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### HELP US GO GREEN!

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#### *Dear Alumni and Friends,*

It is my pleasure to highlight our recent accomplishments in the Department of Biology. The faculty and students are energized and have been very productive.

We constantly innovate our teaching methodology to keep pace with the rapidly advancing fields in biology. This past year, we restructured our undergraduate curriculum to align with BioCore, a national standard for the study of life sciences. We also developed a new interdisciplinary neuroscience major, welcoming its first students in the Fall 2017 semester, in collaboration with the Iowa Neuroscience Institute and the Department of Psychological and Brain Sciences.

To accommodate the growth in our biology and biomedical sciences majors, as well as the newly initiated neuroscience major, we are undergoing a \$1.7 million renovation in the Biology Building. This renovation will increase capacity, and more importantly, create a fusion of TILE (Transform – Interact – Learn – Engage) technology and lab training to provide a unique interactive learning experience that is a first-of-its-kind innovation on campus.

As we expand our curricula and facilities, we also welcome two new faculty members to the department—Dr. David Rehard and Dr. Bin He. Dr. Rehard joins us from the University of Missouri and is our new Non-Majors Biology Lecturer. In January 2018, Dr. He, who earned his Ph.D. from the University of Chicago and performed post-doctoral research at Harvard University, will join us as a tenure-track Assistant Professor. His research focuses on the evolution of gene regulatory networks.

Additionally, I would like to acknowledge our hard-working and talented faculty and staff. This year, we have submitted an unprecedented number of grant applications to fuel our groundbreaking research and won several awards, some of which are described in this newsletter. Also, we celebrated the promotions of Dr. Bryan Phillips to Associate Professor and Dr. Joshua Weiner to Professor! We look forward to their continued success in the future.

It is important to note that all of these exciting developments come at a cost—one that the department is being asked to bear as state budgets remain tight. Furthermore, support for graduate students and core facilities has dwindled severely. In order to maintain our strength as a department during these times of transition, we are increasingly reliant on private gifts and are grateful to have such a solid bedrock of dedicated alumni and friends. If you are in a position to make a gift or bequest to the Department of Biology, please visit [givetoioowa.org/biology](http://givetoioowa.org/biology), or contact me directly ([diane-slusarski@uiowa.edu](mailto:diane-slusarski@uiowa.edu)). I have enjoyed my role in aiding the success of our department as chair, and I look forward to another great academic year!

Sincerely,

*Diane C. Slusarski, Ph.D. | Professor and Chair, Department of Biology*

## The DSHB Thrives and Invests in UI Students and Faculty



The Developmental Studies Hybridoma Bank (DSHB), a national resource created by the National Institutes of Health (NIH), is housed in the Department of Biology. It was brought to the UI by **Dr. David R. Soll**, the Roy J. and Lucille Carver/Emil Witschi Professor of Biology, from Johns Hopkins University in 1995 and has been directed by him since then. It has grown from one staff member and 150 hybridomas, which produce monoclonal antibodies for research and medicine, to an administrative and research staff of over 20 and more than 5,500 hybridomas. It is the only self-funded national resource created by NIH.

The DSHB reinvests the resources generated by production and distribution of the hybridomas in its own operations as well as UI students and faculty. This year the DSHB provided five fellowships for first-year graduate students and one for a DSHB graduate fellow, offsetting the elimination of such funds by state spending cuts. The DSHB again covered the costs of the Department of

Biology graduate student retreat, held in Davenport, Iowa, and provided three College of Liberal Arts and Sciences fellowships to professors in the humanities for travel expenses and to attend meetings. In its 2017 fiscal year, the DSHB provided salaries of \$1.6 million to its staff, \$165,000 for student and faculty fellowships, \$250,000 for administrative costs, \$13,000 for the retreat, and approximately \$200,000 in operational and research expenses.

The DSHB collection grew by 15% this year and its income from monoclonal antibody distribution has grown by 4%. The DSHB has also successfully completed the early stages of identifying anti-tumorigenic drugs in the form of monoclonal antibodies. If successful, the licensing fees generated from these antibodies will support the growth of the Monoclonal Antibody Research Institute as well as continuing to provide resources to the Department of Biology to help compensate for state funding cuts to education.

