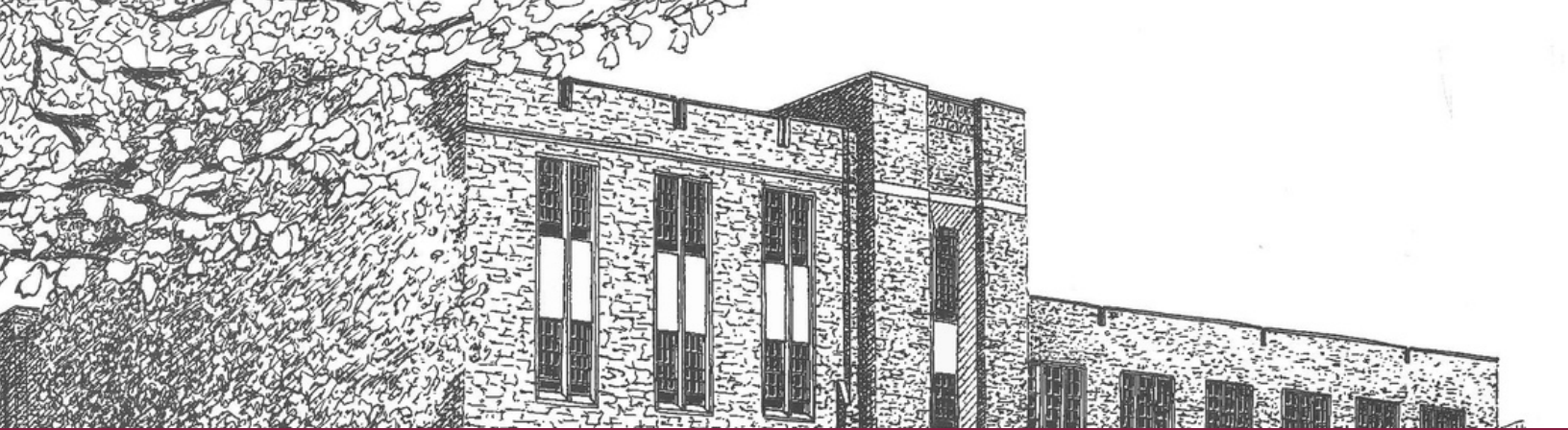




# ENGEL HALL NEWS

## LETTER FROM THE DEPARTMENT HEAD

May 13, 2021

Dear VT Biochemistry Alumni, Friends, and Students,

We hope you enjoy this newsletter, which celebrates the end of a very long, and sometimes, difficult academic year. After spending 23 years in higher education, I already had a tremendous respect for college students' resilience and fortitude, but this year underscored how truly resilient our students are. They met significant public and emotional health challenges, and kept going with their Biochemistry learning and training. As a note, most of our classes were online, most of the year. A key exception to this was our six credit BCHM 4124 lab course. Alumni will recognize that this is a key course to "becoming a practicing biochemist", so it was important to ensure this occurred in a face to face manner, and to maintain COVID-19 safety. To accomplish these goals, students for the first time worked individually, i.e. not in lab pairs. We also co-opted other spaces in Engel Hall, so that students could spread out over several rooms, and thus maintain the required physical distancing. We used information from noted aerosol experts to keep our air circulation, and overall quality high, both by using portable purifiers and CO<sub>2</sub> monitors. I am happy to report that we had no detected spread of COVID-19 in these lab classes, thanks to the diligence of students and faculty, including Professors **Kristopher Hite**, **Peter Kennelly**, **Tim Larson**, **Jianyong Li**, **Jim Tokuhisa**, and **Jinsong Zhu**, along with help from Biochemistry staff, including **Danny Eanes** and **Steve Lowe**.

This year also saw the development and deployment of a new 2000-level biochemistry lab course, a new biophysics-inspired course for advanced students, and continuation of our big data-containing course for majors, and a course on reading scientific literature. Despite the quarantine and other events, our newest faculty have been very successful in teaching spectacular courses, getting their research programs funded, publishing papers, and in graduating very talented graduate students. This year, we engaged 43 graduate students, and we have just completed eight student defenses at the time of this writing. We hope to tell you more about these research programs and students in our next newsletter. For now, please check out our commencement webpage on our website, which contains a short video taken at our recent senior event. We are thankful our graduates have an in-person graduation (this week!), and we look forward to seeing you all in the future. Call us, stop by our building, and/or email us to let us know how you are doing! I enjoy hearing from you and share your news with faculty and staff.

