

Biology Students Showcase Excellence at Stander Symposium

The UD Department of Biology has a long history of outstanding participation in the annual Stander Symposium. The symposium serves as a venue for students of all disciplines to present their individual and collaborative research projects, often worked on for longer than the academic year. It features a keynote speaker, poster sessions, performances, art exhibits and oral presentations. Honoring the late Brother Joseph W. Stander, S.M., professor of mathematics and provost (1974–89), the Stander Symposium fosters the Marianist tradition of community and gives students the opportunity to learn from each other.

“The best part of Stander is the opportunity to have students from every discipline under one roof presenting,” said undergraduate student Madison Irwin, a biology major. “There are so many different projects and it’s a

great thing to have it all in one place.”

All UD students are invited to attend the Stander Symposium as an “alternate day of learning.”

Nonparticipating students are encouraged to attend the symposium to appreciate and learn from the research of their peers. For students presenting posters, discussing their work with students of other disciplines is another learning experience.

“I think the best thing about it is the fact that it forces you to really know your data and be able to talk about it at an intelligent level with the faculty that come by and ask you about it, as well as undergrads,” said biology graduate student Eric Camino. “Can you discuss it with people in your field as well as with people in other studies? Can you explain why it’s relevant? I think that science, when you really understand it, can be explained on both levels

within your field and outside it.”

UD biology students have a unique experience in their research projects because of the all-inclusive collaboration with faculty members in the lab and presenting their findings, often for the first time, at the symposium.

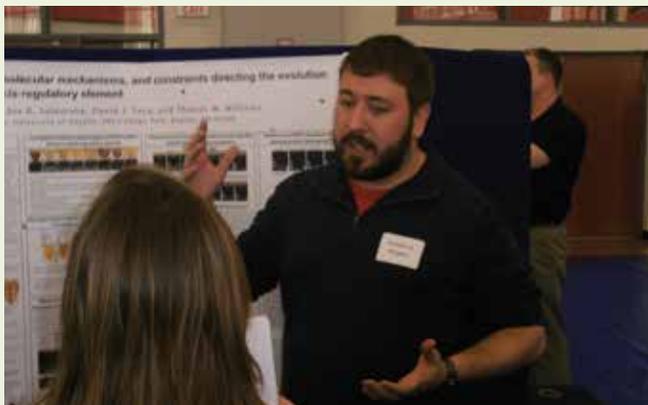
“The department has grown, and the number of students participating in Stander has grown,” said Dr. Jayne Robinson, UD biology professor. “It’s an integral part of our curriculum because it’s one thing for students to go in the lab and do the work, but science doesn’t help the world if it’s not communicated. Students have to learn how to communicate their work, and their ultimate goal is to publish it, but one of the first stages is to go on from doing the Stander Symposium to presenting their work at regional, national and international meetings.”

UD biology students also appreciate having the Stander Symposium as a springboard for their research.

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Biology faculty and undergraduate and graduate student participants at the UD 2014 Brother Joseph W. Stander Symposium (not all are pictured).



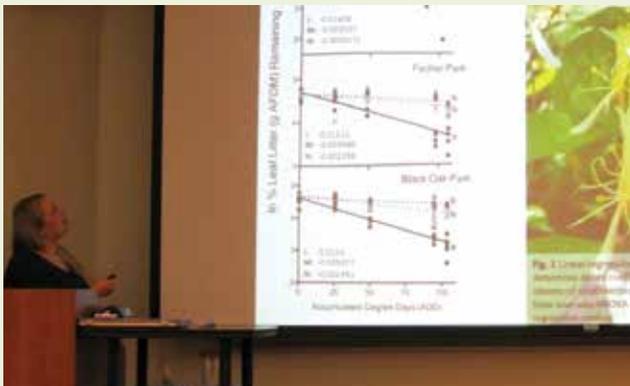
Dr. Will Rogers '14 discusses his research poster at the 2014 Stander Symposium.

“Projects evolve,” said graduate student Sumant Grover. “The big questions remain the same, but your findings change the way you think about them. It’s a good platform for conceiving what you want to do at international conferences; it’s a growing basis of your research and a good firsthand experience.”

Faculty members in the biology department encourage participation in the symposium. The research component of the presentation fosters collaboration between undergraduate students, graduate students and faculty.

“We want the students in the laboratory,” said Dr. Karolyn Hansen, UD biology professor. “It’s such a rich experience to have those different levels of research in the laboratory. The adviser, the mentor, is the driver and the focus of the lab. The grad students come in and learn from the mentor and choose really challenging projects, and the undergrads come in and learn from the graduate students ... we foster that at a very high level.”

