

THE CATALYST

DEPARTMENT OF BIOCHEMISTRY 2012 - 2013





Dear Alumni, Friends, and Colleagues,

It has been a busy year, particularly over the months since January when our new President, former Indiana Governor Mitch Daniels, arrived on campus.

One of President Daniels' primary focus areas is the affordability of a Purdue undergraduate education, and not long after becoming President he announced a two-year tuition freeze. Although Purdue University is repeatedly ranked nationally as a "best buy" in terms of the benefits students derive for their tuition dollars (see a number of links listed at <http://www.purdue.edu/newsroom/rankings/ranking.html>), the university's faculty and staff are working hard to identify additional efficiencies so that a Purdue education can be kept as affordable as possible.

In this edition of *The Catalyst*, we are proud to profile how a number of our alumni are helping us in this effort. In my commentary in last year's edition, I described scholarship opportunities through Purdue University's Indiana Challenge Match Program. I am thrilled to report that thanks to a number of alumni who were in a position to give to our program, we now have an additional five scholarships for students in the Department of Biochemistry that will reduce the cost of their education by thousands of dollars per year.

And while cost is a concern, the quality of the education we deliver is also of paramount importance to our faculty. In that context we're proud that our students continue to excel. One, but by no means the only, example is featured on the cover of this report. In May of 2013, Gabriel Rangel was recognized with the G.A. Ross Award, given annually to the outstanding man graduate from Purdue University. This award, following so closely on the heels of Flora Roberts Award for outstanding female graduate presented to Rachel Schluttenhofer in 2011, speaks strongly to the quality of our students, and the effort our faculty and staff put into their education.

In closing, we will continue to strive to make a Purdue education affordable and excellent. The benefits to our students are apparent. And to everyone who helps us with that mission with donations large or small, I want to send a sincere thank you. As you'll see in the following pages, our students say thank you too.

Dr. Clint Chapple
Department Head

On the Cover

The G. A. Ross award is presented annually to Purdue's outstanding graduating senior man who demonstrates high standards of academic achievement, outstanding leadership, strength of character and service to Purdue and community. This year's recipient was Biochemistry senior Gabriel Rangel.

One of the reasons that Rangel chose Biochemistry at Purdue was his intense interest in research. During the spring of his freshman year, Rangel began working in the laboratory of Dr. Scott Briggs, continuing to work there until graduation. Rangel had extensive research experience outside of Purdue as well. He worked at the Indiana University Simon Cancer Center examining the effect of a drug on prostate cancer cells, was selected to participate in the Howard Hughes Medical Institute Exceptional Research Opportunities Program, and did field work in Mali. Rangel was also selected for the Summer Program in Biological Sciences at the Harvard School of Public Health, where he did research on malaria.

In 2011, Rangel was awarded a Barry M. Goldwater Scholarship, a highly prestigious award that is given to less than 300 students nationwide. In 2013, Rangel was awarded a HHMI Gilliam Fellowship for Advanced Study, which provides full support for up to four years.

Rangel was a founding member of the board of directors of an ambitious new international endeavor. Project HEART (Health, Education and Agriculture for Regional Transformation) is an effort to sustainably raise the living standard of the city of Gondar, Ethiopia. In 2012, Rangel and the other directors of Project HEART were invited to Washington, D.C., as finalists at the Clinton Global Initiative University, where Project HEART was recognized as an outstanding project in the focus area of Poverty Alleviation.

In May 2013, Rangel graduated from Purdue with highest distinction. His future plans include obtaining a Ph.D. in a field that will allow him to do scientific research related to tropical diseases. He began his studies this summer in biological sciences at the Harvard School of Public Health.

Notables

- 12** Study Abroad Creates Lasting Memories
- 16** How Are You Going to Change the World When You Leave Purdue?
- 20** Biochemistry Aliquots
- 22** Scholarships
- 23** Graduates
- 24** In Memoriam
- 25** Alumni Updates
- 28** Grants
- 30** Publications
- 32** Donors

This report is published annually by the Purdue University Department of Biochemistry.

Executive Editor, Clint Chapple
Editor & Production Managers,
Kristi Trimble and Nicki Stone
Photos by Tom Campbell and
John Underwood

It is the policy of Purdue University that all persons have equal opportunity and access to its educational programs, services, activities, and facilities without regard to race, religion, color, sex, age, national origin or ancestry, genetic information, marital status, parental status, sexual orientation, gender identity and expression, disability or status as a veteran. Purdue University is an Affirmative Action institution. This material may be available in alternative formats.

Department of Biochemistry
Purdue University
175 S. University Street
West Lafayette, Indiana
47907 - 2063
<http://www.biochem.purdue.edu>
Phone: (765) 494-1600
Fax: (765) 494-7897

Features

- 2** A Day in the Life of Biochemistry's Newest Laboratory
- 6** Faculty Profile – Natalia Dudareva
- 8** Recognizing Excellence
- 10** Delivering on Discovery
- 14** Breakthrough Discovery Reveals Potential for New Anti-Fungal Drugs
- 18** Undergraduates Thankful for Donor Support



A Day in the Life of Biochemistry's Newest Laboratory

From sunrise to sunset, thousands of fruit flies will give up their lives for the sake of science in studies led by new Assistant Professor Vikki Weake.

The Purdue campus seems deceptively quiet on this bright summer morning, but although most classes are finished, staff and graduate students in the Department of Biochemistry are still hard at work. Construction crews

are beginning their work on an array of nearby summer construction projects and the sound of heavy machinery fills the air, as the first scientists in the department arrive for the day. Today is Friday, June 21, 2013, and over the

next 24 hours, we will take a journey through the lab of the newest faculty member in the Department of Biochemistry, Assistant Professor Vikki Weake.



8:17am

8:17am – Dr. Vikki Weake walks into her lab on the third floor of the Biochemistry Building and heads immediately for the fly room. “We work with *Drosophila*, the common fruit fly, in our lab,” she explains. She takes two vials out of an incubator and carries them into the fly room. “My first task in the morning is always to collect the flies for my different crosses,” she says as she tips the flies out onto a white pad under the dissecting microscope. The flies move about a little before quickly becoming immobile as carbon dioxide seeps out of the white pad. “Our lab uses genetic tools to do biochemistry,” she explains. “For example, today I’m crossing two fly stocks together so that we can label some of the cells in the brains of their offspring with a green fluorescent marker that will indicate where a particular gene is turned on. We’ll be able to isolate these labeled cells and use them for proteomic or gene expression studies.” Weake transfers the flies into a new vial and places them back in the incubator as she explains further, “*Drosophila* gives us a powerful model system to study how groups of proteins that regulate gene expression work in different cell types in a multicellular organism.” She adds, “Although right now we focus on epigenetic regulatory complexes such as SAGA (Spt-Ada-Gcn5-Acetyltransferase) that regulate gene expression, the approaches that we use can be applied to many different protein complexes that function in similar ways.”

9:45am – Standing beside her bench in the lab, first-year graduate student Jingqun Ma measures liquid into different wells in a plate using a pipette. She taps a button on a nearby instrument and its lid opens, revealing a metal grid. As she places the plate inside the machine, she explains, “I will be measuring gene expression levels in 96 analyses simultaneously.” The samples that she’s testing now come from particular brain cells that Ma has carefully isolated from the developing visual system of *Drosophila* larvae. “By comparing the expression levels of



9:45am

different genes in my samples, I can know whether I have the cells I’m interested in,” Ma says. Weake explains, “Mutations in SAGA cause a devastating human neurodegenerative disease, spinocerebellar ataxia 7, in which patients go blind.” She adds, “If we can understand how SAGA works to regulate gene expression in different cell types in the eye and brain, we might gain some insight into what goes wrong in this human disease. Some of our *Drosophila* SAGA mutants have specific defects in the developing eye and brain. Jingqun has been working on ways to specifically isolate particular cell types from these mutants so that she can look at global levels of gene expression and identify genes that might cause the visual system defects.”

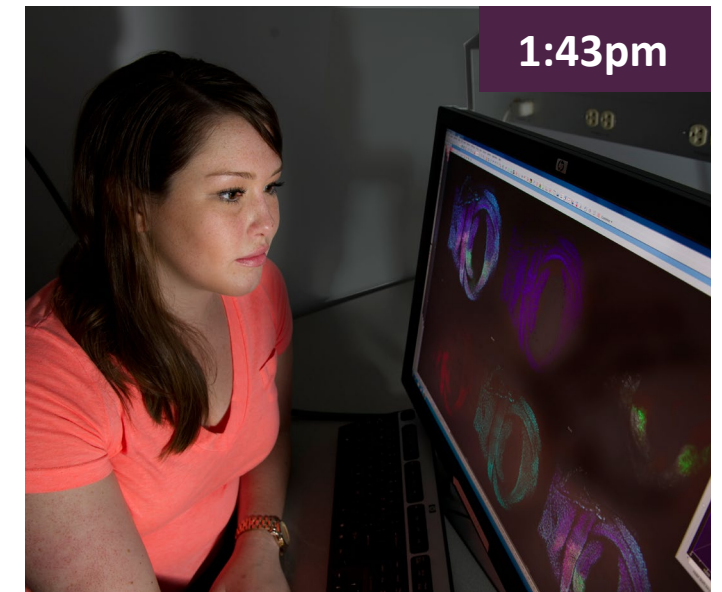
10:22am – It’s mid-morning as Senior Research Associate Dr. Hana Hall peers into the microscope and carefully picks up small white specks that she transfers into the vial she holds in her hand. The microscope shines a blue fluorescent light that makes some of the small white specks glow green. “I’m selecting the eggs that don’t glow green, so that later I can harvest them.” Hall is separating mutant *Drosophila* embryos from their wild-type siblings by selecting those that don’t express a green fluorescent marker. “We need to extract protein from these mutants so that we can do proteomic analysis and look at the modifications that differ from the wild type. We want to find new targets of SAGA that aren’t histones.” The histone proteins that bind to DNA are the major known targets of SAGA’s enzymatic activities, but Hall thinks that other proteins such as transcription factors could also be targets of SAGA. “Some of these other proteins might be important for the specific roles for SAGA that we’ve seen in the brain and eye,” adds Weake. “Hana’s work will help us to figure out whether these non-histone targets of SAGA are important for its tissue-specific functions.”



10:22am

1:43pm – It’s a bright summer day outside as first-year graduate student Rachel Stegeman sits inside a dark room looking intently at the computer screen. A heart-shaped image composed of dark blue, red, turquoise and green dots fills the screen in front of her. “I’m looking at a wing imaginal disc from a *Drosophila* larva,” she says. She points to the left side of the heart shape, which is bright green. “In the bright green area, we know a certain gene has been depleted because when it is, our marker gene can be expressed. The red and the turquoise colors represent different histone modification levels, and we look for changes in these in the green area – where the gene is depleted – compared to the rest of the disc,” she explains. Stegeman is collaborating with a graduate student in Scott Briggs’ lab, Kayla Harmeyer, to see whether the loss of specific histone modifying proteins in flies causes the same effect as in yeast. Weake says, “It’s great to work together with Scott’s lab because we’re both interested in the same types of proteins – in particular one called Gcn5 that adds an acetyl group to histone proteins. It’s a lot of fun to see whether the mechanisms that he’s finding in yeast for this protein also happen in a multicellular organism such as *Drosophila*. When we find it does, it gives us more confidence that our findings will be relevant in the context of human disease.”