Sincerely,

Sincerely,  
Glenda E. Gillaspay  
Professor and Head, Biochemistry  
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**BIOCHEMISTRY**  
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VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY  
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## STAY CONNECTED

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Follow us on social media for daily content, which includes announcements, event information, student features, departmental plans, and more!



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# CELEBRATING FALL CLASS OF 2020



CONGRATULATIONS TO  
ALL OF OUR FALL  
2020 GRADUATES!



**Anna Tran** was 1 of 140 graduates who received their bachelor's degree from the College of Agriculture and Life Sciences. A virtual commencement was held for the Fall Class of 2020.

## CLASS OF 2020: ROWAN WOOLDRIDGE TRANSLATES COMPLEX RESEARCH INTO MEANING

**Rowan Wooldridge** is quick to tell you that his plans to pursue a master's degree in biochemistry at Virginia Tech stem from the undergraduate research that, not only revealed his extensive passion for science, but also established the groundwork for his intended future career in biotechnology.

Wooldridge, who is also pursuing a minor in philosophy, was one of three recipients of the inaugural Undergraduate Research Excellence Award which was presented following the annual Dennis Dean Undergraduate Research and Creative Scholarship Conference in April 2020. The conference features student projects from all disciplines and areas of research.

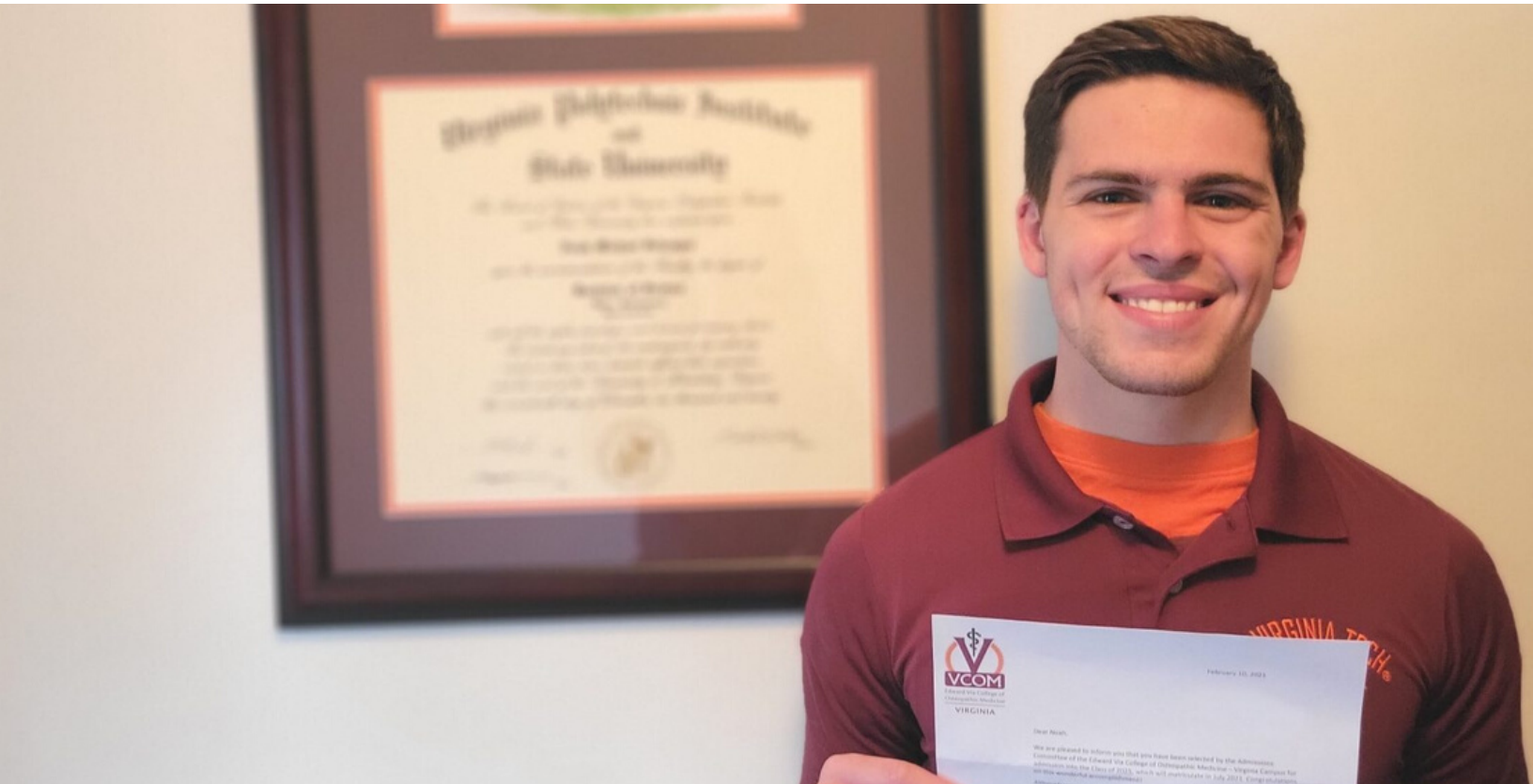
Wooldridge was identified and named a finalist for the Undergraduate Research Excellence Award based on his completion of the Undergraduate Research Excellence Program (UREP). Wooldridge and two other recipients were recognized for their ability to communicate their research effectively to a broad audience as well as their creative use of visuals and technology to enhance their message in the five-minute presentation video they each uploaded for the conference.

