Biology graduate students, program among university’s most successful

The research grants continue to pour in. The job market for these graduate students continues to grow. And this department’s faculty research publications are some of the most cited in the nation. What’s going on here?

What’s going on, in the words of Dr. Mark Nielsen, director of University of Dayton’s Graduate Program in Biology, is that “the graduate program is the engine of the department. We have a vibrant program that provides exceptional training for the students, generates research funding for the faculty and University, and contributes to research discoveries for the betterment of the world. That’s a combination that’s hard to beat.”

Biology research soaring

That combination has led to some tremendous successes of late, including the management of research grants totaling $5.6 million in 2011. Additionally, research expenditures exceeded one million dollars in 2011, an increase of 40% over 2007. And while faculty set the agenda for their laboratories, it is the graduate students who do most of the day-in-day-out experimentation in the research labs.

“You often find our graduate students working in the labs late into night and on the weekends,” said Dr. Jayne Robinson, department chairperson. “Without their dedication, faculty would be unable to conduct their important research and bring in funding to the University.”

Beyond the nationally-recognized work in UD’s laboratories, biology department faculty communicate their research and results through peer-reviewed publications. In 2010, biology faculty published 27 journal articles, seven of which included graduate students as authors. The department’s research has caught the attention of the scientific community. In the most recent National Research Council (NRC) assessment of research universities, the biology department ranked 6th among 76 biology programs in the country for the number of times the faculty’s publications were cited, a testament to the quality and relevance of their research.

Biology graduate students also participate in regional, national and international science conferences, and in the past year presented their research findings at over 40 meetings. In 2011, two graduate students were recognized nationally for their research: Andrew Lewis, who was awarded the Best Student Presentation at the North American Forensic Entomology Association meeting, and Venky Mutyam, who won the Novo Nordisk Foundation Travel Award and the Scholander Award for outstanding poster presentation at the Experimental Biology meeting.

Marianist values resonate with UD alumni award winners

Three of the four 2011 University of Dayton National Alumni Association Alumni Award recipients are alumni of the biology department or premedical programs. Dr. Susann M. Brady-Kalnay, Dr. Daniel R. Fiehrer and Dr. M. Michele Mariscalco all were recognized for their work not only in their professional fields but for their service to their communities. All three recipients have embodied UD’s Marianist values and traditions and have carried them out in their daily lives.

Dr. Susann M. Brady-Kalnay

Dr. Susann Brady-Kalnay’s connection to the University of Dayton began in the 1890s when her great-grandfather attended St. Mary’s Institute for Boys. Her father and uncle both attended UD as well.

Brady-Kalnay graduated from UD in 1987 with a Bachelor of Science in biology and is now a professor at Case Western Reserve University in the department of Molecular Biology and Microbiology. She received the 2011 Special Achievement Award for distinction in professional or civic activities.

Brady-Kalnay was nominated by James P. Crawford ’85 who cited her twenty plus years of outstanding work in the area of cancer research and her service in education, especially for women and minorities.

Brady-Kalnay’s research on cell adhesion and how it is continued on page 2

continued on page 2
The department offers the M.S. and Ph.D. degrees in biology and a combined 5-year B.S./M.S. in biology. Also, collaboration between the Department of Biology, the School of Engineering and the College of Arts and Sciences has yielded a new offering: an M.S. degree in bioengineering. Over the past five years, the biology department awarded 13 M.S. and 11 Ph.D. degrees in biology, with students earning positions as scientists at Air Force Research Laboratories, University of Cincinnati Children’s Hospital, College of William and Mary, and the EPA among others.

**Undergraduate research mentorship unrivaled**

One of the most important roles for biology graduate students is mentorship of undergraduate research. According to Dr. Robinson, the quality of education undergraduates experience through research at UD is unrivaled.

“Our undergraduates receive superior mentoring from their graduate student counterparts,” said Robinson. “These mentoring opportunities may be difficult to find at other universities, which are either too large to provide an important role for undergraduates in their research, or too small to be doing research. Our faculty and graduate students work together as a team to create a true research experience for undergraduates, one that translates to job interviews and graduate school acceptances.”

Each of the forty or more undergraduate biology students presenting at UD’s annual research symposium, the Stander Symposium, benefit from training by a graduate student. Many are able to publish their research in peer-reviewed journals, a remarkable achievement.

