Zebrafish are a recent addition to the departmental menagerie courtesy of a new project in the Ogas laboratory. Ogas’ group works in the area of chromatin and epigenetics where they have been using Arabidopsis as a model organism for over a dozen years. In general, Ogas’ team is interested in how organisms use chromatin-based mechanisms to restrict gene expression to particular periods of development. In particular, they have been using Arabidopsis to investigate how repression of seed genes is established during germination. Understanding how this repression is achieved could help unlock currently inaccessible developmental potential in a variety of important crop species.

Ogas’ work has shown that repression of seed genes is dependent on changes in the structure of chromatin, the complex of DNA and proteins that exists within a cell’s nucleus. Specifically, they have found that whether or not seed genes are expressed is dependent on a protein that belongs to the Mi-2 family of chromatin remodelers. Mi-2 proteins dynamically alter chromatin structure and can turn genes on or off. Mi-2 proteins restrict expression of developmentally-regulated genes in both plants and animals, although their work has revealed that Mi-2 proteins act via a pathway that is distinct from that used in animals.

While analyzing Mi-2 proteins from a range of organisms, Ogas’ group discovered that a known tumor suppressor, CHD5, is a vertebrate-specific Mi-2 family member. Loss of CHD5 is associated with a number of cancers in humans, including neuroblastoma and acute myelogenous leukemia (AML). Although previous work has linked CHD5 to the critically important tumor suppressor p53, it is still very much an open question as to how CHD5 acts as a tumor suppressor.

Because their analysis revealed that CHD5 proteins are only found in vertebrates, they are now determining whether zebrafish can be used to examine the tumor suppression role of CHD5 proteins. Zebrafish offer a robust suite of tools with which to dissect processes such as tumor suppression.

To determine whether CHD5 acts as a tumor suppressor in zebrafish, the Ogas group first needed to determine the role that CHD5 plays in this organism. They have already found that CHD5 is expressed mainly in the brain of zebrafish, as it is in mammals. Reduction of CHD5 expression during embryogenesis has an impact on eye and brain development in zebrafish but no tumor phenotype. This result is not surprising, however, given that mammalian CHD5-associated tumors only develop after birth. The Ogas group is now generating fish in which they can conditionally reduce CHD5 expression and examine the effect of this reduction on tumor formation in juvenile and adult fish.

If you swing by the department sometime in the future and still find zebrafish, you’ll know that their investigations turned up something promising.
Dear Alumni, students, staff and faculty,

It’s time again to assemble “The Catalyst” and to reflect upon what we have accomplished this year. At the risk of sounding like a broken record (an anachronistic saying for the iPod-carrying class of 2014 who have just finished their first year in the Department of Biochemistry), it has been an exceptional year and we have many people and accomplishments of which we can be proud.

In October of 2010, an external review of the department by several outstanding scientists from across the country provided us with a very strong and supportive evaluation along with some outstanding suggestions for how we can continue to improve. Many of those suggestions are already being implemented and we look forward to growing better and stronger as a result. At about the same time, Dr. Jian-Kang Zhu, a faculty member in the Department of Horticulture and Landscape Architecture with a joint appointment in the Department of Biochemistry, arrived on campus. Dr. Zhu was recruited to Purdue from the University of California – Riverside under President Cordova’s “Leading Faculty Initiative”. He is a recently-minted member of the National Academy of Sciences and adds significant leadership to our department’s expertise in epigenetics.

We were also delighted to welcome back to the Purdue campus Emeritus Professor Dr. Klaus Herrmann when his former Ph.D. student JoAnn Suzich was awarded an honorary doctorate for her role in the development of the Human Papilloma Virus (HPV) vaccine now marketed by Merck as Gardasil.

It is also hard not to continue to be impressed with the undergraduates we have the privilege of teaching. As you’ll see inside, Gabe Rangel was the Outstanding Sophomore in the College of Agriculture for 2010-2011 and as featured on our cover, Senior Rachel Schluttenhoff er was chosen as the Outstanding Female Graduate for Purdue University. For a department with only around one hundred undergraduates to have so many of our students (repeatedly) honored in this way may seem surprising, but as a faculty member who has taught both of these students, and many more fantastic undergraduates in our program like them, it comes as no surprise to me whatsoever.

Finally, not all the news was good. This year we lost our long-time colleague Henry Weiner to the cancer he had battled for many years. His many former students, colleagues, and friends will miss him very much.

Clint Chapple
Head, Department of Biochemistry
We are very proud of all our undergraduate majors and their many accomplishments, but sometimes one (or two!) earns special recognition at a higher level.

Rachel E. Schluttenhofe from Thorntown, Indiana, was awarded the 2011 Flora Roberts Award. The award is presented annually to the outstanding senior woman at Purdue to honor her scholarship, leadership, character and service to the university community and beyond. The award is made possible through a bequest from Flora Roberts, a member of the Purdue class of 1887. The recipient receives a $500 award, a medallion and has her name inscribed on an award marker on the Purdue Mall. Schluttenhofer is the fifth Purdue Agriculture student to win the Flora Roberts Award in the past eight years. The last student from the Department of Biochemistry to win the award was Melissa Ann Ashlock (B.S. Biochemistry, 1980).

In addition to her impressive portfolio of academic achievements, Schluttenhofer has an accomplished and extensive track record in service and outreach to Purdue and the larger community. She has performed mission work abroad in Bolivia, El Salvador and Guatemala as well as closer to home in Chicago and New Orleans. Perhaps the strongest affirmation of her commitment to service was demonstrated by her choice of a study abroad experience during the 2010 summer. Schluttenhofer spent two months participating in a CIEE Community Public Health experience in the Dominican Republic. She left for the Dominican Republic for seven weeks just 12 hours after returning from a mission trip to Bolivia through her church. Rather than living in a dorm with other exchange students, she lived with a host family and immersed herself in the local community. In addition to enhancing her already considerable Spanish skills (she graduated with a Spanish minor), Schluttenhofer also gave educational lectures on infections and assisted at a rural health clinic. If you talk with her about the experience, however, all you will hear about is how much everyone there gave to her. “Once you start going on mission trips, it’s hard to turn your back on all of the problems of the world,” Schluttenhofer said. “Last summer we visited a batey (a community of sugar-cane field workers) in the Dominican Republic. That experience was very touching to me,” she said. “The men work in the sugar-cane fields, and the batey has one water tank that gets filled twice a week. Each family is allotted three buckets of water each day for cleaning, washing,

“We are very proud of both Rachel and Gabe for their hard work and accomplishments. Honors like the Flora Roberts Award and the Goldwater Scholarship help shine a bright light on the achievements and excellence of our students in the College of Agriculture.”

--Dr. Jay Akridge, Glenn W. Sample Dean of Agriculture
Receive Top Honors

dishes, cooking, drinking or anything else. Three buckets. That just shocked me. I think it’s important for people to realize that the majority of the world doesn’t live like we live here in the United States.”

In the classroom or in the field, Schluttenhofer’s academic advisor has no doubt she will be successful. “My senior class emphasizes critical thinking and classroom participation,” explained Joe Ogas, an associate professor of biochemistry. “Rachel excelled in both areas and is clearly one of the strongest students with whom I have ever had the pleasure to work.” Schluttenhofer graduated in May with highest distinction and she began a Ph.D. program in biological sciences at the University of Notre Dame this summer with an emphasis on tropical diseases.

Gabriel Rangel from Indianapolis, Indiana, was recognized by the College of Agriculture as the outstanding sophomore for 2011 and was one of 275 students in the nation to receive a Barry M. Goldwater Scholarship. Christine Sahley, professor of biological sciences and chair of the committee that selects which students from Purdue can enter the limited national competition comments, “The competition is intense at the university level as well. Each year we continue to receive applications from exceptional students with amazing accomplishments and deciding which to put forward is extremely difficult.”

The Barry Goldwater Scholarship Program was established to encourage outstanding students to actively pursue and excel in a career in mathematics, natural sciences or engineering and is given to outstanding students who have demonstrated excellence and commitment to academic study and research. As a Goldwater Scholar, Rangel will receive up to $7,500 per year for two years for educational expenses. “This national recognition is truly an honor for Gabe. It recognizes his exceptional academic ability and promise in a very public way. He is now a member of a very elite academic group. It also puts some pressure on him - Goldwater scholarship winners have gone on to win Nobel prizes, to be awarded McArthur Genius Awards and to become leaders in their fields. This is a significant honor for Purdue as well. Gabe’s award shows that Purdue students can successfully compete with students from Harvard, Yale, Stanford and MIT,” says Sahley.

Rangel carries an outstanding GPA and his career goal is to advance knowledge and prevention of neglected diseases. “To me, being given the title of Goldwater Scholar is not simply an award, and it certainly is not an end point. It is a high bar of standards that the Goldwater committee members and my recommenders have set before me for which they think I can and should aim, and I will strive to meet their high expectations throughout my academic and professional scientific career,” says Rangel.

“Without the supportive atmosphere of Purdue University, the College of Agriculture and especially the Department of Biochemistry, success like this for any student is not possible! It requires the advice and support of many mentors, role models and advisors for a student to find success, and I have personally found countless exceptional people to fill those roles here at Purdue.”

