on April 17th.

Elisar Barbar gave an invited talk at a Symposium in honor of professor George Barany in Chicago, IL, June 8th, titled From BPTI to Dynein to SARS-CoV-2: How the Woodward/Barany Team Paved the Way for Ushering in the New Field of Intrinsically Disordered Proteins.

# **Teaching and Learning News**

**Juan Vanegas**' BB 483/583 Capstone class gave a seminar to share how machine learning and artificial intelligence are transforming the way research is conducted in biochemistry and biophysics, covering topics in cancer detection and diagnostics, drug development and design, metabolic engineering, and protein design.

**Lauren Dalton**'s Advanced Cell Biology students had a poster session in LINC to share projects they had been researching throughout the term. There were projects on using radiation as energy source in fungi from the Chernobyl region, the cellular basis of camouflage, how some species of sea slugs steal and maintain chloroplasts and more.

In **Kate Shay's** class "Cancer: Society's Malignant Shadow", students participated in a reenactment of AMP v. Myriad Genetics, the Supreme Court decision on the patenting of BRCA

genes.



#### **Conferences and Poster Presentations**

**Nate Mortimer** presented "The Unknown Venome" with BB graduate student **Michael Youkhateh**, and undergraduate students Donny Bertucci, Ansen Garvin, Amanda Sinha, Cora Bailey at the Engineering Expo on June 7, hosted by the College of Engineering at the CH2M Hill Alumni Center.



**Ryan Mehl** attended the Bioorganic Gordon Conference, *Leveraging Chemical Biology to Reveal Therapeutic Opportunities* and presented the poster "The GCE4All Research Center: Promoting Your Ability to use Genetic Code Expansion in Your Research". (June 9-14, 2024. Andover, NH).

#### Dam Proud Day 2024

This year's Dam Proud Day, held on April 24th, was a HUGE success! The BB Department raised over \$7200 to support paid research opportunities during the academic year! These funds will support the efforts of two to three undergraduate students, as well as the outreach activities of the Biophysical Society Student Chapter.

A special thank you to BB/BMB alumni Michael Layoun, MD; Juan Vanegas, PhD; Joaquin Galvan Rodriguez and Alyssa Schroeder for joining us for our Dam Proud Day seminar to share their career and research highlights!

# Cell-ebrate our alumni: science talks, Kahoot, cake!











# **Welcome New Faculty**

We are happy to welcome Dr. Dan Liefwalker to our department as an assistant professor. His research includes Cancer metabolism and epigenetics primarily working with the oncoprotein MYC. Dan's initial training was at Oregon State. As an undergraduate he worked in an analytical chemistry lab in Dr. Staci Simonich's group while gaining his BB degree. He then went on to join Dr. Kolluri's group, also at OSU, as his first graduate student where his interest in cancer biology began through working on the aryl hydrocarbon receptor in the Environmental and Molecular Toxicology department. He then became a postdoctoral scholar at Stanford Medicine with Dr. Dean Felsher and then a research assistant professor at OHSU working with Dr. Rosalie Sears, both are well-established leaders in the MYC field. Twelve years after leaving OSU, he and his wife and two daughters are excited to be back in Corvallis to build up his independent research program that he developed at OHSU.



# Dan Liefwalker

Assistant Professor Department of Biochemistry & Biophysics

#### Research

The Liefwalker lab investigates oncogene biology using conditional expressing models of oncogene-driven cancers, with a particular focus on c-MYC (MYC). Despite being the first human oncogene discovered the primary role and function of MYC remains a subject of debate. As a master transcription factor, c-MYC (MYC) is known to regulate up to 30% of the genome, and promotes pluripotent stem cell reprogramming, self-renewal, cell identity, and cell plasticity—all of which are common features of cancer. In normal cells overexpression of MYC results in cell death, however in cancer settings MYC overexpression enhances cell survival. The Liefwalker lab's primary focus is to understand how MYC evades apoptosis in cancer, and to seek therapeutic opportunities to restore cell death selective to MYC-dependent malignancies.

#### **GCE News**

The **International GCE Webinar** series continues, see our upcoming schedule and register for future webinars here.

# INTERNATIONAL GCE WEBINAR: SPRING 2024 SPEAKERS



APRIL 18TH

JUNE 20ST

GCE4AII





Oregon State

University



Supported by:
OSU College of Science,
OSU Dept Biochemistry & Biophysics
NIH GCE4All Research Center

# **Upcoming GCE Workshop & Conference-**

# Selecting your Synthetase – Expanding GCE Chemistries: Aug 2-8th 2024

This 7-day intensive lecture and laboratory course will focus on the theory and practice of engineering amino-acyl tRNA synthetase (RS)/tRNA pairs for encoding non-canonical amino

acids (ncAAs). All attendees can perform selections with an ncAA of their choice and model ncAAs provided by the Center.

Apply & Register at: https://gceworkshops.org/

GCE Conference: Aug 8-10th 2024

The GCE4All Research Center, along with conference chairs, Abhishek Chatterjee and Kathrin Lang, are excited to announce the 3rd GCE Conference. The GCE Conference is meant to bring together GCE users and, more importantly, interested parties who have not yet adopted the technology, to catalyze a more rapid expansion of the use of noncanonical amino acids in biomedical research. Attendees from industry, academia and other research institutions will convene to discuss the latest techniques and approaches that are applicable to a broad variety of fields.

