

BIOLOGICAL AND ALLIED HEALTH CLUB NEWS

BAHS Club has the pleasure of reflecting on a very busy and active year. We want to say a hearty thank you to the many people who have planned and participated in this year's events ranging from workshops on preparing applications to clinical programs and mock interviews to trips such as the Body Worlds Exhibit. We especially want to thank a wonderful group of officers who have worked well together: **Valerie Van Cleef** (President), **Rebecca Rugg** (Vice-President), **Joel Gyimesi** (Treasurer), and **Rachel Brous** (Secretary). The club owes a debt of gratitude to these officers who have generously organized events for the club. I know you're almost off to enjoy your summer but WAIT, check out the events below.

End of the Semester BAHS Club Events



Last BAHS Club Meeting of the Semester
April 25 2006 at 5:30 pm in HSC 178 (Biology Seminar Room).

Meeting Agenda:

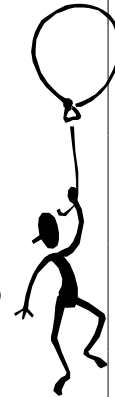
- Officer elections
- Summer research opportunities
- Summer preparations for applying to clinical or professional programs



Annual Biology and Allied Health Banquet
Sunday, April 30th 2006

1-3 pm Kehr Union Hide-Away

All biology and allied health students are invited to join in the fun and celebrate the end of the academic year at the Biology and Allied Health Club's Annual Banquet. The gathering is a time to bid our seniors a fond farewell and launch the underclassmen to their summers with fun, games, and good food. Cost is \$9 for students and \$13 for faculty. The meal is catered by Susquehanna Chef. The menu includes chicken and broccoli alfredo, vegetable lasagna, tossed salad, fruit salad, herb roasted potatoes, green beans almandine, beverages, and dessert. **To purchase a ticket, see department secretary, Ms. Vicki Beishline by noon on Thursday, April 27.** Please bring a check for \$9 made payable to Biology Club BU.



Planning for the Fall Semester

Do you have any events in mind for the fall semester? Please come to the April 25th BAHS club meeting and suggest an event. Suggestions that are in the works for next fall are: **white-water rafting** (moved from the spring semester due to low water levels in the Lehigh River) and a trip to New York to visit the **American Museum of Natural History**, the museum of the real Indiana Jones (Roy Chapman Andrews).



BAHS Updates

Calling All Students Needing Ecology

Were you unable to schedule Ecology for the fall semester? The biology department may have a solution, but we need students to put in requests for the course in order to justify adding another section. The course lecture would meet Monday and Wednesday 12-12:50 p.m. The new lab section would meet Tuesday afternoons from 1-3:50 p.m. If you want to take Ecology in the fall semester and can re-arrange your schedule to match these class meeting times, please come by the biology office (HSC 125) and complete a "NEEDS ECOLOGY FORM." Please do this by April 28, 2006.



Calling All Students Needing Chemistry for the Sciences 2

Were you unable to schedule Chemistry for the Sciences II this summer? Please see Ms Pollock, Chemistry Department Secretary, to be put on a waitlist so another section can be added.



News You Can Use Important Dates:

Reading Days: No Classes: Thursday and Friday, May 4 and 5

Finals Week: Monday, May 8 to Saturday, May 13

Undergraduate Commencement: Saturday, May 13. This year there will be two undergraduate commencement ceremonies and they will be held on upper campus at Redman Stadium. The ceremony for the College of Science and Technology will be in the morning at 10:00 a.m. Graduate Commencement is Friday, May 12 in Haas Auditorium.



Deadline to submit an application and proposal for Undergraduate Research in Biology:

For Summer: Last day of classes in spring semester

For Fall: Last day of classes in spring semester

(These are deadlines for submission of proposals to the Dean's office. They should be submitted to Dr. Till by April 26 at 4 p.m.)

Deadline to sign-up for Internships:

For Summer: 2nd day of classes of chosen summer session

For Fall: 5th day of classes, fall semester

(Internship proposals must be turned in much earlier for sites with which the university does not have an affiliation.)



BAHS seeks Lab Coordinator

BAHS is currently searching for a permanent, full time Biology Laboratory Coordinator. This is a new position in the department. Among the lab coordinator's responsibilities are the coordination and preparation of materials for lab courses, training and supervising student lab assistants, maintaining and inventory of lab equipment, serving as curator of collections in biology labs, supervising the purchasing of lab supplies and equipment, and serving as a lab safety coordinator. A bachelor's degree in biological science is required. Other requirements include the ability to maintain microbial cultures, prepare materials for teaching laboratories, and prepare solutions; excellent computer and math skills (college level algebra or higher); ability to organize, direct, and supervise activities is required; and demonstrated effectiveness with diverse populations is required. For more information see <http://www.bloomu.edu/admin/admin/hr/postings/06-041.php>

COST Hosts the Iditarod

The 2nd Annual Iditarod, a science competition, was held on April 21, 2006. Twenty teams from area high schools competed in the areas of Biology, Geosciences, Physics, and Chemistry. Thanks to **Drs. Brubaker** and **Williams** and to all who helped with the event.