Rangel is no stranger to academic recognition. In addition to being selected Outstanding Freshman in the College of Agriculture in 2010, a sampling of his honors includes the Senator Richard G. Lugar Scholarship, the Lilly Endowment Community Scholarship, the Purdue Trustees Scholarship and the National Hispanic Recognition Program Scholarship. During the academic year, Rangel works in Dr. Scott Briggs’ laboratory where he is determining how histone modifications impact gene expression. This summer he was selected by the HHMI Exceptional Research Opportunities Program (EXROP) to work with HHMI investigator Dr. Christopher Plowe at the University of Maryland Medical School. Plowe’s research focuses on the molecular epidemiology of malaria and development of drugs and vaccines for the treatment of malaria.
Our friend and colleague of 45 years, Professor Henry “Hank” Weiner passed away on October 28, 2010, at the age of 73. Born May 18, 1937, in Cleveland, Ohio, he graduated from Thomas Jefferson High School in San Antonio, Texas. Hank earned a bachelor’s degree in chemical engineering from Case Institute of Technology in 1959 and a Ph.D. in organic chemistry from Purdue University in 1963 (Major Professor: Richard A Sneed). Hank’s dissertation focused on the mechanism and stereochemistry of solvolysis reactions. His fascination with the mechanism of chemical reactions, including enzyme-catalyzed reactions, was the bedrock upon which he built his career.

After graduating from Purdue, Hank did post-doctoral research with two giants in the field of enzymology, Dr. Daniel Koshland, then at Brookhaven National Laboratory, and Dr. Hugo Theorell at the Karolinska Institute in Stockholm, Sweden. With Koshland, he explored substrate binding to anhydro-chymotrypsin. In Theorell’s lab, Hank fell in love with the enzymology of the carbonyl group, working for the first time with alcohol dehydrogenase. In 1966, Hank joined the Department of Biochemistry at Purdue University, which Barney Axelrod, the head of biochemistry at the time, was remaking. He quickly established himself as an excellent researcher and teacher. Like all new faculty members in that era, Hank took on a significant teaching responsibility his first year. He rose quickly through the ranks, earning promotion to associate professor in 1969 and to professor in 1976. During his career he taught BCHM 307 (Biochemistry), BCHM 665 (Enzyme Mechanisms), BCHM 690 (Seminar in Biochemistry), and BCHM 561 (General Biochemistry I) each for ten years, as well as BCHM 490 (Undergraduate Seminar) for four years. Hank’s forte was teaching at the graduate level and mentoring graduate students. At least part of his excellence grew from his willingness to pose questions before he had an answer. He understood the importance of asking questions, whether in his own research, or to goad graduate students into thinking deeply, or to examine the department’s approach to education.

Hank was not wedded to one enzyme mechanism or one approach to his science. In the early 1980s he switched his focus to aldehyde dehydrogenases, enzymes of high relevance to alcoholism. From that time for the rest of his career the Alcohol Institute of the National Institutes of Health funded his research continuously, recognizing him in 2006 as being in the top 5 percent of grant award winners for the previous 25 years. Hank was also an early adopter of recombinant DNA approaches in his research, cloning and sequencing aldehyde dehydrogenase genes in the 1980s. In the early 1990s he began a collaboration with a colleague, Dr. Thomas Hurley, at the IU School of Medicine in Indianapolis that led to the determination of the structure of an important aldehyde dehydrogenase.

Hank’s excellence in graduate education was recognized in his selection by the Department of Biochemistry as its Outstanding Graduate Educator in 2007 and 2009, and documented by his receipt of the College of Agriculture’s Outstanding Graduate Educator Award in 2008, and of Purdue University’s Provost’s Award for Outstanding Graduate Faculty Mentor in 2009. Hank would undoubtedly cite as an equally important legacy the 22 graduate students who earned their M.S. and/or Ph.D. degrees under his direction. He was also mentor to 15 post-doctoral fellows from around the world.

In addition to authoring more than 200 journal articles, Hank founded and organized fifteen successive biennial international scientific meetings, Enzymology and Molecular Biology of Carbonyl Metabolism.

A multidimensional human being, Hank enjoyed baking breads (his contribution to departmental get-togethers was a Hank-baked challah or some other bread) and teaching others how to bake. Among his other hobbies, he was a woodturner. Hank was very active in Temple Israel, serving as Temple president for four years. And he possessed a wry humor that emerged when least expected. Meeting with then Dean Richard Kohls in 1969, who had come to Axelrod’s office to inform Hank of his promotion to associate professor, Hank was asked by Dean Kohls how he happened to have black hair and yet a red beard. Without missing a beat Hank replied, “I dye my beard.” Dean Kohls was speechless (a rare occurrence!).

Hank and his wife, Esther, celebrated their 50th wedding anniversary a few months before he passed away. In addition to his wife, Hank is survived by his daughter Suzanna Stoebick (husband: Rob), his son Alex Weiner (wife: Dori Rubin), and three grandchildren.
The Department of Biochemistry joined with the Departments of Biological Sciences, Biomedical Engineering, and Statistics to submit a proposal to the Howard Hughes Medical Institute (HHMI) Undergraduate Education program. In the fall of 2010, a four-year $1.5 million grant was awarded to fund the program entitled, “Deviating from the Standard: Integrating Statistical Analysis and Experimental Design into Life Science Education.” Dennis Minchella, a professor of biological sciences and P.I. says, “The goal is to increase the exposure of life science undergraduate students to experimental design and statistics.”

Jim Forney, Professor of Biochemistry, serves as a Co-P.I. and leads the faculty development section of the program. He is facilitating a series of Faculty Learning Communities including faculty and postdoctoral research scientists who are working together to incorporate statistics into the curriculum, develop innovative teaching approaches and share their experiences in the classroom. Forney remarks, “I’ve been teaching for more than 20 years, but I rarely meet with my colleagues to discuss educational ideas or problems in the classroom. The Faculty Learning Community became a great source of information, feedback and moral support for my teaching. I hope other members had the same experience.” Each faculty member agrees to generate one teaching module for their course that includes statistics or experimental design, and postdoctoral scientists work together with faculty on these projects.

The HHMI program also provides competitively awarded summer research positions for undergraduate students on the Purdue campus. The program provides “hands-on” experience for students focusing on experimental design and statistical analysis. In addition to eight weeks of independent research in Purdue laboratories, the students attend weekly quantitative training sessions that utilize active learning modules based on problems from the students’ own research projects. Combining faculty-led classroom innovations with active student participation will produce a new generation of life scientists who embrace the value of statistics in advanced research.

In 2011, biochemistry faculty hosted three students in the program: Charles Hayes IV from Morehouse College (Forney), Lotti Brose from our own undergraduate program (Ogas) and Michael Blatchley from Purdue’s Weldon School of Biomedical Engineering (Chapple).
If you Google “reasons to study abroad” you will get over 4 million results, many of them “Top 10 Lists” created to convince college students to spend anywhere from a few weeks to an entire academic year living and learning in another country. Some common themes were repeated on list after list: gain new cultural insights, develop a new perspective on your home country, learn a language, develop life skills, learn about yourself, and expand your worldview.

In its most recent strategic plan, the College of Agriculture set the expectation that every undergraduate student participate in at least one “transformational learning experience” prior to graduation. Study abroad is one example of a transformational learning experience, and the College is seeking to increase participation in study abroad to at least 40 percent of graduating students.

Biochemistry students who study abroad would agree with many of the statements on those top 10 lists and many of them write to us about their adventures as illustrated on the facing page. May 2011 graduate Megan Schnur, who studied in Ireland during fall semester 2010 said, “It’s so much more than living in a different country for a semester. It’s allowing yourself to be vulnerable, appreciate cultural differences, and change the way you think about life.”

Craig Chanley, a December 2010 graduate, had similar sentiments about his summer 2010 experience in Taiwan, “Apart from improving my Chinese language skills significantly, this trip opened my eyes to global culture in ways no textbook or film or lecture could do, and now all I can think about is finding a way to go back.”

How can we encourage more biochemistry students to participate in this “transformational learning experience” of studying abroad? First, by removing any real or perceived barriers to their participation; and second, by ensuring that there are programs available that appeal to students.

In the recent revision of the biochemistry undergraduate curriculum, special effort was made to overcome the obstacle of delayed graduation if a student studies abroad. The program is flexible enough to allow for up to a semester of study abroad and still maintains a generous number of electives. Similarly, Purdue offers programs designed with a student budget in mind to help overcome the cost barrier of international travel. Students participating in a semester exchange pay Purdue tuition, and additional aid is available to deal with the financial burden of living and travel costs. Linda Vallade, Program Leader for Agricultural Study Abroad, said, “We try to make studying abroad financially possible. While semester exchanges are still the most cost-effective way to study abroad, we strive to keep all of our course costs as low as possible, and we continue to look for outside sources to provide scholarships and grants to those who participate.”

“It was by far one of the greatest experiences of my life.”

—Chelsea Nofsinger

Continued on page 9...
Hey Sherry! So my Alaskan adventure has been great! We almost had a collision with a humpback whale, but we managed to keep our boat caught halibut and salmon and learned a lot about the hatcheries. I've stayed in a NOAA station at Point Walter. Thanks for everything this week. 

Heather

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Megan Schmier
Bellevue House 4, Apt 1, Rm 2
Bellevue 104
Dublin 4

Dear Purdue Brother Dept,

Greetings from Dublin! I hope all is well back in Indiana. I've been here 5 weeks & gone to see several places within Ireland, including Howth, Cork, Blarney & the Wicklow Mountains, as well as Brussels & Bruges in Belgium (where I ran into Dr. Brandt!). I've taken so many pictures that I'll have to share with you when I return. A group of guys & I have plans to travel to Galway, Derry, London & Barcelona (& hopefully some other places too) before the semester ends! Classes are going well; even better since they're only Tuesday through Thursday! Take care!

