Biological Sciences

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VirginiaTech
Invent the Future


Ellison Smyth
1891-1925


I.D. Wilson
1925-1958


Fred Orcutt
1960-1966


Bob Paterson
1967-1979


George Simmons
1979-80; 1988-90


Ernie Stout
1980-1988


Joe Cowles
1990-2002


Bob Jones
2002-2010


Brenda Winkel
2010-

Greetings from Brenda Winkel, the New Biological Sciences Department Head

In this space last fall, Dr. Robert Jones, our department head of the past eight years, bid us farewell as he headed to exciting new challenges as Dean of the Eberly College of Arts and Sciences at West Virginia University. He reflected on how much the department had changed in his time as head – the growth in the numbers of undergraduate biology majors and doctoral students, retirements of long-time faculty and hiring of new professors and instructors, and the move of many of our molecular-focused research groups out of Derring and into new facilities. In fact, we now have faculty and students in seven different locations (see map)! Dr. Jones established our Alumni Advisory Board, which provides valuable external perspective and support (and includes Dr. Carole Pratt, who is featured on p. 6) , and helped start the OWLs group of retired faculty. He also oversaw a time of growth in research funding and in our department's reputation for cooperation and collaboration across the campus.


Generated with Google Earth

I was fortunate to be elected to take over the reins of the collegial and vibrant Department of Biological Sciences this past August. I am a long-time member of the department, hired by Dr. Joe Cowles in 1992 as an assistant professor of molecular biology. Last fall I became the 9th (and first female) head in the 120 year history of the department (see photos above). **DO YOU KNOW WHO WAS HEAD OF BIOLOGY WHEN YOU WERE AT VIRGINIA TECH?** Those of you who have taken BIOL4774 Molecular Biology Laboratory may know me from that course, which I started teaching in 1993 with Muriel Lederman (pictured left at about that time). I also established an active research program, focused on understanding the biochemistry of intact cells, specifically the machinery that produces flavonoids in the model plant, *Arabidopsis thaliana*. Six postdocs, 13 Ph.D. students, two Masters's, and 45 undergraduates have contributed to this work. I have also enjoyed a long-standing and very productive collaboration with Dr. Karen Brewer in the Department of Chemistry to develop light-activated anti-cancer agents, also together with numerous postdocs and graduate and undergraduate students.


Muriel Lederman teaching Molecular Lab circa 1993

There are many exciting things afoot for the department and the momentum continues to grow for us. Although there are now more than 1700 majors (primary and double) in Biological Sciences and only 35 research and teaching faculty, our courses are in good hands with the help of eight instructors and a number of retired faculty – including Drs. Andrews, Simmons, Krieg, Turner, and Benoit – who are helping us maintain a reputation of teaching excellence. New endeavors like the HHMI Award described on page 4 are helping us forge new frontiers in science education. Our department also continues to pride itself on its diverse and growing research endeavors, which span the gamut of life sciences, from freshwater ecology to cancer biology. At the same time we are seeing a gradual convergence of methodologies and relatedness of the questions that are being addressed. Inside this newsletter you see a few examples, from the laboratories of Drs. Belden, Cimini, and Hawley. We also have a remarkable staff that helps keep our teaching programs, our finances, and the many other complex operations of our large department running smoothly – you'll be learning more about them in future newsletters!

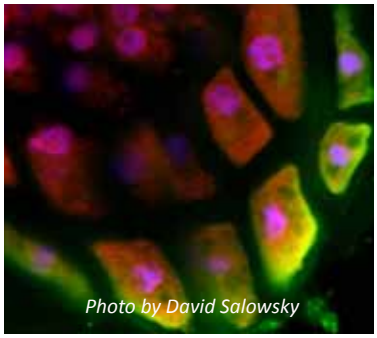


Photo by David Salowsky

I look forward to staying in touch with the larger family that is the Department of Biological Sciences through this publication. We'd love to feature not only our immediate members, but also those of you who have moved on from here and are doing great things beyond Virginia Tech. **Please let us hear from you!**

Brenda S.J. Winkel
Department Head

This newsletter was created by Valerie Sutherland, Program Support Technician for the Department of Biological Sciences. We welcome comments and items of interest for future newsletters. Please contact Valerie Sutherland (vsutherl@vt.edu) via e-mail, or write to us at the Department of Biological Sciences, Mail Code 0406, Virginia Tech, Blacksburg, VA 24061.