Beta Beta Beta Initiates New Members



Beta Beta Beta Initiation Ceremony

UI=undergraduate initiate;
GI=graduate initiate;
E=existing member

Christopher Kashi (UI),
Jennifer Intelicato-Young
(GI), **Ashley Welikonich**
(UI), **Laura Halon** (UI),
Valarie van Cleef (E, Vice
President), **Chase Kelch**
(E, President), **Jessica
Teders** (UI), **Trinity
Stempko** (UI)



Beta Beta Beta welcomed its newest members at its initiation ceremony on March 30 (see photo.) Beta Beta Beta is an honor society for biology students who achieve superior academic records and who display an aptitude for and interest in the life sciences. Its mission is to stimulate scholarship, to disseminate scientific knowledge, and to promote biological research. To fulfill this mission, the national organization of Beta Beta Beta recognizes the accomplishments of outstanding individuals and chapters and publishes a national journal, *BIOS*. The faculty advisor of the BU chapter of Tri-Beta is **Dr. Chamuris**.

BAHS Outstanding Students Named

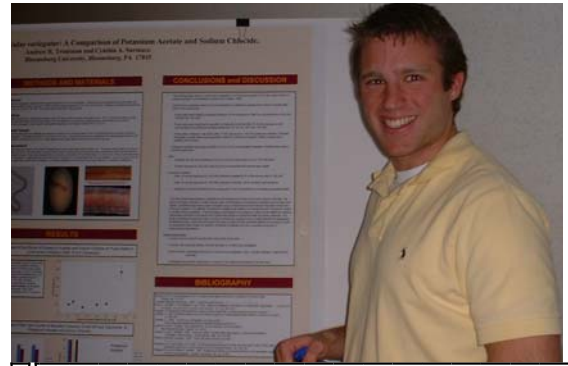
Nicole L. Dalessandro (left) was named Outstanding Biology Student. Nicole is graduating with a B.S. in Biology and a concentration in pre-medical sciences. She will be attending either podiatry or medical school this coming fall. Nicole is a member of Phi Kappa Phi and the President and founder of the Pre-Medical Sciences Club. She has also conducted research on antibiotic toxicity in black worms with Dr. Surmacz. Nicole participated in the summer internship program in podiatry at Temple University and has extensive experience shadowing health professionals. In addition, Nicole has spent endless hours tutoring students in organic chemistry, physics, and many of our biology courses.



Janelle R. Haas (right) was named Outstanding Allied Health Sciences Student. Janelle is graduating with a B.S. in Medical Imaging with a concentration in sonography. She has completed the clinical portion of her degree through College Misericordia with clinical sites at Williamsport Hospital, Bloomsburg Hospital, and Geisinger Maternal Fetal Medicine. She is currently employed at Evangelical Community Hospital.

Greetings from CPUB

Kutztown University recently hosted the annual meeting of the Commonwealth of PA University Biologists (CPUB). Drs. Williams, Hranitz, and Surmacz and senior biology major **Andrew Troutman** joined with their counterparts from other universities in the PA State System of Higher Education for a day of research presentations, workshops, and meetings. **Andrew Troutman** and Dr. Surmacz presented “De-icer toxicity in *Lumbriculus variegatus*: a comparison of potassium acetate and sodium chloride.” In the faculty pedagogy session, Dr. Hranitz presented a poster with co-authors Drs. Davis, Brubaker, and Hansen on “Inquiry-based research reinforces methods in biotechnology.” Dr. Surmacz’s poster was entitled “Animal Locomotion: Bringing Structure-Function Relationships to Life in the Introductory Biology Lab.” **Nicole Dalessandro** was honored by receiving BU’s outstanding biology student award.



Andy Troutman received 2nd prize for his poster on de-icer toxicity in the Ecology and Organismal Biology category at CPUB. Way to go Andy!



Krissie Tofts, Linda Yeany, and Nick Ernst recently presented their research results at the PAS meeting.