Megan Schmier

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Buenos días! I'm here in the Dominican Republic enjoying my 8 day rural clinic stay. Myself and two other students slept and cooked our meals in the clinic and during the day observed the doctor during her consultations. The community is very welcoming. I play quite a bit of dominos and yesterday rode up the mountain in the back of a truck to pick mangos delicious.

- Rachel

REPÚBLICA DOMINICANA
(Please by Image)
Life in Africa: The eight-hour drive from the airport in Entebbe, through the capital city of Kampala, and into the rural region of Karamoja was astounding. In the city, while a few areas were more modern with banks and even a mall, the typical roads were lined with rugged, one-story, concrete shops. Countless people dressed in dated Westernized clothing filled every space—some sitting around a fire, some making furniture, some at your car window selling produce. The bustle subsided as we neared Karamoja—extremely rugged roads; gorgeous, flat terrain with expansive skies; and a small, rugged mountain range. The people in villages along the way lived in mud huts and were dressed in wraps and blankets. The children were particularly excited to see the Land Rover full of white people. They’d run alongside us, pointing and yelling, “Mzungu! Mzungu!” (White person).

I lived on the mission compound where Dr. Jim, some interns, and three missionary families live. While the surrounding villages were as rural as you can get, our houses were modern in comparison. We had some solar electricity and running water (no hot water though!). The clinic was about a ten-minute walk from the compound so every morning we walked there and greeted people in the local tribal language. “Ejok-a?” (How are you?). “Ejok-nooi” (Doing well). The clinic is just what you’d imagine when you think of a rural, African clinic—dingy, rusty, cracking concrete walls, tippy wooden benches, ancient exam tables and chairs, and the smell during the sunny hours of the day was pretty indescribable. There is a little waiting room, which is pretty much just a concrete slab with tarp walls and a metal roof. It is generally crammed with people, mostly mothers and children. Further back, there are three tiny exam rooms and Jim’s office. There is also a shipping container that serves as a small lab that smells like one of the general chemistry labs at Purdue and houses the precious microscope. In the back there is a small pharmacy where medications are dispensed.

Other than Dr. Jim and Nurse Jenny who are from the United States, all the staff are Ugandan. There are three nurses, three translators, one lab technician, and one receptionist. The nurses see all of the patients and consult Dr. Jim with the more difficult cases. All the staff know English, but you still have to talk in an African accent to them or they simply will not understand you! Godfrey, one of the translators, made it his goal to teach me the tribal Karimajong language. (English is the national language, but we rarely had an English-speaking patient). I succeeded in learning to greet and ask a person’s name; simple commands like “come,” “go,” and “sit down”; how to count to ten; and how to refuse a marriage proposal.

At first, everything was new and disorienting, but as time went on, I fell in love with Africa and felt comfortable and almost at home there. Part of this was because I saw how the missionaries lived full and happy lives and definitely considered Africa their home. It was also because I became more in tune with the culture and made some great friends with Ugandans. This all really made me sure that I could not merely survive doing medicine overseas, but that I could really thrive and enjoy living and working in a developing nation.

Medical Experiences: I got a lot of medical experience while I was there. There were two other med students there at different times during my stay. Dr. Jim would have us do histories and physicals and then present to him what we thought the diagnosis might be. Taking those histories was a challenge due to the language barrier, but it was nonetheless exciting to learn how to communicate through translators. Once I got used to the cultural differences, I realized that you can communicate volumes without words at all! In addition to the hands-on clinical experience, I can’t emphasize enough the additional benefit of having Dr. Jim as a teacher for those two months. In the morning before things got too chaotic, he would sit down and give a short lesson on some relevant topic (which we were expected to remember!). He also had a small but useful library, of which I took advantage. Jim would also give weekly lessons to
all the staff, constantly improving the medical care provided at the clinic. He even had me give one of the lectures, which was a lot of fun.

**Malaria:** Almost every patient got tested for malaria and many did have the parasitic disease. While the physical presentation of malaria can be quite varied, it eventually became very familiar to me. For a few days, I worked with Moses in the lab and became quite adept at performing the malaria finger stick, blood smear, stain, and inspection under the microscope. Unfortunately, malaria can be extremely serious, especially in infants and children. I remember multiple times sending mothers to the nearest hospital, an hour walk away. (The clinic wasn’t equipped to keep patients overnight). We’d send them off, often knowing that their little one probably wouldn’t make it. The stabbing pain in the pit of my stomach trying to hold back tears became quite a familiar feeling.

**Malnutrition:** Malnutrition was another extremely common malady. Tuesdays were “Malnutrition Days” at the clinic. Children aged 6 months to 5 years could come in for free once a week to receive a week’s supply of Plumpy’nut, which the WHO classifies as “ready to use therapeutic food.” Tiny children with skinny, wobbly limbs, huge protruding bellies, and deep gorgeous eyes would come in and absolutely devour their packet of Plumpy’nut. It was simultaneously the saddest and most adoral thing I’ve ever seen.

**Immunization Outreach:** On Fridays, we packed backpacks full of vaccines, vitamins, syringes, and sometimes a machete for the tough trails, and hiked to an area village to administer vaccines. One memorable day involved a two-hour hike through slippery mud, murky streams, eight foot tall grass, and loose rocks to reach a mountain village. When we got there, we were muddy up to our knees and our hands were raw from using them to climb up the steep path. I was shocked that this was the trail many mothers and children would use to come to our clinic, their closest healthcare. We set up in a small clearing in the woods. The mothers and children gathered, clutching their tattered immunization cards that record the immunizations they’ve had as well as their growth curve. We’d weigh the wriggly kids, screen them for malnutrition, and give the needed vitamins, deworming medications, or vaccines. These were my absolute favorite days.

*Emily tells us that she definitely brought back a fair amount of clinical knowledge and improved skills, but that it only made her realize how much she has left to learn. But she says that she’ll also take away something that’s more important… “All the exciting experiences mixed with the sad, heart-wrenching times like having to experience the deep sadness of seeing a child die, which I will never forget—all those experiences have genuinely caused my love of medicine and of people to mature from an interest into a true passion.”*

---continued from page 6---

set out in the College of Agriculture’s current strategic plan is to reduce financial barriers to participation by developing a study abroad endowment.

Linda Vallade also explained, “We have been successfully working to identify programs, universities, internships, and research opportunities suitable for all majors within the College of Agriculture – including biochemistry. Our goal is to help students find the program which is best for them, whether it be long- or short-term.”

Biochemistry students come from a range of backgrounds and have different career goals. Agricultural Study Abroad offers over 20 programs each year, with hundreds more available through the university Study Abroad Office. These range in duration from a week to a semester abroad, in locations from Australia to Trinidad. Many of the short-term programs are led by faculty and staff and are organized around a particular theme. Biochemistry Undergraduate Program Coordinator **Sherry Pogranichniy** not only encourages students to seek out study abroad programs, but has recently become involved in developing and leading programs. She was invited to co-lead, with a member of the Food Science faculty, a group that visited Italy during spring break 2010. Currently she is planning a Maymester 2012 study abroad program to Ukraine that will be designed for pre-veterinary and veterinary students (about 20 percent of biochemistry majors are pre-vet). The program will be co-led with Dr. Roman Pogranichniy from the Department of Comparative Pathobiology in the School of Veterinary Medicine. The Pogranichniys led a similar program twice while at Iowa State University, and are excited to be able to offer this opportunity to students at Purdue. Sherry was also invited by the Agricultural Study Abroad Office to visit two of their program sites this summer: University College in Dublin, Ireland, and Ecole d’Ingénieurs de Purpan in Toulouse, France. Her goals in visiting these sites are to learn more about the programs in order to encourage students to study abroad there, to identify coursework available to biochemistry students at these locations, and to explore opportunities for students to participate in undergraduate research while abroad.

By working to create programs that vary in duration, destination and theme, as well as removing the real and perceived barriers to study abroad, the Department of Biochemistry and the College of Agriculture hope to increase the number of students studying abroad and taking advantage of this transformational learning experience. Senior **Dan Martin**, who spent summer 2010 as a research intern in Costa Rica agreed, “Traveling to Costa Rica was a life-changing cultural experience.”
The Department of Biochemistry had the opportunity to have another of its alumni recognized last year when Purdue University bestowed an Honorary Doctorate on Dr. JoAnn Suzich (Ph.D. 1983, Herrmann). Suzich is a leading scientist and researcher in biochemistry and has, among other achievements, played a critical role in the advancement and treatment of health issues affecting women and children.

Suzich is vice president for research and development at MedImmune, where she is responsible for overseeing the company’s research in the development of antibodies and antibody-like molecules for the prevention and treatment of infectious disease. In addition, she recently assumed responsibility for MedImmune’s research on novel vaccines.

Since joining MedImmune in 1988 as a scientist, she has held several positions of increasing responsibility, most recently as senior director, infectious disease research. She has been involved in many key development programs, including Synagis® (palivizumab) which is the only monoclonal antibody approved by the U.S. Food and Drug Administration (FDA) to help prevent an infectious disease, and the virus-like particle technology that is the basis of the human papillomavirus (HPV) vaccines used to prevent cervical cancer. HPV is thought to be responsible for 70 percent of the instances of cervical cancer.