Virginia Tech's First Human Frontier Science Program Grant Awarded

Daniela Cimini, Assistant Professor of Biological Sciences, is the first researcher from Virginia Tech to be awarded a collaborative international grant from the Human Frontier Science Program (HFSP).

Dr. Cimini and two colleagues from universities in Austria and Germany will divide the $1.05 million three-year grant. HFSP is a prestigious international funding agency that supports innovative and interdisciplinary basic research focused on the complex mechanisms of living organisms.

Cimini has a growing international reputation in the study of chromosome structure and mechanics, the molecular controls over cell division, and the relationships between errors in cell division and many human diseases, including cancer. She will team with Juraj Gregan from the University of Vienna, Austria, and Iva Tolic-Norrelykke from the Max Plank Institute of Molecular Cell Biology and Genetics in Germany.

"I was surprised to discover that I was the first researcher ever to be awarded an HFSP at Virginia Tech, but at the same time, I felt really honored to be in such a position," Cimini said. "My team includes a biophysicist, which will add another perspective to my research. The internationality of the team will give my research visibility outside the U.S. and possibly open doors for future collaborations."

HFSP awarded grants to 34 international teams this year.

"Daniela's rapidly growing success in research results from a clever combination of classic genetic and molecular biology approaches with new imaging technologies for studying the behavior of living cells," said Robert Jones, former Professor and Head of the department.

Cimini earned her bachelor's, master's, and Ph.D. in molecular and cellular biology from the University of Rome La Sapienza. She joined the Virginia Tech faculty in 2005. *--From an article by Catherine Doss of the College of Science*

About Dr. Cimini's Research:

Maintenance of the correct number of chromosomes is necessary for the development and survival of an organism. Animal cells maintain a correct diploid chromosome number by equally segregating their DNA (chromosomes) during replication into two daughter cells at each division. When chromosome segregation does not occur correctly, aneuploid daughter cells (i.e. cells possessing an incorrect chromosome number) are produced. Aneuploidy is well-known for causing severe genetic diseases (such as Down's+ syndrome) and is the leading cause of miscarriage and stillbirth in humans. In addition, aneuploidy is now believed to play a key role in cancer development and progression. Therefore, understanding the mechanisms leading to inaccurate chromosome segregation is critical for understanding how cancer develops and progresses and will be the starting point for the development of diagnosis, prevention, and intervention protocols. Dr. Cimini's laboratory uses a combination of live-cell imaging, quantitative microscopy, and protein inhibition to identify the cellular and molecular mechanisms responsible for inaccurate chromosome segregation.

VT Science Education Outreach Study

Last year, **Tom Jenssen**, Associate Professor Emeritus of Biological Sciences, initiated an outreach study with selected high school science students at the Hawaiian Academy of Arts and Sciences (HAAS) in Pahoa, Hawaii (Big Island). The study exploits a "natural experiment" whereby the green anole (*Anolis carolinensis*), a temperate zone lizard of southeastern U.S., was released 60 years ago. The colonizing *A. carolinensis* are in a tropical environment in which seasonal cues are all but absent – day:night photoperiod ratio varies < 2 h annually, and mean monthly air temperatures and rainfall vary between 22-25 C and 8-11", respectively. Compared with mainland populations that have a strict 4-month breeding season (April-July), Hawaiian *A. carolinensis* should be selected for a score of measureable changes that favor an expanded breeding season.