**Teaching: A cornerstone of UD’s mission**

Teaching excellence is a cornerstone of UD’s mission, one well supported by the biology graduate program. Fifteen graduate students serve as teaching assistants (TAs) in the department, and deliver 30 or more undergraduate student laboratories each term. The teaching opportunity is reciprocal, with undergraduates learning science through hands-on experimentation and graduate students learning to teach undergraduate students as part of their degree program.

“Casey Hanley, the biology laboratory coordinator who manages the introductory biology labs, is key to the success of TAs, training them to effectively deliver the lab courses,” said Robinson.

For some graduates, such as alumna Dr. Amy Beumer (B.S. ’01, Ph.D. ’06), an assistant professor at Richard Bland College of the College of William and Mary, the experience educating others leads to a future career.

“The opportunity to serve as a TA during the school year was great for me,” said Beumer. “It first got me into teaching and allowed me to focus my time at UD, not only on teaching but on research, as it provided a stipend.”

**Community, diversity and fellowship**

Biology graduate students’ roles in research, mentorship, and teaching make them fundamental to building and maintaining a healthy community of learners in the department. These graduate students are diverse in gender, race and culture (11 women, 10 men; 8 international students), which contributes to a dynamic community of learning beyond the classroom and laboratory. The Biology Graduate Program was ranked in 2010 by the NRC in the top 1/3 for diversity, one of the three basic metrics by which graduate programs were ranked.

“I enjoyed the friendships, camaraderie and incredible learning environment in and out of the classroom,” said Dr. Bill Billotte (Ph.D. ’02) who manages the Counterterrorism And Response Technologies program for the National Institute of Standards and Technology (NIST). “The key strengths of [UD] are the people and the family spirit of the faculty and staff. I have attended, including UD, four universities and interacted with several more during my career, and not one is even close to the spirit and fellowship I experienced during my time at UD.”

**Working together for success**

“It takes many people working together on common goals for our graduate program to thrive,” said Robinson. “Our graduate program director, Mark Nielsen provides the leadership and creativity that moves us forward. The program runs smoothly in large measure due to the energy and talent of our program and laboratory coordinators, Sue Trainum and Casey Hanley, who are invaluable.”

“With any program there are administrative snafus and deadlines to be met, and Sue Trainum performs the magic that keeps the trains on time,” said Nielsen. “She is always one step ahead of problems and her insight is invaluable.”

“The support of the UD Graduate School and Dr. Paul Vanderburgh, Dean of Graduate, Professional and Continuing Education, is another key which helps our program and students succeed,” said Nielsen.

As a leader in research, graduate education, mentorship, and teaching and as a community of diverse learning, it’s easy to see why UD’s Biology Graduate Program continues to earn the respect of the international science community and the interest of so many talented undergraduates from across the country and the world.

“This trajectory of success in research funding and productivity in the Department of Biology is so impressive in multiple ways,” said Vanderburgh. “First, our biology faculty are flourishing in development of their research agendas. Second, our graduate students work shoulder-to-shoulder with faculty and are mentored in a culture where funded, peer-reviewed research is truly the expectation. Third, and perhaps most distinctive from other universities, UD’s biology undergraduates have the opportunity to conduct publishable research that prepares them for the best medical schools and research graduate programs anywhere.”

“We’ve got a great story to tell,” said Nielsen. “This is the place to learn. This is the place to become the scientist you want to be.”

**Acknowledgements**

The BioFlyer was produced with the guidance of Dr. Jayne Robinson. Articles were written by Kiley Mullane, Justin Guinn, Dr. Mark Nielsen and Cathy Wolfe (editor).
**Marianist values** continued from page 1

altered in cancerous cells has attracted national attention. Her work is helping make cancer treatment more effective by detecting changes in invasive cancer cells at the protein level.

Brady-Kalnay credits her time at the University of Dayton for giving her research experience as an undergraduate, which has directly impacted her work today. She recognizes professors such as Dr. Rowe, Dr. Kearns, and Dr. Giffin for encouraging her to pursue her research.

“John Rowe was kind enough to let me work in his lab for four years,” she said. “I had a great education. I spent a lot of time in Sherman Hall. That experience influenced me to go onto graduate school.”

She started studying cell adhesion as a graduate student and said that the depth of time she has spent in this area has allowed her to make the research contributions she has. Brady-Kalnay’s goal was always to simply make a contribution to her field.

Brady-Kalnay has also embodied the Marianist values of UD.

