



COLLEGE OF LIBERAL ARTS & SCIENCES

The Department of

# BIOLOGY

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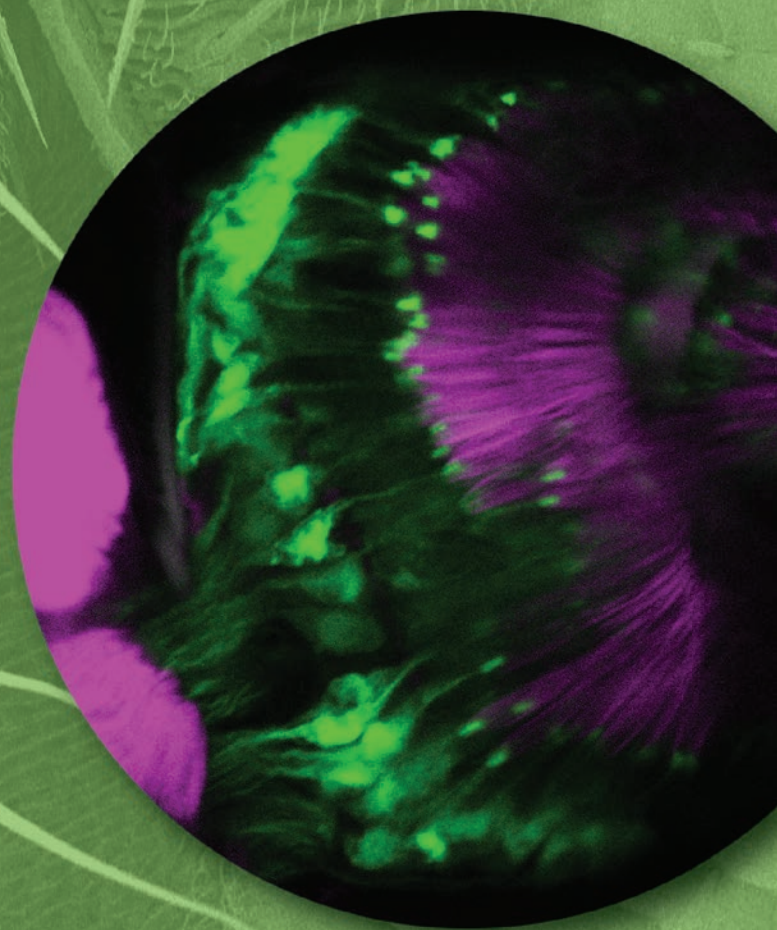
Spring 2016

## IN THIS ISSUE

Department Research Could  
Provide Insight on Cancer

Moderate Noise Levels Can  
Cause Hearing Loss

Alumni Participate in Biology  
Career Event



THE  
UNIVERSITY  
OF IOWA



<b>3-4</b>	Department Research
<b>5-6</b>	Featured Alumni
<b>8</b>	Faculty and Staff Retirements
<b>9</b>	Biology Graduates
<b>10</b>	Alumna Receives Dissertation Prize
<b>10</b>	In Remembrance

Steve Kehoe  
Casey Westlake

Alexis Rice

**Photo on the cover:** Scanning electron micrograph of a fruit fly antenna, the sensor for the courtship song.

**Inset:** The mechanosensory organ, Johnston's organ, in the second antennal segment viewed by expression of GFP in neurons (green) and by staining for actin (magenta).

**Image was provided by the Eberl Lab in the Department of Biology and appeared on the front cover of the *Journal of Comparative Physiology A*, January 2015 publication (Volume 201, Number 1).**

Lori Adams  
Joseph Bagnara  
Phil Ecklund  
Jan Fassler  
Bernd Fritzsich  
Anna Gaw  
Steven Green  
Stuart Haring  
Theresa Hegmann  
Heather Hines  
Jian-Ping (J.-P.) Jin  
Bryant McAllister  
Bryan Phillips  
Shelley Plattner  
Sara Ring  
Sarit Smolikove  
David Soll

## 2015: ONE YEAR AFTER THE DEPARTMENTAL REVIEW



In 2014, the Department of Biology participated in the first full-scale departmental review since 2005, resulting in a 300+ page document. In December 2014, we received a detailed report pointing out that “the department has great potential for future development.” However, we need “to grow both in numbers of faculty and in the numbers of graduate students if the University [of Iowa] is to sustain a Research 1-level biology program in the future.” The report also recommended that the department develop leadership from within to eventually replace the outgoing Departmental Executive Officer (DEO).

The year 2015 saw unprecedented changes among our faculty. At the senior level, we lost three outstanding faculty to retirement (Steve Hendrix, Jim Lin, and Bob Malone in alphabetical order). Together they provided over 100 years of service to the department. Detailing their many achievements would take all the space I have in this letter. Therefore, special overviews written by faculty close to the retirees are included in this newsletter and the Summer 2015 edition.

We just finished reviewing three junior faculty for tenure and promotion and one for promotion to full professor and are optimistic that all four will be approved. It is noteworthy that each of the three junior faculty have at least one graduate student who has completed his/her thesis, published at least one paper, and moved on to his/her next position as a postdoctoral research scholar. I believe this reflects not only on the excellent mentoring by faculty involved with these students but also on the restructuring of the graduate program under the past leadership of Josh Weiner and new leadership of Doug Houston.

Overall, department funding has again increased slightly year over year, indicating that the faculty remains competitive in obtaining extramural support — a remarkable achievement given the current funding climate. This is also supported by the number of high profile papers published by faculty and the citations they have received, amounting to record heights in both categories for 2015. Clearly, the advancement of science is moving forward in the department.

These gains in research have to be put in perspective with the undergraduate teaching workload that continues to increase as a result of the higher number of enrolled students and decreasing number of faculty. This shifts the faculty-to-student ratio unless new faculty can be hired. Anyone familiar with higher education knows that student success and low faculty-to-student ratios are linked. At the moment, the department is seeing an increase in entry-level classes, which is still a welcome change from the minor decline we have seen in previous years. The increase appears to be related to the various activities organized primarily by the Associate Chair of Undergraduate Education, Bryant McAllister.

This past year was remarkable for me in that I published a special edition for a journal and co-edited a book on the development of the mammalian hearing organ. I was also notified in June that I was elected to the German National Academy of Sciences. This academy is the oldest continuously operating academy for medicine and the natural sciences in the world and has only 1500 members. Together with Dr. Chun-Fang Wu, the department now has two National Academy members, clearly showing international recognition of departmental research. Finally, my intention is to serve the department as a faculty member intensively engaged in research once I step down as DEO at the end of June 2016; therefore, making this the last letter I am writing to you.