## Doctor of Philosophy (Ph.D.) in Biology

Andrew Adrian, Fall '15 (Comeron Lab)  
 Laura Bankers, Summer '17 (Neiman Lab)  
 Clinton Rice, Summer '16 (Erives Lab)  
 C. Anthony Scott, Summer '17 (Slusarski Lab)  
 Joel Sharbrough, Summer '16 (Neiman Lab)  
 Nicholas Stewart, Summer '17 (McAllister Lab)  
 Elizabeth Stroebele, Spring '16 (Erives Lab)  
 Setu Vora, Summer '17 (Phillips Lab)



Photo provided by the UI Office of Strategic Communication.

## Master of Science (M.S.) in Biology

Richard Bowman, Fall '17 (Smolikove Lab)  
 Clayton Gordy, Fall '17 (Fritzsich Lab)  
 Alaine Hippee, Spring '16 (Forbes Lab)  
 Robert J. Taylor, Jr., Summer '17 (Dailey Lab)  
 Robert Todd, Fall '15 (Prahlad Lab)  
 Claire Tucci, Summer '16 (Houston/Neiman Labs)

## Bachelor of Arts in Biology with Honors

Alejandro Nambo, Fall '16 (Comeron Lab)  
 Grant Read, Spring '17 (Smolikove Lab)

## Biology Alumna Returns to Campus



Photo provided by the UI Department of Biology.

Speaking to a record number of students attending the “Exploring Careers in the Biosciences” event, **Jennifer Davis Ruff** shared some insight into her career that ultimately led to her current position as the Vice President of Corporate Communications and Investor Relations for TESARO, Inc., an oncology-focused biopharmaceutical company. This annual event organized by the UI Department of Biology and Pomerantz Career Center was held on September 19, 2017, and is designed to

provide students with an opportunity to network with employers and receive information on graduate and professional programs.

Twenty years ago, Davis Ruff (Bachelor of Arts in Biology, 1997) had the same feelings that many of the students in attendance are experiencing – not knowing what career path to take. For her, internships were the key. “I was not a stellar student by any stretch of the imagination, but somehow I landed internships at Baxter and then Amgen . . .,” said Davis Ruff in an email prior to the event. She credits those experiences, along with working in a lab on campus during her senior year, that enabled her to get into Northwestern University where she completed a Master of Science degree in Biotechnology

## Bachelor of Science in Biology with Honors

Jenna Barnes, Spring '16 (Slusarski Lab)  
 Jesse Barnes, Spring '16 (Llopert Lab)  
 Scott Benson, Fall '15 (Prahlad Lab)  
 Christopher Blum, Spring '17 (Slusarski Lab)  
 Sean Clausen, Spring '16 (Smolikove Lab)  
 William Evans, Spring '16 (Manak Lab)  
 Timothy Fuqua, Spring '17 (Erives Lab)  
 Clayton Gordy, Spring '16 (Fritzsich Lab)  
 Joshua James, Spring '16 (Weiner Lab)  
 Tamar Kavlashvili, Spring '17 (Phillips/Leslie Labs)  
 Michael Klemme, Spring '17 (Soll Lab)  
 Brigid Lemburg, Spring '16 (Stipp Lab)  
 Mengqi Lin, Spring '17 (Neiman Lab)  
 Bisola Omoba, Fall '15 (Eberl Lab)  
 Amy Peiper, Fall '15 (Smolikove Lab)  
 Zhuoyue Shi, Fall '16 (Smolikove Lab)  
 Isaac Weinberg, Spring '16 (Logsdon/Neiman Labs)  
 Taylor Westpheling, Spring '17 (Smolikove Lab)  
 Matthew Zinselmeier, Spring '16 (Phillips Lab)

(a combination science/business degree program) in 1998.

After a year of working at Motorola Life Sciences, she realized that she didn’t want to stay in a lab forever and wanted to pursue the business side of things. This led her to take some finance courses at Northwestern during the evening and then to work as a biotech stock analyst for a couple of years at two Wall Street firms. She described this as “an incredible vantage point for someone in their mid-20s!” After the stock market downturn in 2002 – 03, Davis Ruff was laid off. She then began focusing on investor relations and corporate communications in both small biotech and big pharmaceutical companies (including Pfizer, Inc.), which ultimately led to her current role at TESARO.

“[I did not have] the most traditional path, but my science background has been essential to being able to understand clinical trial design, trial results, and the basics of drug development, and to talk to other people about it. I love working in industry in a field where I can still be involved with the science, doing great things for people with cancer, but not working in a lab,” says Davis Ruff.

Looking back at her career, Davis Ruff says she wouldn’t change a thing. “I fell in the right place at the right time. I loved Iowa and hope my kids will go there.”

