

DEPARTMENT OF BIOLOGY ANNUAL ALUMNI NEWSLETTER

Summer 2006

FROM THE DEPARTMENT CHAIR ...

It has been a very eventful year for the Augustana Biology Department! We started the fall with two faculty searches, one for a Cell Biologist-Biochemist to replace Deb Carlson, and one for an Evolutionary Developmental Biologist to replace Lee Johnson. I am very happy to report that we have hired two outstanding individuals. Dr. Laura Beaster-Jones will be joining us in the "Evo-Devo" position, and Dr. Mark Larson will be our new Cell Biologist-Biochemist. Laura Beaster-Jones received her undergraduate degree from Whitman College, and her Ph.D. from the University of Illinois at Chicago. She did postdoctoral work at the Scripps Institution of Oceanography at the University of California-San Diego. Her area of specialization is in developmental genetics of amphioxus, in order to understand the evolutionary origins of patterning mechanisms that led to the vertebrate body plan. Amphioxus is one of those interesting creatures that is a chordate, but not a vertebrate animal. Mark Larson did his undergraduate work at Concordia College in Moorhead, MN, and his Ph.D. at the University of North Carolina at Chapel Hill. He did postdoctoral work at the University of Birmingham in the U.K. Mark's research focuses on examining the conditions that promote platelet formation from megakaryocytes in the bone marrow, and elucidating the biochemistry behind platelet spreading. We are very excited about these two new additions to the Department, and feel they will strengthen our program for years to come.

This spring we said goodbye to our two temporary faculty members, Dr. Amy Lewis and Dr. Eric Liknes. We thank Amy and Eric for their service in the department over the last two years, filling in for sabbatical leaves and Deb Carlson's departure. Eric has taken a position in the Biology Department at Northern State University in Aberdeen. As of this writing, Amy has not accepted a new position. We wish them both the best for the future!

This year we have had several opportunities to celebrate the career of Professor Leland Johnson. Lee retired this spring with 42.5 years of service to the Augustana College Biology Department! He has been an outstanding teacher, scholar, and mentor. His teaching has been enhanced by his research experiences with students here at Augie, as well as his work in England, Denmark, Australia, and New Zealand. We thank Lee for his service and will miss him greatly. Lee will be continuing with the College, but in a much different role. He will be educating people on the GSC expansion project. As you know, the College

is in the planning stages of an expansion and renovation of Gilbert Science Center. We will continue to work on these plans and encourage the process along. I will let Lee tell you more about this.

We are excited to report that we have \$100,000 to fund new teaching microscopes in the Department. We hope to have the new microscopes in the teaching labs for the fall semester. In combination with replacements in the last two years, this will mean we will have all new microscopes in all of our teaching labs. This upgrade will greatly improve our students' laboratory experience.

Another project we are working on is the establishment of a Biology Research Endowment. The idea is to create an endowed fund that will provide funds for faculty and student research projects indefinitely. The opportunity for students to engage in real research is a distinctive strength of the Department, and this source of funding will assist us greatly in keeping our research projects moving forward.

This year we obtained a new plant growth chamber, and Steve Matzner will be able to obtain another one from his new USDA grant. This will bring our number of growth chambers up to four. In order to provide a suitable environment for this equipment, we are building a new environmentally-controlled room in the GSC garage. The addition of these chambers and the new room will greatly enhance our capability for plant research and teaching.

This summer we have 18 students funded in research



*L to R: (Front) M. Wanous, A. Lewis, V. Olness, L. King
(Back) L. Johnson, M. Diggins, S. Matzner, P. Egland, A. Vogelmann*

projects by the South Dakota BRIN grant. We have an additional 5 students funded by individual faculty grants, and 3 students working in research off campus (Mayo Clinic and the University of Iowa). I am sure Maureen will tell you more about the summer research going on. Along the lines of student research, here's a great story. At the last South Dakota Academy of Science meeting in Chamberlain on April 8, 2006, there were 46 research poster presentations. 17 of these were from Augustana students. Two Outstanding Undergraduate Research Poster Awards were given, **both** of which went to Augustana Biology Department students!