“As you leave UD your goal is to be a leader and be of service to your community and I think that I have been able to do that through teaching and mentoring over the years,” she said.

Her involvement at UD extended beyond the laboratory. Brady-Kalnay was a member of Beta Beta Beta, the National Biological Honor Society, as well as a member of the UD Cross Country team. She also met her husband while they both attended UD. She described her time as an undergraduate at UD as a wonderful experience.

“I thank the University for the tremendous impact it has had on my life and hope that I continue to make you proud,” she said while receiving her award.

**Dr. Daniel R. Fiehrer**

Daniel Fiehrer has spent close to the last forty years carrying out the Marianist values he gained from his time at the University of Dayton in his work with the Blackfeet Tribe.

Fiehrer ’62, graduated with a Bachelor of Science in pre-dentistry. He received the Christian Service Award for living out the Marianist ideals. He was nominated by his brother Ken Fiehrer ’53 and his wife Marlene Fiehrer.

Ken and Marlene Fiehrer nominated Daniel Fiehrer, “based on his nearly 38 years of free orthodontic service to the children of the Blackfeet Nation and his financial support to the preservation of the culture of the Blackfeet people through commissioning artists and filmmakers.”

One Wednesday a month, children of the Blackfeet Tribe would arrive in Helena, MT, where Fiehrer’s private practice is located. Over the course of 38 years, he has treated over 350 children, including multiple generations of families.

Fiehrer described receiving the award as a humbling experience. He said working with the Blackfeet Tribe was a privilege and an honor.

He was inspired by the Marianists and other faculty who taught him while at UD. Brothers Machowicz, Chudd, Mann, Lucier as well as Dr. Schuelein and biology professor Gertrude Shay “had a profound influence on me as teachers, both in preparing me for dental school and for giving of themselves, thus enabling me to personally experience service to others,” he said.

It was these Marianist values that led him to work with the Blackfeet Tribe. Fiehrer’s involvement with the Blackfeet community extended beyond the orthodontic care he provided. He commissioned a series of 42 paintings which depict the Blackfeet Indian Medicine Lodge Sun Dance Ceremony as well as a documentary entitled OKAN, Covenant with the Stars.

In recognition of his service to the Blackfeet Nation, he was given the title of Chief Dan Holy Eagle and received an Eagle Feather headdress from Chief Earl Old Person.

“I hope my journey in this world is indicative of the influence that the Marianists have had on my beliefs and actions,” he said.

**Dr. M. Michele Mariscalco**

Dr. M. Michele Mariscalco has dedicated her life to carrying out the University of Dayton’s mission of “Learn, Lead and Serve”.

Mariscalco received the Distinguished Alumnus Award for national or international achievements. After graduating from the University of Dayton in 1977 with a Bachelor of Science in pre-medicine, she received her M.D. from the University of Cincinnati College of Medicine. For the past 30 years Mariscalco has practiced medicine in the field of pediatric critical care. She was a professor at the Baylor College of Medicine and has most recently taken on the position of associate dean for research at the University of Kansas School of Medicine-Wichita.

Mariscalco created a complex multi-disciplinary care path for children with sickle cell disease. This path follows children from the intensive care unit through outpatient care. Her emphasis not only on the treatment of patients but caring for them as individuals is what led to her nomination for this award.

She was nominated by Myron Achbach, Director of Admissions Emeritus at UD and her colleagues.

“I can’t imagine another graduate exceeding her acting out the ‘learn, lead and serve’ mission of the university,” Achbach said.

UD’s mission is one that has stayed with Mariscalco beyond her time at UD.

“Learn, lead and serve is deeply rooted in all of the graduates continued on page 4
Jan Bertke has brought her wealth of administrative experience from previous jobs at Sinclair Community College and NCR to her new role at the University of Dayton as Senior Administrative Assistant for the Department of Biology. Bertke started her new position in February and has enjoyed the UD environment.

“aristic values continued from page 3

of UD and especially this
graduate,” she said while
accepting her award.

Mariscalco’s colleagues
describe her as an energetic
and caring teacher, leader and
doctor.

While at UD Mariscalco
said she had the privilege of
learning from some really
remarkable educators. She
lists Dr. Williams, Dr. Shrout,
Professor Ramsey, Dr. Fox and
M. Michelle Mariscalco, M.D., ’77

attitude to her work,” said
department chairperson Dr.
Jayne Robinson. “The work in
the department is fast-paced
and ever changing and Jan goes
with the flow and always goes
the extra kilometer to get things
done.”