Apply & Register at: https://gceconferences.org/



 ${\bf Contact~gce 4 all-admin@oregon state.edu~with~questions/concerns}$ 

### **BB Faculty Promotions**

Congratulations to the BB Faculty who received promotions this year!

David Hendrix has been promoted to Professor Kenton Hokanson has been promoted to Senior Instructor I Kate Shay has been promoted to Senior Instructor I Zhen Yu has been promoted to Senior Faculty Research Assistant II

#### From the BPS Student Chapter

The BPS Student Chapter hosted a biophysics outreach tabling event on April 5th where we engaged with OSU students, visiting prospective students, and community members. We demonstrated the importance of protein structure and the principles of viral self-assembly with 3D printed structures, disseminated informational materials about what biophysics is and what we do as a student chapter of the Biophysical Society, made origami versions of DNA and virus capsids, and had a photo-booth!



# **Grad Specific News**

Cat Vesely and BB Alum Rachel Franklin presented the poster "Top-Down Characterization of Genetically Encoded Bcl-xL Phosphorylation and Phosphomimetics Using Electron Capture Dissociation" at the ASMS Conference, June 2-6 in Anaheim, CA.

Cat Vesely received a travel award from Agilent to present her work at the ASMS Conference (June 2-6, 2024. Anaheim, CA), and presented a talk titled "Decoding Cell Fate: Unveiling The Phosphorylation Switch In Apoptosis Through Synergistic Genetic Code Expansion And Mass Spectrometry Technologies."



**Nick Bretz** presented his 3rd year talk titled "Not Quite FedEx: How are Venom Proteins Packaged for Delivery by the Parasitoid Wasp *Ganaspis hookeri*?" on April 17th

**Sanjay Ramprasad** presented his 3rd year talk titled "Distinct Binding Mechanisms of LATS1 with Tandem WW Domain Partners" on May 8th

**Sarah McGee** presented her 3<sub>rd</sub> year talk titled "Denitrase Characterization and Implications for Their Role in Oxidative Stress" on May 22<sub>nd</sub>

Monica Vidal-Franco completed her master's Final Examination "Testing and Validation of Atomistic and Coarse-grained Models for Gating Mechanosensitive Channels" on May 29th, and is headed for nursing school at Linfield.

Patrick Allen and Moriah Mathis will enter their second year as GCE fellows in Fall 2024.

**Sarah McGee** passed her preliminary oral exam on April 8th.

Hannah Stuwe passed her preliminary oral exam on May 28th.

Sanjay Ramprasad passed his preliminary oral exam on May 29th.

Tilo Chatterjee received the Dean's Catalyst award for this Summer.

## **Undergrad News**

Sahana Shah successfully defended her honors thesis on May 3rd.

Gretchen Fujimura successfully defended her honors thesis on May 29th.

Maya Sonpatki successfully defended her honors thesis on May 30th.

Jessica Kollinski successfully defended her honors thesis on May 30th.

AJ Damiana, an honors BMB student in the Vrailas-Mortimer Lab completed a PRAx Student Fellowship to create an art piece for the lab to use for outreach events. Her piece, pictured below, is entitled "The Cell-ebration of Age", and consists two watercolor pieces; one of a healthy cell and one of an aged cell. AJ's work was on display at The Little Gallery in Kidder Hall until June 6th. More on this here https://biochem.oregonstate.edu/impact/2024/04/biochemistry-praxfellow-conveys-science-through-art



#### **Outreach**

**Kayla Jara** and **Patrick Allen** visited Seven Oaks Middle School in Lebanon on May 31st to give talks for their annual Career Exploration day!

**Hannah Stuwe**'s outreach activities with high school students has become increasingly popular, with more schools reaching out to ask for a session with her!

#### **Awards**

Congratulations to the 2024 SURE and CURE award winners!

#### SURE Recipients:

Hope Smith (Fang Lab)
Shelby Galipeau (Vrailas-Mortimer Lab)
Charlie Xu (Bradford Lab)
Avari Alcaire (Sikora Lab)
Jessica Chavez-Chairez (Hokanson Lab)
Audrey Anderson (Bain Lab)
Elijah Zacharia (Stevens Lab)
Lizelle Uddipa (Menge Lab)

#### **CURE Recipients:**

AJ Damiana (Vrailas-Mortimer Lab) Erin Huang (Johnson Lab) Jacob Huntley (Qiu Lab) Zachary Ottoman (Mortimer Lab) Nathan Palazzolo (Mehl Lab) Dinah Schultz (Johnson Lab) Ngoc Truong (Barbar Lab) Codi Wood (Hokanson Lab)

#### Other undergrad awards from Alysia Vrailas-Mortimer:

Carmen Brown was selected as a 2024 Linus Pauling Institute Summer Research Scholar.

**Lauren Clayton** was selected as a 2024 Linus Pauling Institute Summer Research Scholar.

AJ Damiana was selected as a 2024 Linus Pauling Institute Summer Research Scholar.