*The Department of Biology appreciates Jennifer Davis Ruff for taking the time to share her experiences with our students. Alumni who would like to participate in future biology career events should contact Steve Kehoe ([biology@uiowa.edu](mailto:biology@uiowa.edu); 319-335-1050).*

## Alum Establishes Scholarship Fund for Biology Graduate Students

By Sara Ring, Associate Director of Development, College of Liberal Arts and Sciences, The UI Center for Advancement

As a young student on the University of Iowa campus, **Michael Dykstra** paid \$65 for a used 1960 Plymouth Valiant. He had no way of knowing the road that lay ahead and where that car might take him. He began his academic career as a botany major at the UI. Through many twists and turns, he eventually obtained four degrees and published three books and 80 scientific papers.

Dykstra grew up in Iowa City and now resides in Apex, North Carolina, with his wife, Dr. Shelley Ching. He retired from academia in 2014 after a career that spanned the pharmaceutical industry, medical microbiology, and veterinary medicine. In the spring of 2016, he started a new chapter working for the government at the National Institute of Environmental Health Sciences. Dykstra earned both his B.A. ('69) and M.S. ('71) in botany at Iowa. He went on to earn a Ph.D. in botany from the University of North Carolina at Chapel Hill where his late grandfather also taught before his tenure as a professor at Iowa. In 1982, Dykstra completed his M.S. in Medical Microbiology at the University of Georgia in Athens. Although his career took him away from Iowa, he still has fond memories of his time at the UI.

As an undergraduate student studying botany, Dykstra spent a lot of time in the then-named Chemistry Botany Building (now Chemistry Building) on campus. He studied with Thomas Melchert, a plant taxonomist, who guided him into the field of botany as an undergraduate. There, he met Robert Embree, who became his mentor in mycology during his master's degree work. Dykstra credits

those experiences with helping him develop problem-solving skills to be successful in settings as diverse as academia, industry, and government.

To honor his ties to the Iowa City community, Dykstra recently established the **Michael J. Dykstra Graduate Scholarship Fund** through the UI Center for Advancement. The fund will provide scholarship support for a graduate student in the UI Department of Biology. Dykstra believes strongly in higher education and with ever-decreasing public support, he notes, "Someone needs to pick up the slack, particularly for graduate education."

Dykstra hopes that his gift will provide educational support for future leaders in scientific research and teaching. He says, "The ever-increasing technological needs of society must be met by well-educated individuals for whom my gift is dedicated."

When Dykstra was in graduate school, he was introduced to Hermann Hesse's famous work *The Glass Bead Game*. The book was also published under the title *Magister Ludi*, named for the central character in the book. The story takes place in a fictional European country called Castalia, which is established for the sole purpose of educating elite young scholars and teaching them to play the Glass Bead Game. The game itself is layered and highly complex and is intended to be a fusion of all branches of knowledge. Although the book is utopian fiction, Dykstra explains that it is a "wonderful exploration of what an academic community can be with the ability to interrelate all knowledge." For Dykstra, those seeds of knowledge were planted at the University of Iowa, and he continues to cultivate them.

## Featured Alumna: Michelle Sullivan

**Michelle Sullivan**, born in Ames, Iowa, and raised in nearby Urbandale, knew she wanted to attend the University of Iowa (UI) because of the city, the culture, and the hands-on opportunities for students. However, her road to becoming a biology student was less clear at first.

Sullivan planned to major in mathematics but changed to biology after completing an honors project during her first semester.

Sullivan also took a dance class that first year and absolutely loved it. "I have never been good at doing one thing only, and I love participating in extracurricular activities," admits Sullivan. She completed her Bachelor of Science in Biology (Evolution track) with a dance minor in Spring 2014.

Sullivan found pursuing both the arts and sciences at the UI to be complementary. "You have to be creative to be a scientist," said Sullivan in a May 2014 interview with the UI Office of Strategic Communication. "90 percent of the time the method you try doesn't work in a scientific experiment, so you have to think, OK, well, what didn't work and how can I reevaluate that and fix it and make it work better. And the same thing happens on the dance floor. It's the same creative problem-solving that happens in both the studio and the lab."

During her sophomore year, Sullivan met then UI Assistant (now Associate) Professor of Biology, **Maurine Neiman**, and began doing research in her lab as part of the Biology Honors Program. "Maurine

Neiman was my most influential mentor while at Iowa. Even as an undergraduate, she gave me opportunities that many students don't get to experience until they are in doctoral programs—presenting at conferences, conducting independent research projects, taking graduate course work. . . . She instilled in me a belief that a scientist's work goes beyond the lab." Sullivan's research in the Neiman Lab involved the study of freshwater snails to answer questions about sexual reproduction.