"Rowan's engagement in undergraduate research has really helped him develop holistically as a student," said Keri Swaby, director for the Office of Undergraduate Research, on Wooldridge's selection for the award. "He has fully invested in all stages of research from training and engaging through disseminating and reflecting, and even beyond as a peer mentor. But one thing that Rowan has mastered, which will be an invaluable skill for his future, is the ability to break down the complexity of his project and make it understandable and accessible to the general public."

Even before starting at Virginia Tech, Wooldridge knew he wanted to engage in some sort of laboratory research. He joined the Scharf lab in Spring 2019 and was awarded a prestigious 2019 Fralin Summer Undergraduate Research Fellowship and later, a 2019-20 Fralin Undergraduate Research Fellowship, to continue his project.

**To continue reading, head to our Biochemistry Newsroom for the full article.**

# CELEBRATING FALL CLASS OF 2020



## OVERCOMING IMPOSTOR SYNDROME: BIOCHEMISTRY ALUMNUS NOAH SCHRAYER RECEIVES ACCEPTANCE LETTER FROM VCOM

Biochemistry alumnus **Noah Schray** received an acceptance letter from Edward Via College of Osteopathic Medicine (VCOM) in February 2021. As he opened the letter, the December 2020 graduate reflected on his high school field trip to VCOM. He enjoyed seeing the student life aspect of medical school, hearing about the differences between osteopathic and allopathic medicine, and learning about the healthcare system and its functions in more detail. Despite his excitement and interest, after the field trip, Schray initially didn't think he was cut out for medical school.

"I definitely had impostor syndrome. I thought that I wouldn't be able to go to medical school because I went to high school in Appalachia," Schray said. "I didn't think I'd master the science and math courses that I needed in order to be in the health field. When I started community college though, my attitude changed. I remembered thinking to myself that maybe I could actually do this."

After a year at community college, Schray enrolled in Virginia Tech as a transfer student and became a student in the Department of Biochemistry, which is in the College of Agriculture and Life Sciences. "The classes and the freedom of the major was appealing to me. The biochemistry curriculum sets you up for success," he said.

Ultimately, the reason that originally held Schray back from pursuing a career in medicine became his source of motivation. "A lot of Appalachia is considered medically underserved and there's a strong lack of physicians in Appalachia. Many of my loved ones in my region have experienced healthcare disparities. All of this is part of what inspired me to get into medicine," he said.

Schray is determined to give back to his community in Bristol, Virginia. He hopes to identify an area with a shortage of primary care physicians and return to the region after he completes his service with the Navy. Schray hopes to join the Navy through the Health Professions Scholarship Program, which is designed to provide financial incentives for students to attend a school to be a physician, dentist, optometrist or clinical psychologist to ultimately receive an appointment as an officer. Schray's application is still in process but he remains excited about this opportunity because of his familial connection to the Navy; his father served in the Navy for 7 years and his grandfather for 33.

Schray credits his father and grandfather's naval service to explain his deep-seated need to help others. His mother would also serve as an inspiration for him. Growing up, he remembers his mother telling him: you get what you give, so give love.

"To me, love isn't always familial or intimate, it can mean just helping others and that's how I've interpreted this motto and applied it in my daily life," Schray said.

# CELEBRATING SPRING CLASS OF 2021

## CALS OUTSTANDING SENIOR SENAH STEPHENS

Double majoring in Biochemistry and Biological Sciences with a minor in Chemistry, it's hard to imagine that **Senah Stephens** would have time for anything else not science related. But if you found yourself at any Hokie football, basketball, or a number of other VT athletic events, you would have seen her on the sideline, cheering for and entertaining Hokies through the HighTech Spirit Squad. Her academic excellence is only matched by her commitment to her squad, service to the community, and helping others succeed academically.

