

What's New with BB

(Apr 1st, 2021 through June 15th, 2021)

Dear BB community,

This has been quite an eventful term capping a very unusual academic year. I am happy to report that we graduated a total of 77 students (67 BMB and 10 BB); many of them were in the Honor's College and heavily involved in research. We had a virtual gathering to wish our undergrads a happy end of a beautiful journey and to send them off to the world—quite a different world now, and one that more than ever needs the skills, knowledge, and empathy that we instilled in them to make it a better place. Reaching milestones is always rewarding but also nostalgic, we will miss all these students, especially those who worked in our labs. With milestones like these, I am always reminded how important it is to enjoy the journey and not just reaching the destination. I am so delighted that our department has always attracted students who are passionate about both their classes and their research, and who really seemed to enjoy the journey and make the best of their time here and get the most out of college.



I want to congratulate all the students for getting to the finish line. This past year and a half have not been easy. Remote learning is isolating, and requires self-motivation, discipline and grit. Students have had to find new ways to experience what a university is about; networking and exchanging of ideas and in-person interactions with faculty and students. We are proud that our department is one of the very few on campus that delivered in person lab classes, where students actually did pipet, isolate DNA, grow cells and purify proteins, and talk to faculty and fellow students face to face.

We also provided opportunities for many students to be involved in our research labs

that stayed open during the pandemic. They provided help on our projects spanning from work on SARS-CoV2, mechanisms of aging and cancer research, to development of new technology that pushes the field. For more on graduation, watch our graduation video prepared by various faculty [here](#)

I want to also acknowledge the hard work by faculty and graduate students during this remote teaching and in person lab classes. I am proud of all the extra effort and the sacrifices we made to deliver top quality experience.



I am delighted to welcome back the office staff, faculty and students this summer! We are looking forward to a productive summer—keeping masks on inside the building, but free to work in all labs.

Highlights for me this past term is (finally) submitting a predoctoral training grant. I have been talking about preparing a training grant for the past several years, and it is *so* gratifying to see that it is done. Thank you all for responding with your contributions whether in sending biosketches, CVs, collaborations, course syllabi, meetings, writing support letters, collecting data for tables, etc. I want to specifically thank Aayushi who was my right hand in all this—sending emails, collecting information for 6 or 7 tables, I lost count, and for responding to emails from me at any time of the day and night.

We have accomplished a lot this term, on the research, teaching, and outreach fronts. The Department is in great shape despite COVID! I'm very glad to cap this year with so much good news.

Submitted Proposals:

Elisar Barbar (BB), **Michael Blouin** (IB), **Maria Franco** (BB), **Afua Nyarko** (BB), and **Patrick Reardon** (NMR) submitted their team's SciRIS proposal.

Elisar Barbar submitted a T32 Training Grant to the NIH NIGMS

Dave Hendrix submitted an NIH R01 in collaboration with Maria Franco.

Dave Hendrix also submitted to the USDA National Institute of Food and Agriculture

Jesse Howe submitted an F31 fellowship proposal: *Deciphering Synergistic Roles of LC8 and the 53BP1 Oligomerization Domain in 53BP1 DNA Repair*.

Isabelle Logan submitted two proposals: one to the Children's Tumor Foundation for the Young Investigator Award, *Signaling pathways regulated by nitrated proteins as novel therapeutic targets for neurofibromatosis type 2*, and the other to the Collins Medical Trust, *Cell-surface nitrated proteins*

Ryan Mehl submitted four proposals one to AbbVie Inc, two to Amgen Inc, and one to The Progeria Research Foundation.

Two letters of intent were submitted for internal competition to the Research Office for a Murdock Trust request, one led by **Patrick Reardon** for a Cryo probe NMR Cyro EM DED and Vitrobot, the other by Bo Sun, **Michael Freitag**, **Colin Johnson**, **Weihong Qiu** for a super resolution microscope. A concept paper was submitted for internal competition by **Victor Hsu** to the Keck Foundation

Funded Grants:

We DID hit the jackpot this term!

