

The *Catalyst*

Department of Biochemistry 2019



Justin Couetil, Biochemistry's third
G.A. Ross Award winner this decade

PURDUE
UNIVERSITY

College of Agriculture



Welcome

Dear alumni, students, staff, faculty and friends of The Department of Biochemistry:

The Department of Biochemistry has a number of exciting accomplishments to report for 2018/19. We continue our tradition of having award-winning faculty! Professor Natalia Dudareva was selected as the 2018 Herbert Newby McCoy Award winner. The McCoy award was established in 1964 and is the most prestigious award given by Purdue in the natural sciences. Professor Beth Tran was awarded the RNA Society's 2018 Lifetime Service Award and is the youngest RNA society member to win this award. She also was designated as one of only three Showalter Faculty Scholars at Purdue for 2018/19. Professors Jim Forney and Clint Chapple were inducted into The Book of Great Teachers, which only opens every five years to honor outstanding faculty who have demonstrated sustained excellence in the classroom. This August, we had four faculty promotions, which has never happened in the history of this department (at least as far back as 1962). Drs. Humaira Gowher and Vikki Weake were promoted to Associate Professor and Drs. Joe Ogas and Brian Dilkes were promoted to Professor.

This fall, 44 outstanding new freshman joined our Biochemistry undergraduate program. Like our faculty, our Biochemistry students continue to be award-winning. Stephanie Price and Abdias Rodriguez were selected as the College of Agriculture's Outstanding Junior and Senior in 2018, and in 2019, Clayton Hicks won the Outstanding Freshman in Agriculture award. We are also proud to see Justin Couetil selected as the 2019 G.A. Ross Outstanding Senior Man at Purdue for 2019. This is our fourth Outstanding Senior Man or Woman in 10 years. We had two outstanding international undergraduate students here over the past year from Heinrich Heine University Dusseldorf (HHUD) as part of our new exchange program, and this fall, two more.

Nine new outstanding graduate students are in the midst of their first laboratory rotations this fall. Our 13 graduate students who joined us in fall 2018 all found homes in faculty labs within the department, and their dissertation research is off to a great start. We awarded 13 of our graduate students this year with Bird Stair research fellowships totaling \$65,500. These research fellowships are made to individual students (up to \$5K) or collaborative teams (up to \$10K) for meritorious research proposals. These funds come from our Bird Stair Estate Endowment, which we are very grateful to have for our students.

Some infrastructure changes are occurring on the first floor of the Biochemistry building. Extensive renovation of our BCHM 107 teaching lab was completed just in time for the fall semester. The new lab has expanded bench space to accommodate our growing student body, modern fume hoods and eyewash stations for safety, and interactive big screen monitors for video demonstrations and sharing of student and instructor data and slides. We are really excited to announce that a new biochemistry commons space is coming this year, thanks to a generous donation from Gilbert "Skip" (Class of 1960) and Molly Opperman. The old mailroom and three other rooms will be completely renovated in an open concept design that will accommodate up to 50 people. A full feature on this transformative project will appear in next year's Catalyst.

Once again, it has been a great year for accomplishments in all mission areas in the Department of Biochemistry, and this is due to the continued support we get from all of you. We want to hear about your stories and accomplishments, so please share them with us so we can spread the good news through The Catalyst and our monthly newsletter, Molecular Matters.

Andy Mesecar - Department Head

On the cover



It's not where you start, but where you finish. That adage applies to academic careers, too. Just ask Justin Couetil, Biochemistry's second G.A. Ross Award recipient in four years.

He was three years from being named Purdue's top senior male student, but a switch from the College of Science to the College of Agriculture

was at least worth discussing with Sherry Pogranichniy, Biochemistry's undergraduate program administrator. She quickly arranged a meeting with Department Head Andy Mesecar. A day later, Couetil's mind was made up.

"The program's individual attention to students made my diverse curricula, study abroad, year-round research, and preparation for medical school possible," Couetil says. Business, liberal arts, and STEM – his course load was intentionally varied. He appreciated Biochemistry's small classes. A highlight: Assistant Professor Pete Pascuzzi, who has a courtesy appointment in Biochemistry, helped Couetil discover coding skills that aren't going to waste.

A recent issue of *Biotechnology Progress* includes news of detecting minute quantities of salmonella on spinach in less than eight hours, a third of the time commonly necessary. That stems from research, with contributions from Couetil and conducted in the Laboratory of Renewable Resource Engineering (LORRE), that followed up on work that earned the U.S. Food and Drug Administration's 2014 Food Safety Challenge.

Couetil is in the Indiana University School of Medicine at the Northwest-Gary campus. His specialty has yet to be determined. "Purdue has shown me that teaching and strong academic research can be rewarding as well," he says. "I'm approaching it like undergrad: I'll work hard, keep doors open and see what opportunities come my way."

And he'll likely continue to remember advice offered up years ago: "Everybody is too busy thinking about themselves to obsess over whatever dumb thing you did. Just let go and move forward." My mom told me that when I started school, and I continue to remind myself of it every day."

THEY STAND OUT

The G.A. Ross Award is presented annually to Purdue University's top male student, as chosen by the Office of the Dean of Students. Here are the Department of Biochemistry's winners:

Justin Couetil, 2019

Quinton Nannet, 2016

Gabriel Rangel, 2013

The Flora Roberts Award is presented annually to Purdue University's top female student. The Department of Biochemistry's winners:

Rachel Schluttenhofer, 2011

Melissa Ashlock, 1980

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She has a stellar international reputation. Her research is groundbreaking. As the saying goes, she can write her own ticket – and she did. Purdue is "a very comfortable place to work."

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PURDUE'S BOOK OF GREAT TEACHERS

ADDS 2 FROM BIOCHEMISTRY

'Let me try that again'

Teaching complicated material in a simple way? He can do that.

Clint Chapple

Joined Purdue in 1993

Full professor in 2000

Department Head, Biochemistry, 2008-2015

Distinguished Professor, since 2007

Director of the Center for Plant Biology, since 2017

Herbert Newby McCoy Award, Purdue University, 2007

Outstanding Graduate Mentor, College of Agriculture, 2017

Richard L. Kohls Outstanding Undergraduate Teacher Award,
College of Agriculture, 2006-2007

Outstanding Undergraduate Teacher Award,
Department of Biochemistry, 2005-2006

From a July 2019 interview. Content lightly edited for clarity.

The first class I ever taught, I filled in for my Ph.D. supervisor. One lecture. I learned then that you can explain things at a fairly superficial level and people will understand. You know, your elevator pitch. And you can explain things in great depth. Given enough time, people can understand what you're talking about. But if you hit it anywhere in the middle, people are completely lost. That's the challenge: To figure out what level of detail to give. I've never forgotten that one horrible lecture, where I did such a terrible job.

Becoming good at teaching is a lot of practice, repetition and experimentation. It is important to remember what it

was like being a student. Trying to not have too short of a memory. Trying to put yourself in the shoes of the student and understanding what they know, what they don't know.

When I was going for a promotion I was asked to write a statement of teaching philosophy. It wasn't until I was asked – I'd been teaching for four or five years – that I realized yeah, I do have a perspective on how to do this. I taught Biochem 307 for a dozen years. That's a one-semester service course that teaches students from a wide range of departments about the fundamentals of biochemistry. Save for one or two out of a class of 200, it's always students who do not want to be there. That was a good training ground.

I haven't taught a wide variety of classes. I taught Plant Growth and Development when I first got here, some biochemical and genetic aspects of that; Biochemistry 307 and Biochemistry 100. That's it. Interesting, heh? Maybe the department didn't think they could trust me with the really hard stuff!

I've loved my teaching assignments. I guess I have a bit of a knack for teaching complicated material in a simple way. What do you really have to know?

I've recently changed how I do it, though. I used to lecture on a topic for one, two or three lectures and then say, "Here's an interesting example that hopefully will make you glad that you learned all this stuff!" Too often they weren't that glad. Now we do it the other way around.

We talk about a scenario and then say, "What biochemistry do we need to know to understand what's

A bronze-and-walnut wall display in the west foyer of the Purdue Memorial Union calls attention to Purdue University's Book of Great Teachers. Jim Forney and Clint Chapple were two of the 45 professors added last fall to the list that now bears 429 names. Both have brought honor and distinction to the Department of Biochemistry for much of the past three decades. "The Book of Great Teachers honors the very best of our Purdue educators and underscores our commitment to teaching excellence," Provost Jay Akridge said at the ceremony. "We thank them on behalf of the countless lives they have influenced through their wisdom and guidance."

going on in this particular case study?" Instead of making them listen to a bunch of "boring" biochemistry and then giving an example of why they might find it interesting, we talk about the interesting examples and then say, "How does that come about? Why does a Siamese cat have the pigmentation pattern it does?" One of my students thought this was so cool that she adopted a Siamese cat. You never know what sort of impact you'll have on people's lives.

Each semester I'm in front of my students for 30 hours, talking more or less extemporaneously. Am I going to make a mistake? Am I going to nail one thing one year and just really do a bad job of explaining it the next year? Of course. I absolutely don't mind looking at the students and saying, "You know, that was a terrible explanation. Let me try that again." You've got to do that. That's also one of the ways that you convey to the students that you're on their side. That you're not "up here" and they're "down there." You're human.