[READ MORE  
ABOUT SENAH](#)



## COS OUTSTANDING SENIOR TAYLAN TUNCKANAT

**Taylan Tunckanat**, an undergraduate student in the Department of Biochemistry, was recognized as one of the department's outstanding seniors. Tunckanat is an undergraduate research assistant in Dr. Kylie Allen's lab and is currently enrolled in the department's Accelerated Master's Program, where he'll earn both his Bachelor of Science and Master of Science in Biochemistry by Spring 2022. He's the president of the Biochemistry Club, an ambassador for the Office of Undergraduate Research, and an active member in Alpha Chi Sigma, a professional chemistry fraternity.

[READ MORE  
ABOUT TAYLAN](#)



## CONGRATULATIONS TO ALL OF OUR SPRING 2021 GRADUATES!

### MEET BIOCHEMISTRY MAY 2021 GRADUATE: VINCENT KIM

After graduation, **Vincent Kim** is planning to return to South Korea for military service and then come back to the United States to begin pharmacy school! Kim's favorite Virginia Tech memory was Gobblerfest. His favorite class in the College of Agriculture and Life Sciences was General Biochemistry 4116 and his favorite professor is Dr. Kristopher Hite.

[CHECK OUT THE CALS DIGITAL YEARBOOK  
FOR MORE GRADUATE PROFILES](#)



# CELEBRATING SPRING CLASS OF 2021



## FRALIN UNDERGRADUATE RESEARCH FELLOW CONDUCTS META-ANALYSIS ON STUDIES ABOUT PAIN

You may have heard of the question: "How would you rate your pain on a scale of one to ten?" Well, according to Virginia Tech biochemistry major **Taylor Tuhy**, a senior undergraduate researcher working with **Matt Buczynski** and **Ann Gregus**, assistant professors in the School of Neuroscience, the answer may not be that simple.

As part of the Fralin Undergraduate Research Fellowship (FURF), Tuhy is studying the formalin pain test, the most commonly used preclinical model to quantitatively evaluate inflammatory pain in rodents with minimal subjective input.

"According to a study done by the CDC in 2019, over one in five people in the United States have been diagnosed with chronic pain," stated Tuhy. "There is a lot of focus in the neuroscience community right now to study inflammation-driven chronic pain to develop non-opioid treatments. However, it is difficult to study in rodents because they can't tell us how much pain they have, so researchers rely on other subjective measurements. The formalin test can use objective measurements, that is why this test is so important."

But because the test is so widely used, every lab conducts the test differently, which makes it difficult for scientists to compare results between labs and identify larger trends in potential new therapeutic drugs.

Gregus and Buczynski, are hoping to set the record straight, by conducting a meta-analysis of 2,000 papers from academic journals that used the formalin test. Tuhy, along with 10 undergraduates spanning across three separate universities, have been working together to analyze over 900 papers so far. In the future, they hope to continue analyzing papers to increase statistical accuracy.

"This is the first time that something of this scale has been done for a preclinical behavioral pain test," said Tuhy. "We evaluated the literature and found the most common experimental factors that were different between labs, and we are analyzing the data to determine which factors in how the formalin test is administered have the greatest impact on predicting clinical success. When you are comparing results between labs, it becomes difficult if more than one variable is being changed at a time. We hope this work can help make it easier for researchers to identify potential drugs to test in clinical trials."

Tuhy, a first-generation college student, has been involved with research from the minute she stepped onto Virginia Tech's Blacksburg campus. Her freshman year, an upperclassman gave her a simple piece of advice: "If you want to become a scientist or go into medicine, get involved in research as early as possible." She took that advice and ran with it.

To continue reading, head to our [Biochemistry Newsroom](#) for the full article.



MEET BIOCHEMISTRY MAY 2021 GRADUATE:  
LAUREN HALL

**Lauren Hall's** favorite Virginia Tech memory was getting coffee at Dunkin' and sitting on the Drillfield to enjoy it with her friends. Before Lauren graduates, she leaves future Hokies with this advice:

"Say yes to every opportunity, you'll either find something you love or something you don't love and both experiences are equally important!"



MEET BIOCHEMISTRY MAY 2021 GRADUATE:  
ALYSSA TON

Biochemistry Senior **Alyssa Ton** will be furthering her education at Boston University. She'll be attending Boston University's School of Public Health and focusing on Health Policy and Law.

CHECK OUT THE CALS DIGITAL YEARBOOK  
FOR MORE GRADUATE PROFILES

# UNDERGRADUATE STUDENT FEATURES



## CLAIRE COHEN

Biochemistry sophomore, **Claire Cohen**, is our inaugural undergraduate Student Advocate on the Departmental Diversity & Inclusion Committee. "I hope that my passion for getting people involved and helping others will allow me to reach out to people in our department and bring new ideas and thoughts to the committee," Claire said.