Elisar Barbar (BB), **Michael Blouin** (IB), **Maria Franco** (BB), **Afua Nyarko** (BB), and **Patrick Reardon** (NMR) submitted their team's SciRIS proposal: *Multi-scale approaches to understand the roles of dynamic protein complexes in biology* was funded for \$20,000.

Elisar Barbar received notice that the NIH proposal with OHSU/PSU/UO collaborators multi-PI R01 proposal for \$2,254,892.00 (\$1.5 M Barbar's share), will be funded to carry out "Multiscale Characterization of a Unique Class of Duplex, Multivalent IDP Systems" with a July 1st starting date.

Maca Franco's proposal to get training and free microscope time to do cryo-EM at OHSU was approved.

Both of **Isabelle Logan's** proposals have been funded, 89K from the Children's Tumor Foundation for the Young Investigator Award, *Signaling pathways regulated by nitrated proteins as novel therapeutic targets for neurofibromatosis type 2*, and 30K from the Collins Medical Trust, *Cell-surface nitrated proteins*.

Ryan Mehl and **Rick Cooley** have been awarded for 4 years for a total of \$1,209,960 by the NSF on work that will continue the development of tetrazine ligations inside mammalian cells to advance single molecule tracking and imaging of dynamic proteins. Project Title: *Ideal eukaryotic tetrazine ligations for imaging protein dynamics in live cells*

Ryan Mehl and **Rick Cooley**'s R01 renewal application form NIH GM114653-06 has been approved for funding for 4 years at \$200,000 direct costs per year, total of \$1,188,000.

Afua Nyarko's proposal titled: *Assembly of multivalent regulatory complexes in hippo signaling* has been funded by the NSF for 4 years in the amount of \$820,000.

Patrick Reardon's RERF proposal has been awarded \$51,320.00 to support the purchase of the *Sample changer upgrades for the 800 and 700 MHz NMR spectrometers*.

Fritz Gombart's application to NIGMS entitled "Nanofiber-based Delivery of Combined Immune-modulating Compounds to Minimize Infection and Enhance Wound Healing" is going to be funded for four years (\$1,080,000 direct costs). Fritz is the corresponding PI on the subcontract.

Publications

From the Beckman group:

Shen X, Xu T, Hakkila B, Hare M, Wang Q, Wang Q, **Beckman J.S**, Sun L. (2021). [Capillary Zone Electrophoresis-Electron-Capture Collision-Induced Dissociation on a Quadrupole Time-of-Flight Mass Spectrometer for Top-Down Characterization of Intact Proteins](#). *J Am Soc Mass Spectrom*. Mar 22. doi: 10.1021/jasms.0c00484. Epub ahead of print. PMID: 33749270.

Beckman J.S, Voinov V.G, Hare M, Sturgeon D, Vasil'ev Y, Oppenheimer D, Shaw J.B, Wu S, Glaskin R, Klein C, Schwarzer C, Stafford G. (2021) [Improved Protein and PTM Characterization with a Practical Electron-Based Fragmentation on Q-TOF Instruments](#). *J Am Soc Mass Spectrom*. Apr 29. doi: 10.1021/jasms.0c00482. Epub ahead of print. PMID: 33914527.

From the Johnson group:

Manchanda A, Bonventre J.A, Bugel S.M, Chatterjee P, Tanguay R, **Johnson C.P**. (2021). [Truncation of the otoferlin transmembrane domain alters the development of hair cells and reduces membrane docking](#). *Mol Biol Cell*. May 12 doi: 10.1091/mbc.E20-10-0657. Online ahead of print.

From the Mehl group:

Chaparro Sosa A.F, Bednar R.M, **Mehl R.A**, Schwartz D.K, Kaar J.L. (2021). [Faster Surface Ligation Reactions Improve Immobilized Enzyme Structure and Activity](#). *J Am Chem Soc*. May 12;143(18):7154-7163. doi: 10.1021/jacs.1c02375. Epub 2021 Apr 29. PMID: 33914511.