Berke grew up in the Dayton
area and appreciates the
Marianist values of UD. She was
surprised by the numbers of
people at UD she already knew,
which she said is comforting.

“I like the people I work with and I think that’s important,”
Bertke said.

Bertke enjoys being part of the UD community and working
in an educational environment. “Best thing is I’m learning
something new every day,” she said.

Dr. Krane accepts new position, expands her role on campus

Biology professor Dr. Carissa Krane is the new Associate
Director of Research for the University of Dayton Honors Program.

Dr. Krane serves as liaison for those students enrolled in the
honors program interested in doing a thesis. She began the
new position over the summer.

“I love working with students primarily,” she said. “That’s
really why I wanted to do this.”

Her principal responsibility is to oversee the honors
thesis process, which is a three semester program where
students engage in research or creative expression within
their major. The program culminates with a written thesis
and presentations at the Honors Symposium and Stander Symposium.

“It really allows them [students] to go deep into their

Dr. Burky amongst others as educators who had a profound
impact on her.

Br. Don Geiger, more than any other professor at UD,
impacted and influenced Mariscalco’s career. She worked in
his lab and described him as her first academic mentor.

“He was the first to show me what a great scientist is and
how they think,” she said. “Knowing Don and recognizing
what a real mentor is has made all the difference.”

Mariscalco was at a loss for words when asked where she
would be if she had not attended UD. Her path of serving
others and being a leader began at UD.

“Learn, lead and serve has also been for me a journey and
it’s taken me to some very remarkable places, personally,
professionally, spiritually and physically,” she said.

Welcoming environment for new senior administrative assistant

Jan Bertke has brought her wealth of administrative
experience from previous jobs at Sinclair Community
College and NCR to her new role at the University of
Dayton as Senior Administrative Assistant for the Department
of Biology. Bertke started her new position in February and
has enjoyed the UD environment.

“The people are very friendly,” she said. “I enjoy the
excitement of students learning.”

Bertke is responsible for the day-to-day management of the
department office. She describes her job as, “everything from
receptionist, to student hiring, to budgets, to purchasing, to
accounting for the office, to maintaining the office.”

“Jan has brought considerable experience and a great

M. Michelle Mariscalco, M.D., ’77

http://biology.udayton.edu

continued on page 5
Dr. Krane accepts continued from page 4
returning that kind of professional mentorship.”

In accepting the new position, Krane will work with students in all majors, helping them network, prepare proposals and facilitating the overall process.

“I think the perception is that it’s easier to do undergraduate research in the sciences or engineering because we have labs and we have ongoing projects,” she said. “I wanted to be able to help to encourage students from across campus who might not think it is possible to actually pursue some undergraduate thesis opportunities.”

Krane is still just as involved in the biology department.

New lecturer hopes to give back through his teaching

Dr. Phil Nickell has always wanted to teach. He feels a responsibility to help students and to give back for the help he received. Nickell was hired to teach human physiology and anatomy labs at UD.

“There were a high number of applicants for this position and Phil represents the cream of a talented crop,” said Dr. Jayne Robinson, chair of the Department of Biology. “We are very fortunate to have him.”

Nickell recently received his doctorate in comparative physiology from The University of Notre Dame and began teaching at UD this fall. He describes his new role as a full-time lecturer in the biology department as a dream job, allowing him to fulfill professional goals and be close to his family that lives in the Dayton area.

Nickell is grateful for those who have helped him get to where he is today. He said while it’s important to make advancements and be productive in his field, there is also a need to assist students as they start their studies and careers. “I feel a responsibility to help others,” he said.

Nickell’s recent experience as a student allows him to empathize with his students. He has found that UD students care about more than just their grades. He describes them as good people and hard workers who want to get more out of their education.

“The quality of the student population, that’s why I’m really excited to part of the UD community,” he said.

Next semester Nickell will also teach anatomy labs in addition to human physiology labs. Nickell previously taught human physiology labs at Notre Dame while working on his research on beetle larvae for his dissertation.

Nickell’s ability to empathize with his students and passion for physiology have benefited him as he starts his career at UD.

Dillon’s passion for teaching shines through in her work

Mary Ellen Dillon’s dedication to teaching is evident in the many roles she has undertaken at the University of Dayton and beyond.

