

He's Not In Kansas Anymore!

He's not in Kansas anymore, and we in the Department of Biology and Geology are very glad! Dr. Derek Zelmer took up residence as Assistant Professor of Biology in our department this Fall, with teaching duties including Biological Science II, Invertebrate Zoology, Parasitology, and Ecology. Dr. Zelmer comes to us from seven years of teaching at Emporia State University in Emporia, Kansas, as an Assistant and then Associate Professor of Biology. Originally from Calgary in Alberta, Canada, Dr. Zelmer earned his bachelor and master's degrees in Biological Sciences at the University of Calgary. He went on to do his Ph.D. at Wake Forest University in Winston-Salem, NC, where he also served as Visiting Assistant Professor for a year following the conferral of his degree. Then it was on to Kansas for seven years before returning in August to the Carolinas.

Growing up in Calgary, he often went hiking and cross-country skiing in the nearby



Dr. Zelmer observing Sarah Tracy at the dissecting microscope

Rocky Mountains. He also spent time on his uncle's farm in Saskatchewan. He loved being outdoors. "I was always trying to figure out how things worked-taking things apart and putting them back together," says Zelmer. He was a bike courier during the 1988 Winter Olympics in Calgary, also helping to lay sod around the speed skating arena. He put himself through college by fighting fires with a helicopter rappel crew. Of his interest in ecology and parasitology he says, "It just made sense to me. It's the way

I think anyway." His master's work studying parasites in yellow perch was funded by the Alberta Fish and Wildlife Commission.

The road from Calgary to Winston-Salem originated with a letter from Dr. Gerald Esch at Wake Forest to Dr. Hisao Arai, Derek's MS advisor. Dr. Esch was looking for students for his lab, and when Derek realized he had cited him several times in his master's thesis, he called him up, and the rest, as they say, is history. His Ph.D work involved population dynamics of a parasite of green frogs.. He also did postdoctoral work in Costa Rica on parasites of frogs

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From The Chair:

by Dr. William Jackson

The Department of Biology and Geology is growing! This January we welcomed a new faculty member, Dr. Michelle Vieyra. Dr. Vieyra obtained her PhD from the University of South Carolina in 2006, and is teaching human anatomy along with major's courses. Her research interest involves the study of olfaction in turtles. She joins our other two new faculty members: Dr. Derek Zelmer and Mr. Brad Reinhart, both of whom joined us in August. Dr. Zelmer has jumped right into our curriculum and is currently teaching Ecology and Evolution. As lab manager, Mr. Reinhart has taken charge of all laboratory preps, student lab assistants, and ordering. He is also teaching in our introductory biology sequence. Last fall the department requested a new position to further increase the number of human anatomy and physiology sections that we can offer. For several years now, we have struggled to offer enough sections of human anatomy and physiology to accommodate the

large number of students needing these courses. Since the retirement of John Spooner some years ago, we have been relying on part time instructors like Buck Pridgen and Norris O'Dell to teach these courses for us. We even lured Dr. Spooner out of retirement for a time to help teach anatomy. Over the past two years, both Dr. Pridgen and Dr. Spooner left the university, forcing us to reduce the number of anatomy sections we could offer. This is now beginning to change. We recently received permission to begin a search for a full time Instructor to teach human anatomy and physiology. A successful search will provide us with two full time faculty members in this important area of our curriculum. In this issue of Evolutions, we have included articles on the two August faculty additions: Reinhart and Zelmer. Stay tuned for the next edition for news on Dr. Vieyra and our newest faculty member in anatomy. My only problem now is finding a place to put everyone!

Faculty Focus: Reinhart

It has been ten years since Brad Reinhart graduated from USCA with a Bachelor of Science degree in Biology, and this Fall the department welcomed him back in the position of lab manager and instructor.