From the Gombart group (also in collaboration with Hsu):

Zhang Y, Bobe G, Miranda CL, Lowry MB, **Hsu V**, Löhr C, Wong C, Jump D, Robinson M, Sharpton TJ, Maier CS, Stevens JF, and **Gombart AF** (2021). Tetrahydroxanthohumol, a xanthohumol derivative, significantly attenuates high-fat diet induced hepatic steatosis in vivo by antagonizing PPAR gamma. *eLife*. eLife 2021;10:e66398 doi: [10.7554/eLife.66398](#)

Faculty Awards:

Michael Freitag was honored with the [F.A. Gilfillan Award](#) for Distinguished Scholarship in Science. The Gilfillan award is the highest honor given to a faculty member in the College whose scholarship and scientific accomplishments have extended over a substantial period of time.

The **Disease Mechanism and Prevention Fund (DPF)** award went to **Adrian Gombart**, professor of Biochemistry and Biophysics. The donor-supported award supports research into the mechanism, diagnosis, treatment, and prevention of disease by faculty within the College of Science.

Kari Van Zee won the [Frederick H. Horne Award](#) for her exceptional qualities as a teacher and mentor. This award is named after Fred Horne, OSU Professor Emeritus of Chemistry and the former College of Science Dean for 13 years, from 1986 to 1999.

Invited Zoominars:

Elisar Barbar Title: *Protein disorder in regulation and assembly of large molecular machines*, Online seminar series focusing on intrinsically disordered proteins (www.idpseminars.com, Twitter: @IDPseminars), April 15th, 2021

Fritz Gombart

April 7, 2021, National University of Natural Medicine, Portland, OR, "*Targeting nuclear receptors to treat disease*".

May 4, 2021, Linus Pauling Institute, 25th Anniversary Webinar Series, "*Why a healthy immune system needs vitamin D*".

Heather Masson-Forsythe Title: *A dancing duplex: The SARS-CoV2 nucleocapsid phosphoprotein's multivalent binding to RNA*, June 3rd at the virtual symposium IDPSIG, Intrinsically disordered protein scientific interest group.

Graduate Awards:

Congratulations to **Isabelle Logan** for receiving the Children's Tumor Foundation Young Investigator Award grant for her proposal titled: *Signaling pathways regulated by nitrated proteins as novel therapeutic targets for neurofibromatosis type 2*. The total amount of this award is \$89,000 INCLUSIVE of indirect costs. The anticipated granting period is two years, from 7/1/2021 to 6/30/2023.

Congratulations to **Heather Masson-Forsythe** for receiving the **Inclusive Excellence Award** for her vital contributions to many equity and justice and outreach programs that have brought recognition not only to the biochemistry department but also to Oregon State.

Undergraduate Awards:

Congratulations to BMB-Honors College senior, **Maja Engler**, OSU's newest Fulbright Scholar! Maja has been selected for an Open Study/Research award in Germany where she will collaborate with Ulm University to research winter polymorphism in hibernating Djungarian hamsters, to better understand potential biomedical applications for humans.

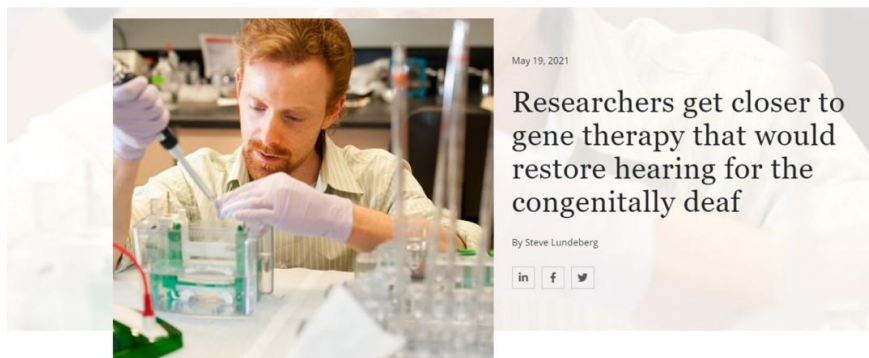
Congratulations to **Ilana Gottfried-Lee** from the Cooley lab for receiving the 2021 Honors College Outstanding Thesis Award in the science/public health category. We are very proud of all that Ilana has accomplished in the last 2 years. Another well-deserved recognition for the work being done in our department. The Honor's College had a near-record number of nominations this year, all of them outstanding, and Ilana's writing and research accomplishments stood out above the rest.

