Bioluminescence

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Editors: Brooke Stabler and Gloria Caddell http://biology.uco.edu/biodream/newsletter.htmf

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Chairman's Corner

The Biology Department at UCO is still growing. In the spring of 2008 I reported declared majors at 800. This spring we came in at 900 plus majors. Where are we putting all of us? That is a question that is very hard to answer. For courses that do not have laboratories we find other classrooms across campus. In some instances we are not able to offer enough sections to satisfy the growing needs of our students. What can we do about this? We're open to suggestions!

One of several accomplishments of the Biology Department for the year was curriculum revision. Starting in the fall of 2009, all biology majors will be required to have completed a statistics course for science majors and a calculus course. The Mathematics Department has developed a statistics course that uses practical applications of statistics for science studies. All upper-level Biology courses (3000-5000) now require a statistics course as a prerequisite.

Other revisions of our curriculum are also in progress. The faculty in the Department of Biology has made the decision to modify the current biology core courses. We hope to have the changes in place by the fall of 2010. At that time entering freshman will be required to take majors Biology I and Biology II courses. These courses will replace Plant and Animal Biology. Biology I will cover cell, genetics, evolution and ecology while Biology II will cover organismal diversity from the approach of strategic adaptations. From there, the biology core will include Cell Biology at the 2000 level and Genetics, Evolution, Ecology and Microbiology at the 3000 level. Students will be required to take at least one upper division plant and one upper division animal course other than those listed in the core. All other biology courses are electives, so students may select emphasis areas.

Dr. Riaz Ahmad is retiring from the Biology Department at the end of the summer session 2009. Dr. Ahmad has been a member of the Biology Department Faculty since the Fall of 1976. For thirty- four years, Dr. Ahmad's wit and teaching talent have prepared students for nursing, medical school, medical technology and graduate programs in microbiology. Riaz teaches Pathogenic Microbiology and Immunology, Biology of Cancer, and Virology and has continued to teach the introductory level microbiology in the summer. He will be sorely missed. In fact, we had to hire two microbiologists to teach his courses! Joining us in the fall of 2009 will be Dr. Robert Brennan and Dr. Hari Kotturi. Dr. Brennan was a Microbiology Research Specialist at the 3M Medical Division, Diagnostic Department before agreeing to join the UCO faculty. Dr. Hari Kotturi has just received his Ph.D. in Microbiology from Clemson University, South Carolina. We are pleased to welcome both of them to the Biology Department.

Chairman's Corner (cont.)

In the late spring of 2008 the estate of Dr. Margaret Hamilton (Professor Emeritus in Biology) donated a large scholarship endowment to the Biology Department. In coming years a student with an interest in Botany will receive support with their tuition and textbooks. Many students remember Dr. Hamilton as the Pre-health professions advisor before Dr. Peggy Guthrie and as a Botany professor. After retiring, Dr. Hamilton was a volunteer greeter at Edmond Memorial Hospital for many years. She remained very active in volunteer work until her death in 2007. We are very grateful to Dr. Hamilton and her estate for this support of our Biology Majors.

In the fall of 2008, Dr. Bill Caire received an NSF grant to support our Herbarium and Museum collections. The grant supports students and faculty working in the collections and new museum specimen cases and supplies. The newly completed Herbarium and Museum space supported by our alumni is now being upgraded via new casing and protection for specimens. There's more about the museum below.

Thanks again to everyone who helped us complete the Science laboratories and the Museums. We are also in the process of planning an extension to the Science laboratory building for the alcohol collection. The plans have been completed, and we had what we thought was enough to complete the building. But as all things do, cost went up because of safety and other issues so we are on hold right now for that particular project. Perhaps we will soon be able to announce its completion!

What's happening?

UCO Natural History Museum receives NSF Funding

Through the years and as the faculty has grown and diversified, the natural history collections in the Biology Department have increased in size, diversity and significance. Tens of thousands of specimens now exist in the UCO Natural History Museum (UCONHM). Restricted funding through the early years of the Department forced the collections to be housed in odd spaces, in institutionally constructed wooden cabinets, and in assorted, often substandard specimen boxes, trays and vials. Additionally, the specimens had limited use outside UCO due to lack of knowledge of their existence and lack of accessibility.

Last year, the university and the National Science Foundation recognized the educational, research and outreach significance of these historic natural history collections and have made funds available continuing through this next year to protect and modernize one of Oklahoma's oldest natural history collections. Funds from the NSF are being used to move the collections into new storage units, replace internal containers (jars, lids, vials, boxes, etc.), and build an accessible electronic database (DataLink) and webpage. Faculty are allocated release time to work in their respective areas of the collections and six students under the direction of the new Collections' Manager, Ms. Lynda Loucks, are gaining experience in curation techniques.

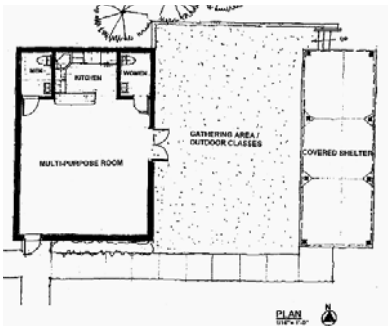
Collectively, these actions help preserve a significant and historic state, national and international collection and make it accessible for research and education. The museum is a historical record of our natural history legacy. It protects voucher specimens from research projects and serves as a tissue storage archive for DNA studies. It also provides specimens for reference and identification purposes, for education, for investigations of biogeography and population genetics. The specimens are a foundation for phylogenetic and systematic studies, and help us to better understand geographic variation, historical and current distributions of organisms, and the seasonality of organisms in unique habitats.

It is crucial that we protect the past for the future. Technology is evolving at a rapid rate and new methods for examining specimens are being developed all the time. We have no idea what will be important and necessary in the future or what knowledge can be gleaned from specimens deposited in natural history collections. The NSF collection improvement grant modernizes a natural history museum which will be available to provide opportunities for discovery, teaching, training, and active engagement of students in science. The updated facilities can be utilized for student research projects, for teacher training, and by teachers wishing to engage students in transformative learning experiences. As participation in museum activities increases, there will be more "professional learning" experiences and these can attract a new generation of conservationists, curators, and scientists. The UCONHM webpage will include non-technical literature, links to websites, and lists of UCONHM personnel available as speakers. Along with DataLink, it will be an outreach tool to diverse audiences such as K-12, other universities, government agencies and public organizations. The UCONHM can serve as a model for other smaller Oklahoma institutions wishing to protect and modernize their collections.