I hope you enjoy this edition of the newsletter.

### Bernd Fritzsich, Ph.D.

Fellow, AAAS; Member, German National Academy of Sciences Leopoldina  
Departmental Executive Officer (DEO) and Professor of Biology  
Co-Director, Center on Aging & Aging Mind and Brain Initiative (AMBI)



# NEW STAFF

## ANNA GAW



Anna Gaw, Biology's undergraduate academic advisor who started her position in March 2015, was lucky to discover that she wanted to work with college students not very long after she had been one herself.

Gaw, who was born in Rhode Island but grew up in the Midwest, studied parks, recreation, and tourism at the University of Missouri. While working in the college library after

graduating, Gaw realized that she wanted to work with college students as an academic advisor. She received a Master of Science in Counseling and Student Development at Kansas State University (KSU), where she pursued her passion for advising through an assistantship in the KSU College of Education.

"It was the best choice I ever made," she says.

Gaw first worked as an academic advisor at Spring Hill College in Mobile, Ala. From there, she became the director of academic advising at Missouri University of Science and Technology. Gaw and her team often worked with students in academic distress and developed a variety of programming to support student success.

Before coming to Iowa, Gaw spent several months in Moshi, Tanzania, working with

a grassroots organization, Give a Heart to Africa. There she taught courses in English, computers, and business to adult women in the community, who hoped to benefit from the tourism industry centered around Mount Kilimanjaro. She also traveled in Turkey and parts of Europe.

"I love the department; it's a really great community," Gaw says of her experience at Iowa so far, adding that she loves being part of an academic department while still having the support of advisors across the College of Liberal Arts and Sciences. Gaw hopes to develop programming to help undergraduates investigate career options in and outside of the health sciences. When she's not advising students, she likes to read and paint.



## A NEW OPPORTUNITY FOR SUPPORTING IOWA

Whether it's stem cell research or global warming, the biological sciences have assumed a particularly important role in issues affecting our daily lives. At the University of Iowa, our Department of Biology helps solve the world's greatest concerns through its educational opportunities and world-class research.

To continue to move forward, we must hire new faculty involved in cutting edge research, recruit the best graduate students, and continue to acquire the latest technology for training and research. In the past, many donors have supported the Department of Biology through annual gifts from an individual retirement account (IRA).

Thankfully, recent legislation has made the charitable IRA rollover option permanent, meaning you can make tax-free annual gifts from your IRA. The rules for making charitable IRA rollover gifts are:

- You must be at least age 70½ at the time the gift is made.
- You may transfer up to \$100,000 per year from your IRA directly to a qualified charity.
- The gift must come directly from your IRA, not from any other type of retirement plan.
- You do not include the distribution in your income, nor will you take a deduction for the gift.
- The distribution will count toward your required minimum distribution from your IRA.
- You may not receive anything in exchange for the gift, including athletic seating priority, a charitable gift annuity, or a charitable remainder trust.

While this is a great opportunity for you to make a charitable gift, we encourage you to visit with your financial advisor to determine if taking advantage of this legislation is right for you.

For more information, contact Sara Ring ([sara-ring@uiowa](mailto:sara-ring@uiowa), 319-467-3639), Assistant Director of Development, UI College of Liberal Arts and Sciences, or visit [www.uifoundation.planningyourlegacy.org](http://www.uifoundation.planningyourlegacy.org)

By Sara Ring, Assistant Director of Development

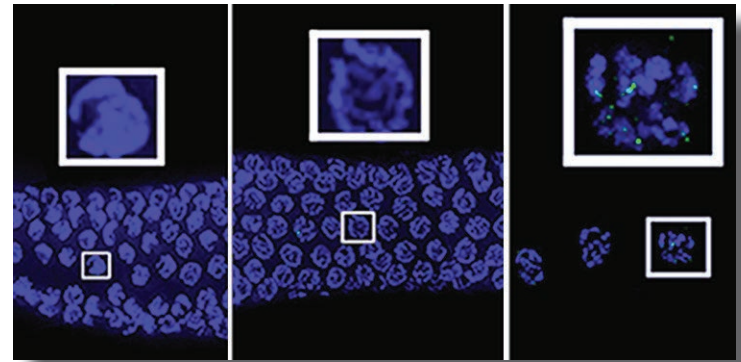
To learn how gifts make a difference for faculty, staff, and students in the Department of Biology, please visit [www.givetoioowa.org/biology](http://www.givetoioowa.org/biology) or contact Sara Ring at the UI Foundation ([sara-ring@uiowa.edu](mailto:sara-ring@uiowa.edu), 319-467-3639).



## BIOLOGY PROFESSOR SEEKS TO UNDERSTAND DNA REPAIR PATHWAYS AND THEIR ROLE IN CANCER PROGRESSION

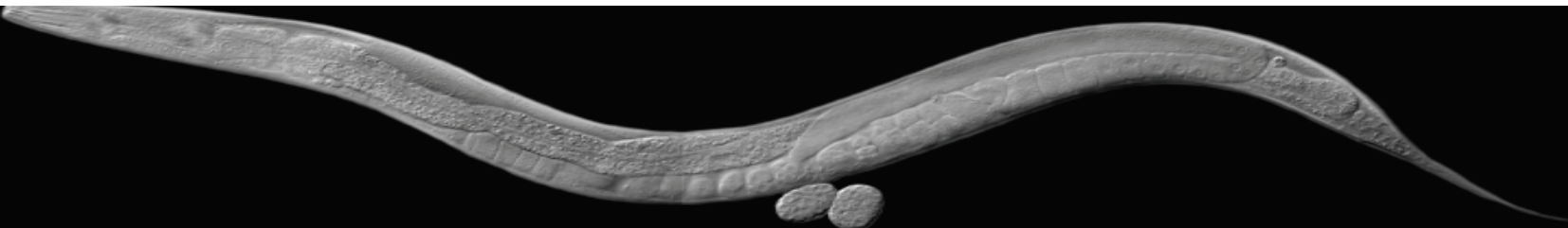
DNA double-strand breaks (DSBs), in which both strands in the double helix are severed, are harmful to living organisms since they lead to cell death or DNA alteration. This is a result of the use of error-prone instead of error-free repair pathways. These DNA alterations include chromosomal abnormalities frequently associated with changes in gene structure and regulation and often promote tumors that are frequently found in cells of cancer patients. Sarit Smolikove, an Assistant Professor of Biology at the University of Iowa, was awarded a five-year, \$1.4 million grant from the National Institutes of Health with the long-term goal of identifying mechanisms involved in selecting an error-free versus an error-prone repair pathway.