## ANDREW PEDRAZA

Biochemistry junior, **Andrew Pedraza**, is in the Virginia Tech Corp of Cadets and in the Biochemistry Club. Pedraza is also a Fire Team Leader, Squad Leader, Academics NCO, and Company Physical Training Instructor. He's the recipient of the Viers Achievement Award for Academic Excellence. His desired career path is biopharmaceuticals.



## ROSE NELSON

Biochemistry senior, **Rose Nelson**, is the recipient of the James Lewis Howe Award for the Virginia Blue Ridge Section of the American Chemical Society! "I am deeply honored to receive this award," Nelson said. "Biochemistry and my campus involvements have significantly challenged me, and I am overjoyed to see the growth that overcoming it produces!"



# UNDERGRADUATE STUDENT FEATURES



## SARAH SEAY

Biochemistry sophomore, **Sarah Seay**, is in the VT Running Club, a member of Chi Alpha and Biochemistry Club, and a volunteer with Hokie Helpers and the Market Place Food Pantry. She's also been involved in research with two labs! In Dr. Santos' Chemistry Lab, Seay was a part of a study about SPNS2 to design inhibitors for the treatment of Multiple Sclerosis. In Dr. Nguyen's Nanophysics Lab, she aided in a graduate's study of Terahertz spectroscopy of biomolecules in liquid water.

## KYLE ARNOLD

Biochemistry freshman, **Kyle Arnold**, is heavily involved in the National Society of Collegiate Scholars and was recently inducted in the National Honors Society.



## LENA MOORE

Biochemistry junior, **Lena Moore**, was recently elected as the Vice President of Diversity, Equity, and Inclusivity for her sorority, Alpha Chi Omega (AXO)! Moore is also involved in Club Cheerleading.



## FROM COSTA RICA TO THE NATIONAL HUMAN GENOME RESEARCH INSTITUTE: BIOCHEMIST ARIANA UMAÑA USES HER FAMILY AS INSPIRATION

When **Ariana Umaña** visited Blacksburg from Costa Rica five years ago, it planted a seed in her mind: she wanted to come back and earn her Ph.D. at Virginia Tech.

Not only is she achieving that this fall, but she is also going to work at the National Human Research Genome Institute, part of the National Institutes of Health, after graduation this winter.

"I'm excited about taking the next step to see where this is going to lead me and to work at such a high-impact research institute immediately after graduation," Umaña said.

[...] That time in Blacksburg had a major impact on Umaña's desire to pursue her childhood dream of becoming a scientist. While here, she met Daniel Slade, an assistant professor of biochemistry, whose research piqued her interests.

[READ THE FULL STORY ONLINE](#)

## FIRST-GENERATION COLLEGE STUDENT, ALEXA SALSURY, BECOMES FIRST IN THE DEPARTMENT TO RECEIVE AN AAUW DISSERTATION FELLOWSHIP

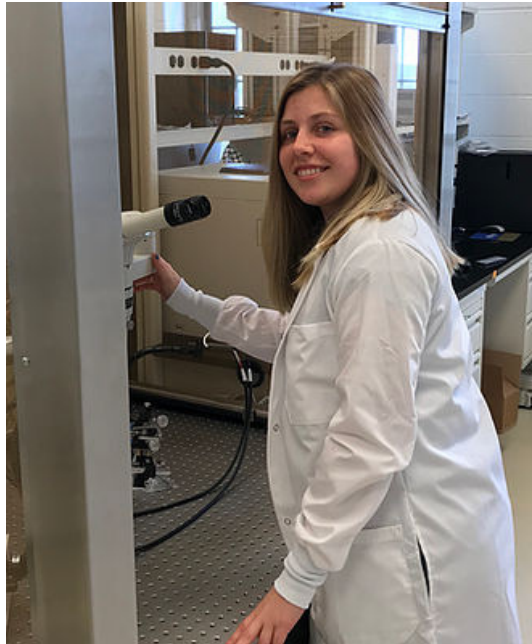
**Alexa Salsbury**, a first-generation college student and 4th year Ph.D. candidate in the Department of Biochemistry won an AAUW (American Association of University Women) Dissertation Fellowship. Salsbury is the first student in the department to receive this award. This fellowship is awarded to women finishing a graduate degree, in any discipline, who demonstrate the potential to make significant contributions to their field and academic equity. The award will fund her final year in the biochemistry Ph.D. program, where she'll finish her dissertation project on Polarizable Molecular Dynamics Simulations of G-Quadruplexes.