The Selman Living Lab

The Selman Living Lab continues to develop; some things change while others remain the same. We still worry some each spring when the severe storms track through northwest Oklahoma. How will the high winds impact the SLL this year? During April, one faculty member and her student researcher spent kind of an anxious night at the facility while severe thunderstorms hit nearby areas and tornado watches were issued for Woodward and Freedom through much of the night. Luckily the storms passed them by.

A National Science Foundation grant submitted by Dr. Caire was awarded to UCO just last month for the amount of $239,000. This grant will be used to add a permanent concrete multipurpose building (25 x 36 ft.). It will serve as a kitchen, a classroom, as lab space and as a bit safer retreat during summer storms than the double wide trailer on site. Additionally, in collaboration with Alabaster Caverns State Park, summer science programs for students will be developed as soon as the new building is complete.



A grant from the US Fish and Wildlife Service of $5,000 matched by the university is being used to purchase a bridge for Salty Creek on the 320-acre research site. This will allow foot traffic across the creek for research and education activities.

A $3,100 grant from the Aldridge Foundation provided the funds necessary to purchase 10 Bat Houses which can hold up to 400 bats each, and five night vision scopes. These were all placed on poles and put in place by the Biology Club.

The "Adopt a Bat" fundraising campaign has brought in several thousand dollars which will be added to other funds to build a "Bat Condo" house (similar to the picture on the next page) which will house several thousand bats. This will provide students and researchers the opportunity to study bat behavior and food habits.

Research, teaching and public activities continue at the SLL. Dr. Steve Maier of NWOSU provides public star shows at the SLL Astronomy facility for interested groups. A long term collaborative study initiated in 2007 by Dr. Caire and the Oklahoma Biological Survey continues to document invertebrates in the SLL gypsum caves. Ryan Shipley, an undergraduate student, continues his research on reptiles and amphibians and has added a study about the food habits of some of the bats in the SLL caves. Dr. Caddell and her students continue research on the gypsum outcrop plant species. The Selman Cave System is the largest hibernaculum for the cave myotis in Oklahoma. An important conservation project spanning 15 years has involved estimating the bat population size each year. The Central Oklahoma Grotto helps in these annual surveys. The UCO TriBeta Biology Honor Society regularly conducts service-learning projects at the SLL. The SLL is used by civic groups such as the Sierra Club, Audubon Society and Master Naturalists. Dr. Brad Watkins of the UCO Geography Department is using the SLL for his GIS courses this year. He is installing GIS software and wireless cards on the 13 computers that were donated by Dell Computers. He and Dr. Caddell, his Co-Pi, are submitting an NSF grant proposal to support GIS studies on juniper invasion at the SLL. They have received a UCO on-campus grant to fund a pilot study for this project.

Send donations to support the Selman Living Lab to:
Dr. William Caire, Biol. Dept., Howell Hall, Univ. Central Oklahoma, 100 N. Univ. Drive, Edmond, OK 73034

Faculty News

Recent Publications

Baird, T.A. 2009. Does experimentally induced conspicuous coloration increase risk of predation and conspecific aggression in first-year collared lizard males? *Herpetologica*. 65: 31-38.

Baird, T.A. 2008. A growth cost of experimentally induced conspicuous coloration in first-year collared lizard males. *Behavioral Ecology*. 19: 589-593.

Baird, T.A. 2008. *Crotaphytus collaris* (eastern collared lizard) homing. *Herpetological Review* 39: 88.

Butler, C. 2009. *Review of* Hughes, J. M. Cranes: A natural history of a bird in crisis. Ibis 151: 411-412.

Caddell, G. M. 2009. Oklahoma's parasitic plants. *Gaillardia*, the newsletter of the Oklahoma Native Plant Society. Summer 2009 issue.

Caire, W., *Smith, B.* and *Estep, A.D. 2008. New records of the porcupine, *Erethizon dorsatum*, (Rodentia: Erethizontidae) in Oklahoma. *Proceedings of the Oklahoma Academy of Science* 88:15-20.

Caire, W., Wilson, P.W. and *Wilbert, A.T.A. 2008. Notes on the food habits of the Short-eared Owl (*Asio flammeus*: Strigiformes: Strigidae) in Oklahoma. *Proceedings of the Oklahoma Academy of Science* 88:9-14.

*Curtis, J.L. and **Baird, T.A**. 2008. Within-population variation in free-living adult and ectoparasitic larval trombiculid mites on collared lizards. *Herpetologica* 64: 189-199.

Guzmán-Dávalos, L., Contu, M., Ortega, A., Vizzini, A., Herrera, M., **Ovrebo, C.,** Rodríguez, A., Villalobos-Arámbula, R., Palomera, V., Vargas, G. and Santerre, A. 2008. New morphological and molecular data on *Gymnopilus purpureosquamulosus* and its phylogenetic relationships among similar species. *Sydowia* 60 (1): 41-56.

Jordan, M. A., Hollis, J.L., **Stone, P.A.** and Snell, H.L. 2008. Habitat as a source of intrapopulational variation of ornament size in Galapagos lava lizards (*Microlophus albemarlensis* complex). *Amphibia-Reptilia* 29:278-283.

*Locey, K. J., **Butler, C.J.** and Martin, D.L. 2008. *Ctenosaura pectinata* (Spiny-tailed Iguana) population status. *Herpetological Review* 39: 348-349.

*Locey, K.J. and **Stone, P.A.** 2008. Ontogenetic factors affecting diffusion dispersal in the introduced Mediterranean gecko, *Hemidactylus turcicus. Journal of Herpetology* 42:593-599.

Lodge, D.J, and **Ovrebo, C. L.** 2008. First records of Hygrophoraceae from Panama including a new species of *Camarophyllus* and a new veiled species in *Hygrocybe* section *Firmae. Fungal Diversity* 32: 69-80.

Milazzo, M.L., Cajimat, M.N.B., **Haynie, M. L.,** Abbott, K.D., Bradley, R.D. and Fulhorst, C.F. 2008. Diversity among Tacaribe serocomplex viruses (family Arenaviridae) naturally associated with the white-throated woodrat (*Neotoma albigula*) in the southwestern United States. *Journal of Vector-Borne and Zoonotic Diseases* 8:523-540.