BAHS at PAS

BAHS faculty and students were well represented at the recent meeting of the Pennsylvania Academy of Science (PAS) held in Grantville, PA. **Stacy Rogers, Dr. Corbin, and Dr. Wassmer** presented the poster “Prevalence of nest ectoparasites is independent of group size and nest density in barn swallows (*Hirundo rustica*).” **Danielle Wartko, Linda Yeany, Dr. Hranitz, and Dr. Baird** presented “Heterozygosity-fitness correlations in a population of collared lizards, *Crotaphytus collaris*.” **Linda Yeany, Danielle Wartko, Dr. Hranitz, and Dr. Baird** presented “Investigation of the effect of population structure on heterozygosity-fitness correlations in collared lizards, *Crotaphytus collaris*.” **Nicholas Ernst and Dr. Corbin** discussed their research “Acid mine drainage and nesting insectivorous birds along tributaries of the Susquehanna River.” **Kristine Tofts** presented her honors thesis entitled “Effects of obesity and cigarette smoking on reproductive success.” Her collaborators are **Dr. Surmacz** and A. Reilly from the Fertility Center at Geisinger Medical Center. **Dr. Hansen** and his collaborators Anna Stauffer and Dr. Robishaw from the Weis Research Center, Geisinger Clinic, presented “G Protein receptor regulation of zebrafish cardiac development .”

COST Research Day

The College of Science and Technology will host its third annual Research Day on Thursday, May 4 to showcase faculty and student research. This special event coincides with Reading Day (no classes will be held). Everyone is welcome to attend. All events will be held in Hartline Science Center. The program features a variety of poster presentations and talks. The following BAHS students and faculty are participating:



Presentations in Kuster Auditorium:

- 9:00 a.m. **Kristine Tofts**, Aliceann Riley, and Cindy Surmacz. “The effects of obesity and cigarette smoking on reproductive success”
 11:15 a.m. **Kevin Nawrocki** and Steven Rier. “Effects of acid mine drainage (AMD) on nitrogen and phosphorous uptake by stream microbial communities.”
 11:30 a.m. **Chase Kelch** and Steven Rier. “Effects of acid mine drainage (AMD) on leaf litter decomposition in a stream.”
 2:15 p.m. **Jamie Willour** and Judy Kipe-Nolt. “The new radiologist assistant profession: opinions of radiologists and technologists in PA.”

Posters in Hartline Lobby: Presented at 10:15 a.m. to 11:00 and 3:00 to 4:00 p.m.

- Andrew Troutman** and Cindy Surmacz. “De-icer toxicity in *Lumbriculus variegatus*: a comparison of potassium acetate and sodium chloride.”
Linda Yeany, Danielle Wartko, Troy Baird, and John Hranitz. “Investigation of the effects of population structure on heterozygosity-fitness relationships in collared lizards.”
Laura Halon, Nick Bixler, and Kristen Brubaker. “Cloning forkhead box containing genes from solitary bees.”
Linda Yeany, Danielle Wartko, Troy Baird, and John Hranitz. “Investigation of coding and non-coding DNA in heterozygosity-fitness relationships in collared lizards.”



Pre-professional Committee News

BU Pre-Medicine Updates Check out the Pre-Medicine Club

The Pre-Medicine Club is meeting Wednesday, April 26 at 7:00 p.m. in 178 HSC. On the agenda are election of officers for the fall 2006, a discussion of mentoring of incoming freshmen, and a "question and answer" session. The Pre-medicine Club is also organizing study groups to prepare for the Medical College Admission Test (MCAT), the Dental Admission Test (DAT), and the Optometry Admission Test (OAT). To participate, contact club president **Nicole Dalessandro** at nldaless@bloomu.edu

Sign up for the Pre-Medical Science Option

Students who are interested in the new pre-medical science option in the B.S. Biology degree can sign up at the Academic Advisement Office, 216 Student Services Center. For more information, contact your academic advisor. The pre-medical sciences curriculum sheet can be downloaded from http://departments.bloomu.edu/biology/curriculum_sheets.html



Time to Visit!

The Philadelphia College of Osteopathic Medicine (PCOM) is sponsoring an Open House on Saturday, April 29, 2006 from 11:00 a.m. to 1:00 p.m. The open house provides an opportunity to learn about osteopathic medicine, hear about life at medical school, observe osteopathic manipulative therapy, meet students, and tour the campus. Please RSVP to PCOM's Admissions Office by April 21, 2006. Call 800-999-6998 or send an e-mail to PCOM: admissions@pcom.edu

The School of Osteopathic Medicine (SOM) at the University of Medicine and Dentistry of New Jersey UMDNJ in Stafford, New Jersey is having an open house on Friday, April 28 from 12 to 4:30 p.m. The open house will present material on the competitive medical student, the curriculum at SOM, research at SOM, question and answer sessions with current medical students, tours of the campus, and a demonstration of osteopathic manipulative medicine. You may register on-line at <http://som.umdnj.edu> or http://som.umdnj.edu/education/admissions/admiss_open_house.html

What are your Summer Plans?