For UD alumni, the involvement in the Stander Symposium projects as undergraduate students had lasting impacts for them.



Rachel McNeish, biology graduate student, gives her oral presentation at 2014 Stander Symposium.

“While working in Dr. Krane’s laboratory [at UD as an undergraduate], I collaborated with current Notre Dame

graduate student Connor Ratycz and current UD graduate student Kyle McGrail,” said Mark Hawk ’14, a graduate student at University of Notre Dame. “It was a great experience to bounce ideas off of one another as well as help each other with certain protocols. Working with both Kyle and Connor has inspired me to work in science and continue to develop collaborations with fellow students, which in turn forges robust friendships.”

“The part I enjoyed most about research was reading the primary literature and other studies that were previously performed in my field to construct my own hypothesis and develop experiments,” said Connor Ratycz ’14.

Experiencing the research process firsthand can affirm their career choice for some students and teach skills that will be critical in future careers as scientists.



2014 Stander Symposium graduate and undergraduate participants from the lab of Dr. Ryan McEwan.

“Students grow in experience, gain knowledge about themselves in what their strengths and weaknesses are, which helps them decide their career path,” said Hansen.

For Hawk, the experience certainly proved invaluable.

“Stander was a steppingstone in developing my scientific communication skills,” Hawk said. “It has enabled me to explain scientific data at the highest of standards as well as develop the professional side of scientific poster presentations. Stander reaffirmed my career choice of science management due to the enjoyment I have when talking about science.”

At the conclusion of the symposium, projects done by UD biology students all have one thing in common: overwhelming success!

“When they’re finished with Stander, walking back with their poster under their arm and a smile on their face, saying ‘I did it,’ it’s an attainment of a goal and it drives them to want to do the next thing because they’ve proved that they can do this kind of work,” said Hansen. “It’s the realization that they can accomplish a project, present it and feel really good about it.”

Biology department welcomes new microbiologist

Dr. Yvonne Sun discovered that she was a practical person as well as a problem-solver from watching the TV show MacGyver at a young age. The more she thought about it, the more becoming a scientist made sense to her as she continued her education and began to think about a career.

Sun moved to California from Taiwan as a high school student. She went on to receive her bachelor's degree from the University of California, San Diego, and her doctoral degree from the University of California, Berkeley. She then completed a postdoctoral fellowship at the University of Michigan.

In her first year at UD as an assistant professor, Sun is teaching general microbiology and will eventually manage the microbiology lab associated with the class. So far, her favorite thing about UD is the community atmosphere and the friendly people. Sun selected UD to be her new home because of the connection she felt during her interviewing experience and the warm interaction with the faculty and graduate students.

"I feel like the students I interact with are very good. They're very polite, and they work hard," she said. "Also, the people in the biology department have all been very helpful and very supportive. They were definitely one of the main reasons I decided to come here."

In her microbiology research, Sun studies how different chemical parameters affect the way bacteria behave, particularly during host-pathogen interactions. She first began her research as part of a postdoctoral fellowship awarded by the United States Department of Agriculture at the University of Michigan.

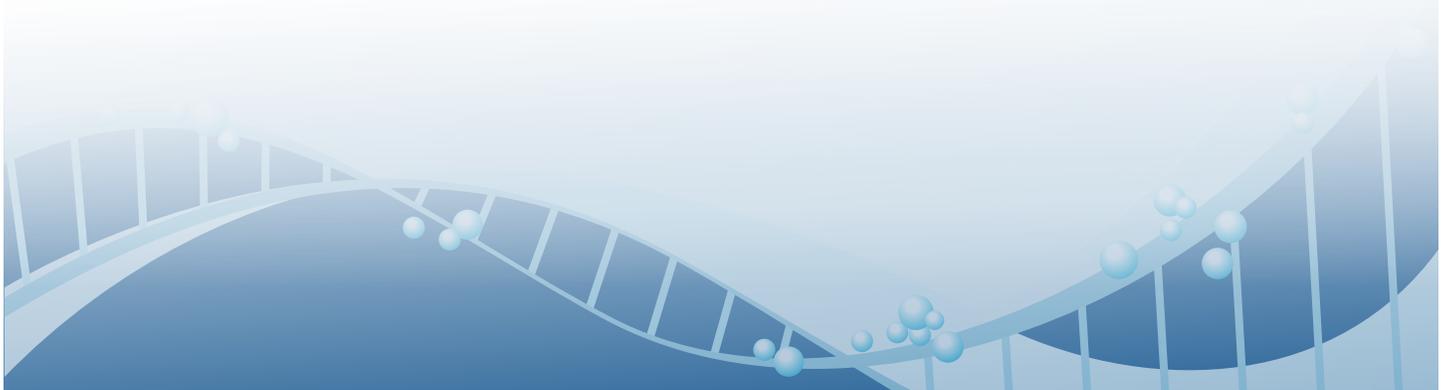
At UD, Sun will examine how environmental factors like oxygen affect pathogens such as *Listeria monocytogenes*, a foodborne pathogen usually found in cheese and deli meats that can survive in cold environments for a long time. *Listeria* is an important pathogen because even though there are a low number of cases annually, the mortality rate from *Listeria* infection is very high.



