



BioSynthesis

Volume 4, Issue 5 (November 2005)

BioSynthesis On-Line: <http://departments.bloomu.edu/biology/>

Fall Semester Dates

NOV 1: Ohio College of Podiatric Medicine, 5:00 p.m. 178 HSC
NOV 2: Career & Internship Expo, KUB, 12:00 to 3:00 p.m.
NOV 8: Last Day to withdraw from a class
NOV 9: Fall into Health Program, Reducing Test Anxiety, Columbia, 9:00 p.m.
NOV 11: Journal Club, 3:00 p.m., 178 HSC
NOV 12: Practice MCAT, 79 HSC, 8:00 a.m.
NOV 17: Great American Smoke-Out Fair, KUB
NOV 18: Journal Club, 3:00 p.m., 178 HSC
NOV 19: Biology Club Field trip to Hawk Mountain
NOV 23 to NOV 27: Thanksgiving Recess



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Vertebrate Zoology Field Trip to the Marine Science Center

Dr. John Hranitz and members of the Vertebrate Zoology class headed to the Marine Science Center at Wallops Island, VA on Fall Reading Day for some great field experiences. The primary objective was to observe the diversity of vertebrates concentrated in these coastal habitats. The group's short Friday afternoon drive/hike around the wildlife loop, while cool and overcast, did not disappoint. They observed foraging behavior in Snowy Egrets as well as many waterfowl including mallard ducks, wood ducks, and black ducks. On Saturday morning, our field biologists worked off breakfast by pulling trawls with Captain Bill at the helm. They delicately searched through the blue crabs (and a mantis shrimp) for a variety of blennies, toadfish, perch, drum, and black sea bass. One net yielded a diamondback terrapin carrying some of Dr. Venn's favorite creatures on its back (see below.) In the early afternoon, the group transferred the fishes in the catch to aquaria at the Marine Science Center for identification. The fish were then released back into the bay. The group proceeded to hike across Assateague Island to observe birds in different habitats. This provided some close views of a variety of birds, but the focus of the island's "birders" was a large number of adult and immature herons roosting in the secondary dunes. Whether it was being on the move all weekend or the MSC breakfast, all was quiet on the trip home with only the occasional head popping above the seat backs, rather like the occasional dolphin breaching the water's surface.

Photos. Left: Black crowned night herons pose for the paparazzi! Upper Right: **Talia McAlister** (left), **Rachel Brous** (middle), and **Amy Christine** (right) are scouting for birds in the marsh from a monitor boat. Lower Right: Diamond back terrapin (and barnacles!)

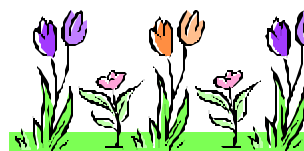


Black Crowned Night Herons (juveniles)



Diamondback terrapin

Thinking About Bio Electives for the Spring?



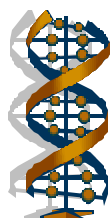
If you are a sophomore, junior, or senior, it is time to contemplate your choices of biology electives for the spring 2006 semester. There are great choices available for all flavors of biology.



For those who are biomedical in their orientation, there is Immunology and Neurophysiology. Immunology (50.343) introduces components and functions of human immune system; application of immunology to infectious disease, blood transfusion, organ transplantation, and cancer. Its pre-requisite is Cell Biology, 50.271. Clinical Lab Science majors are required to take this course. Neurophysiology (50.476) teaches how the nervous system integrates thousands of incoming messages with memories and comes to logical conclusions (well most of the time logical). Although higher vertebrates are the focus, much of the research uses invertebrates. (Did you know that the son of Dr. Keffer Hartline won the Nobel Prize for work on vision in the horseshoe crab?) If you have the following courses you are ready to “neuro,” Cell Biology (50.271) and Anatomy & Physiology 2 (50.174) OR Vertebrate Systems Physiology (50.474) OR Comparative Animal Physiology (50.480).



For those of you who are ready to head to the field, Ornithology (50.459) is the place to be. The great thing about a bird course is that after taking it, you will have a better appreciation of the diversity of life on our planet and the unique history of that diversity. You'll be able to identify the regional birds by sight and sound and have a general knowledge of avian anatomy, physiology, behavior, and ecology. Some study off-campus is required. The field trips will be low to no-cost excursions to regional bird hotspots. You should expect being in the field during inclement weather, especially during the first part of the semester. One weekend field trip to the Marine Science Consortium, Wallops Island, VA includes additional student costs. Talk with Dr. Corbin (HSC 173, Hartline West) to learn more. Prerequisite: Concepts in Biology II (50.115) or consent of the instructor.