To date, Jenssen, HAAS science instructor Molly Mair, and interested science students have began collecting female green anoles during March of 2010, 4 weeks before mainland female begin reproduction. Females were examined for evidence of early ovulation.* Establishing protocol and finding equipment limited the 2010 sample.** However, this year, Jenssen and Mair want to intensify their survey to include both spring and fall months and look for "early" and "late" reproductive females. Providing the skill sets needed to collect, preserve, and dissect lizards are quite elementary and easily taught, and the outcome could well be a manuscript suggesting rapid evolutionary change.

* A female *A. carolinensis* ovulates an egg every 5-7 days for 4 months (16-18 eggs/breeding season)

** The pictured jars of preservative actually contain 151 rum, and the dissection scope was borrowed for the day from the natural history museum in Hilo.

Loss of biodiversity can increase disease transmission

By Susan Truelove, University Relations

Current species extinction rates are estimated to be at least 100 times higher than normal background levels. This loss of biodiversity has many costs, including the alteration of many "ecosystem services," such as flood control, water purification, pollination of crop plants, and soil production. A paper in the Dec. 2 issue of *Nature*, co-authored by **Lisa Belden**, Assistant Professor of Biological Sciences, provides a review of the scientific literature relating to yet another important impact of biodiversity loss, namely how this loss can result in the increase of the transmission and spread of infectious diseases, such as Lyme disease and West Nile.

Felicia Keesing, Associate Professor of Biology at Bard College in Annandale, N.Y. and Richard Ostfeld, disease ecologist at the Cary Institute of Ecosystem Studies in Millbrook, N.Y. instigated the study and invited 11 others to contribute, including Belden.

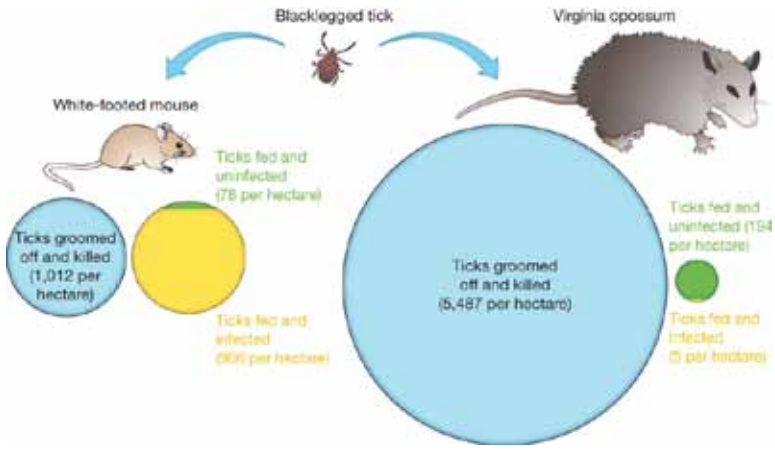
"The consequences of losing biodiversity have been discussed for decades," said Belden. "In recent years, people have begun talking about increased disease transmission as a consequence of loss of biodiversity."

As a result, there has been an expansion from the traditional focus of understanding only host and pathogen interactions to the inclusion of ecological and environmental factors. "A lot of emerging diseases come from animals or are transmitted by insect vectors – mosquitoes, ticks. We need to think about how species interact in these complex disease systems, and about environmental conditions, such as rainfall, climate change, and changes in land use. People have only recently begun to do that," said Belden.

The article in *Nature* cited research revealing that several mechanisms can be responsible for the protective effect of biodiversity. For example, the spread of pathogens can be limited in diverse systems because there are more "dead-end" hosts that don't support pathogen growth or transmission. In addition, loss of species often increases encounter rates between pathogens and hosts. The classic example of this is with Lyme disease in the Northeastern United States. When there are abundant species in the system, the ticks that vector the pathogen end up biting a lot of different host species, such as opossums, that either kill most of the ticks that attach to them or are poor hosts of the pathogen. In contrast, as species are lost from these systems, White-footed mice, which are very good pathogen hosts, become more abundant. These hosts are then more commonly used by the ticks, which increases the human risk of disease in these low diversity systems.