“DNA damage repair is mainly studied in single-cell systems. Although these are extremely powerful, they may not give us a complete understanding of how DNA damage repair promotes cancer since this process is taking place in the whole organism,” says Smolikove. Her research uses *Caenorhabditis elegans* (*C. elegans*), a multicellular model organism which allows her to perform genetic assays for DNA repair in the whole organism at a low cost and with an efficient time scale. She adds, “our main aim is to identify novel genes that regulate DNA damage repair pathway choice in an organismal context.”



Germline of a mutant *Caenorhabditis elegans* (*C. elegans*) that is impaired in DSB repair. Sections of different regions of the germline (different stages of meiosis) is presented along with a zoomed-in inset. Chromosomes (DAPI= Blue) and ssDNA binding protein (RAD51= Green). Photo provided by Sarit Smolikove.

Smolikove will also examine how pathway choice is temporally regulated in the *C. elegans* germline, the cells that may pass along mutations to offspring. The conservation of genes and pathways between this animal model and humans will serve as an efficient approach for the discovery of genes in humans affecting the formation and progression of cancer. Understanding how error-free as opposed to error-prone pathways are selected will be fundamental for determining how cancer progresses and for promoting cancer treatment.



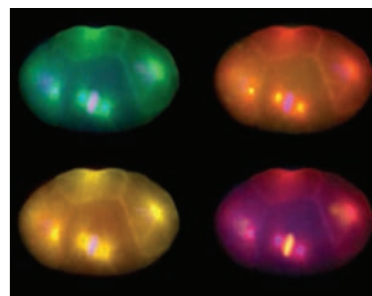
## RESEARCH ON CELL DIVISION COULD PROVIDE INSIGHT ON BIRTH DEFECTS AND TUMORS

In normal cell division, a parent cell produces two daughter cells with the same fate or polarity. For example, a skin cell produces two more identical skin cells. In asymmetric cell division (ACD), a parent cell produces two daughter cells with different fates. For example, a neural stem cell might produce a neuron and another neural stem cell. In addition to its essential role in development, ACD is used throughout adulthood to regulate stem cell behavior and, when defective, has been implicated as a cancer-causing mechanism.

Bryan Phillips, Assistant Professor of Biology at the University of Iowa, and Kristi Neufeld, Associate Professor of Molecular Biosciences at the University of Kansas, have received a three-year, \$1.2 million grant from the National Science Foundation. The project is the first to use two powerful genetic model systems, mice and *Caenorhabditis elegans* (*C. elegans*) nematodes, to investigate the conservation of mechanisms that drive ACD.

The Phillips Lab studies *C. elegans* to better understand the role of normal and defective ACD during development. In both mice and the nematodes, extracellular signals stabilize the protein beta-catenin, causing asymmetric gene expression.

The *Caenorhabditis elegans* (*C. elegans*) is an experimental model animal studied by researchers in the Department of Biology. *C. elegans* is a free-living, non-parasitic soil roundworm with a large number of genes very similar to other organisms, including humans. Photo provided by Maria Gallegos.



The embryos of the nematode *C. elegans* are experimentally amenable to microscopy and genetic manipulation that uncover novel developmental mechanisms. Photo provided by Setu Vora, a Biology Ph.D. student in the Phillips Lab.

“What we hope to accomplish with this collaborative grant is to take advantage of several recently-discovered commonalities of mouse and nematode ACD and determine the mechanisms of beta-catenin regulation in *C. elegans*. Then we will test those mechanisms for mammalian conservation in order to uncover general principles that govern cell polarity during ACD,” says Phillips.

The research could provide insight into the underlying causes of ACD-related birth defects as well as tumors resulting from mispolarized stem cells.

## RESEARCH SHOWS MODERATE NOISE CAN CAUSE HEARING LOSS

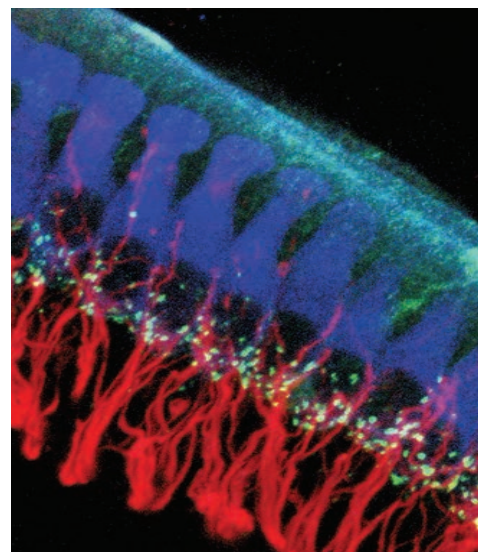
Hearing begins with sensory cells, “hair cells,” that detect sound. Hair cells transmit to spiral ganglion neurons (nerve cells) that, in turn, relay auditory information to the brain. Noise imperils this system. Loud noise destroys hair cells, causing profound hearing loss. While scientists once believed that this was the only way noise caused hearing loss, recent studies have shown that noise damages the synapses, or links between hair cells and neurons. Such “synaptopathy” occurs even at noise levels too low to damage hair cells.

Steven Green, Professor of Biology, received a three-year, \$1.5 million grant from the Department of Defense to study prevention and treatment of synaptopathy. Because synapses do not regenerate, the damage accumulates with age. While not causing profound hearing loss, it can impair ability to understand speech in a noisy environment, exacerbate age-related hearing loss, and cause tinnitus. The concern is great because we frequently encounter noise

levels capable of causing synaptopathy; for example, in the military, at sporting events, concerts, clubs, and as earbud users.

Dr. Green recently participated in a National Institutes of Health panel to advise on research priorities for the diagnosis and treatment of synaptopathy. Dr. Green’s lab developed an in vitro model to investigate the cause of synaptopathy and determine means by which the damage can be prevented and synapses can be made to regenerate. Based on these studies, the lab has identified a promising protective strategy now being tested in animal models of noise-induced synaptopathy.

“These studies began by careful consideration of the basic biology of synapses followed by methodical testing of alternative mechanisms. Being in a biology department helps to direct one’s attention first to the basic research questions,” says Dr. Green.



Synaptic connections between hair cells and nerve fibers in the inner ear. Synapses are green spots at the junction of hair cells (blue) and nerve fibers (red).