Shwartz, A., Strubbe, D., **Butler, C.J.**, Matthysen, E. and Kark, S. 2009. The effect of enemy-release and climate conditions on invasive birds: a regional test using the Rose-ringed parakeet (*Psittacula krameri*) as a case study. *Diversity and Distributions* 15: 310-318.

Olson, P.E., Castro, A., Joern, M., DuTeau, N.M., Pilon-Smits, E. and Reardon, K.F. (2008) Effects of agronomic practices on phytoremediation of an aged PAH contaminated soil. *Journal of Environmental Quality* 37:1439-1446.

Ovrebo, C. L. and Weber, N.S. 2008. Common spring mushrooms of Oklahoma. *Oklahoma Native Plant Record* 8(1): 57-60.

*Telemeco, R.S., Elphick, M.J. and Shine, R. 2009. Nesting lizards (*Bassiana duperreyi*) compensate partly, but not completely, for climate change. *Ecology* 90: 17-22.

Recent Presentations

(See also student and faculty presentations listed for SWAN, OAS Technical Meeting, LS-OKAMP and Oklahoma Research Day, as well as thesis presentations by graduate students)

Baird, T.A. and Baird, T.D. Stalking water dragons, turtle-headed sea snakes and other wildlife in New South Wales and New Caledonia. University of Central Oklahoma Sigma Xi Society, April, 2009.

Baird, T.A. Collared lizards as a model system for experimental field studies. Workshop on grant writing, Jackson College of Research. January, 2009.

Butler, C. Citizen Science. Keynote speaker for Association of Zoos and Aquariums Mid-Year Meeting, Oklahoma City, OK. 2009.

Butler, C. Spring warblers. Oklahoma City Audubon Society, Oklahoma City, OK., 2009.

Butler, C. Fall warblers & a Christmas Bird Count refresher. Tulsa Audubon Society, Tulsa, OK., 2008.

*Koppari, K.L., *Cloud, T.L., *Smith, S.T., **Caire, W.,** Van Den Bussche, R.A. and **Wilson, G.M**. Population genetic structure of the Cave Myotis, *Myotis velifer*, from cave localities in northwestern Oklahoma. Texas Society of Mammalogists Meeting, Junction TX, 20th-22nd Febuary 2009 and Transformative Learning Conference, University of Central Oklahoma, Edmond, OK., 11 Febuary 2009.

Shwartz, A., Strubbe, D., **Butler, C.J.,** Matthysen, E. and Kark, S. Does predator-release or climate-matching shape invasion success in Rose-ringed Parakeets? 125th stated meeting of the American Ornithologists Union. Portland, OR, 2008.

*Smith, K. A., and **Haynie, M.L.** Genetic variation in striped skunk (*Mephitis mephitis*) populations in Oklahoma and Texas. Transformative Learning Conference, Edmond, Oklahoma, February 2009.

*Smith, K. A., and **Haynie, M.L.**. Genetic variation within striped skunk (*Mephitis mephitis*) populations in Texas and Oklahoma. Texas Society of Mammalogists, Junction, Texas, February 2009.

*Telemeco, R.S., Elphick, M.J. and Shine, R. Nesting lizards (*Bassiana duperreyi*) compensate partly, but not completely, for climate change. Second Meeting of the Australasian Societies of Herpetology, February, 2009.

*Telemeco, R.S., Elphick, M.J. and Shine, R. Scincid lizards compensate partly, but not completely, for climate change when nesting. American Society of Ichthyologists and Herpetologists, July, 2008.

Wilson, G.M., and **Barthell, J.F.** Promoting grantsmanship: engaging faculty and students. Society of Research Administrators International, Oklahoma Chapter, University of Central Oklahoma, Edmond, OK, 2008.

***** denotes current or former students, and bold a current UCO professor

Biology Department Participation:
Oklahoma Academy of Science 99th Annual Fall Technical Meeting
Southern Nazarene University, October 31, 2008

Oral Presentations

*Andrews, C. M. and **Vaughan, M. B.** De-epidermized dermis inhibits invasion of Ras-expressing keratinocytes.

*****Chukwuma, S. N. and **Vaughan, M.B**. Alpha smooth muscle actin expression variation within clonal populations of fibroblasts.

*Palmer, T.R. and **Vaughan, M.B**. Fibroblast differentiation in a new wound healing model.

*Rice, K. and **Caddell, G**. Effects of abiotic factors and cattle grazing on gypsum outcrop plant communities in the Cimarron Gypsum Hills, northwestern Oklahoma.

Poster Presentations

*Koppari, K. L., *Cloud, T.L., *Smith, S.T., **Caire, W.,** Van den Bussche, R.A. and **Wilson, G.M**. Population genetic structure of the cave myotis, *Myotis velifer*, in northwestern Oklahoma during winter months.

*****Koppari, K. L.**,** Wu, F. and Rankin, S. Identifying protein interactions important in sister chromatid cohesion.

* denotes current or former student, and bold a UCO professor

Biology Department Participation:
The Southwestern Association of Naturalists 56th Annual Meeting
Universidad Autónoma de Nuevo León, Monterrey, Mexico
April 23-25, 2009

Oral Presentations

*Braun, C., **Baird, T**. and *LeBeau, J. An experimental field test of optimal escape theory in hatching collared lizards *Crotaphytus collaris*.

**Butler, C., ***Pham, L., *Stinedurf, J. and Kelly, J. Migratory ecology of yellow rails in Oklahoma.

*Rogers, K.P. and **Baird, T.** Is dispersal from natal sites sex-biased in collared lizards?

*Smith, K. and **Haynie, M**. The genetic diversity of striped skunk *Mephitis mephitis* populations throughout Oklahoma and Texas.

*Stanila, B. and **Stone, P.A.** Effects of resource abundance on Sonoran mud turtle (*Kinosternon sonoriense*) populations.

*Telemeco, R.S. and **Baird, T**. Capital energy fuels production of multiple clutches in collared lizards.

Poster presentations

*Roy, C. and **C. Butler**. 2009. Population genetics of the Brownsville Common Yellowthroat.

* denotes current or former student, and bold a UCO professor

Biology Department Participation:
Eighth Annual Research Day for Regional Universities
Northeastern State University, Broken Arrow, Oklahoma
November 14, 2008

*Ackley, C. Single tube isolation and extract-n-Amp PCR ready mix.

*Andrews, C.M. and **M.B. Vaughan**. Inhibition of Ras-expressing keratinocytes by de-epidermized dermis.

*Banks, S. and **M.B. Vaughan.** Effect of hydrogen peroxide on myofibroblast phenotype.