Dr. Hansen will be launching 50.435, Bioinformatics and Genomic Analysis, in which you will learn to manipulate genomic sequence information (i.e. data files). From this you can learn meaningful information about genes, gene structure, gene regulation, and gene evolution. The course will focus on the kinds of information that can be extracted from large DNA sequences in order to understand gene function. Particular emphasis will be placed on understanding our genetic predisposition(s) to disease and the relationship of the human genome to the genomes of other organisms. Prerequisites: 50.271, 53.141, and either 50.332 or 50.333, or permission of the instructor. Got questions; see Dr. Hansen (HSC 270 Hartline West).

Have you been thinking that some research on your resume could be the “icing” on your application to graduate school or professional school or even open the door to your first job? If you have, (1) you are pretty smart and (2) we have the right course for you. In Methods in Biotechnology (MIB) (50.484), you will be a member of a research team working with faculty and peers and will investigate cool problems in our state-of-the-art, new Biotechnology Laboratory in Hartline West. See Dr. Davis ASAP (right now!, HSC 272 Hartline West) to discuss projects; you and he will need to finalize plans by November 18th. MIB requires a background in Molecular Biology or Biochemistry 2 or the permission of Dr. Davis.



For those of you shopping for a course with environmental significance, Dr. Rier has put together “Global Change Biology” as the Current Topics course (50.489). This course will explore the biological consequences of current environment change including rising levels of atmospheric CO₂, climate change, loss of biodiversity, and eutrophication. The course format will combine short lectures with student oral presentations and class discussions. Readings will be drawn primarily from the current scientific literature.

As always if you have problems scheduling a course for which you have the appropriate background, drop by the department office and complete a “Difficulties in Scheduling” form.



Thinking ahead to next year: Dr. Hranitz will offer Population Biology in Spring 2007. This course includes population structure and dynamics, population genetics, population ecology, and speciation. To be well prepared for the course you need to complete Genetics and Ecology prior to Spring 2007. Make sure that you get these scheduled this spring and/or fall (2006).



IMPORTANT!

Due to high demand for biology and allied health science courses, all students **MUST** attend lab the first week of class or they will be dropped from the roll to accommodate students on waiting lists.

Deadlines!

Deadline to withdraw from a class: **Tuesday, November 8, 2005 (4:30 p.m.)**

Deadline to submit approved proposals for Undergraduate Research in Biology to Dean's Office: **November 22, 2005**. These must be submitted to the chairperson by **November 15, 2005**.

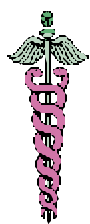
Scheduling Note: The Physics Department plans to offer Introductory Physics I and II (54.111 and 112) during summer 2006.



It's Time for Academic Advisement!

ALL students should see their academic advisor in preparation for scheduling. Not sure who your advisor is? Check on STINF or the bulletin board directly across from the BAHS office (125 Hartline). The following table will help you to locate BAHS faculty and staff.

Office or Faculty	Room	Locator 1	Locator 2
Department Office	HSC 125	Hartline East**	Green floor
Dr Zareen Amin	HSC 172	Hartline West*	First (main) floor
Dr Joe Ardizzi	HSC 106	Hartline East	Green floor
Ms Vicki Beishline, BAHS Secretary	HSC 124	Hartline East	Green floor
Dr Kris Brubaker	HSC 177	Hartline West	First (main) floor
Dr George Chamuris	HSC 105	Hartline East	Green floor
Dr Clay Corbin	HSC 173	Hartline West	First (main) floor
Dr George Davis	HSC 272	Hartline West	Top floor
Ms Melinda Diltz	HSC 265	Hartline West	Top floor
Dr Carl Hansen, Graduate Programs in Biology Coordinator	HSC 270	Hartline West	Top floor
Dr John Hranitz	HSC 271	Hartline West	Top floor
Dr Judy Kipe-Nolt, Allied Health Sci- ences Programs Coordinator	HSC 269	Hartline West	Top floor
Dr Thom Klinger	HSC 005	Hartline East	Red floor
Dr Mark Melnychuk	HSC 266	Hartline West	Top floor
Dr Barry Nolt	HSC 113A	Hartline East	Green floor
Dr Steve Rier	HSC 102	Hartline East	Green floor
Dr Cindy Surmacz	HSC 268	Hartline West	Top floor
Dr Margaret Till, Chairperson	HSC 126	Hartline East	Green floor
Dr Gary Wassmer	HSC169	Hartline West	First (main) floor
Dr Kevin Williams	HSC 103	Hartline East	Green floor
Dr Marianna Wood, Assistant Chairper- son	HSC 104	Hartline East	Green floor
* Hartline West refers to the new addition to Hartline. **Hartline East refers to the older section of Hartline.			



