

## Annual Newsletter Fall 2020

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Newsletter editor: P. Wolfskill

## MESSAGE FROM THE CHAIR



*From left to right: Prof. Ruth Walker (Mt. Sinai) and Prof. Adrian Danek (Univ. Munich), members of the Advisory Board of the Advocacy for Neuroacanthocytosis Patients, Dr. Jae-Sook Park and Dr. Aaron Neiman, Professor & Department Chair*

I hope this letter finds you well. As everywhere, this year has been unlike any other for the Department of Biochemistry and Cell Biology due to the Coronavirus pandemic that began in March. In response to Governor Cuomo's orders, all research activities (except those directly related to Covid-19) were shut down for three months. In mid-June, the department began a phased ramp up of research, which has us back to full strength as the fall semester starts. There have been many adjustments in the laboratories to minimize the chances of viral transmission, including scheduling work shifts to reduce the occupancy in labs, wearing masks in all public areas, limiting the number of people in elevators, and more. It has been good to see people embracing these changes and it makes me optimistic that our labs will be able to remain open until the end of the pandemic.

Another major hurdle resulting from the pandemic was that faculty had just two weeks over spring break to convert all our courses to remote instruction for the last half of the spring semester. This was a Herculean feat and a difficult adjustment for both the faculty and the students. Many of the classes taught by BCB faculty are large, and therefore almost all of our courses are online for the fall semester as well. I have been inspired by the resilience shown by the BCB faculty, staff, and students throughout this difficult time and am proud of the effort that everyone is making to ensure a high standard of instruction and research.

There were a lot of positive developments in the Department this year. You can read about many of these in the Newsletter, but I want to highlight a few.

Among the grants and awards faculty obtained this year, Bernadette Holdener received an Innovator Award from the Hydrocephalus Association; Steven Glynn received an Idea Award from the Barth Syndrome Foundation; and Jae-Sook Park, a senior research scientist in the Neiman lab, was awarded the Glenn Irvine Prize by the Advocacy for Neuroacanthocytosis patients. All of these awards highlight the importance of the basic research done in the BCB Department in understanding different human diseases. Our Biochemistry majors earned many honors, including Alexander Chirokikh, who was a Ward Melville Valedictorian at this spring's virtual commencement. Finally, I am very excited to report that we have hired a fantastic new Assistant Professor this year, Chi-Kuo Hu, who will be joining us from Stanford University. Chi-Kuo's research focuses on  
*(Continued on page 2)*

## MESSAGE FROM THE CHAIR

the molecular events of diapause (a form of suspended animation) in the African Killifish. Chi-Kuo's groundbreaking work has recently been highlighted in *Science* magazine and *Scientific American*. We are looking forward to having him join us in January of 2021.

Unfortunately, even when this pandemic passes, we will be dealing with the fallout for many years to come. One imminent effect is on the New York State budget and consequent cuts to state funding for the University, which are expected to be 25% this year. While these cuts do not affect our research funding from grants, they will impact our ability to support that research, for example maintaining research equipment and departmental facilities, assisting with student support and bridging faculty who have a gap in funding. More than ever, the Department is relying on philanthropy to help buffer our faculty and students from these effects. A year ago I announced the establishment of the Biochemistry and Cell

Biology Endowment Fund. The goal of the endowment is to provide a reliable source of financial resources to support the Department in just these circumstances. We also have a Biochemistry and Cell Biology Excellence Fund. Donations into this fund are available for immediate use. We will be participating in the Stony Brook University Giving Day again this year to raise funds for the Endowment. I will send more information on that in future emails, but please consider contributing to either the Excellence fund or to the Endowment to help the Department continue its important work now and in the future.

Sincerely,

*Aaron Neiman*

*Professor and Department Chair*

## MCB & BSB GRADUATE PROGRAM ANNOUNCEMENTS

The Molecular and Cellular Biology (MCB) and Biochemistry and Structural Biology (BSB) programs provide graduate students with training at the forefront of modern biological sciences. Dr. Wali Karzai continues to serve as MCB Director and BSB is led by Dr. Steven Glynn.

Last year, twelve students successfully graduated with PhD degrees (MCB: Drs. Naishitha Anaparthi, Anna Banach, Gregory Carbonetti, Xianan Liu, Matthew Simons, and Nithya Sivaram; BSB: Drs. Bojian Ding, Andreyah Pope, Omar Sanchez Reyes, Prajna Shanbhogue, Roger Shek, and Johnna St. Clair).

The graduate programs held their joint annual BBQ to welcome the incoming graduate students. Students were able to meet with faculty, chat with senior students, and play games organized by the second-year students. The MCB program held its annual Second Year Student Symposium in June at the Hilton Garden Inn. Second year students were given the opportunity to hone their presentation skills and showcase the research work to their colleagues and MCB program faculty.

The annual MCB-BSB program retreat was held in October at the Willow Creek Golf & Country Club in Mt. Sinai. Faculty from both programs were invited to speak and present highlights from their recent research. Speakers included Drs. D. Pisconti (BCB), S. Chowdhury (BCB), M. Airola (BCB), B. Sheridan (Micro), H. Kim (Micro), and P. Kumar (Micro). All 4th year MCB and BSB students presented posters highlighting

their research, which generated much interest among the attendees. Best poster awards at the retreat were given to Valerie Khayyo and Jeffrey Stith. Brandon Irizzary and Arnab Choksi received awards for outstanding service to the graduate programs.

The incoming MCB class contains 12 students and the incoming BSB class has 5 students. The MCB and BSB programs have not been spared the impact of the COVID-19 pandemic, and many of incoming international students are expected to defer the beginning of their PhD studies until Spring 2021. We look forward to meeting these students in the Spring and helping them join our vibrant community of early career scientists.

Sincerely,

*Wali Karzai, MCB Program Director &*

*Steven Glynn, BSB Program Director*

Please visit our websites:

[www.stonybrook.edu/mcb/](http://www.stonybrook.edu/mcb/)

[www.stonybrook.edu/bsb/](http://www.stonybrook.edu/bsb/)

## BIOCHEMISTRY AND CELL BIOLOGY MASTERS PROGRAM

### 2019 graduating BCB MS class:

From the left: Ian Miranda, Biao Zhang, Thomas Jannace, William Podolsky, Neta Dean (Program Director), Mohammed Bah, Guangmei Liu, Mohammed Ali Shaaban, Mckenna Glasheen. Not shown are Jessica Caliendo, Shannon Kanadinc, Paul Geraci, Sebastian Alvarez



testament to these words, especially in these times. Recent successes include Matthew DiGiovanni, who this year became the Associate Director of the Science and Technology Entry Program (STEP) at Nassau Community College in Suffolk, NY. Weijing Gu (grad BCB MS 2018) landed a research position at the neuropharmaceutical company Proneurotech (San Francisco, CA). From our 2019 graduates, Shannon

Kanadinc is currently at Regeneron (Tarrytown, NY); Ian Miranda at Pfizer, Pearl River, NJ; McKenna Glasheen is at the Sidney Kimmel Cancer Center at Thomas Jefferson University, Philadelphia, PA. Guangmei Lu graduated in 2019 and began her PhD studies at UC, Santa Cruz.

**T**he Biochemistry and Cell Biology MS graduate program is about to enter its second decade and by all metrics, it continues to be a success! This program aims to prepare our graduate students for careers in the life sciences by providing a strong foundation in both theoretical and practical biochemistry and cell biology. As measured by our student career outcomes, we are meeting our goals.