Summer MCAT

The MCAT is a standardized exam required for admission to allopathic, osteopathic, and many veterinary schools. The exam assesses mastery in biology, general and organic chemistry, physics, scientific problem solving, critical thinking, and writing skills. The summer MCAT is scheduled for **August 19**. The registration deadline is July 14. To register go to: <http://www.aamc.org/students/mcat/start.htm>

Summer Vacation Ideas

The committee wishes all pre-professional students a rewarding, relaxing, and rejuvenating summer. Remember summer is a great time to job-shadow. Many students also choose to do their volunteer work during the summer. Rising juniors are reminded to submit their completed application packets to the committee by the end of the summer or the start of the fall semester at the latest.

GRE Preparation Course Offered

Penn State's Office of Career Services will hold a preparation course for the Graduate Record Exam (GRE) on June 10-11, 2006 at the University Park campus. The GRE is a standardized exam required for many graduate and some professional programs. A flyer and registration materials can be found at http://www.sa.psu.edu/career/PDF/GRE_Prep_Courses.pdf.

Any questions? Please feel free to contact any member of the Pre-professional Committee. The co-chairs of the committee are **Drs. Ardizzi** and **Melnychuk** (BAHS). Other committee members include **Drs. Surmacz** (BAHS), **Hallen** (Chemistry), and **Bell** (Chemistry).

Allied Health Updates



IMPORTANT NOTICE FOR MI AND CLS STUDENTS

ALL CLS and MI students who applied for clinical programs this year must see Dr. Kipe-Nolt this week if you have not yet done so. This includes those who have been accepted into clinicals and those who have not.



BAHS Students Accepted to Clinical Programs

Congratulations to the following students **who have been accepted and who have signed up** for the following programs.

Abington Memorial: Megan Weber

Johns Hopkins Hospital: Ashley Boos, Ashley Corwin, Nicole Nestico, Nicole Shambach, Kelleigh Eckenrode, Danielle Rill

Wyoming Valley Sonography: Ashley O'Gara

Wyoming Valley Radiography: Bruce Bortree, Emily Miller, Heather Pennell, Laura Hurley

Geisinger: Talia Bartko, Ryan Jones, Krista Garrett, Lauren Sterkenberg, Stephanie Gabel, William Knapick

Reading Hospital: Thomas O'Malley, Bryan Wiest, Brett Wiest, Nathan Archey, Alyssa Brenner, Breanne Connors, Stephanie Tinna, Sara Zerbe

Lancaster General - Nuclear Medicine: Tanya McFalls

Thomas Jefferson: Megan Coyne, Alison Lewis, Valerie Mead

Misericordia: Wendy Grumben

Reading St. Joseph's: Jill Stoudt

OPPORTUNITY

Mark Liddington, a 1990 BU MI graduate, is looking for recent MI graduates to work in his Medical Physics Consulting Firm in eastern Pennsylvania. If interested contact Mark at 1-800-446-7622 ext.2



BAHS Students Learn About Cancer

A full house was present at the Kehr Union Ballroom for "Understanding Cancer: How Research Can Help You," the keynote address of the 15th annual Health Sciences Symposium. The featured speaker was BU alumna Dr. Lynn Matrisian '75, a professor of cancer biology at Vanderbilt University and past-president of the American Association for Cancer Research. Dr. Matrisian discussed the biology of cancer cells and how they can be stopped through targeted therapies that are more effective and less toxic. During Friday's concurrent sessions, **Dr. Kristen Brubaker** discussed her research on the mechanisms of prostate cancer metastasis to bone. The symposium also included student posters and a health fair. Many BAHS students participated in the event. **Nicole Dalessandro** introduced Dr. Matrisian at the keynote address while **Michelle Sienkiewicz** and **Nick Bixler** had the opportunity to join her for breakfast. **Michelle Sienkiewicz** and **Krissie Tofts** served as poster judges. Our cheerful poster set-up committee (even at 7 a.m.!) consisted of **Talia McAlister, Valerie Letukas, Christina Hough, and Kimberly Dodson**. BAHS students who served on the facilities committee were: **Teal Ingerick, Katura Andrews, Kaylee Fisher, Alison Grimm, Jennifer Krott, Krista Bond, Lissa Mercado, Christy Lehman, Michelle Sienkiewicz, Lauren Shilling, Sara Stackhouse, and Regina Steppe**. The following winners of the student poster contest were members of the Anatomy and Physiology II class: First prize: Get Your Ticket...Learn About Rickets, **Alisa Hendrickson, Kayla Sabotchick, and Laura Clauser**. Second Prize: Throwing a Stone, **Jonathan Muldowney, Brad Matje, Tony Collins, and Josh Harris**. Third Prize: Toast to Liver Cirrhosis, **Sara Becker, Liz Hoch, Teal Ingerick, and Lissa Mercado**. Honorable Mentions: A Walk through Parkinson's, **Tarryn Adams, Jessica Mowery, Molly Renn, and Melissa Zimmerman**; As the Spine Curves, **Melanie Johnson, Andrea Long, Sarah McCoach, and Adrienne Snyder**; and Progeria: How old am I?, **Jackie Cardell, Tim Donaghy, Jessica Kearney, and Sarah Reynolds**.