2021 SURE Award winners	
Name	Mentor
Mikayla Chen	Neil Shay
Gabriel Dreyer	KC Walsh
Gretchen Fujimura	Elisar Barbar
Madeline Goebel	Joe Beckman
Kayleana Green	Kenton Hokanson
Kaitlyn Hughes	Elisar Barbar
Rowan Nelson	Frederick Colwell
Paul Nguyen	Stacey Harper
Travis Pennington	Tory Hagen
Grace Scuderi	Tory Hagen
Arjun Subramanian	David Hendrix

2021 CURE Award Winner	
Name	Mentor
Alex Sathler	Franco
Josh Griffis	Cooley
Sarina Grant	Estevez
Lizzie Milford	Freitag
Kitty Liu	Gombart
Grace Petrina	Mehl
Emily Gemmill	Qiu

BB in the News:

Johnson Lab Featured in OSU IMPACT Magazine & Genetic Engineering & Biotechnology News



Colin Johnson, associate professor of biochemistry and biophysics

Dr. Colin Johnson and graduate student, **Aayushi Manchanda**, discuss their work using a truncated version of the otoferlin gene and zebrafish to advance targeted gene therapy.

[IMPACT](#)
[Other News](#)

BB Graduate Student Heather Masson-Forsythe on SciArtsRUs: Dissertation Dancin' Docs

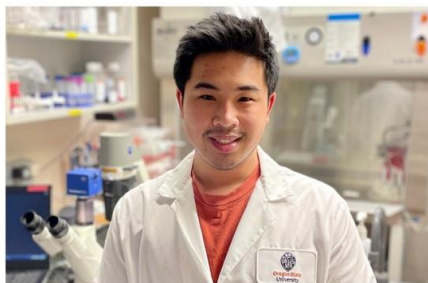
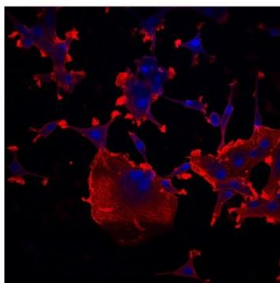


Heather was interviewed in a Facebook Live event with the non-profit organization, SciArtsRUs, in accordance with their mission to improve community access to Science, Art and Music education. The event featuring Heather and other Dance Your PhD artists is now published on YouTube!

Meet these amazing scientific artists or are they artistic scientists. Winners of the eminent, high impact journal Science magazines, “Dance your PhD contest” cover topics: “Multivalent binding of the partially disordered SARS-CoV-2 nucleocapsid phosphoprotein dimer to RNA” and “Structure and Stability of Atmospheric Clusters”.

[Youtube Video](#)
[Facebook SciArtsRUs](#)

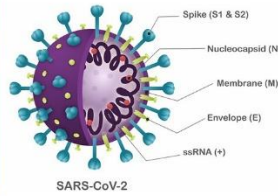
Kyle Nyguen & Franco Lab Featured in ASBMB Today



Targeting nitrated proteins could lead to new cancer drugs

Kyle Nyguen recently represented BB, OSU, and the Franco Lab at ASBMB 2021! Follow the [link](#) to read the ASBMB Today article all about Kyle’s recent research efforts concerning nitrated proteins and treatment of glioblastoma tumors.