For details of our program, see

<https://www.stonybrook.edu/commcms/biochem/education/graduate/biochemistry-and-cell-biology-ms>

*“In the midst of chaos, there is also opportunity”*—Sun Tsu. Our Stony Brook BCB MS graduate students are a



**The Fall 2019 Incoming Class (shown left) contains sixteen students** From left to right **Row 1**- Maryam Azmi, Rakshika Balasubramaniam, Kalliopi Chatzis, Michael Ciccone, Noelle Derosé. **Row 2**- Katie Donnelly, Mariam Elhawary, Kassidy Hallum, Andrew Hillowe, Jitika Rajpot. **Row 3** - Andrew Resnick, Pei-ni Tsai, Xiang Ying Wu, Yang Wu. Not shown are Karen Calabrese, Ramya Bondalapati.

## THE INSTITUTE FOR STEM EDUCATION (I-STEM)

*The Institute for STEM Education (I-STEM)*, which is housed in the Biochemistry Department, was founded by Professor David Bynum in 2007, and has grown to become a national leader in STEM education research, teacher education, and community outreach. I-STEM has been an incubator of innovative, interdisciplinary STEM education collaborations with the university and its surrounding communities. I-STEM is directed by Biochemistry and Cell Biology faculty member Keith Sheppard.

*I-STEM has made notable contributions to STEM teaching, research, and policy at the University including:*

- Generating more than \$33M in external grant funding, including \$8M+ in current grant funding.
- Assisting with the educational plans of 12 recent and current NSF Early CAREER awards across various departments at the University.
- Creating a PhD Program in Science Education in 2010, which has now graduated 21 students and currently enrolls 20 students. Students in the

program have published 20 peer reviewed journal articles in the last two academic years and made more than 30 national conference presentations.

- Faculty are active in state and national STEM educational policy activities, serving on editorial boards, writing policy statements, serving on advisory panels and meeting with key state leadership staff.

*I-STEM is a major provider of high-quality STEM Teacher Education:*

- Offers a full complement of BS and MAT programs in all STEM education fields and is one of the major producers of STEM teachers in the state.
- I-STEM is the regional hub for the New York State Science and Mathematics Master Teacher program with more than 90 appointed master teachers.
- I-STEM has been awarded a National American Physical Society 5+ Award for five of the last six years for its high production of Physics Teachers.

*I-STEM is a leading provider of high-quality STEM outreach and student support:*

- I-STEM has awarded \$6.4M in fellowships and scholarships to postdoctoral, graduate, undergraduate, and high school students who have been actively involved in research or teaching in STEM disciplines

- More than 5,000 students attend our Teaching Labs annually; 85% of Long Island school districts have participated, though COVID has had a major impact on present outreach activities. Labs are offered in biology, geoscience, chemistry, sustainable chemistry and physics. Summer camps are offered in all disciplines of sciences, mathematics, and engineering.

- I-STEM has established research and professional development partnerships with the wider scientific community at Cold Spring Harbor Laboratories, Brookhaven National Laboratories, STEM Hub, American Museum of Natural History, New York Botanical Garden, as well as NYS schools and community colleges.

Dr. Keith Sheppard Director, Institute for STEM Education Associate



Keeping in touch during Friday happy hours during the Covid-19 shutdown (left).

## UNDERGRADUATE AWARDS FOR BCB MAJOR CLASS 2020

The Biochemistry and Cell Biology Undergraduate program had 83 graduates in May. Many honors for our Biochemistry majors were announced at the ceremony.

### University Outstanding Achievement

Riya Gandhi, Nicholas Roig, Ezekwe Udokuma, Jessica Vilas-Boas

### University Provosts Award

Ruben De Man, Jesse Pace, Zaid Rahman

### University Chancellors Award

Ezekwe Udokuma, Nicholas Roig, Jessica Vilas-Boas

### Phi Beta Kappa

Alexander Chirokikh, Evan Davis, Noah Durica, Nicholas Roig, Lauren Bednor

### Ward Melville Valedictorian Award

Alexander Chirokikh

### Biochemistry Department Outstanding Achievement Award

Hamza Allaham, Cameron Chino, Evan Davis, Zachary Hage, Tahrima Huq, Jesse Pace, Nicholas Roig, Ravnit Singh, Eric Tan, Adrian Thompson

### Biochemistry Major Honors Thesis

Ruben De Man, Nicholas Roig, Evan Davis, Jesse Pace, Tahrima Huq, Moeka Sasazawa, Jessica Vilas-Boas

Erika Nemeth, Undergraduate Biochemistry major named 2020 Goldwater Scholar



### Summa Cum Laude

Hamza Allaham, Cameron Chino, Evan Davis, Udokuma, Ezekwe, Zachary Hage, Christopher Little, Jesse Pace, Zaid Rahman, Alexander Rhee, Nicholas Roig, Ravnit Singh, Eric Tan, Adrian Thompson

### Magna Cum Laude

Ali Ahmadi, Ashley Amundson, Bharath Ayloo, Caitlin Bricault, Cameron Chino, Ruben De Man, Gor Grigoryan, Terrie Hsun, Tony Li, Thomas Lin, Jorge Pincay, Rumana Rahman, Lynne Richardson, Mohammad Sadeghi

### Laude

Cody Brady, Jin Ha Choi, Antony Chu, Ryan Dibenedetto, Noah Durica, Kirsten Fautz, Tahrima Huq, Shan Jin, Arafat Khan, Austin Lau, Melvin Li, Alden Liang, Karen Liang, Allan Mai, Christopher March, Akshay Muttath, Oindrila Naha, Moez Naveed, Fernando Orellana, Kajol Patel, Moeka Sasazawa, Selena Thomas, Gerry Tran, Jessica Vilas-Boas, Tereza Bitkowska, Griffin Walker, Jennifer Yuen, Yujie Zhao

## SUCCESSFUL ONLINE COURSES!

**The Biology Online Program**, which administers several of the Department of Biochemistry and Cell Biology online courses over the summer (BIO202, BIO310, BIO 314, BIO358 and BIO361), continues to attract students from other universities and educational institutions throughout the U.S. as well as Stony Brook University students. The courses are being recommended by medical schools, health related facilities, and advisors from other institutions as academically rigorous courses with high academic integrity and taught by the same faculty teaching at Stony Brook University during our academic year. Thirty two percent of the enrollment in BIO361 and BIO310 were students from other institutions.

## FACULTY UPDATES

### MICHAEL AIROLA

The Airola lab is now in its fourth year of existence and continues to study the structure, function, and inhibition of lipid modifying enzymes. The lab has welcomed several new members, including senior scientist Dr. Shujuan Gao, PhD graduate students Lingshuang Wu and Taylor Rahn, and masters students Noelle Derose and Mariam Elhwary. Other members of the group include PhD students Forrest Bowling, Valerie Khayyo, and Yong-Mi Choi; and postdoctoral fellow Nivea Pereria De Sa. Weijing Gu graduated with his masters in May of 2019 and took a job in the Bay Area with the biotech company Proneurotech. Before the covid-19 shutdown, Mike gave talks at Southern Methodist University and Albert Einstein Medical School, and after gave virtual talks sponsored by the American Society of Biochemistry and Molecular Biology and Sphingolipid Webinar Series. Other lab members gave talks/posters and won several awards. This includes Forrest Bowling who won both best poster and best art project at our Department retreat, Valerie Khayyo who won best talk at our Department retreat and the South Eastern Regional Lipid Conference. We are thrilled to report the publication of our first two manuscripts from the lab. The first manuscript was published in *Nature Chemical Biology* with Forrest as the first author. This paper reported the first structure of human phospholipase D, and provided insight into how this signal transduction enzyme is activated by lipids and protein effectors. Valerie published the first structure of a lipin phosphatidic acid phosphatase in *Nature Communications*, and her paper was selected as an F1000 prime paper. In other news, Mike co-started a virtual lipid webinar series to give students/postdocs the opportunity to present their work during the Covid-19 shutdown. Valerie and Forrest kicked off the series and started a hugely successfully series that continues to run for over 4 months and has attracted ~300 scientists each week. While the shutdown has been challenging, we are thrilled to be back in the lab, pursuing new science and hope to report several exciting studies during the next year. Stay tuned!

