

# What's New with BB

(Feb 1<sup>st</sup>, 2021 through March 31<sup>st</sup>, 2021)

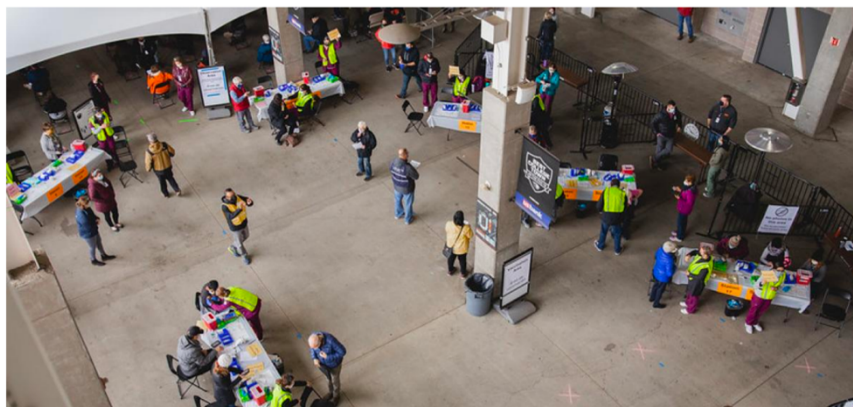
Dear BB community,

This has been quite an eventful couple of months. While we are going about our business of teaching and research, there has been an impeachment trial, snow storms and ice across the nation, power outages everywhere including at OSU (causing problems for many of us), resignation of the OSU president and subsequent press attention, mass shootings in Boulder and Southern California, and new COVID variants on the horizon causing surges and lockdowns in Europe and multiple places in the US.

But there are also many good things happening to be optimistic about! We've seen great success of the vaccine rollout and OSU's role in vaccinating the community at Reser Stadium (below) is a huge accomplishment and something to be proud of. I am hopeful that by summer we can begin interacting in person again.

March 22, 2021

As I've said before, this has been a great time for the resurgence of science. The success of the vaccine and the constant presence of scientists in the news underscores the need for us to position ourselves to leverage this renewed interest and tap into federal opportunities and educate the state legislature about the



importance of our research. Although the U.S. is averaging more than three million shots a day as of this past weekend, disinformation online is sowing distrust in vaccines. While these are great times to be a scientist, we still have a lot of work to do. I believe these two years will set the agenda for fundamental progress in science over the next ten years.

In recognition of Women's History Month, I was honored to be part of a panel organized and hosted by the College of Science, **Women in leadership: Achieving an equal future in a COVID-19 world** to acknowledge and celebrate the role of women in leadership and in the battle against COVID-19. The panel also addressed the challenges and opportunities of women leaders working in Science. It was a good opportunity for me to highlight the traits of women leaders that help them in times of crisis, such as multi-tasking, resilience, optimism, collaboration, and knowing how to handle ambiguity. I also highlighted the importance of having policies in place to help women have a family and a career, allowing women to seamlessly transition back to work after a break and sustain a career that is joyful and life-affirming. I highlighted the importance of more representation and the need for women to see successful women leaders as role models who can combine a career, family and life.



### **Submitted Proposals:**

**Ryan Mehl** submitted a proposal, "Collective charge density (CCD); Development of a novel cellular delivery and uptake technology to increase the safety and efficacy of phosphorodiamidate morpholino oligomer (PMO) targeting lamin-A cryptic splice donor site", on March 19<sup>th</sup>, 2021.

**Maria Franco** submitted a proposal, "Redox Signaling in Neurofibromatosis", on February 10<sup>th</sup>, 2021.

**David Hendrix** submitted a proposal, "Position-Dependent Codon Usage Bias and Translational Efficiency", on February 11<sup>th</sup>, 2021.

**Elisar Barbar** submitted a proposal, "Structural basis of phosphorylation and alternative splicing in Dynein Regulation", on February 17<sup>th</sup>, 2021.

### **Reviewed Proposals:**

**Fritz Gombart** nanofiber R01 renewal with Jingwei Xie as the PI received an impact score 34 and percentile score of 16. This is in the fundable range for NIGMS (about 85% or so are funded with this score). Fritz is the corresponding PI on the sub award to OSU which also includes Arup and Gitali.