You always try to hire people you think will be good teachers. In the Department of Biochemistry, 75% of the appointment is research and 25% is teaching. The bulk of a faculty member's appointment – what they're supposed to be doing – is research. It's an R1 university. But at the same time you can promote and value the teaching program and try to lead by example. All the years I was department head I continued to teach. We worked hard to develop the undergraduate program. We started in a pretty good place. On my first day as head we did a full-day department undergraduate teaching retreat. That was my first priority.

We've developed processes that help ensure our students' success. We've had and continue to have a crazy number of students who are recognized as top students in their years in the College of Agriculture. That's because we have fabulous students and also because we pay attention to them. Right from the beginning the students see that this is a department where people have watchful eyes on them and will hold them accountable. That provides a rigorous and positive environment.

The enrollment continues to climb. I think that's in no small part based on the reputation that we've established and continue to build on.





'I didn't know that!'

Content always matters. So does the teacher's enthusiasm for the subject.

James D. Forney

Joined Purdue in 1988

Full Professor in 1999

Department Head, Biochemistry, 2001-2008

Since 2008, Adjunct Professor, Indiana University School of Medicine

Top 10 Teacher in the School of Science, 1997

Outstanding Biochemistry Teacher, 1998, 2009, 2013

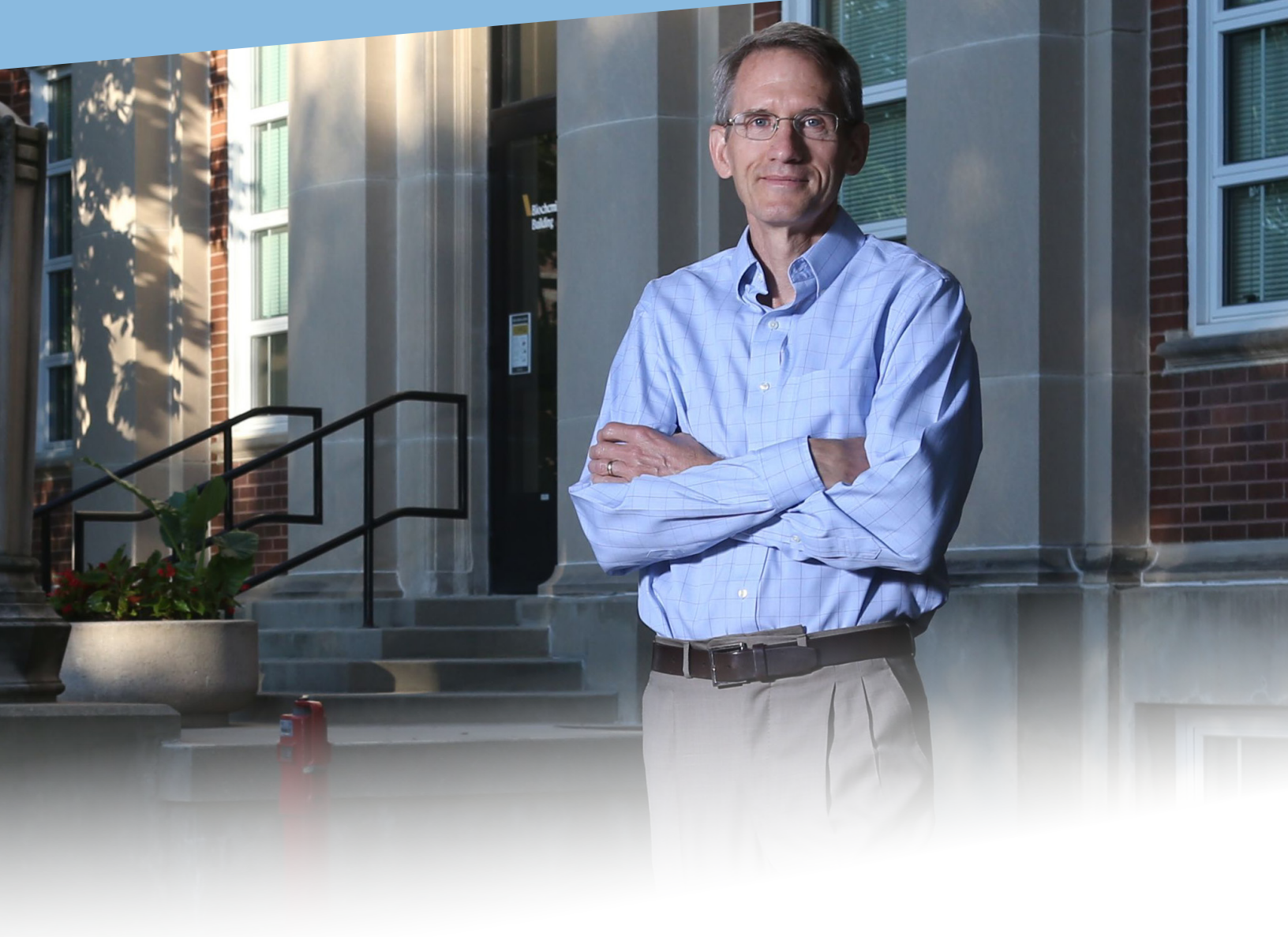
IU Trustee Teaching Award, 2013

From a July 2019 interview. Content lightly edited for clarity.

I didn't think I was particularly good at it, but I realized there was an intellectual challenge to teaching as well as research. And the idea of representing my discipline, and trying to help students appreciate biochemistry, was something that I guess – inspired is maybe too fancy a word – but something that encouraged me to do a better job with my teaching. At the same time I gradually realized I enjoyed teaching, and that made it more fun.

Occasionally you get positive feedback from students but the truth is oftentimes you're not quite sure, when you're actually doing the teaching, whether the students are enjoying it or not. It's not always easy to tell. I'm sure not everyone always enjoys it but you hope some find it valuable.

As department head, when hiring faculty we were looking for people with strong research backgrounds. But there was always discussion about how effective these people will be in the classroom. Can we imagine, based on their interactions and the seminars that they



gave, that they would be effective communicators? You have to recognize that when each of us arrived, we were probably not great teachers. You can't expect everyone to have figured out how they're going to work in a classroom before they have a lot of experience. But you can get a feel for that.

I have learned a lot more biochemistry, a larger breadth of biochemistry, as a teacher than as a researcher. I learn something every semester, from every course I teach. Students ask questions that I can't answer, so I have to look it up and get back to them. Learning new things is interesting. Just realizing – "I didn't know that!" You can get that from teaching as well as research.

I probably spent more time in the beginning worried about being a content expert rather than understanding that the key things in the classroom are to project your interest and enthusiasm for the subject, and to interact and engage with the students. I certainly would teach general biochemistry differently now than I did early in my career.

It takes me two or three times of teaching a course before I really settle in on what I think are the key themes. I don't think it's fair to present all of the information as equally important. You've got to decide that these are the concepts that students need to know, and here are examples – some sort of way to convey a hierarchy of what students ought to take home from a course.

We're not all going to teach exactly the same. You have to figure out what you're comfortable with, what's compatible with your personality. Students can appreciate a lot of different approaches, but they all have two common themes: students need to know that you're on their side and that you want them to learn.



They'll figure it out

The closing ceremony of the 2019 Summer Science Program at Purdue University was set to begin in Room 1054 of Honors College South. The agenda was flexible but 36 teenagers, fresh from a 39-day immersion in biochemistry, were certain what the first item of business had to be.

"All stand for the pledge!"

Knowing what was coming, Dr. Mark Hall shook his head and grinned.

"Cdc14 Phosphatases Preferentially Dephosphorylate a Subset of Cyclin-dependent kinase (Cdk) Sites Containing Phosphoserine."

Laughter. Cheers. Applause. Much satisfaction at being able, perhaps one last time, to recite, in unison, the title of a 2012 paper – "It's well-respected. Gets cited quite a bit" – co-authored by Hall. Though he cannot explain why the students seized on the tongue-twister, he knows that their affection for it reflects the sense of community that the program, in its third year at Purdue, strives to create.

The Summer Science Program is a national independent nonprofit that dates to 1959. Astrophysics was the lone subject – Biochemistry Professor Joe Ogas is an alumnus – until recently. Ogas mentioned that the program wanted to branch out. Associate Professor Hall, who has been at Purdue since 2004, had just developed a

biochemistry lab course. He adapted it, and his proposal was accepted. After test runs, the Purdue program began in 2017. The success of the biochemistry program spurred SSP to duplicate it at the University of California at San Diego this year.

"I think the overall impact of this program will be significantly greater than the impact of anything else I've done professionally in terms of research," says Hall, who worked this year with Associate Professor Stefan Paula of the departments of Biochemistry and Chemistry; Debra Arvin, site director for SSP and the academic dean of mathematics at Melissa High School in Texas; and four teaching assistants. The students worked and lived in the Honors College. Hall thanks the Department of Biochemistry and the Office of the Provost for being very supportive of the program.

The nearly six-week program, which wrapped up July 23, "is structured, to a certain extent," Hall says. "We can't completely turn them loose. But we design it in a way where they feel like they're having to figure it out on their own. We'll tell them, 'Here's what you need to do. Now you need to find this information and figure out how you're going to do it.' They have to design their own experimental protocols at multiple points.