Suzich’s leadership has helped build MedImmune – where she is known as “employee number 13” – from a fledgling company with four employees, founded by fellow Purdue alumnus Dr. Wayne Hockmeyer, to an international biotechnology company with over 3,000 employees worldwide. She has worked closely with all aspects of the company, including discovery research, biopharmaceutical development, clinical research, translational sciences, regulatory affairs, business development, and medical affairs. Numerous internal committees have benefited from her oversight and service.

Before joining MedImmune, Suzich was a scientist at Molecular Genetics, Inc. from 1986 to 1988. In this position, she used cell-free transcription and translation, and recombinant vaccinia viruses, to study the expression strategy and coding capacity of the M segment RNA of Rift Valley fever virus.

Her career has been marked by a consistent focus on devising antibodies and vaccines against many of the deadly and debilitating viruses that infect humans.

Suzich is the inventor of four patents and has authored 29 publications. She is the recipient of the Wallace H. Steinberg Award for Innovation.
Michael Beach (Ph.D. 1987, Rodwell) is equally comfortable addressing an international scientific forum, a class of fifth-graders, or a television news audience. In all settings, his research and work in public health have made him a respected epidemiologist and authority on disease prevention, especially waterborne diseases, and for these achievements, Dr. Beach was named a Distinguished Agricultural Alumnus in 2010.

In his current position, he coordinates activities related to water safety, sanitation, and hygiene across eight centers of the CDC. Beach manages 55 professionals on four teams. The Domestic Water, Sanitation, and Hygiene (WASH) Epidemiology Team focuses on waterborne disease surveillance, emergency response, and prevention of diseases associated with drinking, recreational, and other water uses in the United States; the Global WASH Epidemiology Team works on preventing diarrheal and nonenteric disease associated with water use and inadequate sanitation and hygiene in the developing world; a WASH Laboratory Team studies environmental microbiology, molecular epidemiology, serology, and free-living amoebae related to global prevention of WASH-related diseases; and the Health Promotion and Communications Team translates science into prevention messages and campaigns to promote global waterborne disease prevention.

Beach led efforts to fund and design a Healthy Water website that highlights CDC waterborne disease and water-related work. Since www.cdc.gov/healthywater went live in March 2009, it has had more than a million hits.

Beach's epidemiological activities have not been restricted to waterborne problems; he has participated in 25 outbreak investigations as well. His experience has therefore affected topics of considerable interest to the agricultural community. Beach is a lifelong learner who values the continual new challenges the CDC offers as well as the applicability of his work. “I’ve never felt that I go very long without seeing the direct impact that I have,” he says. “We make decisions on a regular basis that impact national and international health.”

“Purdue taught me systematic thinking — to think in a way that can be tested, can be repeated, is going to have an impact. We had a very strong faculty, a powerful group that pushed us to the limit of everything. I left Purdue with a very strong foundation.” —Michael Beach
A faculty member in the Department of Biochemistry has discovered a key process in cell growth that can lead to the formation of tumors. **Xiaoqi Liu**, Assistant Professor of Biochemistry, found that an overabundance of the polo-like kinase 1, or Plk1, molecule during cell growth, as well as a shortage of the p53 molecule, will lead to tumor formation. Studies in Liu's laboratory showed that the Plk1 molecule indirectly attacks p53 in a process called ubiquitination. “This provides one mechanism for how p53 loses its function in cancer cells,” said Liu, whose work was published in the *Journal of Biological Chemistry*.

During cell growth, Plk1 functions as a protein kinase to add a phosphate group to a protein called Topors. Phosphorylation of Topors causes it to bind to p53, enhancing its rate of ubiquitination, leading to destruction of p53 by the proteasome. Liu said p53 could be thought of as a protective agent in cells. When Topors causes p53 degradation, the effects of Plk1 are enhanced, allowing the cells to become cancerous. “We’re trying to understand how p53 is regulated. We want to keep p53 as normal as possible,” Liu said. “In about 50 percent of cancers, p53 has lost its function, and there is too much Plk1. Since Plk1 is overexpressed in cancers, it is a potential cancer therapy target.” Liu said the next step in the research is to test different Plk1 inhibitors to see how they affect the phosphorylation process.

Researchers from Sichuan University in China and faculty in the Department of Basic Medical Sciences at Purdue collaborated with Liu on the research. The work was funded through a Howard Temin Award from the National Institutes of Health.

In related work also published in the *Journal of Biological Chemistry* Liu found that cytoplasmic linker protein-170, or CLIP-170, plays a major role in proper cell duplication and DNA distribution. When the protein is removed, cell duplicates lack entire copies of DNA and can become cancerous. “DNA has to be equally distributed from a mother cell to its daughter cells. If the cells are not identical to the mother cell, they can become cancerous,” Liu said. “Normal cells have a very tightly regulated process to avoid aneuploidy, or the unequal distribution of chromosomes. Aneuploidy is a hallmark of cancer.”

A cell goes through two important processes before it divides: it creates a second copy of its own DNA, and it will create two centrosomes, or poles, that will draw the DNA to them. When the centrosomes have pulled the two copies of the DNA apart, the cell divides in a process called mitosis, creating two identical cells. But when CLIP-170 was removed from a cell in Liu’s lab, more than two centrosomes formed, pulling the DNA in several directions. Each centrosome received less than a full copy of the DNA. Liu also found that a cyclin-dependent kinase called Cdc2, activates CLIP-170 by phosphorylation. Cdc2 is an enzyme that is considered the master regulator of cell growth, and without it, CLIP-170 is not activated and multiple centrosomes form.

“Without either Cdc2 or CLIP-170, a cell has an increased chance of becoming a cancer cell,” Liu said.

Liu’s lab will continue to look for regulators and mechanisms that turn normal cells into cancer cells.

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*Adapted from an article by Brian Wallheimer*
Follow our Leaders

Korbin Davis is one of Purdue Agriculture’s top undergraduate scientists. The senior biochemistry major works in the lab of cancer researcher Xiaoqi Liu, investigating DNA damage caused by ultraviolet light. He’s also a teaching assistant in human anatomy and physiology courses and tutors agriculture majors in chemistry. Medical school is on the horizon.

Davis exhibits the same high aptitude for leadership that he does for science. As a sophomore, he enrolled in Purdue Agriculture’s Leadership Development Certificate Program, a non-credit, voluntary curriculum designed to help students sharpen so-called “soft” skills—leadership, interpersonal skills, communication and teamwork. The LDCP was created in 2005 after employers interviewing at Purdue repeatedly said that students with leadership skills and experiences have a competitive edge in landing a job and succeeding in the workplace. “This program helps students gain more confidence in their skills, regardless of whether they have been previously exposed to leadership experiences,” said Tracie Egger, program manager and assistant director of academic programs in agriculture. When entering the program, students complete an assessment of their strengths and areas where they can grow. They are matched with a faculty or staff coach and develop a personal leadership plan, or what Egger calls a “roadmap for their leadership journey.”

Linda Vallade, program leader for agriculture study abroad, has been a volunteer coach since the program started. “To be a coach, you really need to enjoy and appreciate students,” she said. “I’m always impressed by what they accomplish in the community and how they grow.” Vallade said that coaches offer encouragement, guidance and suggestions. “One of our main roles is to support students as they step out of their comfort zones and stretch a little.” “Coaches are important,” Egger added. “They nudge the students and help to keep them focused on goals and expectations. They reach out to the students and can make a difference in their lives.”

Another benefit for students is the opportunity to attend a national leadership conference. Egger takes more than 50 students to an annual leaders’ conference sponsored by Agriculture Future of America, an organization that creates partnerships with community leaders, corporate representatives and educators to prepare the next generation of leaders. At the conference, students network with industry leaders and interview for jobs and internships. Davis was among a small group of students selected for the AFA’s Student Advisory Team, and last summer traveled throughout the country to plan for the conference and meet with potential sponsors.

Many of the AFA’s corporate partners also support the leadership program and its students. “The LDCP can give students a leg up when competing for internships or for jobs after graduation,” Egger said. Davis says an LDCP trip to Pioneer’s facilities in Johnston, Iowa, paved the way for an internship with the company’s maize breeding program. “I give all the credit to the LDCP and the opportunities it provides,” he said. “I was able to use the skills I learned to initiate a conversation with a Pioneer representative and have a successful interview. It landed me an internship that was the experience of a lifetime.”

Even though the program is only five years old, it has already become a national model for leadership development. Egger regularly receives requests from other institutions that want to develop a similar program. In 2008 the LDCP was named Outstanding Leadership Program of the Year by the Association of Leadership Educators. For seniors like Davis, the experience provided them with skills to successfully transition to the next phase of their lives.

Condensed from an article by Olivia Maddox & Joanne P. Willis

“I’ve learned how to meet professionals, ask for an interview, build a network, work on a team, and choose the best opportunities for myself and others.”

--Korbin Davis.
Every biochemistry department should have at least one signature event a year upon which the faculty, staff and students can temporarily put aside the exams they need to grade and the meetings that they need to attend to instead enjoy the company of an internationally renowned scientist. Fortunately, Purdue’s Department of Biochemistry was able to host three such scientists this year, two of which are members of the National Academy of Sciences.