Department Head, Elisar Barbar, explains research into SARS-CoV-2 nucleocapsid protein & new treatments



“If we interfere with how the RNA of the N [protein] protects the RNA, then the RNA can be cleaved, can be cut into pieces, will not work and then we don’t have replication or transmission of the virus,” Barbar said.

“All the worries that we have now about variants and if the vaccine works against the variants is because we’re focusing on the S protein, but when we start focusing on the N protein, the N protein does not vary as much. So, the vaccines that are developed would have a more lasting effect,” Barbar said.

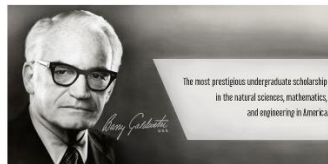
[Koin](#)
[NSF Discoveries](#)
[OSU Today](#)
[Journal Article](#)

Elisar Barbar helped produce the episode “The Ties That Bind.” The Discovery Files radio feature is distributed nationally by the CBS Radio Network and run on other radio stations across the country—from Los Angeles to Washington, D.C. The radio series is also distributed internationally by the American Forces Network.

NSF.gov: The Discovery Files-[The Ties That Bind](#)

BB Undergrads Recognized as Goldwater Scholars

Congrats to [Emily Gemmill](#) and [Alyssa Pratt](#) and their respective mentors, Dr. Weihong Qiu and Dr. David Hendrix.



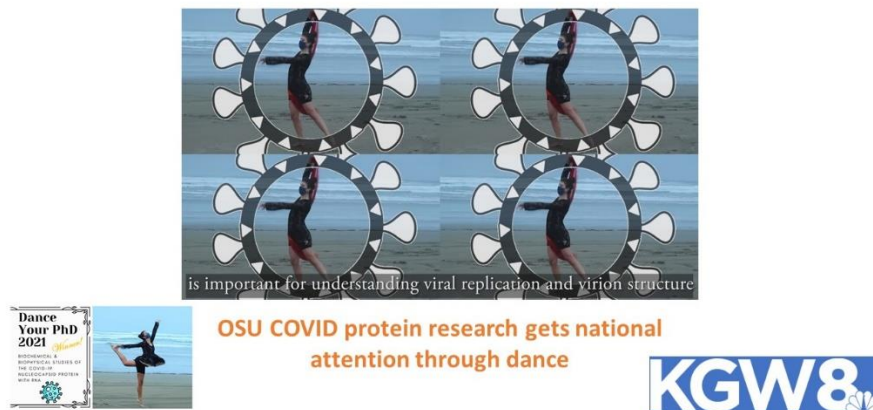
Emily Gemmill, a junior, and sophomore **Alyssa Pratt** have been awarded the 2021 Goldwater awards, which is the top undergraduate award in the country for sophomores and juniors in STEM.

Gemmill is pursuing a double major in biochemistry and biophysics and mathematics, with a minor in chemistry and options in advanced biophysics and mathematical biology. Pratt, a second-year Honors

student, is double majoring in computer science and biochemistry and molecular biology with a concentration in computational molecular biology.

**[iIMPACT
Top Scholars OSU](#)**

Heather Masson-Forsythe featured on KGW8



Heather Masson-Forsythe was featured on **[KGW8](#)** through her dance.

[Dance Your PhD Contest](#)
[Original Video](#)
[NPR](#)
[Forbes](#)

Heather's video Title: [Dancing in STEM: Social Media Trends to Bring STEM to All](http://videohall.com/p/2133)
<http://videohall.com/p/2133>

3 Quick Hacks to Build Cognizance, Agency, and Logical Flow in a STEM WIC Class

In the midst of the pandemic and a shift to remote learning, many are at our wits' end converting classes, keeping our students motivated, and keeping ourselves motivated. Just thinking about how to better a WIC course or try something new may be daunting. However, biologist **Lauren Dalton** has some tried and true activities/strategies that may help both you and your students; she shares 3 quick hacks that are fun (or mostly fun) and also help build students cognizance around their communication abilities, agency in what they write about, and logical flow in their written pieces.

