



# COLLEGE OF LIBERAL ARTS & SCIENCES


## The Department of

# BIOLOGY

Summer 2015

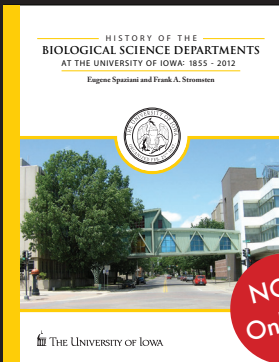
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Dear Alumni and Friends of Biology,

It has been seven years since I took the helm of the Department of Biology. In the spring, we finished an extensive review of the department, and I was asked by the Dean of the College of Liberal Arts and Sciences to stay on for two more years, which I accepted. While the outcome of the review was very good overall, the department has to work hard to solve a number of issues that are imposed on us by forces outside our control. One of the biggest has been the dramatic change in the educational landscape and university funding that continues to pose challenges for us.

On the bright side, the external committee conducting the review noted that we have hired excellent, young faculty who are deeply engaged in their research and the department. The reviewers were particularly impressed with the level of grant support the younger faculty have obtained despite a 25% decline in funding from the National Institutes of Health (NIH) over the last eight years. This next generation of Biology faculty is well positioned to become the next leaders in their respective areas of expertise. The selection of the new faculty was, of course, the passing gift of the now retired or soon retiring senior faculty. They shaped the department in the past so that it was attractive for the new faculty. It is with thanks to both the incoming and outgoing faculty that the department has moved forward in the level of funding, publication of scholarly work, and national and international recognition without missing a beat. While there is turnover in faculty, the excellence of the department remains the same.

Another positive that was specifically noted by the review committee was the dedication of the administrative staff. I want to use this opportunity to express my sincere thanks to all of them. Without their help and dedication, the department could not have overcome the challenges we have faced over the last eight years. Thank you.

One of the new developments in the department is the addition of the interdisciplinary Biomedical Sciences major. It is designed for the undergraduate student with an aptitude for the sciences who plans to attend medical school or conduct biomedical research in graduate school and beyond. Under the guidance of Bryant McAllister, Associate Chair of Undergraduate Education, the classes for this new major will be offered for the first time in the Fall 2015 semester. This new major integrates well into our curriculum overhaul of the Biology major, which we continue to offer to the much larger number of Biology students.

Finally, our newly revised Ph.D. program continues to be successful. Over the last few years, we have reduced the average length of time for graduate students to complete a Ph.D. degree to 5.5 years. During this same time, we have increased the productivity of students measured by the number of publications before their first postdoctoral position. In reviewing our data on the changes to the Ph.D. program, I also noticed with great satisfaction that many of our recent graduates have already accepted postdoctoral positions at other institutions. This indicates that our carefully crafted reorganization of the program did not negatively affect the excellence of our graduate students. I would like to thank, in particular, Joshua Weiner and Douglas Houston, former and current Associate Chairs of Graduate Education, respectively, for their guidance in accomplishing this successful reorganization in such a short time.

Thank you for your continued support and interest in the Department of Biology. I look forward to updating you again at the end of the year.

Sincerely,

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)



## Professor Lin Retires

By Dr. David R. Soll, Roy J. and Lucille Carver/Emil Witschi Professor of Biology

Professor Jim Lin officially retired at the end of June 2015. He ends an outstanding career as a researcher and teacher. When one scrutinizes his career, the things that one normally says about a retiring professor seem to be no more than platitudes when applied to him. His career was indeed outstanding. He received his Ph.D. in 1979 at the University of Connecticut, distinguishing himself as the first to generate a missense mutation in a bacterial lipoprotein, which led to eleven high-end impact publications. He then turned his attention to the cytoskeleton, moving to the laboratory of the Nobel Prize Laureate Dr. James D. Watson at Cold Spring Harbor Laboratories. There he discovered the isoforms of tropomyosin, which regulate the interaction of actin and myosin in muscle and non-muscle cells.

In 1984, we recruited Jim as an Assistant Professor. He brought with him a National Institutes of Health (NIH) grant and immediately won the prestigious Pew Biomedical Scholar award. He was rapidly promoted to Associate and Full Professor. Jim went on to make discovery after discovery, publishing during his career approximately 140 articles and receiving over 25 external

grants to fund his research. His latest work has been on the molecular biology of heart development, for which he received an NIH grant that ends in 2016. His success was due to his dedicated research partner, Jenny Lin, and, without a doubt, to his love and passion for basic research. This passion and dedication also transferred to his teaching. He was an exceptional lecturer in both cell biology courses and seminars and an outstanding student mentor. He directed more than 36 undergraduate researchers, 16 master's and Ph.D. students, and 13 postdoctoral research scholars.