In September 2010, Cathie Martin, a professor at the University of East Anglia and a group leader at the John Innes Centre - the leading plant research institute in Europe - delivered the Beach Distinguished Lectures. She is also Editor-in-Chief of *The Plant Cell*, through which she has been piloting new features in scientific publishing, including ‘Teaching Tools in Plant Biology,’ and is co-author of the undergraduate-level text book: *Plant Biology* published by Garland Science (2009).

Martin’s fundamental research has focused on the relationship between diet and health and how crops can be fortified to improve diets. Her work has involved linking leading clinical and epidemiological researchers with plant breeders and metabolic engineers to develop scientific understanding of how diet can help to maintain health, lead to healthy aging and reduce the risk of chronic disease.

Robert T. Sauer, Salvador Luria Professor of Biology at the Massachusetts Institute of Technology, presented the Bernard Axelrod Lectures in October 2010. Sauer is a member of the National Academy of Sciences and the American Academy of Arts and Sciences and has co-authored over 300 papers. Using the tools of protein biochemistry, molecular genetics, and structural biology, Sauer’s lab has studied protein-DNA interactions, protein folding and stability, and most recently, mechanisms of intracellular protein degradation. A common thread throughout Bob Sauer’s research career has been his interest in deciphering the details of proteins that are part of elaborate molecular machines.

Sauer’s honors include the Hans Neurath Award of the Protein Society. Dr. Fred Gimble comments, “Bob has long had connections to the Biochemistry faculty. He and Emeritus Professor Mark Hermodson both served two year stints as presidents of the Protein Society at times when it was facing possible financial disaster due to the start-up costs associated with its new journal, *Protein Science*. Fortunately, they managed to steer the ship to calmer waters and survive the ordeal unscathed.” During his visit, Bob met with graduate students, postdoctoral fellows and faculty where he shared his views on the current state of science and the complementary roles of the research being performed in academia and in the biotech industry.

Thomas R. Cech a professor in the Department of Chemistry and Biochemistry at the University of Colorado delivered the Bernard Axelrod Lectures in March 2011 during which he described the research in his lab over the past two decades to a standing-room-only crowd in Pfendler Hall Deans Auditorium. In 1987 Cech was elected to the U.S. National Academy of Sciences and in 1989 he was awarded the Nobel Prize in Chemistry. His talk was entitled “Crawling Out of the RNA World: From Ribozymes to Telomerase”, a reference to the discovery that Cech and his research group made when they found that RNA, like proteins, could catalyze chemical reactions inside of a cell. Prior to this point, RNA was believed to function largely as a passive information carrier. Host Dr. Barbara Golden comments, “During his visit, Cech engaged everyone in the department, from our undergraduate and graduate students to our faculty, in conversation about their current research and their future plans. It was also great to celebrate his visit over dinner where we were joined by Paul Huber, an alumnus of our department and a Professor at Notre Dame University.”

Besides putting meetings and exam grading aside, why is it important to host these distinguished speakers? Anton Iliuk, an August 2011 Ph.D. graduate, comments, “It was very surprising to learn that many of these speakers actually did not start their research in the fields they are currently in. Therefore, they offered valuable advice to not be afraid of completely switching my research objectives and my career path.”

“It is from our interactions with the speakers,” notes current graduate student Yi Li, “that I realize that successful scientists are normal people and we could one day become one of them through the work we are doing today.”

Finally, Aurelie Chuong, a Ph.D. student in Joe Kappock’s laboratory said, “Interacting with the distinguished speakers is a great way to see how far and successful someone has become who was previously in our shoes (as grad students and postdocs). Not only that, it is a great way to start building a network of different points of views or even potential collaborators, which is why it is important that we keep inviting speakers with different experiences. Even though the field of science might seem huge, it is a small world after all, and no one can do science alone.”

![Cathie Martin](image1)

![Robert T. Sauer](image2)

![Thomas R. Cech](image3)
Andy Tao, Associate Professor of Biochemistry, was featured in the September/October 2010 issue of Purdue Alumnus (pg. 46) for his development of PolyMAC (polymer-based metal-ion affinity capture) technology. Using this patented approach the Tao group can isolate proteins and peptides that have been phosphorylated. This new retrieval method makes studying proteins relevant to cancer, many of which are aberrantly phosphorylated, easier. Based in part on this new technology, Tao and his graduate student Anton Iliuk established Tymora Analytical Operations, LLC in West Lafayette in December 2010. Tao explains that he was searching for a Roman/Greek name equivalent to signaling for his company and decided on Tymora, which comes from the Greek goddess of good fortune. “Commonly consisting of adventurers and others who rely on a mixture of luck and skill to achieve their goals, the Tymoran clergy encourages folk to pursue their dreams. They are also duty bound to aid the daring by providing healing and even some minor magic items.”

Tao was selected to be a University Faculty Scholar for 2011-2016. The program recognizes outstanding faculty who are on an accelerated path for academic distinction in the discovery and dissemination of knowledge.

Korbin Davis, a senior in biochemistry, received 1st place in a poster presentation among undergraduate students involved in the Cancer Prevention Internship Program. Korbin started doing research in the Liu lab during the summer of 2010 on the project, “Polo-like kinase 1 role in repair of UV-induced photoproducts” and continued until his graduation in May. The Cancer Prevention Internship Program is a National Cancer Institute-funded education program that builds on the focus and expertise of cancer prevention interdisciplinary research at Purdue University.

Jessica Schoenherr (Clemens lab), Nick Anderson (Chapple lab) and Liang Xue (Tao lab) were the 2011 recipients of Beach Family Travel Grants. The award supported Jessica’s attendance at the American Society for Biochemistry and Molecular Biology (ASBMB) Annual Meeting in April 2011 where she presented a poster about her work with the protein Activated Cdc42 kinase (Ack). Nick attended the Gordon Research Conference on Plant Metabolic Engineering in July 2011 where he presented a poster about his research regarding cell wall manipulation for the improvement of biofuels. Liang attended the American Society for Mass Spectrometry in June 2011 and presented a poster explaining his research involving proteomic strategy to identify protein kinase substrates and substrate specificity.

Jessica Schoenherr (Clemens lab) was the 2011 Hickory Stick Award winner for outstanding performance as a teaching assistant. She was recognized for her excellent work in BCHM 307 during the fall 2010 semester. Jessica was recognized at the Celebration of Graduate Student Teachers banquet hosted by the Committee on the Education of Teaching Assistants (CETA) and the Office of the Provost in April 2011.

Xu “Sirius” Li (Chapple lab) was the first recipient of the departmental Senior Researcher Award. This award will be given annually to recognize a postdoctoral fellow, research associate or staff scientist for outstanding research accomplishments in the lab. Sirius was recognized for his numerous contributions to the department, including his exceptional productivity in the laboratory as a research scientist, his willingness to collaborate with other research groups, and his mentorship of graduate and undergraduate students.

Three employees were recognized at the departmental holiday luncheon for their long-term service to Purdue: Jo Cusumano, Laboratory Manager (25 years), Steve Widger, Biochemistry Storekeeper (10 years); and Elaine Chase, Laboratory Technician (20 years).
Allison Shockley, a biochemistry junior working in the Ogas lab, was awarded an Agricultural Research Fund Scholarship for 2011-12. Annually, $2,000 scholarships are awarded to students who demonstrate high academic performance, quality research contributions, and a desire for continued learning about the conduct of research. An additional $500 is awarded to the recipient's faculty mentor for supplies and expenses incurred during the course of the student's research.

Juan Martinez (Hall lab) was the 2011 recipient of the Arnold K. Balls Award honoring a graduate student who has demonstrated outstanding research potential, scholarliness and intellectual curiosity. Juan's research contributions directly led to successful grant proposals to the American Heart Association and National Science Foundation. Juan graduated in May and had previously received the Hickory Stick Award, the departmental PRF fellowship, and the first Henry A. Moses Award.

Several undergraduates were 2011 recipients of scholarships funded by the Department of Biochemistry. Dahlia Shvets (junior), Erin Nicklow (freshman), Betheny Moore (junior), Kayleigh Nyffeler (sophomore), Kim Tyler (sophomore), and Alexis Zobel (freshman) received the Edwin T. Mertz Memorial Scholarship. Gabe Rangel (sophomore) and Laura Henry (junior) received the Ray W. Fuller Memorial Scholarship. Elizabeth Bell (freshman) received the Patrick C. Matchette Scholarship.

Shawn Liu (Liu lab) was the 2011 recipient of the Henry A. Moses Award established in 2008 by biochemistry alumnus Dr. Bradley Sheares to honor his mentor and fellow alumnus Dr. Henry Moses for his contributions to research, education and service. Shawn was recognized for his 1st author paper, “Plk1 phosphorylation of G2 and S-phase-expressed 1 protein is essential for p53 inactivation during G2 checkpoint recovery” (2010) EMBO Reports (11), 626-632. Shawn also was selected by the department to receive a one-year Purdue Research Foundation (PRF) Research Grant. These grants are provided by the College of Agriculture in conjunction with the Office of the Vice President for Research. The award recognized Shawn’s research and teaching accomplishments.

