

AUGUSTANA

DEPARTMENT OF BIOLOGY

GREETINGS FROM THE DEPARTMENT CHAIR

This fall we welcomed 81 new biology majors to the department giving us a current total of 222 Biology majors at Augustana! Yes, that is a lot of excellent students. In fact, in the last 5 years, we have averaged 80-100 more biology majors than we had prior to 2006. We are proud that, more than

earned his Ph.D. from the University of Tulsa. Dan teaches Introductory Biology, Insect Ecology, Evolution and Behavioral Ecology. His research is focused on the evolution of behavior, with a special interest in animal communication, mating systems and neuroethology. Dr. Seasson Vitiello is serving as our geneticist in the



Biology Department Members: L to R: (back) Craig Spencer, Ann Schaeftbauer, Paul Eglund, Brenda Rieger, Dan Howard, and Mark Larson; (middle) Mike Chapman, Amy Lewis, Ann Vogelmann, Libby King, and Jennifer Gubbels; (front) Cheryl Holzapfel, Val Olness, Seasson Vitiello, and Joan Phillips

ever, people recognize our department as a great place to study biology.

One of the biggest changes in the department this year has involved our Biology Department personnel. First, we wished Dr. Mike Wanous luck as he left the department after 13 years to serve as the Associate Academic Dean at Augustana. We are glad that he is still here on campus, but miss having him here in the department.

This fall, we welcomed two new faculty members to the department. Dr. Dan Howard joined us from the University of Toronto where he was a postdoctoral fellow in the Integrative Behaviour and Neuroscience Laboratory. He

absence of Mike Wanous. She teaches Genetics, Molecular Biology, Cell Biology, Cell Signaling and Biology and Human Concerns. Her research focuses on using molecular yeast genetics to study cystinosis, a pediatric lysosomal storage disorder. Seasson received her Ph.D. in Biochemistry from the University of Rochester School of Medicine and Dentistry, followed by post-doctoral research there and at Sanford Research/USD.

In addition to our new faculty, Ann Schaeftbauer has joined the Biology Department to provide much needed secretarial support.

[continue article on page 2](#)

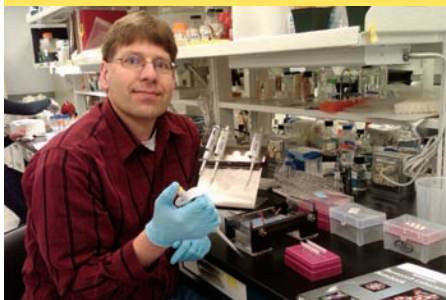
NEWSLETTER



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Biology Professor Receives Grant to Work at Cornell University

Dr. Seven Matzner has been working at Cornell University and the Boyce Thompson Institute for Plant Research at Cornell since September. His work is funded by a sabbatical grant from the USDA



Steve Matzner, plant physiologist, is learning cutting-edge techniques to study plant epigenetics.

to work on epigenetic regulation of water use efficiency in tomatoes. Dr. Matzner's grant includes funding for two Augustana students to assist in his sabbatical research at Boyce Thompson/Cornell. Epigenetic regulation involves modification to DNA that enables or prevents genes from being expressed (without changing the underlying genetic code). In essence, different groups of genes can be turned on or off in response to various environmental conditions. This is Dr. Matzner's first foray into molecular research methods and he has quickly learned to wield a mean pipette. During his postdoctoral work, Dr. Matzner was at the Boyce Thompson Institute (although with different researchers). It is a cutting edge research environment and Dr. Matzner hopes to establish collaborations that enable more students to conduct research in New York.

DEPARTMENT CHAIR continued...

Ann has a background in education and is also an Augustana-trained nurse. With the increased number of students and amount of activity in Biology, we certainly have appreciated the support that Ann provides.

The last semester was especially busy in the department with searches for two tenure-track faculty members. One search was to fill the position currently occupied by Dr. Val Olness, as Val is retiring following the Spring of 2011. We are very fortunate to have hired Carrie Hall to fill the position. Carrie will be getting her Ph.D. in Biology with a minor in Science Education from Idaho State in April of 2011. In addition to a focus in science education, Carrie has a background in biochemistry and conservation biology. She looks forward to involving education majors in ecological field experiences that can be integrated into K-12 classrooms.