"The unique thing about this program is that they are working together with peers. There are a lot of research programs where students get placed in different labs



and then they're working with a graduate student or a post-doc or a professor. They're not interacting all the time with the group they're with. Here they're living and working together all the time, so they form tight bonds and friendships."

In Their Words

Most of the 36 students who came to Purdue for the Summer Science Program are high school seniors this fall. Here's what some of them had to say about the experience. (Edited for length and clarity.)

Ricardo Linares, Chicago, Illinois. This was relatively new to me. I didn't know a lot of the biology I learned here. I learned how to do bacterial transformation, run assays – a lot of other stuff, too. (Surprises?) There was one midnight lab where we all messed up and we had to come back after dinner and re-do the whole lab that we just did.

Angela Gao, Fairmont, California. I never had done any type of research. It was surprising how approachable it was and how easy the professors made it for us to get used to doing research. (Regrets?) This program is only five weeks. It sounds long but when you're in it, it feels really short, so I wish I'd spent more time just talking with people. Trying to be more efficient so I could have more time with people.

Jeffrey Han, East Brunswick, New Jersey. I liked how they let us be on our own. They offered us guidance when we had difficulty, but for a large part they let us design our own protocols, run our own assays, analyze our own results. We got full immersion into what it's like to be a

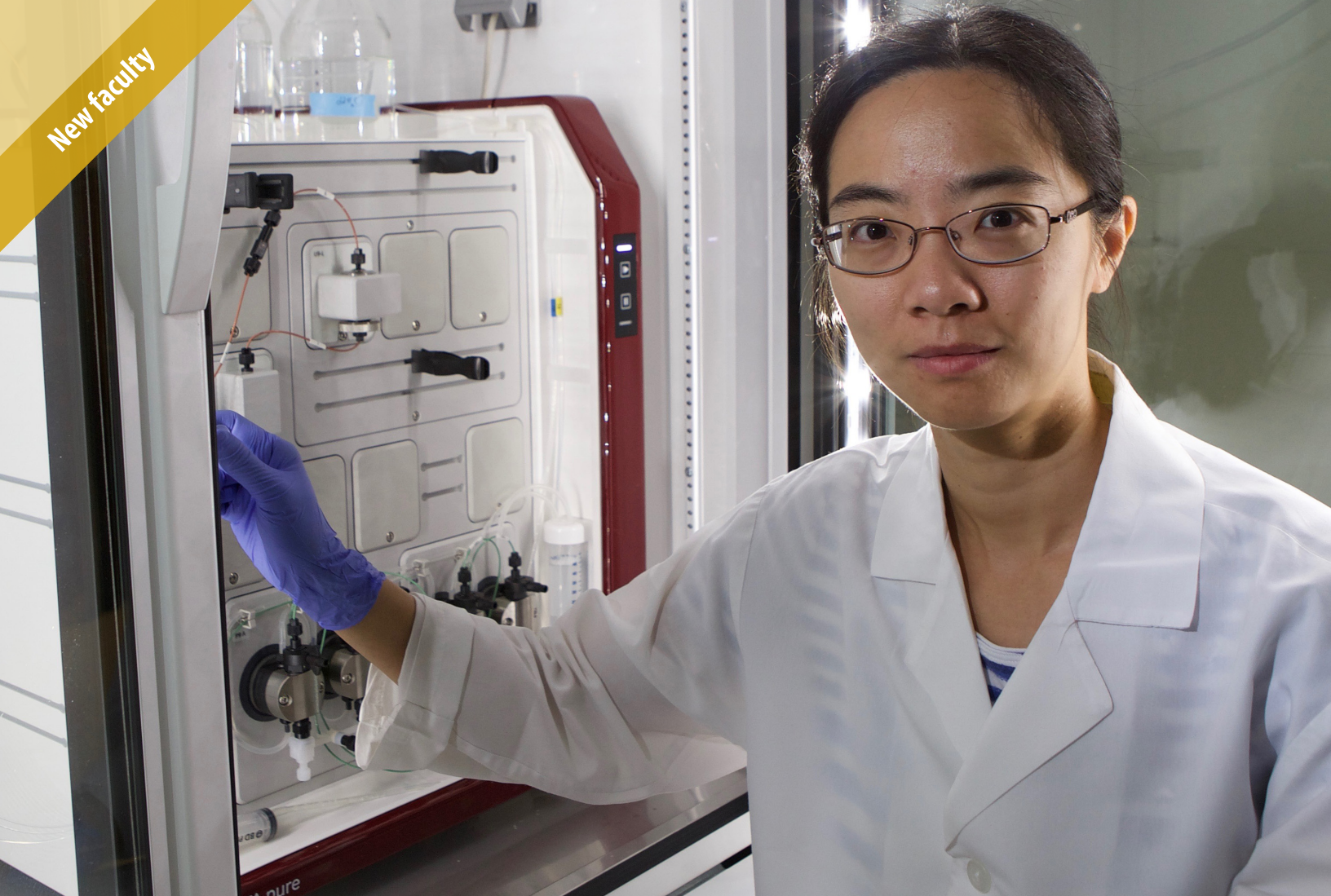
scientist. We got to take control of our own projects. It made it feel more personal. I really like the stuff we did here, so I'm probably going to be following biochemistry for a long time.

Allen Wu, Fargo, North Dakota. What I really enjoyed about SSP is that it introduces basically every single part of the research process. A lot of camps have mentors that basically do specific parts of the research for you, and you don't get the entire experience. But at SSP we do basically everything ourselves, which allows us to get this complete experience and see what research can be like in the future. I wasn't that interested in biochemistry before coming here but I think it can be a career path that I'll explore.

Elizabeth Chen, San Diego, California. From a really young age I knew I wanted to be a doctor with medical research. So I've always been looking forward to these opportunities. Essentially they opened the lab doors and were like, "Have fun!" The trust was a very fun thing. Another thing was the inner-connectivity of every single thing you learn. There's biology, there's chemistry, and we see the intricacies and the connections between them.

Evan Yandell, West Lafayette, Harrison High School. Just being able to be in the lab and work on a longer project and have some input in designing how it was done. And these guys are pretty OK!

Lea Twicken, San Mateo, California. I realized from being in SSP that having a welcoming academic and collaborative environment is really important to me, so that will help me in continuing my college search. (First time in Indiana.) It's humid. (Highlight or lowlight?) Midnight lab – that was a long night. But going through a night like that and coming out the other side and realizing you can do things like that – that was really special.




Breaking down for building up

By Xing Liu

When I was a young child, my mother was once worried about my intelligence because she did not think I “appeared smart.” At that time, my residential area in the province of Szechwan in southwestern China was not urbanized; rather it was surrounded by fields and green lands, so I spent lots of time looking at plants and playing with insects. My mother was often puzzled by the fact that I could quietly spend a whole afternoon with a snail, or keep staring at plants for mysterious reasons, or play with water for hours. What she did not know is, if these activities were moved into a laboratory, they would have a different name—experiments.

Apparently, my interest in biology emerged before I started school, but I did not learn what experiments really were until I entered Beijing Normal University, where I studied Biology and Biotechnology. During the four-year undergraduate training, I was exposed

to different types of experimental systems, such as plants, animals, human cell culture, recombinant DNA and proteins. I was particularly fascinated by plants, because although plants are still, they are intelligent and have developed various strategies to interact with their environment. I wanted to know how they achieve this, so I joined the Plant Biological Sciences Graduate Program at the University of Minnesota, Twin Cities. From 2006 to 2012, I was studying the metabolic regulation of auxin, a plant hormone that is essential to plants. Using stable isotope labeling and quantitative mass spectrometry as my primary research tools, I found how a pulse of light changes the biosynthesis and transport of auxin in young plant seedlings, and I revealed that it is the unmodified form of auxin that is transported over the plant stem.



hormones including auxin that I studied in graduate school; in humans, they regulate processes ranging from cell cycle to circadian rhythm. My postdoctoral work revealed that to keep their activity of tagging the target protein with a ubiquitin chain and sending the tagged protein for breakdown, the Skp1•Cul1•F-box (SCF) type of ubiquitin ligases themselves need to be broken apart so that the subunits of SCFs can be recycled and new SCFs can be rapidly assembled. The dynamic assembly and disassembly of the SCFs ensure that the right types of SCFs are timely formed when their cognate substrate proteins are present and demanding ubiquitination.

In the beginning of 2018, I joined the Department of Biochemistry at Purdue University. I am also a member of the Purdue Center for Plant Biology. Here, I will employ multidisciplinary approaches to further explore mechanisms regulating the ubiquitin-proteasome dependent protein degradation, using both human cell culture and plants as my experimental systems. Together with my lab colleagues, Mr. Melaku Garsamo and Dr. Kankan Wang, we are enthusiastic about understanding how the fundamental process of selectively breaking down cellular proteins builds up ourselves and lives in the world surrounding us.