5:47pm – As the day winds to a close, Research Assistant Bob Stephenson and undergraduate Marcus Hosler retrieve some plates containing yeast colonies from an incubator. Stephenson holds up a plate and points at some spots of yeast that are starting to show growth. “In this experiment we replace a yeast gene with the analogous gene from *Drosophila*,” says Stephenson. Hosler explains further, “Because these yeast grew, we can conclude that the *Drosophila* gene is functionally equivalent to the yeast gene.” Weake adds, “Although we usually use *Drosophila* as a model system, sometimes it’s useful



1:43pm

to be able to switch to yeast or mammalian cells to answer specific questions. Bob’s studies on the link between Gcn5 and a protein that regulates DNA replication are starting to look very promising, and this is an exciting new area of research in our lab.”

6:22pm – Lab members say goodnight as they head home after a busy day. It’s a diverse group with people from different places both within the USA and abroad: Indiana, Minnesota, Illinois, China and Slovakia. “It’s great to have people from so many different places in the lab,” says Weake who is originally from New Zealand. “I’m really enjoying being here at Purdue and I’m happy to be a part of the Department of Biochemistry.”



5:47pm



Faculty Profile – Natalia Duudareva

A biochemist by training, Dr. Natalia Dudareva joined the faculty of Purdue University in 1997 as an assistant professor in the Department of Horticulture and Landscape Architecture. Now a distinguished professor, Dudareva this year took the opportunity presented by an ongoing reconfiguration of plant sciences in the College of Agriculture to move her majority faculty appointment to the Department of Biochemistry. We had a few questions.

Where were you raised and what brought you to the United States?

I grew up and received my education in Novosibirsk, one of the largest cities in Siberia. I was fortunate to get my undergraduate degree from Novosibirsk State University, which was established in my hometown along with 20 different research institutions. I fell in love with science during my school years and as a freshman was already involved in various research projects. The opportunity to do research at the cutting edge brought me to the U.S.

You've had an interesting educational background. Would you please tell our readers about it?

I did my Ph.D. at the Institute of Cytology and Genetics

in Novosibirsk, but defended it in Kiev, Ukraine, in front of a doctoral committee of biochemists. In 1991, I moved to Strasbourg, France, where I worked in the Institute of Plant Molecular Biology for two years. I then did postdoctoral research at the University of Windsor in Canada and at the University of Michigan (Ann Arbor). While in France, I received my second Ph.D. from the University of Louis Pasteur.

Did you always know that you wanted to become a researcher/professor?

Being raised in a scientific family it looked like a normal path for me. I was always fascinated by the number of unanswered questions and I loved to challenge myself. Both of my parents were scientists; my mom was a professor of

physics in the college and my dad was also a physicist and had a big laboratory in the scientific institute. They never encouraged me to pursue a career in science, but we always had a lot of interesting and challenging discussions at home so I really couldn't have imagined another path for myself.

What is your current research focus?

My current research focus is on the biosynthesis and regulation of both primary and secondary metabolites in plants with an emphasis on aromatic amino acids and plant volatile organic compounds.

What questions are you trying to answer in this research?

Plants have a remarkable ability to synthesize a vast array of substances that are not only vital for plant growth, development, reproduction and defense, but also are important to humans in the form of food, medicines, industrial raw materials and biofuels. At this time, however, we are still limited in our ability to manipulate plants for our benefit for lack of a comprehensive understanding of metabolic networks and their regulation. Our research will fill

important gaps in our knowledge of plant metabolism and lay a foundation for future rational metabolic engineering of plants to improve flavor and aroma quality, boost plant defenses, increase pollinator attraction and heighten amounts of biologically active compounds.

How did you become interested in this research?

I became interested in this research during my postdoctoral work in Dr. Eran Pichersky's laboratory at the University of Michigan. In the early nineties, we were the first group in the world that investigated production of floral volatiles at the molecular level. In 1997, I decided to continue this research in my laboratory at Purdue University.

What do you love about science?

Discovering something new and exciting, analyzing our data and putting the pieces of the puzzle together. I love to find answers to challenging questions. Also, I like to work with junior researchers, graduate students, postdocs and undergraduates, to whom I can transfer some of my experience and knowledge.



Linda Siersema

Recognizing Excellence

If you ask alumni of the Department of Biochemistry who they remember from their time here, odds are they won't remember only the faculty members with whom they worked, or the students or post-docs they shared a class or lab with, but they'll also mention a staff member or two. Staff who made it possible for them to get their

work done. Staff who saw to it that they got into the classes they wanted, or received their visa in time, or stayed late to make sure the paperwork was filed so they could get paid in order to pay the bills.

This year the department initiated a new award to recognize our outstanding staff. In recognition of her

40 years of service to the department, Linda Siersema was recognized as the inaugural recipient of the Linda Siersema Staff Excellence Award. Siersema has held a range of positions within the department, beginning as a secretary, also serving as an account clerk, and for the past 33 years functioning as the storeroom manager. When asked why she has been such a faithful employee of the department, Siersema responded, "I have stayed in the department for the past 40 years because I think we have the best faculty and students on campus. I love my job and hopefully I can help everyone in some way with their research needs."

A number of our alumni wrote to support the naming of this new award after Siersema and to say how much she has meant to them:

I finished my Ph.D. in 2002 and remember Linda fondly. My husband got his Ph.D. from the Biochemistry and Molecular Biology Program, and he worked for Dr. Charbonneau. When we graduated I was about seven and a half months pregnant with our first child. We moved to Texas right after our August graduation and our son was born five weeks later. When he was born, I emailed my advisor and other people in the Department announcing the birth of our child. Linda sent us a gift for him, a silver spoon that we still have and treasure.

Tania Malave and Edwin Traverso (Ph.D. 2002, Forney and Charbonneau)

Since day one she was very nice, something I was thankful of, particularly as a 1st year grad student. Whether I needed to place an order for a chemical from an obscure provider in Germany (even after 4pm) or letting me sneak in the back room to look for a box of the perfect fit for my needs, she always did it gladly. She definitely made my experience at Purdue more enjoyable.

Juan Martinez (Ph.D. 2011, Hall)

Linda's smile and comforting presence in the storeroom gave a pleasant break from the disappointments of experiments gone awry, mind-numbing preparation for prelims, and sometimes a bit too much fun at the Stabilizer the night before. In the 30 plus years and 3 institutions post-Purdue I've only grown to appreciate all the more the support we had in the Department of Biochemistry. It was a family and Linda was my resident sister who always helped me believe I could get through whatever trial or tribulation of the moment. An award well named!

One thing that I remember about the storeroom policies was the seemingly arbitrary rule of "one pencil per visit". This just didn't fit the need when one was working on their prelim proposals, writing a manuscript, that monumental tome of a dissertation. Linda would let us stretch this rule a bit by following it literally. We would recruit a host of other

students to line up with each student picking up a pencil then handing it to the person in need. Linda held to the letter of the rule while allowing the wheels of research and training to stay well oiled. It may have seemed small at the time but to me that defines community!

Ed Krug (Ph.D. 1983, Kent)

This new departmental award is yet another way that our college recognizes the critical role that our staff play in the operation of the university. In the words of Jay Akridge, the Glenn Sample Dean of Agriculture, "The College of Agriculture has the only administrative/professional staff advancement program at Purdue. The program provides a framework for a meaningful review and advancement system for our a/p staff; recognizes and rewards excellence in performance; and encourages continued achievement and service. The College of Agriculture is fortunate to have the talents of exceptional a/p staff who are committed to the mission of the College and always working to move it forward. They demonstrate growth, innovation, creativity, and a true passion for their work. This program allows us to recognize these outstanding a/p staff who exhibit dedicated service and commitment to excellence in support of College of Agriculture initiatives."

Siersema heartily agrees with the words of the dean: "I think the a/p advancement program helps keep employees focused on their jobs and gives them a chance to be rewarded. I think other colleges should adopt this program because it encourages employees to find ways to grow and learn new skills." And what about this new departmental award? According to Siersema, "It gives the staff a chance to set goals and be rewarded for their efforts." Fortunately for us, we will have no difficulty in finding deserving awardees in the years to come!



Delivering on Discovery

When Dr. Andy Tao, at the time Assistant Professor of Biochemistry at Purdue, and his Ph.D. student Anton Iliuk first presented their new technology at the 56th American Society for Mass Spectrometry (ASMS) conference, they certainly did not expect the kind of positive interest it generated. “We were just trying to address a puzzling issue among colleagues in our scientific field,” Iliuk says. But it went quite a bit beyond that. Dozens of requests to try the products and a couple of patent applications later, Tao and Iliuk saw the market need for their technologies and the opportunity in front of them to start a company.

As a result, Tymora Analytical Operations, LLC was created in December 2010 in the Purdue Research Park – a world-renowned business incubation center. “Two companies have attempted to license our technology, but I felt it had the highest possibility of turning into something that really benefits other researchers if we are closely involved in the process. In this case, a start-up in the Purdue Research Park made more sense to me with all sorts of available support in the Purdue community,” Tao says. It also did not hurt that Tao’s entrepreneurial mentality has received a lot of nurturing from his former advisors – Dr. Graham Cooks (Ph.D. advisor in the Department of Chemistry at Purdue) and Dr. Leroy Hood (postdoctoral advisor at the Institute of Systems Biology) – legends in their fields responsible for creating several multi-million and multi-billion dollar companies.

“When Andy approached me with the proposition to start our own company and commercialize our technologies, to say that I was taken by surprise would be an understatement,” remembers Iliuk. “This idea is a pretty big deviation from the typical bifurcated career path for scientists of choosing either academia or an established company. Maybe that’s why it has caught my attention.” Iliuk always wanted to carry out cancer research, and this opportunity to co-found the company enhanced his desire to couple discovery with delivery. Being able to contribute to society by producing tangible products that can help others with their cancer research is the primary goal for both Tao and Iliuk.