*Bass, C. and **Bass, D.** Invertebrates of water-filled bracts in *Heliconia caribaea* from Saba.

*Becker, E., **P. Stone** and *B. Stanila. Fecal analysis of Sonoran mud turtles, *Kinosternon sonoriense*.

*Braun, C.A. and **T.A Baird**. An experimental test of optimal escape theory in hatchling collared lizards, *Crotaphytus collaris*.

Butler, C., *J. Curtis and *K. McBride. Distribution of the threatened dwarf palmetto, *Sabal minor*, in Oklahoma.

Caire, W. and C. P. McHugh. Prevalence of Leishmaniasis in Oklahoma Rodents

*Callard, N. and **C. Butler**. Nestboxes for Mangrove Swallows – if you build it, will they come?

*Chukwuma, S.N. and **M.B. Vaughan.** Effect of n-acetyl cysteine on myofibroblast phenotype reversal.

*Clement, M., **J. F. Barthell**, H. Wells, K. C. Crocker, *E. C. Becker, K. D. Leavitt, B. T. McCall, M. Mills-Novoa, C. M. Walker and T. Petanidou. Understanding an invasive species at home: a comparison of pollinator responses to nectar availability in the thistle *Centaurea solstitialis* L. on islands in Greece and the western United States.

*Koppari, K. L.**,** Wu, F. and Rankin, S. Identifying protein interactions important in sister chromatid cohesion.

*Koppari, K.L., *Cloud, T.L., *Smith, S.T., **Caire, W.,** Van Den Bussche, R.A. and **Wilson, G.M**. Population genetic structure of the cave myotis, *Myotis velifer*, from cave localities in northwestern Oklahoma.

Ovrebo, C. L., E. Allan, D. Bass, C. Butler, G. Caddell, W. Caire, J. Hellack, W. Lord, M. Mays, *C. Walker. Field Biology course – Its place in a biology curriculum.

*Palmer, T.R., and **M.B. Vaughan**. Are these skin equivalents tense enough for myofibroblasts?

*Pham, L. and **C. Butler**. Using stable isotopes to explore migratory connectivity in the Yellow Rail.

*Pham, L., *C. Roy, *N. Burgess, *E. Davis, and **C. Butler**. The changing dove fauna of Oklahoma City.

*Pham, L., *K. J. Locey, **C. J. Butler**, and B. W. Watkins. Dietary diversity of *Tyto alba* across the ecoregions of Oklahoma.

*Redd, J. and **W. D. Lord**. Barriers to insect colonization: wind as a potential factor limiting resources.

*Rice, K. and **G. Caddell**. Effects of abiotic factors and grazing on gypsum outcrop vegetation.

*Roy, C. and **C. Butler.** Genetic diversity of the Brownsville Common Yellowthroat (*Geothlypis trichas insperata*).

*Rogers, K.P. and **Baird, T.A.** Is natal dispersal sex-biased in collared lizards?

*Smith, K.A. and **M. Haynie**. Genetic variation within skunk populations (*Mephitis mephitis*) in Oklahoma and Texas.

*Stanila, B. and **P. Stone**. Morphology and demography of Sonoran mud turtles (*Kinosternon sonoriense*).

*Telemeco, R.S., M.J. Elphick, and R. Shine. Nesting lizards (*Bassiana duperreyi*) compensate partly, but not completely, for climate change.

*Terefe, E.S., and **M.B. Vaughan.** Analysis of tissue layer stratification in cells over expressing Cdk4 and telomerase (hTERT), and long-time cultured cells with green fluorescence protein.

* denotes current or former student, and bold a UCO professor

Biology Department Participation:
Oklahoma Louis Stokes Alliance for Minority Participation in Science, Technology, Engineering, and Mathematics 14th Annual Research Symposium
Oklahoma State University, September 20, 2008

Oral Presentations

Redd, J.R., **Lord, W. D.,** *Davidson, H., *Metzger, K. Forensic Entomology: Preliminary observations of carrion colonization of necrophagous flies (Diptera: Calliphoridae) in two suburban habitats in central Oklahoma.

Posters

*Goode, S. D. and **Stabler, L. B.** Competition between honeylocust and silk tree under high and low irrigation volume treatments.

*Terefe, E. and **Vaughan, M.** Analysis of tissue layer stratification in cells over expressing Cdk4 and long time cultured cells with green fluorescence protein.

Other Faculty Activities

Oklahoma Academy of Science Field meetings

The 2008 fall field meeting was held at Black Mesa State Park in Kenton. UCO faculty took a break from leading field trips at this meeting but quite a few attended, including **David Bass, Jenna Hellack, and Bill Caire.** Members of the BBB Biology club also made the trip, and reported that the hike up to the highest point in Oklahoma, 4,973 feet above sea level, was great exercise and offered a great view! Participants also saw the ornithopod dinosaur tracks in the area.

The 2009 spring meeting was held at Lake Eufaula State Park in Checotah. **Dr. Gloria Caddell** directed the meeting and **Dr. David Bass** helped organize the meeting. **Dr. Clark Ovrebo** and **Dr. Chris Butler** led field trips. Also attending were **Dr. Brooke Stabler**, **Dr. Bill Caire**, and more than a dozen students from the Department of Biology. Many participated in a very wet field trip to an ancient Crosstimbers forest at Okmulgee State Park. Researchers from Oklahoma State led the trip, giving participants a good overview of the forest and how fire impacts it.

Grants and Awards Received

Dr. Troy Baird received the Sigma Xi Distinguished Researcher of the Year award and a Faculty Merit Credit Award during April, 2009.

Dr. Bill Caire has received a grant from the National Science Foundation Field Station and Marine Laboratories (FSML) program in the amount of $239,538 to construct an education building at the Selman Living Laboratory. Dr. Caire is also lead PI on the Natural History Museum grant described at the beginning of the newsletter, which has been renewed for approximately $100,000.