ALLIED HEALTH NEWS

Medical Imaging Students: Apply NOW to Clinical Programs

Medical Imaging Students are encouraged to submit their applications to clinical programs as soon as possible. Apply to at least five hospitals—there is a lot of competition. Go on line or call schools for applications.

Fall into Health Program Series

The Health Sciences Learning Community is continuing its series of programs on health-related topics. All programs will be held at 9:00 p.m. in the Columbia Fireside Lounge and free refreshments will be served. Upcoming programs include: Wednesday, November 9: Managing/Reducing Test Anxiety by Professors Oman, Sanders, and Culver, Department of Nursing and Wednesday, November 30: Exercise Science. Everyone is welcome!



Internships for Medical Imaging Students

Internship experiences for Medical Imaging students have been established at Bloomsburg Hospital and Geisinger Medical Center in Danville, PA. Interns at Bloomsburg Hospital may observe in the areas of nuclear medicine and MRI. Interns at Geisinger Medical Center may observe all imaging areas and meet both a radiologist and a hospital supervisor. Interns spend about one-half to two-thirds of the semester visiting the internship site under the guidance of the on-site supervisor and the remainder of the semester writing a 10-20 page internship report. Applications for the medical imaging internships at Bloomsburg Hospital and Geisinger Medical Center can be obtained from **Dr. Hranitz** and will be available October 26. The deadline to submit applications is November 4, 2005.

Great American Smoke-Out Fair

BU will host its annual Great American Smoke Out Fair in Multi-Purpose rooms A and B of Kehr Union on Thursday, November 17, 2005 from 10 a.m. to 3 p.m. This event is held in conjunction with the annual event sponsored by the American Cancer Society. The Smoke-Out Fair will feature informational booths aimed at combating smoking and tobacco use. The groups participating include: DAWN, the Student Health Center, and our own **Biology Club**. The Fair will also feature posters and brochures prepared by various university classes including the Human Biology classes of **Dr. Zareen Amin** and **Professor Melinda Diltz**. Also participating will be **Dr. Hranitz's** Anatomy and Physiology II students who will be preparing poster critiques. A keynote address will be presented at 7:00 p.m. in Multi-Purpose Rooms A and B. All are welcome! We hope to see you there!



Check out BodyWorlds!

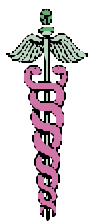


The Franklin Institute Science Museum in Philadelphia is featuring a new 22,000 square foot exhibit called BodyWorlds. This anatomical exhibit consists of over 200 authentic human specimens and 25 real human bodies that have been preserved through the process of plastination. In this technology, body fluids and fat are impregnated with plastics that harden under vacuum. This process is slow; it takes about 1500 hours to plastinate a body. Guests can explore the link between human health and body structure and function. The exhibit is intended for both a lay audience and for health professionals. For more information, see the poster and brochure on the bulletin board outside the Anatomy and Physiology lab or see <http://www.gophila.com/bodyworlds/index.htm>. The exhibit will be on display through April 23, 2006. Tickets to the exhibit can be purchased online at www.fi.edu/BodyWorlds.

Save the Date!

The Annual Health Sciences Symposium is scheduled for Thursday, April 7 and Friday, April 8, 2006. This year's theme is centered on understanding cancer. The keynote speaker is BU alumna Dr. Lynn McCormick Matrisian. Dr. Matrisian is the Ingram Distinguished Professor of Cancer Research and the Chair of the Department of Cancer Biology at the Vanderbilt-Ingram Cancer Center in Nashville, TN. Dr. Matrisian recently served as the president of the American Association for Cancer Research. Her research investigates communication pathways between cells and their environment and their contribution to the development and spread of cancer.





News from the Pre-professional Committee

The BU pre-professional committee hosted an orientation session for students last month at Andruss Library. We had a nice turnout! (perhaps it was the cookies!) Thanks to all for attending. According to our department database, we currently have 73 pre-professional students who are enrolled in the following programs: pre-Chiropractic (6); pre-Dental (7); pre-Medical (43); pre-Veterinary (8); pre-Optometry (6); pre-Podiatry (3). Welcome aboard!