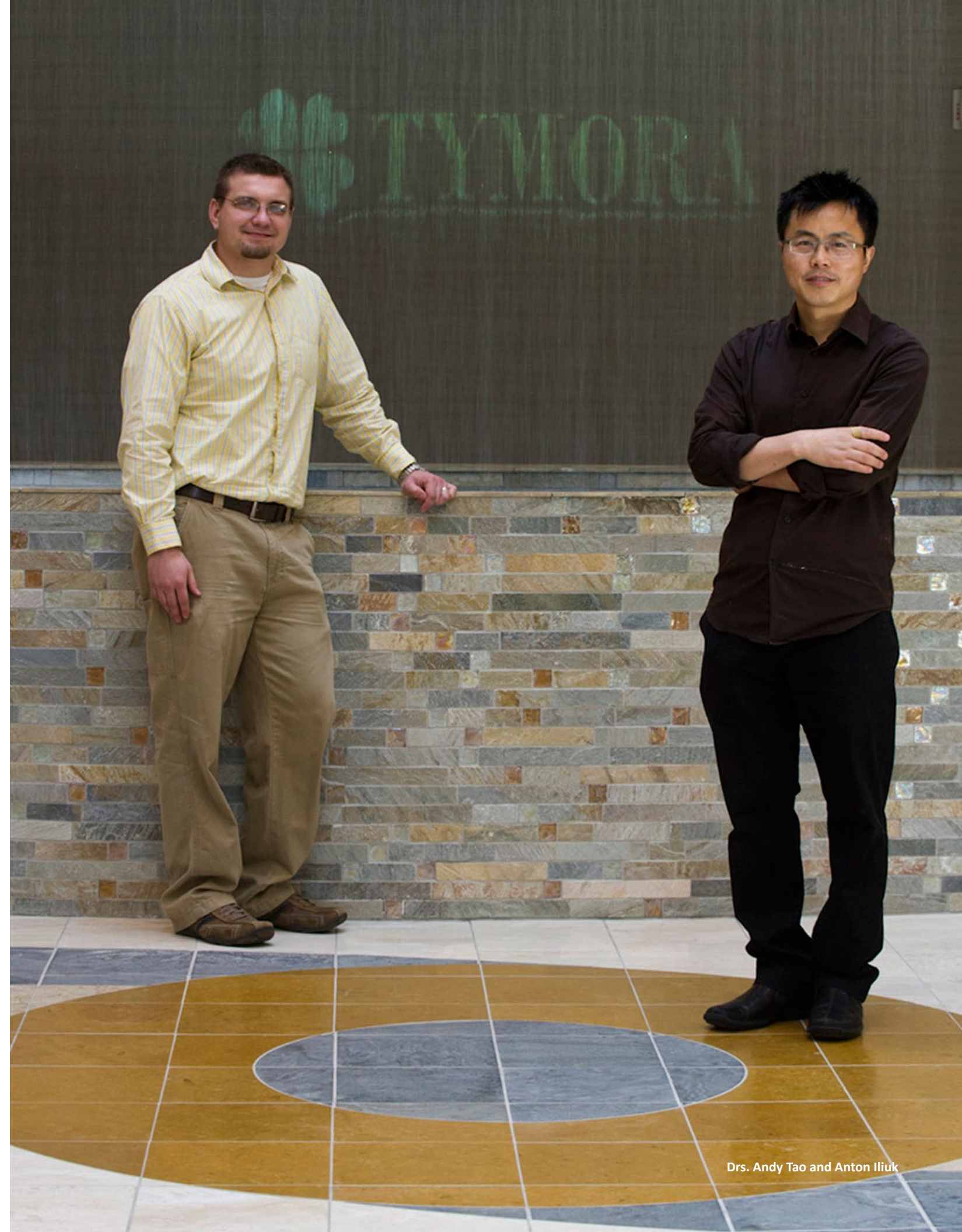
At this stage, the company is still very young, generating revenue from the sales of a single product based on their original technology introduced in 2008. Their main focus remains on R&D to develop and optimize their other products, for which they received a few Small Business Innovative Research (SBIR) grants from NIH and NSF. “While our current commercial efforts focus on lab R&D products, our plan is to eventually enter the cancer diagnostics field and

directly contribute to the fight to recognize and prevent the devastating disease,” says Iliuk. “This idea has been a dream of mine for quite some time, but now I feel that there is actually a good chance of turning it into reality.”

Tao and Iliuk’s experience on turning biochemistry lab discoveries to products on the market shows that you don’t necessarily need to have extensive business training and a large investment package to create a start-up company. More importantly, it requires a good idea that fulfills a genuine need and a passion to make a difference. With Tymora Analytical Operations, LLC they join the historic Purdue entrepreneurial culture responsible for the creation of countless successful companies. “I was trained as a chemist and now work in the Department of Biochemistry. For me, this turned out to be a great path for technology commercialization. That is, I have some basic skill sets to invent tools and now I have come to know how to deliver them in a practical sense. It could have been a dangerous path for a junior faculty member 20-30 years ago because most faculty members were expected to work only in their labs and stay as far away as possible from business. This is certainly not the case now at Purdue. I have received great support and recognition for my entrepreneurial engagement,” Tao says. “People frequently ask me whether the entrepreneurial activity affects my university lab research. I have told them, yes, in a profoundly positive way. Through establishing Tymora, while it is too early to say it will be successful, I have significantly reshaped my lab’s research focusing on true innovation and high impact.”

“We were just trying to address a puzzling issue among colleagues in our scientific field.”

Dr. Anton Iliuk, President,
Chief Technology Officer
of Tymora Analytical
Operations, LLC



Drs. Andy Tao and Anton Iliuk

Study Abroad Creates Lasting Memories



England, Spring

During Easter break of my semester in England, I was about to embark on a two week backpacking trip in Italy alone, and I was so nervous. I arrived in Venice, checked into my hostel and sat down for a second to gather myself, feeling a little overwhelmed. Just then two girls walked up and invited me to join them for dinner. I spent the next day and a half sightseeing Venice with them. It was so much fun and really bolstered my confidence for the entire trip. At every city, while I was entering and leaving alone, I met so many awesome people along the way and always found someone to hang out with.

Amanda Smith

Leading a group of students on a 19-day tour of Eastern Europe was both challenging and rewarding. The challenge – getting them to put down their smart phones and actually engage with their surroundings! The reward – seeing their eyes opened to a new culture and the realization that even though people may seem different on the outside, we are very much alike. The students most enjoyed hands-on experiences at the veterinary schools and teaching farms we visited, along with opportunities to interact with Ukrainian and Czech students. My favorite cultural experience was watching a performance by student and faculty singing and dancing groups in Lviv, Ukraine, followed by a lesson on how to make pysanky (Ukrainian Easter Eggs).

Sherry Pogranichniy, Undergraduate Program Administrator



Ukraine and Czech Republic, Maymester

When classes were finished, I spent a week in Mendoza, a province in western Argentina known for outdoor activities in the Andes Mountains and as one of the leading producers of wine in the Americas. I had the opportunity to tour several vineyards in the area by bike, learn about viticulture and production, and taste many of the famous Malbec wines from the area. This tour was one of my favorite memories of my time abroad!

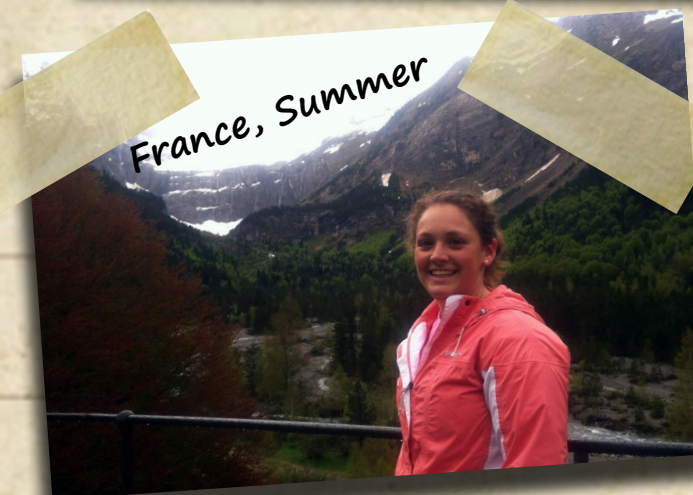
Erin Nicklow



Argentina, Summer

When I was abroad in Ireland, I went to the Dublin Horse Show. It was so awesome; the horses were jumping 7'3"!! I will miss the rural areas of Ireland the most. They are so beautiful and relaxing. It was a great experience where I not only learned a lot about the horse industry, but I also learned a great deal about another culture. Everyone should study abroad if they can!

Bethany Monroe



France, Summer

My favorite memory is when I travelled to a small fishing town in France with two of my French friends. We spent the weekend laughing, eating, and simply enjoying each other's company in a "typical" French environment. There was a beach with a castle on one side and a church on the other with mountains in the background and vineyards on the hillsides. The scenery was unforgettable.

Alexis Zobel

My host mother and I took a trip out of Madrid one evening to visit one of her favorite places – Castillo de Manzanares El Real. We spent the evening exploring the old castle and the quaint town, and stopped at a small café for coffee and biscocho. She told me stories of how she had spent her childhood in the town and how she met her husband there. That's probably my favorite memory because at that moment I realized how lucky I was to be able to study abroad for a summer, and to be able to understand people in another language.

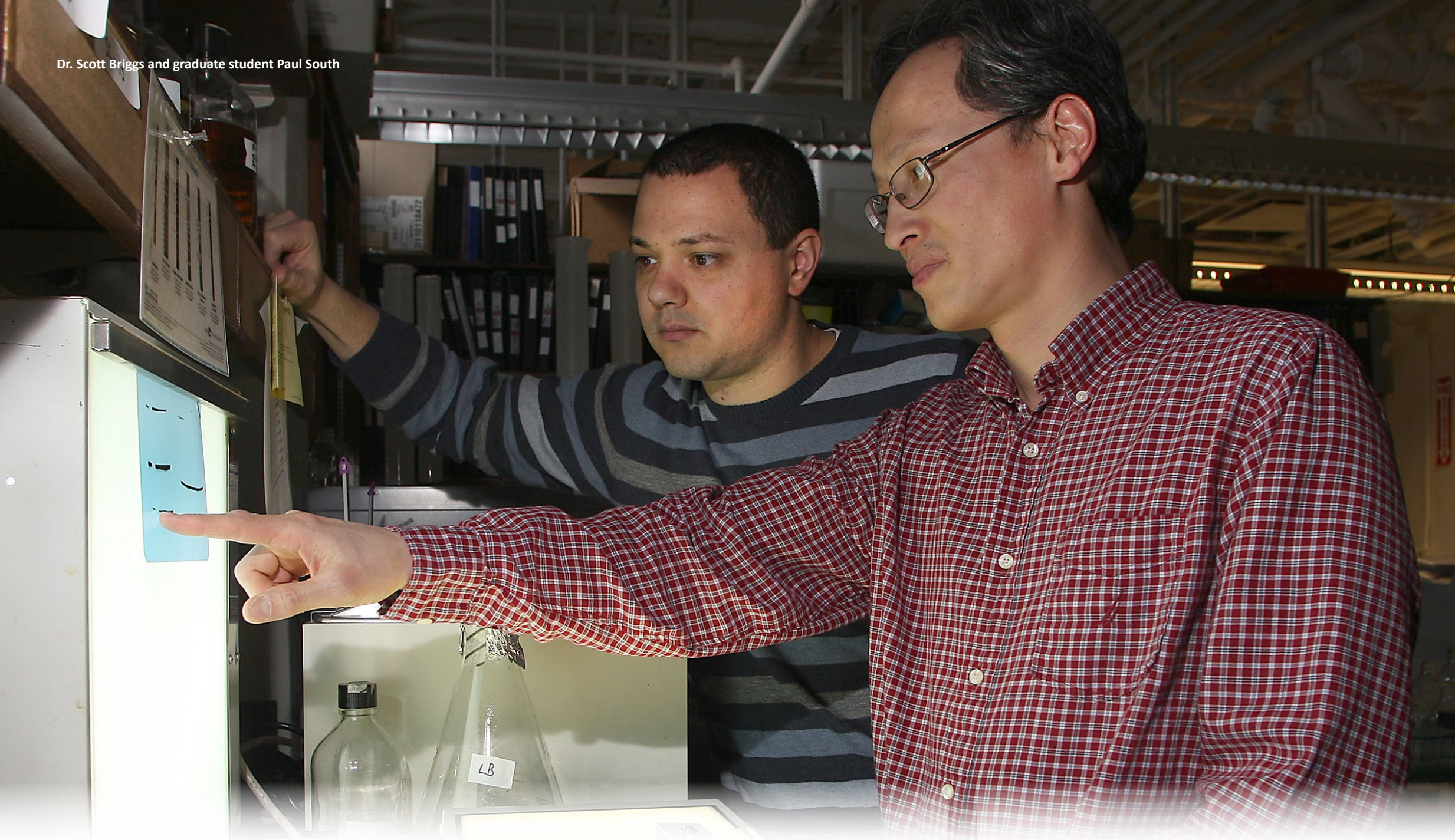
Cody Schnur



Ireland, Summer



Spain, Summer



Breakthrough Discovery Reveals Potential for New Anti-Fungal Drugs

Since its identification from gallstones in 1784, cholesterol has been extensively studied by scientists around the world and research on this topic has resulted in 13 Nobel Prizes. Cholesterol is an elaborate, but essential membrane molecule that requires over 30 enzymes for its synthesis. Because high levels of cholesterol are a major risk factor for heart disease, scientists and pharmaceutical companies are interested in identifying and developing drugs to reduce cholesterol levels. Statin inhibitors known to reduce cholesterol levels include clinically approved drugs such as Crestor, Lipitor, and Zocor. All of these drugs target and inhibit HMG-CoA reductase, an enzyme that plays a central role in the production of cholesterol and ergosterol, the yeast equivalent to cholesterol.