Turning to my own experiences this last year, it has been challenging, but also rewarding, being Department Chair. It has been very valuable to learn about how the Department functions as a whole. A highlight this year was the acceptance of our paper from my sabbatical in England in the journal *Nature*. "Molecular characterization of *Ph1* as a major chromosome pairing locus in polyploid wheat" came out in the February 9 issue. The year in England was a wonderful experience both professionally and for the whole family. We are very happy that friends we made in England are visiting us here in South Dakota in June and July. This summer I have a new team of enthusiastic students working with me on my research project here at Augustana. Elizabeth Davis from Spencer, IA, and Kristina Harris from Kansas City, KS, are being funded from my USDA grant. Rob Ihry from Fargo, ND, and Karissa Tieszen from Sioux Falls, are being funded by the BRIN grant. So far, we are off to a great start with some good RNA isolations already! If you've ever worked with RNA you know this is

VERY GOOD news, especially if you're trying to isolate it from a tissue that is mostly starch, like wheat endosperm. We will have a postdoctoral fellow joining us in August. Dr. Eric Storlie comes with a rich background in wheat genetics and will be a welcome addition to the research team.

We are looking forward to the coming year with anticipation as our new faculty members bring fresh energy and perspective to our team. Please remember to stop by the Department if you are ever in town. We love seeing our former students and hearing about what you are up to!

Mike Wanous

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My second year is over and I'm looking forward to the third! Time is going fast, and that is always a good indication that you enjoy what you do. I have continued to teach the microbiology courses as well as teach on the teams for the first semester of the freshman biology course and Cell Biology. This year I also served as the faculty advisor to Tri-Beta, the biology honor society (let us know if you'd like to order an Augustana Tri-Beta T-shirt!), and I have a growing number of academic advisees.

On the research front, Kelley Vannatta (2006, Owatonna, MN) joined me on studies of the interactions that occur between species of bacteria that are found in dental plaque. Kelley did a great job and a poster she presented on her work won an Outstanding Undergraduate Research Poster Award at the South Dakota Academy of Science meeting this spring. Kim Heinemann (2007, Flandreau, SD) is continuing with this project and related work this summer with support from the NIH BRIN grant. In September, we received our new scanning laser confocal microscope. I will be using it for experiments on interactions between bacterial species in biofilms. The scope has also received plenty of use by scientists from other institutions in Sioux Falls. We have enjoyed interacting with them in the department and having the Augustana Biology Department be "the place to go" for doing confocal experiments.

It has been an especially wonderful year for my wife, Kristi, and me with the birth of our son Clark on January 5th. Clark is a healthy, happy baby and his big sister Claire really loves him. We are glad to live here in the Midwest near family, as they were a big help with the new baby.

I hope you have had a good year!

Best Wishes,

Paul Egland

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2006 ADMISSIONS TO PROFESSIONAL & GRADUATE PROGRAMS



GRADUATE PROGRAMS

Bartelt, Rebekah Univ. Iowa (Microbiology)
Hahn, Sara S.D.S.U. (Pharmacy)

MEDICINE

Beck, Larissa ('04) Sanford School of Med.—USD
Engbers, Jonathan Univ. Iowa
Johnson, Amanda Univ. N.D.
Mattick (Winterton), Erin (00) Sanford School of Med.—U.S.D.

OSTEOPATHIC MEDICINE

Pokorney, Ryan KC Univ. of Med. & Biosciences
Swenson, Nicole KC Univ. of Med. & Biosciences

DENTISTRY

Johnson, Andrew (early acceptance) Univ. of Minn.
Lervick, Bridget Univ. of Minn.
Lewis, Chelsea Creighton Univ.
Skjei, Kyle (early acceptance) Univ. of Minn.

OPTOMETRY

Godtland, Ragna Southern Coll. of Optometry-Memphis

PHYSICIAN ASSISTANT

Sykora, Beth Augsburg College

PHYSICAL THERAPY

Atteberry, Kara Washington Univ.
Wynia, Cara Creighton Univ.