The mission of the BU pre-professional committee is to HELP YOU gain admission to professional school. We do this by advising pre-professional students, assisting students with the application process, evaluating student credentials, preparing committee letters of evaluation, obtaining resources for students relating to professional schools, and establishing relationships with professional schools. Let us know how we can help you. The co-chairs of the committee are **Drs. Joseph Ardizzi** and **Mark Melnychuk**, Department of Biological and Allied Health Sciences. Other committee members include **Dr. Cindy Surmacz** from Biological and Allied Health Sciences and **Drs. Christopher Hallen** and **Toni Trumbo-Bell** from Chemistry. Students are encouraged to check the committee website (<http://departments.bloomu.edu/biology/preprof.htm>) for announcements, current events, information on course selection, pre-professional test materials, and links to important web sites. Also, current information is displayed on the bulletin board outside of room 106 HSC.

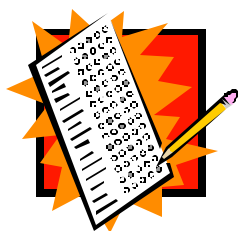
Campus Visits

Mr. Aaron Berger, an admissions representative from the Ohio College of Podiatric Medicine, Cleveland, Ohio, will be on campus Tuesday, November 1, 2005 at 5 p.m. in 178 Hartline (BAHS Conference Room) to meet with interested students. Mr. Berger will discuss opportunities and careers in podiatric medicine. His visit is sponsored by the Biology Club.

Upcoming Programs

Temple University Health Sciences Center is hosting a "Pre-Health Professions Day" on Saturday, November 19, on the campus of The Temple University School of Podiatric Medicine. Programs represented will be the Podiatric Medical School, The School of Dentistry, The School of Pharmacy, and The College of Allied Health Professions. Events will include an overview of the programs, a student panel for question and answers, a campus tour, and a short recruitment fair. The events will end by 2 p.m. Please pre-register by November 15, 2005 by calling either 1-800-220-FEET or 1-215-625-5451

The University of Pittsburgh-Carnegie Mellon is sponsoring a Summer Undergraduate Research Program for underrepresented minorities. This 10-week research and enrichment program is designed for students in their freshman through junior years. The application deadline for the summer program is February 1, 2006. For further information, contact **Dr. Ardizzi**.



PRACTICE MCAT TO BE OFFERED!

The Pre-professional Committee will offer its annual Mock MCAT exam on **Saturday, November 12, 2005 from 8 a.m. to 3 p.m.** MCAT, a test developed by the Association of Medical Colleges, is the standardized test required for medical school admission. Although dental and optometry schools have their own specialized standard examinations, pre-dental and pre-optometry students would benefit by this opportunity to gain exposure to the standardized test experience. The MCAT assesses mastery in biology, general and organic chemistry, physics, scientific problem solving, critical thinking, and writing skills. Scores are provided in four categories: biological science, critical thinking, physical sciences, and writing. By taking a practice MCAT you will become familiar with the length and format of the exam and the depth and breadth of its questions. After receiving your "practice scores" you will get a better understanding of the content areas that require further study. The practice MCAT is recommended for sophomores, juniors, or seniors. Freshmen should probably wait until they have had more college science courses.

- **WHEN:** Saturday, November 12, 8:00 a.m. to 3:00 pm.
- **WHERE:** 79 Hartline
- **BRING:** A lunch, pencils, and erasers
- **DO NOT BRING:** cell phones, calculators, or back packs
- **TO RESERVE YOUR SEAT:** E-mail Dr. Hallen (cph@bloomu.edu) by November 8
- **ANY QUESTIONS?** Please feel free to contact any member of the Pre-professional Committee.

What's new?



BAHS Students Honored for Outstanding Freshman Year Performance

Phi Kappa Phi is the nation's oldest, largest, and most selective honor society that recognizes and promotes academic achievement in all fields of higher education. Each year, the Bloomsburg University Chapter of the Honor Society of Phi Kappa Phi presents awards to exceptional students on the basis of their academic performance in the freshman year. This year five BAHS students are among those honored by the Society. The award recipients include: **Stephanie Gabel**, Medical Imaging; **Susan Heckman**, Medical Imaging; **Valerie Mead**, Medical Imaging; **Kaitlyn Sanders**, Pre-pharmacy; and **Bryan Wiest**, Medical Imaging.