Hailey Harris was selected as a 2024 Linus Pauling Institute Summer Research Scholar.

Shelby Galipeau was awarded a 2024 OSURA Fellowship.

**Dhilan Thanik** received a 2024 Summer LIFE Scholars award.

Hailey Harris received a 2024 Summer LIFE Scholars award.

**Chaz Kayser** received 2024 OSU ASBMB Student Chapter award to attend the Discover BMB conference in San Antonio, TX.

**Francisco Hernandez** received the 2024 OSU ASBMB Student Chapter award, COS Travel Award, and the LPI Travel Award Discover BMB conference in San Antonio, TX.

#### 2024 BB Grad Dessert

## Congratulations to the BB/BMB Class of 2024!

- 15 Biochemistry-Biophysics majors
- 53 Biochemistry- Molecular Biology
- 13 of those are in Honors College









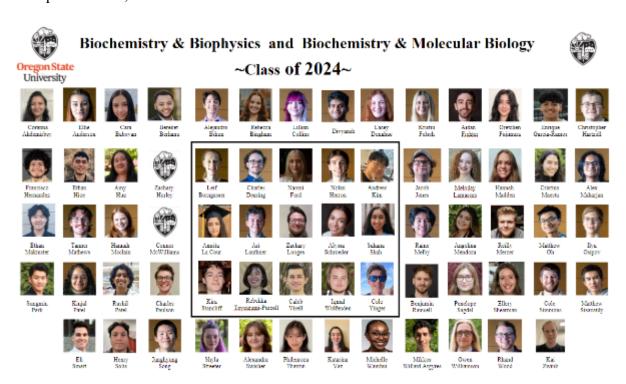
# Amongst the graduating seniors are:

- a veteran and members of National Guard, ROTC
- a ballerina
- a ceramicist
- an athlete-rower
- several musicians: members of OSU Marching Band, OSU Symphony and other music
- ensembles
- Peer advisors for the College of Science, Resident advisors and learning/teaching
- assistants
- Members of Greek Life
- Study/research abroad in countries including Spain, Japan, Taiwan
- Goldwater awardee
- Internships at Lonza in Bend, Merck, University of Michigan, with AMGEN, UCLA,
- Internship with NASA
- Aspiring researchers, dentists, optometrists, physicians, physician assistants, pharmacists,
- genetic counselors

## **Undergrad research:**

• At least 75% have had undergraduate research experience. Some have chosen other opportunities in line with their goals, such as clinical work.

- Research labs across campus- College of Veterinary Medicine, Pharmacy, Liberal Arts, Forestry, Earth Ocean and Atmospheric Science, Agricultural Science, Science, and Engineering
- Several of them have already presented at professional conferences such as the ASBMB, Biophysical Society, Chemical Biology, been included as authors of scientific publications, and received national awards.







They have overcome significant challenges including the COVID pandemic, being care givers to family members, supporting their own families to reach this finish line.

They are accomplished, compassionate, smart, supportive of each other and of us as faculty.







# Commencement 2024











# **End of the Year Celebration**

The 2024 End of the Year Celebration was held on Tuesday, June 19, at the Lions Shelter at Avery Park. The BB Labs all played a role in organizing this event, and we enjoyed delicious appetizers, fun games, and awards!









#### 2024 BB Awards

**Sarah Louie** (not pictured) has been awarded a GCE Fellowship, beginning in Fall 2024

**Jesse Howe** received the 2024 Distinguished Research Award.

**Hannah Stuwe** received the 2024 Exceptional Mentoring Award.

**Kristen Snitchler** (not pictured) received the 2024 Exceptional Service Award

Joline Nguyen and Hannah Long will share the 2024 Christopher and Catherine Mathews Graduate Fellowship Award

#### **Past Events**

#### April 2024

- 3: Graduate Student Hannah Stuwe 3rd Year Talk
- 5: BPS Student Chapter BPS Week Activity
- 5: Faculty Meeting
- 10: BB Seminar Series Speaker Dr. Shawn Lockery
- 16: Faculty BYO Lunch Meeting
- 17: Graduate Student Nick Bretz 3rd Year Talk
- 19: Faculty meeting
- 24: Dam Proud Day

#### May 2024

- 1: BB Seminar Series Speaker Dr. Justin Kollman
- 3: Faculty Meeting
- 8: Graduate Student Sanjay Ramprasad 3rd Year Talk
- 14: Faculty BYO Lunch Meeting
- 15: BB Seminar Series Speaker Dr. Myriam Cotten
- 22: Graduate Student Sarah McGee 3rd Year Talk
- 29: Graduate Student Monica Vidal-Franco 3rd Year Talk

#### June 2024

- 14: BB Grad Dessert
- 15: Commencement
- 18: End of the Year Celebration

# **Upcoming Events**

August 8-10 – GCE Conference

September 17 – University Day

September 18 – Fall Retreat—science fest day at the coast

September 25 – First day of Fall term classes

Thank you for reading this far, and we will catch up again at the beginning of Fall term. Please let Kimberly know if your event/activity was not included so we add it in the next issue.

Elisar