The other faculty search in the

department was due to the demands of the increase in students, both majors and non-majors enrolled in Biology courses. We think of this as filling the position left vacant after Dr. Gil Blankespoor's retirement in 2002. This position has been filled by Dr. Cecelia Miles. Cecelia, a developmental biologist, earned her Ph.D. in zoology from the University of Florida and is currently a postdoctoral fellow at the University of Chicago. She will be teaching courses including Developmental Biology and Embryology. We are pleased to have Cecelia join the department. Her research interest lies in spatial patterning in development.

Dr. Steve Matzner is currently on sabbatical at Cornell University in Ithaca, NY. I, especially, have missed having Steve here since I am taking his place as the Department Chair in his absence! Steve left the department in great shape and will resume Department Chair position when he returns.

We hope this finds you well. Please stop by the Biology Department when you are in the area.

Paul Eglund

DEPARTMENT FACULTY, STAFF & EMERITI

Faculty

Paul Eglund paul.egland@augie.edu Microbiology
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Mark Larson mark.larson@augie.edu Cell Biology
Amy Lewis amy.lewis@augie.edu Ornithology
Steve Matzner steven.matzner@augie.edu Plant Physiology
Val Olness val.olness@augie.edu Science Education
Craig Spencer craig.spencer@augie.edu Aquatic Ecology
Ann Vogelmann ann.vogelmann@augie.edu Botany; Human Anatomy
Season Vitiello season.vitiello@augie.edu Genetics; Molecular Biology

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DR. OLNES RETIRES FROM AUGUSTANA

A 2010-2011 Science Education Update

A final *Cliff Notes* version on the current status of secondary science education at Augustana. I am retiring from full-time teaching at the end of this semester!!! However, I will be returning to teach one course – Physical Geography/Earth Science – I couldn't quite cut the umbilical cord entirely!!

So – I get one last shot at “braggin’ rights” in our production of knowledgeable teachers who are accomplished in the constructivist epistemology AND who are able to pass the PRAXIS licensing “tests” to identify “highly qualified teachers” – both in content and pedagogy. If you recall from previous *Cliff Notes*, the successful completion of these professional assessments is now required for every education major, both elementary and secondary, before a state license can be issued. So, we can PREPARE them to teach through their four (or five) years at Augie but, until they have cracked the passing score on the respective PRAXIS tests, they cannot teach! But all of our secondary science education majors pass with flying colors – a testament to the quality of our students as well as our program!!

Currently, we have ten graduates



teaching in the Sioux Falls and surrounding school districts and five in towns close by - in fact one of the ‘new cadre’ of future teachers was inspired to become a teacher by one of the ‘old cadre’ – yikes...I’ve been here THAT long?! But, lest you think that we don’t share our talented teachers, we have “representatives” in Texas, Nebraska, Wisconsin, Iowa, California, and several in Minnesota – one of whom did a three year hitch in Myanmar (Burma) at the International School there!! To say I am proud of all of their accomplishments would be an understatement...so thanks to all of them for making my time at Augustana so rewarding!!

My “sheep rancher” husband and I are celebrating my “retirement” and our forty-eighth wedding anniversary by taking a trip to New Zealand, by way of Fiji, this autumn. I figure I have one *long* trip left in me....

We continue to have to dig ourselves out from the eternal snowstorms and bail our way out of the spring flooding but hey...the price of corn was at an all time high!!

My very final quote, one which we probably should all try to live by in these troubled times: *There are two types of people – those who come in to a room and say, “Well, here I am,” and those who come in and say, “Ah, there you are.”*
–Frederick Collins

Valerie Olness

2010 BIOLOGY PUBLICATIONS

The year 2010 turned out to be a great one for publications for two of our faculty members in the Biology Department along with collaborators from other institutions. Papers accepted for publication or already published include the following:

Jenny Gubbels had a paper published in *Molecular Cancer* (Gubbels et al., 2010 Jan 9:11) that was the final data paper to be published from her dissertation from the University of Wisconsin-Madison.