Another component of pathogen transmission is diversity within individual hosts, Belden said. "Macro systems, such as Lyme disease, are what are best understood. But there are diverse microbial systems within animals that can influence disease outcomes as well, such as the microbes within humans. Based on cell number alone, we humans are mostly bacterial, and most of that microbial diversity resides within our guts. We know that the composition of these microbial communities can affect many characteristics, including whether we are lean or obese," she said. "We also know that some disease outcomes may be influenced by these microbial communities. I would argue we should be careful about how we treat our microbes. A single dose of antibiotics can have long-term impacts, so they shouldn't be overused; they shouldn't be prescribed or taken for viral infections like the common cold."

The *Nature* article authors have specific recommendations for additional research and management approaches, such as targeted surveillance against wildlife pathogens where there has been land-use change; preserving intact habitats in these areas to reduce human-animal contact; and reducing contact between wildlife and domestic animals in areas of high-density animal husbandry. They conclude, "We must increase the number of disease systems for which we understand the effects of biodiversity, … implement specific policies informed by this science, (and) monitor changes in epidemiology in regions in which conservation measures are imposed." *(continued on page 6)*



Lyme disease is transmitted to humans by the bite of an infected blacklegged tick (Ixodes scapularis). Immature ticks can acquire the infection if they feed on an infected host and can become infectious to humans if they subsequently survive to the next life stage. White-footed mice are abundant in northeastern forests and feed many ticks. Ticks that attempt to feed on Virginia opossums are likely to be groomed off and killed. Green-and-yellow circles show the mean number of ticks per hectare fed by mice or opossums; yellow shading shows the proportion of ticks infected after feeding. Blue circles show the mean number of ticks per hectare groomed off and killed. Ticks that feed on mice are highly likely to become infected with the bacterium that causes Lyme disease, whereas those that feed on opossums are not.

From "Impacts of biodiversity on the emergence and transmission of infectious diseases." *Nature* 468, 647–652 (02 December 2010)

HokieSpeed: NSF Award for Supercomputing

Khidir Hilu, Professor of Biological Sciences, is a co-principal investigator on a $2 million grant from the National Science Foundation. Under the NSF's Major Instrumentation Program, Wu Feng (Associate Professor of Computer Science, Electrical and Computer Engineering), Scott King (Professor of Geosciences), and Hilu will collaborate on creating HokieSpeed, a versatile new supercomputing instrument for accelerating and transforming discovery and innovation across a myriad of disciplines.

Virginia Tech became a key player in the field of high-end computing in 2003, when it designed and built System X, which was ranked as the fastest academic supercomputer in the world (November, 2003 TOP 500 List).

Wu Feng describes HokieSpeed as "a new heterogeneous supercomputing instrument based on a combination of central processing units (CPUs) and graphical processing units (GPUs). In terms of raw performance, he noted that HokieSpeed is expected to deliver 35 times better peak performance, 70 times better peak power efficiency, and 14 times better peak space efficiency than System X."

HHMI Award for Undergraduate Science Education

Jill Sible, Professor of Biological Sciences and Associate Dean for Curriculum, Instruction, and Advising in the College of Science, is a co-principal investigator on a $1.4 million grant from the Howard Hughes Medical Institute. Under the Precollege and Undergraduate Science Education Program, Sible, along with Bev Watford (Professor and Interim Head, Dept. of Engineering Education and Director of the Center for the Enhancement of Engineering Diversity) and Erin Dolan (Associate Professor of Biochemistry), will work together to encourage university faculty to develop new ways to teach and inspire undergraduate students about science and research.