The college of Math and Sciences received a grant from the National Science Foundation Science, Technology, Engineering and Mathematics Talent Program (STEP). The award is $1,998,750 over 5 years to provide a "Double Bridge" program for incoming freshman and transfer students majoring in Science, Technology, Engineering and Mathematics (STEM) fields. A Summer Bridge is designed to give high school seniors a head start on their college experience by spending four weeks at a participating college campus doing research with a faculty mentor. During the Fall Bridge, students transferring to a participating university from a community college will have the opportunity to live on campus for one week to receive advisement about STEM majors, apply for financial aid and receive information concerning research opportunities on campus. The Double Bridge program is a premiere opportunity for UCO and other participating educational institutions to tap an underrepresented pool of talented students who do not typically pursue degrees in STEM majors due to a lack of guidance and preparation. Other Oklahoma institutions participating in the program are: Langston University, Northeastern Oklahoma State University, East Central University, Rose State College, Oklahoma City Community College, Redlands Community College, Oklahoma State Institute of Technology-Okmulgee, and Comanche Nation College. The Principal Investigator (PI) is Dr. Wei Chen, Assistant Dean, and Co-PIs are **Dr. John Barthell**, Dean, and **Dr. Gregory Wilson**, Executive Director of the UCO Office of Research & Grants. **Dr. Mel Vaughan**, Associate Professor of Biology, serves as the UCO campus coordinator for the grant.

Dr. John Barthell, Dean and Professor of Biology, has received an award from the National Science Foundation Research Experiences for Undergraduates (REU) program. The grant, $301,586 over 4 years, provides summer research experiences in Turkey and Greece for six undergraduate students per year. Dr. Barthell was first funded by the REU in 2005 and this new grant continues funding for his research on the ecology and behavior of honey bees and solitary bees in Greece and Turkey. This grant is in partnership with professors at Uladag and Ankara Universities in Turkey, Trakia University in Bulgaria, University of the Aegean in Greece, Bloomsburg University in Pennsylvania, Tulsa University, and Oklahoma State University. Other senior personnel on the grant are Dr. Charles Abramson, OSU; Dr. John Hranitz, Bloomsburg; and Dr. Harrington Wells, Tulsa.

Dr. Chris Butler, Assistant Professor of Biology, has received a two-year $6,400 grant from the USDA Forest Service to examine migratory connectivity in the Yellow Rail (*Coturnicops noveboracensis*) in the Ouachita National Forest of southeastern Oklahoma.

Other News

Seven students in the General Methods of Teaching Science class attended the Oklahoma Science Teachers Association (OSTA) meeting held on the NSU-Broken Arrow campus October 25-26, 2008. The students helped with the conference and attended sessions**. Dr. Elizabeth Allan** was elected to the OSTA board as the College representative.

Dr. Gloria Caddell prepared plant identification pamphlets for Alabaster Caverns State Park.

Dr. Mel Vaughan presented research data at the Experimental Biology 2009 meeting in New Orleans, accompanied by graduate student Joanne Peterson and undergraduates Eyuel Terefe, Tiffany Palmer, and Capri Andrews. Each student presented research results, and Capri Andrews won the American Association of Anatomists' undergraduate poster presentation award. Tiffany Palmer was a finalist for that award as well.

Dr. Chris Butler continues to serve on the Board of Directors of the Central Oklahoma Audubon Society. He was also the keynote speaker for the Association of Zoos & Aquariums' mid-year meeting in Oklahoma City. He gave a presentation on "Citizen Science" at the Cox Convention Center on March 25.

Dr. Bill Caire and **Dr. Gloria Caddell** facilitated an Emporia State University, Kansas, professor and his students at the Selman Living Lab on September 12 and 13th. The students were preparing lesson plans on bats to be used in intercity schools in Kansas City. They caved some, helped mist net bats for **Dr. Greg Wilson's** DNA work and then observed a bat flight of over a million bats. Also in attendance were students from Dr. Caire's mammalogy class and the Sierra Club. Kyra Burras, a Ph.D. graduate student from the Missouri Botanical Garden who also is working with Harvard, was at the Selman Living Lab the follwing week studying pollinator loads on *Onoethera*. Assisting her at the SLL were Ron and Gloria Hoggard, former graduates of UCO (Dr. Caddell's MS students). **Dr. Gloria Caddell** and **Dr. Bill Caire** taught sections of a teachers' workshop entitled "Teaching Civic Engagement and the Politics of Democracy: Environmental History, Land and Energy Stewardship, and Community in Oklahoma"funded by the Oklahoma Humanities Council and directed by Dr. Patti Loughlin, Department of History and Geography. The workshop was held from July 27-30 on the UCO Campus and at the Selman Living Laboratory.

The Selman Living Lab hosted 40 to 50 members of UCO sorority Delta Zeta for a retreat and cave tour on October 4 and 5. **Ms. Lynda Loucks**, **Dr. Wayne Lord** and his wife, and several mammology students assisted the Delta Zeta members with their activities.

Dr. Clark Ovrebo attended several meetings, including the New Mexico Mycological Society Annual Foray, Aug 14-17, in Taos, New Mexico, the Oklahoma Native Plant Society annual meeting, Sept. 26-28, in Idabel, Oklahoma and the Gulf States Mycological Society Winter Foray, in Lafayette, LA, Dec 5-7.

Dr. Paul Stone and students Brian Stanila, Roxie Hites, Erica Becker, Curtis Behenna, and Kelly Smith went on a sampling trip to New Mexico August 2-10, 2008. They sampled Sonoran Mud Turtles in 7 canyons of the Peloncillo Mountains, capturing almost 200 individuals. Data from this trip are part of the final season of field data for Brian Stanila's Master's Thesis, and part of Paul Stone's long-term (1994-2008) mark-recapture study on this species. That work has continued this summer.

Biology Department recipients of the
Dr. Joe C. Jackson College of Graduate Studies and Research
Fall 2009 On-campus Grants

Troy Baird	$7500- Probing the consequences of mass male mortality, bright male hatchling coloration, and hormone-parasite-reproductive interactions in collared lizards
Chris Butler	$7500 – Migratory ecology of yellow rails.
Jim Bidlack	$6196- Harnessing solar energy using photosynthetic and organic pigments to generate voltage in photovoltaic cells.

Mel Vaughan	$6919- Effect of n-acetyl cysteine expression on the structure and function of Dupuytren's disease myofibroblasts.
Gloria Caddell	$7500 - Landscape-level mapping of eastern redcedar encroachment at the Selman Living Laboratory Brad Watkins (PI-Department of History and Geography, Gloria Caddell co-PI)

Meet the Faculty

Dr. Janice Countaway

I was born in a suburb of Boston, MA, a proud member of the Red Sox Nation. The first television ever brought into our home was purchased so that my dad and grandfather could watch Red Sox baseball. My parents raised me with the belief that the world was full of exciting possibilities. I was not the kid collecting insects or studying nature at a young age, my connection with science began with my introduction to the microscope and to the cell. I was intrigued by the complexity of structure and function, the wonder of so much being accomplished by components too small to see with the human eye. Thus began my journey that brought me to UCO.