**Ryan Mehl's** NIH renewal received an impact score 33, and in the 13th percentile, which is also in the fundable range.

### **Funded Grants:**

**Elisar Barbar** received supplemental support to the award in the amount of 18,000 for support for "Research Experiences for Undergraduates"

**Project Title:** Structural Basis of Phosphorylation and Alternative Splicing in Dynein Regulation

**Fritz Gombart** was awarded \$10,000 from the College of Science at OSU for the proposal title, "Role of the Cathelicidin Antimicrobial Peptide in the Development of Alzheimer's Disease".

### **NIH and NSF panels:**

**Elisar Barbar** served on NIH special emphasis panel to review Renewal of Centers of Biomedical Research Excellence [COBRE] March 4-5.

### **Publications**

*From the **Barbar** group:*

Forsythe HM, Galvan JR, Yu Z, Pinckney S, Reardon P, Cooley RB, Zhu P, Rolland AD, Prell JS, **Barbar E**. [Multivalent binding of the partially disordered SARS-CoV-2 nucleocapsid phosphoprotein dimer to RNA](#). Biophys J. 2021 Mar 29:S0006-3495(21)00253-8. doi: 10.1016/j.bpj.2021.03.023. Online ahead of print.

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Eastwood E.L, Jara K.A, Bornelöv S, Munafò M, Frantzis V, Kneuss E, **Barbar E.J**, Czech B, and Hannon G.J. (2021). **Dimerisation of the PICTS complex via LC8/Cut-up drives co-transcriptional transposon silencing in *Drosophila***. *Elife*. Feb 4;10e65557. Doi: 10.7554/eLife.65557.  
<https://pubmed.ncbi.nlm.nih.gov/33538693/>

Loening N.M, and **Barbar E**. (2021). **Structural characterization of the self-association domain of swallow**. *Protein Sci*. Feb 27. Doi: 10.1002/pro.4055. Online ahead of print.  
<https://pubmed.ncbi.nlm.nih.gov/33641207/>

From the **Cooley** group:

Forsythe HM, Galvan JR, Yu Z, Pinckney S, Reardon P, **Cooley RB**, Zhu P, Rolland AD, Prell JS, Barbar E. **Multivalent binding of the partially disordered SARS-CoV-2 nucleocapsid phosphoprotein dimer to RNA**. *Biophys J*. 2021 Mar 29:S0006-3495(21)00253-8. doi: 10.1016/j.bpj.2021.03.023. Online ahead of print.

From the **Freitag** group:

Möller M, Habig M, Lorrain C, Feurtey A, Haueisen J, Fagundes W.C, Alizadeh A, **Freitag M**, and Stukenbrock E.H. (2021). **Recent loss of the Dim2 DNA methyltransferase decreases mutation rate in repeats and changes evolutionary trajectory in a fungal pathogen**. *PLoS Genet*. Mar 22;17(3):e1009448. Doi: 10.1371/journal.pgen.1009448. Online ahead of print.  
<https://pubmed.ncbi.nlm.nih.gov/33750960/>

From the **Hendrix** group:

Eriksen R.L, Padgitt-Cobb L.K, Townsend M.S, and Henning J.A. (2021). **Gene expression for secondary metabolite biosynthesis in hop (*Humulus lupulus* L.) leaf lupulin glands exposed to heat and low-water stress**. *Sci Rep*. Mar 4;11(1):5138. Doi: 10.1038/s41598-021-84691-y.  
<https://pubmed.ncbi.nlm.nih.gov/33664420/>

Padgitt-Cobb L.K, Kingan S.B, Wells J, Elser J, Kronmiller B, Moore D, Concepcion G, Peluso P, Rank D, Jaiswal P, Henning J, and **Hendrix D.A**. (2021). **A draft phased assembly of the diploid Cascade hop (*Humulus lupulus*) genome**. *Plant Genome*. Feb 18:e20072. <https://doi.org/10.1002/tpg2.20072>  
<https://access.onlinelibrary.wiley.com/doi/10.1002/tpg2.20072>

From the **Karplus** group:

Peskin A.V, Meotti F.C, Kean K.M, Göbl C, Peixoto A.S, Pace P.E, Horne C.R, Heath S.G, Crowther J.M, Dobson R.C, **Karplus P.A**, and Winterbourn C.C. (2021). **Modifying the resolving cysteine affects the structure and hydrogen peroxide reactivity of peroxiredoxin 2**. *J Biol Chem*. Mar 2;100494. doi: 10.1016/j.jbc.2021.100494. Online ahead of print.  
<https://pubmed.ncbi.nlm.nih.gov/33667550/>

## Invited Zoominars

**Elisar Barbar** Title: *Protein disorder in regulation and assembly of large molecular machines*, Iowa State University, delivered by zoom on Feb 24<sup>th</sup>, 2021.

**Andy Karplus** International Symposium DFG Priority Program 1710; “The preexisting local-unfolding equilibrium in a Peroxiredoxin Q: seeing (by NMR) is believing” (co-delivered with Leslie Poole), in Germany but via Zoom, Mar 29-31, 2021

### Undergraduate Awards:

Congratulations to **Emily Gemmill** and **Alyssa Pratt** mentored by Weihong Qiu and David Hendrix for being awarded the 2021 Goldwater Scholarship.

**Gabe Davis** applied for the 1<sup>st</sup> annual HP Community Scholarship Program for Underrepresented Minorities (URM) students pursuing a degree in STEM and won the 2021 HP Community Scholarship for \$10,000. Congratulations

### BB in the News:

## BB Lab Courses Making an Impact



It’s been really fun,” said senior instructor Kari Van Zee, who has been leading biochemistry’s blended lab series this term. “Students are doing a good job of taking responsibility for their health and ours.”

Biochemistry Molecular Techniques (BB494) and Experimental Chemistry (CH 362) are among the few labs offered in-person this year, with instructors working quickly to ensure maximum participant safety while still providing an engaging hands-on experience. Despite the inherent logistical challenges, course instructors felt that providing students the opportunity to take the class in person would help ensure that students of all learning styles were adequately prepared for life after graduation.

<https://biochem.oregonstate.edu/content/bb-lab-courses-making-impact>

BB representatives in the Coalition of Graduate employees are **Nathan Waugh** and **Tilottama Chatterjee**, Tilo has been interviewed regarding TRACE random testing

<https://biochem.oregonstate.edu/content/coalition-graduate-employees-was-negotiations-university-six-months-try-establish-demand>

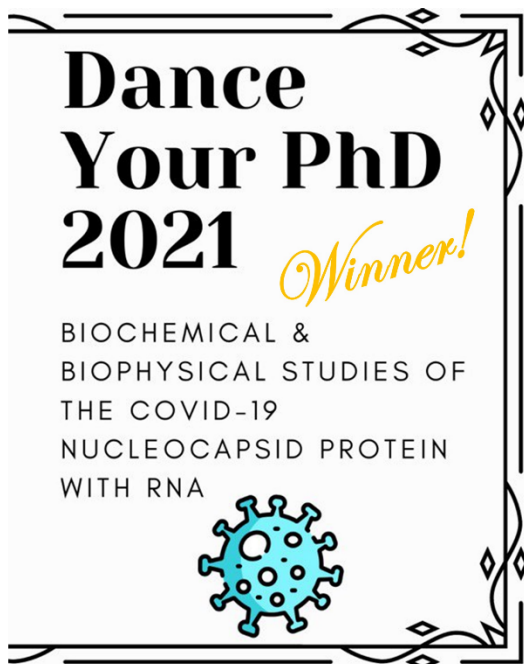
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Tilottama Chatterjee is a biochemistry and biophysics PhD student, as well as a graduate employee at OSU.