Work on the needed enzymes to make cholesterol was the long-time research focus of Emeritus Professor Victor Rodwell.

Rodwell's work centered on HMG-CoA reductase and his group was the first to purify the protein. Carrying on in this tradition of research and, coincidentally in Rodwell's former research laboratory, is Associate Professor Scott Briggs.

As often happens in research, Briggs did not set out to work on cholesterol metabolism. Over the past decade, the Briggs laboratory has been focusing on the molecular biology and biochemistry of histone methylation and histone methyltransferases. In particular, they study one of the proteins that catalyze this modification, the yeast histone methyltransferase, Set1. Until now, the physiological importance of the yeast Set1 remained elusive. This was probably because yeast cells lacking *SET1* are viable and do not have a major growth defect.

A major breakthrough came about when trying to determine why yeast lacking Bre2, a protein that associates with Set1, had a growth defect when treated with Brefeldin A, an antifungal drug. Analysis by Paul South, a graduate student at the time, determined that yeast lacking *SET1* also grew poorly when treated with Brefeldin A. South recalls, "Based on this growth defect, we thought that we had a clue what Set1 was doing in yeast."

"Our original hypothesis turned out to be incorrect," said Briggs, but then they recalled that yeast lacking the genes needed for ergosterol production also grow slower when treated with Brefeldin A. With this in mind, South took the initiative to determine if cells lacking *SET1* had reduced levels of ergosterol. This line of investigation turned out to be correct and led to the conclusion that Set1 was needed for proper ergosterol production and expression of genes necessary for the biosynthesis of ergosterol including HMG-CoA reductase.

"It is amazing how simple questions can lead you into new research directions. I would have never thought I would be studying the genes needed to produce cholesterol or ergosterol," said Briggs.

The work may even have a broader impact because an enzyme required for ergosterol production is a target of anti-fungal drugs. The Briggs lab is now studying whether yeast lacking *SET1* and other factors that modify histones are susceptible to these clinically-relevant anti-fungal drugs. If so, inhibiting Set1's methyltransferase activity may be another way to prevent the growth of pathogenic yeast or fight drug-resistant fungal infections. Further details of this work can be found in the February 4, 2013 edition of the *Proceedings of the National Academy of Sciences*.

How Are You Going to Change the World When You Leave Purdue?



Amjad Nasir
Graduate Student

I was born and educated in the Middle East and I know from my own experience that science has to be taught as more than science. I would like to use the training and education I received at Purdue University in biochemistry to promote science as a discipline that helps our societies, as a discipline that encourages critical thinking, teaches the language of the scientific method, and contributes to the global knowledge base.



Kayla Harmeyer
Graduate Student

After graduating, I plan to continue my career studying epigenetics. I am excited about where the field will take us in the next 10-20 years. I hope to make my mark by advancing what we know about how gene expression is controlled so that we have a better understanding of how transcriptional misregulation can lead to disease.



SungUn (Andrew) Huh
Graduate Student

Although millions of people over 60 are suffering from neurodegenerative diseases, the causes of these diseases are still not known. My main project was focused on Parkinson's disease. I hope to continue my research career as a postdoc studying not only Parkinson's disease, but also other neurodegenerative diseases, and I would like to help people suffering from these afflictions.



Brett Bishop
Graduate Student

Cancer does not discriminate. It affects everyone and finding its cure would greatly improve our world. As I leave Purdue, I feel equipped to ask questions that need to be asked to help find that cure. I know that I have acquired the necessary skills to answer some of those questions, which, in the end, will lead us to the goal of saving lives.



Christie Eissler
Graduate Student

Am I going to change the world by finding a cure for cancer or a treatment for Alzheimer's disease? Probably not. I am going to change the world by continuing to conduct basic science research with the same rigor and standards that I have learned while working on my Ph.D. By rigorously testing my hypotheses and always being critical of my data, I will continue to publish work that provides a deeper understanding of complex biological processes.



Nick Bonawitz
Senior Research Assistant

There are currently over 7 billion humans living on our planet. That number is conservatively predicted to increase by more than 2 billion by the mid-2040s. Only through unprecedented agricultural innovation can we possibly hope to avoid catastrophic shortfalls of food, fiber and energy. Upon leaving Purdue, I hope to secure a position in the agricultural biotechnology sector and seek new ways to shape plants to our needs and to more fully take advantage of the vast resources they offer.

Undergraduates Thankful for Donor Support



Graduate student Brett Bishop and undergraduate student Monica Bomber

The Department of Biochemistry is fortunate to attract some of the most talented students at Purdue. They are successful in the classroom, in the lab, and across campus. Although our students have been privileged to earn scholarships from the College of Agriculture, we have had fewer opportunities to recognize them with departmental scholarships. Luckily, the situation is beginning to improve thanks to new Biochemistry scholarships created in the past year through the Indiana Challenge Match. Former Purdue President France Córdoba instituted a program to increase the number of scholarships available to students in an effort to help them cope with rising tuition costs. The program offered one-time 1:1 matching funds derived through recent gains from university investments to create new scholarship endowments for Indiana students.

Our Biochemistry alumni and friends rose to the challenge, adding five new scholarship endowments through the Indiana Challenge Match program:

- Steve and Jane (B.S. 1992) Lavey Scholarship in Biochemistry and Agricultural and Biological Engineering
- Zhao-Herrmann Scholarship for Biochemistry, established by Jian-Mih Zhao (Ph.D. 1992, Herrmann) in honor of Emeritus Professor Klaus Herrmann
- Kwok Yip Tso Scholarship in Biochemistry, established by J.-Yun Tso (Ph.D. 1981, Zalkin) in honor of his late father
- David (B.S. 1978) and Mary Scheible Scholarship in Biochemistry
- Zygmunt Family Scholarship in Biochemistry, established by Deborah Zygmunt (B.S. 1977) and her mother Loretta in memory of Deb's father, Dr. Walter Zygmunt

Students in our program are extremely grateful for the scholarships they have received. "Quite honestly, without scholarships I would not have been able to attend Purdue. As an out-of-state student and the oldest of four kids, my parents let me apply to whichever schools I wanted, but told me a big factor in the final decision would be scholarship support," said Emma Lendy, a sophomore. "Without scholarships I wouldn't have been able to do as well in my classes. Because of the funding I have received, I have been able to dedicate myself more to my studies," said senior Monica Bomber.

The department feels very fortunate to have such passionate alumni and friends who give generously to support our students. The students in turn appreciate what our donors are giving them. "I do not know if all donors realize how much of a blessing their generosity is," said Lendy. Senior Erin Nicklow shared a similar perspective, "I have enjoyed having the opportunity to meet some of the donors who have made contributions to scholarships I

received. I am so grateful for their generosity and the opportunities these scholarships will provide me in the future."

Many students attribute part of their success to their scholarships. "Receiving help to pay for tuition has been a huge component of my success at Purdue," said Nicklow. "The scholarships I have received have enabled me to attend Purdue and receive a great education," said Lendy. Senior Alexis Zobel reported, "All of my scholarships have helped take the stress of paying for school off my shoulders so I can focus more on studying and learning." Zobel also has had the opportunity to study abroad twice, which she's sure would not have been a possibility without scholarship support.

One student even stated that her scholarships are not only helping her, but also are allowing her to make a difference in other students' lives. "Scholarships have allowed me to put more time into being a Resident Assistant. It has allowed me to affect the lives of other undergraduates as they start learning how to be successful college students," said Bomber.

Emma Lendy had a simple message to our donors that surely reflects the feelings of all scholarship recipients, "Thanks to the generosity of Purdue and the scholarship donors, I'm proud to say I will be a Purdue alumna."

We echo our students' appreciation, and thank all of the generous donors to the Department of Biochemistry who make an impact on not only our undergraduates, but also on our graduate students, faculty, and staff.

If you would like more information about how you can give to the Department of Biochemistry, please contact Kyle Bymaster, Director of Development for the College of Agriculture at bymastkd@purdue.edu or by phone at 765-494-8158.



Recipients of the 2013-2014 Zygmunt Family Scholarship:
L-R: Emily Erickson, Moriah Massafaro and Alexis Zobel

biochemistry aliquots

Research Assistant **Sara Cloutier** (Tran lab) received “Paper of the Week” honors from the July 27 issue of the *Journal of Biological Chemistry*. Articles selected for this honor are considered by the editors to be in the top one percent of articles reviewed in a year in terms of significance and overall importance.

Associate Professor **Andy Tao** was selected to serve as one of two scholars for the 2012-2013 Entrepreneurial Leadership Academy. With this honor he received \$15,000 from the Burton D. Morgan Center for Entrepreneurship at Purdue.

The Biochemistry Club received a \$1,500 grant from the Purdue Office of Engagement Student Grant Program for Community Service/Service Learning Projects for their project titled, “Biochemistry Club Community Outreach.” Contributors to the proposal were undergraduate students **Will Beyer**, **Erin Nicklow** and **Gabriel Rangel**.



Purdue iGEM Team

The Purdue iGEM (International Genetically Engineered Machine) Team, including Biochemistry undergraduate students **Amanda Shanly** (ABE & BCHM), **Gordon Showalter** (ABE & BCHM), **James Nolan** (ABE & BCHM) and **Peter Mercado-Reyes** (BCHM), won gold medal standing at the iGEM 2012 Americas East Regional Jamboree in Pittsburgh on October 12-14, 2012.

Four alumni returned to campus as guest speakers in BCHM 39000 (Professional Development Seminar). **Andrew Riebe** (B.S. 2007) earned his Doctor of Veterinary Medicine degree from Purdue in May 2011. **Chris Sinclair** (Ph.D. 1999, Rossie) is a business excellence manager with Abbott Laboratories. **Anton Iliuk** (Ph.D. 2011, Tao) serves as President and Chief Technology Officer of Tymora Analytical Operations, LLC. **Nicole Sigurdson** (B.S. 2009) is currently an Intellectual Property Attorney at Dinsmore & Shohl, LLP, in Cincinnati, OH.



Drs. Ann Kirchmaier and Amy Lossie (Animal Sciences)

Associate Professors **Ann Kirchmaier**, **Xiaoqi Liu** and **Andy Tao** were honored with Seed for Success awards sponsored by the Office of the Vice President for Research for their efforts in obtaining research grants worth \$1 million dollars or more.

Biochemistry senior **Gabriel Rangel** received a Howard Hughes Medical Institute Gilliam Fellowship for Advanced Study, which provides full support for up to four years of study towards a Ph.D.