My science education began as a zoology major at The University of Vermont. My focus on cell structure and function became prominent in my junior year, when I was able to enroll in upper-level electives. Upon graduation, my interest turned to the study of the structure-function relationships of biological molecules, although I was still very uncertain of my career goals. I accepted a position as a research technician at Massachusetts General Hospital, working on a project involving G-protein coupled receptors. Two years later, much wiser and vastly more mature, I enrolled as a graduate student in nutritional biochemistry at Cornell University in Ithaca, NY where I received an M.S. and a Ph.D. working on enzyme kinetics and glucose homeostasis.

In early 1988, I returned to Massachusetts for a post-doctoral position in the lab of Dr. Roger J. Davis at University of MA Medical Center, studying receptor-ligand binding and cell signaling. It was here that I met my husband. After several years, we made the bold move to San Diego and I went to work at a start-up biotech company. The project involved the study of extracellular matrix remodeling during wound healing. During this time I gave birth to my son. Life interrupted my science career and I took some time off to be a mom. My husband and I also took some time to evaluate our personal and professional goals and decided to make some changes that would enable us to achieve more balance in our lives. My husband applied for and was offered a job in Oklahoma City and we moved to Edmond. A few years of being a full time mom and settling into our new home was enough. I began teaching here at UCO as an adjunct in the chemistry department. Now I am honored to have a full time, non-tenure track position in the biology department. I have been from one coast to the other and my position here at UCO has made it all worthwhile. I enjoy teaching general biology (majors and non-majors) and cell biology. I also participate in a collaboration with Dr. David Dyer, Professor in the Department of Microbiology & Immunology at the University of Oklahoma Health Sciences Center, working on the Oklahoma Re-Annotation project (OKRA), established to develop skills in the field of bioinformatics.

Dr. Cari Deen

I was born in 1972 in Tulsa, Oklahoma. I grew up outside of Norman, Oklahoma as an only child surrounded by cats, chickens, guineas, geese, ducks, and all manner of wild animals that ended up on our doorstep. I remember learning the scientific names of the dinosaurs before I was old enough to read. From kindergarten onward, whenever we kids were asked what we wanted to be when we grew up, I always answered “biologist”. I always got a pat on the head and a “We’ll see”.
I graduated from Norman High in 1990, and matriculated at Scripps College in Claremont, California that fall. During my undergraduate work, I spent one semester at the University of Queensland in Brisbane, Australia. During my stay in Australia, I was lucky enough to volunteer for a graduate student who was studying lactation in red kangaroos. After tackling (literally) wild kangaroos in the outback during a field study, I was permanently and irrevocably hooked on field research. I came back to Scripps College and graduated with a Bachelor of Arts in Biology in the spring of 1994. After unsuccessfully

trying to find gainful employment in St. Louis, Missouri in my field with a Bachelor's degree for a year, I enrolled at the University of Oklahoma in the department of Zoology as a Master's student. I completed my Master's degree in 1999, and stayed on to complete my doctorate degree in 2006.

During my graduate work, much to my surprise, I found that I really enjoy teaching. I have taught courses in many subjects, but my favorite so far is physiology. Here at UCO, I have taught courses in general biology, human physiology, and the advanced mammalian physiologies. My research interests include: thermoregulation in reptiles and amphibians, the role of temperature acclimation and fever in thermoselection in reptiles, the role of energetics in thermoregulation of ectothermic animals, the role of temperature in development in amphibians, general physiological ecology, and general physiology. I hope to establish a research program here at UCO and to continue teaching physiology.

Student Activities

Undergraduate Research and Awards

See recent publications, presentations and meetings of the Southwestern Association of Naturalists, Oklahoma Academy of Science, and Research Day for Regional Universities for student research presentations. UCO students are asterisked (*) in those sections.

Recent graduate **Natalia Callard** was awarded a small grant of $245 from Golondrinas de las Americas to build nestboxes for Mangrove Swallows. She conducted an independent study (with **Dr. Chris Butler**) on the breeding biology of Mangrove Swallows.

Shay Still is an undergraduate working with **Dr. Brooke Stabler** doing research on distribution of salt cedar along Oklahoma waterways. Shay's work is funded through the LS-OKAMP program. Dr. Stabler is also working with students Brian Eastman, Long Dihn, and recent graduate Whittney Johnson investigating microhabitats occupied by Mediterranean geckos on the UCO campus.

Dr. Mel Vaughan is working with two McNair scholars this summer: Kiya Harrison and Shaquita Banks. Both are attempting to enhance myofibroblast formation through chemical-induced growth arrest of cells. Kiya is using curcumin; Shaquita is using indirubin.

Kim Koppari won Second Best Poster Award in Collegiate Academy competition at the Oklahoma Academy of Science technical meeting and Third Place for the Frank G. Brooks Award for Excellence in Student Research at the Tri-Beta regional meeting

Two undergraduate students were involved in bat ear research this spring with Dr. Bill Caire; Eileen E. Parks and Kirstin N. Allison. Kirstin was on an LS OKAMP Scholarship and Eileen was a volunteer.

INBRE, SURE-STEP, and SURE

Many of our students are involved in several nationally funded grant programs which promote success in both education and research: the National Science Foundation's SURE STEP grant (Supporting Undergraduate Research and Education for the Science, Technology, Engineering and Mathematics Talent Expansion Program) and the National Institutes of Health (NIH) funded INBRE (Oklahoma IdeA Network of Biomedical Research Excellence) grant for biomedical research. Our students also participate in SURE (Summer Undergraduate Research Experience), a research program funded by and held at the Oklahoma University Health Sciences Center (OUHSC). Many new students also participate in the summer bridge program, which introduces students to formal classroom lectures and research experience.

Summer undergraduate research at OUHSC and OMRF this year includes quite a few UCO students and faculty: Fourteen students will participate in the program, including the following Biology undergraduates:
INBRE: Tiffany Cloud, Halie Ferguson, Kim Koppari, Christian Mirabal, Tiffany Palmer, Charles Wilson and Brittany Zimmerman. Rebecca Sumner is working this summer under the NARCH (Native American Research Centers for

Health) program. In addition, Kim Coughlan, a student from Redlands Community College, is studying whether a preformed basement membrane will inhibit the invasiveness of keratinocytes that overexpress the oncogene H-ras. She's working with **Dr. Mel Vaughan** in the INBRE program. Kim Koppari and Tiffany Cloud, students of **Dr. Greg Wilson**, are also involved in the INBRE program this summer.