When is a Picture Worth \$1,000?

When it wins you a scholarship of course! Benjamin Cummings, a publishing company, is sponsoring a scholarship competition and will present five \$1,000 awards to allied health students. The goal of this contest is to provide a photo that illustrates a concept or process discussed in anatomy & physiology or microbiology. A poster describing the competition is on the bulletin board outside 161 Hartline Science Center. As part of the scholarship application you must submit 1) a photo that clarifies a complex idea, illustrates an analogy that helps you to visualize a process, or replaces a less effective image in your current text or lab manual; and 2) a written description of your photo with an explanation of how it helps to explain the concept. To be eligible, you must currently be taking Anatomy & Physiology or Microbiology or have done so in the past two years. Application forms may be obtained from **Dr. Surmacz**, 268 Hartline. Deadline is November 1, 2006.



Summer Opportunities

BAHS Summer College Offerings

The following courses will be offered by BAHS this summer:

Session I: Human Biology (Dr. Melnychuk); Anatomy & Physiology I (Drs. Surmacz & Hranitz); Intro. Microbiology (Dr. Kipe-Nolt).

Session II: Evolution (Dr. Chamuris)

Session III: Cells, Genes, and Molecules (Dr. Chamuris); Anatomy & Physiology II (Drs. Wassmer and Corbin); Human Sexuality.

Session V: Entomology (Dr. Wassmer)

Session VI: Field Zoology (Dr. Hranitz)

Session VII: Ecology & Evolution - for summer freshmen (Dr. Wood)

Summer Sessions 2006

- Session I - May 30 to July 7 (6 weeks)
- Session II - June 19 to July 28 (six weeks)
- Session III - July 10 to Aug. 18 (six weeks)
- Session IV - May 30 to June 16 (three weeks)
- Session V - June 19 to July 7 (three weeks)
- Session VI - July 10 to July 28 (three weeks)
- Session VII - June 19 to July 28 (six weeks)

Biology Elective Offerings

Evolution (50-430/50-530), 3 credits

Dr. Chamuris, Session II: June 19 – July 28, 2006, Tuesday and Thursday, 1:30 – 5 p.m.

This course treats the major aspects of modern evolutionary theory. The format will be more discussion than lecture, based on readings from a current text and primary literature. Each evolutionary theme will be applied to the the diverse research being done in that area, from bioinformatics to ecology, and from molecular genetics to paleontology. Some hands-on activities are planned, and each student will complete a course project. This summer's offering will include, but will not be limited to, consideration of the teaching of evolutionary concepts in the secondary school. Extracting central evolutionary themes and approaching them against the backdrop of PA's science standards will be addressed. Area biology teachers and secondary education-biology majors would benefit from this course. The course may be applied as an elective for BS/BA biology majors (50-430) or towards the MS degree in Biology as well (50-530). The prerequisites are Genetics (50-332), Ecology (50-351), or permission of the instructor. If you have not yet taken either course, contact Dr. Chamuris before ruling out taking this course.

Field Zoology (50.252), 3 Credits

Dr. Hranitz, Session VI: July, 10 - July, 28, 2006. Monday—Thursday, 9:50 am - 4:00 p.m.

Announcements from Dr. Hranitz

While spring semester is not quite over, we're looking ahead to summer and field courses! There are a few seats still available in the course. For those already enrolled, please be prepared to travel to the **Wallops Island Marine Science Center** for the first week of class. The cost to students is anticipated to be \$75-\$100 for the 3 nights and 3 days. This will include housing, meals, transportation, and one boat trip on a monitor-style boat. Traditionally, we dine at one of the seafood restaurants in the area on the last evening to sample the local cuisine where a nice sit-down meal typically costs \$12-25. You will need to **bring the following gear**: field guides, a day pack, sleeping bag, good hiking shoes, shoes, and clothes that can get wet, muddy, insect repellent, and gear for a possible overnight trip in the field. Feel free to contact me if you have any questions or concerns at 570.380.4130 or jhranitz@bloomu.edu. I look forward to seeing you all this summer!

