November 2013
Issue 7

Bio Buzz

Denison University Department of Biology

Notes From the Chair

With the vibrant colors gradually taking over the view of the Wells Hills from Talbot Hall, it serves as a reminder that it's time for the Fall edition of the Biology Buzz! It also serves as a reminder that change is in the air, and that includes here in the Biology Department. First, we have two new colleagues who joined the department this fall. Dr. Jenna Monroy is a tenure-track colleague who specializes in physiology. Dr. David Smith is an ecologist who is here in a one-year position. He is filling in for Dr. McCall, who is currently enjoying his sabbatical in Arizona. You can read more about both of our new colleagues in this newsletter, as well as additional news about Dr. McCall (he's had a very busy year!). In addition to new faculty faces, we have new students and administrators.

Denison is now under the leadership of a new President, Dr. Adam Weinberg, and a new interim Provost, Dr. Kim Coplin (who many of you already know from her years as a Physics professor and Associate Provost here at Denison). We are very excited by the energy that they bring to campus, and the opportunities that we anticipate will emerge from

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Fall 2013 Seniors Fellows

Meet Maddison Paule, Alison Smith & Elizabeth Steenkiste

Maddie Paule

I couldn't possibly think of a better place to study Biology than my experience at Denison. I came in already knowing that I wanted to be a part of the Biology department, but I was leaning towards the pre-medicine route like a majority of students coming in interested in Biology. Throughout my time on the hill, I've been challenged and stretched in multiple different ways across the academic departments, but none have been more instrumental to my experience than my Biology courses. My first few years through the core courses helped to solidify my choice in Biology as a major, and at the end of my sophomore year when I was enrolled in my first upper level course I became completely absorbed into what I was doing. I was taking Organic Chemistry II and Plant Systematics when I discovered this love for plants. Previously, I had never given much thought to all of the green life around us, but my world was opened up. I learned so much in that class about plants, their structure and classification, but also about myself. I found that I love the technical and hands on aspect of being a Biologist, as I practiced an extreme attention to detail.

As Biology students at Denison, we have the opportunity to take our learning to a whole new level with our experiences in the labs throughout Talbot Hall and the field station out at the Biological Reserve. The textbooks come to life in lab, and I love it. My passions within the department have changed over time as I get newly re-energized by each of the courses that I take, along with my experiences in summer research labs. All of these experiences have built up this multi-faceted educational experience as a major on the varying levels of biology, from the DNA inside a cell all the way to larger community levels. I'm no longer looking at medical schools as the only option after college, but rather I'm excited by the opportunities of pursuing a career directly related to the study of plants. I'll be applying what I learned here at Denison in the future by continuing my Biology education and experience through fieldwork and graduate school. I'm forever grateful for the experiences I have had here in the Denison Biology Department that have helped me grow into the Biologist I am today.

"The textbooks come to life in lab, and I love it. "

Alison Smith

When I began my time here at Denison, I was pretty confident I was going to become a doctor, so I took biology classes from the start. But, I did not expect to enjoy learning it as much as I have. Now I know there's a lot more available to me than just the medical field and you can do so much for the world once you have a foundation in the biological sciences. I've been introduced to so many different aspects of biology, which I might have missed out on if I had gone to a different school and only focused on a pre-medical curriculum. Nowadays, I am pretty confident in my future career as a veterinarian, and I know my Comparative Animal Physiology class in addition to others helped solidify my decision to switch.

While in Talbot, I've done everything from raising my own family of fruit flies, watching planarian worms regenerate body parts, and trekking out into the Biological Reserve to catch insects for various experiments. In addition to biology classes, I have had the good fortune to be a teaching assistant and to participate in summer and senior research studying hormonal communication in the African clawed frog. I learned so much about the research process, and even though research is not my future career goal, I have a much higher appreciation for it.

The best opportunity I had was to take my major abroad to Tanzania, East Africa, where I studied wildlife ecology and management and solidified my desire to become a veterinarian, hopefully with exotic animals. I am now applying to join the Masters International program with the Peace Corps, where I hope to get an MS in animal science abroad before applying to veterinary school. This is something I never would have thought about if I had not done research abroad and at Denison!

I am so happy I spent my time here studying the environment and living things – I am never bored and constantly amazed by the way our world works, and I am excited to keep learning about it as I continue with my studies after Denison.

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Fellows cont.

I didn't have a true appreciation for the biological function of our world until my high school biology class spent several weeks discussing the central dogma. I couldn't fathom how a process invisible to the naked eye could be so complex and sophisticated. The realization that every form of life is maintained by molecular interactions that can't be seen marked the beginning of my passion for biology. The question that fascinated me was how scientists can make discoveries involving molecular interactions without physically looking at them.