Timothy Adams (B.S. 1982) was the 2013 Distinguished Ag Alumnus for the Department of Biochemistry. Undergraduate **Kayleigh Nyffeler** was his citation reader during the convocation. Adams retired from the U.S. Army as a Brigadier General in 2012 after a distinguished 33-year military career and is currently an independent consultant.

Biochemistry junior **Erin Nicklow** was selected a new member of Purdue University’s Barbara Cook Chapter of Mortar Board. As a national honor society for senior students, Mortar Board focuses on scholarship, leadership, and service. The Purdue chapter annually selects 40 of the university’s top rising seniors for membership.

Undergraduate **Peter Mercado-Reyes** was one of the first recipients of the Roger Blalock Emerging Leader Award at Purdue.

Dr. Fred Winston from the Department of Genetics at Harvard Medical School presented the 2013 Bernard Axelrod Lectures.

Dr. Robert Roeder from The Rockefeller University presented the 2012 Beach Lectures.

Postdoctoral Associate **Jeong Im Kim** (Chapple lab) received the “ART of C3Bio” award for 2012 for her research

efforts in the area of bioenergy production.

The 2013 Henry A. Moses Award went to **Ji Chen** (Golden lab) for his first-author paper, “Identification of the catalytic Mg²⁺ ion in the hepatitis delta virus ribozyme,” published in *Biochemistry*.

Graduate student **Whitney Dolan** (Chapple lab) received a \$1,000 Professional Grant from the PGSG (Purdue Graduate Student Government) and a \$1,000 stipend from Cold Spring Harbor to attend the 2012 Cold Spring Harbor course on Eukaryotic Gene Regulation.

Christie Eissler (Hall lab) was awarded a Bilsland Dissertation Fellowship for 2013-14 from the Purdue Graduate School for support in her final semester. She plans to graduate in December. Christie was also the recipient of the 2013 Arnold K. Balls Award. This award is given annually to a graduate student who demonstrates outstanding research potential, scholarliness and intellectual curiosity.

Kit Ma (Tran lab) was the first recipient of the Henry Weiner Travel Award. He traveled to Devos, Switzerland to give an oral presentation at the 18th Annual Meeting of the RNA Society.

Amjad Nasir (Forney lab) and **Li Pan** (Tao lab) received Beach Travel Awards. Li attended the FASEB Conference, Protein Kinases & Protein Phosphorylation in Niagara Falls, NY, and presented a poster. Amjad attended the FASEB Ciliate Molecular Biology Conference in Steamboat Springs, CO, and presented a poster.



Brendan Powers

The recipient of the 2013 Hickory Stick Award for Outstanding Teaching Assistant was **Brendan Powers** (Hall lab) for his work in BCHM 30900 (Biochemistry Laboratory).

Nina Serratore (Briggs lab) received a 2013 Purdue Research Foundation (PRF) Research Grant provided by the College of Agriculture and the Office of the Vice President for Research. The award recognized Nina’s research and teaching accomplishments.



Greg Forney

Biochemistry senior **Greg Forney** won second place in the student division of Purdue University’s Elevator Pitch Competition hosted by the Certificate in Entrepreneurship and Innovation Program. The competition gives participants two minutes to describe the value of their entrepreneurial business venture to a panel of judges.

Kristi Trimble (Administrative Assistant) received a College of Agriculture Administrative/Professional Advancement for excellent performance. She joins other professional staff in the department in rank 6, which is the highest rank in the program.

Professor **Jim Forney** received a 2013 Trustee Teaching Award from the Indiana University School of Medicine for his efforts as instructor of medical biochemistry at the Indiana University School of Medicine-Lafayette Center.

Gabriel Rangel was named Outstanding Senior of 2013 in the College of Agriculture after also winning the honor as a freshman, sophomore and junior – a first in the history of this recognition. **Emily Erickson** won Outstanding Sophomore honors. **Erin Morrison** was Biochemistry’s nominee for Outstanding Freshman and **Erin Nicklow** was the nominee for Outstanding Junior.

Senior Research Associate **Nick Bonawitz** (Chapple lab) received the 2013 Senior Researcher Award from the Department of Biochemistry given annually to recognize outstanding research accomplishments in the lab.

University and College Scholarships 2012-2013

Agriculture Research Fund Scholarship

Rene Arvola, Weize Huang, Kayleigh Nyffeler, Gabriel Rangel, Kimberly Tyler and Michael Wenndt

Emerging Urban Leaders Scholarship

Peter Mercado-Reyes

Ernest & Eva Voliva Memorial Scholarship

Caoilin Hoctor

Floyd E. & Nellie P. Elliot Scholarship

Kathryn Micon

Food, Environment, Engineering and Life Science Scholarship

Patrick Mangan and Misha Remy

Fred and Lynn Hartman Scholarship

Antonia Hur

Gruel Memorial Scholarship

Taeyong Ahn, Kathryn Alleva, Elizabeth Baker, Lotti Brose, Kyle McCarthy, Kayleigh Nyffeler, Gabriel Rangel and Amanda Smith

Henry William and Matilda Marie Sailer Schroeder Memorial Scholarship

Caoilin Hoctor

Joseph S. Dawson and Klaus M. Herrmann Award

Emily Erickson

Kelly and Margaret O'Neill Scholarship

Stephen Dilk, Moriah Massafaro, Ashley Ochs, Coleen Riley, Mackenzie Schultz and Alexis Zobel

Leonard B. Clore Scholarship

Benjamin Walker

Lewis Runkle Scholarship

Elizabeth Baker, Monica Bomber, Jaclyn Goodman and Mercedes LaLand

Lloyd and Gene Sellers Scholarship

Adam Fessenden

Marquis Scholarship

Moriah Massafaro, Jenna Post, Madeline Powell, Mackenzie Schultz, Anna Trotter, Brook Wamsley and Alexis Zobel

Marquart Alumni Scholarship

Madeline Powell, Kayleigh Nyffeler and Sam Schaffter

Mauri Williamson Scholarship for Excellence in Agriculture

Quinton Nannet

Presidential Scholarship

Iris Archer, Lotti Brose, Aaron Bulger, Ryan DeBusk, Breanna Frailey, Emma Lendy, Ryan Louer, Patrick Mangan, Kaitlyn Martin, Erin Morrison, James Nolan, Hannah Pizzato, Kyle Robinson, Cody Schnur, Amanda Shanley and Elizabeth Ziga

Rex Hall Memorial Scholarship

Iris Archer, Mitchell Ayers, Elizabeth Bell, Monica Bomber, Aaron Bulger, Emily Erickson, Adam Fessenden, Jessica Gabbard, Caoilin Hoctor, Molly Johnson, Alexander Kosiak, Mercedes LaLand, Ryan Louer, Moriah Massafaro, Ashley Ochs, Courtney Orme, Hannah Pizzato, Kyle Robinson, Sam Schaffter, Cody Schnur, Yu Xue and Alexis Zobel

Scholarship Award of Excellence

Jenna Post, Madeline Powell, Christina Smith, Brook Wamsley and Corinne Wilschke

Science Bound Scholarship

Mercedes LaLand

Study Abroad Scholarship

Erin Nicklow, Brittney Offenberger, Amanda Smith and Alexis Zobel

Trustees Scholarship

Elizabeth Baker, Elizabeth Bell, William Beyer, Michael Busche, Jessica Gabbard, Alexander Kosiak, Kayleigh Nyffeler, Gabriel Rangel, Sam Schaffter, Amanda Smith, Jessica Wade and Michael Wenndt

Van Scoy Scholarship

Misha Remy

Walter Pugsley Scholarship Fund

Amanda Smith

Departmental Scholarships 2012-2013

Edwin T. Mertz Memorial Scholarship

Kathryn Alleva, Emily Erickson, Moriah Massafaro, Erin Nicklow, Kimberly Tyler and Michael Wenndt

Patrick C. Matchette Scholarship

Elizabeth Bell and Emma Lendy

Ray W. Fuller Memorial Scholarship

Lotti Brose and Kayleigh Nyffeler

2013 Ph.D. Graduates

Michelle Drennan

Heather Hutchens
Next Stop: Agricultural Microbiologist
Sate of NC Department of Agriculture
Raleigh, NC

Xiaoxiao (Shawn) Liu

Next Stop: Postdoctoral Research
Stanford University, Stanford, CA

Paul South

Next Stop: Postdoctoral Research
University of Illinois, Champaign-Urbana, IL

2013 B.S. Graduates

Kathryn Alleva

Next Stop: Podiatry Student
Rosalind Franklin University

Kristy Anderson Ghere

Rene Arvola
Next Stop: Ph.D. Student
University of Michigan

Elizabeth Baker

Next Stop: Intern
Dow AgroSciences

Lotti Brose

Next Stop: Ph.D. Student
University of California-Santa Cruz

David Cockell

Greg Forney

Weize Huang

Next Stop: PharmD./Ph.D. Student
University of Washington-Seattle

Keely Hughes

Next Stop: Surface Warfare Officer
United States Navy

Ha Un Kim

Kathryn Micon

Christina Millhouse

Kayleigh Nyffeler

Next Stop: Lab Technician
Department of Biochemistry, Purdue University

Gabriel Rangel

Next Stop: Ph.D. Student
Harvard University

Amanda Smith

Next Stop: Medical Student
Indiana University School of Medicine

Xinran Sun

Next Stop: Graduate Student
Cornell University

Anna Trotter

Next Stop: Vet Tech Student
Purdue University

Kimberly Tyler

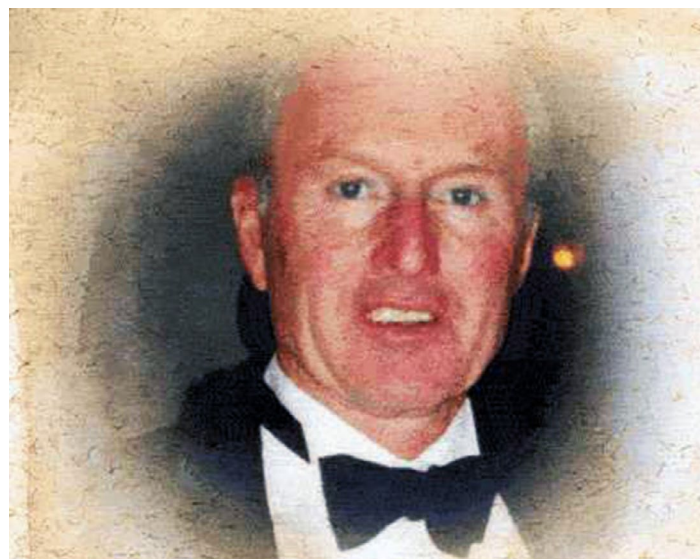
Next Stop: Ph.D. Student
University of Wisconsin-Madison

Benjamin Walker

Next Stop: Ph.D. Student
Indiana University

Michael Wenndt

Next Stop: Ph.D. Student
University of Texas, Austin



Frank Bell (Ph.D. 1968, Quackenbush) passed away on September 2, 2012, at the age of 73. Frank was born in 1939 and at the age of 13, he met his future wife Mary Evelyn Harris. Frank and Mary Evelyn were friends for years, and didn't start dating until after Mary Evelyn's graduation from high school in 1957. Frank graduated from Pickering High School a few years later in 1960, and didn't waste any time proposing! They were married on July 9, 1960.

After high school, Frank went on to study biochemistry at the Ontario Agricultural College, part of University of Toronto, as an undergraduate and later completed his Ph.D. at Purdue University. In 1976, Frank and his family moved to Vicksburg, MI, and he found work as a biochemist at the Upjohn Company. He was a loyal employee at Upjohn for over nineteen years until his retirement in 1996, at the age of 57.