We all learned from his gentleness, humanity and, most of all, his unswerving passion for discovery. In snow storms, on holidays, on Sundays, and in the evenings, one could always find Jim and Jenny's car parked in the Pappajohn garage and the lights on in their lab. We, therefore, salute him and will miss him as our model, mentor, teacher, collaborator, and friend.



## Featured Alumna: Diane Magrane

When Diane Magrane was ten years old, her mother took her and her seven-year-old brother on a bus trip from Ottumwa, Iowa, to Spirit Lake to visit her father. Her father, who was a high school biology teacher, was studying for the summer at Iowa Lakeside Laboratory in Okoboji while pursuing his master's degree in science from the University of Iowa (UI).

Several years later during her own Freshmen Orientation at the UI, Magrane recalls feeling overwhelmed at the plethora of courses available. Her father was standing next to her enrolling in the last of his courses for pursuing his Ph.D. in Science Education at the UI. He asked her what she was planning to study. Magrane responded, "writing." He paused and said, "What science course are you going to take?" She remembered Professor Richard Bovbjerg from Iowa Lakeside Laboratory who was teaching Introduction to Biology, and so she replied, "biology." Magrane went on to say, "That decision opened a career path that has made all the difference for me." These were some of the remarks that Magrane made on June 13, 2015, during her acceptance speech when receiving the UI's Distinguished Alumni Award for Achievement, one of many awards throughout her career.

Magrane earned her bachelor's degree in zoology (one of the former names of the Department of Biology) in 1974 and a Doctorate of Medicine in 1978. "I was an 18-year-old aspiring poet when I arrived and a 26-year-old physician when I left," says Magrane. An influential

leader in women's health and academic medicine, Magrane has made an enormous impact on the lives of academic leaders and students. She currently is a Professor of Obstetrics and Gynecology and serves as the Executive Director of the International Center for Executive Leadership in Academics at Drexel University College of Medicine.

She has improved medical education in many ways including implementing one of the country's most innovative medical curricula at the University of Vermont College of Medicine. "I led a major curriculum change that applied genetics, ethics, and epidemiology to a contemporary understanding of patient care. I was able to pick up from what I had learned from David Soll in 1974." As an undergraduate student at the UI, Magrane worked in the laboratory of Barbara Stay, "who was a wonderful mentor and an inspiration to me as a scientist, gardener, and friend. I was privileged to study with professors who were making breakthroughs." She continues, "Never underestimate the reach of the influence of this university; even a ten year old can see it. I've been a Saint Louis Billiken, a University of Vermont Catamount, and I'm now a Drexel Dragon, but I am always a Hawkeye!" For more information about Diane Magrane and other UI Biology alumni, please visit [biology.uiowa.edu/alumni/spotlights](http://biology.uiowa.edu/alumni/spotlights).



## John Stefaniak Retires

By Dr. Joseph Frankel, Professor Emeritus

John Stefaniak's first day as lab coordinator for our Principles of Animal Biology and Introductory Animal Biology courses was May 9, 1983. He had arrived in Iowa City with his wife, Mary Helen Stefaniak, the previous autumn. Mary Helen, then an aspiring novelist, was entering the Iowa



Writer's Workshop in a two-year MFA program. John, who had acquired considerable expertise in animal physiology, ended up applying for the open position as Lab Coordinator in the Department of Biology. He was our immediate first choice.

John and Mary Helen had intended to stay in Iowa City until Mary got her master's degree, and then return to their native Milwaukee. That was 32 years ago. Although John had no previous experience in his new role, it turned out that he and the job were a perfect fit. John worked in a cavernous, high-ceilinged office in the southwest corner of the pre-renovation Biology Building (which he loved), and there he assembled materials for the nearby teaching labs and frequently interacted with both students and laboratory teaching assistants. He was patient and accommodating with both groups, dealing effectively with the problems and crises that inevitably come up when managing (initially) 25 teaching labs per week. The lecturers of these courses rarely heard of these problems as John has always had the unobtrusive quality of a truly helpful person.

There were many changes in these 32 years. John's office moved in 2002 to a lower-ceilinged room in the department's newest building, Biology Building East (BBE). The courses that he dealt with evolved as the Departments of Biology and Botany merged. The number of students kept going up, now approximately 1,000 every semester (double the number in 1983). More recently, the nature of the courses changed radically, and the labs became more complex and demanding for both the students and the lab preparer (e.g. 16 fly crosses in place of the previous one).

John has been constantly optimistic, never complaining, and, in his own words, finding "interesting things to do every day." John has also maintained an active musical career, having taught music lessons for 30 years and performing at many rock, blues, jazz, and country music venues from Nashville to Las Vegas. It is hard to imagine life on the first floor of BBE without John Stefaniak quietly reigning at its eastern end.