While at the UI, Sullivan received numerous awards and honors including graduating with a 4.0 grade point average, highest distinction (highest 2% of graduating class), University Honors, and Honors in Biology. She was also awarded several scholarships in the Department of Biology and College of Liberal Arts & Sciences.

Sullivan's diverse experiences at the UI led to her real passion: the intersection of science and society. She is currently pursuing a Ph.D. in Biology and Society in the School of Life Sciences at Arizona State University, studying the effects of climate, environmental, and social change on U.S. National Parks. "I am more broadly interested in the future of habitat conservation and protected areas in the Anthropocene—the age of humans in which humans cause environmental and climate change on a global scale," says Sullivan.

Outside of being a graduate student, Sullivan enjoys fitness and is a certified Zumba and Yoga instructor. She also volunteers at the Desert Botanical Gardens and the Arizona Ballet. Yes, she still dances!



Photo provided by the UI Center for Advancement.

# FUNDING HIGHLIGHTS

## MAJOR RESEARCH GRANTS\* (JUNE 2015-JULY 2017)

### Chi-Lien Cheng, Ph.D.

with Co-Investigator **Erin Irish, Ph.D.**

Both Associate Professors of Biology: \$811,540 for 4 years from the National Science Foundation for “Alternation of Generations without Gamete Fusion.”

### Bryan Phillips, Ph.D.

Associate Professor of Biology: \$1,455,972 for 5 years from the National Institutes of Health for “Novel Beta-catenin Regulatory Mechanisms in *C. elegans* Asymmetric Cell Divisions.”

### Sarit Smolikove, Ph.D.

Associate Professor of Biology: \$555,000 for 3 years from the National Science Foundation for “Regulating Synaptonemal Complex Assembly: Mechanisms that Control Protein Aggregation During Meiosis.”

### Chun-Fang Wu, Ph.D.

Professor of Biology: \$1,911,006 for 5 years from the National Institutes of Health for “Genetic Analysis of Age-Related Functional Decline of *Drosophila* NMJ.”

### Andrew Forbes, Ph.D.

Associate Professor of Biology: \$411,225 for 5 years from the National Science Foundation for “Dimensions: Collaborative Research: Diversification Dynamics of Multitrophic Interactions in Tropical Communities.”

### Veena Prahlad, Ph.D.

Assistant Professor of Biology: \$1,518,905 for 5 years for “Uncovering How Serotonergic Signaling Non-Autonomously Regulates Protein Homeostasis” and \$374,771 for 2 years for “Uncovering Non-Autonomous Mechanisms of Control Over Translational Attenuation During Heat Shock in the Metazoan *C. elegans*,” both funded by the National Institutes of Health.

### Diane Slusarski, Ph.D.

Professor of Biology and Department Chair: \$154,000 for 2 years from the American Heart Association for “Elucidating the Mechanisms of the McKusick-Kaufman Syndrome Gene MKKS/BBS6 in Congenital Heart Disease.”

### Steven Green, Ph.D.

Professor of Biology, together with fellow Principal Investigators Mark Warchol (Washington University School of Medicine in St. Louis) and Edwin Rubel (University of Washington, Seattle): \$2,999,607 for 5 years from the National Institutes of Health for “Role of the Innate Immune System in the Survival of Auditory Neurons.”

### Karen Thompson, Ph.D.

Assistant Research Scientist in the lab of **Bernd Fritzscht**, Professor of Biology and Director of the Center on Aging and Aging Mind and Brain Initiative: \$457,250 for 3 years from the National Institutes of Health for “Three-Eared Frogs: A Tool to Dissect Ear Connection Mechanisms.”

### Joshua Weiner, Ph.D.

Professor of Biology and Associate Director of Education and Outreach for the Iowa Neuroscience Institute: \$1,659,622 for 4 years from the National Institutes of Health for the second competitive renewal of “Elucidating Functions of the Gamma-Protocadherins in CNS Development” (14 consecutive years of funding by the end of the grant period in 2021).

\*New research grants with over \$100,000 in total direct costs and a Biology faculty or staff member as the Principal Investigator.