Biology Club Updates

The Biology Club has recently sponsored a number of informative meetings on topics such as undergraduate research, internships, and how to apply to clinical programs. The group is presently revising its constitution to change its name to the Biology and Allied Health Club. The club's T-shirt sale has proven to be very successful. (They even made the BU home page!) The Biology Club thanks everyone who showed their support of Hardy-Weinburg equilibrium by buying a shirt! The group is planning to present an interactive display at the Great American Smoke-Out Fair on November 17 in Kehr Union and is recruiting a group interested in conducting mock interviews for medical schools or clinical programs. Also on the club's schedule is a field trip to Hawk Mountain with the Vertebrate Zoology class on November 19. Please visit with the club president, **Valerie Van Cleef**, or the club advisor, **Dr. Hranitz**, if you have an interest in any of these planned activities. Biology Club invites you to participate; all are welcome!

BUY BIOLOGY & ALLIED HEALTH T-SHIRTS!

- On the front: BU Biology and Allied Health
- On the back: Support Hardy-Weinberg Equilibrium.
Mate randomly.
- Colors: Green or Gray T-shirts
- Cost: \$10
- Where can I find one?
Ask members of Bio Club
or email your orders to:
tamcalis@bloomu.edu
- Supports: Biology and Allied Health Club

Check out the Career and Internship Expo!

The Career Development Center and Multicultural Affairs are teaming up to present the 2005 Career and Internship Expo on Wednesday, November 2 in Multi-Purpose Rooms, Kehr Union from 12:00 to 3:00 p.m. Information will be available on various careers, internships, jobs, and graduate schools. For a complete listing of the over 50 organizations attending, see <http://galileo.bloomu.edu/admin/today/expo.php>. The participating organizations that are of particular interest to BAHS students are the PA Department of Environmental Protection, the PA Department of Conservation and Natural Resources, the Lehigh Valley Medical Center, Interns Plus, and the National Park Service. Dress is campus casual. However, students seeking internships or full time positions should dress professionally and bring copies of their resume.





News from BAHS ALUMNI

Karen Avery (M.S. Biology,) **Johnna Ganz Kratzer** (B.S. Biology), and **Debbie Kurtz** (M.S. Biology) are currently teaching biology in area school districts and recently returned to BU to participate in its annual professional development day for science teachers.

Lindsay Baglini (B.S. Biology, 2005) has entered the Ph.D. program in biochemistry at Wake Forest University.

Brendan Blymire (B.S. Biology, 1998) recently graduated from Temple School of Dentistry.

Emily Bray (B.S. Biology, 2004) and **Michael Kaminsky** (B.S. Biology, 2005) are first year medical students at the Philadelphia College of Osteopathic Medicine (PCOM). Mike recently visited the department to update us on his first year.

Doug Buffington (B.S. Biology, 1988) is practicing medicine in Elysburg, PA after earning his medical degree from the University of Health Sciences in Kansas City and completing a residency at Community General Osteopathic Hospital in Harrisburg.

Thomas Cooper (B.S. Biology, 1993) received a Ph.D. in Wildlife Biology from South Dakota State University and is currently employed by the Minnesota Waterfowl Association.

Zachary Hoffer (B.S. Biology, 1995) obtained his Ph.D. and then completed a post-doctoral fellowship at the College of Medicine, Pennsylvania State University. Dr. Hoffer has published in such journals as *Brain Research*, *The Journal of Comparative Neurology*, and the *Journal of Neurophysiology*. Dr. Hoffer is currently entering his second year of medical school at Drexel University. Zach spent the summer as a second lieutenant at Fort Sam Houston in San Antonio, Texas.

Jennifer Dillow (B.S. Medical Imaging, 2004) is pursuing a second degree in secondary education at Alvernia College, Reading, PA. Jen is also making plans to study abroad in the United Kingdom for spring semester 2006.

Kristy Follmer (B.S. Biology, 2001) has received her M.D. degree from the College of Medicine, Pennsylvania State University and is beginning a residency in emergency medicine at Geisinger Health System.

Tyson Hale (B.S. Biology, 2005) recently volunteered with the American Red Cross in New Orleans to assist hurricane victims.

Eric Horstick (B.S. Biology, 2005) has begun his Ph.D. program at the University of Michigan and has just completed a lab course in cellular and molecular neuroscience. He is currently doing lab rotations.