Entomology (50.457/557), 3 credits

Dr. Wassmer, Session V: June 19 —July 7, 2006, Monday—Thursday, 9:50 to 4:00 p.m.

Bugs R Us! Did you ever wonder what that thing was crawling on your shirt or eating your frosted flakes? If so, join us in Entomology (50.457) this summer. Lecture material will include the physiology, behavior, morphology, and evolution of insects. In lab, you will collect and present insects (and keep your collection at the end of summer). Added bonus - You get to design and conduct a project, this might even included doing brain surgery on cockroaches. Bring your sunscreen and bug repellent.



Bald Eagle/Wildlife Interpretation Internship

Would you like to earn college credit this summer while working with bald eagles, learning about their natural history and sharing your knowledge with the public? Then this internship is right for you! The Department of Biological and Allied Health Sciences in association with the Pennsylvania Raptor & Wildlife Association and Knoebel's Grove Amusement Resort are sponsoring internships in Bald Eagle/Wildlife Interpretation. Interns will field questions about bald eagle natural history and give frequent presentations to the general public at Knoebel's Grove Amusement Park near Elysburg, PA. Junior class status and a strong work ethic are required. To learn more about the internship, please see **Dr. Corbin**, 131 HSC or e-mail ccorbin@bloomu.edu



Faculty and Student Research News

Dr. Kris Brubaker recently attended the American Association for Cancer Research annual meeting in Washington, D.C. She presented the following poster “Nemo Like Kinase Inhibits Androgen Receptor Transcriptional Activity in Prostate Cancer Cells” with co-authors Katayoon H. Emami, Lisha G. Brown, Tiffany E. Pitts, and Eva Corey. Dr. Brubaker also was notified that she has received two research grants: 1) Bloomsburg University Research & Disciplinary Projects

Grant:entitled “A Microarray Analysis to Determine the Functional Significance of Runx2 Expression in Prostate Cancer Cells.” and 2) a PA State System of Higher Education Faculty Development Grant: “Deciphering the Role of Runx2 in Regulating the Expression of Osteoprotegerin and Interleukin-6 in a Prostate Cancer Cell Line, PC-3.”

Kevin Nawrocki has a summer research assistantship to work with Dr. Rier on a preliminary survey of the Roaring Creek watershed. This assistantship will be funded by the Degenstein Foundation.

Jen Biddinger has a summer graduate research assistantship to begin her work on the effects of acid mine drainage on microbial enzyme activities.

Dr. Steven Rier is an author on three different papers in a recent special issue of the journal *Hydrobiologia* that focuses on advances in algal biology. He is the first author on a paper with Jan Stevenson from Michigan State University that examined the response of stream algae across a gradient in nitrogen and phosphorus concentrations in artificial streams. The second paper, which is paired with the first paper, and for which he is the second author, examined the response of stream algae across natural nitrogen and phosphorus gradients. The goal of both papers was to establish models that predict how much nitrogen and phosphorus can be added to a stream from human sources before nuisance algal blooms result. He is a coauthor on the third paper with Nancy Tuchman and others from Loyola University Chicago. This work examined the ability of diatoms to heterotrophically utilize organic substrates.

Dr. Rier and others have another paper coming out in the June issue of the *Journal of Phycology*. This work examined the response of stream algae to experimentally manipulated gradients of light. In this study, they found that stream algae were not as physiologically limited by light as once thought.

Interested in Conducting Research?

Immediate undergraduate or graduate research help needed for project on bird skull morphometrics. Dr. Corbin needs help photographing and digitizing landmarks on skulls of birds of prey (eagles and hawks) and possibly analysis of those landmarks. He is attempting to address the question: What morphological changes are associated with the evolutionary diversification of eagles from their shared common ancestry with other birds of prey. Research helper will gain knowledge of ornithology, anatomy, ecology, evolution and possibly multivariate statistical techniques (although the latter is not necessary). Work should include about 4-5 hours per week (or more if desired) and requires a willingness to learn about digital photography and user-friendly computer programs. The work will be on a volunteer basis initially but may be funded at a later date. Contact Dr. Corbin by phone x4134, email: ccorbin@bloomu.edu, or office HSC173.



Alumni Updates

Neema Chandel (B.S. Biology 2005) recently stopped by to visit the department. Neema is currently enrolled in the physician assistant program at Arcadia University. It was great to see you Neema!

Marnie Cooper (B.S. Biology, 2005) is currently working in the Component Laboratory of the Blood Bank of Delmarva in Newark, DE. This is a busy blood bank that processes and separates blood components from donors in Newark, Dover, and Wilmington, Delaware. The blood is typed and tested for various diseases such as hepatitis, AIDS, and West Nile virus. Marnie is enjoying the experience and is becoming very familiar with quality control.