In his golden years, Frank loved nothing better than spending time with his grandchildren. In his free time, Frank was a dedicated tinkerer. His projects ranged from clocks and watches to old furniture and even muscle cars – he helped his sons put together a car for each year they were born! He was also active in the National Association of Watch & Clock Collectors (NAWCC), where he enjoyed talking shop with his sons and other collectors.

Frank is survived by his wife of 52 years, Mary Evelyn; his sons, Thomas Bell of Yardley, PA, Matthew Bell of Hickory Corners, MI, and James Bell of Armada, MI; and his grandchildren, Anthony, Dmitry, Joanna, Katie, Marlena and Zbigniew. He was preceded in death by his sister, Marilyn.



Kevin Donohue (B.S. 2007) passed away unexpectedly on June 10, 2013, at the age of 28. Kevin spent his childhood years growing up in Jamestown, NY, before he and his family moved to Terre Haute in 1999. He graduated from Terre Haute South Vigo High School in 2003 and earned his B.S. in biochemistry from Purdue in 2007. He then went on to IU

PUI where he earned an M.S. in biology. Upon graduation, Kevin worked for Immune Works in Indianapolis, IN, where he did COPD drug research. While most recently residing in Brownsburg, Kevin had just completed his first year of law school at Robert H. McKinley School of Law in Indianapolis. He worked part time at Reichel IP in Indianapolis. His desire was to become a patent attorney upon graduation in 2015. Kevin is survived by his parents, James and Emily Donohue; brother Patrick and sister Kelly.



James Groarke (Ph.D. 1984, Hermodson) passed away of a heart attack on June 7, 2013, at the age of 58. James was born in New York City and was recognized as a leading authority on baculovirus protein expression. He was a Chief Scientist for Biortus Biosciences in China and a partner with James von Stein in Groarke von Stein, LLC, a consulting company in San Diego, CA. Dr. Groarke is survived by his partner Brendon Connors of New York City.



Thelma Williams (staff 1972-1987) passed away on January 9, 2013, at the age of 90. Thelma was born in 1922, in Wolcott, IN. She graduated from Wolcott High School and Schreiber's Beauty School, both in 1941. In 1951 she married Kenneth L. Williams in Lafayette. Thelma owned William's Beauty Shop for 30 years and then worked for 15

years in the Department of Biochemistry at Purdue University in the dishwashing facility before retiring in 1987. Thelma was a member of Congress Street United Methodist Church and enjoyed spending time with family, flower gardening, her cats and reading.

Thelma is survived by a son, Alan Williams of Lafayette; a daughter, Lisa Mattox of Columbia, MO; two grandchildren, Brett and Kristy Mattox; and a sister-in-law, Norma Jean Danaher of West Lafayette. She was preceded in death by two infants Holly Ann and Corey Lynn and her husband Kenneth.

until she retired in 2008. She was the department chair from 2000-2006. Ellen is enjoying her retirement and continues to reside in Washington, D.C.

Robert Rucker (Ph.D. 1969, Parker) was recently inducted into Purdue's Nutrition Science Hall of Fame for his career contributions in the field of nutrition, in particular activities associated with the American Society of Nutrition and 50 years of research in the area of nutritional biochemistry. He has been a faculty member at the University of California-Davis since 1970 and has served as the chair or vice-chair of the Nutrition department and in various positions in the graduate program in Nutritional Biology at UCD. In addition to Nutrition, he held appointments in Biological Chemistry and Endocrinology in the UCD Medical School. He retired from Davis in 2008, but maintains an active research program. He also remains active with his principle hobby, music performance, and is a member in several community orchestras. Robert and his wife Margaret, who is the chair of the Textiles and Clothing program at UCD, reside in Davis.

1970

Dale Deutsch (Ph.D. 1972) continues his career in the Department of Biochemistry and Cell Biology at Stony Brook where his lab researches FAAH (fatty acid amide hydrolase) and the anandamide FABP (fatty acid binding protein) transporter.

John Zysk (Ph.D. 1978, Whistler) has worked in academe and industry during his career. He did his postdoctoral research at the University of North Carolina, Chapel Hill and St. Jude Children's Hospital and then joined the faculty at the University of Virginia, School of Medicine for five years. He then had a long tenure as a senior and principal scientist in drug discovery at Wyeth in Princeton, NJ; Cephalon in West Chester, PA; and AstraZeneca in Wilmington, DE. He has been an associate professor at Lincoln University of Pennsylvania in the Department of Chemistry for the past two years. Much of his work has involved drug discovery for neurological disorders including Parkinson's disease and schizophrenia. He enjoys traveling, pursuing amateur astronomy and long distance running. He and his wife Maggie reside in Chesapeake City, MD.

Daniel Walker (Ph.D. 1979, Axelrod) spent the past five

alumni updates

1950

Ken Kirby (Ph.D. 1958, Whistler) and his wife Bernice continue to live in Cedar Rapids, IA. Ken reports that he successfully passed his 90th birthday on July 1, 2013.

1960

Ellen Henderson (B.S. 1966 and Ph.D. 1971, Zalkin) took a Jane Coffin Childs postdoctoral fellowship at the University of Edinburgh, Scotland after graduation. She joined the faculty of MIT as assistant professor in the Department of Chemistry in 1974. Ellen then moved to Washington, D.C., in 1980 when she joined the faculty in the Department of Biology at Georgetown University where she remained

years living in Sweden. He returned to the U.S. in 2012 and is now living in the St. Louis, MO, area. Earlier this year, one of the Swedish pharmaceutical companies that he co-founded (Premacure AB) was sold to Shire Pharmaceuticals. Dan is still active with Swedish pharmaceutical companies as a co-founder of ParkCell AB, working on a novel treatment for Parkinson's disease, and as a co-founder and CEO of Global Pharmaceuticals Development, Inc., a drug delivery company. He is also invested in a couple of local St. Louis companies, so his time is spent working in various capacities for all of these companies.

1980

Dan Lebryk (B.S. 1984) took early retirement in May 2013 after a 28-year career with Kraft Foods in Quality and Research. His wife Dianne continues to teach environmental science at Lane Tech High School in Chicago. Their eldest son Paul graduated from Knox College with a B.S. in physics in 2013 and their youngest son Anthony will be a senior in high school and plans to pursue business in college.

Scott Williams (B.S. 1984) was named the Associate Head of the School of Chemistry and Materials Science at Rochester Institute of Technology in August 2013.

2000

Sarah Batta (B.S. 2008) worked for the Peace Corps as a health education specialist in Mali, West Africa, from June 2009 to April 2012. In fall 2012, she began working towards a Master in Public Health degree specializing in Health Education and Communications with a dual concentration in Maternal and Child Health at Tulane University in New Orleans. She hopes to graduate in May 2014.

Hai-Ning Du (Postdoc 2006-2011, Briggs) still lives in Wuhan, Hubei province in China where he continues his faculty position in the College of Life Sciences at Wuhan University. He has established his own laboratory and now has four graduate students. His wife Jing Zhao also works at Wuhan University in the Economics and Management School. Their two children are growing – Alex completed 1st grade and Allison is 2.

Ayesha Elias (Ph.D. 2009, Rossie) will be finishing her fourth year postdoctoral assignment at St. Jude in December 2013.

Ian Fingerman (Postdoc 2004-2009, Briggs) is living in Alexandria, VA, and continues to work for the NIH, National Center for Biotechnology Information (NCBI) in Bethesda, MD, moving from curator and content manager to lead scientist and team leader of the Epigenomics database project (a new resource created to serve as a comprehensive public resource for whole-genome epigenetic data sets). He has published two papers on the database since it was released in the spring of 2010; is involved in outreach for the project; occasionally teaches through the Foundation for Advanced Education in the Sciences (FAES) program; and gives a few invited lectures each semester. Ian is recently engaged and plans to wed his fiancée, Carolyn Whitton in June 2014.

Minjie Guo (Postdoc 2005-2007, Tao) began working at Sundia MediTech Co., Ltd., a leading Shanghai-based pharmaceutical and biotech R&D out-sourcing company, in April 2013 as a senior chemist.

Jim Henderson (Ph.D. 2006, Ogas) moved on from his position as Coordinator of Teaching Labs in the biochemistry department at Purdue in July 2012. He is now an account manager with EMD Millipore covering Indiana and Southern Illinois.

Michael Kalwat (B.S. 2007) received his Ph.D. from the Biochemistry and Molecular Biology program at the Indiana University, School of Medicine in September 2012. He is currently researching MAP kinase signaling as a postdoctoral fellow in Dr. Melanie Cobb's lab at the University of Texas-Southwestern in the Department of Pharmacology. He and his wife Danielle reside in Irving, TX.

Anthony Nguy-Robertson (B.S. 2003) received his Ph.D. in Natural Resources from the University of Nebraska-Lincoln in July 2013. He is doing his postdoctoral work at the university in the School of Natural Resources working on projects studying carbon fluxes in maize and soybean; and using remote sensing to identify the risk of an outbreak of wheat mosaic virus due to hail damage. He and his wife Karen are proud parents of a son Jacoby who was born November 26, 2012.

Efrain Sanchez-Ortiz (Ph.D. 2009, Rossie) is doing his fourth year of postdoctoral work at the University of Texas Southwestern Medical Center. He was married on December 26, 2010, to his wife Melissa in her home town of Ponce, Puerto Rico. The couple met during their graduate careers at Purdue. Melissa received her Ph.D. in MCMP in

2008 and she is a postdoc in the Department of Psychiatry at UT Southwestern. The couple welcomed the birth of twin girls (Valeria Leah and Sofia Leanne) on July 26, 2013.

Jake Stout (Ph.D. 2007, Chapple) completed a research associate position with the National Research Council of Canada in April 2013. He has started a company, Plant Analytics Canada, which will provide quality control testing services for the new medical marijuana system currently being implemented in Canada. He has also accepted an assistant professor position in the Department of Biology at the University of Manitoba, which will commence in July 2014.

Emily Sturm (B.S. 2009) received her M.D. from the IU School of Medicine in May 2013. She began her 5-year residency in General Surgery at the Southern Illinois University in Springfield on June 25, 2013.

Jing-Ke Weng (Ph.D. 2009, Chapple) will leave the Salk Institute and move to Massachusetts where he will join the faculty at the Whitehead Institute and the Department of Biology at MIT as assistant professor in October 2013.

Michelle Weyreter Schumm (B.S. 2009) graduated from the PharmD program at Purdue in May 2013. She is now working as a pharmacist for Kroger in the Indianapolis, IN area.

I-Mei Yu (Ph.D. 2007, Jue Chen) finished her postdoctoral appointment at Princeton University in March 2012. In April of 2012 she moved to Paris, France to begin her second postdoctoral position at Institut Curie in the subcellular structure and cellular dynamic unit to work on the function and structures of motor proteins and their regulators. I-Mei received a two-year Marie Curie Senior postdoctoral fellowship (Marie Curie IIF) that will begin in November 2013.

2010

Jason Markovich (B.S. 2011) completed his second year at DePaul University College of Law in Chicago. While he started out with a focus on patent law, he worked this summer with the Cook County Public Defender's office and will begin pursuing a career in criminal law.

