Lewis & Clark College
Portland, Oregon USA
Biology

Fall 2009, Volume 1, Issue 2

Fall 2009 Seminar Series

September
23rd
Determinants of age at dispersal and settlement pattern in the Belding's ground squirrel, *Spermophilus beldingii*
Dr. Eva-Maria Muecke
Visiting Professor of Biology, Lewis & Clark College

October
21st
Fungal Floral Mimicry
Dr. Bitty Roy
University of Oregon

28th
Making sense of adaptation: The biochemical and biophysical basis of adaptation in hair cells
Dr. Fernan Jaramillo
Lewis & Clark Visiting Scholar

November
11th
Microbial ecology of Oregon forest soils
Dr. David Myrold
Oregon State University

23rd
Jobs in Biology: Summer and Beyond
Dr. Paulette Bierzychudek
Lewis & Clark College

December
2nd
Law, Conservation Biology, and Climate Change
Dr. Dan Rohlf
Lewis & Clark Law School

3rd
Developing a fish-eye view: Genetic patterning of the retina shapes the visual map in the brain
Renee Bend ('02),
graduate student, U. of Utah

All seminars are free and open to the public. They are a great way to meet faculty, current biology majors, and researchers in the NW community.

Light refreshments provided.

Faculty News

Visiting Faculty
Fernan Jaramillo, distinguished visiting Neuroscience scholar, is on campus fall semester to help L&C faculty develop a neuroscience program, and to teach Bio 490, Special Topics in Neuroscience. Prof. Jaramillo is a professor at Carleton College; he studies how nervous systems acquire, process, and relay information.

Jason Merwin, visiting assistant professor of biology, is teaching the Molecular Biology lab course and Cell Biology in fall semester and Bio 200 in spring semester.

Eva-Maria Muecke, adjunct faculty member, is teaching Mammalogy and Bio 141 lab in fall semester and Bio 100 and Bio 151 lab in spring semester. The theme of her Bio 100 course is behavioral ecology. Dr. Muecke is a behavioral ecologist who studies squirrel behavior and life history.

Bianca Breland, adjunct faculty member, will teach Plant Biology and Evolution in spring semester. She completed her doctorate in 2008 at U. Colorado, Boulder in plant evolutionary ecology.

Sabbaticals 2009-2010
Greta Binford was awarded tenure this summer and is on sabbatical for the 2009-2010 school year. During this time she is continuing her research on the biogeography of spiders related to the brown recluse and on venom evolution in this group. She is spending some time collecting spiders in various places around the globe. She is also traveling to China to develop an environmental studies component for a Lewis & Clark overseas course.

Greg Hermann is spending the year on sabbatical, working in his research lab with 7 Lewis & Clark College students. The lab's work is focused on characterizing the genes and mechanisms involved in the formation of lysosomes in *C. elegans*. This summer 5 Lewis & Clark College students presented their work at the International *C. elegans* research meeting.

Deborah Lycan will be on sabbatical in the spring of 09/10 where she will join the lab of Dr. Arlen Johnson at U, of Texas, Austin.

Awards, Publications, & Research
Kellar Autumn published 4 papers last year. His new NSF grant began in August. The project is titled, "Comparative micromechanics of gecko setae: effects of rate, substrate, and environment" and focuses on identifying general, testable principles underlying the extraordinary attachment system that geckos use to climb.

Paulette Bierzychudek is back from a sabbatical year in which she focused on her research on habitat restoration for the Oregon

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Senior Thesis Research

The biology department is proud to have four seniors conducting a yearlong senior research thesis. Their projects:

Micah Depper is investigating the formation of crystalline granules in the gut cells of *C. elegans*, a highly regulated developmental process. Using various genetic techniques he hopes to elucidate the genetic pathways involved in this accumulation and its physiological importance to the worm. Micah's thesis advisor is Dr. Hermann.

Steven Levitte is investigating the mechanisms that control organelle size, using the *C. elegans* gut granule as a model compartment. He uses genetic and cellular approaches to characterize compartment responses to changes in the intracellular environment. Steven's thesis advisor is Dr. Hermann.

Anne McHugh spent the summer collecting butterflies across Oregon. Using the DNA of these specimens, she is creating a molecular "family tree" of the genus *Speyeria.* By including the threatened Oregon Silverspot butterfly in the family tree, Anne hopes to provide the ongoing conservation effort with evolutionary context. Anne's thesis advisors are Dr. Bierzychudek and Dr. Binford.

Becca Salesky is investigating the function of a novel gene believed to be involved in the formation of lysosome-related organelles. Using a variety of molecular techniques, she will assess the effect of a mutation in this gene on the formation of lysosome-related organelles in the small soil nematode *Caenorhabditis elegans.* Becca's thesis advisor is Dr. Hermann.