Brad grew up in a military family, moving around from place to place, including three years in Guam. But when asked where he's from, he says Maryland, as that is where he graduated from high school. He came to USCA on a soccer scholarship, not knowing what his major would be. It wasn't until his third year that he found his calling in biology, his interest sparked by Biology 102

with Dr. Hanlin and Botany with Dr. Shealy. He did his senior research with Dr. Spooner on katydids. When Dr. Hanlin was asked about Brad as an undergraduate, he replied, "I tried to run Brad off when he took my Biology 102 class in '94, but I couldn't shake him. He kept hanging around and even took my vertebrate class. I thought for sure that we were rid of him when he graduated in '96, but damned if he isn't back again! Seriously, Brad is one of our success stories,

and I'm pleased to be able to call him a colleague now. He's doing a wonderful job."

Brad distinguished himself on the soccer field while a student here. He was MVP for three years and team captain for one year. He



modestly says they were good years for the soccer team. He started working at the Savannah River Ecology Lab while still a student, and was hired on full-time after graduation.

His first two years as Research Technician at SREL were spent in the Advanced Analytical Center for Environmental Sciences (AACES) where he studied the effects of phytoremediation and

"The potential this place has is unbelievable-just to see where the school and the department are going-it's such a privilege to be part of this department."

-Brad Reinhart

revegetation on heavy metal contaminated land. He then moved into the Wildlife Program from 2000-2004, and during those years became interested in the trophic transfer of heavy metals (particularly U and Ni) within complex ecosystems, while concurrently earning his M.S. in Environmental Toxicology from the University of Georgia. His thesis, The Use of Small Mammals as Indicators of Heavy Metal Bioavailability in a Contaminated Riparian Zone, concentrated on the species *peromyscus gossypinus* (cotton mouse). He then spent a year in the Wildlife Ecotoxicology and Physiological Ecology Program developing methods and procedures for evaluating heavy metal exposure within known contaminated organisms, and his last year at SREL took him back to the AACES program where he focused his studies on low-tem-

perature and aqueous geochemistry with an emphasis on stable isotopes.

Brad was excited to learn of the position back at his alma mater. It came at a time when he was ready to utilize his education and experience in a broader way. His research and lab managerial experiences, as well as his work with undergraduate students at the ecology lab fit perfectly

with what the department was looking for in the combination lab manager/instructor position. The department had been without a lab manager since 1998 when the position was converted to a tenure-track faculty position. Just ask any of the faculty how grateful they are to have Brad overseeing

our lab program, as well as teaching two 101 and 102 labs each semester, and you will hear kudos for the work he is doing. His enthusiasm for his job is evident: "I'm proud of where I am right now, and I really enjoy what I do. I love the change of pace and being around the students. The potential this place has is unbelievable-just to see where the school and the department are going-it's such a privilege to be part of this department."

Brad has continued playing soccer and also plays lacrosse on a club team. He is already coaching his 2-year-old son, Brennan, to be a soccer star, and wife Cindy, HR manager at Metso Company, completes the team. The department is proud to have one of it's own back in the fold!

Congratulations Graduates

May 2006

Bachelor of Arts

Tammy Horton - Cum laude

Judy Joffrion-Starks

Tamala Mims - Cum laude

Kevin Murdaugh

Julie Shapiro

Bachelor of Science

Connie Arthur - Cum laude

Fernando Blanco - Magna Cum Laude

Dusten Bolin - Cum Laude

Dominique Cassetori

William Aaron Condon

Kurtis Drake

Kalyn Estep - Cum Laude

Lauren Hollingsworth - Cum Laude

Yianne Kritzas - Magna Cum Laude

Ada Gabriela Palacios

Amanda Prescott

Rebecca Ruth

Frank Spradley - Cum Laude

Tamika Thomas

Melissa Warren - Magna Cum Laude

Christina Wilson - Cum Laude

Zachary Wilson - Cum Laude

August 2006

Bachelor of Science

Arlina Adriano

Tiffany Mack

Jacob Pridgen

Student Of the Year

Our Outstanding Biology Student of the Year for 2005-06 is Zachary D. Wilson. This award is chosen annually by nomination and a vote of the faculty in the department. Zach is a native of North Augusta and attended Midland Valley High School. His career at USCA began in the Fall of 2002. Dr. Jackson hired Zach to work on a project funded by a grant from SC BRIN FUTURE (Faculty & Undergraduate Training Using Research Experiences) in the Fall of 2003. This project was entitled, "A systematic analysis of hammerhead ribozyme target sites within HIV-1 Tat" and determined the research path of the rest of Zach's undergraduate career. He continued independent research in the Jackson lab on different projects related to HIV research. He presented talks at the South Carolina Academy of Science in 2004 and 2006 (see SCAS awards article). Zach also

"He was our quality control manager. He made sure everything was done right. He was hardworking, conscientious, responsible, and very organized."