Juan Martinez (Ph.D. 2011, Hall) is in his third year of postdoctoral research at the Institut Curie in Paris, France, in the Genotoxic Stress & Cancer Unit. He and his wife Valezka have adapted to the culture and language and they are enjoying their time in France very much. When they are not at work, they appreciate all that France has to offer with the wonderful museums, restaurants, and historic sites.

Follow us on  acebook and Linked  for up-to-date news and events



grants

Scott Briggs, Purdue Center for Cancer Research SIRG Award, \$17,287, 07/01/2012-06/30/2013, "Investigating the biochemical and biological role of histone demethylases in the MAP kinase signal transduction pathway."

Scott Briggs (Co-PI), Purdue Center for Cancer Research, \$10,000, 05/01/2013-12/31/2013, "A new way to control cholesterol accumulation in prostate cancer."

Clint Chapple (PI), **Natalia Dudareva** (Co-PI), U.S. Department of Energy, \$5,274,045, 09/01/2012-08/31/2017, "Modeling and manipulating phenylpropanoid pathway flux for bioenergy."

Clint Chapple (Co-PI), U.S. Department of Energy, \$15,074,138, 08/01/2009-07/31/2014, "Center for catalytic conversion of biomass to bioenergy."

Clint Chapple, U.S. Department of Energy, \$453,478, 09/01/2011-08/31/2014, "Regulation of carbon allocation to phenylpropanoid metabolism."

Clint Chapple, National Science Foundation, \$553,626, 08/01/2011-07/31/2014, "Arabidopyrones: a new group of specialized plant metabolites from Arabidopsis."

James Forney, National Science Foundation, Research Experiences for Undergraduates (REU), \$231,589, 01/15/2012-01/31/2015, "REU Site: Molecular and biochemical analysis of proteins."

James Forney (Co-PI), Howard Hughes Medical Institute, \$1,500,000, 09/01/2010-08/31/2014, "Deviation from the standard: Integrating statistical analysis and experimental design into life science education."

Barbara Golden, Purdue University Vice Provost for Undergraduate Academic Affairs and the College of Agriculture, \$17,060, 02/01/2013-06/30/2013, "Three-dimensional printing for molecular visualization."

Barbara Golden, Case Western Reserve University/National Institutes of Health, \$80,000, 04/01/2009-03/31/2013, "Characterizing RNA-metal binding by Raman spectroscopy."

Barbara Golden, National Institutes of Health, \$1,602,836, 01/01/2011-12/31/2015, "Coupling of structure and dynamics in RNA catalysis."

Barbara Golden, National Institutes of Health, \$126,256, 28 | 2012 - 2013 issue

05/15/2012-05/14/2013, "Quantitative imaging for biochemistry."

Mark Hall (Co-PI), National Science Foundation, \$604,999, 12/15/2011-11/30/2013, "TRPGR: Novel quantitative proteomic methods to discover and localize endogenous protein complexes."

Mark Hall (Co-PI), AB SCIEX Young Investigators Grant Program Award, \$525,000, 11/01/2012-04/30/2013, "Acquisition of a 5600+ Triple TOF LC-MS/MS proteomics system."

T. Joseph Kappock (Co-PI), University of Illinois, Chicago – Department of Defense, \$3,274,978, 02/11/2011-11/10/2012, "Broad-spectrum antibiotic against category A agents."

Ann Kirchmaier, National Science Foundation, \$298,298, 09/01/2009-08/31/2012, "Single molecule tools for evaluating histone modifications in single living cells."

Ann Kirchmaier, Clinical and Translational Sciences Institute (CTSI), \$8,000, 01/01/2011-08/31/2013, "Bioinformatics for mapping genomic sites of 5-hydroxymethylcytosine, a novel CpG modification catalyzed by the MLL partner TET1 protein family."

Ann Kirchmaier, National Science Foundation, \$261,581, 09/15/2011-08/31/2013, "Replication-coupled chromatin assembly and epigenetic processes in *S. cerevisiae*."

Ann Kirchmaier (Co-PI), W.M. Keck Foundation, \$1,000,000, 03/01/2012-02/28/2015, "Live single cell epigenetic profiling and regulation at single molecule resolution."

Ann Kirchmaier (Co-PI), National Science Foundation, \$300,000, 09/01/2012-08/31/2014, "Single cell quantification of splice variants and epigenetic regulation of splicing."

Ann Kirchmaier, Office of the Vice President for Research Laboratory Research Equipment Program, Nurturing and Advancing Purdue's Research Enterprise, \$53,738, 11/01/2012-05/31/2013, "Acquisition of QIAgility instrument."

Xiaoqi Liu, American Cancer Society, \$720,000, 01/01/2013-12/31/2016, "Plk1 in UV-induced melanoma formation."

Xiaoqi Liu, National Institutes of Health, National Cancer Institute, \$752,542, 09/01/2011-08/31/2014, "Plk1 in chemo-resistance of cancer."

Xiaoqi Liu, National Science Foundation, \$570,000, 03/01/2011-02/28/2014, "Plk1 in DNA replication."

Joe Ogas, National Science Foundation, Research Experiences for Undergraduates (REU) Supplement, \$12,000, 05/17/2010-08/31/2012, "Dissecting the relationship between a CHD3 chromatin remodeler and the repressive epigenetic mark H3K27me3 in Arabidopsis."

W. Andy Tao, National Science Foundation, \$541,593, 07/01/2007-06/30/2013, "CAREER: Soluble nanoparticles for targeted proteomics in vitro and in living cells."

W. Andy Tao (Co-PI), National Institute of Food and Agriculture, U.S. Department of Health and Human Services, \$970,300, 01/15/2010-01/14/2013, "The interactome of pathogenicity factors in the rice blast fungus *Magnaporthe oryzae*."

W. Andy Tao (Co-PI), National Institutes of Health, U.S. Department of Health and Human Services, \$1,118,554, 09/01/2011-05/31/2015, "Identification of protein-metabolite interactome."

W. Andy Tao, National Institutes of Health, Center for Research Resources, \$560,357, 03/01/2009-03/28/2013, "Proteomic studies of dendrimer-based nanomedicines."

W. Andy Tao (Co-PI), National Institutes of Health, Center for Research Resources, \$537,489, 08/09/2010-05/31/2013, "Paper spray ionization mass spectrometry device for direct analysis of biofluid samples."

W. Andy Tao, National Institute of General Medical Sciences, U.S. Department of Health and Human Services, \$1,596,250, 09/01/2010-08/31/2015, "New proteomic technologies for the analysis of tyrosine kinase signaling pathways."

W. Andy Tao (Co-PI), National Institutes of Health/National Institute of General Medical Sciences, \$850,180, 09/01/2012-08/31/2015, "Chemical approaches for detecting S-nitrosothiols."

Anton Iliuk (PI) and **W. Andy Tao** (Co-PI), National Institutes of Health Small Business Innovation Research Phase I, \$150,000, 09/01/2012-02/28/2014, "Multiplexed

detection and imaging of protein phosphorylation based on soluble nanoparticles."

Anton Iliuk (PI) and **W. Andy Tao** (Co-PI), National Institutes of Health Small Business Innovation Research Phase I, \$300,000, 09/01/2012-08/31/2014, "Novel soluble nanoparticles for enrichment of low abundant phosphoproteins."

Anton Iliuk (PI) and **W. Andy Tao** (Co-PI), National Science Foundation Small Business Innovation Research Program, \$500,000, 02/15/2013-02/14/2015, "Development of novel dendrimer-based technologies for phosphorylation analyses Phase II."

Elizabeth Tran, National Institute of General Medical Sciences, U.S. Department of Health and Human Services, \$1,328,587, 04/11/2011-03/31/2016, "The role of DEAD-box proteins in gene expression."

Vikki Weake, Indiana CTSI Purdue Project Development Team, \$10,000, 06/19/2013-06/18/2014, "Proteomic identification of SAGA substrates relevant to SCA7."



Graduate student Ben Carter

2012

Weng, J.-K., Y. Li, H. Mo and **C. Chapple**. 2012. Assembly of an evolutionarily new pathway for α -pyrone biosynthesis in *Arabidopsis*. *Science* **337**: 960-964.

Lee, S., Y. Kaminaga, B. Cooper, E. Pichersky, **N. Dudareva** and **C. Chapple**. 2012. Benzoylation and sinapoylation of glucosinolate R-groups in *Arabidopsis*. *Plant J.* **72**: 411-422.

Qualley, A.V., J.R. Widhalm, F. Adebessin, C.M. Kish and **N. Dudareva**. 2012. Completion of the core β -oxidative pathway of benzoic acid biosynthesis in plants. *Proc. Natl. Acad. Sci. U.S.A.* **109**: 16383-16388.

Muhlemann, J.K., H. Maeda, C.-Y. Chang, P. San Miguel, I. Baxter, B. Cooper, M.A. Perera, B.J. Nikolau, O. Vitek, J.A. Morgan and **N. Dudareva**. 2012. Developmental changes in the metabolic network of snapdragon flowers. *PLoS ONE* **7**: e40381.

Yang, Z., S.U. Huh, J.M. Drennan, H. Kathuria, J.S. Martinez, H. Tsuda, **M.C. Hall** and **J.C. Clemens**. 2012. *Drosophila* Vap-33 is required for axonal localization of Dscam isoforms. *J. Neurosci.* **32**: 17241-17250.

Mullins, E.A. and **T.J. Kappock**. 2012. Crystal structures of *Acetobacter acetii* succinyl-Coenzyme A (CoA): acetate CoA-transferase reveal specificity determinants and illustrate the mechanism used by class I CoA-transferases. *Biochemistry* **51**: 8422-8434.

Chen, J., A. Miller, **A.L. Kirchmaier** and J.M. Irudayaraj. 2012. Single-molecule tools elucidate H2A.Z nucleosome composition. *J. Cell Sci.* **125**: 2954-2964.

Iliuk, A., X.S. Liu, L. Xue, **X. Liu** and **W.A. Tao**. 2012. Chemical visualization of phosphoproteomes on membrane. *Mol. Cell. Proteomics* **11**: 629-639.

Liu, X.S., B. Song, J. Tang, W. Liu, S. Kuang and **X. Liu**. 2012. Plk1 phosphorylates Sgt1 at the kinetochores to promote timely kinetochore-microtubule attachment. *Mol. Cell. Biol.* **32**: 4053-4067.

Liu, W., Y. Wen, P. Bi, X. Lai, X.S. Liu, **X. Liu** and S. Kuang. 2012. Hypoxia promotes satellite cell self-renewal and enhances the efficiency of myoblast transplantation. *Development* **139**: 2857-2865.

Ho, K.K., H. Zhang, **B.L. Golden** and **J. Ogas**. 2012. PICKLE is a CHD subfamily II ATP-dependent chromatin remodeling factor. *Biochim. Biophys. Acta.* **2**: 199-210.

Chu, H., E. Puchulu-Campanella, J.A. Galan, **W.A. Tao**, P.S. Low and J.F. Hoffman. 2012. Identification of cytoskeletal elements enclosing the ATP pools that fuel human red blood cell membrane cation pumps. *Proc. Natl. Acad. Sci. U.S.A.* **109**: 12794-12799.

Pan, L., A. Iliuk, S. Yu, R.L. Geahlen and **W.A. Tao**. 2012. Multiplexed quantitation of protein expression and phosphorylation based on functionalized soluble nanoparticles. *J. Am. Chem. Soc.* **134**: 18201-18204.

Cloutier, S.C., W.K. Ma, L.T. Nguyen and **E.J. Tran**. 2012. The DEAD-box RNA helicase Dbp2 connects RNA quality control with repression of aberrant transcription. *J. Biol. Chem.* **287**: 26155-26166.