### NURIT BALLAS

Nurit Ballas continues to investigate the cellular and molecular mechanisms underlying the neurodevelopmental disorder Rett syndrome (funded by NIH). She continues to serve on graduate student committees, as a reviewer on different NIH study sections and on the Independent Scientific Merit Review Panel for the Governor's Council on Autism NJ, and as Editorial Board Member for the journal *Scientific Reports (Nature)*. Nurit was also invited to speak at the Congress on Rett Syndrome, Baylor, Texas, 2019. Lab members include: Jialin Sun (graduate student), Austin Irwin (Volunteer, pre-Medical School), Christina Rodrigues (Stony Brook undergraduate).

### PAUL BINGHAM

There have been several important areas of progress relevant to our group over the last year.

First, the current Phase III clinical trials of the CPI-613 anti-cancer metabolism drug we invented here at Stony Brook are nearing completion. These data from advanced pancreatic cancer patients are expected to be unsealed and analysis to begin toward the end of this year. We should have a clear answer by early 2021. If this Phase III trial is as successful as our Phase I investigational trial (Alistar, et al., 2017, *Lancet Oncol* **18**: 770), it is realistic to hope that this CPI-613 drug combination may become a standard of care for this very difficult to treat cancer. Indeed, the fact that the clinical trial continued to rapidly accrue patients is a testament to the great need here.

Second, through our daily work in the lab, we continue to make progress in deepening our understanding the fundamental mechanisms underlying tumor response to the CPI-613 drug family. The details of what we are discovering indicate paths forward to further improving the rates and durabilities of patient responses.

Third, Moises Guardado finished his PhD in the Genetic Program in our lab this year. He has taken a staff scientist position at Pall Corporation. He and his family are doing well.

Fourth, Daniel Thach joined the group this year as an entry level research technician. He is making excellent progress and contributing robustly to the preclinical cancer science in the lab.

Finally, as for most faculty, we made major adjustments midstream in the delivery of our large human evolution course (BIO358) last Spring during the explosion of the COVID19 pandemic. Fortunately, all the innovative online teaching work done primarily by Paul's co-instructor, Dr. Joanne Souza, put us in a strong position to make this abrupt transition to completing the course online highly effective. In the process, we learned many important lessons about how to better manage online delivery of very large courses like ours (>500 students), lessons that will likely serve us all well as the pandemic continues to unfold.

### ZUZANA ZUCHAR

We continue to peel the layers of the MOA of CPI-613. This in turn leads to new investigations of cancer metabolism. This year our attention has been focused on the role of peroxisomal lipid metabolism in tumor cells.

## FACULTY UPDATES

### SAIKAT CHOWDHURY

(Pictured R w/ BCB MS Student Mohammed Shaaban)

The Chowdhury lab continues to study cytoskeletal dynamics and regulation using biochemical and structural techniques. In Fall 2019 the lab's first graduate student (BCB MS program and Fulbright fellow) Mohammed Shaaban graduated. While working in the lab, Mohammed determined the first structures of a key cytoskeletal nucleator in its active state using Cryo-EM. This work was recently accepted for publication after peer-review and will be the first publication from the Chowdhury lab. Additionally, the structures determined by Mohammed will be the first published structures from the new SBU Cryo-EM center. Mohammed was accepted in the SBU BSB graduate program for pursuing his doctoral studies and the lab wishes him all the best for his future endeavors. Dr. Bojian Ding, the lab's first postdoctoral scholar, is close to completing a year in the lab. She has made tremendous progress within a short span of time and is gearing up for publishing her new findings. The lab welcomed two new graduate students this year. Mariella Quispe-Carbajal (BSB PhD program) joins the lab from Peru after completing her MS. Elliot Crooks (BSB PhD program) is being co-mentored by Saikat and Steve Smith on structural studies of amyloid proteins. Though the ongoing COVID-19 pandemic did slow down the lab's progress, but all in all the lab continues to make new discoveries and keep moving forward with an enthusiastic and dedicated team.

### VITALY CITOVSKY

Vitaly Citovsky received the *F1000 Faculty Member of the Year 2019 Award*. Vitaly was a recipient of a competitive renewal grant from the US-Israel Binational Agricultural Research and Development Fund (BARD). Vitaly continues to be funded by NIH/NIGMS, NSF, and NSF/USDA/NIFA. Also, the Citovsky lab purchased a new confocal microscope and a new real-time thermocycler using the supplements from NIH/NIGMS and NSF, respectively. Vitaly continues to serve on Editorial Boards of *PLOS ONE*, *Scientific Reports* (Nature Publishing Group), *Biochemical and Biophysical Research Communications* (BBRC), *F1000 Research*, *Frontiers in Plant-Microbe Interactions*, *Frontiers in Plant Physiology*, *Plant Signaling & Behavior*, and *Communicative and*



*Integrative Biology*, and is a member of the Cell Biology section of *Faculty 1000 Biology*. Vitaly served on the Online Biology Faculty Search Committee and the Genetics Graduate Program Admissions Committee and he continues to serve on the Departmental Awards Committee, the Administrative Review Committee of the University Senate, the CAS Senior Promotion and Tenure committee (PTC-S), and the CAS Academic Judiciary Committee.

**LAB MEMBERS:** Undergraduate students: Laith Hana, Jody Huie, John Kaba, Ryan Seecharan, Chao Feng Zhang, Michelle Zhu

Sabbatical: Yufei Hu (South China Agricultural University, China)

Postdocs: Ido Keren, Benoit Lacroix, Mi Sa Vo Phan, Phu Tri Tran

### NETA DEAN

Research in the Dean lab continues to study protein glycosylation and its regulation during fungal cell wall synthesis. The Dean lab welcomed a new member, Rakshi Balasubramaniyam (BCB MS graduate student) who joins Douglass Marr, Yexin Su, and Nidhi Patel (Stony Brook University Biology undergraduates). We also said goodbye to McKenna Glasheen, a BCB MS graduate student. After graduating, McKenna left Stony Brook for Philadelphia to continue her research at the Sidney Kimmel Cancer Center at Thomas Jefferson University. This year Dean lab members were recognized for their achievements with the following awards: Nidhi Patel was awarded *Undergraduate Recognition Award for Outstanding Achievements*. Nidhi Patel, Doug Marr and Yexin Su were recipients of Summer URECA fellowships (2019 Nidhi & Doug, 2020 Yexin Su). In other news about Dean lab alum, Lu Zhao graduated from SBU Dental school, Rachel Jones graduated from SBU Medical School and began her Fellowship at Albert Einstein Medical School. Binghao Zhang (BCB MS, 2018) became a Research Associate at GRMH-GDL, Guangzhou Institutes of Biomedicine and Health in China.

### DALE DEUTSCH

Dale has developed an online cannabis course that was taught for the first time this summer. He was fortunate to have Joanne Souza, PhD and Michael Munoz, BA helping him administer the course. Dale taped 41 lectures that the students watch online. The students have weekly discussion posts, weekly

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quizzes and 2 major exams. The course covers history, legal issues, politics, sociology, plant biology, chemistry, physiology, behavior, neuroscience, and medicinal use. The students range from 2nd year undergraduates to seniors as well as those from outside Stony Brook including teachers, workers in the cannabis industry, and medical cannabis patients.

### J. PETER GERGEN

Research in the Gergen lab continues to investigate the function of the Runt transcription factor in pattern formation during *Drosophila* embryogenesis. Our in-depth studies on *sloppy-paired-1 (slp1)* as a useful model to understand Runt's context-dependent activities as both a repressor and an activator of transcription continue and have expanded to define the role of the Zn-finger transcription factor Odd-paired in regulating two distinct cis-regulatory enhancers that mediate regulation by Runt and other pair-rule transcription factors. Other efforts have extended our studies on the non-autonomous interactions between the *slp1* enhancers to other targets of Runt, including the *wingless* gene and different members of the family of *Toll* receptors whose metameric expression patterns in the early embryo are regulated by Runt.