The annual Department of Biochemistry research retreat was held on October 2 at Turkey Run State Park featuring keynote Speaker Dr. Kristian Baker from the Center for RNA Molecular Biology at Case Western Reserve University. The best poster award winners were Michelle Drennan (Clemens lab), Yi Li (Chapple lab) and Kayla Harmeyer (Briggs lab).
**College and University Scholarship Recipients**

**Freshmen**

William Beyer: Marquardt Farm Scholarship

Matthew Cole: Scholarship Award of Excellence

Amanda Helms: Scholarship Award of Excellence

Patrick Mangan: Food, Environment, Engineering and Life Science NFS Scholarship, Henry William & Matilda Marie Sailer Schroeder Memorial Scholarship

Abishek Parapuzha: Scholarship Award of Excellence

Michael Walsh: Scholarship Award of Excellence

Alexis Zobel: Scholarship Award of Excellence

**Sophomores**

Kathryn Alleva: Floyd E. & Nellie P. Elliott Scholarship

Elizabeth Baker: Fred M. Fraser Memorial Agriculture Scholarship, Rex Hall Memorial Scholarship

Lotti Brose: O.B. Riggs Memorial Scholarship

Kayleigh Nyffeler: Marquardt Farm Scholarship

Amanda Smith: Marquardt Farm Scholarship

Katherine Turpen: J. Kelly O’Neill & Margaret Ritchey O’Neill Memorial Scholarship

**Juniors**

Laura Henry: Presidential Scholarship in Agriculture

Elaine McCarthy: Lewis Runkle Scholarship, J. Kelly O’Neall & Margaret Ritchey O’Neall Memorial Scholarship, Van Scy Scholarship in Agriculture

**Seniors**

Jamie Bergdall: Marquardt Farm Scholarship

Korbin Davis: J. Kelly O’Neall & Margaret Ritchey O’Neall Memorial Scholarship, Marquardt Farm Scholarship

Michael Hans: Elsie L. Gruel Scholarship

Anna Hurlock: Elsie L. Gruel Scholarship

Katrina Landram: J. Kelly O’Neall & Margaret Ritchey O’Neall Memorial Scholarship

Chelsea Noffinger: Marquardt Farm Scholarship

Camellia Reyes: Lewis Runkle Scholarship

Whitney Ringenberg: Elsie L. Gruel Scholarship

Rachel Schluttenhofer: Elsie L. Gruel Scholarship, Pfendler Memorial Agriculture Scholarship

Megan Schnur: Elsie L. Gruel Scholarship, Richard F. and Helen Willsey Memorial Scholarship, Van Scy Scholarship in Agriculture

Leslie Seals: Elsie L. Gruel Scholarship, Martin Agriculture Research Scholarship

Natalie Taylor: Van Scy Scholarship in Agriculture

Zinan Zhou: Elsie L. Gruel Scholarship

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Above: Biochemistry College of Agriculture Scholarship recipients at the awards reception with Dr. Clint Chapple
Amanda Campbell (B.S. 2010)
Next Stop: Ph.D. Biomedical Gateway Program, Indiana University

Craig Chanley (B.S. 2010)

Adam Dillard (B.S. 2010)
Next Stop: Assistant Biochemical Engineer, Laboratory of Renewable Resources Engineering, Purdue University

Zachary Allen (B.S. 2011)
Next Stop: M.S. program in Agronomy, University of Nebraska-Lincoln

Zachary Anderson (B.S. 2011)
Next Stop: Baxter Healthcare Corporation, Round Lake, IL

Nadia Atallah (B.S. 2011)
Next Stop: Ph.D. program in Botany, Purdue University

Jamie Bergdall (B.S. 2011)
Next Stop: School of Veterinary Medicine, Ross University

Alejandra Boecker (B.S. 2011)
Next Stop: Dietetic Internship, Napa State Hospital, CA

Jeremy Bolt (B.S. 2011)

Korbin Davis (B.S. 2011)
Next Stop: Masters of Public Health Program, IUPUI

Michael Hans (B.S. 2011)
Next Stop: Indiana University School of Medicine

Heather Holzhauer (B.S. 2011)
Next Stop: School of Veterinary Medicine, Purdue University

Anna Hurlock (B.S. 2011)
Next Stop: Ph.D. program in Biochemistry, Michigan State University

Na Yeon Lee (B.S. 2011)
Next Stop: Ph.D. program in Human Genetics, Johns Hopkins University

Jason Markovich (B.S. 2011)
Next Stop: Law School at DePaul University

Kaylin Montgomery (B.S. 2011)
Next Stop: Grain Processing Corporation, Washington, IN

Camellia Reyes (B.S. 2011)
Next Stop: Ph.D. program in Biomedical Sciences, University of Virginia

Whitney Ringenberg (B.S. 2011)
Next Stop: Quality Control Chemist, Cargill

Andre Santoso (B.S. 2011)

Rachel Schluttenhofer (B.S. 2011)
Next Stop: Ph.D. program in Biological Sciences, University of Notre Dame

Megan Schnur (B.S. 2011)
Next Stop: School of Veterinary Medicine, Purdue University

Leslie Seals (B.S. 2011)
Next Stop: Quality Control Chemist, Antech Diagnostics

Andrea Stephenson (B.S. 2011)
Next Stop: M.S. program in Biology, IUPUI

Natalie Taylor (B.S. 2011)
Next Stop: Emergency Room Scribe, Franciscan St. Elizabeth Health

Fangke Xu (B.S. 2011)
Next Stop: Ph.D. program in Biological Sciences, Northwestern University

Xiwei Yan (B.S. 2011)
Next Stop: Ph.D. program in Cell & Molecular Biology, University of Texas at Austin

Lifeng Yuan (B.S. 2011)
Next Stop: Ph.D. program in Cell & Molecular Biology, Duke University

Zinan Zhou (B.S. 2011)
Next Stop: Ph.D. program in Pharmacology, University of Pennsylvania
Qiang Gao
Ph.D. 2010 (Regnier)
Next Stop: Research Scientist
R&D Division
Sanofi-Aventis in Cambridge, MA

Jacob Galan
Ph.D. 2010 (Tao)
Next Stop: Postdoctoral Fellow
Institute for Research in Cancer and Immunology
Montreal, PQ, Canada

Anton Iliuk
Ph.D. 2011 (Tao)
Next Stop: Postdoctoral Fellow and
Chief Technology Officer
Purdue University, Department of Biochemistry
and Tymora Analytical Operations, LLC
West Lafayette, IN

Rakesh Joshi
Ph.D. 2011 (Gimble)

Juan Martinez
Ph.D. 2011 (Hall)
Next Stop: Postdoctoral Fellow
Genotoxic stress and cancer unit
Institut Curie in Paris, France

Jennifer Jacobi
M.S. 2011 (Kirchmaier)
Next Stop: Research Assistant
National Center for Genome Resources in Santa Fe, NM
1950s

Don Burns (Ph.D. 1958, Parker) and his wife, Linda, are still living in Los Alamos, New Mexico, where he retired from Los Alamos National Laboratory 15 years ago. Don continues to enjoy retirement and keeps busy with computer editing of video tapes of vacations and trips to visit grandchildren, attending local meetings of computer users, genealogists, and investment clubs. He remains interested in the field of Near-Infrared Spectroscopy and still teaches a basic course at technical conferences. Don is senior editor of the Handbook of Near-Infrared Analysis, first published in 1992, and now in its 3rd edition (CRC Press). He would love to hear from anyone in biochemistry 55-58. e-mail NIRman@cybermesa.com.

Ken Kirby (Ph.D. 1958, Whistler) and his wife, Bernice, are still living in Cedar Rapids, Iowa. Bernice is now in assisted living in an Alzheimer unit and both of their lives have changed, but Ken continues to keep up his activities of band, choir, tennis and golf.

George Linke (Ph.D. 1956, Whistler) continues an active lifestyle at 83. He is involved in Life Long Learning, taking classes at Milwaukee Area Technical College in photography, antique clock repair, upholstery and sewing. George has two grandchildren, one having graduated from Smith College in Northampton, Massachusetts in May.

1960s

Mark Reasor (B.S. 1967) continued on to receive an M.A. in biochemistry from Duke University in 1969. Following two years as an officer in the US Army Chemical Corps, he enrolled in the Johns Hopkins University School of Public Health graduate program and received a Ph.D. in toxicology in 1975. After a postdoctoral fellowship at the National Institutes of Environmental Health Sciences, Mark joined the faculty of the Department of Pharmacology and Toxicology at the West Virginia University School of Medicine. In 2001, he moved to the Department of Physiology and Pharmacology where he is a full professor. For 25 years, Mark conducted research on various aspects of toxicology and pharmacology with an emphasis on the response of the lungs to drugs and chemicals, publishing over 100 research articles and book chapters. During this time he has consulted extensively with the pharmaceutical industry on issues related to drug safety. For the past 10 years Mark has participated in an NIH-funded grant to enhance the biomedical research capabilities of faculty and students in the primarily undergraduate colleges and universities in West Virginia. At the end of December 2011, he will retire and is looking forward to spending more time with his wife, son, daughter and five grandchildren as well as continuing to garden, travel, snorkel, scuba dive and improve his skills in underwater photography. He comments, “I am very appreciative of the role Purdue’s Department of Biochemistry played in my career development, especially the introductory biochemistry course taught by Dr. Joseph Kuć and the independent study I conducted with Dr. Victor Rodwell.”

1970s

John W. Hayes (Ph.D. 1972, Brandt) is currently at Pacific University in Oregon where he has been Dean of the College of Arts and Sciences since 2003. Prior to that, he was at Marlboro College in Vermont for 30 years as a professor of chemistry and as dean for twelve of those years. John plans to retire in July 2012.