Austin Schofield (B.S. Biology, 2002) has been accepted into Thomas Jefferson University's Master's of Science Program in Microbiology for the Summer 2006. Congratulations Austin!

The Reading Lamp: Current Topics in Evolutionary Biology

George Chamuris, Professor



Nothing in biology makes sense except in the light of evolution. – Theodosius Dobzhansky

EVO-DEVO: SOME RECOMMENDED READING

The history of evolutionary thought can be divided into several phases. The pre-Darwinian phase prior to 1859, the subsequent Darwinian phase which transitioned to the Modern Synthesis (merging the largely ecological and behavioral bases for evolutionary theory with the new science of genetics). The synthesis during the middle of the 20th century was largely concerned with microevolutionary processes in local populations, involving studies of adaptation via natural selection, genetic drift, sexual selection, and speciation.

Attempts to connect macroevolutionary patterns studied by paleontologists and systematists to the emerging paradigms of population genetics were not very successful. Meanwhile the separate discipline of developmental biology, largely concerned with the morphological aspects of animal and plant embryology, plodded along until the molecular biology revolution beginning in the 1960's. By the 1990's, the molecular genetic basis of body plan development had become sufficiently understood to bridge the gap between the ecological-genetic part of evolutionary theory and the macroevolutionary parts.

This brings us to the modern phase of evolutionary biology. The new field, dubbed "Evo-Devo," employs the techniques of molecular biology and bioinformatics to connect theoretical elements, forming a comprehensive, unified theory of evolution. The molecular basis for development had become a theoretical adhesive, binding microevolution to macroevolution.

Sean Carroll's *Endless Forms Most Beautiful* (2005) is a well-written and remarkably informative book, readable by anyone who has taken a few biology courses. Following an introduction addressing the history and significance of evo-devo, the author summarizes the modern approaches and findings of developmental biology from a molecular-genetic perspective. Carroll provides just enough background to understand the applications described in the second part.

The second part of the book gives the reader a glimpse into some of the hot areas being studied under this new unified theory of evolution. For example, chapter 6, *The Big Bang of Animal Evolution*, tells the story of the Cambrian Radiation from an evo-devo perspective. Now we can finally look at the bodies of fossil animals and relate their construction to the controlling genetic elements such as the Hox genes. Other chapters tell the stories of the evolution of limbs, wings, pigmentation, and several aspects of human evolution as well.

Wallace Arthur's *Biased Embryos and Evolution* (2004) also addresses historical and current aspects of evolutionary thinking and the pivotal importance of developmental biology. He makes the case that natural selection alone is insufficient to explain observed evolutionary trends in body plan. Arthur builds a case for the importance of *embryonic bias* (previously included as the positive side of *developmental constraint*) as partnering with natural selection to orient the direction of evolutionary change. He defines bias as "...the tendency of the developmental system of any creature to produce variant trajectories in some directions more readily than others." The book is quick and very good reading.

Last, I recommend Mabee's (2006) review of evo-devo from a bioinformatic perspective. As the tools and methodologies of bioinformatics improve, they will help us to thread developmental and evolutionary data together in our explanations of evolutionary trajectories.

Arthur, W. 2004. *Biased embryos and evolution*. Cambridge University Press, Cambridge. 233 p.

Carroll, S.B. 2005. *Endless Forms Most Beautiful: The New Science of Evo Devo and the Making of the Animal Kingdom*. Norton & Company, New York and London. 550 p.

Mabee, P.M. 2006. Integrating evolution and development: the need for bioinformatics in evo-devo. *BioScience* 56:301-309.

READING LAMP UPDATES

In *BioSynthesis* 4(3), April 05 (and mistakenly reprinted in *BioSynthesis* 5(2), March 06), I wrote about the importance of gene recruitment in evolution. Bridgham et al. (2006) present a new example: the evolution of the change in specificity of a steroid receptor. This article, and the whole paradigm of how new genes arise, provides solid refutation of so-called irreducible complexity, one of the pillars of intelligent design creationism (see *BioSynthesis* 4(1), February 05).

In *BioSynthesis* 3(3), April 04, I wrote on the fossil record documenting the transition from lobe-finned fish to tetrapods. Recall that the fish *Panderichthyes* was one of the transitions to *Acanthostega* (the first true tetrapod). We have now found fossils from Northern Canada that fill in the fish-to-tetrapod lineage with greater resolution. Daeshler et al. (2006) and Shubin et al. (2006) report on the discovery of the fossil fish *Tiktaalik roseae*, whose fins contain bones homologous to those of the forelimbs of tetrapods. The new fossils appear to be transitional between *Panderichthyes* and *Acanthostega*.