Kevin Catalan, a BIO BS Honors graduate from 2019, started graduate school in the Graduate Program in Cell, Molecular, Developmental Biology and Biophysics at Johns Hopkins University in September of 2019. Kelsey Hackett, also a BIO BS 2019 Honors graduate has been working as a Medical Scribe while applying to medical schools and will be starting at the SUNY Downstate Medical Center this fall. John Musumeci, who graduated with a BS in Pharmacology in 2020 will be spending a gap year staying at Stony Brook to continue a project on cis-regulatory elements of the Toll2/18-wheeler locus that were the subject of his undergraduate thesis while also working as an adjunct instructor for the Biology Program.

### STEVEN GLYNN

Steve gave a seminar at Middle Tennessee State University and was an invited speaker at the 2020 Keystone Symposium on AAA+ Proteins, where he presented recent work on the structure and mechanism of the mitochondrial AAA+ proteases. Steve was selected as an organizer of the next Keystone Symposium on AAA+ Proteins, scheduled to take place in 2023. Steve was also delighted to receive the 2019-2020 SUNY Chancellor's Award for Excellence in Teaching.

Will Podolsky graduated from the BCB Master's program and his thesis work on Tafazzin, an enzyme required for the formation of mitochondrial cristae, provided the foundation of an IDEA grant award from the Barth Syndrome Foundation.

Undergraduate researcher Ryan McHugh graduated with a double major in Chemistry and Biology in May 2020 after receiving the Goldwater Scholarship and Provost's Award for Academic Excellence. Ryan will enter the Biological Physics, Structure and Design graduate program at the University of Washington this Fall. Another undergraduate researcher, Zachary Hage graduated with a BS in Pharmacology and will join the Pharmacological Sciences Graduate Program at Stony Brook.

Ying Wu joined the lab as a new BCB Masters student and is studying the recognition and turnover of the small Tim mitochondrial chaperones by mitochondrial proteases in humans. Isha Malik joined the lab as an undergraduate research assistant and received a URECA Summer fellowship to use bioinformatic approaches to discover new degron sequences in mitochondrial proteins.

### YUSUF HANNUN

The past year has brought many advances and changes to Dr. Hannun's lab. It would be impossible to reflect on these without first acknowledging the passing of our strongest advocate and collaborator, Dr. Lina Obeid. The loss for our group is immeasurable and moving forward has been difficult for all.

The lab group relocated in January and is now occupying our new space on the 9<sup>th</sup> floor of the MART building. The change has been challenging and exciting.

Dr. Hannun's lab continues to support all levels of students and is proud to share news of their achievements. Undergraduate Erika Nemeth (Mentor: Dr. Daniel Canals) was named a Goldwater Scholar, one of 396 U.S. students receiving the prestigious annual science award in 2020. The award recognizes promising research leaders in the fields of science, mathematics and engineering and includes a scholarship. <https://news.stonybrook.edu/homespotlight/erika-nemeth-21-wins-prestigious-goldwater-scholarship/>

Undergraduate Jonathan Aminov (Mentor: Dr. Chris Clarke) participated in the virtual URECA symposium with his poster entitled "The role of DES1 in Anoikis Resistance In IGF1R and EGFR Overexpressed Basal Breast Cancer". [https://you.stonybrook.edu/urecavirtualcelebration2020/2020-ureca-virtual-posters/medicine\\_jonathan-aminov/](https://you.stonybrook.edu/urecavirtualcelebration2020/2020-ureca-virtual-posters/medicine_jonathan-aminov/)

Graduate students Samia Mohammed and Allen Lee stepped up to join in the hospital's efforts to combat the COVID pandemic. They volunteered their time, working with the Pathology department, to extract RNA from patient samples for testing. Samia was also named a finalist in the SBU Three Minute Thesis Virtual Competition 2020. Her video "A Small Victory in the



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Quest to Cure” can be viewed at: <https://grad.stonybrook.edu/professional-development/sbu3mt/>

Senior member’s recent publications include Dr. Mohamed Salama’s Oncogene paper entitled “PKC $\alpha$  Is Required for Akt-mTORC1 Activation in Non-Small Cell Lung Carcinoma (NSCLC) With EGFR Mutation” <https://pubmed.ncbi.nlm.nih.gov/31420605/>; Dr. Daniel Canals’ FASEB paper entitled “Ceramide launches an acute anti-adhesion pro-migration cell signaling program in response to chemotherapy” <https://faseb.onlinelibrary.wiley.com/doi/abs/10.1096/fj.202000205R>; and Dr. Bachar Hassan and Dr. Jihui Ren’s coauthor contribution to the Molecular and Cellular biology paper entitled “Yeast Sphingolipid Phospholipase Gene *ISC1* Regulates the Spindle Checkpoint by a *CDC55*-Dependent Mechanism” <https://mcb.asm.org/content/40/12/e00340-19.long>

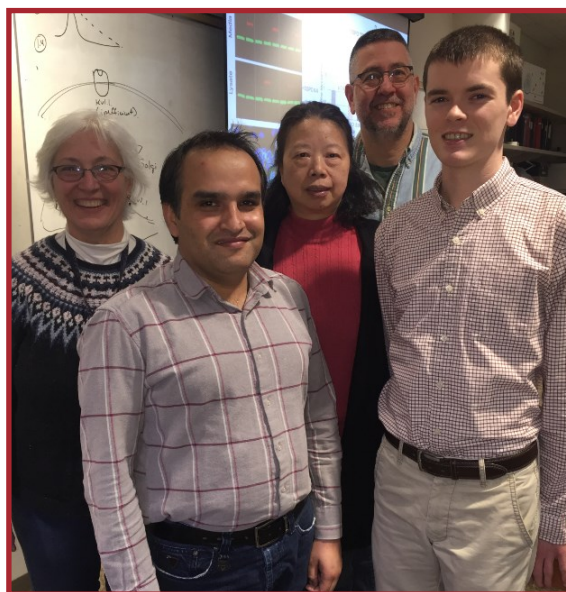
This past August, we also wished well several members who have moved forward with their career goals. Two of our gap year technicians left the lab to enter medical school. Silvia Salamone is attending Harvard Medical School Pathways MD program and Ryan Linzer is attending Albert Einstein College of Medicine. We also said goodbye to recent PhD graduate, Prajna Shanbhogue, who has taken a position with Zoetis (formerly Pfizer Animal Health), as a Protein Design Scientist.

Drs. Hannun and Obeid received the Lifetime Achievement Award from the Eicosanoid Research Foundation. Dr. Hannun was named a SUNY Distinguished Professor.

### BERNADETTE HOLDENER

(pictured left w/ Sanjiv Neupane, Sulan Xu, Richard Grady, Daniel Cameron)

**Bernadette Holdener**, in collaboration with Dr. Robert Haltiwanger at the University of Georgia, is investigating the role of a unique disaccharide modification during embryonic development. Mutations in enzymes that add the sugars to target proteins interfere with tissue organization and organ formation during embryonic development of mice and humans. Understanding the molecular basis for the developmental defects in the mouse mutants will provide a better understanding of what causes common human congenital abnormalities including craniofacial abnormalities, hydrocephalus and chondrodysplasia.