My very first biology class at Denison began to address that question, as lab periods were devoted to learning new techniques and designing our own experiments to answer biological questions. Instead of mindlessly following a prewritten procedure, which is the

Liesje Steenkiste

common practice at many universities, I was actively engaged in the design and execution of my own experiments. The excitement I felt as I collected data during lab encouraged me to pursue research experiences outside of the classroom.

My love of research grew over the course of the following three years, as I had the privilege to work in and collaborate with multiple

"I was actively engaged in the design and execution of my own experiments."

labs in varying academic environments. Through these research experiences, I have formed strong bonds with the faculty and students in the lab. The professors I have worked with in the Biology Department are incredibly skilled in their fields, dedicated to teaching and genuinely interested in their students. It is because of my relationships with my professors and the love of biology they have instilled in me that I plan to go to graduate school to pursue a career in research.

Faculty News

Heather Rhodes served as discussion leader for a session entitled "Sensorimotor Control of Reproduction" at the Gordon Research Conference on Neuroethology: Behavior, Evolution & Neurobiology in Mt. Snow, Vermont, August 18-23, 2013. She presented a poster at that meeting with student co-authors **Rachel Stevenson '12** and **Courtney Ego '11** titled "An evolving understanding of male-male clasping behavior in *Xenopus laevis*." She is also co-author on a paper published in the *Journal of Neuroscience* this summer, titled "Transformation of receptive field properties from lateral geniculate nucleus to superficial V1 in the tree shrew."

Geoff Smith along with former students **Chris Dibble '09**, **Andrew Terlecky '07**, **Chris Dayer '07**, **Allison (Boyd) Burner '07**, and **Megan Ogle '08** recently published a paper titled "Effects of invasive western mosquitofish and ammonium nitrate on Green Frog tadpoles" in the June 2013 issue of *Copeia*.

Andy McCall co-authored a paper in *Oecologia* with former students **Stephen Murphy '09, Colin Venner '09** and **Monique Brown '09** entitled Florivores prefer white over pink petal color morphs in wild radish, *Raphanus sativus*.

Lina Yoo gave an invited talk titled "Signaling in Cancer Development: Stop or Go?" for the Ohio Wesleyan University Science Lecture series on February 28, 2013.

Justina Bartling '13 presented the following poster at the Ecological Society of America meeting in Minneapolis in August 2013, "Detection of Ranavirus in Five Amphibian Species among Three Ohio Ponds" by **Rebecca Homan,** and **Robert Stenger '13** and Jesse Brunner (Washington State University)

Faculty News cont on pg 4

Biology Faculty and Staff 2013-2014

Left to right: Heather Rhodes, Rebecca Homan, Jenna Monroy, Dave Smith, Jenny Etz, Ayana Hinton, Whitney Stocker, Jessica Rettig, Jeff Thompson, Laura Romano, Geoff Smith, Chris Weingart, Lina Yoo, Warren Hauk, Tom Schultz

Not shown: Clare Jen, Eric Liebl, & Andy McCall

Chair Notes cont.

their efforts over the next year. They are joined by the students of the class of 2017, and we have nine full sections of BIOL150 to serve many of these students who are considering biology, environmental science, and health science-related studies. We have 54 biology majors in the current senior class, 14 of whom are pursuing senior research. Lastly, as happens roughly every three years, the departmental leadership "baton" has been handed off. Dr. Rettig completed her third and final year as department chair this spring, having overseen two tenure reviews, a third year faculty review, and a major departmental self-study and external review (just to name a few of her efforts). We are grateful for the dedicated work that she undertook as chair, and hope that her upcoming sabbatical in the spring will provide some rest and relaxation. I am excited to take over the position as chair, as we begin to develop new directions for the department to pursue. You can expect to hear more about these efforts in future communications. Best wishes to everyone, and I hope that you enjoy the rest of this newsletter!

~ **Jeff Thompson**

Congratulations to Andy McCall and Emily Pagano on their marriage!

The wedding was held at Dawes Arboretum on September 1, 2013. Welcome to the Biology Family, Emily!

Welcome Jenna Monroy!

B.A. in Biology from University of Massachusetts, Amherst, 1997

Ph.D. in Biology from Northern Arizona University, Flagstaff 2004

Postdoctoral Research Associate at the University of Washington, Seattle 2004-2006

Postdoctoral Research Associate at Northern Arizona University, Flagstaff 2006-2013

Teaching Biology at Denison: Comparative Physiology, Ecology and Evolution, Intro to Biology, Intro to Neuroscience, Advanced Neuroscience, Neurophysiology

Research: The overall goal of Jenna's research is to understand how animals move, specifically how the nervous and musculoskeletal systems interact to produce an array of different movements. Of particular interest to Jenna is how animals use elastic energy in movement. Ballistic movements, characterized by high velocities and accelerations, are often powered by the storage and recovery of elastic energy. Tongue projection in frogs is one example of high power output via an elastic mechanism. Frogs store elastic energy in their jaw muscles to launch the tongue from the mouth. Jenna is currently working to determine the physiological and biomechanical basis of this high performance. Her current working hypothesis is that the elastic protein, titin, embedded inside muscle, plays a role the storage and recovery of elastic energy. She also studies locomotion in mice with a mutation to titin to better understand its role during movement. Jenna takes an integrative approach to these research questions using techniques and methods from muscle physiology, biomechanics, neurobiology, animal behavior, and evolution.