Michael Massagali (B.S. 1976) received his MA in Sociology from the University of Maryland in 1978 and continued on to receive his Ph.D. from the University of Wisconsin-Madison in 1984. With the exception of teaching for four years at Penn State (1985-1989) he has worked as a survey research methodologist, designing, conducting and analyzing surveys. Michael has worked at the Bureau of the Census, University of Massachusetts-Boston Center for Survey Research, the Picker Institute, Dana-Farber Cancer Center, and for the past 4 years at PatientsLikeMe Inc., an on-line health data sharing website, (www.patientslikeme.com).

Elizabeth (Krug) Mundell (B.S. 1977) worked as an analytical chemist at Eli Lilly Pharmaceuticals in Indianapolis for a year following graduation. She married her husband Jim and moved back to West Lafayette and worked as an analytical chemist in Purdue’s Indiana State Chemist’s Lab for three years before staying home to raise their three children for 15 years. Returning to the workforce, Beth worked for Novogyn Pharmaceuticals in sales for ten years. Most recently she has been working for Qiagen, a molecular diagnostic company, as a clinical specialist for three years. She promotes the Digene HPV tests to physicians and medical practices in the eastern half of North Carolina, and parts of Virginia and South Carolina. Beth was named the #1 clinical sales representative in the US in 2010 and won the President’s Circle trip to Istanbul, Turkey. She and her husband reside in Raleigh, NC. Their oldest son is a lieutenant (j.g.) in the US navy, their daughter is a high school Spanish teacher, and their youngest son is in graduate school.

Edo Pellizzari (Ph.D. 1970, Kuć) was a Fulbright Fellow to the University of Montevideo, Uruguay, and a U.S.P.H.S. postdoctoral fellow in the Texas Medical Center in Houston before joining Research Triangle Institute as a chemist in 1971. Edo retired in January 2011 after a long career with RTI, serving as research vice president of Analytical and Chemical Sciences from 1983 to 2003, being appointed Senior Fellow in 2004, and becoming the Lead Fellow of the Fellow Program and a member of the RTI Executive Leadership Team in 2007. He is nationally and internationally recognized for major contributions in the environmental health sciences, specifically in chemical and aerosol exposure analysis, and for developing and applying personal exposure methodology to population-based studies on toxic chemicals. One of Edo’s notable accomplishments was the identification of chemicals that caused the strange odors in people’s homes at the infamous Love Canal site in 1978. This discovery of chemicals dumped in the canal upon which homes were built subsequently led President Carter to declare a state of emergency and a few months later the federal Superfund Act was passed by Congress. Edo and his wife live in Chapel Hill, North Carolina where they raised six children. He now devotes his time to his hobbies, astronomy and building classic cars.

David Scheible (B.S. 1978) continued at Purdue after graduation and received a MSIA degree from Krannert in 1979. Directly out of college he worked with the B. F. Goodrich Company in sales and marketing and in 1982 was named Sales Manager for the Latin American market. He moved on to work with Avery Denison for 13 years in a variety of general management roles that took him to Cleveland and Detroit. In January 1999, David became COO with Graphic Packaging International (NYSE:GPK), a $4.2 billion global paperboard based packaging company headquartered in Atlanta, GA, with over 12,500 employees located around the world. David
was appointed President and Chief Executive Officer in 2007. Graphic Packaging International is the world's largest manufacturer of folding cartons for the consumer food and beverage markets supporting global brands like AB, Coca-Cola, General Mills, Kellogg, Kraft, Miller Coors, Nestle, Pepsi Co., and many more. They operate seven paperboard mills and over 70 converting plants throughout North America, South America, Europe, and Asia. He and his wife Mary (B.S. 1979, Pharmacy) live in Atlanta and have three grown daughters.

**Daniel Walker** (Ph.D. 1979, Axelrod) and his wife Jill recently purchased a home in St. Louis where he plans to reside full-time within the next 12-18 months. For now he continues to spend the majority of his time living in Sweden where he runs his consulting company, Ocean Consulting LLC, working mainly with small pharmaceutical and medical device companies. He also invests in start-up companies. Dan is founder, owner and board member of Premacure AB, a company focused on preventing complications from preterm birth utilizing replacement therapy of Insulin-Like Growth Hormone. He is founder, owner, board member and CEO of ParkCell AB, a company working with the transplantation of autologous cells for the treatment of Parkinson's disease. Daniel is also owner and CEO of DermMatrix AB, a company focused on providing extended pain relief to patients with chronic wounds.

**Naomi (Ditkowsky) Chambers** (B.S. 1983) is currently a scientific compliance specialist with Abbott Laboratories where she has worked for 17 years. She and her husband Larry (B.S. 1982, Krannert School of Business) have two children and reside in Deerfield, IL.

**Jeffrey Dean** (Ph.D. 1986, Herrmann) has added duty as graduate coordinator for the Graduate Program in Bioinformatics at the University of Georgia to his regular appointments as professor in both the School of Forestry and Natural Resources and the Department of Biochemistry and Molecular Biology. In April 2011, he had the pleasure of hosting Purdue Biochemistry’s own distinguished professor and head, Clint Chapple, who presented a seminar as part of The Future of Bioenergy Lecture Series organized by the UGA Bioenergy Systems Research Institute (BSRI) and the Bioenergy Science Center (BESC).

**Tuajuanda Jordan** (Ph.D. 1989, Rodwell) moved from Columbia, Maryland, to Portland, Oregon, this summer. She had been with Howard Hughes Medical Institute since 2006 where she started as a senior program officer. In 2008, she was promoted to director of a new division, the Science Education Alliance. Tuajuanda started a new adventure in her career journey on July 1 when she became Dean of the College of Arts and Sciences at Lewis & Clark College.

**Janice Morand** (Ph.D. 1988, Kent) has been with the University of California, Davis since 1989 and is currently a project manager in the Internship and Career Center.

**Larry Morand** (Ph.D. 1989, Krogmann) has been with the University of California, Davis since 1989 and is currently a lecturer and academic coordinator in the Department of Molecular and Cellular Biology.

**Ronda Rolfes** (Ph.D. 1990, Zalkin) joined the faculty in the Department of Biology at Georgetown University in 1995 and is currently an associate professor. Her research group investigates how fungal cells sense and respond to environmental conditions. With funding from the NIH and NSF, her group has studied *Saccharomyces cerevisiae* for a number of years and has recently begun investigations into *Candida albicans*. Ronda has taught courses in genetics, advanced molecular biology and graduate foundations in molecular and cell biology. She and her husband, Tom Dever, and their two children live in Bethesda, MD.

**Scott Rosenthal** (Ph.D. 1995, Rodwell) continues to work for Amgen and was promoted to principal scientist in the Process Development Organization in 2011. In this role Scott is responsible for leading a team of scientists to characterize the purification process used to produce a late-stage protein therapeutic that looks very promising in various oncology settings including ovarian cancer. Scott and his wife Christine still reside in Longmont, CO, with their two children, now 7 and 5.

**Chris Sinclair** (Ph.D. 1999, Rossie) continues to live in North Chicago with his wife and four children and work for Abbott, a global healthcare company. In 2011, he was promoted within his Business Excellence Management role and given the added responsibility of managing the group responsible for administering training to over 500 technical and non-technical staff.

**Jacob Adler** (B.S. 2008) is finishing his third year of graduate school. He is currently a NSF GK-12 Fellow at Indiana University School of Medicine in Indianapolis, IN. There he is studying how the Amot family proteins control the trafficking of other membrane-associated proteins and teaching part-time at local high schools to bring excitement from his research into science classrooms.

**Amanda Burns** (B.S. 2006) graduated from the University of Louisville School of Medicine in May 2011. She is now doing her internal medicine residency at St. Louis University and is excited to have purchased her first home.

**Yoshiaki Hagiwara** (B.S. 2005) received his M.S. degree in 2009 from Kobe University. He is working for a bio-venture company, GenoMembrane Inc. in Yokohama-shi, Kanagawa-ken, Japan as a researcher and a sales representative.

**Adam Henry** (B.S. 2009) just completed his second year at Indiana University School of Medicine-Northwest in Gary. He will continue his clinical rotations in northwest Indiana as well. Adam and his wife Rebecca celebrated their first year wedding anniversary on July 31. During his first year of school, Adam and several classmates helped to create a nonprofit organization called Medical Student Missions in response to the earthquake in Haiti in January 2010. He has had several opportunities to visit Haiti and participate in medical clinics along with other students, as well as work in the hospital and cholera clinics located in Verrettes, Haiti. He says, “It’s been an amazing opportunity to serve the people of Haiti and see first-hand the successes and challenges of practicing medicine in the developing world.” To learn more, visit [www.medicalstudentmissions.org](http://www.medicalstudentmissions.org) or email him at adamhenry.adh@gmail.com.
Collin Mitchell (B.S. 2000) has recently accepted a promotion within EMD Millipore to the position of District Manager for the Pacific Northwest in the San Francisco Bay Area. He will be managing eight reps that cover the Bay Area, Oregon, Washington, Montana and Hawaii.