Bernadette was invited to present the results of these studies at the 2019 Federation of American Societies for Experimental Biology (FASEB) Matricellular proteins in tissue remodeling and disease meeting and the 2019 and 2020 American Society of Biochemistry and Molecular Biology Annual Meeting (ASBMB) (postponed until May 2021). Bernadette was recently awarded an “Innovator Award” from the Hydrocephalus Association. <https://www.hydroassoc.org/get-to-know-dr-bernadette-holdener-ha-2019-innovator-award-grantee/#:~:text=The%20Innovator%20Award%20is%20designed,received%20an%20Innovator%20Award%20grant.https://upload.latest.facebook.com/HydroAssoc/posts/10156911000236546>

Dr. Sanjiv Neupane, a postdoctoral fellow in the lab, presented a poster at the 2020 Society for Developmental Biology Conference (online). Daniel Cameron, BS graduated in December 2019 with honors for his research investigating the role of the disaccharide in skeletal development. Bernadette continues to co-teach the core Developmental Biology course for the Biology Major Developmental Genetics Biology track with Dr. Thomsen. She continues to serve as the Director of Undergraduate Biochemistry Majors, and also serves on the Biochemistry and Cell Biology Executive, Biology Executive, and IACUC committees, and Chairs the Stony Brook University Stem Cell Advisory committee.

### NANCY HOLLINGSWORTH

In the latter half of 2019, Nancy attended the EMBO Meiosis meeting in La Rochelle, France and a meeting at Cold Spring Harbor Labs about “Yeast Research: Origins, Insights and Breakthroughs”. She gave a seminar on her research to the Stony Brook University Department of Medicine. Nancy was a discussion leader for a session of the “Meiosis in Quarantine” 2020 Gordon Research Conference. Due to the pandemic, the in person conference was cancelled and instead each Thursday four talks were given by Zoom. Nancy also participated in an NIH study section reviewing K99/R00 Pathway to Independence grants. She was chair of the Biochemistry and Cell Biology Junior Faculty Search Committee that resulted in the successful recruitment of Chi Kuo Hu from Stanford University. Nancy was also chair of a committee responsible for reviewing an accusation of

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academic misconduct for a faculty member at SUNY Downstate.

Lauren Bednor, an undergraduate, a member of the **Hollingsworth lab** since the summer before her sophomore year graduated summa cum laude with Honors in Biology in May 2020. Lauren was a co-author on a *PLoS Genetics* paper from her research in the Hollingsworth lab and will start working on a PhD at Weill Cornell Graduate School in the BCMB Allied Program in Fall 2020. Jason Weng completed his second year in the Hollingsworth lab and is a rising junior. He was accepted into the Summer Undergraduate Research Fellowship program at Rockefeller University for 2020. Andrew Ziesel, a Genetics graduate student in the lab, successfully passed his thesis proposal defense and has advanced to candidacy. Hengyao Niu, a former graduate student in the Hollingsworth lab, became a tenured Associate Professor at the University of Indiana. Tracy Callender, a former MCB graduate student and IRACDA postdoctoral scientist in the lab, started her tenure track Assistant Professor position at SUNY Farmingdale. Tracy and Nancy will be collaborating on a project to identify high copy suppressors of an essential helicase that the Hollingsworth lab has discovered has a role in meiosis.

### MARTIN KACZOCHA

*The Kaczocha laboratory currently consists of Martin Kaczocha), research scientists/technicians Diane Bogdan, Keith Studholme, Chris Gordon, Mei Yu, and Liqun Wang, Masters students James Trainor and Andrew Hillowe, and undergraduate students Rohan Shan, Lauren Mistretta, Isabelle Loop, and Anna Peraino. The lab has also experienced some turnover with postdoctoral fellow Matthew Elmes moving to California to serve as head of research and development at CannaCraft. Greg Carbonetti finished his PhD and is now serving as an Alda Civic Science Fellow in Chronic Pain. Senior research technician Paty Kanjiya also left the lab to move back with her family to California. Matt, Greg, and Paty were all busy on the home front and each welcomed a new baby to the world. Martin Kaczocha gave an invited lecture at the Gordon Research conference on endocannabinoids in Spain. He also served on the NIH MNPS and HIV-endocannabinoid study sections, and was inducted into the National Academy of Inventors. The Kaczocha lab continues to study acute and chronic pain but has also branched out to new areas of brain endocannabinoid signaling and prostate cancer. The lab continues to pursue research projects that are largely but not entirely translational in nature, which are generously funded by two R01 grants from the National Institute on Drug Abuse: "FABPs: Novel Roles in Pain and Inflammation" and "Endocannabinoid Metabolism in Acute Pain", an R56 from the National Institute of Mental Health: "Synaptic Transport of Endocannabinoids in the Brain",*

and an R01 from the National Cancer Institute: "Development of the Next Generation of FABP5 Inhibitors to Treat Prostate Cancer". We are also excited to continue our DoD funded collaboration with Dr. Michelino Puopolo on spinal cord injury pain and to continue our work with Dr. Steven Glynn on characterizing endocannabinoid metabolizing enzymes.

### WALI KARZAI

Current members of the Karzai lab are Dr. Thiago Rodrigues, Dr. Junjie Feng, Arnav Choksi (PhD student from the MCB program), and Pei-Ni Tsai (MS student from the BCB program). We continue to study Quality Control Mechanisms in protein synthesis and directed proteolysis by AAA+ enzymes. We have focused our recent efforts on understanding the mechanistic details and biological functions of two highly conserved AAA+ enzymes, Lon and ClpXP. Our efforts on the biochemical and structural analysis of the ATP-fueled Lon nanomachine yielded unprecedented insight into how this key protease engages substrates and harnesses the energy of the ATP binding and hydrolysis to unfold and degrade its protein substrates. The results of this study (Structural basis for distinct operational modes and protease activation in AAA+ protease **Lon**) were published in *Science Advances*. Our studies of the mechanism by which the AAA+ ClpXP protease is targeted to tmRNA rescued ribosomes have yielded unique insights into how adaptor proteins guide AAA+ enzyme to specific subcellular locations. The results of this fascinating study (Adaptor-Guided Recruitment of the AAA+ Protease ClpXP to tmRNA-Rescued Ribosomes), with broader implications for the targeting of other AAA+ enzymes, have been submitted for publication and are currently under review.

Dr. Karzai continues to serve as the Director of the MCB graduate program, course director for Bio 362 (Biochemistry II), MCB 603 and 604, GRD 500, and course codirector for MCB 503 (Molecular Genetics).

### ERWIN LONDON

Erwin presented a talk at the University of Tennessee, Dept. of Biochemistry and Molecular and Cell Biology, Knoxville, TN Nov. 2019, and the Biophysical Society Annual Meeting, Symposium on Membrane Asymmetry, San Diego, CA. February 2020. A talk at Binghamton University was cancelled due to the COVID-19 pandemic. He continues to be Principal Investigator on an NIH MIRA award "Transformative Lipid Exchange Approaches to Study Membrane Organization" and an NSF grant "Cyclodextrin-Catalyzed Exchange to Control Lipid Composition and Lipid Asymmetry: From Liposomes to Cells." One paper from the lab (Li, G., Wang, Q., Kakuda, S., and London, E. (2020) "Nanodomains can persist at physiologic temperature in plasma membrane vesicles and be modulated by

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altering cell lipids. *J. Lipid Res.* 61:758-766.) Was chosen as a Research Highlight in *J. Lipid Res.*, discussed in a commentary article in same *J. Lipid Res.* issue (May 2020) and discussed in *ASBMB Today* “Shedding light on lipid raft formation” (April 21, 2020). Erwin also continues to serve as a member of the Postdoctoral Fellowship Award Committee for the Life Sciences Research Foundation and as a regular Member of the N.I.H. Biochemistry and Biophysics of Membranes Study Section (term 2017-2021). Lab members in mid-2019 included research assistant professor Guangtao Li, postdoctoral research associate, Shinako Kakuda, and PhD students Pavana Suresh, and Bingchen Li. PhD student Qing Wang graduated in Dec. 2019.

### ED LUK

Ed Luk and his group have made good progress this year despite disruptions by the Coronavirus pandemic. The Luk lab continues to receive funding from the NIH on an R01 research grant. In October 2019, Ed was invited to give a talk at the EMBO Workshop in Greece. He presented a new story about a histone chaperone. Three papers by the Luk Lab came out in early 2020 and were published in *Cell Reports*, *PNAS*, and *eLIFE*. In April, Ed received the Godfrey Excellence in Teaching Award. He is especially proud of this honor as the Award was nominated and selected by Stony Brook’s students.