"Today, at research universities across the nation, few students are being trained to use the interdisciplinary strategies needed to confront today's most important scientific problems," said Virginia Tech Senior Vice President and Provost Mark McNamee. "With this grant, we hope to break down the separation of basic and applied research, particularly between engineering and life sciences, and help undergraduate students acquire the knowledge and skills they will need to address the scientific challenges of the future."

Under the leadership of Vice President and Dean for Undergraduate Education (and Professor of Biological Sciences) **Daniel Wubah**, Virginia Tech is developing a "scieneering" minor that will unite all sciences with engineering. Students who pursue the minor will take courses in departments outside their major and participate in seminars exploring topics at the interface of science and engineering.

"They will also be required to complete their capstone research project in a laboratory outside their major discipline," said Wubah. "That means a biology major will need to do their research in an engineering lab and an engineering major will go to a chemistry, biology, or physics lab."

The scieneering program is Virginia Tech's first step toward developing an interdisciplinary undergraduate biomedical engineering program, building on a successful biomedical engineering graduate program already on campus.

"The idea is to do something innovative for the students to prepare them for the challenges they will face in their future careers," says Wubah. "It has been a goal of the administration to increase the number of students who get research experiences. That has been successful, but support of the scieneering program will take us to the next level."

The Biological Sciences Outreach Program, led by **Mike Rosenzweig**, Instructor of Biological Sciences, has partnered with the Town of Blacksburg and SEEDS to open the Blacksburg Nature Center in the town's historic Price House. During 2010, the nature center offered volunteer opportunities to thirty Virginia Tech service learning students and dozens more from the VT SEEDS club and other groups on campus and in the community. This spring, students from **Dana Hawley's** (Assistant Professor of Biological Sciences) ornithology course will be volunteering at the nature center.

Fulbright Award for Tuberculosis Study in Africa

By Catherine Doss, College of Science

Bonnie Fairbanks, a Ph.D. student in Biological Sciences, has been awarded a prestigious Fulbright scholarship to pursue her research in Botswana studying tuberculosis in mongoose populations.

The research may offer insight into the spread of the disease among humans, according to Fairbanks.

Fairbanks, from Tomball, Texas, is pursuing a doctorate in disease ecology. She will work with the Centre for Conservation of African Resources: Communities Animals and Land Use. Her project titled "Behavior and Physiological Factors Affecting TB [tuberculosis] Infection in Banded Mongooses," will elucidate the variation in TB incidences in banded mongooses.

"Because the species of bacteria that are infecting the banded mongooses is of unknown origin and may affect humans, this outbreak has implications for both the local community and the local ecosystem." Fairbanks said. "Education of the local community will be carried out to protect both humans and wildlife."

This long-term study was established by Kathleen Alexander, associate professor of fisheries and wildlife science, who continues to provide international disease ecology training opportunities to Virginia Tech students through her research program. Fairbanks is co-advised by Alexander and **Dana Hawley**, Assistant Professor of Biological Sciences.

Fairbanks says her career goal is to continue research and teaching in academia.

"I have learned that being a good scientist means having good questions as much as having good answers," she said. "Questions drive research, fuel both teaching and learning, and open the door to understand other cultures. I'm excited to work on a project that not only answers questions about animals, but also depends in part on people of another culture, where interaction with them creates learning opportunities for both of us."

Fairbanks has a bachelor's degree from Rice University and a master's from Auburn. She was the recipient of the **John Cairns Fellowship in Biological Sciences** and is a member of the Society for Integrative and Comparative Biology.

The Fulbright program, established in 1946 by legislation sponsored by Sen. J. William Fullbright, is America's flagship international education exchange activity. It is sponsored by the U.S. Department of State, Bureau of Education and Cultural Affairs. The program is designed "to increase mutual understanding between the people of the United States and the people of other countries." Since the program was established, thousands of United States faculty and professionals have studied, taught, or conducted research abroad, and thousands of their counterparts from other countries have engaged in similar activities in the United States.

A New Jeopardy Record!