Dr. Vaughan is also working in the Summer Bridge program – incoming freshmen students will use three different assays to determine whether antioxidants affect myofibroblast formation.

Visit the SURE-STEP WebPage at UCO: http://cms.uco.edu/sure-step
Visit the INBRE website: http://okinbre.org/

Graduate Students

Currently there are 12 graduate students in the Biology department with 3 newcomers this past year. Newcomers include Erica Judd, who will be working with **Dr. Chris Butler**, Jocelyn Provo, working with **Dr. Beth Allan**, and Michelle Gerlosky, who will be working with **Dr. Michelle Haynie.** All three of these new grad students earned undergraduate degrees in the Biology department at UCO.

Rory Telemeco defended his master's thesis "Are reproductive life history traits of Australian three-lined skinks fixed or phenotypically plastic?" on April 17. Rory was our outstanding graduate student for 2008-2009. He will pursue his Ph.D. at Iowa State University.

Rory also won second place ($200) for the Graduate Student Research Award from the Herpetologists League at the annual meeting of the American Society of Herpetologists meeting in Montreal Canada for his paper entitled "Scincid lizards partly but not completely adjust to climate change".

Joanne Peterson defended her master's thesis on July 8th. She worked with Dr. Vaughan studying "The effects of replicative senescence and telomerase on the contraction and motility of fibroblasts".

Student Clubs

Pre-Med Health Professions Club

The Pre-Med/Health Professions Club, winner of the 2008 Vice President's Outstanding Organization Award, is still working to provide its members with an extraordinary extracurricular opportunity! We bring to the UCO campus speakers such as health professionals, graduate students, and admissions experts who give students insight into their professions and advice on acceptance into graduate programs. But, that's not all we do! The Pre-Med/Health Professions Club has also continued to take an exciting role in both the UCO campus and our community. Over the last year, the club participated in UCO student involvement fairs, the UCO Earth Day fair, home building with Habitat for Humanity, preparing dinners for the Ronald McDonald House, the American Cancer Society's Relay for Life, and collecting items for the Edmond Hope Center. Also, this spring semester the club participated in the OU-COM Mini-Med School and travelled to Tulsa for the OSU-COM Med-Xtravaganza. Thanks to the generosity of the OKC Kaplan Center and the engagement of our sponsor Dr. Anne Ewing, the club was able to provide our four most active members with free Kaplan test prep courses this year (that's two more than any previous year)! The recipients were Branden Carr, Alexandra Anyah, Arturo Federico, and Derek Pourtorkan. This year the club is focusing on continuing to provide students with valuable opportunities, but in addition, the club is working to assess its performance and improve opportunities for students interested in all health professions. The current officers are Suzie Ondak, Diep Pham, Philip Zrenda, Dan Foerester, Leighann Parham, and Joy Hammond. Access club information and updates through the Biology homepage, or now on Facebook!

Submitted by club president Suzie Ondak

Tri-Beta Biology Club and National Biological Honor Society

UCO's chapter of the Tri-Beta Biology Club, Psi Mu, had a fun-filled year. We started off the Fall 2008 semester with a meeting and were honored to have Alan Peoples and Keith Thomas from the Wildlife Department as our speakers. Our organization continued to host bi-monthly meetings for the remainder of the fall semester as well as the spring 2009 semester. We were excited to invite speakers such as Kristy Bradley, state epidemiologist; and Jay Villemarette, owner and president of Skulls Unlimited ®; as well as many other fabulous speakers. Our vice-president Kelly Smith did a fantastic job getting a variety of speakers to come talk with our organization. Tri-Beta participated in the Student Involvement Fair during Stampede week and we were able to expand our membership and introduce our organization to new students. One of the highlight events for our organization is to attend the Oklahoma Academy of Sciences Field Meetings each semester. In the fall it was held at Black Mesa State Park and in the spring it was held at Lake Eufaula State Park. Members attended both of these events and had a great time learning about the parks and spending time camping. In October 2008, officers and members took some time away from the class work and participated in a ropes course that was available on campus; it was a great friendship and team building activity. UCO's Selman Living Lab near Woodward Oklahoma is always in need of some tender loving care and Tri-Beta has always been there to lend a hand. This tradition continued for the Fall 2008 and Spring 2009 semesters with one service trip each semester. We installed bat houses and did a fair amount of clean up with help from other students and faculty from around Oklahoma. Many of our members participate in undergraduate and graduate research and presented their research at conferences such as Oklahoma Research Day, Texas Society of Mammalogists, Southwestern Association of Naturalists(SWAN), and the Federation of American Scientists in Experimental Biology(FASEB) National Meeting. We inducted a total of 18 new members to Tri-Beta National Honor Society as well as many new members to the Biology Club portion of our organization. Overall we had a fantastic year and anticipate what the new school year will bring!

Submitted by club president Kim Koppari

2008 Beta Beta Beta South-Central Regional Convention
University of Oklahoma Biological Research Station, Lake Texoma
April 3-5, 2009

Poster Presentations

*Chuckwuma, Sarah. Behavioral characteristics of myofibroblast populations.

*Cloud, Tiffany. Comparative phylogeography of multiple species of *Peromyscus* in the south-central United States.

Oral Presentations

*Bass, Courtney. Aquatic invertebrates of water-filled bracts in *Heliconia caribaea* from Saba.

*Koppari, Kimberly. Population genetic structure of hibernating cave myotis, *Myotis velifer*, from cave localities in northwestern Oklahoma.

*Smith, Kelly. Genetic diversity of striped skunk (*Mephitis mephitis*) populations throughout Oklahoma and Texas.

The 27th Annual College of Mathematics and Science Awards Banquet

Lothar Hornuff Field Biology Award ***Cody Braun***

Cody is a graduate of Edmond Memorial High School and transferred to UCO from SWOSU. He works as a research assistant for Dr. Troy Baird and does research on the behavioral ecology of Eastern collard lizards. Cody is an outstanding field biologist and plans on a career in conservation biology. He has presented his work at international meetings and is currently considering his options for graduate study and research.