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Congratulations to the 2010-2011 Scholarship Recipients

Sven G. Froiland Scholarship in Biology:

Michelle Erhardt	Benson, MN
Samuel Evenson	Sioux Falls
Carl Hjelmén	Garretson
Dane Rasmussen	Aberdeen
Andrea Sherman	Sioux Falls

Will Rosine Memorial Scholarship:

Natalie Ronning	Rapid City
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Dilwyn Rogers Ecology Scholarship:

Natalie Ronning	Rapid City
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Stalheim-Smith Biology Teaching Scholarship:

Kathryn Buyck	Danvers, MN
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Y.T. Johnson Pre-Medical School Scholarship:

MacKenzie Beukelman
Sioux Falls

Rebecka Bogue	Beresford
Matthew Braithwaite	Sioux Falls
Alexandra Burke	Watertown
Elizabeth Helsper	Brookings
John Hokanson	Cottonwood, MN

Rachel Hurley	Canton
Brian Juber	Worthington
Laura Leckband	Ocheyedan, IA
Luke Lynass	Sturgis
Jacquelyn Miles	Tea
Maricia (Pick) Pronk	Edgerton, MN

Michael Reopelle	Sioux Falls
Rebecca Schieffer	Parkston
Kyle Tamminga	Rochester, MN
Kelsey Wolter	Webster

PUBLICATIONS continued...

This paper described the property of a large protein (MUC16) present on ovarian cancer cells to inhibit immune cell binding to the cancer cell, thus showing another way that cancer evades the immune system.

Gubbels first review article was published in the *Journal of Ovarian Research* (Gubbels et al., 2010 3:8) that stemmed from the introductory chapter of her dissertation on ovarian cancer.

She also had a paper published in *Molecular Cancer* (Belisle et al., 2010 May 9(1):118.) This was also work that she had done at the University of Wisconsin-Madison, and involved work that showed soluble MUC16 (a protein over-expressed by ovarian cancer cells) can bind to and directly inhibit immune cells.

Mark Larson had a paper published in the *Journal of Cell Biology* (Thon et al., 191:861-74) with his collaborators at the Brigham and Women's Hospital/Harvard Medical School. The paper stems from his summer of 2009 research on-site in Boston. The paper describes for the first time the final stages of platelet maturation following their release from precursor cells called megakaryocytes.

Larson also had a paper published in the journal *Prostaglandins, Leukotrienes, and Essential Fatty Acids* (Block et al., 82:87-95) with collaborators at the University of Rochester (NY) and Sanford Health. This paper made use of data generated from small clinical trials carried out at Augustana in 2008 and 2009, and it examined the effects of omega-3 fatty acid consumption on plasma lipid levels.

BIOLOGY SEMINAR SERIES

Each semester we host several research seminars covering a broad range of current biological topics. It's designed to provide opportunities for students and faculty to interact with scientists from other institutions. Seminars are free and open

to the public.

Check the Biology Department home page for periodic updates. To receive the schedule for each semester, send your email address to:
cheryl.holzapfel@augie.edu

PLANS FOR THE GILBERT SCIENCE COMPLEX

Augustana is in the quiet phase of a \$30 million campaign to construct a new laboratory and research wing connected to the existing Gilbert Science Center (GSC). The new facility will result in the Gilbert Science **Center Complex**.

The GSC facility has served our campus well since 1966. Yet today, the Natural Science Division is in dire need of

molecular research. This integration of research and teaching lab space will allow us to expose more students than ever to our research and more effectively utilize the research grade equipment for teaching our courses. Another key feature is a dedicated nursing education wing, complete with a nursing simulation laboratory to provide cutting-edge teaching technology.



Artist rendering of the New Gilbert Science Complex from 33rd and Summit.

expanded and updated facilities. The sciences at Augustana have out grown the current GSC in every way. Our challenge is to provide our students, faculty and state-of-the-art equipment with a safe, reliable and highly functional facility that reflects the quality of education that occurs at Augustana.