## NEW PROGRAM INITIATIVES

### Lori Adams, Ph.D.

Co-Investigators **Lori Adams**, Biology Lecturer, Biology Honors Program Advisor, and Program Director of the Iowa Biosciences Academy and the Latham Science Engagement Initiative, and **Vincent Rodgers**, Professor of Physics and Astronomy: \$565,494 for 5 years for a collaboration with Iowa State University, funded by the National Science Foundation, for the Louis Stokes Alliance for Minority Participation (LSAMP) Iowa-Illinois-Nebraska STEM Partnership for Innovation in Research and Education (IINSPIRE) Program. This program, originally formed in 2011 with an alliance of 16 two- and four-year colleges and universities in the Midwest, seeks to continue advancing recruitment and retention of underrepresented minorities in undergraduate STEM academic programs.

### Bryant McAllister, Ph.D.

**Bryant McAllister**, Associate Professor: \$151,693 for 2 years from the Roy J. Carver Charitable Trust for “Formation of a Personal Genome Learning Center.” This project established the Personal Genome Learning Center, a student group at the University of Iowa, with a mission to foster knowledge of genetic and evolutionary principles through engagement with personal genomics. Outreach efforts of the center focus on educating the Iowa City community about the use and interpretation of commercial DNA tests such as 23andMe and AncestryDNA.

*Photo of the skywalk that connects Biology Building East (BBE) and Biology Building (BB). Photo provided by the UI Office of Strategic Communication.*

# UNDERGRADUATE PROGRAM

## Biology Undergraduate Scholarships & Awards

The Department of Biology announced the following undergraduate students as recipients of the Biology scholarships and awards for 2016 – 2017.

For more information, please visit [biology.uiowa.edu/undergraduate-program/scholarships-and-awards](http://biology.uiowa.edu/undergraduate-program/scholarships-and-awards)

### Arthur J. and Flora D. Levin Excellence in Undergraduate Teaching Award

Charles Ankenbauer  
Taryn Nishimura

### Arthur J. and Flora D. Levin Awards for Outstanding Honors Presentations

Kieran Hartley (Outstanding Award)  
Michael Klemme (Distinguished Award)  
Brittany Todd (Commendable Award)

### Evelyn Hart Watson Undergraduate Research Fellowship

Brooke Jennings

### Clifford W. Hesseltine Awards in Biology

Emma Greimann  
Pooja Patel

### Avis Cone Undergraduate Research Fellowship

Jorge Moreno  
Brad Orpano

### Lowden Prize in Biology

Grant Read

### Robbie Prize

Caroline Wilford



Photo provided by the UI Department of Biology.

## New Direction for Undergraduate Program

By Erin Irish, Associate Professor of Biology and Associate Chair of Undergraduate Education

Associate Professor, **Erin Irish**, became the Associate Chair of Undergraduate Education in January 2017, replacing Bryant McAllister who served in that role since June of 2012. Here is her report on the undergraduate program's new direction.

What courses should constitute a bachelor's degree in biology? How should a Bachelor of Arts (BA) in Biology differ from a Bachelor of Science (BS) in Biology? Does every biology major really need two semesters of physics? Are our students learning enough biology? These were some of the questions a committee of faculty, instructors, and advisors addressed in the past year, having been charged with reexamining and updating the course requirements for our undergraduate degree programs. The outcome was new sets of required and elective courses for the BA and the BS—Comprehensive Track, which were unanimously approved by the full Department of Biology faculty last spring.

The framework for the redesign was BioCore, a national standard that follows guidelines established from a collaboration between the National Science Foundation and the American Association for the Advancement in Science, which culminated in the report, *Vision and Change in Undergraduate Biology Education: A Call to Action*. *Vision and Change* identified five core concepts that should underpin an undergraduate education in biology: evolution; structure and function; information flow, storage and change; transformations of energy and matter; and systems. The updated curricula of the UI biology majors now more closely mirror that organization with the addition of Cell Biology to the current core

of required courses of the introductory sequence plus Genetics and Evolution. Both Cell Biology and Ecology were added to the core of required courses for the BS Comprehensive Track, which will be renamed the BS in Integrative Biology when these changes go into effect in Fall 2018.

Upper-level biology courses will be organized into two “menus” that align with the BioCore structure. Each major will require a minimum number of courses from the two menus. The number of semester hours earned from taking biology courses will also be changed so that students will take an average of two more courses taught by our faculty. This addresses the concern that our current BA degree has allowed students so much freedom to choose courses that it has been possible to earn a biology degree with as few as 22 semester hours of biology!