-Dr. William Jackson

worked in the department doing lab prep for the introductory biology and Genetics courses. In his senior year, he supervised the other lab prep students and basically served as lab manager for both the intro courses and the Jackson lab. Dr. Jackson says of Zach: "He was our quality control manager. He made sure everything was done right. He was hardworking, conscientious, responsible, and very organized." Zach also served as the student representative on a biology faculty search committee in Spring 2005. He graduated cum laude in May 2006 and began doctoral studies at the Medical College of Georgia in Fall 2006. The department was honored to have Zach Wilson as a student and we look forward to hearing of his future success.



Dr. Bill Jackson and Zachary Wilson

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"It was a blast!" Jennifer recalls. "Dr. Yates just made it so much fun." Among her other favorite classes were Dr. Fetterolf's Chemistry 111 and 112 and doing her senior research in Dr. Bill Jackson's lab with classmate Cindy Hollingshead, who was also headed to vet school at Mississippi State.

When she began vet school, Jennifer was planning to go into large animal practice, but between her third and fourth years she began to rethink that decision, and settled instead on small animal practice. She still loves horses and is very happy to be back in Aiken where she can ride and spend time on the farm with the horses, but, she says, "I wanted that to be my hobby, something to enjoy, not my business." Her current horse is a six year old thoroughbred named Rainbow. But her most constant companion is Bailey, her five year old boxer. She got Bailey just before starting vet school, so they've already been through a lot together.

Jennifer is enjoying being back in Aiken near her family. Younger sister Lauren is a junior biology major at USCA and her parents are still on the farm. She says she hasn't gotten used to being called "Dr. Ray" yet, but it's growing on her.. We are very proud of Jennifer's achievements and welcome her back to Aiken.

South Carolina Academy Of Science

Two of our May graduates were honored at the South Carolina Academy of Science meeting held on March 10, 2006 at USC Columbia by being selected for Undergraduate Research Awards in their respective fields.

Zachary Wilson received the award for his presentation entitled Characterization of the Retroviral Vector pLNPolIX in the Cell and Molecular Biology section and Melissa Warren's presentation of Chemical Analysis of Pigmented Sclerites from Diseased Coral Sea Fans earned her the Undergraduate Research Award in the Field Biology section.

Melissa was also chosen for the American Association for the Advancement of Science Award to the Outstanding Female Undergraduate Scientist.

The department is very proud of the achievements of these two students. Zach is currently enrolled in a Ph.D. program at the Medical College of Georgia and Melissa at the University of Georgia.

Alumni Update Online

Did you know?

You can update your address and let us know what you've been doing since graduation online! Just go to www.usca.edu/biogen/alumni.asp. We'd love to share your news!

Christie Jordon Curry, 2000, received a Doctor of Pharmacy Degree from the University of Georgia College of Pharmacy in May 2006. She is employed as a pharmacist at Kroger in Evans, GA.

Judy Joffrion-Starks, 2006, is enrolled in a graduate program at the University of Nebraska, working towards a PhD in pharmacology/toxicology and is the proud mom of Benton Oliver.



Recent Faculty Activities

Dr. Andy Dyer was promoted to Associate Professor and tenured in June 2006 by the University of South Carolina Board of Directors. Dr. Dyer attended the Ecological Society of America annual meeting in Memphis, TN in August, 2006, presenting a poster on "The biochemistry of germination inhibition in *Aegilops triuncialis*."

Dr. Allen Dennis presented a poster, "Wenlock-Ludlow post-accretionary terrane dispersal in the central Appalachians: the Carolina and Cat Square terranes and the Salinic basins of the northern Appalachians," at the International Geoscience Programme IGCP 497 - The Rheic Ocean: Its Origin, Evolution and Correlatives in Evora, Portugal in October, 2006.