Xing Liu

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My graduate research shaped me into a biochemist, and I very much appreciated the beauty of biochemistry—deciphering the molecular basis of life. Therefore, I decided to continue my research journey on the path of biochemistry, and I joined the group of Dr. Raymond Deshaies at the California Institute of Technology

‘I could quietly spend a whole afternoon with a snail ... or play with water for hours. ... If these activities were moved into a laboratory, they would have a different name — experiments.’

(Caltech) as a postdoctoral researcher. At Caltech, I studied ubiquitin ligases using human recombinant protein and human cell culture. Through their capacity of targeting important cellular regulators for ubiquitination and degradation, ubiquitin ligases have now been well known to play critical roles in eukaryotic cells. In plants, they are receptors for multiple growth



As novel metabolic pathways evolve, she'll be watching

By Jen Wisecaver

The goal of my research is to characterize novel metabolic pathways and understand how these pathways evolve. Specialized metabolism serves myriad biological functions at the interface of the organism and its environment. For example, land plants, being rooted in place and often at the mercy of their surroundings, have specialized pathways to resist abiotic stress, attract pollinators and seed dispersers, and combat pathogens and herbivores. Similarly, fungi, which digest their food extracellularly and must guard these nutrients from competitors, have specialized pathways to make potent antimicrobial compounds. Moreover, specialized metabolic pathways are often the business end of evolutionary arms races. As one species evolves a toxic pathway, competing species often evolve complementary resistance.

Biochemical surveys of species from across the tree of life suggest that the number of specialized metabolic pathways is enormous. This makes sense if we consider that the unique ecology of different species necessitates the evolution of unique metabolites. Yet, it is because of their fast-evolving nature that nearly all of these pathways are unresolved at the genetic level, which hampers our ability to study specialized metabolism or harness the products for human applications. As an NSF Plant Genome Research Program Postdoctoral Fellow, I developed an effective approach using gene co-expression networks to identify the genes that form specialized metabolic pathways. This strategy offers new insight for gene annotation where earlier methods have been insufficient.

My path to this research focus has been a bit meandering. I owe my interest in biology and evolution to my grandfather, who was a genetics professor at Pepperdine University. He took me fossil hunting and gave me an old microscope from his lab.

I followed in his footsteps, deciding to major in Biology with an emphasis in cellular and molecular biology.

As an undergrad, I spent two summers at the American Museum of Natural History interning as a research assistant. The lab I worked in studied bacterial symbionts of animals, and my job was to identify the strain of bacteria present in a newly collected species of leech. To do that, I had to sequence a small part of the bacteria's genome and compare it to an online database. I remember being completely blown away by the size of this database and the power it represented, giving me access to the work of thousands of other scientists from around the world. Around this same time, the first high throughput DNA sequencing machines were coming on the market, and whole genome sequencing was becoming available to anyone with the skills to interpret these massive data files. I knew that the future of biology was going to be increasingly computational, and I wanted to be on this scientific forefront.

I went to the University of Arizona for my Ph.D. in part because of its Integrative Graduate Education and Research Traineeship in Comparative Genomics. This was a fantastic program that fully funded me for four years, giving me the opportunity to explore different aspects of genome science. I developed an interest in genome innovation, in other words studying how new genes arise in genomes. I studied amazing single celled algae called dinoflagellates, many of which form toxic blooms and are responsible for shellfish poisoning in humans. I discovered that many of the genes in dinoflagellates, particularly the ones involved in making toxins, were acquired via horizontal gene transfer from bacteria in their environment, similar to how the genes for antibiotic resistance spreads through a hospital. I then shifted my focus from algae to fungi, a group of organisms with not only a remarkable range of metabolic pathways but also hundreds of sequenced genomes spanning the diversity of the fungal kingdom. I developed a comparative genomic pipeline to evaluate nearly 250,000 genes from 208 fungal genomes. My research showed that gene duplication, and not horizontal gene transfer, was the dominant driver of gene innovation in fungi.

So just to recap, I've worked with omic sized data from algae, fungi, plants, and bacteria. The best thing about spreading myself out across these different systems is that it exposed me to different academic communities. I've found that different communities are interested in similar questions about genome evolution, but they all approach

'I knew that the future of biology was going to be increasingly computational, and I wanted to be on this scientific forefront.'

these questions a little differently. For example, there are thousands of bacterial and fungal genomes sequenced, allowing us to make detailed comparative analyses between genomes. However, there is little associated work on gene expression in these groups, which hampers our ability to understand what the different genes are actually doing. In contrast, there are far fewer plant genomes sequenced, which hampers comparative analysis, but the genomes that have been sequenced are accompanied by fantastic experiments looking at gene expression over thousands of different tissue types and environmental conditions.

The overarching goal of the new lab is to combine the strengths of both communities. To this end, we have the first nanopore sequencing machine at Purdue University. This sequencing machine is the size of a small external hard drive, and allows us to sequence high quality, contiguous genomes from plants and algae at a rate that was once only possible at large sequencing centers. By coupling this new technology with the gene co-expression networks I developed during my postdoc, I hope to accelerate the pace of discovery of genes and pathways involved in specialized metabolism and natural product production.

Jen Wisecaver

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Article in Summer 2019 edition of *Envision* magazine:
<https://ag.purdue.edu/envision/when-toxic-blooms-thrive/>

Website: <https://www.wisecaverlab.com>

Google Scholar profile:
<https://scholar.google.com/citations?user=2lrO8j8AAAAJ&hl=en>



This is where she wants to be

As her reputation grows, Natalia Dudareva appreciates being ‘happy practically every day’

Natalia Dudareva fields and grants many requests to attend national and international seminars and conferences. After years of groundbreaking research, there is considerable demand for her time and wisdom. She savors such opportunities – and mines them for all they’re worth.

“When you go to those meetings, you display your research and your discipline,” says Dudareva, a Distinguished Professor in the Department of Biochemistry since 2013. “I see that people are being more productive, and I’m thinking, ‘Oh, what am I doing in the lab? Why am I less productive?’ This is a driving force – you’re energized. It’s like a competition. Not real competition, but competition inside yourself to be better.

“This is why it’s very important to go to the meetings,” says the 2018 recipient of the Herbert Newby McCoy Award, one of Purdue University’s top three research honors and given for outstanding work in the natural sciences. “Because this is ... they always put me down,” she says, laughing heartily. “It makes me work harder. Because you don’t see yourself. You see excellent scientists around you and you think, ‘I’m not

doing so good.’ This is what I always feel!”

Dudareva arrived at Purdue in 1997, joining the Department of Horticulture and Landscape Architecture. The move to Biochemistry came in 2011. Offers have been extended but not accepted. When asked why, she answers decisively.

“I’m happy practically every day,” she says. “A very good atmosphere; very good colleagues. You’re around people who speak the same language. If you have a question, you can go and discuss, and discussions are very interesting. I really appreciate it a lot.

“Practically, you have everything you need to do science. We have good facilities; you can find everything. It’s a very comfortable place to work.”

Her work demands collaboration on a scale unimaginable in the not-so-distant past. The reins of location have been loosened by technological progress. Dudareva appreciates that in ways that some younger colleagues cannot. Remember carousel slide projectors?

“Times have changed. It’s not like the old days when you sent a letter,” she says. “Of course, you could call but you can’t talk very long because it’s very expensive. New generations can’t even imagine days without Skype, smartphones and the internet.

“But there were such days! Making slides! You needed to prepare the slides and take a picture and put in film and put it in the carousel. This is actually how I came to Purdue. My presentation was in a carousel!”



‘Driven like very few people I know’

What colleagues say about Natalia Dudareva

“Someone who is very passionate about the work she does. She gives it everything. Science is not something that’s just a job – it’s a career, a life, a lifestyle, a passion to be a professor, and she embodies that.”

- Mark Hall, Associate Professor

DRIVE
Drive. That woman is driven like very few people I know. She took us on a trip to Russia. She organized it for a number of colleagues from other universities. She spoke in Moscow and St. Petersburg. She’s driven on vacation! We got to St. Petersburg and had dinner and she said, “And now we will go for walk.” It was 9 o’clock at night, in the middle of the summer. The sun sets very late in St. Petersburg in the summer; it’s quite far north. Our little walk was 12 kilometers. I had a pair of sandals on. I had plantar fasciitis for three months as a result of Natalia’s drive!

She has an excellent system. She has very high expectations for herself and her students. She’s very good at pulling the evidence together to identify new biochemical processes in plants. She has had and is having a terrific career. Go look at her list of invited seminars if you get a copy of her CV. She’s constantly being flown around the globe for talks. I don’t know how she does it. It would drive me crazy.

- Clint Chapple, Distinguished Professor

PASSION
We began to work together formally about 10 years ago with my research group providing mathematical modeling support that complemented experiments on flower metabolism that her group was doing. We have gone on to write many collaborative proposals. Together we have published around 10 papers with many more on the way. The thing that impresses me most is her drive for excellence in all aspects of scholarly pursuit. She is particularly adroit at both seeing the big picture in terms of what research questions to pursue and focusing on the small details needed to go from the bench experiments all the way to publication. Above all, Natalia is an inspirational person and has taught me a lot about how to write great papers and think like a scientist.

- Dr. John Morgan, who has a courtesy appointment with the Department of Biochemistry. He is a Professor and Director of Graduate Studies for the Department of Chemical Engineering.