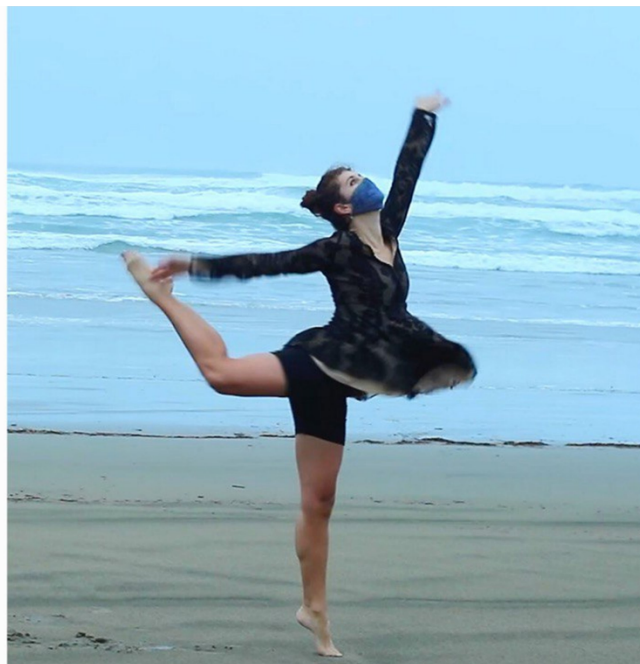

"I'm sure TRACE can be cited as random testing," Chatterjee said. "That's true. I don't think it counts as prevalence testing if its not getting us an accurate measure of the number of cases on campus right now."

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**Dance  
Your PhD  
2021** *Winner!*

BIOCHEMICAL &  
BIOPHYSICAL STUDIES OF  
THE COVID-19  
NUCLEOCAPSID PROTEIN  
WITH RNA



**Heather Forsythe-Masson** from the Barbar Lab has been announced as the winner of the COVID section of the [Dance Your PhD contest](#)! Congratulations to **Heather Masson-Forsythe** for winning this year's **Dance your PhD** contest and being featured in *Science*. Heather won the COVID-19 category for her work titled: Biochemical & biophysical studies of the COVID-19 nucleocapsid protein with RNA. Heather is not only a talented TikTok science creator, but also a hard worker creative scientist with two first author papers under her belt so far, and several more in preparation, and now we know she is an internationally recognized award winner AWESOME dancer!

To find out more about the Dance Your PhD Contest: <https://www.sciencemag.org/projects/dance-your-phd/official-rules>

<https://biochem.oregonstate.edu/content/dance-your-phd-2021-winner>

<https://science.oregonstate.edu/impact/2021/03/dancing-through-genres-biochemistrybiophysics-student-wins-science-magazines-dance>

<https://www.forbes.com/sites/evaamsen/2021/03/15/dance-shows-how-a-coronavirus-protein-interacts-with-its-genetic-material/?sh=4d156bdf19d5>

<https://www.npr.org/2021/03/09/975125771/3-grad-students-in-helsinki-win-dance-your-ph-d-contest>



Biochemistry Professor Elisar Barbar in her lab.

February 11, 2021

## Women scientists at the forefront of the fight against COVID-19

By Vrushali Bokil



women have made critical contributions to understanding and combating the virus and mitigating its effects on disadvantaged populations.

<https://science.oregonstate.edu/impact/2021/02/women-scientists-at-the-forefront-of-the-fight-against-covid-19>

More on the event here: <https://science.oregonstate.edu/impact/2021/03/join-us-for-an-online-panel-discussion-women-in-leadership-achieving-an-equal-future>. Graduate student **Tilottama Chatterjee** was one of the students leading the panel.

### More News from the Grads

- GSA Winter Term Travel Award went to Kayla Jara for the BPS Annual Meeting
- BPS Student Chapter got approved and now has 20+ members including graduate and undergraduates from the department
- BPS Annual Meeting
  - Aidan gave a talk
  - Kayla, Amber, and Kasie presented posters
- Kyle received the graduate student/postdoc researcher award for the upcoming ASBMB 2021 conference (hosted by experimental biology) and was also selected to present a live, oral, presentation
- Lillian published “A Draft phased assembly of the diploid Cascade hop (*Humulus lupulus*) genome”
  - <https://ktvz.com/news/oregon-northwest/2021/02/22/osu-usda-scientists-gain-new-understanding-of-hop-genome/>
- The “BB Believers” represented our department well at the PubTrivia event raising money for the food drive. Andy, Elise, Felisha, Sanjay, Monica, and past graduate Dan took home 3<sup>rd</sup> place!
- GSA Spring Term Travel Award went to Amanda Radke for the Experimental Biology conference upcoming in April