Dr. Johnson Retires from 42½ Years of Dedicated Teaching

This is my final contribution to this newsletter in this form as I have finished a final teaching cycle and will be moving on to work on the GSC addition-renovation project which I described a little last year. We'll be out talking with many of you, I hope, about this next step toward fulfilling the vision that has been spelled out over the years starting from the days of Sven Froiland and Will Rosine. I think the Department has done well over the years in developing this shared vision of science teaching in an active scientific environment and it's time to take another big step forward for the benefit of future students. More on that later.

Now, it's time for me to say thanks to all of you and to everyone who has helped to make my long career here an experience that I wouldn't trade for any other. My heart and mind are content and I look forward to new challenges, but there surely were roller-coaster moments this spring. There were the great high moments when so many people said and did so many wonderful things and there were scores of letters, greetings, and e-mails from so many of you. I can't thank you enough. On the other hand there were some very nostalgic, soul-searching moments in empty classrooms after classes as the year ran down. Probably both are natural for such a time of life change.

My colleagues at the University of Maine also gave me a special recognition in June to mark my fifteenth year as part of their program and I must thank them as well. Over the years,

my workshop there has had almost 150 participants from colleges and universities across this country and Canada as well as a few from overseas. These "alums" teach Developmental Biology to numerous upper division students all over. I feel proud and blessed to be able to have a hand in teaching of my discipline on this broader scale. They tell me this work in Maine can continue as long as I wish so there will be no abrupt change in that. I'll continue so long as my colleague and friend, Eric Cole from St. Olaf, wants to work with me there. We have been together in this work for seven of the fifteen years that I've been doing it.

You can be assured that our Biology Department is in good hands for the future. Paul Egland has proven to be a great addition to the faculty and I'm very confident that Mark Larson and Laura

Beaster-Jones will also become stalwarts as the years go by. The future here looks very bright to me.

The past year has been great for alumni visits to the Department. Thanks to all of you who stopped in. I'll still be working in GSC next year and would be more than happy to see any of you who come by in the future. Thank you again for everything and all the best to all of you for the future. God bless you.

Leland Johnson
leland.johnson@augie.edu



Dr. Leland Johnson

As I write this, I am sitting in H.L.'s room at Sioux Valley Hospital where he has just had a second surgery to repair a rupture of the quadriceps muscles where they attach to the patellar tendon. Throughout his ordeal, he has been attended by excellent doctors, nurses, and physical therapists; many of them our alums.

It has been an interesting academic year and summer. I continue to be program coordinator for the NIH-BRIN (INBRE) grant to the Sanford School of Medicine at the University of South Dakota. Augustana, Black Hills State, Dakota Wesleyan, and Mount Marty are the undergraduate institutions involved in the program, as well as Oglala Lakota and Sisseton-Whapeton tribal colleges.

This summer the BRIN grant is supporting 18

undergraduate research fellows and 5 faculty at Augustana. In addition, our two new faculty, Drs. Laura Beaster-Jones and Mark Larson, have been supported for a month as they set up their research labs at Augustana and get to know the faculty of the genomics and proteomics core facilities at the School of Medicine. Our confocal microscope purchased last year has a fourth laser added on (which brings its value to \$200K—courtesy of the BRIN grant). It is being utilized heavily by four different investigators. We have also added a research grade NMR this year for Dr. Jetty Duffy-Matzner and her colleagues in chemistry. In addition to the BRIN supported students, 8 other undergrads are supported on faculty research grants (NIH, USDA, and NASA) for a total of 26 biology majors

RESEARCH PROJECTS IN THE AUGUSTANA BIOLOGY DEPT. – 2006 *



Maureen Diggins: "Microarray analysis of gene expression in ovaries of lethal yellow (A^y/a) and black (a/a) mice" (with Drs. John Brannian and Kathleen Eyster)

Funding: NIH-INBRE

Student: Cody Henriksen ('07)