"With the pandemic hitting and everything shutting down, the AAUW fellowship gave me extra confidence and excitement to push my research and finish my last year," Salsbury said. "I'm very happy that this organization felt that my work in the Lemkul lab was important and had the potential to help others."

[READ THE FULL STORY ONLINE](#)



# GRADUATE STUDENT HIGHLIGHTS



## MORGEN VANDERGIESSEN

**Morgen VanderGiessen**, a Master's student working in **Dr. Clément Vinauger's** lab, received the Bruce Anderson award this past December! The award was established in recognition of the service of **Dr. Bruce Anderson** as Department Head (1970-1982) and **Connie Anderson**, also active in the department. A scholarship is provided to a rising senior who has been employed part-time while a student at Virginia Tech.

## FORDE UPSHUR

The Interfaces of Global Change IGEP welcomed 12 new Ph.D. fellows in Spring 2021 and Biochemistry Ph.D. student, **Forde Upshur**, was one of them! The incoming cohort holds the most diverse disciplinary representation to date for an IGC admissions cycle, representing 10 different departments and 5 colleges across the Virginia Tech campus!



## JOANNA REINHOLD

**Joanna Reinhold**, a Ph.D. student working in **Dr. Chloé Lahondère's** lab, received a departmental Outreach and Service Award this past December! "I felt honored to be acknowledged for service and outreach, which have always been important to me."

# GRADUATE STUDENT HIGHLIGHTS

# COMBATING COVID-19 WITH BIOCHEMISTRY KNOWLEDGE + EDUCATION



## BIOCHEMISTRY AND CHEMISTRY ALUMNA FIGHTING ON THE FRONT-LINES OF COVID

**Katherine Vaughn's** mother would inspire her to begin her journey in the medical career path, but her experiences in the health care field along with the education she received within the biochemistry department would motivate Vaughn to fight on the front lines of the pandemic and to give back to the campus community.

"I want to treat patients to the best of my abilities and I believe that to do so, you need to be able to understand and critique research, seek out benefits, and critically think for yourself," said Vaughn.

[READ THE FULL STORY ONLINE](#)



## Biochemistry senior strives to enhance the lives of future students by helping prevent the spread of COVID-19

You can find **Preston Callaway** interacting with patients and collecting samples at Cassell Stadium from 6-8 a.m. and at Lane Stadium from 8 a.m.-4 p.m.

"I'm not going to be the one to find a cure or anything, but I feel like I play an important role in keeping COVID-19 under control by being a swabber at ArcPoint," said Callaway.

[READ THE FULL STORY ONLINE](#)

# COMBATING COVID-19 WITH BIOCHEMISTRY KNOWLEDGE + EDUCATION



**Ryan Burnette ('99 B.S., '04 Ph.D.)** is the Vice President of the Life Sciences department at Merrick & Company. As a biochemistry graduate, he's been able to get involved in influential projects around the world for the last 15 years, including during the SARS-CoV-2 pandemic.

"I recently led a team to help execute the rapid conversion of a drug production that was approaching demolition into the major production site for a COVID-19 vaccine production facility as part of Operation Warp Speed. In 77 days, we went from an old building to stockpiling vaccines for distribution throughout the U.S.," Burnette said.



**Kendra Jacomo ('11 B.S.)** is a Senior Research Associate at Moderna, Inc.

"My time at Virginia Tech prepared me for the challenging yet rewarding career I have working for Moderna. Ut Prosim is a motto that Virginia Tech instilled in me and I live it each day by helping to serve the world with therapeutics. It's times like these that make my career feel that much more meaningful as I can see the impact I'm having in the world," Jacomo said.



**Nghi Phung ('20 B.S.)** is a research technician at the Virginia Tech Molecular Diagnostics Laboratory at Fralin Biomedical Research Institute at VTC and is one of 25 skilled staff members who keep Virginia Tech's COVID-19 testing lab running 7 days-a-week.

Virginia Tech's COVID-19 analysis lab reached a milestone in March, breaking more than 100,000 samples analyzed since the lab opened less than a year ago. The 100,000th sample arrived on March 11. The lab opened on April 20, 2020, and received permission from the Food and Drug Administration to carry out testing while its Emergency Use Authorization was under consideration in order to help expand public health lab testing capacity in Southwest Virginia.



## THE JOURNEY OF A COVID-19 TEST RESULT STARTS WITH THIS TEAM

**Darren Liu**, biochemistry junior, began working at the site last fall. He wants to be a pharmacist, and landing a job with ARCpoint was the perfect way for him to gain experience, he said. Liu primarily works afternoon shifts and checks in people for their appointments. He's also trained as a swabber.