Want to learn more about senior thesis requirements? Download the "Writing a Senior Thesis" PDF from our website:
http://www.lclark.edu/college/departments/biology/student_resources/policies/

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Science Without Limits Symposium

In keeping with Lewis & Clark's development of a neuroscience concentration and our ongoing desire to expand educational opportunities and information beyond the L & C campus, the 2009 Science Without Limits Symposium had a neuroscience theme. Keynote speaker, Dr. V. Ramachandran, MD, PhD, a highly acclaimed neuroscientist from University of California at San Diego, presented the Keynote Address on September 15th, titled "Behavior, Perception, and the Brain." He also took part in a Panel Discussion: *Innovations in Neuroscience from the Lab to the Clinic."

A panel of distinguished scholars discussed how cutting-edge research on topics from phantom limbs to the mechanics of hearing can be used to treat patients.

To read more about Lewis & Clark's Neuroscience Initiative please visit the HHMI web page http://www.lclark.edu/college/programs/hhmi_collaborative_research/neuroscience_initiative/

Faculty News cont'd

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silverspot butterfly in the coastal grassland at Cascade Head. She and her technician Katy Warner developed a mathematical model describing the movement of silverspot larvae as they search for host plants. She's Biology Department Chair this year.
Prof. Bierzychudek published 3 papers last year, one of which was co-authored by Lewis & Clark students, Anne McHugh and Laura Thomas. Their discovery that larval butterflies cannot detect their host plants from even 10 cm away, and that instead they stumble into their food by random chance, was reported in *Ecological Entomology*. An article about co-authoring scientific papers with students appeared in the Fall 2009 issue of the *Council on Undergraduate Research's Quarterly*.

Ken Clifton has published two papers on reproductive timing in coral reef habitats and continues to be an active member of the coral reef research community as a reviewer of grants and manuscripts. Last summer he was busy with continued study of the effects of elevated CO_2 on calcified algae while also working with colleagues to develop an interdisciplinary science course for pre-majors. That course is being offered for the first time in the spring of 2010. In August he departed for East Africa to assume leadership of the annual overseas program to that region.

Peter Kennedy published a paper entitled "Root tip competition among ectomycorrhizal fungi: are priority effects the rule or an exception?" This study examined temporal and spatial mechanisms of competition among fungi colonizing seedling roots. Two other papers on the root symbiosis between *Alnus rubra* (red alder) and *Frankia*, a group of nitrogen-fixing bacteria, have also recently been submitted for publication with three LC undergraduate co-authors. Research on the *A. rubra-Frankia* symbiosis last summer took place with the assistance of a Rogers Research Fellowship student, a Beckmann Foundation student scholar, and a teacher at West Linn High School, through the Murdock Charitable Trust's "Partners in Science" program. Two other summer Rogers research students also worked on further examining the dynamics of ectomycorrhizal competition. Turin Hill presented the results of her senior thesis research on the ectomycorrhizal fungi associated with *A. rubra* at the Mycological Society of America national meeting in Utah. Students affiliated with the Kennedy lab have recently been accepted into graduate ecology programs at Cornell University, Oregon State University, and medical school at the University of Washington.

Deborah Lycan had two students working in her lab last summer- Becca Fitch is now a junior Biology major and a Pamplin Fellow, and James Chu is a senior BCMB major. This spring, Dr. Lycan is preparing a manuscript on the role of Ltv1 in 40S ribosome subunit maturation for publication this summer.

Gary Reiness spent the 2008-9 year on sabbatical leave, mostly conducting research on the movement of neurotrophic proteins in cells at Oregon Health and Science University in the laboratory of Dr. Caroline Enns. LC students Kenneth McCullough '10 and Alix Dixon '11 joined him on the project during the summer of 2009.
Dr. Reiness also spent over a month in the national office of Project Kaleidoscope (PKAL) in Washington, DC. At PKAL, a national consortium that aims to improve undergraduate mathematics and science education, he helped to write a guide to effective teaching strategies and prepare a grant proposal to the National Science Foundation to extend PKAL's efforts. In July, he attended a conference, also in Washington, DC, on Transforming Undergraduate Biology Education, where he presented a poster describing Lewis & Clark's Biology Department's emphasis on research in biology across the curriculum.
He also found time to squeeze in some backpacking trips to the Beartooth Wilderness and Canyonlands National Park, and to do some cross country skiing on Mt. Rainier at Christmastime. In Fall 2009, he returned to Lewis & Clark and taught Biology 100 for nonmajors. He is developing a new introductory course in Neuroscience with colleagues in Psychology.

HHMI Grant Received

Lewis & Clark has received a 4-year, $1.3 million grant from the Howard Hughes Medical Institute to support collaborative approaches to undergraduate science education. The grant supports student research, aims to broaden access to science, and provides funds for the development of new interdisciplinary science courses. New courses include "Origins of Life in the Universe," a course designed for non-science majors and team-taught by Prof. Ken Clifton, Prof. Liz Safran in Geology, Prof. Steven Tufte in Physics, and Prof. Niko Loening in Chemistry. It will be offered for the first time in Spring 2010.

The HHMI grant also supported the Science Without Limits Symposium (described above). To find out more about the HHMI grant and the various initiatives it supports, please visit the HHMI web page http://www.lclark.edu/college/programs/hhmi_collaborative_research/