Mary Jo Melichercik (B.S. Biology 2005) will start an internship with the Florida Fish and Wildlife Research Institute. She will be assisting with a manatee tracking project in the Tampa Bay area. Her primary responsibility will be to record movements and behavioral observations from land and boat. For more information about this internship visit the web site: http://www.floridamarine.org/features/view_article.asp?id=23644

Robert Meyers (B.S. Biology, 1994) is practicing as an oral surgeon in Camp Hill, PA.

Leon O'Neill, IV (B.S. Biology, 1999) has graduated from Philadelphia College of Osteopathic Medicine, receiving his Doctor of Osteopathic Medicine degree.

Charles Penn (B.S. Biology) is employed as a senior staff-level bioanalytical chemist at Sanofi Pasteur, Inc., the vaccine division of Sanofi Aventis group. Charles is also pursuing a graduate degree in biochemistry at the University of Scranton.

Alison Pottage (M.S. Biology, 2001) is currently working as an arborist for a commercial tree care company, 'SavATree' based in Philadelphia.

Jonathan Sabo (B.S. Biology, 2002) has accepted a position as microbiologist with the Pennsylvania State Department of Health in the West Chester/Philadelphia area.

BAHS Updates



Journal Club Is Marching On!

Journal Club has been the place to be this semester! We traveled to Antarctica through a slide presentation by Dr. Hansen, learned about bone cancer research with Dr. Brubaker, and met a fascinating wood roach courtesy of Dr. Wassmer. We hope that you will join us as the adventures continue.

What is journal club? It is an opportunity to get together informally with fellow students and faculty to discuss late-breaking research articles on the cutting edge of biology, while eating munchies! A graduate student or faculty member leads a discussion of a recent paper from the biological literature.

The papers under discussion can be downloaded from <http://facstaff.bloomu.edu/ccorbin> Journal club

meets on selected Fridays at 3 p.m. in the Biological and Allied Health Sciences Seminar Room, 178 Hartline Science Center. A special journal Club was held on October 28. **Michelle (Bradley) Pettitt** presented the results of her Graduate Directed Study project on the "Effects of atrazine on early ranid tadpole development." Upcoming journal club dates, speakers, and topics are outlined in the chart below. For more information, contact Dr. Corbin at X4132 or ccorbin@bloomu.edu Everyone is invited! We hope to see you there!

Date	Speaker	Topic
Friday, Nov. 11	Dr. Rier	A Midsummer's Dry Stream, Act 1: Using measurement of ecosystem function to assess stream health
Friday, Nov. 18	Stephanie Benfer	A Midsummer's Dry Stream, Act 2: Puck and Robin measure uptake velocity
Friday, Dec. 2	Stacy Rogers	Sex, lice, and videotapes: you have cuddly parasites in your barn.

Mark your calendars!



Mark your calendars for the following spring semester events:

Commonwealth of Pennsylvania University Biologists (CPUB) will hold its annual meeting at Kutztown University on March 24 -26, 2006. CPUB is an organization of biology faculty from the fourteen universities in the State System of Higher Education. CPUB holds annual meetings to highlight student and faculty research. This is a good venue to present the results of your undergraduate or graduate research projects!

The annual meeting of the Pennsylvania Academy of Science (PAS) is in Grantsville, PA (near Harrisburg) on March 31 to April 2, 2006. The meeting features a keynote address and research posters and presentations on a wide variety of topics. This is another good forum for students to present the results of their research projects. Deadline for abstracts is December 15, 2005. For more information see <http://pennsci.org/index.htm>

Digital Library

The BEN collaborative, a group composed of the American Association for the Advancement of Science and 11 other professional societies, has launched an online digital library to support teaching and learning at undergraduate and graduate institutions. The BEN portal site contains a variety of resources such as a multimedia auditorium, a reading room, a reference room, and tools for teaching and learning. Over 61 subdisciplines of biology are included, literally ranging from A to Z (agriculture to zoology). Specific resources include everything from journal articles and animations to field trip guides and photos. Check out the digital library at <http://www.biosciencednet.org/>



Stay Connected!

Important sources of information:

- 1) The BU Biology/Allied Health Website <http://departments.bloomu.edu/biology/>
- 2) The bulletin board case adjacent to the elevator, green floor.
- 3) Be sure to check your BU e-mail for messages from the department office, faculty, friends, etc. You can forward your BU e-mail to other e-addresses.