Bridgham, J.T., S.M. Carroll, and J.W. Thornton. 2006. Evolution of hormone-receptor complexity by molecular exploitation. *Science* 312:97-101

Daeschler, E.B., N.H. Shubin, and F.A. Jenkins. 2006 A Devonian tetrapod-like fish and the evolution of the tetrapod body plan. *Nature* 440:757-763.

Shubin, N.H., E.B. Daeschler, and F.A. Jenkins. 2006 The pectoral fin of *Tiktaalik roseae* and the origin of the tetrapod limb. *Nature* 440:764-771

Everything's Coming Up Sunflowers!

BioSynthesis is delighted to share this wonderful photo by aspiring photographer and B.S. Biology major **Jesse Bobonis**. Jesse took the picture in Addison, Maine in September 2005 using a Kodak DX 7590 5.0 megapixel digital camera. Thanks, Jesse!



Join in the “All-Day Dialogue on the Environment”

The Amphitheater outside Scranton Commons will be the site of the “All-Day Dialogue on the Environment” on April 27. BAHS own **Dr. Rier** will participate in a panel discussion entitled “The Big Picture” at 9:45 a.m. Other panelists include Dr. Hintz, Geography and Geosciences, Dr. Mackin, Provost, and Dr. Vidovic, Economics. The featured speaker is Donald Brown, Director, Pennsylvania Consortium for Interdisciplinary Environmental Policy, PA Department of Environmental Protection. Mr. Brown will speak at 11:00 a.m.. Free pizza and beverages are provided. Music, poetry readings, and a discussion on a “green campus” round out the afternoon. The event is sponsored by the BU American Democracy Project and Democracy Matters.

THE STORY OF AN INTERNSHIP THAT MADE A DREAM COME TRUE

BY DR. HRANITZ

On April 3rd, the Biology and Allied Health Club hosted **Mary Jo Melicher-cik**, a 2005 graduate (B.S. Biology), who presented an overview of her activities as an intern at the Florida Fish & Wildlife Conservation Commission (FFWCC). Mary Jo's story is interesting because she, like most students, had a career goal in mind when she enrolled at BU. Her goal was very specific— to conduct research on manatees. I recall first meeting Mary Jo in Marine Ecology class at the Marine Science Center. When I learned her career objective, I immediately thought “hope for the best and plan for the worst.” Hope for the best in the sense that nearly anything is possible with a good attitude and planning. Plan for the worst because the only manatees in the world are located in the Gulf of Mexico on the west coast of Florida and only a handful of research programs study manatees. What were the odds of one student from Pennsylvania landing such a job? Therefore, Mary Jo had a “Plan B” in place. In Mary Jo's case, Plan B was not needed because she took advantage of the opportunity to demonstrate her knowledge, research skills, and motivation by doing an internship studying manatees. As an intern for the FFWCC, she tagged and tracked manatees in order to learn their habitat requirements. She constructed Argos-linked GPS tags, tagged animals, monitored movements using GPS, and confirmed positions of manatees from a boat. Upon completion of her internship, she was hired because she possessed the specific skills and knowledge for the research position and can now work independently. Best wishes to Mary Jo! Anyone interested in a similar internship opportunity can visit www.fmri.edu or www.myfwc.com.



Ornithology Class Studies Birds at the Beach

The Ornithology class recently went on a field trip to Wallops Island and Assateague Island, which includes parts of the Chincoteague National Wildlife Refuge. The group stayed at the Marine Science Consortium. While in the area, the class observed more than 60 bird species during their trip including brown-headed nuthatch, piping plover, peregrine falcon, willet, sanderling, American oystercatcher, and many species of herons and egrets. The area is an excellent place to study, work, explore, and play. For more information on taking courses at the Marine Science Consortium this summer for Biology elective credit, contact Drs. Klinger, Hranitz, or Corbin.

Ornithology class on the beach at Assateague Island. From left to right: **Dr. Corbin, Nick Ernst, Zac Wert, Steph Findley, Bill Donmoyer, Mike Dzwonek, Laura Yost, Jon Confer, Phu “Foo Fighter” Ho, and Rachel Jacobs.**



This has been a busy, exciting, and successful academic year. Between moving to Hartline West, searching for new faculty members, hosting events such as the Health Sciences Symposium, Science and Technology Day, and Iditarod, and research and classes, there hasn't been a dull moment! Thanks to all of you who helped to make this academic year a successful one! That includes our departmental secretary, student secretaries, work study students, lab assistants, Biology and Pre-Medicine Club members, volunteers at Open House, the Science Iditarod, and the Health Sciences Symposium, graduate assistants, research students, and all of you who make this a great place to teach and learn!