COLLABORATION

Dr. Dudareva has had an impactful career training the next generation of researchers. If you were to ask her, though, she would tell you that she's most adept at mentoring people for careers in academia. And she has the track record to back it up. A major factor that led me to work with Natalia in the first place was that she convinced me she would rigorously prepare me for a career in academia. If you ever stop by Dr. Dudareva's office, you are unlikely to find her in there alone. That's because she can use most any situation—whether it's preparing a course syllabus, writing a manuscript submission cover letter or negotiating the terms of a service contract with an equipment vendor—as a teaching moment for her mentees.

There's a huge learning curve for assistant professors and little to no formal training for many of the necessary tasks we encounter. By giving her mentees access to the day-to-day activities of a successful faculty member, Natalia is able to provide experiential learning opportunities that equip future assistant professors with a roadmap to success.

- Joshua Widhalm,
Assistant Professor, Horticulture and Landscape
Architecture, spent 4.5 years as a postdoctoral
researcher with Dr. Dudareva.

What she's done lately

Succinctly summarizing Natalia Dudareva's accomplishments is not easy, but Suresh Garimella did it well in May 2018, when he announced that she was the recipient of the Herbert Newby McCoy Award.

"Dr. Dudareva is one of the world's leading authorities on the biochemistry of floral scent compounds, the mixture of substances produced by flowers to attract pollinators," said Garimella, who was then Purdue's executive vice president for research and partnerships. He's now the president of the University of Vermont.

"In recent years, she has helped define a new area of study in plant biology — the transport and release of plant volatile organic compounds. Some of her recent work in this field is truly groundbreaking."

Here's a glance at some of the most recent recognition received by Dudareva, whose academic journey began in 1972 with a bachelor's degree from Novosibirsk State University, Russia.

More on the McCoy Award:

<https://www.purdue.edu/newsroom/releases/2018/Q2/biochemist-selected-for-purdues-2018-herbert-newby-mccoy-award.html>

Humboldt Research Award, 2016:

Granted in recognition of researchers whose discoveries, theories or insights have had a significant impact on their discipline and who are expected to continue producing field-advancing achievements in the future.

<https://www.purdue.edu/newsroom/releases/2016/Q2/plant-biologist-dudareva-earns-humboldt-research-award.html>

RELATED RESEARCH

<https://www.purdue.edu/newsroom/releases/2019/Q1/purdue-scientists-nail-down-important-plant-compound-pathway.html>

Natural fumigation as a mechanism for volatile transport between flower organs.

Benoît Boachon, Joseph H. Lynch, Shaunak Ray, Jing Yuan, Kristian Mark P. Caldo, Robert R. Junker, Sharon A. Kessler, John A. Morgan, Natalia Dudareva. *Nature Chemical Biology* 2019, 15 (6): 583-588 new function of kryptonoids

ACCOMPLISHED

They've earned it

Achievements, promotions, awards

Academic Year July 1, 2018 – June 30, 2019

Ann Kirchmaier and **Scott Briggs** served as co-organizers for the 2018 Midwest Chromatin and Epigenetics meeting. More than 200 scientists from across the Midwest attended the two-day conference held on Purdue's West Lafayette campus.

Jen Wisecaver was awarded The Arthur C. Neish Young Investigator Award from the Phytochemical Society of North America at the 57th annual meeting in San Luis Potosi, Mexico, in August 2018. This award is given each year by the Phytochemical Society of North America (PSNA) to outstanding early career scientists.

In August 2018 the Department of Biochemistry welcomed a record 13 new students to its graduate program, as well as its largest-ever incoming class of 53 freshmen.

Graduate student **Erin Sorlien** attended the 2018 edition of the Cold Spring Harbor Laboratories course on Chromatin, Epigenetics and Gene Expression (GeneX) in summer 2018.

In summer 2018 nine students participated in the Research Experience for Undergraduates (REU) program. While here, the students had advanced training in the manipulation and analysis of proteins. The program facilitates deep understanding of experimental laboratory research, insights into protein biochemistry and contemplation of the broader context of research.

The department held its annual research retreat at The Trails in rural West Lafayette. Sylvie Doublé from the University of Vermont, Department of Microbiology and Molecular Genetics, was the invited speaker.

Sherlene Brown became a 2018 Global Ambassador for the Purdue Graduate School. The Graduate School's Global Ambassadors initiative was launched in 2010 as part of the Graduate School's strategic plan to double the number of international students from certain geographic regions, specifically South America, Europe and Africa.

Graduate student **Samantha Lee** was awarded the Maxine and Edward Nichols Fellowship by Purdue University.

Elizabeth Tran was designated a Showalter Faculty Scholar for 2018.

The **Beach Lecture Series** was held on November 6-7, 2018. Dr. Chaitan Khosla, Wells H. Rauser and Harold M. Petiprin Professor in the School of Engineering and Professor of Chemistry and, by courtesy, of Biochemistry, Stanford University, was the speaker. He presented two seminars: "Assembly Line Polyketide Synthases: Discovery, Evolution, Mechanisms" and "An Unusual Disulfide Bond and its Role in Celiac Disease Pathogenesis."

Clint Chapple and **James Forney** were inducted into Purdue's The Book of Great Teachers. The Book of Great Teachers was dedicated in 1999 and currently holds the names of 384 distinguished faculty, with 45 more names added this year. These faculty members who have devoted their lives to excellence in teaching and scholarship were nominated by students, alumni and colleagues. The nomination process for the book occurs every five years. Other Biochemistry faculty in the book include Professor Emeritus Karl Brandt, and the late Barney Axelrod and Larry Butler.

Elizabeth Tran was awarded the RNA Society's 2018 Lifetime Service Award. She is the youngest RNA Society member to win the award.

Undergraduates **Quin Waterbury** and **Madison Smith** were inducted into Chi Omega Lambda, the ASBMB honor society. They were two of only 33 inductees this year.

Biochemistry undergrad **Seba Kaakeh** was part of the first-place team in the Social Innovation/Non-Profit category in the Burton D. Morgan Model Competition, as well as winning the Li Family Prize for Social Innovation. Her team pitched "Global Sign," a consulting agency that assists governments, companies, and public places to make their content accessible to the deaf and hard of hearing.

The Department of Biochemistry's 2019 **Axelrod Distinguished Lectures** took place on April 9-10. Dr. Jennifer Nemhauser from University of Washington presented two unique lectures: "Institution Logic: Partnering with artists for better biology education, outreach and mentorship" and "Plant Logic: Discovering and re-engineering design rules governing plant form".

Associate Research Scientist **Joseph Lynch** (Dudareva lab) received an ASBMB travel grant to participate in the 2019 ASPB Midwestern Annual Meeting and a CPB travel grant to participate in the 2019 Plant Metabolic Engineering Gordon Research Conference, in Lucca (Barga), Italy, in June 2019. Joe was also selected as one of four Center for Plant Biology Ambassadors for 2019.

Graduate student **Sherlene Brown** (Mattoo lab) won first prize at the Sigma Xi Graduate Student & Post-Doctoral Research Poster Competition held in February 2019. Sherlene's poster was titled "Characterization of a Fic protein from the respiratory pathogen, *Bordetella Bronchiseptica*."

The Department of Biochemistry awarded Bird Stair Graduate Fellowship awards to 13 graduate students. A total of \$65,000 was distributed to support the students' research projects. Students receiving awards were: **Kortany Baker** (Briggs lab), **Aaron Benjamin** (Lohman lab), **Trevor Boram** (Lohman lab), **Srishti Chakravorty** (Kazemian lab), **Rui (Gary) Gan** (Golden lab), **Melaku Garsamo** (Liu lab), **Youssef Hegazy** (Tran lab), **Smriti Hoda** (Briggs lab), **Juan (Jupa) Jauregui** (Weake lab), **Jiaxin Long** (Ogas lab), **Fabiola Muro-Villanueva** (Chapple lab), **Lee Stunkard** (Lohman lab), **Kirsten Westerhouse** (Ogas lab).

Four Biochemistry faculty earned promotions: **Humaira Gowher** – Associate Professor with tenure; **Vikki Weake** – Associate Professor with tenure; **Brian Dilkes** – Professor; **Joe Ogas** – Professor.

Kortany Baker (Briggs lab) was named the Department of Biochemistry Outstanding Teaching Assistant. This award is given annually to recognize a student's performance as a teaching assistant. Kortany also received the College of Agriculture Excellence in Teaching award.

Shannon Stirling (Dudareva lab) received an ASBMB travel grant to attend the 2019 ASPB Midwestern Annual Meeting.

Eliana Torres-Zelada (Weake lab) was named the recipient of a one-year Purdue Research Foundation (PRF) Research Grant. This grant is provided by the College of Agriculture in conjunction with the Office of the Vice President for Research. This award is given to a student who has demonstrated commitment to the department either through excellence in research or as a departmental teaching assistant.

The Beach Travel award is given twice a year, fall and spring, to help defray the costs of a graduate student attending a scientific meeting. **Allison Norvil** (Gowher lab) received the fall Beach Travel Award. She attended the Gordon Research Conference - Epigenetic Mechanisms Across Scales: From Molecules to Environment and Evolution at Holderness School in Holderness, New Hampshire, in July 2019. **Emma Lendy** (Mesecar lab) received the spring Beach Travel award. Emma used her award to attend the Protein Society Symposium in Seattle, Washington, in July 2019.