## Professor Hendrix Retires

By Dr. Erin Irish, Associate Professor of Biology

Professor Stephen Hendrix retired at the end of June 2015. Steve has been our department's longest serving ecologist. He came to the University of Iowa (UI) in 1975 after completing his Ph.D. in Plant Ecology with a minor in Entomology at



UC Berkeley. With an initial appointment to the Department of Botany, he rose through the ranks during a period of departmental merging and name changes and was promoted to Professor in 1994. For nearly a decade, he served as Academic Coordinator for the Environmental Sciences Program as it grew into a premier interdisciplinary natural science major in the College of Liberal Arts & Sciences. Since then, he added associations with Ecology, Evolution and Organismal Biology at Iowa State University, the UI's Ph.D. program in Applied Mathematical and Computational Sciences, and most recently, the Iowa Lakeside Laboratory, where he has served as Director of Academics and Research since 2012.

Steve has made important contributions to the education of graduate students—supervising a dozen masters' degrees and eight Ph.D.'s. Throughout the years, over 100 undergraduates, high school students, and teachers have conducted independent research in his laboratory. His classroom teaching has most recently included a popular undergraduate course in Ecology and a graduate course in Writing for the Natural Sciences. The high quality of his teaching in these and other courses was marked by a President and Provost Award for Teaching Excellence in 2013.

As an expert in plant/animal interactions, Steve's research investigated questions at the individual, population, and community levels of ecology. Much of his earlier work focused on compensatory responses to herbivory in wild parsnip, *Pastinaca sativa*, and other members of the carrot family. Recent work pivoted to the pollinator side of the interaction where Steve has examined diversity of bees in agricultural and prairie remnant habitats. With the current concern for dramatic losses in European honey bee populations, his research continues to have a major impact on applied as well as basic biology. Steve's research was supported by many years of funding from the National Science Foundation (NSF) and other agencies. With retirement, Steve is free to pursue his other passion, bicycling. Safe pedaling, Steve!

CELEBRATING RETIREMENT

## Publication Highlights

### **Ana Llopart, Assistant Professor of Biology**

Sex chromosomes play a special role in speciation. The X chromosome, in particular, has a disproportionately large effect on hybrid dysfunction (i.e., inviability and sterility), an empirical pattern so widespread across animal species that it is known as the second rule of speciation. In her most recent paper published on March 19, 2015, in *PLOS ONE*, Ana Llopart shows that both protein sequences and gene expression evolve faster in X-linked than in autosomal genes. These results, which are based on combining classic genetics and next generation sequencing methodologies, provide new insights into the genetic basis of sterility in males.

### **Bryan Phillips, Assistant Professor of Biology**

Dividing cells have to deal with a lot of events happening all at once. This process is even more complicated when the two daughter cells are different, which happens often during development and in adult stem cells. Centrosomes are tiny cellular machines that help out; they pull apart the chromosomes so that each daughter cell gets an equal share of DNA. Setu Vora, a Biology Ph.D. student in the Phillips Lab at the University of Iowa, and Bryan Phillips found that centrosomes also help turnover/degrade certain proteins that are potent regulators of development. This means that the daughter cells inherit a smaller amount of these proteins that they can regulate normally, leading to proper cellular differentiation decisions. Vora and Phillips' discovery was published in the April 20, 2015, issue of *Current Biology*.

### **Veena Prahlad, Assistant Professor of Biology and Aging Mind & Brain Initiative (AMBI)**

All cells possess mechanisms to detect and respond to environmental changes that can cause macromolecular damage. However, these mechanisms that are essential guards against diseases such as Alzheimer's and Parkinson's, have a cost. For instance, the response to prevent the accumulation of protein damage results in the slowing of cell division and growth rates. In a multicellular organism such as the roundworm, *C. elegans*, stress responses are under centralized control, and the nervous system coordinates how different cells respond to protein damage. In the January 19, 2015, issue of *Current Biology*, Prahlad and her team discovered that the conserved bioamine serotonin is one of the signaling molecules that is released by the nervous system in response to harmful conditions to trigger protective responses in other cells. Thus, the activity of specific sensory neurons protects other cells from protein damage. These results offer the novel possibility of modulating the activity of the nervous system as a means of suppressing the toxicity in diseases such as Alzheimer's and Parkinson's.

### **Sarit Smolikove, Assistant Professor of Biology**

The synaptonemal complex is a protein structure required for the cellular processes leading to the formation of cells such as eggs and sperm. Defects in these processes are associated with infertility and developmental disabilities such as Down syndrome. In the November 2014 publication of *PLOS Genetics*, Smolikove and her research team identify a pathway involving posttranslational modifications which regulates the assembly of the synaptonemal complex. In the future, Smolikove and her team will identify additional components of this pathway and the specific protein marks that are required for synaptonemal complex assembly.

*Background: Chromosomes (Blue) and synaptonemal complex (Green) in germline nuclei of wild-type (top half of image) and csn mutants (bottom half of image).*

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