"I wanted to help out," said Liu. "As a future health care worker, I wanted to do something."

[READ THE FULL STORY ONLINE](#)

# COMBATING COVID-19 WITH BIOCHEMISTRY KNOWLEDGE + EDUCATION

## POLICY DESTINATION AREA TEAM DEVELOPS COVID-19 DATABASE TO SPUR POLICY AND SOCIAL SCIENCE RESEARCH

"As the coronavirus tightened its grip across the globe in late spring 2020, faculty members associated with the Policy Destination Area began brainstorming about how they could respond to the pandemic. The interdisciplinary team came up with the idea to develop a "database of databases" related to the policies around the pandemic, with direct links to data for researchers to use."

[...]

"We work with students from any discipline and teach them about data literacy and management, programming, and data visualization," said **Dr. Anne M. Brown**, assistant professor of biochemistry in the College of Agriculture and Life Sciences and director of DataBridge. "Students get to see how real projects work, how messy they are, and how their efforts can impact output for research projects and the sharing of information."



**DR. ANNE BROWN**



**TRUITT ELLIOTT**

"Working on this project required me to learn a lot of new skills quickly, but I've been able to use what I've learned about web scripting to focus more on web development and database management. I look forward to being able to use and refine these skills on other projects like this," said **Truitt Elliott**, a biochemistry major and one of two students primarily assigned to the project.

[READ THE FULL STORY ONLINE](#)

# COMBATING COVID-19 WITH BIOCHEMISTRY KNOWLEDGE + EDUCATION

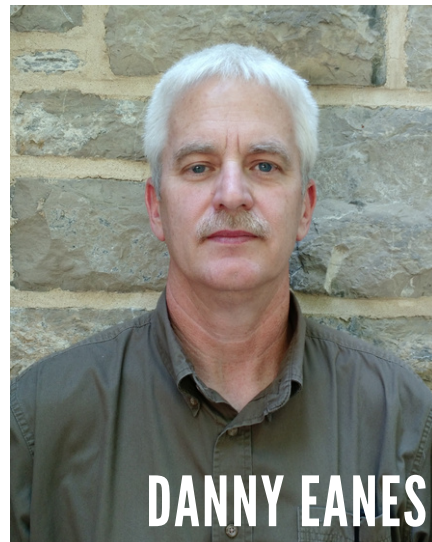
"When the going gets tough in a pandemic, the tough get going!"

This past December, the department celebrated **Steve Lowe** and **Danny Eanes**. They received the Overall Department Impact Award for their service and dedication to the department, especially in the face of a global pandemic.

"While labs were shut down in the Spring, Danny Eanes and Steve Lowe came in every day to ensure that Biochemistry research programs and equipment were protected." **Glenda Gillaspy**, Department Head and Professor says. "When labs opened back up, Danny and Steve became even more of our "go-to" guys for helping us carry out our safety plans, deal with ventilation and other structural issues, and to craft partitions and other devices to help Biochemistry faculty, staff and students stay safe."

"The checking of equipment during Covid-19 was really nothing different than any other time as most major equipment is checked every day," said Lowe, an HVAC Installation & Repair Technician in our department. "The worry for me was finding parts when so many scientific suppliers were shut down. I did stock up a few common components from local suppliers and held my breath. Only one large failure during the shutdown but several were prevented by just knowing the systems, their sounds, appearance, and so forth."

"In the department of Biochemistry, our main responsibility has always been to educate the students. When COVID came to light, we had to make safety a high priority for the entire department - students, faculty, and staff alike," said Eanes, an Electronics Technician in our department. "Under Dr. Gillaspy's leadership, meetings were held to discuss the best way to handle the necessary changes. We were then able to implement new safety protocols including physical barriers and spacing to allow for distancing to accomplish our goal of having students back in the classroom."



**DANNY EANES**



**STEVE LOWE**



## DR. JINSONG ZHU RECEIVES AWARD FROM THE NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES

Dr. Jinsong Zhu received an NIH award for his project entitled "Molecular mechanism of juvenile hormone action in mosquito reproduction." The award will cover Dr. Zhu and his team for 5 years with a total budget of \$2 million!

# FACULTY SPOTLIGHTS



## CHEVON THORPE APPOINTED ASSISTANT DEAN OF INCLUSION, DIVERSITY, AND EQUITY IN THE COLLEGE OF AGRICULTURE AND LIFE SCIENCES

"I am excited to join the leadership team in leading our intentional action towards organizational and transformational change," said **Dr. Chevon Thorpe**.