Yvonne Sun, Ph.D.

Sun is excited to develop future courses, including a microbiome class to discuss bacteria associated with humans and how bacteria are important in health and disease, and a science communication class to improve the way students talk about basic research. She believes better science communication skills will bridge the gap between science education and basic research.

"This is my inspiration and why I want to be here," Sun said. "As a researcher and a teacher, I have the responsibility to incorporate the research process with my teaching so that students can understand what research is all about. Every student with a curious and inquiring mind can be a scientist. I want to train the next generation of scholars to be better scientists and have faith in basic research."



Fred Tenover: Alumnus on the forefront of microbiology

Throughout August and September, the nation was in fever pitch. Ebola had come to America. While the CDC tried to project a sense of calm, the public heard mixed messages from politicians, the media, doctors and Facebook friends.

While the public quickly became familiar with important information such as Ebola symptoms and a 21-day incubation period, it also considered questions like, “Can you contract Ebola from a bowling ball?” and “Should the government require quarantine of a returning health care worker who has no symptoms?”

For many people, it was panic. For Dr. Fred Tenover '76, it was déjà vu.

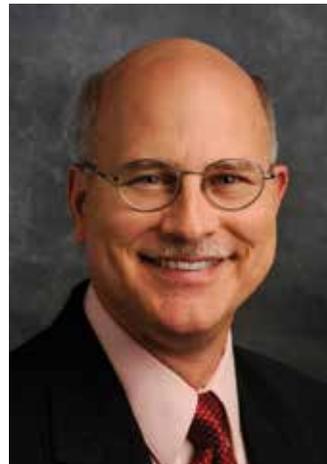
“I’ve seen this happen multiple times before,” he said. “Whether it’s HIV/AIDS, multidrug-resistant tuberculosis or SARS, there seems to be a familiar pattern: First comes awareness of a disease, then panic, then education and then control. The problem is that we in the science community don’t always handle the education component well.”

Tenover had a front row seat to this pattern during an 18-year tenure at the Centers for Disease Control, where his primary focus was on antimicrobial resistance. Since 2008, he has been at Cepheid, a biotechnology company that develops and markets rapid diagnostic equipment, where he currently is vice president for scientific affairs. He also maintains two faculty positions at Stanford and Emory universities.

Tenover visited the University of Dayton Nov. 13 to share his experiences with faculty and students. He said he has noticed a disturbing trend, where politics is heavily influencing science, creating confusion and mistrust in the public. For example, in the mid-1990s, Congress prohibited the CDC from continuing to use funding to report on gun violence statistics. Tenover wonders what will happen if diseases like Ebola or AIDS or tuberculosis become similarly politicized.

“We’re in a difficult situation because we’re trying to educate the public about diseases, but at the same time we’ve politicized the science to a point where a lot of people are suspicious and distrust even our best scientists,” he said. “So when the CDC said the spread of Ebola is not airborne, some accuse the CDC of not understanding the disease, while others assume they are hiding important information.

“Education can work,” he continues, “but we have to be communicating more often, and with a clearer sense of authority, and more scientists need to be more involved in the process. My greatest concern is that some of the best efforts



Fred Tenover, Ph.D. '76

of public health education are either going unheeded or they’re being turned for political purposes. This ultimately could have devastating consequences for controlling infectious diseases.”

One such area where misinformation is affecting public health is in the widespread use of antibiotics. Many people don’t realize that antibiotics are useless against viral infections, and in some cases can even cause harm.

“One in every five patients who visit an ER for an adverse drug effect are there due to an antibiotic,” Tenover said. “When you take an antibiotic, you wipe out your intestinal flora, which opens it up to being invaded to disease-causing organisms. Few people realize that antibiotics can cause harm, especially when they are not indicated in the first place.”

The overuse of antibiotics — and their misuse — has also contributed to the rise of antibiotic-resistant bacteria. It’s this never-ending game of cat and mouse that keeps Tenover motivated to find new and better ways to treat and prevent infection.

At Cepheid, Tenover is involved with the development and marketing of a rapid diagnostic device that can identify a bacterial infection in one hour, as opposed to the standard 48-hour culture.