BAHS Faculty Activities

Several BAHS faculty recently received Research/Scholarship grants from the College of Science and Technology. **Dr. George Davis** received funding for his project *An Investigation of Phytosiderophore Conjugates as a Means of Delivering Effector Molecules to Target Species*. **Dr. Kristen Brubaker** was awarded a grant to conduct the project *Deciphering the Role of Runx2 in Osteoprotegerin Protein Expression in the Prostate Cancer Cell Line PC-3*. This research will be conducted with **Cassandra Clay**, a student enrolled in Research in Biology I. **Drs. Joseph Ardizzi, Mark Melnychuk, and Cynthia Surmacz** from BAHS along with **Dr. Christopher Hallen** in Chemistry received a grant to purchase and administer practice MCAT exams to pre-professional students.

Dr. Kipe-Nolt gave a presentation on our newly approved Radiologist Assistant (RA) program at the Education Council meeting of the American Society of Radiologic Technologists in Albuquerque, NM.

Dr. Rier has published a paper in the journal *Microbial Ecology* with colleagues L. R. Janus, N.L. Angeloni, J. McCormack, N.C. Tuchman, and J.J. Kelly. The paper is entitled "Elevated atmospheric CO₂ alters soil microbial communities associated with trembling aspen (*Populus tremuloides*) roots."

Dr. Surmacz recently participated in Bloomsburg University's Professional Development Day for area K-12 teachers and BU student teachers. She presented two workshops *Debating Ethical Issues in the Classroom: Use of Decision-Making Models* and *A Sampler of Inquiry-Based Activities for Anatomy and Physiology*.

Dr. Wassmer is conducting research on the Pennsylvania wood roach. He is seeking one or two students to assist with this project. Studies can be directed anywhere from ecological work to protein sequencing. If you are interested, please contact him as soon as possible. (HSC 169 Hartline West, gwassmer@bloomu.edu).

Research Feature

Nest abundance of insectivorous birds along acid mine drainage (AMD) affected and unaffected streams.

Dr. Clay Corbin and Nick Ernst (Business Major, Biology Minor)

Bloomsburg University is a great place to study the effects of natural resource exploitation on riparian ecosystems. This region has a very high density of streams and has a long history of mining activity. Riparian areas lie along streams and generally have a rich diversity and density of organisms. Vertebrates benefit from water and food provided by the stream. Kingfishers, herons, and ospreys can be found along many Pennsylvania streams eating fish. In addition, many invertebrates (e.g. mayflies) emerge from streams providing food for insectivorous birds and bats. The links of this food chain may break when food items disappear or become reduced in quality. One factor that may break food chain links is acid mine drainage (AMD). AMD, resulting from the mining of coal and other deposits, contains dissolved metals such as aluminum that are toxic to fish and invertebrates. Hence, a reduced quantity or quality of food would, in turn, lead to a reduction of consumers at higher levels in the food chain.

We predict that AMD-affected streams will support the breeding activities of fewer insectivorous birds. Hence, we are sampling sites along four local streams, two AMD streams (Catawissa and Nescopeck Creeks) and two non-AMD streams (Fishing and Little Fishing Creeks) for nests. Insectivorous birds that can be found nesting along these streams include the Eastern Phoebe and several swallow species (Barn, Cliff, Northern Rough-winged, and Tree). A common area for these birds to nest is under bridges crossing the stream. We count the number of nests of the birds listed above and note qualities of the bridge itself including type and amounts of nesting availability. Currently, we are in the middle of sampling and will conclude our field work by the end of the semester. We plan on presenting the results of our research at two venues next spring. The first is at the Pennsylvania Academy of Science meetings in Harrisburg next March and the second presentation will be a part of the dedication ceremonies associated with a new limestone treatment facility on Catawissa Creek. The latter will be attended by Governor Rendell.

If interested in gaining valuable research experience associated with streams and AMD, please see one of the following who have current projects:

Dr. Rier (algal and invertebrate biology, stream ecology, ecosystem ecology), HSC 102

Dr. Hranitz (fish biology, molecular ecology, population ecology), HSC 271

Dr. Corbin (bird or bat biology, community ecology), HSC 173



The Reading Lamp: Current Topics in Evolutionary Biology

George Chamuris, Professor



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

Evolutionary Theory is Essential for Understanding Influenza A

Why do we need a new flu vaccine each year? Why are we so concerned about a possible pandemic of avian (bird) flu, when so far all confirmed cases of bird flu in humans have resulted from bird-to-human, not human-to-human transmission? Because influenza A continues to evolve (Webster et al., 1992), generating new antigenic variants which may have the ability to cause a devastating pandemic associated with high mortality. The 20th century witnessed many epidemics and three pandemics: the Hong Kong pandemic of 1968, the Asian pandemic of 1957, and the 1918 pandemic (e.g. see Reid and Taubenberger, 2003). Another pandemic is inevitable (Webster, 1997). Are we ready (Webby and Webster, 2003)?