Roger Craig, Virginia Tech Alumni (B.S., Biological Sciences/Biochemistry, '99), ended his reign as champion on the Jeopardy game show on Sept. 21, 2010, amassing a seven-day total of $231,200 in cash winnings. The 33-year-old graduate student at the University of Delaware earned a prominent place in the show's history by becoming the third highest winning contestant on the quiz show (excluding tournaments), right behind Ken Jennings ($2,520,700) and David Madden ($430,400).

"I had no idea that I became the third highest winner until Alex Trebek announced it," Craig said in an interview following his final match. "I was totally shocked. It obviously helped by having set the highest single game record and by my large Daily Double bets."

A native of Newark, Del., Craig will earn a Ph.D. in computer science this fall. He plans to use the money to pay off school loans, buy a new car, travel and donate to charity.

When asked about his success on "Jeopardy!," Craig said, "My mother taught me how to read and encouraged my passion for learning. I'm also very grateful to every teacher I've had -- from kindergarten to grad school."

Farm Upbringing Drives Alumnas' Passion for Serving Rural Communities

By Catherine Doss, College of Science

For **Carole Pratt** ('72, Biological Sciences), enrolling in summer school at Virginia Tech was a no-brainer. It meant not having to hoe tobacco on her small family farm in Smyth County, Va. The plan worked so well that Pratt continued with her schooling year-round and graduated with a degree in biological sciences in three years. While attending the university, she was a female scientist on a campus that was predominantly male."I was definitely outnumbered," Pratt said. "It was right at the cusp of when everything was changing on a lot of college campuses. So it was an exciting time to be here."

Many of Pratt's fond memories from Virginia Tech involve her two college roommates, Brenda Carol Minor (BS '72) and Kay Moody Winzenried (BS '72, MBA '83), with whom she is still close friends. In fact, the Moody-Pratt-Minor Scholarship was endowed by Winzenried and her husband in honor of their lasting friendship."It was one of the nicest things ever done for me," Pratt said. Pratt was involved in research projects all three summers while she attended school. "I thought I wanted to do biological research," she said, "but I enrolled in dental school, and my career went in a different direction."

After her first year at the Medical College of Virginia, Pratt married Richard Mansell, and the two later set up a dental practice in rural Pulaski County, a short 20 miles from Blacksburg. "One reason we chose Pulaski County was because it was so close to Virginia Tech," she said. "We knew the university was an exciting community, and we wanted to be nearby."Mansell and Pratt operated the practice for 32 years before selling it in 2008. But "retired" is a far cry from what Pratt's life looks like now. She is one of the college's most active and service-oriented alumni, serving as a member of the **Alumni Advisory Board for Biological Sciences**, the Roundtable Advisory Board for the college, the university's Alumni Association board, and as co-chair of the university's Women in Leadership and Philanthropy (WLP) group.

Pratt's list of volunteer activities extends beyond the university and includes serving with the state's Economic Development Partnership as well as leadership roles on the state's Board of Health and Medicaid Board. But the service project that she speaks of with the most passion is the Remote Area Medical Mission of Mercy (RAM) project, a national organization devoted to providing healthcare to individuals who, for geographic or financial reasons, have limited or no access to it. RAM holds a large, walk-in health clinic in Wise County every year. The county, which borders Kentucky, is located deep in the Appalachian mountains and is one of the most economically depressed areas in the state. For 11 years, Pratt, along with thousands of others, has donated her time and medical skills to the RAM event.

"All the things I have done in healthcare have been grounded in rural communities," she said. "It's what I know. Having grown up in a farm family, I know the challenges of rural families. This clinic is a lifesaver for many of them. When her two children were young, Pratt took them to the annual RAM clinic to see first-hand what some of the basic needs are in remote communities. Today, they are each involved in service. Her son, Matt Mansell, volunteers at the YMCA in Richmond; daughter Megan Morris plans a medical mission in Africa. "We've always felt like it's part of our responsibility to give back," Pratt said. "We are so fortunate to be at a point in our lives when we are able to do that." Pratt's husband gives back by volunteering at the Free Clinic of the New River Valley.