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- Heather Forsythe-Masson from the Barbar Lab was announced as the winner of the Covid section of the Dance Your PhD contest! This news was covered by FORBES and NPR!
- The BPS Student Chapter held their first event in celebration of Biophysics Week – Biomolecular NMR at OSU: A Walkthrough Tour”
  - Video to be posted on the BPS webpage shortly

## Celebrations/New Beginnings

Graduate student Isabelle Logan successfully defended her thesis “Cheers to Hops! How Xanthohumol can Improve Health” and is moving on to ALS for a postdoctoral position in Maria Franco’s lab. Congratulations Isabelle!

Isabelle has been the perfect student, the perfect TA, the perfect instructor, the perfect mentor, and a most productive researcher. I am very happy for her success and glad to see her move on to another chapter.



Isabelle Logan

## Special Recognition of our grad students who have TA'd during this pandemic:

- Ally Erlendson
- Shauna Otto
- Brittany Lasher
- Rachel Franklin
- Monica Franco
- Cat Hoang
- Felisha Imholt
- Sanjay Ramprasad
- Jun Yang
- Kasie Baker
- Tilottama Chatterjee
- Alex Eddins
- Jesse Howe
- Isabelle Logan
- Amanda Radke
- Amber Vogel
- Phil Zhu

## **BB Outreach**

The **Biophysical Society (BPS) Student Chapter** held their first event in celebration of Biophysics Week – Biomolecular NMR at OSU: A Walkthrough Tour” event organized by **Aidan Estelle**.

**Jesse Howe** is a panelist in an event organized by the BPS Education Committee "Aspiring Careers in Biophysics for Undergraduates". It is on Tuesday, April 6. The free event offers valuable networking opportunities with peers, Biophysical Society Committee members, and scientists at all career levels. It will include a panel discussion on academic and career paths in biophysics, with opportunities for questions and answers from the students.

## **Upcoming events**

### **Career panel for undergrads—April 6<sup>th</sup>, 9 -11 am Pacific time**

"Aspiring Careers in Biophysics for Undergraduates". It is on Tuesday, April 6. The event is free, and it does not require BPS membership. **12:00 pm - 2:00 pm USA Eastern**

Students can come prepared to find out about the course of study that aspiring biophysicists undertake, what it means to be a biophysicist, and how biophysicists make important discoveries!

[Here is the link!](#)

### **OMSI-OSU Virtual Workshops: April 8, 3-4:30 p.m**

The College of Science and OMSI offer opportunities for members of the OSU community (OSU faculty, staff, graduate and undergraduate students engaged in research) to build and hone their science communication skills. We are offering a workshop on April 8, 3-4:30 p.m., "Controversial Subjects: Don't avoid tackling controversial issues anymore." In this workshop we'll learn and practice strategies for writing and talking about controversial topics in a productive and hopeful way. Subjects include: framing, the power of metaphor, explanatory chains and solutions. Registration closes April 6. Register/learn more at: <https://omsi.edu/science-communication-services>.

### **BB seminar, April 7<sup>th</sup>, 12 pm (note time change)**

**Arp2/3-dependent initial ciliary biogenesis in Chlamydomonas:** Prachee Avasthi, is an associate professor of biochemistry and cell biology at the Geisel School of Medicine at Dartmouth. She is the 2020 recipient of the Women in Cell Biology Junior Award for Excellence in Research for her work using a unicellular green alga as a model system to uncover novel mechanisms regulating assembly of the ubiquitous cellular antenna, the cilium. She also founded the online peer-mentorship community for thousands of junior faculty worldwide, New PI Slack. April 7, noon. Register here: <https://beav.es/J6Q>.

### **2021 F.A. Memorial Gilfillan—Apr 8th**

The 2021 F.A. Memorial Gilfillan Lecture on April 8 featuring **Michael Blouin**, professor of integrative biology, who will present "What Darwin couldn't imagine: a personal journey through the ever-changing field of evolutionary genetics."

Thankful for all of you and hoping for an in person get together after we all get the vaccine. The office will be open so there will be more life back in the building, stay tuned regarding the times.

Till then.

Elisar