Ed’s team currently has five members. Leonidas (Louie) Pierrakeas is a former MSc student of the BCB program and is currently working as a technician in the lab. Louie is a co-first and co-author on the *Cell Reports* and *PNAS* papers, respectively. He will be joining the MCB program this Fall and will continue to work in Ed’s lab as a PhD student. Cynthia Converso and Scott Yang entered year 2 of their pre-doctoral training in the MCB program. They both made excellent progress on their projects. Cindy set up a new assay to understand how a chromatin remodeling enzyme finds its target sites on the genome. Scott found that a component of the transcription machinery might play a direct role in remodeling chromatin structures at promoters. Ramya Bondalapati is a MSc student in the lab. She is developing a new approach to study protein-protein interactions in yeast. Alex Rhee just graduated with a BS degree in Biochemistry at Stony Brook. He will be joining Ed’s lab as a postdoc researcher in the Fall.

### BENJAMIN MARTIN

As of the summer of 2020, the Martin Lab consists of undergraduate Sam Escobar, BCB Master’s student Yang Wu, PhD students Arwa Al Anber,

Alex Larkin, Rob Morabito, Eric Paulissen, Samantha Stettmisch, Zheng Sun, and Courtney Tello, technicians Neal Bhattacharji, Maria Gacha Garay, and Stephanie Flanagan, and Postdoctoral Fellows Becca Adikes and Nick Palmisano, who are both working jointly in the Martin lab and the lab of Dave Matus. Ben Matin, Dave Matus, and Yuefan Deng (Applied Mathematics and Statistics) were successful in acquiring an internal Stony Brook Cancer Center award for a pilot project in pilot proposals in Engineering, Physical Sciences and Oncology, which provides a year of funding to develop an image analysis pipeline for high resolution fluorescent microscopy. The lab continues to work on a project funded by the Damon Runyon Cancer Research Foundation examining how the cell cycle state affects the invasive phenotype of both normal cells and cancer cells. The lab is also supported by the Pershing Square Sohn Cancer Research Alliance to investigate the mechanism by which circulating tumor cells are able to exit blood vessels and populate new tissues and organs during metastasis. The rest of the group is continuing with research related to neuromesodermal progenitors, which are an important stem cell-like population of cells that are critical for the formation of the vertebrate body plan and also serve as an excellent in vivo model of broad stem cell related questions. The lab is excited to welcome postdoctoral fellow Dr. David Gray in August, who received his PhD from UCLA.

**DAVID MATUS** – (*Pictured center in Red — Celebrating the departmental tenure talk and the first Matus lab t-shirt!*)

The Matus lab had a busy year! Our current research focus is subdivided into generating and improving tools for the cell and developmental biology community and trying to understand how the decisions cells make to divide (or not) affect cell behavior. In the fall of 2019 we published papers on both of



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these topics of interest. MD/PhD student Michael Martinez, in the Pharmacology graduate program, led a collaboration with Dr. Jordan Ward's lab at the University of California Santa Cruz, optimizing an *in vivo* protein degradation strategy in our lab's model organism of choice, the roundworm nematode, *C. elegans*. This work was published in the Genetics Society of America journal, *G3* and featured on the cover of the January 2020 issue. Not to be outdone with cover features, Genetics program PhD students, Taylor Medwig-Kinney and Jayson Smith co-lead a study, featured on the cover of *Development*, investigating how a network of genes programs cell invasive behavior in *C. elegans*. Insights from this work may have important implications for how cancer cells invade and how gene networks function. We also posted a pre-print of a long-running project in the lab to *bioRxiv*, developing and optimizing a new biosensor in *C. elegans* to visualize the cell cycle in living animals, a study involving most of the Matus lab, with collaborations from Stanford University and the University of Virginia, led by postdoctoral fellow Dr. Rebecca Adikes and Genetics program PhD student Abraham Kohrman. This year was also a great year for the Matus lab to disseminate research results at national and international conferences. At the annual American Society for Cell Biology conference this past December, our post-baccalaureate researcher and former Stony Brook Biology undergraduate, Ononah Ahmed, was awarded first place in a poster competition for presenting the results of her honor's thesis. This spring, in the virtual Allied Genetics Conference, the Matus lab gave three talks, from Michael Martinez, Taylor Medwig-Kinney and Dr. Rebecca Adikes. As this was first major virtual conference of our field, due to Covid-19, the online meeting was extremely well attended, with audiences over 600+ in attendance! Finally, at the beginning of July, Dr. Adikes and myself co-organized a symposium for the Society of Developmental Biology, to open their virtual conference, bringing together microscopists, biologists and computational biologists. Lastly, in spite of all the pandemic-related shutdowns, and endless Zoom meetings, 2020 will also be remembered fondly for the Matus lab, as we graduated our first PhD student, Abraham Kohrman, from the Genetics program. Abe has just started a postdoctoral researcher position in Dr. Eszter Posfai's lab at Princeton University. We are looking forward to a productive 2020-2021!

### AARON NEIMAN

There was some turnover in personnel in the Neiman Lab this year. Mohamed Bah completed his Masters studies in December and Kai Zhang, after many years as a technician in the lab, left last summer to join the Molecular and Cell Biology graduate program here at Stony Brook. Last fall, Ken Sweeney joined the laboratory as the new technician and Katie Donnelly joined as a Masters student. In June, Kai returned as a first year PhD student. The current make up of the lab is Jae-Sook Park

(Research Scientist), Leo Bemena (Postdoctoral Scholar), Greisly Nunez and Kai Zhang (PhD students), Katie Donnelly (Masters student), and Ken Sweeney (technician). When he isn't wintering in Florida or California, Rolf Sternglanz (Professor Emeritus) continues to work in the lab and consult on all things yeast.

In other awesome news, Jae-Sook Park, who has for many years spearheaded our efforts to understand the function of the Vps13 protein was named the winner of the first Glenn Irvine Prize given by the Advocacy for Neuroacanthocytosis Patients. The award, which includes a talk at next year's International Neuroacanthocytosis meeting and a cash prize of £5000, was established in memory Glenn Irvine, a founder of the Advocacy. The award is given to a junior investigator for their contributions to understanding the basis of Neuroacanthocytosis syndromes. Congratulations Jae-Sook!

Research in the lab is currently focused on three distinct areas: 1) in collaboration with Christine Chrissian and Ruth Clark at City College of New York, we are investigating a conserved role for lipids in the assembly of the fungal cell wall; 2) the structure and activity of the spindle pole body during spore formation; and 3) the regulation and function of Vps13 proteins in both yeast and mammalian cells.

### DADA PISCONTI

The Pisconti lab has grown from its first year at Stony Brook and we are beginning to reap the rewards of our hard work. A paper on the role of syndecan-4 in muscle development has been recently accepted for publication. In this paper, which we produced in collaboration with colleagues at University of Oslo and the Norwegian agency Nofima, we demonstrate that the proteoglycan syndecan-4, which is expressed in muscle stem cells and endothelial cells, is essential for proper muscle development in animals. This work is especially relevant for the meat industry because it shows that syndecan-4 could be targeted to improve the quality and sustainability of meat production. Two other papers have been submitted to two different journals, both of which deal with the role of another proteoglycan, syndecan-3, in two different types of stem cells: mesenchymal stem cells and muscle stem cells. The former shows that targeting syndecan-3 may significantly enhance the efficacy of stem cell-based treatment of rheumatoid arthritis. The latter demonstrates that syndecan-3 acts as a timekeeper during muscle regeneration and may be targeted to ameliorate diabetic myopathy. Lastly, we wrote a review article on the fascinating, multifaceted biology of syndecan-3 in the musculoskeletal system, which has just been accepted for publication. Unfortunately, the COVID-19 pandemic prevented all the fun activities and travels to conferences that we were planning for the Spring and Summer, but we hope to make up for it as soon as possible!