“This allows a doctor to optimize the antibiotic treatment of a patient before he or she leaves the emergency room,” he said. “And that’s our goal, to increase the effectiveness of antibiotics by not overtreating people who don’t have bacterial infections and not undertreating people who may have resistant strains.”

Tenover earned bachelor’s degrees in biology and chemistry from the University of Dayton in 1976 followed by master’s and doctoral degrees in medical microbiology from the University of Rochester.

MEEC offers opportunities for research and networking

University of Dayton biology graduate students went above and beyond in taking on the opportunity to host and facilitate the 2014 Midwest Ecology and Evolution Conference (MEEC) March 1-2, 2014, at the UD River Campus.

MEEC, which is hosted by a different institution each year, provides a low-pressure, safe environment for young scientists to present their research at a regional conference. It also supplies an outstanding opportunity for graduate and undergraduate students to network with students and faculty from surrounding institutions and to connect with potential graduate or postdoctoral advisers.



Rachel McNeish, Ryan McEwan, Ph.D. and Jessica Davis.

UD graduate student Jessica Davis, who graduated in August 2014 with an M.S. in biology, and doctoral student Rachel McNeish, who will complete her Ph.D. in aquatic ecology in 2016, attended the MEEC conference in 2013 at the University of Notre Dame. As the conference concluded, they learned that the conference was in need of a host for 2014 and saw an opportunity to both improve the conference and put the UD biology and graduate programs on the map.

Davis and McNeish worked with UD biology chair Dr. Jayne Robinson and their adviser, Dr. Ryan McEwan, to have the 2014 conference approved by the University. Davis and McNeish, together with UD biology professors McEwan and Dr. Tom Williams, advertised the conference and networked with colleagues at other universities, inviting them to participate. Davis and McNeish also took responsibility for all the behind-the-scenes event planning leading up to the conference and organized donations from publishing companies and local businesses to fund the nonprofit MEEC conference.

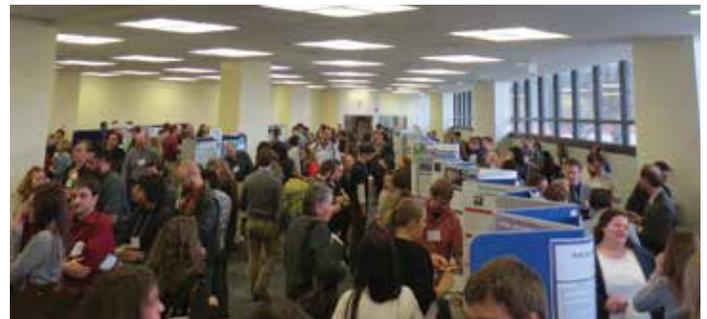
McEwan and Dr. Armin Moczek (Indiana University) contributed as the keynote speakers of the conference. Along with McEwan, UD biology professors Dr. Albert Burky and Dr. Jayne Robinson and Associate Provost for Graduate Academic Affairs Dr. Paul Vanderburgh made significant contributions of their time to assist with organizing the conference.

Davis and McNeish, in collaboration with numerous UD graduate and undergraduate volunteers, made the 2014 MEEC conference an overwhelming success. The conference hosted 328 attendees and 241 presenters from 53 universities, nearly doubling the attendance of the 2013 MEEC conference at Notre Dame.

Though Davis and McNeish worked tirelessly throughout the conference, they appreciated the opportunity to gather with colleagues from other universities. "I enjoyed the professional development and networking with familiar faces from other MEEC conferences I've attended," McNeish said. "In addition, I got to form relationships with other graduate students at different universities within their fields, which can really help me out in the future."

MEEC attendees and faculty alike were appreciative of the organization and success of the event. "This MEEC conference highlighted the important interface of graduate and undergraduate education enhancing student opportunities and prestige for UD," Burky said. "This conference highlighted graduate education at UD and our quality graduate program in biology to outstanding university peers."

"I was really impressed with the quality of the presentations and posters, the turnout, and the leadership of Rachel McNeish and Jessica Davis, the conference planners," said Vanderburgh. "Their work was nothing short of heroic!"



Poster session at the 2014 Midwest Ecology and Evolution Conference (MEEC) at the UD River Campus.



A poster presentation at the 2014 Midwest Ecology and Evolution Conference.

Passing of the gavel: Change at chair

The UD biology department will continue to thrive during a transition in leadership. After eight years of service to the biology department, Dr. Jayne Robinson concluded her tenure as chair, and Dr. Mark Nielsen, a member of the faculty since 2001, assumed the role of chair in July 2014. Under Robinson's leadership, the UD biology department doubled its research productivity, as well as the number of students entering the University as biology majors.