"Apoptosis in ovarian follicles of lethal yellow (A^y) and black (a/a) mice" (with Dr. John Brannian)

Funding: NIH-AREA

Student: Mandi Greenway ('08)

Paul Eglund: "Changes in gene expression during symbiosis of dental plaque bacteria"

Funding: NIH-INBRE

Student: Kim Heinemann ('07)

Steve Matzner: "Variation in transpiration among different family lines in *Boechea stricta*" (with Dr. David Siemens at BHSU)

Funding: NIH-INBRE

Student: Aaron Burkhardt ('07)

"Effects of soil moisture and texture differences on transpiration rates in silver maple and in two contrasting bean cultivars"

Funding: ARAF

Student: Aron Merchen ('08)

Craig Spencer: "Use of remote sensing, stable isotopes and paleolimnology to document forest fires and forest regrowth in Glacier National Park and the Black Hills"

Funding: Granskou

Student: Kari Pabst ('05)

Mike Wanous: "Identification and mapping of genes regulating the expression of the HMW glutenins in wheat"

Funding: USDA and NIH-INBRE

Students: Elizabeth Davis ('08); Tina Harris ('08);

Robert Ihry ('08); Karissa Tieszen ('08)

* Visit the Biology website to find information about research projects of the 26 biology students involved in research this summer. <http://www.augie.edu/dept/biology/Web/news.html>

funded by grants this summer. Our colleagues in chemistry, physics, and computer science are supporting another 24, for a total of 50 science majors on research projects this summer.

Our research on obesity and infertility in the lethal yellow (A^y/a) mouse model continues as does our collaboration with John Brannian, Ph.D., director of the assisted reproduction laboratory of the Sioux Valley Clinic, OB/GYN. We are working on leptin receptors and intracellular pathways involved in leptin resistance. In addition, our research student, Cody Henriksen, has been working on differences in gene expression between yellow mice and black controls, using gene microarrays. We are seeing some exciting differences in level of gene expression. Our other research student, Mandi Greenway, is doing some interesting work on apoptosis in pre-ovulatory follicles in the obese yellow mice.

I have finished two years of a three year term as chair of the Natural Science Division. It is an interesting experience. My favorite part is celebrating the dedication of those who have just retired after many years of service (Lee Johnson and Karel Vander Lugt) and the coming of talented new scientists (Dr. Drew Alton in physics as well as our two new assistant professors in biology). Drew is a high energy particle physicist from Fermi Lab who studies neutrinos. He is arriving just in time for (we hope) a major NSF sponsored lab to be built deep in the old Homestake gold mine near Lead, a facility which will trap

neutrinos sent underground from Fermi Lab near Chicago.

I had the joy of teaching Physiology again last fall and Endocrinology this past spring. As always, I was blessed with bright, hard working students who were an absolute joy to teach. We graduated 40 bright young biology majors this past spring and look forward to an influx of enthusiastic young scientists this fall. Thank you for sending the wonderful young people whom you have referred to us. Please stop by and visit whenever possible!

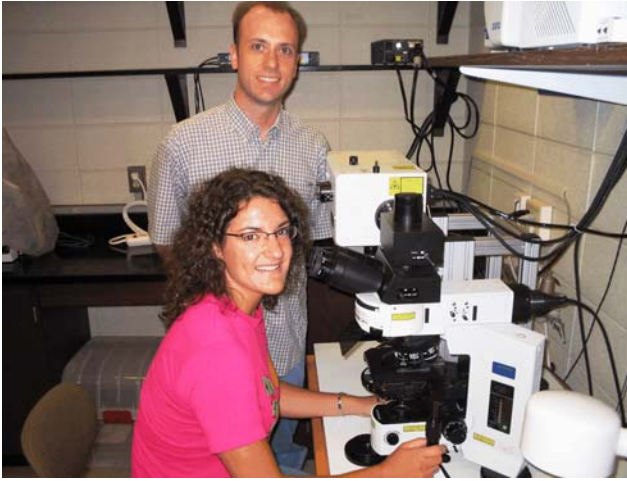
Maureen Diggins

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Foundations. Last year I was thinking about transitions. This year I have been thinking about foundations and the odd mix of good fortune and hard work that lay the groundwork for the future. In our most recent hires, Paul Eglund (joined us in 2004), Laura Beaster-Jones and Mark Larson (joining us this summer), we have laid the foundation for a very strong future biology department.