The Henry Weiner Travel Grant is given twice a year, fall and spring, to help defray the costs of a graduate student or postdoc to attend a scientific meeting. The award was established in 2012 in memory of Dr. Henry A. Weiner, professor of Biochemistry from 1966 to 2010. **Xiangying (Candy) Mao** (Chapple lab) received the fall award. She used the award to attend the International Society for Computational Biology in New York City in December 2018. **Lee Stunkard** (Lohman lab) received the spring Henry Weiner Travel Grant. Lee used his award to travel to the Gordon Research Conference - Enzymes, Coenzymes and Metabolic Pathways: Origins and Evolution in Enzyme Catalysis and Metabolic Networks in Waterville Valley, New Hampshire, in July 2019.

Lee Stunkard (Lohman lab) and **Fabiola Muro-Villanueva** (Chapple lab) received Bilsland Dissertation Fellowships. The College of Agriculture, in conjunction with the Graduate School, makes this fellowship available to provide a semester of salary support to graduate students who are within the final year of completing their Ph.D.

Hana Hall (Weake lab) received the Don Carlson Award. This award recognizes a post-doctoral fellow, research associate or staff scientist for outstanding research accomplishments in the lab. Dr. Don Carlson was a professor in the Department of Biochemistry from 1975 to 1985. He served as head from 1975 to 1981.

Rachel Weaver, Administrative Assistant to the Department Head, received the Linda Siersema Staff Excellence Award. This award was established in 2013 in recognition of Linda Siersema, who worked in the department her entire 41-year career, retiring in 2014. The award is given annually to a staff member who has demonstrated outstanding performance and service to the department.

Four students completed the requirements of the Graduate Certificate in Biochemistry and Molecular Biology: **Emily Overway**, **Zian Liu**, **Abigail Gress** and **Gabrielle Buck**.

Each year, the department selects one student as the outstanding student from each class on the basis of excellence in academics, research and service. These students are then nominated for the college-level awards. Our outstanding students this year are: Freshman – **Clayton Hicks**, Sophomore – **Ana Pascual-Garrigos**, Junior – **Quin Waterbury**, and Senior – **Stephanie Price**. Clayton Hicks was selected as the Outstanding Freshman Student in the College of Agriculture.

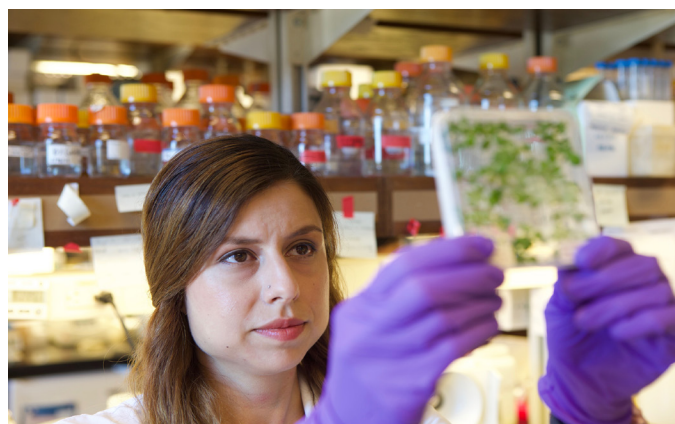
Erin Sorlien was a top 10 finalist in the Three Minute Thesis (3MT®) Competition.

Justin Couetil was selected as the 2019 G.A. Ross Award winner. Recipients of this award are selected by the Office of the Dean of Students, and the award is presented annually to Purdue's outstanding graduating senior man.

Melaku Garsamo (Liu lab) received the Henry A. Moses Award, which recognizes a graduate student for an early publication. This award was established in 2008 by Dr. Bradley Sheares and Adrienne Simmons, to honor his mentor and fellow alumnus, Dr. Henry Moses, for his contributions to research, education and service. Dr. Moses played an influential role in Sheares'

decision to pursue his doctorate at Purdue. Melaku is being recognized for his first author publication, "Using In Vitro Fluorescence Resonance Energy Transfer to Study the Dynamics of Protein Complexes at a Millisecond Time Scale," which was published in Journal of Visualized Experiments.

Xiangying (Candy) Mao (Chapple lab) received the A.K. Balls Award. This award was established in 1969 to honor the memory of Professor A.K. Balls (1891-1966) whose scientific achievements and personal virtues have made biochemistry a richer discipline. The award is given annually to a Biochemistry graduate student approaching completion of their doctoral program who exhibits unusual potential for significant contributions to biochemical research.



What have you been doing?

1950s

Ken Kirby (M.S. 1956, Ph.D. 1958, Whistler) celebrated his 96th birthday in July. He has had some health challenges lately, but is working through those.

1960s

John Burd (B.S. 1968) continues to work on finding natural alternatives to prescription drugs to help individuals lead healthier lives. For information on his natural treatment for diabetes, see his website, lysulin.com.

George Cruzan (Ph.D. 1969, Quackenbush) retired in April 2018 after 22 years as President and Principal Toxicologist of ToxWorks.

John (Ted) MacNintch (M.S. 1963, Ph.D. 1965, Quackenbush) currently lives in Fishkill, New York, with his wife, Joan, and son Mike.

1980s

Paul Cantrell (B.S. 1980) retired in August 2017 after nearly 30 years employment with Eli Lilly and Company. After working as a biochemist conducting basic research for several years at various institutions, he joined Eli Lilly in 1987 as a biochemist in discovery research, focusing on intracellular signaling, particularly in bone tissue. He eventually moved from the research division to the law division; he went to law school in the evenings while being trained and working in patent law during the day. Paul spent the last 27 years of his career as a patent attorney, focusing on patent procurement in the early days, and moving into a management role and directing patent litigation efforts for many years.

Doug Johnson (Ph.D. 1983, Somerville) is currently a Professor and Vice Chair of the Department of Microbiology and Molecular Genetics at the University of Vermont.

Scott Williams (B.S. 1984) is currently Professor of Inorganic Chemistry at Rochester Institute of Technology. He spent the summer conducting research on designed metal oxide nanoparticles for battery applications at the U.S. Air Force Research Laboratory in Dayton, Ohio, as part of the U.S. Air Force Research Lab Summer Faculty Fellowship Program.

1990s

Scott Rosenthal (Ph.D. 1995, Rodwell) switched coasts at the beginning of the year, leaving AstraZeneca in Frederick, Maryland, for Genentech/Roche in Oceanside, California. Scott joined Genentech Oceanside as the site's head (Sr. Director) of the Manufacturing Science and Technology (MSAT) group. In that role he leads a team of over 50 scientists and engineers responsible for automation, validation and process engineering. Additionally, Scott is part of the site leadership team responsible for developing and deploying strategy at the site.

2000s

Jacob Adler (B.S. 2008) was recently promoted to Associate Professor of Biology at Brescia University in Owensboro, Kentucky. Jacob has been recognized recently for his Course-based Undergraduate Research Experiences and work with lipid droplet formation in cervical cancer cells and was honored with the President's Award for Innovative Teaching at Brescia University.

Amanda Burns-Heinemann (B.S. 2006) is working as a primary care provider through the Indianapolis VA Medical Center. She married Ryan Heinemann in April 2019.

Mark Fretz (B.S. 2001) and his wife, Deborah, welcomed their third child, Greta Rae Fretz, on February 9, 2019.

Erika Morris (B.S. 2001, M.S. 2003) is working as the Account Executive – Midwest Region for Boston Analytical.

Autumn Sutherlin (Ph.D. 2003, Rodwell) was recently named the Chair of the Department of Chemistry and Biochemistry at Abilene Christian University.

2010s

Mitchell Ayers (B.S. 2015) is currently a Ph.D. student in the Purdue University Interdisciplinary Life Science Program (PULSe). He recently joined the lab of Dr. Michael Wendt in the Department of Medicinal Chemistry and Molecular Pharmacology.

Ryan Louer (B.S. 2015) graduated from Indiana University School of Medicine. He is beginning his residency training in Pediatrics and Anesthesia at Boston Children's Hospital and Brigham and Women's Hospital.

Lauren Macadlo (B.S. 2017) is working as a Research Technician II at Duke University in the Cell Biology Department.

Jordan Page (B.S. 2018) currently resides in Colorado with his wife, Lacy. He works at Tolmar, a Colorado-based pharmaceutical company, as an analytical chemist for the quality control department. He will begin a master's degree program in biomedical engineering at Colorado State University.

Gabe Rangel (B.S. 2013) successfully defended his doctoral dissertation titled "Empowering the experimental biology of Plasmodium vivax through elucidating requirements for ex vivo culture" and graduated in May from the Harvard University Biological Sciences in Public Health Ph.D. program. After finishing remaining projects with his doctoral adviser, Professor Manoj T. Duraisingh, Gabe will move with his wife and dogs to Penn State University in the fall to continue malaria research as an Eberly Postdoctoral Fellow under Professor Manuel Llinás.