In the first phase of the project, Augustana will build a new 89,000 sq. ft. space connecting the existing north and west wings. Key elements of the \$30 million new construction include integrated teaching and research laboratories for biological and chemical sciences, complete with specialized areas for tissue culture, microscopy and

In the second phase of the project, the College will renovate the existing 86,000 sq. ft. facility to provide modern classrooms and offices, as well as new physics and computer science laboratories. These additional and modern spaces will allow for further growth of programs and the strong research base established by faculty.

The Gilbert Science Complex project is the number-one fund raising priority of College President, Rob Oliver, our Office of Development, the Board of Trustees and Volunteer Campaign Leadership.

STUDY ABROAD COURSES TO CENTRAL AMERICA AND NEW ZEALAND

The Biology Department has a long history of encouraging study abroad opportunities and other off-campus study programs. The length of study can range from a month to a semester to an academic year.

Tropical Ecology of Guatemala, Belize, and Spanish Immersion

During the 2011 J-Term, eight biology students had the opportunity to study tropical ecology and español in Central America. Led by Dr. Craig Spencer and



J-Term 2011 Class trekking through the Bio-Itzá Rainforest Reserve.

philosophy professor Dr. David O'Hara, the students studied coral reefs in Belize for a short while, but spent most of their time in northern Guatemala with a non-profit organization called Bio-Itzá. This amazing organization of local indigenous Mayan people is dedicated to rescuing the ancestral knowledge and traditions of the Maya Itzá culture and associated tropical forests in Guatemala Tikal Peten. While living with host families in the village of San José, they spent considerable time trekking through the rainforest experiencing first-hand these incredible ecosystems as well as very real issues of the poaching of timber, wildlife, and Mayan artifacts.

This was the fourth course with Bio-Itzá and the relationship deepens each time. It's like having a part of the Augie family in Guatemala. Last October, Augustana hosted the Assistant Director of Bio-Itzá (Adérito Tesucún) at Augustana for an incredible week of guest lectures and field trips. Since he had done the same for Augustana students in his country, Aderito was treated to some of South Dakota's best as

part of the annual fall ecology class field trip to the Black Hills and Badlands—see photo of Aderito, second from left, with the Ecology class, camping in the Badlands.

Last summer Luke Lynass ('12) a veteran of our 2010 course in Guatemala made a website on behalf of Bio-Itzá, www.bio.itza.com. Most of the photos include Augustana students. Please check it out and spread the word to people who might be interested in a Spanish immersion experience in a tranquil village in the heart of the tropical forests of northern Guatemala (cost: \$160/week for room, board, one-on-one Spanish instruction, and excursions to the rainforests, Tikal, etc.)

Explorations in Aotearoa I: The Biogeography and Culture of the New Zealand North Island

Drs. Dan Howard and Carrie Hall are offering this interdisciplinary course during the January 3-26th, 2012, Interim. It is designed to

immerse the students in an interactive study of the unique biogeography and indigenous culture of the North Island of New Zealand. New Zealand exhibits levels of biological endemism unrivaled across the globe. Students will

conduct both qualitative and quantitative investigations designed to increase their understanding of the evolutionary and historical events that shaped the natural and human history of this island. During the course, students will attend traditional dance performance and experience traditional food at a Maori hangi (feast). They will explore the biogeography, ecology and evolution of the island flora and fauna through hands-on field



Bio-Itzá Director, Adérito Tesucún, camped this fall with the ecology class on a field trip to the Black Hills and Badlands to share some of South Dakota's best.

exercises at multiple locations. The last week of the course will be spent on Matiu/Somes Island conducting biological research focused on increasing our understanding of the evolution of acoustic and vibrational communication in New Zealand insects. For additional information or for a course syllabus, see the Augustana website www.augie.edu or email Dr. Howard directly at daniel.howard@augie.edu.