# FUNDING ACTIVITY

## FISCAL YEAR JULY 1, 2014 – JUNE 30, 2015

The Department of Biology and the UI Microscopy Core received funds for the purchase and support of a Leica Superresolution Stimulated Emission Depletion (STED) Microscope. The microscope, which is housed in the Eckstein Medical Research Building, is administered by the University of Iowa Central Microscopy Research Facilities. This microscope allows light-based biomedical imaging of cellular details at an unprecedented resolution even in live images and will stimulate research across campus. Funding for this project totals over \$875,000, of which \$450,000 was provided from the Roy J. Carver Charitable Trust. The remainder of funds will come from the Office of the Vice President for Research and Economic Development, the College of Liberal Arts and Sciences, the Carver College of Medicine, and several individual users.

The University of Iowa Office of the Vice President for Research and Economic Development awarded a 2015 Internal Funding Initiative (IFI) to **Chi-Lien Cheng, Associate Professor of Biology**, for her project, “Asexual Seed Production in Agriculture.” IFI programs encourage collaboration and multidisciplinary projects with an overall emphasis on innovation and impact.

**Andrew Forbes, Assistant Professor of Biology**, received a 2014 Internal Funding Initiative from the University of Iowa (UI) Office of the Vice President for Research and Economic Development for his research project, “A genome-wide analysis of the effect of sexual reproduction on the rate of molecular evolution.” Forbes also was the recipient of a 2014 Seed Grant Award from the UI Center for Global & Regional Environmental Research for measuring the impact of urban and agricultural land use on insect diversity.

**Bernd Fritzsich, Departmental Executive Officer and Professor of Biology**, in collaboration with students and faculty from the College of Liberal Arts & Sciences (including the Department of Biology) and College of Engineering, received a three-year grant from the Iowa Space Grant Consortium. The ultimate goal of this study is to help astronauts regain motor function more rapidly upon return to Earth and also benefit the elderly, who suffer from hearing loss, improve their balance.

**Katelyn Larkin, a former Biology graduate student and current research assistant** in the Neiman Lab, received a one-year Young Explorers Grant from the National Geographic Society for her research project, “Does parasite pressure drive the evolution of life-history variation?”

The Iowa Science Foundation awarded funds to **Maurine Neiman, Associate Professor of Biology; and Laura Bankers, a Biology Ph.D. student**, for their research on “Evaluating the influence of polyploidy and asexuality on patterns of genome evolution.”

**Anna Malkova, Associate Professor of Biology**, received a four-year, \$1.1 million grant from the National Institutes of Health. The grant is a renewal of her previous work studying how cells repair DNA breaks. The repair of DNA breaks is crucial for cell survival and imprecise or faulty repair can lead to various genomic instabilities including cancer.

**Malkova and Sarit Smolikove, Assistant Professor of Biology**, also received a supplemental grant from the National Institutes of Health for a Leica microscope.

**Joshua Weiner, Associate Professor of Biology**, and Dr. Robert Burgess from The Jackson Laboratory, received a two-year, \$500,000+ grant from the National Institutes of Health, to develop novel gene editing techniques for use in mice for their research on a family of 22 adhesion molecules, the gamma-protocadherins. These are important for specifying the formation of neural networks during brain development, and the new techniques will generate mouse strains with varying numbers of the 22 proteins disabled in order to probe their function.





## JOSEPH BAGNARA



When Joseph Bagnara came to Iowa City in September 1952, it was just the beginning of a journey that would lead to many traveled roads, earning him international recognition while making lasting friendships. Born and raised in Rochester, New York, Bagnara received his Bachelor of Arts degree in Biology from the University of Rochester. During his senior year, he decided to attend graduate school to further study his interest in embryology.

“I was excited to receive acceptance into the graduate program . . . at the University of Iowa,” says Bagnara in his memoir, *Unfinished Business: A Biologist in the Latter Half of the 20th Century*. “It meant both the start of a new life and the key to my future.” One of Bagnara’s professors at Rochester had an acquaintance at the UI with Professor Emil Witschi, a well-known embryologist in the Department of Zoology (now the Department of Biology). Upon arriving in Iowa City, Bagnara met Professor Witschi and became one of his graduate students. “[Witschi] had a very impressive program at Iowa . . . . The principal theme of his program dealt with embryonic sex determination, but specific research topics took many directions from genetics to behavior,” says Bagnara. “In my own case, I began to work with pigment cells and with pigmentation. . . . I certainly did not intend to work with pigmentation for all of my life, and, in fact, knew little about pigment cells when I started graduate work.”

During the summer of his first graduate year, Bagnara met Lou Schulze, who was also a student at the UI. They married in September 1955 in the Danforth Chapel on the UI campus. Lou graduated in June 1956 with a Bachelor of Science in Chemical Engineering, one of the first women at the UI to have earned such a degree. In August, Bagnara received his Ph.D. in Zoology. Then, in September, he accepted a position as a zoology instructor at the University of Arizona (UA) and eventually became a professor there in 1964. He spent his entire academic career at the UA, retiring in 1992. During his long career at the UA, one of Bagnara’s successful Ph.D. students was Sally Mason, the recently retired UI President.

In 2001, Bagnara was awarded the prestigious “Order of the Sacred Treasure” from the government of Japan for his long research collaboration with Japanese scientists and his support of seven Japanese postdoctoral fellows in his lab. In addition, he made contributions to the growth of pigment cell research in Japan.

In 2013, Bagnara published his memoir, *Unfinished Business: A Biologist in the Latter Half of the 20th Century*, which details his scientific and cultural adventures. As noted on the back cover of this book, “Now retired, [Bagnara] leaves behind a legacy of discovery and knowledge. And yet, as in any life, there is unfinished business.”

## HEATHER HINES



For Heather Hines, summers in college meant hours in the sun collecting bees on the prairie as part of her undergraduate honors research in Professor Steve Hendrix’s lab. “Dr. Hendrix did a great job easing me into research, first under the mentorship of a graduate student, and then in developing my own project,” Hines says. “He made me feel like an important part of the research team in his lab. Being part of this community was my most valued undergraduate experience. Dr. Hendrix taught me what a career in research science is about, preparing me for graduate school and beyond.”

Hines, originally from Edgewood, Iowa, received a bachelor’s degree in anthropology and biology from the University of Iowa in 2001. “The University of Iowa is a great institution for studying biology and was close to home. Going to the University of Iowa was a big step for me, having grown up in a small town,” says Hines. She chose biology because she enjoyed spending time outdoors and was intrigued by how organisms developed and evolved over time.