"The biology department was highly productive when Jayne became chair in 2006," Nielsen said. "Through her leadership we became even more productive, as illustrated in the growth of our most important metrics: peer-reviewed publications, grant funding and number of majors. Jayne hired eight new and talented faculty during her tenure as chair, faculty that will guide our department for decades to come. She fought hard to support the department while representing the department with integrity and grace. Jayne set a high bar for being chair, leaving me a good challenge as I move forward in the position."

"My view of the job of chair is that of the servant-leader," explained Robinson. "Serving the department, making sure we offer the courses and research experiences the students need and desire and the faculty has the resources that they need; giving both the tools they need to be productive and successful. My time as chair has deepened my appreciation of what it means to serve and advance the mission of the people and the unit that you're leading. It was a privilege to lead such a talented group of people. Of course I must give credit to the outstanding staff that made it possible every day for me to do my job."

For the fall 2014 semester, Robinson was granted a sabbatical, a semester free of teaching obligations to pursue her research. She was recently awarded a patent for her invention that uses light-sensitive materials to increase the effectiveness of bacteria-fighting antibiotics. The sabbatical resulted in significant furthering of the patented technology which involved both graduate and undergraduate students in her lab. She resumes teaching in the biology department in spring 2015.

Meanwhile, she has a lot of confidence in Nielsen's leadership abilities. "He deeply cares about the department and the people



Mark Nielsen, Ph.D.

in it, and he will use that concern as his guiding principle and advance the mission of the department," Robinson said.

Nielsen is enjoying settling into his new role as chair and said that staff members within the biology department have been especially helpful in easing the transition. He looks forward to contributing to the continued growth of the department, which currently has over 250 undergraduate majors and 20 graduate students. In addition to his many responsibilities as chair, Nielsen will continue to serve as an academic adviser and teach biology seminar courses.

Nielsen hopes that the biology department will continue to flourish and grow under his leadership, and that he can provide the faculty and students with all the resources they need to be successful.

"The undergraduate students we have the privilege to teach in our classes are a really engaged and earnest group," said Nielsen. "Our faculty members continue to grow and excel as scientists and researchers, engaging students in their laboratories as well as in the classrooms. I hope we might be able to grow a little along with the students to which we deliver our curriculum."

Acknowledgements

BioFlyer was produced with the guidance of Dr. Mark Nielsen. Articles were written by Kerry Lange, Cameron Fullam and Cathy Wolfe (editor). Photos by Larry Burgess, Doug Hansen and others.

Dr. John Rowe: A leader and collaborator retires

After a 37-year teaching, administrative and research career at UD, microbiology professor Dr. John Rowe retired in spring 2014. During the 16 years (1990-2006) he served as chair of the biology department, Rowe strengthened the biology Ph.D. program, enhanced the undergraduate program and improved the research productivity of the department. He also led new collaborative research efforts across campus and with Wright-Patterson Air Force Base.

“John has always been an advocate for research at the University of Dayton,” said Dr. Mark Nielsen, chair of the Department of Biology. “He jumped directly from being chair to launching a nanotoxicology research initiative that earned NSF funding and significant funding from WPAFB. The funding resulted in over 10 publications and provided research support for faculty, postdocs, grad students and many wonderful undergrad students. Together with Dr. Panagiotis Tsonis he was also fundamental in launching TREND (Center for Tissue Regeneration & Engineering at Dayton), which involves 20 researchers from six academic departments and the University of Dayton Research Institute. These researchers perform more than \$1 million per year in sponsored research and have compiled more than 500 peer-reviewed articles. It is now a center of excellence for the state.”

The drive to make connections with other scientists and coalesce the strengths of professionals in different research areas to generate powerful collaborative efforts was key to Rowe’s success.

“One of the other important things that John did was to work closely with the other departments in the College of Arts & Sciences, the School of Engineering, UDRI and Wright-Patterson Air Force Base to develop our nanotechnology programs and launch the NEST (Nanoscale Engineering Science and Technology) Laboratory,” said UD biology professor and former chair Dr. Jayne Robinson. “Early on, he helped position us for growth and always kept the department in the queue for future research projects. You could always tell that John wanted us to succeed.”

Throughout his time at UD, Rowe had a very active research program, with projects examining the development of possible vaccines, studying the nitrogen cycle and the de-nitrification process, and most recently, focusing on nanoparticles and biological interactions with nanoparticles. In his nanoparticle research, Rowe has collaborated with UD biology faculty members Dr. Mark Nielsen, Dr. Yiling Hong (now of Western University of Health Sciences) and Dr. Jayne Robinson with funding from Wright-Patterson Air Force Base in a multifaceted project to develop a triage to assess the toxicity of



John Rowe, Ph.D.

nanoparticles using *in vivo* bacterial and cell culture models and an *in vitro Drosophila* model.