I started thinking along these lines during Lee Johnson's keynote address for the Beta, Beta, Beta (Biology Honor Society) banquet. He titled it "Accidental



Dr. Paul England and Kim Heinemann (07)

NEW CONFOCAL SCANNING LASER MICROSCOPE

In September of 2005, the Biology Department received the Olympus FV300 confocal scanning laser microscope. The purchase was made possible largely by funding from the South Dakota-BRIN grant. The scope uses lasers, rather than regular white light, to illuminate fluorescently

labeled samples. Lasers scan through labeled specimens, and a series of in-focus images are collected by a computer, which re-constructs the images that are captured by the microscope. In addition to use by Augustana faculty, the scope is used by scientists from the South Dakota Health Research Foundation and the Avera Research Group of the USD School of Medicine. We have enjoyed the interaction with other local scientists and our students have benefitted from the new connections we have made.

Biologist” and highlighted some of the humorous “fortunate” events that led him into the field of biology and to Augustana, (and Australia and other far off localities.) He will now be making the transition from teacher to salesperson (or is that a change?) as he spends the next year laying the groundwork in selling people on the idea of a future GSC addition/remodel.

On the teaching front, the foundation I laid in the past for my Plant Ecology class appears to be working as it continues to be a popular class. One of the more interesting independent projects this past year was looking at the distribution of purple pincushion cactus (*Coryphantha vivipara*) out near Great Bear Recreation Area and relating it to various abiotic factors (light, temperature etc.). The students crawled all over the hills marking the cactus. You can get an idea of how dedicated they were to the project when you consider the manner in which they found a lot of the cactus. Ouch!

This next year will be a year of laying foundations for our introductory classes as we incorporate new faculty. Laura Beaster-Jones and I will begin the challenging task of reshaping the Biology 121 (Intro to Biol. Principles II) class. I am not sure exactly how this class will evolve, but hope it will continue to provide a solid biology foundation for our students

On the research front, it has been a very good year indeed. I was finally able to publish the work that Ellen Holste (2003, Humbolt, IA) started several years ago in Plant, Cell and Environment (a very respectable journal in my field). Ellen was first author on the paper and

Burkhardt (Sr, Sioux Falls, SD) is working with myself and Dr. David Siemens at Black Hills State University. We are working with an *Arabidopsis* relative, *Boechera stricta*. Right now we are scouting out possible water-related traits to study, but the goal for the future is to look at differences in gene regulation (in genes related to drought or stress tolerance).

Aron Merchen (Jr, Crofton, NE) is helping me to continue my work studying how “plant plumbing” changes under different environmental conditions. Specifically, we are trying to determine if there is a pattern to changes across different resource levels (high, medium, and low water levels). It has been proposed that hydraulic efficiency decreases as resource level increases; we plan to test this. Chad Backsen (Jr, Fargo, ND) is working out at the University of Idaho on a collaborative NASA grant with Dr. Lee Vierling. Chad will be working with several graduate students at the U. of Idaho on their projects. In fact, he will be working with Meghan Calhoun (2004, Rapid City, SD), who is a now a graduate student in the Vierling lab.

On the home front, it is a continual struggle to balance home life and work commitments. Our eldest son, Daniel will be starting middle school this next year. Our middle son, Joshua will be turning “double digits” this year. Both continue to make progress towards a black belt in karate (I should probably know what belt level they are actually at). The youngest, Luke, will leave the Campus Learning Center and start kindergarten this year. What a blessing Augie’s Campus Learning Center has

Megan Jerke (2006, Sioux Falls, SD) who contributed to the project during the summer of 2004 was also a co-author.