In addition to working with Hendrix, Hines also worked in the labs of Dr. Barbara Stay in the Department of Biology, and Dr. Thomas Schmidt in the Department of Molecular Physiology & Biophysics. After graduating, Hines continued to study bees, focusing on the evolution of bumble bee species. She received her master’s and Ph.D. in entomology from the University of Illinois at Urbana-Champaign studying the evolutionary history of bumble bees. She completed her postdoctoral research at North Carolina State University focusing her research on the developmental genetics underlying butterfly coloration.

Since 2012, Hines has been an assistant professor at Penn State University, where she received a National Science Foundation Early Faculty CAREER Award and continues her research on mimetic coloring in bumble bees. She and her partner Andrew Deans, an associate professor at Penn State, have two children, Vivian and Hugo Deans. Hines loves to travel, and her efforts to collect bumble bees have taken her to Turkey, Mexico, Malaysia, and Myanmar.

Hines reflected on her time at Iowa by saying, “The University of Iowa presented vast opportunities to find what interested me and allowed me to connect with like-minded individuals. The University of Iowa has a cozy, college-town atmosphere, a vibrant downtown, and great educational resources.”

## TERESA HEGMANN



For Theresa Hegmann, biology is a family affair. Her father, Joe Hegmann, was a professor in the Department of Biology, and she remembers spending hours of her childhood in his lab, playing with lab mice, learning chess from graduate students, and helping to record data.

Hegmann decided to study biology at the University of Iowa (UI) and in 1984 joined the lab of Professor Jim Lin, where she assisted with research on cell motility. She gained valuable skills ranging from photography, to cell culture, to revising a manuscript, and also contributed to four papers of which three are first author publications. She forged close bonds with Professor Lin, whom she describes as an “amazing mentor and a sweet, sweet man,” and his wife and research assistant, Jenny, whom Hegmann came to see as a second mother. Hegmann also gave birth to her daughter, Natasha, during her time in the Lin Lab. As a baby, Natasha would nap in a drawer in the lab of her godfather, Biology Professor Steve Hendrix.

While she enjoyed the research she did, Hegmann discovered it wasn't her “complete calling.” After working as a teaching assistant for a cell biology class and volunteering at the Iowa City Free Medical Clinic, she enrolled in the Physician Assistant Program at the UI. Hegmann later received her Master of Physician Assistant Studies degree from the University of Nebraska Medical Center in 1999.

She currently is a clinical professor in the UI Department of Physician Assistant Studies and Services. Prior to that, Hegmann was a full-time clinical physician assistant for 10 years, and she has continued part-time clinical practice since joining the department, in the areas of family practice and urgent care. Hegmann is a 1983 National Merit Scholar, a UI Presidential Scholar, a 2002 Carver College of Medicine Teaching Scholar, the 2013 Iowa Physician Assistant Society (IPAS) Physician Assistant of the Year, and the 2015 recipient of the Physician Assistant Education Association (PAEA) Research Achievement Award. “I wouldn't be who I am or where I am if I hadn't been in Professor Lin's Lab,” she says. “I'm deeply grateful for the opportunity.”

## STUART HARING



When Stuart Haring decided to attend graduate school at the University of Iowa (UI), he discovered that Iowa City was a lot like his hometown of Fargo, North Dakota. “What I enjoyed most about being at the University of Iowa was the small-town feel with big-time opportunities and experiences,” Haring says.

Haring, who completed his bachelor's at the University of North Dakota, came to graduate school at the UI with his wife, Jodie, who pursued a Ph.D. in microbiology. Haring tackled his doctoral studies in Professor Robert Malone's lab, focusing on meiotic recombination. While Haring fondly remembers many department members, his advisor had the most lasting influence on him. Haring remembers Dr. Malone as demanding but loyal and caring as well.

“I believe I would have been successful as a scientist anywhere, but I also believe my experience at the UI and in Bob's lab helped me to sharpen my skills as a scientist and educator in ways I would not have otherwise,” Haring says.

After receiving his Ph.D. in biology in 2004, Haring worked in the Department of Biochemistry with Marc Wold as a postdoctoral fellow. He and Jodie then returned to their hometown of Fargo where he is an associate professor in the Department of Chemistry and Biochemistry and the Interdisciplinary Cellular and Molecular Biology Program at North Dakota State University. Stuart, Jodie, and their dog live close to both their families and have enjoyed reconnecting with childhood friends.

“My Ph.D. from the UI Department of Biological Sciences [now the Department of Biology] has allowed me to fulfill not only my dream of becoming a tenured faculty member at a research university, but it also allowed me to return ‘home’ and make an impact on future professionals, many of which come from my home state and surrounding areas,” Haring says.

## JIAN-PING (J.-P.) JIN



Jian-Ping Jin, known as J.-P., joined Dr. Jim Lin's Lab in 1986, after graduating from the Fourth Military Medical University in China. Jin, who trained as a cardiologist in China, spent his time in Dr. Lin's lab studying troponin, a protein that regulates the contraction of skeletal and cardiac muscles.

Jin says that he enjoyed the “open and welcoming educational environment at the UI” and the helpful professors and staff he found in the Department of Biology, especially Dr. Lin's wife, Jenny, who also worked as a research assistant in the lab. In 1989, Jin finished his Ph.D. in biology in three years and four months – a record in the department at that time. In addition, his thesis research with Professor Lin generated a total of six papers of which five are first author publications. Jin credits the department with supporting him all the way through his career as an educator and researcher. “He's a sweet, gentle man with the most remarkable knowledge base ever,” says Theresa Hegmann, who worked with Jin in the Lin Lab.

Since 2009, Jin has been Professor and Chair of the Department of Physiology at Wayne State University School of Medicine in Detroit, the largest single campus medical school in the United States. He was awarded the William D. Traitel Endowed Chair in Physiology in June 2015. Jin has lectured nationally and internationally. He has published over 140 research articles and has written several review articles and edited two books about troponin. Jin is also editor-in-chief of the journal, *Archives of Biochemistry and Biophysics*. He is a chartered member of the National Institutes of Health's (NIH) Cardiac Contractility, Hypertrophy and Failure Study Section; and the Principal Investigator (PI) on two NIH R01 grants, a R01 Supplement, and a R21 grant. He also serves as the PI and Program Director on a highly competitive NIH T32 training grant, which is the only pre-doctoral cardiovascular T32 program in the state of Michigan.

A leading researcher in the field of muscle contractility and cell motility studies, Jin holds four U.S. patents. His research has had a profound impact on the diagnosis of heart attacks and the treatment of heart failure and cancer metastasis.