Led by: Lauren Dalton, Instructor, Biochemistry and Biophysics

- [Watch the recording](#)
- Download the [workshop slides](#), [writing prompts](#), and communication activity [instructions](#) and [image](#)

New Beginnings

Congratulations to **Miranda Leek** for successfully presenting her report and passing the oral exam with no dissenting votes and graduating with a non-thesis Master this term! We wish you the best in all your endeavors.

Tony Reyna and family will be moving to Texas early next week. He will continue working remotely until we find a replacement. Thank you for all your help and many years of dedicated service, Tony!

From the GSA

April-

- **Mareike Moller** published "[Recent loss of the Dim2 DNA methyltransferase decreases mutation rate in repeats and changes evolutionary trajectory in a fungal pathogen](#)"
- **Heather Masson-Forsythe** published "[Multivalent Binding of the partially disordered SARS-CoV-2 nucleocapsid phosphoprotein dimer to RNA](#)"
- **Heather Masson-Forsythe** received the Inclusive Excellence Award for her vital contributions to many equity and justice and outreach programs that have brought recognition not only to the biochemistry department but also to Oregon State.
- **Amanda Radke** attended and presented work at the Experimental Biology Conference.

May-

- **Aayushi Manchanda** was featured alongside Colin Johnson in [OSU IMPACT](#) and in [Genetic Engineering & Biotechnology News](#) to discuss their work using a truncated version of the otoferlin gene and zebrafish to advance targeted gene therapy.
- **Heather Masson-Forsythe** participated in a Live interview with SciArtsRUs: Dissertation Dancin' Docs. The interview is now up on [YouTube!](#)
- **Heather Masson-Forsythe** created a video for the STEM to All showcase.
 - Title: [Dancing in STEM: Social Media Trends to Bring STEM to All](#)
- **Kyle Nyguen** represented BB, OSU, and the Franco Lab at ASBMB 2021! Follow the [link](#) to read the ASBMB Today article all about Kyle's recent research efforts concerning nitrated proteins and treatment of glioblastoma tumors.
- BB seniors, [Seth Pinckney](#) & [Ilana Gottfried-Lee](#) both recently defended their Honors theses. They were also each featured in OSU IMPACT stories.

Alumni

Andres Cardenas has received the College of Science Young Alumni Award. The award ceremony will be Friday, Nov. 12 – save the date! A nice Impact article about Andres is [here](#):

Isabella Karabinas who worked in Alvaro's lab and graduated last year will be attending Weill Cornell Medical College this fall. She was accepted to the Tri-Institutional Weill Cornell/Rockefeller/Sloan-Kettering MD/PhD program, as well as the Wash U, University of Rochester, and University of Iowa MST programs and the Stanford MD program.

Department Business

Thanks to the fantastic work led by Kari, we now have a BMB minor!!

Office Summer plans

-Office will be open over the summer from 10am-2pm.

-During that time, mail will be picked up by Juri or Michael G.

-Tony will be 100% remote and will be available during summer unless otherwise noted. You can feel free to reach him via phone call or text (559) 284-5612. Tony will be out of the office 6/17, 6/18 and 6/21-6/25.

-Dina is currently scheduled to work Monday – Thursday from 9am-3pm.

The BB Staff email will reach Tony, Dina, Juri, and Michael so generally it is best to use that email unless your inquiry is directed towards Tony or Dina.

Events this week

June 15th: Faculty meeting, 3-5 pm

June 16th: 9 am PhD Candidate, Riley Bednar from the Mehl lab will present his dissertation defense titled: "Exploring the Limits of Ligation Rate and Specificity in Protein Immobilization Using the Genetically Encoded Tetrazine Ligation"

Join here: <https://beav.es/3AN>

June 17th: Episode with Heather goes [live](#) on June 17!

Coffee hour

To stay connected I will be holding coffee hours on Fridays first and third week of each month at 3 pm. I will also continue to send weekly emails, and happy to chat in person in my office or the hallways of ALS.

Have a great summer and send me your news!

Elisar