Visiting faculty member, David Smith

I am interested in using a genetic and evolutionary perspective to understand patterns in species interactions and biodiversity. Because plants serve as the foundation for much of the surrounding ecosystem, plant evolution is likely to have a large impact on species interactions, community structure and local biodiversity. Further, previous research has shown that human activity (e.g. the introduction of exotic species, climate change and habitat fragmentation) can cause plants to rapidly evolve. For part of my research, I've shown that introduced elk can cause native plants to rapidly evolve, which then causes a shift in the diversity and predatory-prey interactions within the animal community associated with the plants. My research was recently featured in a PBS documentary *A Thousand Invisible Cords*. You can watch clips or the full-length documentary on Vimeo!

Next spring I will be teaching Ecology & Evolution (Bio 202) as well as Ornithology.

In my free time, I enjoy trail running and spending time with my wife and two kids.

Anderson Lecture Series

The Biology Department is hosting the 2013-2014 Anderson Lecture which will occur on February 19, 2014. This year's speaker will be **Dr. Tyrone Hayes** of the University of California - Berkeley.

He is best known for his research into the role played by the herbicide atrazine in the feminization of frogs (turns out that atrazine is an endocrine disruptor). Due to this line of research, Dr. Hayes has actively pushed for better review and regulation of pesticides and other chemicals that humans apply to the environment, as these may adversely affect human health.

Our Spring ***Bio Buzz*** contains even more alumni info!

Send your updates to **biology@denison.edu**

You can also stay in touch with our Facebook group,

Denison Biology Alumni and Faculty

just search and ask to join!

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We publish **two** editions of the ***Biology Buzz***. The fall edition features a wrap-up of our summer activities, information about new faculty, introduces our senior fellows, and highlights the activities of current faculty. In the spring edition, we hope to have heard from **alumni** so that we can share some of your interesting activities with other alumni and our current students. Please let us know what you've been up to and how biology plays a role in your current activities by sending your former professors an email or drop a message into the biology email-box biology@denison.edu. And, as always, if you wish to be removed from the Newsletter mailings, we can do that too. **Note: The Spring Newsletter is electronic only. Please send your email if you would like to receive it** ☺

Faculty News cont

Jeff Thompson presented a poster entitled "Multiple histone post-translational modifications operate in concert in UV damage repair *Saccharomyces cerevisiae*" at the FASEB Summer Research Conference on Epigenetics, Chromatin, and Trancripion, Nassau,Bahamas, June 2013. It was co-authored with students **Anna Boudoures '12, Jacob Pfeil '12, Arron Cole '13,** and **Dora Vines '13**.

A research paper by **Tom Schultz** entitled "Lost in the crowd or hidden

in the grass: signal apparency of female polymorphic damselflies in alternative habitats" appears in the November issue of *Animal Behaviour*. Tom also presented the poster "Picking your rival out of a crowd: the color of male damselflies engaging in scramble competition", co-authored with **Erin Gorsich '08** and **Pete Surace '11**, at the 50th Annual Meeting of the Animal Behavior Society in Boulder, CO.

Where in the World is Phil Stukus??

I am greatly enjoying my retirement and am still living in Granville. My wife and I spend time traveling and especially enjoy visiting our grandchildren who live in the Cleveland area and in West Lafayette, Indiana. I have a lab at Owens Corning in Granville and do microbiological testing for them there, giving me an opportunity to grow my "bugs", something that I will always enjoy. I love hearing from graduates and look forward to their calls when they are in the area. I still can be reached at stukus@denison.edu.

Photo: Hawaiian island of Molokai

DENISON UNIVERSITY

Big Red Weekend served as the setting for a Biology Alumni Career Panel this fall. Our panel featured a nurse practitioner **(Amanda Stammler Dunlevy '03)**, a dentist **(Katelyn Ciul Miller '08)**, a science editor **(Nathan Reid '03)**, and a recruitment & admissions manager for a teacher training program **(Melissa Tribue '05)**. Students heard about different pathways our alumni have taken and had an opportunity to ask our alums a variety of questions.

The Biology Department is thankful for the participation of these alumni!