## BIOLOGY ALUMNI PARTICIPATE IN OPEN HOUSE AND CAREER NIGHT



On the evening of February 4, 2015, the Department of Biology hosted an open house and career night for prospective and current UI Biology students. The event featured tours of the department and research labs, a panel of current UI Biology students who answered questions from prospective students and guests, an opportunity to speak to career and academic advisors, and an alumni panel representing the broad career outcomes available to graduates of the program.

The Associate Chair of Undergraduate Education, Bryant McAllister, welcomed guests and set the program for the evening by describing the modern bioeconomy and outlining career opportunities in the health, food, fuel, & life industries available to life scientists.

The introduction to the Department of Biology included a keynote presentation from alumnus, Andrew Schumacher (Bachelor of Science in Biology, 2002). Andy recounted his career path, from his start as an aspiring pre-med student in the Biology program, to

his shift away from medicine after graduating with honors towards his other passion, food. While working at Quinton's as a cook in Iowa City and in the Emergency Room at UI Hospitals and Clinics, he recalled a moment on the Pentacrest when he first thought about the notion of combining his biology background with cooking to forge a career. As part of this transformation, he moved to New York City, attended culinary school, and worked on his cooking skills. During this time, he participated as a contestant on the 2nd season of *The Food Network Star* – a gig he landed through a connection with another UI alumnus. Andy returned to Iowa and continued to develop his craft at the Lincoln Café in Mount Vernon. During this period, Andy's original epiphany of combining biology and cooking became reality. His undergraduate education provided the foundation and confidence to incorporate the intersection of physics, chemistry, and biology into his craft. In February 2013, Andy and his wife, Carrie, opened Cobble Hill Eatery and Dispensary in Cedar Rapids.

Andy's presentation truly embodied the way he was described by Guy Fieri, a fellow contestant and eventual winner of *The Next Food Network Star - Season 2*, "[Andy] reminds you that the world is your oyster, that boundaries are only imaginary lines, and that you can be whatever you want to be."

Attendees were then split into separate sessions. One session, mainly attended by prospective students and guests, focused on the contrast of different majors available in

the life sciences at the UI and the experiences of current UI Biology students. These current students talked about the realities of changing focus, the resources available for research and volunteer opportunities, and the educational value of these experiences. Allanda Hageman from the Office of Admissions also spoke about the admissions process and student life at the UI.

Lori Adams, Director of the Biology Honors Program and Iowa Biosciences Academy and a Lecturer in the Department of Biology, led a separate session for current UI students to learn about research and career opportunities beyond the classroom. A central feature of the session was an alumni panel that consisted of Andy Schumacher; Daniel Cerne (Bachelor of Science in Biology, 2006), a Process Engineer at Integrated DNA Technologies; and Hannah Hoffman (Bachelor of Science in Biology, 2010; M.D., 2014), a Medical Resident at Iowa Methodist Medical Center. These individuals represent the broad career outcomes available to graduates of the Biology program. Alicia Joens from the Pomerantz Career Center and Sarah McNitt from International Programs at the UI were also available to describe the resources available to students that want to explore career options, internship opportunities, and/or study abroad programs.

We appreciate the willingness of these three alumni sharing their experiences with current and prospective 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).

## THE DEVELOPMENTAL STUDIES HYBRIDOMA BANK (DSHB) GROWS AND CONTINUES TO SUPPORT GRADUATE STUDENTS

The Developmental Studies Hybridoma Bank (DSHB), a national resource created by the National Institutes of Health, is housed in the Department of Biology at the University of Iowa. Under the direction of David R. Soll, the Roy J. and Lucille Carver/Emil Witschi Professor of Biology, the DSHB is contributing \$100,000 to the department for four graduate student fellowships beginning in the Spring 2016 semester and \$35,000 for a dedicated DSHB graduate student. These fellows will learn to generate hybridomas (a hybrid cell made in a lab by fusing a normal cell with a cancer cell) and characterize the monoclonal antibodies the hybridomas secrete. Fellows will each produce one or more reagents for their own research. This experience will be valuable to them if they decide to work for a pharmaceutical company since the majority of high-end anti-cancer drugs are monoclonal

antibodies. Last year, five graduate students (Thomas Conway, Kar Men Mah, Ben Allewa, Josh Thompson, and Denise Oh) guided by the DSHB staff, successfully generated hybridomas for their research. In the Spring 2016 semester, the DSHB group is also teaching a course on New Monoclonal Antibody Technologies and Drug Development for undergraduate seniors and graduate students to prepare them for both academic and industry careers.

The DSHB grew at an unprecedented rate in the past two years, doubling the collection from approximately 1,500 to well over 3,000 hybridomas through institutional contributions. The European Molecular Biology Laboratory banked 900 hybridomas, the culmination of a ten-year project involving 20 European institutions and universities. The National Cancer Institute banked 115



hybridomas from their Proteomics Initiative, and the NIH Common Fund banked 824 hybridomas from their antibody initiative. Last year, the DSHB shipped close to 70,000 samples worldwide, maintaining its status as the largest non-profit antibody distributor in the world. This has been due in no small part to the synergism between the Department of Biology and the DSHB. We also announced the appointment of Dr. Douglas Houston, Associate Professor of Biology, as the Assistant Director of the DSHB. For more information about the DSHB, please visit: [dshb.biology.uiowa.edu](http://dshb.biology.uiowa.edu)

Send us your news and updated contact information! Send an email to [biology@uiowa.edu](mailto:biology@uiowa.edu) or visit [biology.uiowa.edu/alumni](http://biology.uiowa.edu/alumni) and complete the "Keep-In-Touch" form.





# RETIREMENTS



## JERRY BEACH

Jerry Beach, *Drosophila* (Fly) Kitchen Coordinator, retired from the Department of Biology effective November 13, 2015, after 33 years of service. During his time in the department, Jerry dutifully supported media preparation for the many fly labs in the department. This little-known “fly kitchen” located in the basement of the Biology Building serves a critical function preparing fly food for departmental teaching and research activities involving the culture of *Drosophila melanogaster* and other species. The unfortunate part of working with flies is that stocks require continuous maintenance each generation - they can't be saved in long-term storage like other laboratory organisms. We were very fortunate to have Jerry's service over these many years and to be able to count on his support. He will be missed!



## SHELLEY PLATTNER

Shelley Plattner retired in August 2015 after 29 years in the department. He served as the manager of the Department of Biology's Carver Center for Imaging. Plattner received his bachelor's and master's degrees in botany from Washington University in St. Louis and came to Iowa City in 1971 to study algae. He worked with a single-celled alga, *Ankistrodesmus* sp., whose ultrastructure was best viewed using electron microscopy.