Andzelika Rzucidlo (B.S. 2017) is pursuing a Master of Public Health with a concentration in epidemiology at Indiana University's Fairbanks School of Public Health. She works for the Indiana State Department of Health as the Injury Prevention Epidemiologist in the Division of Trauma and Injury Prevention.

Paul South (Ph.D. 2012, Briggs) recently completed a postdoctoral position in Illinois and will be starting as Assistant Professor of Plant Physiology in the Department of Biological Sciences at Louisiana State University in August 2019.

We want to hear news and updates from our alumni.

Send information to:
biochem4@purdue.edu

Thanks.

Prepared to move ahead

2018-2019 Ph.D. Graduates

Longyun Guo

Next Stop: Senior Scientist II, Wuxi Biologics, Shanghai, China

Laura Henry

Next Stop: Analytical Chemist, Heritage Group

Yu-Hsuan (Karen) Lai

Next Stop: Bioinformatics Scientist, St. Jude Children's Hospital

Faeze Saatchi

Next Stop: Postdoctoral Researcher, University of Texas Southwestern Medical Center

Erin Sorlien

Next Stop: Postdoctoral Researcher, Purdue University

Peng Wang

Next Stop: Scientist, Willow Biosciences Inc.

Zheng (Cindy) Xing

Next Stop: Postdoctoral Researcher, Purdue University

2018-2019 M.S. Graduates

Courtney Traugh

Next Stop: Instructional Support Technician, Chemistry and Biochemistry Departments, California State University

2018-2019 B.S. Graduates

Benjamin Anderson

Next Stop: Research Technician, Penn State Hershey Medical Center

Deborah Aremu

Next Stop: Seeking employment

Thomas Ault

Next Stop: Seeking employment

Jacob Bosler

Next Stop: Lab Technician, Evonik

Amy Bowman

Next Stop: Doctor of Pharmacy, University of Wisconsin-Madison

James Breedlove

Next Stop: Seeking employment

Gabrielle Buck

Next Stop: Ph.D. in Biochemistry and Cell Biology, Rice University

Cameron Bumbleburg

Next Stop: Applying to graduate school

William Collier

Next: Marian University College of Osteopathic Medicine

Justin Couetil

Next Stop: Indiana University School of Medicine

Katharine Eastman

Next Stop: Ph.D. in Biochemistry, Purdue University

James Ford

Next Stop: Study Technician, Covance

Nicole Forstoffer

Next Stop: Assistant Scientist, PPD Laboratories

Mekenzie Gear

Next Stop: Master of Public Health, Emory University

Mark Gee

Next Stop: Engineer/Research Associate, PowerPollen

Abigail Gress

Next Stop: Ph.D. in Microbiology, Immunology and Cancer Biology, University of Minnesota

Jenna Heiser

Next Stop: Quality Control Inspector, NOW Foods

Sarah Innis

Next Stop: Ph.D. in Animal Sciences, Purdue University

Chelsea Lee

Next Stop: Intern, Chanel

Derek Lillo

Next Stop: Associate Quality Assurance Technician, Catalent

Paige Lippens

Next Stop: Seeking employment

Zian Liu

Next Stop: Ph.D. in Quantitative and Computation Biology, Baylor College of Medicine

Eleanor Logue

Next Stop: 2nd Lieutenant and Chemical Officer in the United States Army

Amie Michie

Next Stop: Research Scientist, PPD Laboratories

Adam Moll

Next Stop: Biochemist, Eurofins PSS

Adrian Ortiz-Velez

Next Stop: M.S. in Bioinformatics, San Diego State University

Emily Overway

Next Stop: Ph.D. in Biomedical and Biological Sciences, Vanderbilt University

Sarah Pitts

Next Stop: M.S. in Food Science, Purdue University

Stephanie Price

Next Stop: Manufacturing Scientist, Eli Lilly

Jay Qiu

Next Stop: M.S. in Genetic Counseling, Emory University

Joseph Quaid

Next Stop: Seeking employment

Jolynn Reyling

Next Stop: A.A.S. in Dental Hygiene, North Dakota State College of Science

Sylvia Robertson

Next Stop: Au Pair in Germany, then applying to M.S. programs for fall 2020

Carleena Rocuskie

Next Stop: Applying to graduate school

Elizabeth Schwartz

Next Stop: Applying to medical school

Madison Smith

Next Stop: Research Assistant, Covance

Claire Stamper

Next Stop: iEDGE Corps intern, The Navigators

Ashwin Sunderraj

Next Stop: Northwestern University Feinberg School of Medicine

Michael Toussaint

Next Stop: Scribe, Mercy Hospital, Miami

Daniel Wesenberg

Next Stop: Ph.D., Duke University

Recognizing their potential

2018-2019

Departmental Scholarships

Bernard Axelrod Biochemistry Scholarship

Benjamin Anderson, Jacob Boyer

Dr. Stephen P. and Charlotte A. Coburn Scholarship in Biochemistry

Emily Overway, Carleena Rocuskie

Ray Fuller Scholarship in Biochemistry

Stephanie Price

Edwin T. Mertz Memorial Scholarship

Yoonju Bae, Jianheng Ling, Zian Liu, Christopher Schorr, Ashwin Sunderraj, Reed Trende, Quin Waterbury, Nathan Watervoort

David & Mary Scheible Scholarship

Nicole Adkins, Gabrielle Buck, William Collier

Kwok Yip Tso Scholarship

Abigail Gress

Donald and Rita Weeks Scholarship

Ana Pascual-Garrigos

Zhao-Hermann Scholarship in Biochemistry

Livia Georgescu

Zygmunt Family Scholarship in Biochemistry

Hannah Blum, Justin Couetil, Ellen Denning, Reid Herran, Clayton Hicks, Emily Johnson, Jonathan Le, Paige Lippens, Christopher Roberts, Jonathan Schwartz, Madison Smith, Claire Stamper, Karenna Tankersley, Kathryn Wolfert

College Scholarships

Alva R. Bryant Ag Alumni Scholarship

Seba Kaakeh, Susan Lam, Ashique Zami, Zachary Zelden

College of Agriculture Scholarship Award of Excellence

Tess Snyder

Floyd and Nellie Elliott Scholarship in Agriculture

Matthew Dawson, Abigail Murphy

Don and Jean Uran Foltz Scholarship in Agriculture

Ethan Brown

Gordon J. Graham and Wayne P. Rothgeb Scholarship

Nicole Adkins, Noah Johnson

Gruel Memorial Scholarship

Ben Anderson, Gabrielle Buck, William Collier, Justin Couetil, Mekenzie Gear, Abigail Gress, Emily Overway, Stephanie Price, Ashwin Sunderraj

Rex Hall Memorial Scholarship

Jacob Boyer, Ellen Denning, August Dunbar, Reid Herran, Christopher Roberts, Carleena Rocuskie, Baishuai Sun, Quin Waterbury, Kathryn Wolfert

Joe and Carrie Hatfield Scholarship in Agriculture

Ashique Zami

Fred and Lynn Hartman Ag Scholarship

Dylan Riddle

Horizon Ag Study Abroad Scholarship

Haley Staniszewski

Ice Miller LLP Scholarship in Agriculture

Ben Anderson

David E. Jackson Memorial Ag Scholarship

Paige Lippens

Wayne and Barbara Jennings Memorial Scholarship

Amy Bowman, Ethan Brown, Matthew Dawson, Seba Kaakeh, Abigail Murphy, Isabella Prislusky, Carleena Rocuskie, Madison Smith, Jonathan Schwartz, Claire Stamper, Ashique Zami

Latta Scholarship

Sarah Pitts

Ned Liechty Memorial Scholarship in Agriculture

Alexander Angel

Lawrence and Ruth Love Endowed Scholarship in Agriculture

Quin Waterbury

Marquardt Alumni Scholarship

Jacob Boyer, Reid Herran, Jonathan Schwartz

Martin Ag Research Scholarship

Ben Anderson, Gabrielle Buck, Justin Couetil, Abigail Gress, Jianheng Ling, Kaylen Meeks, Ana Pascual-Garrigos, Claire Stamper, Ashwin Sunderraj

Dale McMillen Alumni Scholarship

Claire Stamper

Office of Academic Programs Freshman Study Abroad Scholarship

Tess Snyder

J. Kelly O'Neill and Margaret Ritchey O'Neill Memorial Scholarship

Amy Bowman, Seba Kaakeh, Cameron Matthews, Stephanie Price, Isabella Prislusky, Carleena Rocuskie, Karenna Tankersley, Benjamin Waddey, Quin Waterbury, Jordyn Wattman

Herbert and Dortha Parker Scholarship

Livia Georgescu

Dr. Donald and Margo Powers Scholarship

Brandon Hunter

Walter Pugsley Scholarship

Isabella Prislusky

O.B. Riggs Memorial Scholarship

Kaylen Meeks

Lewis Runkle Scholarship

Claire Stamper

Henry William and Matilda Marie Sailer Schroeder Memorial Scholarship

Claire Stamper

Lloyd and Gene Sellers Scholarship

Ana Pascual-Garrigos

Sheehan Study Abroad Scholarship

Katharine Eastman, Haley Staniszewski, Gabrielle Williams

Merrill Turley Family Ag Scholarship

Madison Smith

Henry Andrew and Ida Sophia Sailer Wedeking Memorial Scholarship

Thomas Ault

Rich and Helen Willsey Scholarship in Agriculture

Mekenzie Gear, Stephanie Price

Robert J. Woods Scholarship

Jianheng Ling, Nathan Watervoort

University Scholarships

Alumni General Scholarship

Mekenzie Gear, Zachary Zelten

Steven C. Beering Scholarship

Mark Gee

Big Moves Study Abroad Scholarship

Katharine Eastman, Reid Herran, Sarah Innis, Stephanie Price, Madison Smith, Tess Snyder, Haley Staniszewski, Gabrielle Williams