This redesign of the BA and BS—Comprehensive Track provides the impetus to adjust the structure of other majors offered by the Department of Biology to match the new requirements in numbers of semester hours as well as to reexamine the composition of required and elective course sets. Two other BS tracks, Evolution and Plant Biology, have consistently seen modest enrollment. Although they will be eliminated beginning in Fall 2018, students who have a keen interest in those disciplines will be able to take virtually the same sets of courses in the context of the BS in Integrative Biology. And that physics question? Students will now find one, two, or even zero courses as options for STEM courses supporting the BA.



Photo provided by the UI Office of Strategic Communication.

## Collegiate Fellow - Bernd Fritzsich



**Bernd Fritzsich**, Professor of Biology, was named a 2017 Collegiate Fellow, the UI College of Liberal Arts and Sciences' (CLAS) highest faculty honor. Fritzsich received the award in recognition of his distinguished research, teaching, and service. He will serve a renewable five-year appointment as CLAS Collegiate Fellow. "Professor Fritzsich is a leading neuroscientist internationally," CLAS Dean Chaden Djalali said, "and it is my great privilege to name him

Collegiate Fellow. His influential research has been key to establishing the University of Iowa's reputation as a vital center of neuroscience, and his teaching and leadership have inspired students at all levels as well as his faculty colleagues."

## Collegiate Teaching Award - Joshua Weiner



**Joshua Weiner**, Professor of Biology, was one of six recipients of the 2016 – 17 Collegiate Teaching Award from the UI College of Liberal Arts and Sciences (CLAS) in recognition of his exemplary performance as a teacher. Weiner, a neurobiologist, teaches majors and non-majors alike. His large and popular course, "How the Brain Works (and Why it Doesn't)," fulfills a General Education science requirement for students of all majors. He also teaches upper-level courses in neurobiology, regularly directs research by doctoral candidates, and engages students at all levels in the laboratory through one-on-one instruction and mentoring. Weiner is also the Associate Director of Education and Outreach for the new Iowa Neuroscience Institute (INI). See the article on the back cover for more information on the INI.

## Underrepresented Middle School Students Contribute to Genetics Research



Photo provided by Shannan Barker.

For the second consecutive summer, **Sarit Smolikove**, Associate Professor of Biology, offered a 3-week program that exposed middle school students who are underrepresented minorities in science to the Smolikove Lab's research. With support from the National Science Foundation (NSF), the budding science students had

the unique opportunity to contribute to biological research related to Smolikove's NSF grant, "Regulating Synaptonemal Complex Assembly: Mechanisms that Control Protein Aggregation during Meiosis." The grant supports research on synaptonemal complex proteins, which are essential for the partitioning of chromosomes in the division that creates eggs and sperm. Specifically, the research aims to identify how these complex proteins are prevented from forming aggregates that impair their function. Smolikove commented, "I'm excited by the opportunity to expose young students to genetics research performed in the Department of Biology and to bring these discoveries to the public."

## UI Student Team is First from Iowa to Enter iGEM Competition

A group of UI undergraduate students from many different disciplines across campus will be the first team from the state of Iowa to enter the International Genetic Engineering Machine (iGEM) Competition, known as the Giant Jamboree. iGEM is an international foundation that sponsors the annual worldwide synthetic biology competition for undergraduate students. Each student team strives to solve real-world challenges by building genetically engineered systems using standard, interchangeable parts.



The multidisciplinary team from the UI is interested in the environmentally sustainable and affordable production of industrial bioplastics by using microorganisms to produce the platform chemical, 3-hydroxypropionic acid (3-HP). To facilitate this process, the team has constructed a light-emitting device that allows real-time monitoring of 3-HP production and circumvents the need for expensive and time-consuming high-performance liquid chromatography. In November, they presented their work and competed with other teams from around the globe at the Giant Jamboree in Boston. The research and fundraising for this project is primarily student-driven with guidance from three faculty advisors: **Jan Fassler** (Biology), Craig Ellermeier (Microbiology), and Ed Sander (Biomedical Engineering). The Department of Biology also contributed by providing equipment, supplies, and space for the students to work throughout the summer.

For more information about this project, visit [uiowa.edu/igem](http://uiowa.edu/igem)

**Left:** The University of Iowa Department of Biology's Outreach Program, "Hawkeyes at the Microscope," participated in the STEM Day at the Iowa State Fair on Sunday, August 20, 2017.

For more information on Hawkeyes at the Microscope, visit [biology.uiowa.edu/outreach/hawkeyes-microscope](http://biology.uiowa.edu/outreach/hawkeyes-microscope)



Photo provided by the UI Department of Biology.