Rowe has published 50 papers in peer-reviewed journals and received numerous awards, including the NSF European Award, which provided him the opportunity to conduct research in the Netherlands; the Nolan Faculty Research Award from Sigma Xi; and the UD Beta Beta Beta Research Award. He taught many undergraduate and graduate students over the years in courses including microbiology, advanced microbiology, general biology, sophomore and senior seminars, and biological instrumentation.

Rowe has enjoyed his time at UD and has been a true asset to the biology department. He said he finds the greatest reward in the many accolades received by the department during his time as chair.

“I felt the best about what was accomplished by this whole department when I was chair over that 16-year period of time,” said Rowe. “I’m really going to miss UD. It’s a school where you get to know everybody and it’s very close-knit. I think most of the students are very happy here, and that is mainly due to the dedication of the faculty in all disciplines.”

Rowe has worked especially closely with the School of Engineering, focusing on aeronautical bioengineering, interaction of biology and nanoparticles, and microbial fuel cells. He especially thanks Dr. Saber Hussain, Dr. John Schlager at WPAFB, and Dr. Morley Stone for allowing him to collaborate on research projects with them.

Dr. Rowe and his wife, Robbie, reside in the Dayton area but look forward to joining their daughter in Portland, Oregon, in the next few years.

Dr. Ryan McEwan: Teacher, researcher and mentor

Since he arrived at the University of Dayton in 2008, Associate Professor Dr. Ryan McEwan has set high standards within the biology department for research, student engagement and course development. He has several research projects funded by prestigious national organizations, and students that graduate from UD following his mentorship in the lab experience great success in their professional careers.

McEwan, an ecologist, has developed all the courses he teaches. He teaches both undergraduate and graduate-level Ecological Restoration classes and the accompanying field lab. He also teaches Plant Diversity and Ecology, as well as the general Ecology class. In addition, he teaches graduate-level classes in the spring, with the spring 2015 course focused on data analysis using the statistical software program R.

McEwan's research focuses on the ecology of forests and streams. His primary research project is funded by a large grant from the National Science Foundation and examines how the invasive bush Amur honeysuckle (*Lonicera maackii*) impacts stream biology and its ecological function. Another project began after McEwan finished a speaking tour at several universities in Taiwan, when he and a graduate school friend who is now a faculty member in Taiwan decided to collaborate in research. This project is funded by a grant through the Smithsonian Institution's Center for Tropical Forest Science and seeks to understand how biodiversity and ecosystem function are related in the high-diversity subtropical broadleaved forests of Taiwan. His third research project represents a constellation of research activities that revolve around the idea of understanding how temperate deciduous forests of eastern North America are changing over the long term.

UD biology students also benefit from McEwan's research dedication as he welcomes numerous students to work in his lab. McEwan sees mentoring students as an integral part of their education. He's proud of the hard work his students put in during lab hours and how earnest they are to learn.

"Currently, more than 10 UD undergrads are working in my research lab actively engaged in the scientific process from start to finish — from hypothesis formation, through experimental design, to project execution," said McEwan. "As an example, for the year 2013, a total of 1,102 hours were logged by undergraduates in experiential learning opportunities in my laboratory. These hours were accumulated during 680 separate laboratory experiences and 186 experiences in off-campus field work. One of my graduate students has had 51 different UD undergraduate students work on her projects alone."



Ryan McEwan, Ph.D.

McEwan describes his proudest achievement at UD as the success students have when they graduate and move on to other programs or in their careers. He loves having the opportunity to teach students, to be a springboard as they prepare for their professional endeavors, and to learn from them.

"The most important things I try to teach students are independence, self-confidence, the importance of initiative, being able to problem-solve and being careful in their work," he said. "I want them to feel like they can do anything that's asked of them and to have an indomitable spirit."

"The goal for my lab is to become more and more widely recognized for the science we do and for the people that come out of it," said McEwan. "When I came to UD, my goal was to create one of the best plant ecology labs in North America. That's a very ambitious goal, and we're not there yet, but I'll continue to pursue that."

Quite a discovery



Amit Singh, Ph.D.

For Dr. Amit Singh, there's nothing like being in the lab. It's where discoveries happen — and not just the scientific ones.

"You're looking for something unknown," said Singh, associate professor and director of the graduate program in biology.

He first gained access to a college laboratory as a freshman in India at Government Degree College Nahan, Himachal Pradesh University. "In the process of research, I started enjoying subjects I didn't know I enjoyed, like genetics, which is now my bread and butter," he said.