Serving her alma mater is something that comes easily for Pratt. She said the university's international reputation of excellence and the high-caliber students it attracts inspire her to be part of the school's future. "One of the reasons so many of us give our volunteer hours to Virginia Tech is so that we can interact with the students," she said. Pratt regularly serves on selection committees for undergraduate and graduate scholarships. "These students are the whole package … not just academically, but also in community service, sports, clubs, and other activities. The sky's the limit for these students."

She said one of the most gratifying associations with the university was seeing scholarship money being awarded. "When you give money to a university, it's an investment in the future because you know students are going to benefit," she said. "A lot of the dollars donated to Virginia Tech go into building someone's future. I don't think you can buy that kind of a deal anywhere else." Side-stepping her farm responsibilities back in 1969 led Pratt on a journey that keeps her on both the giving and receiving ends. Her tireless work for the college and university has broadened her scope but at the same time kept her near her roots.

"None of us gets to where we are in life by ourselves," Pratt said. I think it's very important to have a philosophy of giving back what you've been given or more than what you've been given."

A model many of us can live by.

For more information on the Remote Area Medical Mission of Mercy (RAM) project, visit www.ram.org.

Zhe Bao, a Ph.D. student in Biological Sciences, was named as a 2010 ICTAS Doctoral Scholar. She is advised by **Erik Nilsen**, Professor of Biological Sciences. Her research is focused on the interaction between an invasive tree species and its functionally similar native tree in the forest.

Sunny Crawley, a Ph.D. student in **Khidir Hilu's** lab, was chosen by the Virginia Tech Graduate School to represent Virginia Tech in a video on graduate education in the Commonwealth of Virginia. Several other lab members will also be featured. The video was created by the Virginia Council of Graduate Schools, and will be aired on VACGS.net and at www.grads.vt.edu.

The department is recieving a $5000 Engaged Apartment Award to help implement a plan for community engagment centered on the Blacksburg Nature Center, SEEDS ("Seek Education, Explore, DiScover"), the Micro Club, and the department's 4000-level Orinthology course. The award is thanks to the efforts of many department members, including **Mike Rosenzweig**, **Dana Hawley**, **Jill Sible**, **Lisa Belden**, **Ann Stevens**, **Ignacio Moore**, and **Rich Walker**.

Graduate Student **Sharmistha Mitra** (**Capelluto Lab**) has recently been awarded for the Best Interdisciplinary Oral Presentation at the American Coastal Conference Interdisciplinary Forum for Discovery in Life Sciences, which was held at Virginia Tech this past October.

Undergraduate Researcher and AMP Scholar, **Iriscilla Ayala** (Capelluto Lab), won the Best Poster Presentation Award at the the Third Annual Interdisciplinary Research Conference at Bennett College in Greensboro, NC.

Jianhua Xing, Assistant Professor of Biological Sciences, has received two grants from the NSF; one for $108,955 to study methodology development in systems biology, and one for $217,568 to study the functional roles of protein slow conformational changes in biological network dynamics.

John Tyson, University Distinguished Professor of Biological Sciences, has been named by the Society for Mathematical Biology as the 2011 recipient of the Arthur T. Winfree Prize. The award, offered every other year, honors "theoreticians whose research has inspired significant new biology."

Daniel Capelluto, Assistant Professor of Biological Sciences, has been awarded a $155, 655 grant from the NIH - NICHD for his research on "Structural Basis of Dishevelled-2 Membrane Targeting in the WNT/PCP Signalling Pathway."

Khidir Hilu, Professor of Biological Sciences, served as an external examiner for a doctoral defense at Gothernburg University in Sweden in January 2011. His visit has resulted in research collaborations on biodiversity and bioinformatics.