Photo provided by Anne Frankel.

**Norman E. Williams**, who passed away on October 24, 2016 at age 88, was initially appointed as an Instructor in the Zoology Department of the State University of Iowa in 1957. He started out as a young protozoologist and ended up nearly five decades later as an accomplished cell biologist with some successful forays into genomics. Norman completed his Ph.D. at the University of California at Los Angeles (UCLA) under

Professor Waldo Furgason, who named the genus *Tetrahymena* in 1940. On arriving at Iowa, Norman quickly attracted four graduate students who did their Ph.D. research on the morphogenesis and physiology of the polymorphic *Tetrahymena* species, *T. vorax*, and *T. patula*. Norman himself continued the research that he had begun at UCLA on the developmental biology of cell-division-synchronized *Tetrahymena pyriformis*. In the 1960's, Norman took advantage of two successive research leaves to become an expert electron microscopist and begin biochemical explorations of the asexual *Tetrahymena pyriformis* and later of the sexual *T. thermophila*. Norman's favorite study, carried out with five collaborators four years after his formal retirement in 2001, revealed that disruption of the major actin gene of *Tetrahymena thermophila* impaired cell motility and phagocytosis but did not affect cell division constriction.

Norman loved working at the bench, both alone and with others. He shepherded eleven graduate students to their Ph.D.'s.

All of them published papers based on their Ph.D. work, seven of them as sole authors. He additionally supervised four master's students, worked with four domestic collaborators, and hosted six investigators from abroad. His students found him always available for discussions and helpful in the task of assembling and writing dissertations. He later developed close friendships with some of these students and co-workers.

Norman's teaching evolved along with his research. The General Zoology course sequence that Norman taught when he first arrived was replaced by an intensive one-semester Principles of Animal Biology course followed by a two-semester Principles of Biology sequence taught after the merger of the Biology and Botany departments. Norman's Protozoology course was first replaced by a course entitled "Cell and Molecular Biology of Protozoa," followed by an alternation of advanced courses in "Development in Single Cell Systems" and "Virus Assembly and Cell Organelle Development." He taught in a straightforward and effective manner, continually updating the content of his courses to keep pace with developments in rapidly changing fields. Norman was also actively involved in various departmental committees, including two terms on the department's Executive Committee. He served as President of the Society of Protozoologists in the 1984-85 academic year and also was on its Executive Committee for a number of years.

*A more detailed report of Norman's research accomplishments can be found in the article "In Memoriam: Norman E. Williams (1928-2016): Pioneer of Ciliate Architecture" by Joseph Frankel and Howard E. Buhse in the May/June 2017 issue (DOI: 10.1111/jeu.12395) of the Journal of Eukaryotic Microbiology.*