New Biology Faculty Profiles

Dr. Carrie Hall

Start Date: Fall 2011

Teaching: General Biology courses, Education Methods and Biology for Education Majors

Research Interests: Efficacy of hands-on teaching and learning strategies, conservation biology

Education: PhD in Biology, minor in Science Education, Idaho State

Dr. Cecelia Miles

Start Date: Fall 2011

Teaching: General Biology courses, Developmental Biology and Embryology

Research Interests: Spatial patterning in development

Education: Ph.D. in Zoology, University of Florida

FACULTY RESEARCH PROJECTS



Paul Mallory ('12) and Dane Rasmussen ('13) are preparing samples for sequencing reactions to identify oral bacteria.

Paul Eglund: "Interspecies signaling in oral bacterial communities." Dental plaque is a bacterial community composed of 100's of species that interact with each other. Eglund and students worked to understand the changes in gene expression caused by these interactions.

Funding: NIH-INBRE

Students: Paul Mallory ('12), Dane Rasmussen ('13)

Mark Larson: "Examining the effects of exogenous omega-3 fatty acids on platelet membranes and platelet function." Omega-3 fatty acids from oily fish are known to reduce the risk for adverse cardiovascular events. In order to better understand the mechanism of these preventative events, Dr. Larson and his students examined if the fatty acids could be directly added to the platelet membrane, and tested the effects of this addition on platelet function.

Funding: NIH-INBRE

Students: Mercedes Hodges ('12)

23 Additional Biology Majors Participated in Summer Research & Internships at these Locations

- Harvard-MIT, Division of Health Science & Tech
- Mayo Clinic, Rochester
- National Institute of Health, Bethesda, MD
- University of California, San Diego
- University of Iowa
- University of Minnesota
- Sanford Research/USD, Sioux Falls
- USD Sanford School of Medicine, Vermillion
- Avera Research Institute/ USDSSM/V, Sioux Falls
- South Dakota State University, Brookings
- SD Department of Health, Pierre
- Great Plains Zoo, Sioux Falls
- Colorado Game Fish & Parks
- Santo Domingo, Dominican Republic



Ecology class at work in Newton Hills State Park to test burning as a control mechanism for sumac

Craig Spencer: "Prairie Restoration and Sumac control studies at Newton Hills State Park." We are restoring native prairie vegetation at Newton Hills State Park. Ecology classes are clearing trees and brush, collecting and planting native grasses and forbs (service learning.) Summer research includes testing various sumac control techniques: cutting, burning, and selective herbicide use.

Funding: Biology Department; Augustana Service Learning Grant

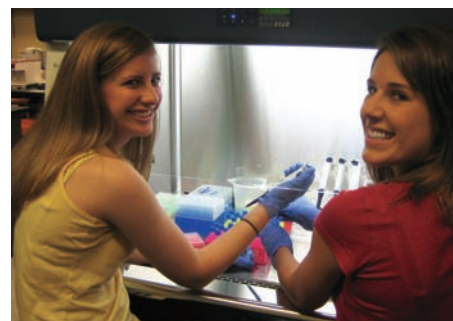
Students: Luke Lynass ('12); Principles of Ecology students

Steve Matzner: "Effect of stem flexing on xylem vessel size in two contrasting *Phaseolus vulgaris* cultivars." Recent work has indicated a link between plant drought tolerance and stem strength (defined by stem density and cell wall thickness.) Dr. Matzner and his students' work sought to understand the relationships and tradeoffs between drought tolerance, cell wall thickness and xylem vessel size in two common bean cultivars.

Funding: USDA and Augustana Research and Artist Fund

Student: Natalie Ronning ('11)

Jennifer Gubbels: "Examination of the functions of MUC16 and SUSD2 as metastatic proteins in epithelial ovarian cancer." Ovarian cancer over-expresses many different proteins that are minimally expressed in normal tissues, including the proteins MUC16 and SUSD2. The Gubbels' lab is focused on how these proteins contribute to the protection of the tumor cells from immune attack and thus the role of the protein in facilitating metastasis.



Jackie Miles ('12) and Kristina Roth ('12) prepare ovarian cancer tumor cells which will be analyzed by the flow cytometer.