Dillon is currently a full time lecturer in the Department of Biology, teaching introductory biology for science majors and a biology course in the Integrated Natural Science Sequence (INSS) for non-science majors. She has previously been a biology lab coordinator and the INSS coordinator at UD and has taught high school science.

In her twenty years at UD, Dillon has seen technology transform the classroom, which has changed the way students learn and how she helps them. “Students are bombarded with so much information from so many classes,” she explained. “They need help with critical thinking skills.”

Despite changes in the classroom some parts of teaching remain the same. “Your teaching personality stays the same no matter what technology you use,” said Dillon.

Dillon’s interest in interdisciplinary education led her to the position of coordinator for the INSS. She describes the program as a collaborative effort among faculty from biology, chemistry, physics and geology departments to create a curriculum that worked and benefitted students.

“I really enjoyed interacting with the faculty, trying to see how we could integrate the science sequence more,” Dillon said. “To do a good job, that doesn’t happen accidentally. You have to do it intentionally.”

Dillon’s efforts to create curriculum and courses that truly
**Faculty and staff highlights**

- Dr. Eric Benbow was awarded funding from the City of Dayton to conduct storm water monitoring. Additionally, the Hamilton County Park District provided funding to Benbow and collaborators to perform a temporal assessment of invertebrate structure and function within vernal pools of Southwestern Ohio.
- Mary Ellen Dillon has been retained as a consultant by IQ-ity, an online curriculum company. She is editing and developing online biology curricula for secondary education in Ohio and California.
- Brother Don Geiger, S.M., received the 2011 Partner of the Year Award for Lifetime Achievement from the Greater Dayton Conservation Fund of the Dayton Foundation and the Greater Dayton partners for the Environment. The award recognizes people and organizations who demonstrate leadership and inspire the community through their work for the protection, preservation and restoration of the region’s environmental and agricultural resources.
- Dr. Yiling Hong (BIO) and Dr. Khalid Lafdi (CME) received funding from the NIH to study the cytotoxic and genotoxic effects of manufactured nanoparticles on stem cells.
- Dr. Jeff Kavanaugh was appointed chair of the Institutional Animal Care and Use Committee, the standing institutional review board established in compliance with the Public Health Service Policy on Humane Care and Use of Laboratory Animals.
- Dr. Carissa Krane and collaborators at Wright State University were funded by the NSF to study the roles and regulation of aqua/glyceroporins in a freezer tolerant amphibian. Krane received a grant from the LEADER Consortium/NSF ADVANCE Program for multi-disciplinary STEM grant preparation support in bioengineering.
- Dr. Tom Williams was awarded an NSF grant to study the structure, function and evolution of regulatory network controlling sexually dimorphic fruit fly development. He also received funding from the American Heart Association to examine the mutational and resulting mechanistic basis for naturally occurring variation in the behavior of fruit fly switches.

---

**Thank you for your gifts!**

Many of the experiences we are able to offer our students are possible only because of the generosity of those who have made donations designated to the Department of Biology. If you would like to designate your future donations to the University directly to the biology department, you may donate online at the University’s alumni site (http://udayton.edu/alumni/give/ud_general_fund.php#2). Select “other” in the designation box and type in “Donation to the Biology Department” in the comments section and your gift will reach us.

---

**Dillon’s passion** continued from page 5

benefit students have extended to schools outside of UD. She designs labs and curricula for several area middle and high school science classes.

“There have been many times where I have mapped out middle school and even high school labs on the kitchen table,” she said. “I became the lab lady.”

Being the self-described lab lady inspired Dillon to design a highly “hands-on” after-school science program for middle school students. The program offered the students personal attention at a critical age.

“They have the cognitive ability to start to understand science and they have energy and enthusiasm,” said Dillon.

Dillon’s UD students, especially education majors, gained valuable teaching experience by working with the middle school students. Dillon is able to combine her love of science and enthusiasm for teaching to help students of all ages and to shape future educators.

Through all of the roles Dillon has taken on, her love of teaching is evident. “Honestly, my passion is teaching,” she said.

“Mary Ellen’s passion for teaching and curriculum development is inspiring,” said Dr. Jayne Robinson, chair of Department of Biology. “She never slows down and is never without a new way to teach difficult concepts,”

---

**Mary Ellen’s passion for teaching and curriculum development is inspiring,” said Dr. Jayne Robinson, chair of Department of Biology. “She never slows down and is never without a new way to teach difficult concepts,”**