Jeff Walters, Harold Bailey Professor of Biological Sciences, has been appointed to the National Research Council's Committee on Independent Scientific Review of Everglades Restoration Progress, which provides a report every two years directly to Congress assessing the progress of the $11 billion Everglades restoration. This fourth edition of the panel will cover 2011-2012. Dr. Walters previously served on the first of these panels (2006-2007).

Dorothea Tholl, Assistant Professor of Biological Sciences, has been invited to be a session speaker to the Terpnet 2011 meeting at Linnaeus University in Kalmar, Sweden (May 22-26). Terpnet is a biannual international conference presenting forefronts in all areas of terpene/isoprenoid investigation in plants and microbes including investigations spanning from biosynthetic mechanisms to assessing the biological activities of these chemicals.

John Tyson, University Distinguished Professor of Biological Sciences and **Bill Baumann**, Associate Professor of Electrical and Computer Engineering, are heading up the mathematical modeling effort of a new NIH-sponsored Cancer Systems Biology Center at the Georgetown University Medical School. Tyson, Baumann, and their students/postdocs are using differential equations to describe and predict the behavior of the signaling networks in breast cancer cells that control cell growth, division, programmed cell death, and response to chemotherapeutic agents (anti-estrogen therapies). GUMS collaborators provide the data needed to build the models and test their predicitions.

Ann Stevens, Professor of Biological Sciences, has an invited review article entitled "Mechanisms and synthetic modulators of AHL-dependent gene regulation", which is being published in *Chemical Reviews*, 2011, 111 (1), pp 4–27. The e-pub is available online now at pubs.acs.org.

A critique of an exhibit about the Human Genome Project at New York's Museum of Natural History, titled "The Genomic Revolution: Secrets of Life, Secrets of Death," by **Muriel Lederman**, Associate Professor Emerita, appeared in Summer 2010 in *Feminist Formations* (formerly the *National Women's Association Journal*).

This spring, Associate Professors of Biological Sciences, **Richard Walker** and **Ignacio Moore,** will be awarded Certificates of Teaching Excellence from Virginia Tech's College of Science.

(*Loss of Biodiversity:* Continuted from page 3)

Belden and her graduate students work in wildlife systems. They study how biodiversity and community-level species interactions affect disease outcomes in two different systems. One system she studies involves parasites with complex lifecycles that have multiple hosts, including snails, amphibians and muskrats. She is also examining how microbial diversity on the skin of frogs can prevent infection with a lethal fungus that is devastating many amphibian populations around the world.

"Ecologists have an important role to play in advancing our knowledge of disease dynamics," Belden said. "We think about complex systems and how species interact and what the consequences are of those interactions, and also, what happens when we start removing those species and interactions. Biodiversity loss has clear consequences. We've known about many of these consequences for a long time, and now we can add an increased risk of many infectious diseases to that list."

Belden is an affiliated faculty member with the Fralin Life Science Institute at Virginia Tech.

The article, "Impacts of Biodiversity on the Emergence and Transmission of infectious Disease," appeared in the Dec. 2, 2010, issue of *Nature*. Authors are Keesing; Belden; Peter Daszak of the Wildlife Trust, New York, N.Y.; Andrew Dobson of the Department of Ecology and Evolutionary Biology, Princeton University; C. Drew Harvell of the Department of Ecology and Evolutionary Biology, Cornell University; Robert D. Holt of the Department of Biology, University of Florida; Peter Hudson of the Center for Infectious Disease Dynamics, Pennsylvania State University; Anna Jolles of the College of Veterinary Medicine, Oregon State University; Kate E. Jones of the Institute of Zoology, Zoological Society of London; Charles Mitchell of the Department of Biology, The University of North Carolina at Chapel Hill; Samuel S. Myers of Harvard Medical School; Tiffany Bogich of the Wildlife Trust; and Ostfeld. The lead authors' news release was posted by the National Science Foundation.

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