Dr. William Jackson and 2005 graduate Katherine Anderson published: "Design and cloning of a hammerhead ribozyme targeted to HIV-1 Vif mRNA" in the Journal of the South Carolina Academy of Science, 3(1):24-30.

Dr. William Pirkle, along with F.L. Pirkle, E.C. Pirkle, and D.L. Pirkle, published "Heavy mineral mining in the Atlantic coastal plain of Florida and Georgia and the chemical and physical characteristics of the deposits" in the 2005 International Heavy Minerals Conference Proceedings, Society for Mining, Metallurgy, and Exploration, Akser, M. and Elder, J., eds, p. 7-18.

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and toads with Dr. Dan Brooks of the University of Toronto.

Dr. Zelmer's love of teaching stems from his own interests. "I have an innate curiosity. I like to figure out answers to my own questions," he says, "and I try to get the students to figure out the steps to take to solve the problems themselves." He keeps a high level of challenge in his classes, and offers to help any students who might need some extra assistance. "We're trying to produce thinkers," sums up his teaching philosophy.



USC Aiken appealed to Zelmer from the start. "It's small enough to allow for individual attention, and the people in the department are doing exciting things and are excited about what they are doing," he said. "After my interview, I was really hoping to get the offer."

Since arriving in August, Dr. Zelmer has been busy setting up his lab and teaching four ABIO 102 labs. His research here will focus on among-scale interactions of population and community processes in aquatic systems, determinants of parasite community structure in aquatic vertebrates, and transmission dynamics of parasites in lotic ecosystems. He will focus on yellow perch, as they are "a good trash fish—they pick up a lot of parasites. Fish are a nice, neat package. The data are more easily interpretable,

plus they are just cool."

Dr. Zelmer sees many oppor-

"Fish are a nice, neat package. The data are more easily interpretable, plus they are just cool"

-Dr. Derek Zelmer

tunities for students to work in his lab doing independent research. Areas to be investigated include life cycle studies, parasite studies, age studies, and researching parasitic effects on intermediate hosts. He has already taken on one student in his first semester. He also plans to be involved with the Ecology of the Bahamas course with Dr. Garriet Smith. They hope to take a class to the Gerace Research Station on San Salvador during Maymester 2007.

Others in the department have already gotten used to the 1969 Ford Bronco in one of the first parking spaces outside the building indicating Dr. Zelmer's early arrival at school, but his outside interests are many and varied. Photography, including underwater photography, hunting with bow or flint lock, fishing, especially fly-fishing, snorkeling and scuba diving, carpentry with antique or hand tools, brewing beer, gunsmithing, building "the ultimate vinyl sound system", and keeping that Bronco in running condition are among the things that keep him occupied in the off-school hours. "I like to learn how to do things," says Zelmer. What a wonderful opportunity for our students to learn biology from such a professor.



Spring 2006 Independent Research Projects

Research continues to be an integral part of our department's program. Students pursue independent study projects under the tutelage of faculty members, and those pursuing a B.S. degree are required to complete a senior research project. Listed below are projects for Spring 2006.

Independent Study Projects

- Lesley Duffie: Design and cloning of an anti-HIV hammerhead ribozyme. Advisor: Dr. William Jackson
- Cari Fritz-French: Design and cloning of an anti-HIV Nef ribozyme. Advisor: Dr. William Jackson.
- Brooke Harrison: Design and cloning of an anti-HIV LTR ribozyme. Advisor: Dr. William Jackson.
- Larry Hicks: Characterize aerosolized microorganisms from African Dust. Advisor: Dr. Garriet Smith
- Nancy Jones: Ribozyme analysis techniques. Advisor: Dr. William Jackson
- Mindy McDonald: Design and cloning of an anti-HIV LTR non-catalytic ribozyme. Advisor: Dr. William Jackson.
- Sarah Mendoza: Characterize aerosolized microorganisms from African Dust. Advisor: Dr. Garriet Smith.
- Frankie Spradley: Bacterial isolation from African dust. Advisor: Dr. Garriet Smith.
- Garret Webster: Design and cloning of an anti-HIV LTR ribozyme. Advisor: Dr. William Jackson.