Boilermaker Xtra Special Scholarship

Amy Bowman, Quin Waterbury

Emerging Leaders Scholarship

Kierra Jammer

Mitchell and Cheri Daniels Scholarship

Stephanie Price

Marquis Renewable Scholarship

Matthew Dawson, Audrey Ellis, Mekenzie Gear, Rachel Goedde, Jake McClain, Allison Megl, Jonathan Schwartz, Claire Stamper, Gabrielle Williams

Office of Undergraduate Research Scholarship

Ashwin Sunderraj, Nathan Watervoort

Presidential Scholarship

Ben Anderson, Alexander Angel, Kimaya Bakhle, Amy Bowman, Gabrielle Buck, William Collier, Justin Couetil, Livia Georgescu, Rachel Goedde, Abigail Gress, William Hadjis, Reid Herran, Kristen Herrera, Clayton Hicks, Emily Overway, Tara Paarlberg, Ana Pascual-Garrigos, Christopher Roberts, Elizabeth Schwartz, Tess Snyder, Haley Staniszewski, Ashwin Sunderraj, Gabrielle Williams, Kathryn Wolfert

Purdue Class of 1937 Scholarship

Thomas Ault

Purdue Cooperative Housing Association Scholarship

Reid Herran, Madison Smith

Purdue Sponsored National Merit Scholarship

Kathryn Wolfert

G.A. Ross Senior Award

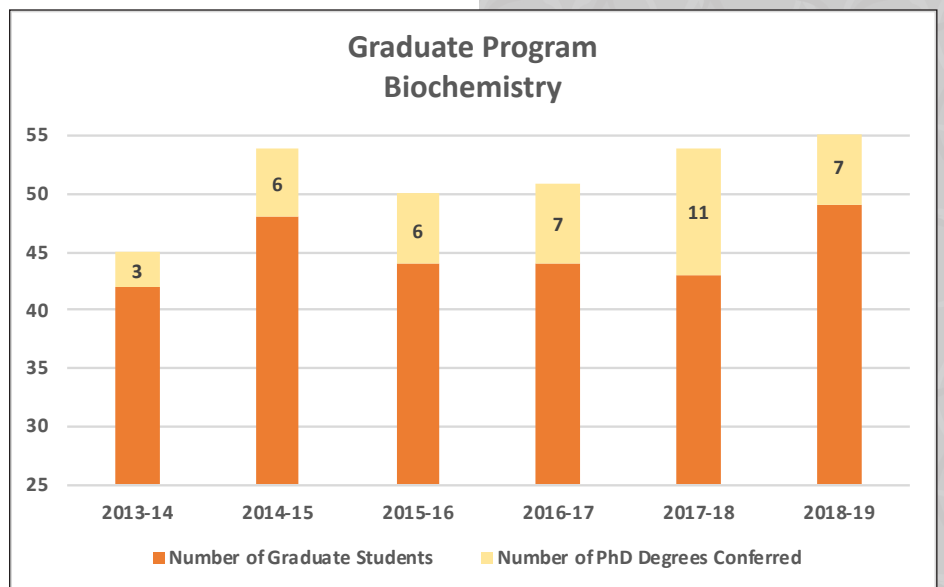
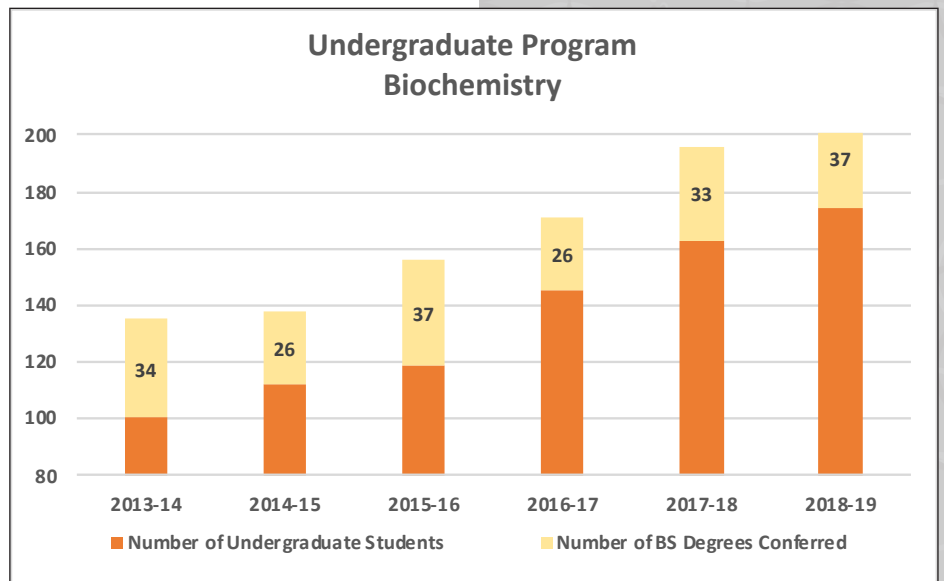
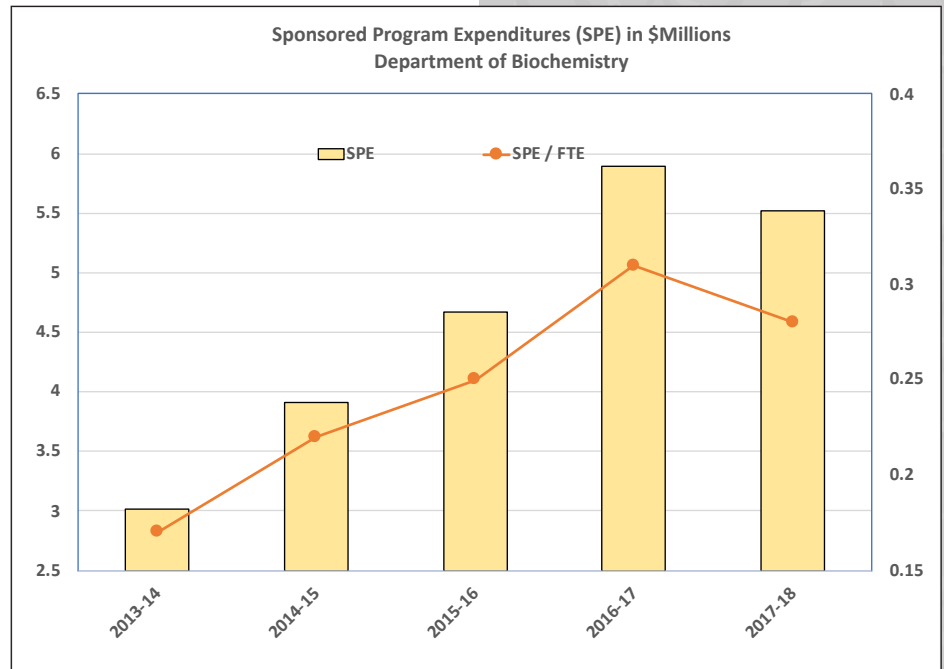
Justin Couetil

Trustees Scholarship

Ellen Denning, Reed Trende

Year in review

There are a number of important metrics, such as faculty research grant expenditures and undergraduate and graduate student enrollment, that Purdue University uses to assess departmental progress. Such metrics are used in part for determining our departmental budget and the number of faculty positions. These charts give a snapshot of the past few years and show that we are well-positioned for continued growth.



Let's keep in touch.

It's easier than ever to keep up with what's new in the Department of Biochemistry. In addition to *The Catalyst*, you can follow the department's happenings through our monthly newsletter, *Molecular Matters*, or via social media. We invite you to join us as we explore and find new ways to keep our alumni, prospective students, colleagues, and "friends of biochemistry" up-to-date.

You can connect with us on LinkedIn (Purdue Biochemistry) or follow us on Twitter (@PurdueBiochem). In today's fast-paced technological world, time and information go hand-in-hand. Using social media services allows us to more easily and quickly provide you with news in a variety of outlets. Aren't a fan of social media? Don't worry. We will continue to communicate with you through *The Catalyst* and our website, www.ag.purdue.edu/biochem.

Communication is a two-way street. Let us know how we're doing and what you're up to! Send any and all updates to biochem4@purdue.edu. We would love to hear from you! If you aren't receiving our monthly newsletters and would like to, send in your email address.

While every effort has been made to ensure that information in *The Catalyst* is accurate and up-to-date, the Department of Biochemistry cannot guarantee accuracy and is not responsible for any errors or omissions. If you believe something is in error, please contact *The Catalyst*, Department of Biochemistry, 175 S. University St., West Lafayette, IN 47907.

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