Anthony Nguy-Robertson (B.S. 2003) continued teaching Biology and Chemistry at Warren Central High School in Indianapolis until 2007. During the summer months, he got involved in doing chemical analysis of water samples with a remote sensing laboratory at Indiana University-Purdue University Indianapolis (IUPUI). Deciding that a Master's degree in science would provide more opportunities than one in education, he quit teaching and took a research fellowship at IUPUI in the Department of Earth Sciences under Dr. Lin Li and received his M.S. degree in 2009. Tony married Karen Nguy in 2009 and changed his last name to Nguy-Robertson. In the fall of 2009 he started in the Ph.D. program at the University of Nebraska-Lincoln in the School of Natural Resources under Dr. Anatoly Gitelson. He continues studies in remote sensing, but is now focusing on vegetation (primarily maize and soybean). Tony is now a Ph.D. candidate and hopes to defend his thesis and graduate in 2012. When he's not working on his research he enjoys volunteering as a science fair judge, science bowl science judge, and science olympiad event supervisor.

Scott Secrist (B.S. 2008) started working for Purdue's Student Access, Transition and Success Programs department following his graduation. He is currently an assistant director. In this role, he works primarily with Purdue Promise, an initiative created by President Cordova that provides students from low-income backgrounds with financial, academic and social support.

Noah Shields (B.S. 2008) continued his education at Purdue and received his M.S. degree in December 2010 in Youth Development and Ag Education. He is currently employed as a senior zookeeper at the Columbian Park Zoo in Lafayette, IN.

Erika Snodderley (B.S. 2001, M.S. 2003, Forney) joined the Biomarker Center of Excellence at Covance Laboratories in Greenfield, IN, in 2009 and was recently promoted from staff scientist to team leader in the assay development team. Prior to her work at Covance, Erika spent five years as a senior biochemist in R&D at Dow AgroSciences where she gained experience with bioassay development and optimization in R&D and regulated environments, technology transfer and laboratory operation. Since joining Covance, she has helped establish the basic operation of the lab, and has contributed to multiple successful assay transfer, validation and biomarker projects. Erika lives in Carmel, IN, with her two sons Jacob, 9 and Collin, 6.

Kimberly Stoughton (B.S. 2004) moved to Gurnee, IL, and began working as a quality lab technician for Abbott Laboratories in the Diagnostics Division directly following graduation. In 2005, she changed companies and became a quality research associate with Baxter Healthcare. Kim moved back to Lafayette in 2007 and is working as a non-clinical research associate at MED Institute Inc. (Cook Group) in West Lafayette, IN. She and her husband Jason Hamilton and have a lovely 1 1/2 year old daughter, Lorelai Jane.

Taichi (Endo) Takasuka (M.S. 2005, Kirchmaier) continued and completed his Ph.D. with Purdue's Department of Biological Sciences under Dr. Arnold Stein in 2009. He is completing his 2nd year as a postdoctoral research associate with the Department of Biochemistry at the University of Wisconsin-Madison.

Jing-Ke Weng (Ph.D. 2009, Chapple) is completing his second postdoctoral year at the Salk Institute for Biological Studies in California. He and his wife Mingli (and 4 year old Vivian) welcomed their 2nd child, Howard WeiHan on March 31.

Michelle Weyreter (B.S. 2009) completed her second professional year in Purdue's Doctor of Pharmacy program. She has been a student pharmacist at Kroger in Fishers, IN, since 2007. This summer Michelle did a nuclear pharmacy internship at Cardinal Health in Indianapolis, IN. On July 23, Michelle married Purdue alumnus, Tim Schumm (B.S. 2010 in Electrical Engineering Technology). They live in Zionsville, IN.
Scott Briggs, National Institutes of Health, $1,325,951, 01/01/2006-12/31/2010, “The role of Set1-mediated methylation in chromatin function.”


Scott Briggs, Center for Cancer Research/Purdue Research Foundation Special Incentive Research Grant, $16,795, 06/01/2010-05/31/2011, “Characterization of the oncoprotein ASH2L and the yeast homolog Bre2.”

Nicholas Bonawitz, Life Sciences Research Foundation, $162,000, 08/01/2008-07/31/2011, “BAHD acyltransferases as a means to manipulate lignin biosynthesis and optimize cellulose bioethanol production,” postdoctoral fellowship for research in the laboratory of Clint Chapple.


Clint Chapple, Global Climate and Energy Project, Stanford University, $1,930,000, 03/01/2008-07/13/2011, “Assembly of a lignin modification toolbox.”

Clint Chapple, US Department of Energy, $1,400,000, 09/01/2006-08/31/2010, “Manipulation of lignin biosynthesis to maximize ethanol production from Populus feedstocks.”


Harry Charbonneau and Mark Hall (Co-PIs), Purdue University Center for Cancer Research, Innovative Research Pilot Projects Award, $30,000, 06/01/2010-04/30/2012, “Regulation of cell division by the Cdc14 phosphatase.”

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.”

James Forney, Purdue Research Foundation International Travel Grant, $1,000, 07/10/2011-07/15/2011 “FASEB Ciliate Molecular Biology Meeting in Chania, Greece.”

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, Purdue University College of Agriculture, $33,871, 07/01/2010-06/30/2011, “Instructional innovation proposal – Biochemistry 32200 – Analytical biochemistry of macromolecules Version 2.0.”

Mark Hall, Indiana University School of Medicine - Indiana Clinical and Translational Sciences Institute, $10,000, 01/01/2010-12/31/2011, “Development of methods using SRM on a triple quadrupole mass spectrometer for rapid and sensitive detection of protein biomarkers.”

Mark Hall, National Science Foundation, $586,639, 06/01/2009-05/31/2012, “Regulation of the anaphase-promoting complex by pseudosubstrate inhibition.”

Ann Kirchmaier, Indiana University School of Medicine - Indiana Clinical and Translational Sciences Institute, $10,000, 11/01/2009-04/30/2011, “Manipulating the fate of neural stem cells by regulating epigenetic processes.”

Ann Kirchmaier (Co-PI), Indiana School of Medicine - Indiana Clinical and Translational Sciences Institute, $10,000, 07/01/2010-06/30/2012, “Ultrasensitive detection and quantification platforms for microRNA-based screening, staging and classification of cancer.”

Ann Kirchmaier, Indiana School of Medicine - Indiana Clinical and Translational Sciences Institute Core Grants, $8,000, 01/01/2011-06/30/2012, “Bioinformatics for mapping genomic sites of 5-hydroxymethylcytosine, a novel CpG modification catalyzed by the MLL partner TET1 protein family.”


Ann Kirchmaier, Purdue Research Foundation, $8,000, 06/01/2011-08/12/2011, “Summer faculty grant for mapping genomic sites of 5-hydroxymethylcytosine, a novel CpG modification catalyzed by the MLL partner TET1 protein family.”

Ann Kirchmaier (Co-PI), Purdue Birk Nanotechnology Center, $6,500, 03/15/2010-03/14/2011, “Kirk endowment exploratory research recharge grant.”


Ann Kirchmaier, Purdue University Center for Cancer Research, Innovative Cancer Research Pilot Projects Award, $30,000, 12/01/2010-11/30/2011, “Mapping genomic sites of 5-hydroxymethylcytosine, a novel CpG modification catalyzed by the MLL partner TET1 protein family.”

Xiaoqi Liu (Co-PI), National Cancer Institute, $369,050, 06/01/2009-05/31/2011, “Role of polo-like-kinase (Plk1) in hepatitis B virus-mediated hepatocellular carcinoma.”

Xiaoqi Liu, Purdue University Center for Cancer Research, Innovative Cancer Research Pilot Projects Award, $30,000, 03/01/2010-02/28/12 “Plk1 in adaptive radioresistance of tumor cells during radiotherapy.”

Xiaoqi Liu, United Against Lung Cancer, $100,000, 12/01/2009-11/30/2011, “Validation of polo-like-kinase (Plk1) as a therapeutic target in small cell lung cancer.”

Xiaoqi Liu, Elsa U. Pardee Foundation, $125,000, 01/01/2011-12/31/2011, “Plk1 in chemo resistance of cancer.”

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

Xiaoqi Liu, Showalter Trust, $75,000, 07/01/2011-06/30/2012, “Plk1 in gemcitabine resistance of pancreatic cancer.”

Xiaoqi Liu (Co-PI), Showalter Trust, $75,000, 07/01/2011-06/30/2012, “A synthetic lethal interaction between Plk1 and PTEN in prostate cancer.”

Joe Ogas, National Science Foundation, $300,000, 09/1/2009-08/31/2011, “Dissecting the relationship between a CHD3 chromatin remodeler and the repressive epigenetic mark H3K27me3 in Arabidopsis.”
Joe Ogas, National Science Foundation, Research Experience for Undergraduates Supplement, $12,000, 05/17/10-08/31/12, “Dissecting the relationship between a CHD3 chromatin remodeler and the repressive epigenetic mark H3K27me3 in Arabidopsis.”


W. Andy Tao (Co-PI), National Institute of Food and Agriculture, US 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, 3M General Offices, $45,000, 04/01/2008-03/31/2011, “3M non-tenured faculty grant.”

W. Andy Tao, National Science Foundation, $541,593, 07/01/2007-06/30/2012, “CAREER: Soluble nanopolymers for targeted proteomics in vitro and in living cells.”


W. Andy Tao, Seattle Children’s Research Institute, National Institutes of Health, $137,250, 05/01/2009-04/30/2011, “Eukaryotic-type signaling mediates two-component regulation of GBS virulence.”


W. Andy Tao, National Institute of General Medical Sciences, US Department of Health and Human Services, $1,500,891, 09/01/2010-08/31/2015, “New proteomic technologies for the analysis of tyrosine kinase signaling pathways.”


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