I also received word that the U.S. Department of Agriculture has decided to fund my grant for the next three years (\$177,000). Most of this will go towards a new growth chamber, leaf area meter and two student summer salaries for the next three years.

Speaking of growth chambers and foundations, the powers that be at Augie have conspired to create a new growth chamber room out of half of the GSC garage (jeep room or van room depending on the era you graduated). It will be temperature and humidity controlled and we are hoping that by next year we will have four growth chambers operating for research.

On the research front this summer, Aaron

been to our family. My wife is very excited as she is receiving her new 300 MHz NMR this summer. In fact, Augustana is remodeling a room in the basement of GSC specifically for the new NMR. Apparently the administration figured that if I was getting a new growth chamber room, they better give Duffy a new NMR room in order to maintain harmony in our household.

Hope this finds you well. Best wishes.

Steve Matzner

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Science Education 2006:

There will not even be the Cliff Notes version of Science Education 2006 for the newsletter this year. The recent loss of our grandson has left me with little motivation to write, with or without humor.

Suffice to say--we had a busy year both in and out of the classroom. Many changes are on the horizon in assessment in response to No Child Left Behind assessment results, and National Standards. The good news is that the science educators that we produce at Augie test very well on the new PRAXIS professional licensing "tests"--both in content and pedagogy. The bad news is that too many good teachers burn out these days with all they are asked to do, standards they are asked to meet, and "test scores" they are instructed to raise!!!!

The quote for 2006 is one which I'm endeavoring to keep in mind these days:

"It takes both rain and sunshine to make a rainbow."

Val Olness

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On Sabbatical Leave 2005-06:

Dr. Caig Spencer

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Our Faculty Associates:

Libby King, M.A. from Univ. of Missouri at Kansas City; Certified as Specialist in Microbiology by, and member of, American Society of Clinical Pathologists. Libby began with Augustana in 1994 and teaches labs in Principles of Biology, General Microbiology and Genetics in the fall and labs in Introductory Microbiology and Cell Biology in the spring. In addition, Libby serves as a technician for the department, preparing labs for the introductory courses as well as microbiology, genetics, and cell biology.

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Amy Lewis, Ph.D. in Biological Sciences from South Dakota State University. Amy joined the Biology Department in the fall of 2004 as an Assistant Professor.

This past year she taught Biology and Human Concerns, Biological Principles I, Principles of Ecology, Ornithology, and team taught Intro to Environmental Science last Interim.

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Eric Liknes, Ph.D. in Biology from the University of South Dakota. Eric also joined the Biology Department as an Assistant Professor in the fall of 2004. He has taught Biology and Human Concerns, Biological Principles I and II, Cell Biology, and Biological Chemistry. During Interim he taught Winter Ecology and Outdoor Adventure.

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Ann Vogelmann, Ph.D. in Plant Sciences from Indiana University. Ann served as a Faculty Associate with Augustana in 1997-98 and Adjunct Assistant Professor from 2000 - present. She has taught the Human Anatomy and Intro to Environmental Science courses. She also teaches labs in Human Physiology and Biological Principles I and II.

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The New Biology Microscopes are Here!

The department has obtained 93 new microscopes for the teaching labs — just in time for the beginning of fall semester. With the 19 new microscopes we obtained in the last two years, this brings us up to 112 new teaching microscopes. We are very excited that these high quality Olympus microscopes will greatly improve our students' experience in labs.

Some of the funds for this project came from individual donations to the Biology Department. *Thank you for your generous support in continuing the legacy of excellence of the Augustana Biology Department !*



Mark List ('07)

Additional E MAIL Addresses For Biology:

Please note the faculty addresses are listed throughout this letter.

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Augie Web Sites:

Augie's Home Page:

<http://www.augie.edu>

Biology Department Home Page:

www.augie.edu/dept/biology/index.html



2006 BIOLOGY ALUMNI FILE UPDATE

If you have accomplishments and/or changes in your life, we 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 _____

Current

Address _____

e-mail address _____

Current Occupation/

Place of Employment _____

Graduate or 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 _____

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(or email information to cheryl.holzapfel@augie.edu)