In 1976 Plattner took a job helping doctors perform diagnostic electron microscopy and research at the Veterans Administration Medical Center. He completed his doctorate in botany in 1979 and also started a computer consulting business. In his spare time Plattner was active in both the Hawkeye PC Users

Group and the Bicyclists of Iowa City. He served as president of both organizations and rode eight RAGBRAIs.

Plattner became the director of the Department of Biology's electron microscopy facility in 1986. He was responsible for managing two electron microscopes and training students and researchers. Eventually, the department replaced these instruments with laser confocal microscopes. For many years, Plattner was also a “jack of all trades.” He oversaw the department darkroom, made prints for publication, ran the poster printer, helped with IT issues and provided solutions to AV problems. Over the years Plattner also ordered the liquid nitrogen and chemicals for the x-ray film processor and tracked its usage. At Friday afternoon seminars Plattner often aided the speaker by setting up for the presentation and sometimes video recorded the lecture. He even helped wire the old Biology Building for internet connectivity before the consolidation of the growing campus-wide IT group.

In his retirement, Plattner plans to continue his computer consulting business. He and his wife, Kathy Grove, plan to travel, including visits to sons Aaron and Kevin and their families. Plattner says he will miss working with such wonderful co-workers.



## ROBERT (BOB) MALONE

Bob was a fixture in the Department of Biology since 1985 when he was hired as an associate professor after five years at Loyola University of Chicago Medical School. He was promoted to full professor in 1993 and retired at the end of the Spring 2015 semester.

Bob was a chemist by training and received his Bachelor of Science (*magna cum laude*) in Chemistry from UCLA. In 1976, he earned his Ph.D. from the University of Oregon Institute of Molecular Biology, where he worked with Dr. Frank Stahl on the genetic recombination in phage lambda and *E. coli*. He went on to do postdoctoral work on genetic recombination in yeast in the Esposito laboratory at the

University of Chicago.

Bob's laboratory was funded nearly continuously by major grants from the National Institutes of Health and National Science Foundation between 1980 and 2012. These grants pertained to his work on the identification and characterization of the genes and the timing of events crucial to chromosome pairing and recombination in meiosis. Even after retirement, Bob continues to be involved in the meiotic research going on in the lab of Dr. Sarit Smolikove.

Bob's academic life was in large part defined by the ebb and flow of semesters. His passion for undergraduate education far exceeded the normal strong commitment exhibited by most university faculty. Bob taught many courses, but his favorite was Fundamental Genetics, which he started teaching upon his arrival here and continued until his retirement. He is especially legendary for the amount of time he spent helping individual students reach their potential.

In addition to his formal teaching, Bob spent countless hours in deep conversation with undergraduate and graduate students as they

attempted to learn both the intellectual and practical ropes in a research laboratory. He takes great pride in his training record, which includes four postdoctoral fellows, twelve Ph.D. and four master's students, and over 60 undergraduates who did research in his lab - many went on to get Ph.D. or M.D. degrees at prestigious institutions.

Bob will be sorely missed as a colleague. He was a popular choice to critique proposals and manuscripts in the process of being prepared by colleagues. His special ability to think deeply about a wide range of topics in biology led him to provide thorough and invaluable critiques to anyone seeking his input and to a well-deserved reputation for incisive questions in seminars. With retirement, Bob is dedicating himself to his many other interests, long held in abeyance, including competitive dog training, fishing, gardening, and reading for pleasure, among others. However, catch him in a downtown coffee shop or restaurant at lunchtime, and he will be more than happy to give your current scientific ideas his full attention and a run for their money.

By Dr. Jan Fassler, Professor



# GRADUATES

## BACHELOR OF ARTS IN BIOLOGY WITH HONORS

### Fall 2014

**Thomas Conway** (Soll Lab)

### Spring 2015

**Sarah Ferree** (Phillips Lab)  
**Joseph Hudson** (Prahlad Lab)  
**Katherine Kertels** (Manak Lab)  
**Hannah Maher** (Fritzsche Lab)  
**Alec Seei** (Smolikove Lab)

## BACHELOR OF SCIENCE IN BIOLOGY WITH HONORS

### Fall 2014

**Eric Adams** (Lin Lab)  
**Michael Schon** (Eberl Lab)

### Spring 2015

**Faiza Afsar Ali** (Prahlad Lab)  
**Laura Brummel** (Irish Lab)  
**Tanner Koomar** (Phillips Lab)  
**Emma Smith** (Murray Lab)  
**Matthew Wheat** (Logsdon Lab)  
**Cindy Xu** (Houston Lab)



## DOCTOR OF PHILOSOPHY (PH.D.) IN BIOLOGY

### Fall 2014

**Katelin Ahlers** (Dailey Lab)  
Thesis Title: "Microglial responses to ethanol exposure in a mouse model of fetal alcohol syndrome"

**Benjamin Beydler** (Irish Lab)  
Thesis Title: "Dynamics of gene expression during vegetative phase change in maize"

**Xiaomin Xing** (Wu Lab)  
Thesis Title: "Genetic and Functional Analyses of Synaptic Ca<sup>2+</sup> Dynamics in *Drosophila*"

### Spring 2015

**Amanda Nelson** (Forbes Lab)  
Thesis Title: "Impacts of urban versus agricultural land cover on spatial distributions and trophic interactions among specialist insects"

### Summer 2015

**Austin Baldwin** (Phillips Lab)  
Thesis Title: "Wnt Signaling and Beta Catenin regulation during Asymmetric Cell Division in *Caenorhabditis elegans*"

**Gabriela Hamerlinck** (Forbes Lab)  
Thesis Title: "Coevolution of *Rhagoletis* hosts and their parasitic wasps"

**Yizhi Yin** (Smolikove Lab)  
Thesis Title: "Resection of DNA double-strand breaks in the germline of *Caenorhabditis elegans*"

## MASTER OF SCIENCE (M.S.) IN BIOLOGY

### Spring 2015

**Katelyn Larkin** (Neiman Lab)  
Thesis Title: "Effects of polyploidy and reproductive mode on life history trait expression"

**Kristina Ottens** (Forbes Lab)  
Thesis Title: "Ecological and biogeographical patterns associated with genetic differentiation in a diverse genus of Neotropical fruit flies"

**Christopher Rice** (Logsdon and Neiman Labs)  
Thesis Title: "Evolution of Meiosis Genes in Sexual vs. Asexual *Potamopyrgus antipodarum*"

### Summer 2015

**Betul Zora** (Eberl Lab)  
Thesis Title: "Ion pumps in *Drosophila* Hearing"

## BIOLOGY UNDERGRADUATE STUDENT'S HONORS RESEARCH RESULTS IN A PUBLICATION

**Jenna Barnes**, an outstanding Biology undergraduate honors student, contributed to a paper published January 2016 in *Human Molecular Genetics*. Barnes' research used the zebrafish model to validate a specific gene associated with a rare form of Retinitis pigmentosa, a genetic disorder that leads to progressive vision loss. Barnes, originally from Spencer, Iowa, will graduate in May 2016 with a Bachelor of Science degree in Cell & Developmental Biology. Barnes conducts her research in the Slusarski Lab in the Department of Biology.