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### STEVEN SMITH

Steven Smith continues as the director of the Center for Structural Biology. The facilities for cryo-EM and NMR spectroscopy in the CSB are running smoothly and support research in structural biology across campus. In the lab, we still have two major research focuses. The first is on G protein-coupled receptors. Omar Sanchez-Reyes who was working on the  $\beta_2$ -adrenergic receptor graduated from the BSB program in December and Andreyah Pope who has been working on the visual receptor rhodopsin is now a postdoctoral scientist. The second research focus has been on the Alzheimer's disease (AD). Brandon Irizarry, a BSB graduate student, is focusing on the structure of amyloid deposits on brain blood vessels, which is the hallmark of a separate disease called cerebral amyloid angiopathy (CAA). Elliot Crooks has taken on the task of determining amyloid fibril structures by cryo-EM. He is now working jointly between the Smith and Chowdhury labs. Jitika Rajpoot is focusing on the role of the A $\beta$ 42 peptide in both AD and CAA. A $\beta$ 42 is the most toxic of the amyloid peptides.

### GERALD THOMSEN

Gerald (Jerry) Thomsen's lab is pursuing how cell-cell interactions, signaling pathways, and gene regulatory circuits affect cell fate decisions and pattern formation during animal development and regeneration. We use the African Clawed Frog, *Xenopus laevis*, and the Tropical Clawed Frog, *Xenopus tropicalis*, as vertebrate models and the sea anemone *Nematostella vectensis* as a cnidarian model for development and regeneration. The past year of research has been on mechanisms that regulate patterning in *Xenopus* embryos and regeneration in both sea anemones and *Xenopus* tadpoles.

The embryonic patterning research has focused on evaluating CRISPR-mediated *X. tropicalis* mutants in several genes. One is *Gtpbp2*, a GTPase that functions in BMP and Wnt signaling (see Kirmizitas et al., 2014; 2016), two mRNA splicing factors, *wbp11* and *pqbp1* that regulate FGF signaling (Iwasaki & Thomsen 2014), the *Smurf1* and 2 ubiquitin ligases that regulate TGF-beta signaling (Google "smurf1 or 2") and an old favorite of Jerry's, *Vg1* (Thomsen & Melton 1993, yikes!). Jerry's first graduate student, Marko Horb and his lab at the National *Xenopus* Resource (at MBL in Woods Hole) have generated F1 and F2 lines of *X. tropicalis* mutants in these genes and have begun phenotypic characterization of those mutant embryos. Presently, unpublished results indicate that *Vg1* mutants have difficulty gastrulating, but heterozygotic LOF *Gtpbp2* and *Wbp11* mutants develop rather normally (we suspect that the maternal mRNA pool of these genes may be providing rescue. New matings of F2 mutants (which are maternally mutant) are underway.

The regeneration research continues to delve into how a

*Nematostella* polyp can regenerate its whole body, with focus on mechanisms that specify the "head" of the polyp (the end that has a mouth and tentacles), and we have recently submitted a paper describing how Wnt signaling affects head regeneration (Iwasaki et al.). *Xenopus* tadpoles have joined the regeneration studies to determine whether mechanisms operating in sea anemone regeneration also function in tadpole tail regeneration. Since cnidarians and vertebrates last shared a common ancestor about 550 million years ago, our studies will help inform whether regenerative mechanisms are unique or have been conserved over the course of evolution. Our present focus is on how autophagy functions to affect regeneration.

The past academic year was a bit out of the ordinary, of course, and COVID-19 put a damper on scientific meeting participation, but Jerry attended the *Xenopus* Resources and Technology Meeting in October 2019, held at the National *Xenopus* Resource at MBL in Woods Hole and organized by Jerry's first graduate student, Marko Horb PhD, who is the Director of the NXR. Jerry also attended the Society for Developmental Biology Annual Meeting in July 2020, which would have been in Chicago but instead was held online. He presented a poster summarizing aspects of how Wnt genes function during *Nematostella* head regeneration. Jerry would have attended the annual Northeast SDB meeting in Woods Hole and the International *Xenopus* Meeting in England, but both were postponed until 2021.

Researchers in the lab over the past academic year included Dr. Pat Bossert (current), Master's student Biao Zhang and SBU undergraduates Serena Lee (a national semi-finalist in the 2019 Regeneration Science Talent Search) and Kevin Fung, both freshman and also current lab members.

### LONNIE WOLLMUTH

Synapses are specialized structures that control the flow of information between neurons in the brain. Alterations in synaptic transmission contribute to numerous neurological and psychiatric diseases, such as epilepsy, autism, and schizophrenia. Research in the Wollmuth group addresses biophysical and molecular mechanisms underlying fast synaptic transmission in the brain. This work entails studying those synapses that use glutamate as a neurotransmitter as well as specialized synapses in the retina – ribbon synapses – that are designed for continuous release. Much of our work is done in collaboration with Dr. Helen Hsieh, a pediatric surgeon at SBU Medicine. Details of our research program and activities can be found at our webpage ([www.wollmuthhsieh.com](http://www.wollmuthhsieh.com)).

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Li, J., J. Zhang, W. Tang, R. K. Mizu, H. Kusumoto, W. XiangWei, Y. Xu, W. Chen, J. B. Amin, C. Hu, V. Kannan, S. R. Keller, W. R. Wilcox, J. R. Lemke, S. J. Myers, S. A. Swanger, **L. P. Wollmuth**, S. Petrovski, S. F. Traynelis, and H. Yuan (2019) *De novo* GRIN variants in NMDA receptor M2 channel pore-forming loop are associated with neurological diseases. **Human Mutation**. 40:2393-2413. (PMCID: PMC6874887).

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Zoodsma, J. D.\*, K. Chan\*, A. A. Bhandiwad, D. Golann, G. Liu, S. Syed, A. Napoli, H. Burgess, H. Sirotkin<sup>‡</sup>, and **L. P. Wollmuth<sup>‡</sup>**. (2020) A model to study NMDA receptors in early nervous system development. **Journal of Neuroscience**. 40:3631-3645. (PMCID: PMC7189761). \*Authors contributed equally. <sup>‡</sup>co-senior authors.

Baez, A., T. V. Brunt, G. Moody, **L. P. Wollmuth**, and H. Hsieh (2020) Voltage dependent allosteric modulation of IPSCs by benzodiazepines. **Brain Research**. *In press*.

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### REVIEWS/Chapters

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## NOTEWORTHY

### LIFETIME ACHIEVEMENT AWARD

Drs. Yusuf A. Hannun and Lina Obeid (*pictured below*) were the first dual recipients of a Lifetime Achievement Award at the 16th International Conference on Bioactive Lipids in Cancer, Inflammation and Related Diseases on October 20 in St. Petersburg, Florida. It is also the first time that a woman has received this prestigious award.

As internationally renowned cancer researchers in the field of lipid biochemistry and the study of metabolomics, Drs. Hannun and Obeid have contributed individually and as a team to many novel discoveries. Their research has increased the understanding of the mechanism and regulatory strategies involved in lipid metabolism and its role in cancer development.

Members of the Department of Biochemistry and Cell Biology mourn the passing of Dr. Obeid in Fall 2019.