Years later, while studying in Taiwan, Singh recalls working in a lab with students who spoke different languages. Despite this barrier, they were able to communicate using the shared language of science.

"That taught me experiential learning transcends barriers," he said.

That learning by doing has come to define his approach to undergraduate education. He encourages early participation in his lab and supports his students with presenting research nationally and publishing in peer-reviewed journals.

"The best part about doing research with undergraduates is to see their faces when they make their first discovery," he

said. "When my students are successful, I am proud knowing I was a catalyst for their success. Ultimately, it's because they learned to exploit their own potential."

Singh came to the University of Dayton in 2007 and initially focused his research on birth defects of the eye, using the fruit fly as a model. In 2009, he started working on Alzheimer's disease research, again using the fruit fly.

Alzheimer's is the sixth leading cause of death in the U.S., but it's getting worse: The mortality rates of the top five causes of death are declining, while Alzheimer's mortality rates are rising.

The fly makes a great research model for two reasons: With a life span of 12 days, fruit flies allow Singh to study two generations in just one month. Also, the genetic makeup of fruit fly brains is similar to human brains, and Alzheimer's disease can be modeled in the eyes of a fruit fly through the death of eye-specific nerve cells.

"What takes 65 years to develop in humans can be studied in just 15 days in flies," he said.

Alzheimer's disease occurs in humans when neurons in the brain die. Scientists have linked the death of these neurons to a buildup of plaque in the brain. Healthy brains produce a specific protein made up of 40 amino acids, which are water-soluble. The brains of people who develop Alzheimer's produce the protein with 42 amino acids, making it insoluble, leading to a buildup of plaque.

Most research has focused on preventing the creation of this protein or removing the accumulated plaque, with the goal of delaying the onset of Alzheimer's. But these experiments have been unsuccessful.

So Singh wondered: Could there be a required intermediate signal from the plaque that kills the neurons? And could that signal be blocked?

According to Singh's latest research, the answer to both those questions may be "yes."

After breeding whole generations of fruit flies with Alzheimer's disease expressed in their eyes, Singh and his students experimented with feeding diseased fly larvae various chemical drugs. Remarkably, one of these drugs reversed the disease.

Fruit flies whose parents had "Swiss cheese" eyes — shriveled and riddled with holes — developed perfectly healthy eyes with no expression of the disease they inherited. The flies still had the insoluble protein. The flies still had the buildup of plaque. But their nerve cells survived.

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Is it a cure for Alzheimer's disease? Not yet. And not quite, said Singh.

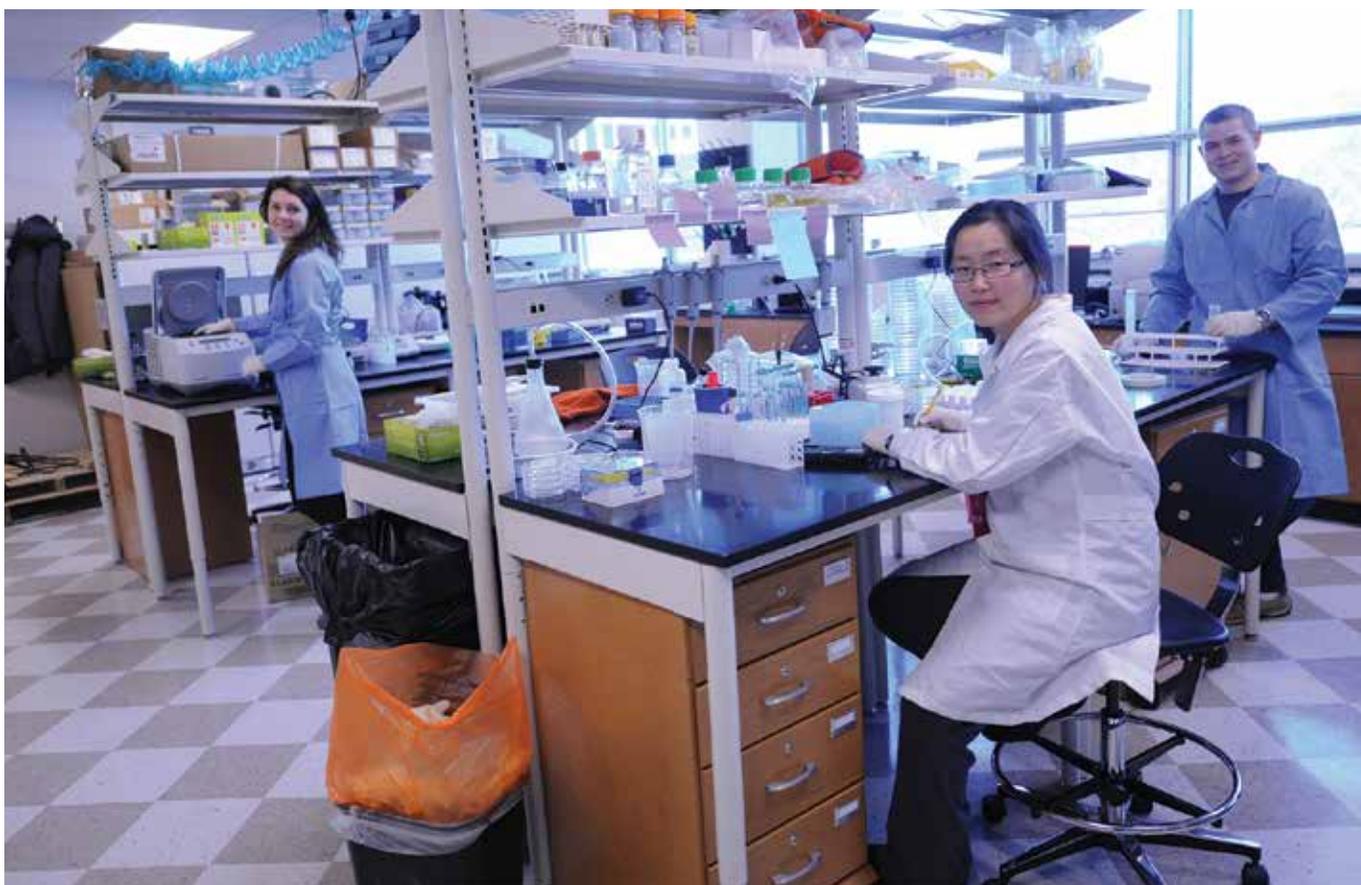
Not yet because the drug needs further testing on brain neurons, not just eye nerve cells. Singh is partnering with another lab to test the drug on animal brains.