Senior Research Projects

- Arlina Adriano: Characterization of Isolates from Gorgonian Corals. Advisor: Dr. Garriet Smith.
- Connie Arthur: Retrovirus-mediated delivery of anti-HIV ribozymes. Advisor: Dr. William Jackson.
- Dustin Bolin: Using Freshwater Invertebrates to Study Ecotoxicology. Advisor: Dr. Michele Harmon.
- Dominique Cassatori: The effect of competition on plastic expression in yellow nutsedge. Advisor: Dr. Andy Dyer.
- Aaron Condon: Habitat selection by ambystomatid salamanders. Advisor: Dr. Hugh Hanlin.
- Kurtis Drake: Soil toxicity testing with samples from New Orleans, LA, and research with trichloroethylene. Advisor: Dr. Michele Harmon.
- Kalyn Estep: Cloning of an anti-Tat ribozyme into a RNA Pol I cassette. Advisor: Dr. William Jackson.
- Jonathan Grantham: The effect of biotic and abiotic factors on the phenology of Brassica. Advisor: Dr. Andy Dyer.
- Lauren Hollingsworth: Design and cloning of an anti-HIV Rev ribozyme. Advisor: Dr. William Jackson.
- Adrienne Kemp: A comparison of tuber production in yellow and purple nutsedges. Advisor: Dr. Andy Dyer.
- Yianne Kritzas: Trans-generational plasticity in *Phyllanthus urinaria*. Advisor: Dr. Andy Dyer.
- Tiffany Mack: The biochemistry of germination inhibition. Advisor: Dr. Andy Dyer.
- Gabby Palacios: Using Nematodes to Study Soil Ecotoxicology. Advisor: Dr. Michele Harmon.
- Amanda Prescott: Initiate and maintain cultures of *Ceriodaphnia dubia* and determine the sensitivity of this new culture to standard. Advisor: Dr. Michele Harmon.
- Jacob Pridgen: Using Freshwater Invertebrates to Study Ecotoxicology. Advisor: Dr. Michele Harmon.
- Tamika Thomas: Experimental research in prokaryotic genetics. Advisor: Dr. James Yates.
- Melissa Warren: Chemical Analysis of Pigmented Sclerites from Discussed Coral Sea Fans. Advisors: Dr. Garriet Smith and Dr. Chad Leverette (Chemistry)
- Christina Wilson: Analysis of Aerosolized Isolates from African Dust. Advisor: Dr. Garriet Smith.
- Zachary Wilson: Characterization of a novel retroviral vector, pLNPolIX. Advisor: Dr. William Jackson.

Alumni Focus

By the time she was five years old, Jennifer Ray was already playing veterinarian with her own vet workshop, practicing on the family pets. Her life's course was set. She never wavered in her determination to be a vet one day, and now that dream has come true and Dr. Ray is practicing at Silver Bluff Animal Hospital in Aiken alongside another USCA alumni, Dr. Norm Wilt.

Jennifer grew up on a farm on the south side of Aiken with beef cattle, horses, and of course dogs and cats. Her family always had several horses of their own, but she said they also boarded horses, often having as many as 40 or 50 at any given time. Her first horse was a Paint pony named Patches, and when she was 10 she got a quarter horse named Duke. Jennifer



graduated from South Aiken High School in 1998 and began her studies at USCA in the Fall of that year. When asked why she had chosen USCA Jennifer said, "I loved the farm, and I loved the horses, so it was a natural choice for me to come to USCA. I knew I would have to go away from home for vet school."

Jennifer graduated magna cum laude with a Bachelor of Science

degree in Biology in December 2001. She worked as a volunteer at Silver Bluff Animal Hospital while a student, and she was hired on as a veterinary technician after graduating for the eight months before she began vet school at the University of Tennessee in Knoxville. She remembers Dr. Yates' Cell and Molecular Biology as one of her favorite classes.

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