(Continued from page 13)

Our group had a busy and successful year. After a successful stint in the lab – first author publications in *Nature Communications* and *The Journal of Neuroscience*, Dr. Kelvin Chan (Program in Neuroscience/MSTP) graduated and went back to Medical School. Both of these manuscripts broke new ground for the lab. The *Nature Communications* paper was our first on how anti-NMDA receptor autoantibodies in lupus affect receptor and brain function (in collaboration with Dr. Betty Diamond, Feinstein). The *Journal of Neuroscience* paper was our first paper, in collaboration with Dr. Howard Sirotkin at SBU, developing zebrafish as a model to study NMDA receptors in brain disease. Josiah Zoodsma, a joint student between Dr. Sirotkin and myself, was also co-1<sup>st</sup> author on the paper with Kelvin. Graduate students/post-docs in our group were busy, presenting posters/talks at various meetings: Conference on Ionotropic Glutamate Receptors at McGill University (Kelvin Chan, Gabriella Moody, Noele Certain), and Gordon Research Conference on Excitatory Neurotransmission (Kelvin Chan). Kelvin also won an award for best poster.

### HONORS & AWARDS 2019-2020

#### **Vitaly Citovsky:**

F1000 Faculty of the year award.

**Steven Glynn:** 2019 Chancellor Award for Excellence in Teaching

**Yusuf Hannun:** Named SUNY Distinguished Professor

**Ed Luk:** (*pictured R*) 2020 Godfrey Excellence in Teaching Award

**Dada Pisconti:** Scientific Teaching Fellow from Summer Institutes on Scientific Teaching

**Pamela Wolfskill:** 2020 UUP Charles Hanson Award for Excellence in Professional Service



### NEWLY FUNDED GRANTS 2019-2020

**Vitaly Citovsky:** NSF Award, Role of Histone Modifying Enzymes in Regulating Alternate Active Versus Silent Gene Expression in Plants

**David Matus and Taylor Kinney:** NIH F31 Award, Transcriptional Regulation of Morphogenic Behavior and Invasive Cell Fate Specification in *C. elegans*

**David Matus and Rebecca Adikes:** NIH F32 Award, Cytoskeletal and Cell Cycle Regulation of Cell Migration During Development

**Bernadette Holdener:** Hydrocephalus Association Innovator Award, How Does Loss of Glucose on TSRs Cause Hydrocephalus

**Vitaly Citovsky:** Bard Foundation Award, Dissecting Genetic Resistance to Tomato Brown Rugose Fruit Virus (ToBRFV), the Emerging Tomato Pathogen

**Steven Glynn:** Barth Syndrome Foundation Award, Structural and Biophysical Studies on Tafazzin

**Martin Kaczocha:** Renaissance School of Medicine “Fusion Award”, A study of FABP5 and its inhibitors as potential prostate cancer therapeutic target and agents.

## ALUMNI NEWS

Below are some recent updates from BCB alumni. Please send us word of what you are up to at:

[Biochemistry\\_Alumni@stonybrook.edu](mailto:Biochemistry_Alumni@stonybrook.edu)

**Angie Rizzino (PhD '74)** is a Professor in the Eppley Institute for Research in Cancer and Allied Diseases at the University of Nebraska

**Ken Marcu (Emeritus Professor and PhD '75)** “In my retirement, in collaboration with colleagues in Greece and the USA, I am continuing to explore how IKKalpha/CHUK functions as a Non-Small-Cell-Lung-Cancer tumor suppressor by negatively regulating the activation and accumulation of Hypoxia inducible proteins. In addition in 2020 I am serving as a co-Editor of a Special MDPI issue of Cancers focused on the role of NFkappa in cancer development and progression.

“ In 2020 I lost one of my best collaborators and friends, Dr. Roland Wolkowicz, to lung cancer on his 58th Birthday. I knew all of the many students he trained over the past 15 years and all of the folks in my lab at Stony Brook and my family as well knew Roland well. He made a surprise entrance to attend my retirement party back in May 2016. Roland was a Professor at San Diego State Univ where I went to visit Roland at least 2X per year for the last ~20 years. He gave several invited seminars at Stony Brook over those past 20 years.”

**Luke Huggins (PhD '99)** was “promoted to Professor of Biology this spring at West Virginia Wesleyan College where I have worked for the last 15 years. It was a long haul, but a relief.”

**Jean-Luc Chaubard (BS '09)** recently became the director of a metabolomics core facility at the University of Chicago within a new microbiome institute. <https://bsd-dfi.prod.uchicago.edu/news/jean-luc-chaubard-phd>

**Jean X. Jiang (PhD '91)** was recently endowed as the Zachry Distinguished University Chair in Cancer Research at the University of Texas Health Science Center at San Antonio. She was elected as AAAS Fellow (with Erwin London serving as one of her nominators). Jean was also honored with the Presidential Distinguished Senior Research Scholar Award, the highest university faculty honor.

**Matthew Elmes (PhD '18)** *pictured right*, [is working to combat the detrimental misconceptions and to educate the public about the wealth of medical benefits boasted by these fascinating chemicals.](#)

### Updates on former Holdener lab members:

**Michael Feldman, MD, PhD**, former high school student in the Holdener lab is now Associate Medical Director in Translational Medicine at Vertex Pharmaceuticals, Instructor in Medicine at Harvard Medical School, and Assistant in Medicine at Massachusetts General Hospital

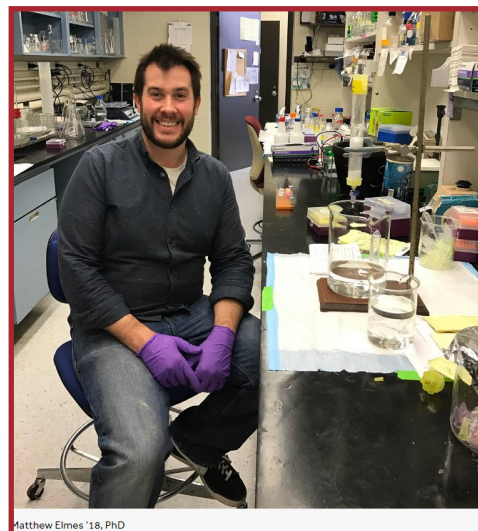
**Charles DeRossi, MS, PhD**, former MS student in the Holdener lab was promoted to Instructor in Pediatrics, Hepatology at Mount Sinai, NY.

**Andrew Taibi, MS, PhD**, former MS student in the Holdener lab recently defended his PhD thesis at the University of Utah.

**Janet Chang Lighthouse, PhD**, former PhD student in the Holdener lab recently was appointed Assistant Professor at St. John Fisher College in New York.

**Mary Wines-Samuelson, PhD**, former PhD student in the Holdener lab is a Staff Scientist at the University of Rochester Medical Center. Mary is studying vascular remodeling via endothelial cells and brain vascular inflammation in Dr. Bradford Berk's lab, and teaches the Neurobiology of Sleep in the summer Mini Medical School Pre-college program. In addition, she is an Adjunct Professor in the Brain and Cognitive Sciences Department at the University of Rochester teaching the Biology of Mental Disorders and Developmental Neurobiology.

**Daniel Cameron, BS**, former Undergraduate in the Holdener lab is now a Research Technician at Memorial Sloan Kettering in New York City. He is working in Dr. Alex Kentsis' lab studying transposable DNA elements and the DNA damage response pathway.



Matthew Elmes '18, PhD

# Thank you!

The Department of Biochemistry and Cell Biology is deeply grateful to the faculty, alumni, and friends who have provided support to the Department this year.

These contributions support the research and teaching missions of the Department of Biochemistry and Cell Biology in many ways. This year, these monies were used to support graduate student stipends, to allow us to maintain our weekly seminar program that brings outstanding scientists from other institutions to exchange ideas with our faculty and students, and to help obtain new scientific instruments and equipment.

**Please consider supporting the Department of Biochemistry and Cell Biology.**



## How to Donate

Go online to: <https://alumniandfriends.stonybrook.edu/online-giving> and type "Biochemistry in the 'Search for a Fund' box. Select either [Biochemistry and Cell Biology Fund for Excellence](#) for immediate support or [Biochemistry and Cell Biology Endowment for Excellence](#) for long term support . You may also send your gift along with this form to the address below:

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