Funding: NIH-INBRE

Students: Jackie Miles ('12), Kristina Roth ('12)

2010 ADMISSIONS TO PROFESSIONAL AND GRADUATE PROGRAMS

BIOLOGY MAJORS

GRADUATE PROGRAMS

Rebecca Sue Johnson	Creighton University, NE M. A. Program, Anatomy & Neurobiology
Neil Patel	University of Vermont, Burlington (Fellowship) Ph.D. Program, Chemistry
Eric Ransom	University of Iowa (Fellowship) Ph.D. Program, Microbiology
Kathryn Severson ('08)	Pennsylvania State University (Scholarship) Accelerated BSN/MSN Program, Nursing
Jillian Tholen	University of Minnesota, Twin Cities (Fellowship) Ph.D. Program, Nutrition

MEDICINE

Aaron Burkhardt ('07)	Kansas City University of Medicine & Biosciences
Kayla Graber	Sanford USDSOM
Benjamin Jensen	Sanford USDSOM (Scholarships: Sanford School of Medicine and William Edwin & Anna H. Wallar)
Nicholas Kaufman	Sanford USDSOM
Laura Mandler ('09)	Sanford USDSOM
Aron Merchen ('08)	Sanford USDSOM
Matthew Moldan	University of Minnesota, Twin Cities
Neil Patel	University of Vermont, Burlington
Emily Thornton	Sanford USDSOM
Austin Vande Berg	Sanford USDSOM

DENTISTRY

Jonathan Held	Creighton University, NE
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CHIROPRACTIC

Zephania Skow	Northwestern Health Sciences University, MN
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PHYSICIAN ASSISTANT (DOCTORATE PROGRAM)

Derek Harmon	University of South Dakota
Amber Krikke	University of Nebraska Medical Center

PHYSICAL THERAPY

Karin Costin	Creighton University, NE
Erika Graslie	Regis University, CO

OPTOMETRY (DOCTORATE PROGRAM)

Mark Buboltz	Illinois College of Optometry
Claire Kosters	University of California, Berkeley (Berkeley Optometry School Scholarship)

OCCUPATIONAL THERAPY

Elizabeth (Kaspar) Franken ('06)	University of South Dakota
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New Computer-Based Systems for Human Physiology Labs

The Biology Department has upgraded our teaching equipment for physiology teaching labs. Gone are the unigraphs and the finger ergometers that served hundreds of students well over many years. These items have been replaced by a computer-based system called iWorx. The iWorx system has the capability of performing many different physiological measurements, including: grip strength, muscle twitch, heart rate, ECG, respiration, and EEGs. We have purchased 6 independent iWorx systems and laptop



Testing grip strength with the new iWorx equipment are Laura Goemann ('12) and Jackie Miles ('12).

computers that are used by student groups in our two physiology courses, Human Physiology and a new upper-level Advanced Human Physiology. We have mastered the basics of the technology and are expanding into new experiments that we can do with this equipment that will give our students a broader knowledge and appreciation for human physiology, as well as experience in designing their own experiments.

Nine students from other academic majors were also accepted into health related graduate and professional schools in 2010.



Alex Natwick ('13) working on new equipment.



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Thanks Contributors

Gifts from alumni and friends of the Biology Department make a difference to us and to our students every year. For example, this year we used gift money to purchase high-resolution recorders and a digitizer for analysis of data generated by Dan Howard's Insect Ecology students. We also used gift money to fund undergraduate summer researchers. Thanks to all of you that contributed to the Department. Your gifts make a big impact on our program.

2010-2011 BIOLOGY ALUMNI FILE UPDATE

If you have accomplishments and/or changes in your life, we would like to know! Help us keep our alumni file up-to-date and take a minute to fill out the form below.

Name: _____
FIRST MAIDEN MARRIED

Year Graduated: _____ Phone: _____

Address: _____

Email: _____

Occupation/Place of Employment: _____

Graduate/Professional School Preparation in Progress or Completed: _____

Personal News/Professional News you want us to know: _____

If you know of potential students for Augustana College, please provide us with their name, address and phone number so that we may contact them.

Name: _____

Address: _____

Phone: _____

Name: _____

Address: _____

Phone: _____

Mail to: **Department of Biology**
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Sioux Falls, SD 57197

Or email information to: cheryl.holzapfel@augie.edu