*By Joseph Frankel, Professor Emeritus*

## OBITUARIES

**Bagnara, Dr. Joseph T.**  
Ph.D. Zoology, 1956  
(October 2, 2016)

**Blackwell, Steven D.**  
B.A. Zoology, 1976  
(March 8, 2015)

**Brannaman, B. Louis**  
B.A. Botany, 1945  
(November 21, 2015)

**Brown, Dr. Merton F., Jr.**  
Ph.D. Botany, 1966  
(October 9, 2016)

**Crepeau, Victor F.**  
B.A. Zoology, 1942  
(February 14, 2017)

**Davis (Schmidt), Dr. Janine A.**  
B.A. Zoology, 1977  
(November 21, 2015)

**Downing, Dr. William L.**  
B.A. Zoology, 1943;  
M.S. Zoology, 1948;  
Ph.D. Zoology, 1951  
(July 21, 2015)

**Egner (Hartman), Virginia H.**  
B.A. Zoology, 1946  
(January 29, 2016)

**Eitel, James M.**  
B.A. Zoology, 1950  
(February 23, 2016)

**Fischthal, Dr. Jacob H.**  
M.S. Zoology, 1938  
(July 7, 2015)

**Giammetta (Whitehorn),  
Dianne L., M.D.**  
B.S. Botany, 1984  
(May 12, 2017)

**Grant, Sandra K.**  
B.A. Zoology, 1977  
(November 27, 2015)

**Hightshoe, Clarence C.**  
M.S. Botany, 1948  
(January 9, 2016)

**Kane (Brattain), Dolores Jean**  
B.A. Zoology, 1951  
(January 20, 2012)

**Klitgaard, Dr. Howard M.**  
B.A. Zoology, 1949  
(December 18, 2015)

**Kluss, Dr. Byron C.**  
B.A. Zoology, 1949;  
M.S. Zoology, 1955;  
Ph.D. Zoology, 1957  
(July 8, 2016)

**Knuth (Kennedy), Elizabeth L., M.D.**  
B.A. Zoology, 1941  
(September 17, 2016)

**Murray, Raymond F.**  
B.A. Botany, 1961  
(January 20, 2016)

**Nelsen, Dr. E. Marlo**  
M.S. Zoology, 1970;  
Ph.D. Zoology, 1974  
(May 23, 2017)

**Peterson (Lindgren), Audrey L.**  
M.S. Zoology, 1948  
(January 10, 2017)

**Ping, Don W., M.D.**  
B.A. Zoology, 1947  
(December 12, 2015)

**Pruckler, Robert M.**  
B.A. Zoology, 1941  
(December 25, 2014)

**Pugh (Wright), Jane W.**  
B.A. Botany, 1936  
(March 5, 2015)

**Stokes, Dr. Bettie R.**  
Ph.D. Botany, 1974  
(March 12, 2016)

**Timmer, Peter E.**  
M.S. Botany, 1965  
(November 15, 2015)

**Trankle, Dr. Robert J.**  
Ph.D. Botany, 1963  
(February 28, 2017)

**West, Dr. William L.**  
Ph.D. Zoology, 1955  
(September 23, 2015)

*\*Birth name (if applicable) and deceased date are listed in parentheses.  
Reference: UI Division of Alumni Records*

## New Neuroscience Major Offered at the UI

In January 2017, **Joshua Weiner**, Professor of Biology, was appointed as the Associate Director of Education and Outreach for the Iowa Neuroscience Institute (INI) by Director Ted Abel. The new INI, which officially opened on February 3, 2017, conducts research to uncover the causes of diseases that affect the brain and nervous system in addition to finding preventions, treatments, and cures.

Worldwide, nearly one-fifth of all disabilities leading to ill health or early death are related to neuropsychiatric, neurodevelopment, or neurological disorders. According to Abel, this is “more than any single category of disease.” Abel, whose son is on the autism spectrum, goes on to say, “At the Iowa Neuroscience Institute, we hope to make a difference in the lives of people like my son – to build a campus-wide neuroscience community that makes revolutionary discoveries in fundamental neuroscience and translates them into clinical treatments for brain disorders.”

The INI also aims to integrate and enhance neuroscience research and education across the University of Iowa. To meet this goal, Weiner and Ryan LaLumiere, Associate Professor of Psychological and Brain Sciences, proposed a new undergraduate major in neuroscience. The new major is a joint effort of the Departments of Biology and Psychological and Brain Sciences (formerly Department of Psychology) with coursework taken from both biology and psychology majors. Most of Iowa’s peer group universities have neuroscience majors but until now, University of Iowa students interested in neuroscience were limited to the neurobiology emphasis track within the larger Bachelor of Science in Biology major. Weiner believes the new neuroscience major will provide students with much broader exposure to key neuroscience concepts and especially enhanced coursework in behavior and cognition. The new major began in the Fall 2017 semester and is administered in the Department of Biology.

In his outreach role, Weiner is planning events that combine top-notch science with public engagement. An event planned for April 2018 will include a new named lectureship sponsored by the INI and the Department of Psychiatry and will feature Dr. Beth Stevens, a Harvard scientist and MacArthur Fellow. Dr. Stevens works on the cellular and molecular mechanisms of synapse elimination, a process that is believed to go awry in autism. Along with Dr. Stevens, Weiner is organizing INI sponsorship of a public lecture and book signing by Eli Gottlieb, a novelist who has written fictionalized accounts of life with his autistic adult brother and several opinion editorials for the *New York Times* about the plight of adults with autism.

Weiner hopes to spread the word nationally about the exciting new initiatives of the INI and UI biomedical research in general through events such as the Society for Neuroscience’s annual meeting, which was held in Washington D.C. in November 2017 for 30,000 attendees. Weiner is optimistic the INI will generate excitement about neuroscience among the general public while also reminding scientists of the human side of the scientific enterprise—the main reason many scientists decide to pursue biomedical research.

The Iowa Neuroscience Institute is based in the Pappajohn Biomedical Discovery Building within the Carver College of Medicine and is supported by a \$45 million grant from the Roy J. Carver Charitable Trust.

*For more information about the INI, please visit [www.medicine.uiowa.edu/iowaneuroscience](http://www.medicine.uiowa.edu/iowaneuroscience)*