Chevon Thorpe will be responsible for the strategic direction of the college diversity, equity, and inclusion activities, which includes promoting a diverse, equitable, and respectful environment for faculty, staff, and students. She was previously the director of inclusion, diversity, and equity, and a collegiate assistant professor in biochemistry.

"I am delighted that Chevon has accepted this enhanced role at a time when the college is implementing the new college strategic plan that has a targeted focus on diversity," said Alan Grant, dean of the college. "With our college at the cornerstone of Virginia Tech's land-grant mission, we are in a unique position to change the world and make it better. [...] Dr. Thorpe is uniquely qualified to help guide us toward that more equitable future."

[...]

[READ THE FULL STORY](#)

## BIOCHEMISTRY PROFESSOR ZHIJIAN 'JAKE' TU HONORED AS UNIVERSITY DISTINGUISHED PROFESSOR

**Dr. Zhijian Tu** and his collaborators were the first to discover the male determination factor in mosquitoes, a finding that could help reduce the spread of diseases that kill hundreds of thousands of people annually.

Mosquitoes are the deadliest animals on Earth and have an immense impact on human health. Around the globe, close to 700,000 people die from mosquito-borne diseases annually and countless more fall ill to them.

"We've been dealing with these infectious diseases for a long time, and it's a continuous challenge," said Zhijian 'Jake' Tu, a professor in the Virginia Tech Department of Biochemistry who has been studying mosquitoes for more than 25 years. "It's a luxury to be able to work on a topic that can help control these diseases and bridge a major gap in our understanding of mosquito biology."

Dr. Tu is the second faculty member in the department to be honored with the title of University Distinguished Professor.

[READ THE FULL STORY](#)



# DONOR GRATITUDE

The events of 2020 serve as an important reminder to invest in the education and training of the next generation of scientists for them to use their biochemical knowledge to positively impact our world. Your gifts to our department constitute a key resource for investing in our future. Just as understanding the function of one gene or enzyme contributes to our understanding of life, so does a small gift serve as a precursor to great things.

We had 50 donors support our department on Giving Day, which occurred this year from noon-noon February 24-25. From all of us in the department, thank you for your continued support. Thanks to your generous gifts on Giving Day, we'll be using the funds to support our newest faculty members' programs and their students in their labs.

Read more about **Dr. Chloé Lahondère** and **Dr. Kylie Allen**'s labs and how their research impacts the world.

## LAHONDÈRE LAB



Mosquitoes transmit pathogens such as Zika virus, dengue virus, Plasmodium to humans and other animals, imposing a significant health and economic burden on communities worldwide and adversely affecting millions of people each year. Despite substantial efforts to prevent the spread of insect-borne diseases, rising insecticide resistance and changes in biting behavior challenge available vector control methods. Moreover, vaccines and treatments remain unavailable for many of these diseases. Consequently, new strategies are urgently needed to limit pathogen transmission.

The Lahondère lab focuses on studying the thermal biology, eco-physiology and neuroethology of disease vector insects and ticks. In regard to mosquitoes, we study diverse aspects on the mosquito biology such as sugar feeding behavior, mosquito-host interactions, disease prevalence and pathogen transmission as well as the effects of climate change on invasive mosquito species in Virginia.

We rely on a collaborative, multidisciplinary and integrative approach, combining field work, behavioral analyses, molecular biology, chemical ecology and electrophysiology. Results from our projects help to get a better understanding of the disease vectors' biology and ecology and lay the groundwork for the development of new tools to control their populations.

## ALLEN LAB



Research in the Allen laboratory is focused on understanding the unique biochemistry occurring within methanogenic archaea. "Methanogens" are a diverse group of anaerobic microorganisms with a complex energy metabolism that reduces select small molecules to produce methane as a final end product. This process, called methanogenesis, generates over a billion tons of methane each year, which accounts for >90% of the methane generated on Earth. Methanogens are found in virtually all types of anaerobic environments, including marine and freshwater habitats, anoxic soils, and as important components of animal microbiomes. Despite the role of methane as a greenhouse gas, methane also represents a valuable and potentially renewable energy source.

Thus, investigating essential enzymes and cofactors in methanogens could lead to the development of novel methane mitigation strategies as well as provide biochemical insights into the engineering of microorganisms for bioenergy applications.

The Allen Lab seeks to discover and characterize new enzymes, reactions, and biomolecules in methanogens. Particularly abundant in methanogens are iron-sulfur cluster enzymes known as radical S-adenosylmethionine (SAM) enzymes, which catalyze incredibly diverse and chemically difficult reactions in a wide range of metabolic processes. Thus, we are defining the functions and elucidating the enzymatic mechanisms of various radical SAM enzymes in methanogens.