Not quite, because Alzheimer's may never be cured. Once a neuron dies, it's gone forever. But Alzheimer's can be prevented or delayed.

"Current research suggests people are either born with this genetic mutation and therefore carry the potential for Alzheimer's disease all their lives or incur these mutations later in life," Singh said. Through genetic testing, researchers could potentially identify carriers of the disease-causing chain of 42 amino acids and begin drug therapy before they begin experiencing the death of neurons.

That would be quite a discovery.

Renovations made for research



Assistant Professor Dr. Yvonne Sun (center), graduate student Nathan Wallace and undergraduate student Ashley Zani work in Sun's new research lab.

Designed with flexibility in mind, the new biology research lab of Dr. Yvonne Sun has adjustable-height mobile island lab benches, mobile cabinets and plug-and-play utilities, which allow the mobile benches to be relocated in the room. The

lab still maintains connections to gas, vacuum, data and power. The entire lab is also ADA-compliant and includes an ADA fume hood, sink and benches.



Photo by Amit Singh, Ph.D.

Fly larval brain and leg imaginal disc.

Faculty and staff highlights

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- **Dr. Jeff Kavanaugh** received the Outstanding Contribution Award for a full-time lecturer in the College of Arts and Sciences. “This award is very competitive and recognizes Jeff’s outstanding performance in teaching, research and service,” explains Dr. Jayne Robinson, former chair of the biology department. Kavanaugh also secured a grant from the Miami Conservancy District to study low dam removal and kayak run installation on the Great Miami River.
- **Dr. Carissa Krane** was elected president of the academic senate for 2014-15.
- **Dr. Ryan McEwan** was promoted to associate professor. McEwan and collaborator Dr. Eric Benbow (Michigan State) won a grant from the National Science Foundation focusing on the hypothesis that the aquatic life in headwater streams is mechanistically linked to the surrounding landscape and that this linkage is fundamentally altered by the invasion of the exotic shrub Amur honeysuckle.
- **Dr. Mark Nielsen** became chair of the biology department in July 2014.



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You can make a difference

Our alumni have often attributed their career achievements to the educational rigor of our course of study, the integral role played by faculty mentors and the opportunities to conduct acclaimed lab and field research. In turn, these alumni have shown their gratitude for their UD experience by generously sharing their time, energy and resources to make the next generation of UD biology students successful. Because of support from alumni and friends we are able to provide these opportunities to students.

If you'd like to designate your future donations directly to the biology department, you may donate online at givenow.udayton.edu. Under "Donation Information" and "Fund," select "Other." In the comments box, type "Donation to the biology department" to ensure your gift will reach us.

The experiences we are able to offer our students are possible because of the generosity of those who have made donations to the Department of Biology.

Thank you!