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# AWARDS & HONORS

**Bernd Fritzscht, Ph.D.**, Departmental Executive Officer and Professor in the UI Department of Biology, was elected as a member of the German National Academy of Sciences, the Leopoldina, in recognition of his scientific achievements. Fritzscht's main area of research focuses on the molecular evolution of the inner ear neurosensory cells (hair cells and neurons) with the aim of restoring hearing.

Founded in 1652, the Leopoldina is the world's oldest continuously existing academy for medicine and the natural sciences. Membership is an honor given only to about 1500 scholars and is comparable to becoming a member of the U.S. National Academy of Sciences. Fritzscht is also a member of the American Association for the Advancement of Science (AAAS). Fritzscht's profile, which highlights his research, career, and awards, is available on the Leopoldina website at [www.leopoldina.org](http://www.leopoldina.org)

**Felicia Ooi**, a Ph.D. candidate in the Integrated Biology (iBio) Graduate Program in the Department of Biology, was one of ten students chosen nationally in 2015 to receive the Glenn/American Federation for Aging Research (AFAR) Scholarship for Research in the Biology of Aging.

This scholarship program was established to give students enrolled in M.D., D.O., Ph.D., or combined-degree programs the opportunity to conduct a three-to-six-month research project focused on biomedical research in aging. The program aims to increase the students' understanding of the challenges involved in improving the quality of life for older people. Ooi is a graduate student under the direction of Veena Prahlad, an Assistant Professor in the Department of Biology and Aging Mind & Brain Initiative (AMBI) at the University of Iowa.

**Karen Thompson**, who earned her Ph.D. in biology in 2013 (Fritzscht Lab), received the 2015 D.C. Spriestersbach Dissertation Prize in the Biological and Life Sciences in recognition of the excellence of her doctoral dissertation: "Ear Manipulations Help Model Neuroplasticity Limitations."

The winner of the D.C. Spriestersbach Dissertation Prize becomes the University of Iowa's nominee in the national competition for the Council of Graduate Schools/University Microfilms International Distinguished Dissertation Award — the most prestigious dissertation prize in the country. Thompson will also be presented with \$2,500 and an award certificate during a ceremony at the James F. Jakobsen Graduate Conference in March 2016. She is continuing her work as a postdoctoral research fellow in the Fritzscht and Houston labs in the UI Department of Biology.



# IN REMEMBRANCE

## **Julia M. Anderson (1935 – 2015)**

Julia Anderson, 80, died on March 4, 2015, at the University of Iowa Hospitals and Clinics. Anderson was a former research scientist for David Soll in the Department of Biology, where she retired in 1993. Her obituary is available on the Lensing Funeral & Cremation Service website: [www.lensingfuneral.com](http://www.lensingfuneral.com)

## **Robert W. ("Bob") Embree (1932 – 2015)**

Robert Embree, 82, a former University of Iowa (UI) Department of Botany (Biology) professor, died peacefully on June 29, 2015, at the Solon Care Center. Embree joined the UI Department of Botany faculty at the beginning of the Fall 1968 semester, achieved tenure, and taught at the UI until his retirement in 1998. For the complete obituary, please visit the Gay & Ciha Funeral & Cremation website: [www.gayandciha.com](http://www.gayandciha.com)

## **Bean, Charles N., M.D.**

B.A. Zoology, 1951 (August 15, 2015)

## **Burton, Dr. Verona Devine**

M.S. Botany, 1946; Ph.D. Botany, 1948 (September 27, 2014)

## **Dale, Dr. Edwin**

Ph.D. Zoology, 1960 (May 22, 2015)

## **Eikleberry, Robert O.**

M.S. Botany, 1959 (May 25, 2015)

## **Fay, Dr. Marcus J.**

M.S. Botany, 1951; Ph.D. Botany, 1953 (May 16, 2015)

## **Ferguson, Dr. Jay L.**

M.S. Botany, 1968; Ph.D. Botany, 1971 (October 30, 2014)

## **Harris, Howard L.**

B.A. Botany, 1940 (November 6, 2014)

## **Henderson, Kathleen M.**

B.A. Zoology, 1966 (August 16, 2015)

## **Loh, Dr. Philip Choo-Seng**

M.S. Zoology, 1953 (January 12, 2014)

## **Marcellus, Constance L.**

B.A. Zoology, 1971 (August 12, 2013)

## **May, Hilda J.**

B.A. Zoology, 1945 (March 17, 2015)

## **Poteet, Ann**

B.A. Zoology, 1939 (December 7, 2014)

## **Schottelius, Dr. Dorothy D.**

B.A. Zoology, 1949 (January 27, 2015)

## **Shaw, Dr. Eugene D.**

M.S. Zoology, 1955 (March 9, 2015)

## **Shaw, Dr. Ross F.**

Ph.D. Zoology, 1961 (November 18, 2014)

## **Smith, Phillip M., Sr., M.D.**

B.A. Zoology, 1949 (April 29, 2015)

## **Stein, Irvin M.**

B.A. Zoology, 1947 (June 18, 2015)

## **Stoll, Dr. J. Lynn**

Ph.D. Zoology, 1989 (December 29, 2014)

## **Stout, Dr. Donald J.**

M.S. Botany, 1947 (May 1, 2015)

## **Verhalen, Dr. Robert D.**

B.A. Zoology, 1963 (March 26, 2015)

## **Verma, Dr. Mahadeo P.**

M.S. Zoology, 1959 (April 12, 2015)

\*Deceased date is listed in parenthesis.

Reference: UI Division of Alumni Records

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PHOTO: The human yeast pathogen, *Candida albicans*, forms a biofilm with a highly-ordered architecture as seen in this high-resolution 3D projection image. Image provided by the Soll Lab.