Outstanding Biology Senior Student Award ***Dominika Kovacikava***

Dominika was born in Slovaskia but grew up in South Africa. She spent a year as a foreign exchange student in Brownsville, Texas during high school before coming to UCO to pursue her undergraduate degree in preparation for dental school. She was awarded a full tennis scholarship at UCO and was named NCAA All American Student Athlete for 2006, 2007, and 2008. Dominika graduated summa cum laude in May and will began studies at the OU Dental School this year.

Ethel Derrick Zoology Award ***Justin Case***

Justin moved from Texas to Oklahoma at the age of 11. He attended Piedmont Public School where he was involved in football, power lifting and wrestling. He also participated in various science projects in high school. Justin received a scholarship for football at Southern Nazarene University, but decided to join the Army National Guard instead. He started at UCO in spring of 2007 in kinesiology but loved zoology and decided to make Biology his major. He is a member of the Big Brother foundation and active in the UCO Pre-health Professions Club. His goal is to go to medical school and deploy overseas with the Army Medical Corps.

Biology Education Senior Award ***Charles Wustrack***

Charles' home town is Lone Grove, Oklahoma. He graduated from high school in St. Charles, Missouri in 1994. He attended St. Charles County Community College in St. Peters, Missouri and then Arkansas State University before enlisting in the U.S. Marine Corps in 1997. After honorable discharge in 2005 Charles moved to Oklahoma, attended Rose State College and then enrolled at UCO in 2006. He is currently student teaching at Choctaw High School. Charles has also received the UCO College of Education's Outstanding Secondary Education Major Award.

Outstanding Medical Technology Student Award ***DeShawn Lang***

DeShawn graduated from El Reno High School and from Prairie View A&M with a degree in Biology. She completed her upper division courses for a B.S. in Clinical Laboratory Science at UCO and her hospital internship at Comanche County Hospital in Lawton. The Clinical Laboratory Program director at Comanche County Hospital praised DeShawn as being an outstanding student and clinician.

Academic Achievement Award ***Dominika Kovacikava, Brittany Upshaw***

The UCO Biology Academic Achievement Award is presented to graduating senior student(s) who excelled throughout their academic career. In order to be considered for this recognition, a 4.0 GPA during the entire undergraduate studies must be maintained and at least 90 hours of coursework must be taken at UCO. Both of these students met those requirements, and both will be attending OU Dental School beginning this year.

Alumni

Alumni News

Amy Padgett-McCue (formerly Amy Sabolich), a 1996 graduate of the Biology Department at UCO, has been accepted into the Master's program at OUHSC Department of Biochemistry and Molecular Biology. She'll be working as a research assistant there beginning August of this year.

Dr. Jeanna Townsend touched base with us last fall. She graduated from UCO in May 2004 with a Biology degree. She subsequently attended the Parker College of Chiropractic where she earned a Doctorate in Chiropractic, A BS in Anatomy, and a BS in Health and Wellness. She's now back in Edmond and has opened a chiropractic clinic in town.

UCO BIOLOGY DEPARTMENT DONATIONS 2008-2009

The Department of Biology has received two significant gifts establishing the first endowed scholarships for the department over the 2008-09 academic year. **Cmdr. Craig Morin** established the Dr. Beverley Cox Endowed Scholarship for Biology. In addition, **Dr. Margaret Hamilton**, long time professor and mentor of the Department of Biology, left a generous gift through her will establishing the Dr. Margaret Hamilton Endowed Scholarship for Botany. With their love of this university, Cmdr. Craig Morin and Dr. Margaret Hamilton have left significant legacies for the students of the Department of Biology for years to come.

If you would like to make a gift to the Dr. Beverley Cox Endowed Scholarship for Biology or the Dr. Margaret Hamilton Endowed Scholarship for Botany, or would like to commemorate a professor, mentor, friend or family member by donating a tribute gift to establish an endowed scholarship or professorship, please contact Melody Hansen at (405) 974-3782 or mhansen5@uco.edu.

Donations to the Department of Biology since July 1, 2008:

Dr. Beverley Cox Endowed Scholarship for Biology, $10,000.00
Dr. Margaret Hamilton Endowed Scholarship for Botany, $89,921.88
Selman Living Laboratory, $540.55

Can you Help?

Growth of the biology department has been greatly facilitated by generous donations from our alumni over the years. As mentioned in the letter from the chair, we continue to grow. We've converted several storage areas into faculty offices, and have just finished converting one large office into several smaller ones. We have plans to build a new, small addition to Howell Hall to house some of the museum materials. The estimates for the new facility have come in, and they're higher than we expected. That's because special construction is needed for storage of combustibles, and many of the museum specimens are preserved in alcohol. The college has come up with some funds for us but we're still about two hundred thousand dollars short of what we need to complete the project. If you can help, please contact Dr. Hellack or Melody Hansen at (405) 974-3782 or mhansen5@uco.edu.

CONGRATULATIONS
to the following UCO Students, who have been accepted to these professional programs for the Fall Semester, 2009.

OSU College of Osteopathic Medicine
Cox, Jessica
Figueiredo, Michael
Lynch, Ben
Owen, Stephanie
Pourtorkan, Arvin
Snyder, Chris

Des Moines University – College of Osteopathic Medicine
Gentry, James

OU College of Medicine
Figueiredo, Michael
Lynch, Ben
Owen, Stephanie
Standlee, Loren
Wilson, Justin

OU College of Dentistry
Crowley, Patrick
Kovacikova, Dominika
Snyder, Chris
Trefonov, Anton
Turpin, Ashlea
Upshaw, Brittany

OU College of Pharmacy
Berepele, Iminabo
Gunter, Katie
Mushili, Mumba
Rhymer, Kim
Weissinger, Chad

OU Physician's Assistant Prog.
Boothe, Jessica
Howell, Candice "Nikki"

OU Occupational Therapy Program
Vogt, Laura

OU Radiography Program
Goode, Shamira

Uniformed Services Univ. Medical School
Standlee, Loren

Arizona Midwestern Podiatric Medical School
Pourtorkan, Arvin

Scholl College of Podiatric Medicine
Pourtorkan, Arvin

Ohio College of Podiatric Medicine
Pourtorkan, Arvin

Rocky Vista University –College of Osteopathic Medicine
Snyder, Chris

St. Francis Hospital – Medical Technology Program
Curtis, Matthew
White, Melanie

Valley View Hospital – Medical Technology Program
O'Neal, Sara "Bri"

LECOM – School of Pharmacy
Berepele, Iminabo

Pacific Northwest University of Health Science
Miller, David

SWOSU – College of Pharmacy
Armstrong, Isiaho
Rhymer, Kim