2013

South, P.F., K.M. Harmeyer, N.D. Serratore and **S.D. Briggs**. 2013. H3K4 methyltransferase Set1 is involved in maintenance of ergosterol homeostasis and resistance to Brefeldin A. *Proc. Natl. Acad. Sci. U.S.A.* **11**: E1016-E1025.

Bonawitz, N.D. and **C. Chapple**. 2013. Can genetic engineering of lignin deposition be accomplished without an unacceptable yield penalty? *Curr. Opin. Biotechnol.* **24**: 336-343.

Abdallah, A.M., X. Zhou, C. Kim, K.K. Shah, C. Hogden, J.A. Schoenherr, **J.C. Clemens** and H.C. Chang. 2013. Activated Cdc42 kinase regulates Dock localization in male germ cells during *Drosophila* spermatogenesis. *Dev. Biol.* **378**: 141-153.

Newquist, G., J.M. Drennan, M. Lamanuzzi, K. Walker, **J.C. Clemens** and T. Kidd. 2013. Blocking apoptotic signaling rescues axon guidance in *Netrin* mutants. *Cell Rep.* **3**: 595-606.

Yeo Y-S, S.E. Nybo, A.G. Chittiboyina, A.D. Weerasooriya, Y.-H. Wang, E. Góngora-Castillo, B. Vaillancourt, C.R. Buell, D. DellaPenna, M.D. Celiz, A.D. Jones, E.S. Syrkin Wurtele, N. Ransom, **N. Dudareva**, K.A. Shaaban, N. Tibrewal, S. Chandra, T. Smillie, I.A. Khan, R.M. Coates, D.S. Watt and J. Chappell. 2013. Functional identification of valerena-1, 10-diene synthase, a terpene synthase catalyzing a unique chemical cascade in the biosynthesis of biologically active sesquiterpenes in *Valeriana officinalis*. *J. Biol. Chem.* **288**: 3163-3173.

Dudareva, N., A. Klempien, J.K. Muhlemann and I. Kaplan. 2013. Biosynthesis, function and metabolic engineering of plant volatile organic compounds. *New Phytologist* **198**: 16-32.

Dudareva, N. and D. DellaPenna. 2013. Plant metabolic engineering: Future prospects and challenges. (Editorial). *Curr. Opin. Biotechnol.* **24**: 226-228.

Heinig, U., M. Gutensohn, **N. Dudareva** and A. Aharoni. 2013. The challenges of cellular compartmentalization in plant metabolic engineering. *Curr. Opin. Biotechnol.* **24**: 239-246.

Gutensohn, M., I. Orlova, T.T.H. Nguyen, R. Davidovich-Rikanati, M.G. Ferruzzi, Y. Sitrit, E. Lewinsohn, E. Pichersky and **N. Dudareva**. 2013. Cytosolic monoterpene biosynthesis is supported by plastid-generated geranyl diphosphate substrate in transgenic tomato fruits. *Plant J.* **75**: 351-363.

Chen, J., A. Ganguly, Z. Miswan, S. Hammes-Schiffer, P.C. Bevilacqua and **B.L. Golden**. 2013. Identification of the catalytic Mg²⁺ ion in the hepatitis delta virus ribozyme. *Biochemistry* **52**: 557-567.

Golden, B.L. 2013. Catalysis by RNA, structure themes: group I introns. *Encyclopedia of Biological Chemistry*, 2nd Edition, Vol. 3. (W.J. Lennarz and M.D. Lane Ed.), Academic Press, pp. 397-400.

Golden, B.L., S. Hammes-Schiffer, P.R. Carey, P.C. Bevilacqua. 2013. An integrated picture of HDV ribozyme catalysis. *Biophysics of RNA Folding*. (Rick Russell ed.), Springer, pp. 135-168.

Yang, T.-Y., C.L. Eissler, **M.C. Hall** and L.L. Parker. 2013. A multiple reaction monitoring (MRM) method to detect Bcr-Abl kinase activity in CML using a peptide biosensor. *PLoS One* **8**: e56627.

Mullins, E.A. and **T.J. Kappock**. 2013. Functional analysis of the acetic acid resistance (aar) gene cluster in *Acetobacter acetii* strain 1023. *Acetic Acid Bacteria* **2**: e3.

Song, B., X.S. Liu, S.J. Rice, S. Kuang, B.D. Elzey, S.F. Konieczny, T.L. Ratliff, T. Hazbun, E.G. Chiorean and **X. Liu**. 2013. Plk1 phosphorylation of Orc2 and Hbo1 contributes to gemcitabine resistance in pancreatic cancer. *Mol. Cancer Ther.* **12**: 58-68.

Park, S., T.L. Scheffler, **S.S. Rossie** and D.E. Gerrard. 2013. AMPK activity is regulated by calcium-mediated protein phosphatase 2A activity. *Cell Calcium* **53**: 217-223.

Hu, L., L. Yang, A.M. Lipchik, R.L. Geahlen, L.L. Parker and **W.A. Tao**. 2013. A quantitative proteomics-based competition binding assay to characterize pTAM-protein interactions. *Anal. Chem.* **85**: 5071-5077.

Iliuk, A.B. and **W.A. Tao**. 2013. Is phosphoproteomics ready for clinical research? *Clin. Chim. Acta.* **420**: 23-27.

Puchulu-Campanella, E., H. Chu, D.J. Anstee, J.A. Galan, **W.A. Tao** and P.S. Low. 2013. Identification of the components of a glycolytic enzyme metabolon on the human red blood cell membrane. *J. Biol. Chem.* **288**: 848-858.

Tao, W.A. and J. Coon. 2013. 2012 ASMS fall workshop: Mass spectrometry-based phosphorylation analysis and phosphoproteomics. *J. Am. Soc. Mass Spectrom.* **24**: 464-465.

Xue, L. and **W.A. Tao**. 2013. Current technologies to identify protein kinase substrates in high throughput. *Front. Biol.* **8**: 216-227.

Mukhopadhyay, A., B. Wei and **H. Weiner**. 2013. Mitochondrial NAD dependent aldehyde dehydrogenase either from yeast or human replaces yeast cytoplasmic NADP dependent aldehyde dehydrogenase for the aerobic growth of yeast on ethanol. *Biochim. Biophys. Acta.* **1830**: 3391-3398.

donors

Dr. Jawed Alam
Dr. Andrew J. Alpert
Dr. Christine M. Ambrose and Dr. Thomas J. Porter
Mr. Dennis R. Bacon and Dr. Leslie A. Rylander
Mr. David E. and Mrs. Beth M. Beeson
Dr. Kenneth M. Bischoff
Mr. Paul W. and Mrs. Mary A. Bower
Dr. Donald A. Burns
Dr. Carl A. Burtis Jr.
Mr. Charles S. and Mrs. Jean A. Campbell
Mr. Paul R. and Mrs. Kimberly A. Cantrell
Dr. Clint C. Chapple and Dr. Janice R. Kelly
Dr. Michael Cherry
Mr. Dennis N. Cipollo
Dr. Stephen P. and Mrs. Charlotte A. Coburn
Dr. Jacques W. and Mrs. Delores A. Delleur
Mr. Gregory P. Donoho
Dr. and Mrs. Peter E. Dunn
Dr. William L. Ellefson
Dr. James D. and Mrs. Nanci Forney
Mr. Mark J. Fretz
Dr. Jon A. Friesen
Mr. Mark Gee
Dr. Melvin E. and Mrs. Beverly W. Gleiter
Dr. Barbara L. Golden
Mr. Kevin J. Hacker
Mr. Raymond C. Hapak
Dr. Nancy Harding
Mr. E. William and Mrs. Sue A. Harris Jr.
Mr. Paul R. and Dr. Marilyn A. Hartig
Dr. Mark A. and Mrs. Sue Hermodson
Dr. Paul W. Huber
Dr. Peter J. Kennelly
Dr. Ann L. Kirchmaier
Dr. John E. and Mrs. Joan A. MacNintch

Dr. Jean Marx
Mrs. Hiroko Matsumoto
Mr. Steven D. and Mrs. Linda S. Mavity
Dr. Ronald W. and Dr. Joan McCune
Dr. Owen Arnold Moe Jr.
Dr. Phillip E. and Mrs. Leanne M. Monroe
Dr. John J. and Mrs. Constance Murphy
Mr. Alan L. and Mrs. Emma J. Neal
Dr. Rodney J. and Ms. Teresa M. Noel
Dr. Joseph P. and Mrs. Dawn M. Ogas
Dr. Bryan L. Ohning
Dr. David E. and Mrs. Lenor Ott
Mr. Thomas P. and Mrs. Catherine S. Penno
Dr. Paul F. and Mrs. Carol Koch Pilch
Mr. Malcolm J. Pitts
Dr. James Plantner
Dr. Lesley J. Putman
Dr. John Joseph Reiners Jr.
Dr. Marvin S. Reitz
Dr. Charles D. and Mrs. Dorothy E. Rowe
Dr. Joseph L. and Mrs. Nancy M. Sannella
Mr. David W. and Mrs. Mary R. Scheible
Dr. David H. and Mrs. Joanna L. Schroeder
Dr. Richard G. and Mrs. Barbara Sleight Jr.
Dr. Edgar E. Smith
Dr. Ronald L. and Mrs. Joyce E. Somerville
Dr. Autumn Lee Sutherlin
Dr. JoAnn Alexis Suzich
Dr. Marie A. Tavianini
Dr. William L. and Mrs. Maureen A. Taylor
Mr. Stephen G. Thoman
Dr. J. Yun Tso
Dr. Edgar H. Ulm
Dr. Robert G. Walker
Dr. Dake Wang and Dr. Xiaoxia Zhao

Dr. Yongxin and Dr. Xinping Wang
Dr. Yuli Wang and Dr. Kunliang Guan
Ms. Abigail A. Weaver
Dr. Robert O. Webster
Mr. Brent R. and Mrs. Jody Weil
Dr. Michael Henry Whittaker
Mrs. Diane A. Wiginton
Mr. Bradley D. and Mrs. Jane D. Wilson
Mr. Michael J. Worns
Dr. Marian L. Yeh
Dr. Jian-Min Zhao
Dr. Limin Zheng and Dr. Keying Ye
Dr. Jianzhong Zhou and Ms. Jun Chen
Ms. Loretta M. Zygmunt

CORPORATE DONORS

Abbott Laboratories Fund
Ball Corporation
Beckman Coulter
Biogen Idec Foundation Inc.
Bristol-Myers Squibb Fdn. Inc.
Eli Lilly & Co. Fdn. Inc. MGP
Eppendorf North America
Houghton International Inc.
Integrated DNA Technologies (IDT)
Monsanto Fund/MGC
New England Biolabs, Inc.
P & G Fund
Pfizer Matching Gifts Program
Science Applications Int'l Corp.
Sigma-Aldrich
Thermo Fisher Scientific
VWR International, Inc.
Wacker Chemical Corporation

PURDUE

UNIVERSITY

Non-profit Organization
U.S. Postage
PAID
Purdue University

Department of Biochemistry
Purdue University
175 S. University Street
West Lafayette, IN 47907-2063

ADDRESS SERVICE REQUESTED



Biochemistry seniors, 2013



Purdue Biochemistry Alumni
LinkedIn



Purdue Biochemistry
Facebook



Purdue Biochemistry
LinkedIn