The evolution of influenza A virus is a simple yet effective example demonstrating how mutation and natural selection act in concert to create changes in phenotype. Understanding the cellular and molecular bases of viral evolution are crucial to effective vaccine development, and epidemiological prediction and surveillance. This is an excellent example of the utility of evolutionary theory (consult Bull and Wichman, 2001, for a review of the subject of applied evolution).

Influenza viruses have an enveloped virion and belong to the family Orthomyxoviridae. These viruses have a single-stranded, negative-sense RNA genome. They are classified into types A, B, and C depending on the antigenic properties of key viral proteins (Suzuki and Nei, 2002). All 15 subtypes of influenza A have a reservoir and originated in aquatic birds (Webster, 1998). Although viruses are generally host-specific, many can cross species boundaries (e.g. strains of HIV evolved from SIV and crossed chimpanzee-human and monkey-human boundaries). Influenza A can infect many species birds, as well as mammals such as horses, pigs, and humans. In aquatic birds such as ducks, influenza A replicates in the intestinal epithelium, producing contaminated feces. Among humans transmission is respiratory, and most of the damage occurs to the respiratory tract.

An important glycoprotein found in the viral envelope of influenza A and B is hemagglutinin (HA). One derivative of HA functions as receptor-binding molecule and is the major target of the immune response. Influenza A HA genes exist in fifteen subtypes, designated H1 – H15. It is generally held that new influenza A pandemics arise in humans when viral variants with new HA subtypes cross the species barrier from bird to human (Suzuki and Nei, 2002), probably with pigs as an intermediate host (consult Webster et al., 1995). Suzuki and Nei (2002) used phylogenetic analyses to estimate that the oldest variants of HA genes in influenza A originated between several hundred to several thousand years ago, and that the HA genes of influenza A and influenza B diverged some 4,000 years ago.

The viral envelope of influenza A includes another glycoprotein called neuraminidase (Voyles, 2002). NA is also a target of the immune system. Portions of HA and NA are antigenic determinants, being the key immunologic regions of concern to the immune system, and to scientists dedicated to the development of new vaccines. Influenza A variants are labeled according to their HA and NA subtypes: e.g. H1N1, H9N2, and H5N1. There are only three known subtypes of influenza A transmitted among humans: H1N1, H1N2, and H3N2; these most likely had at least some portions of key molecules derived from subtypes prevalent in birds (<http://www.cdc.gov/flu/avian>).

Influenza A may undergo antigenic drift (small changes in HA and NA), antigenic shift (large changes in HA and NA to produce new subtypes and combinations) (Webster, 1992) and reassortment (Voyles, 2002). Reassortment may occur when an animal host is infected by more than one antigenic variant, and during the replication phase these may exchange genetic components. These mutations are then subjected to natural selection. Those variants with novel antigenic determinants will replicate more efficiently in previously unexposed and immunologically unprepared host populations. Older variants may re-emerge as individuals immune to them die over the years.

Avian influenza cases (bird-to-human, not human-to-human transmission) include those in Hong Kong in 1997 (H5N1; e.g. Lin et al., 2000), China and Hong Kong in 1999 (H9N2), Virginia in 2002 (H7N2), Holland in 2003 (H7N7), in Hong Kong in 2003 (H9N2), in New York in 2003 (H7N2), in Canada in 2004 (H7N3), and recent outbreaks in southeast Asia (e.g. Viet Nam, H5N1) (<http://www.cdc.gov/flu/avian>).

As of yet, avian influenza strains are not well-adapted for human-to-human transmission and there is no immediate basis for the irrational fear seen in some of the news media. The risk for further evolution is real however. Therefore, we must prepare by increasing vaccine and anti-viral production capacity (the U.S. has only one active vaccine production facility) and improved epidemiological surveillance and quarantine measures. Influenza A will continue to evolve – we need to understand viral evolution and develop strategies based on that understanding.

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Secondary Education in Biology Majors

Consider joining....

NABT

The National Association of Biology Teachers (NABT) is an organization of over 9,000 educators committed to providing high quality education in the life sciences to students at all levels. NABT publishes a monthly journal *The American Biology Teacher*. The ABT is a practical journal containing instant updates, reviews of classroom resources, and a *How-To-Do-It* feature that provides lab activities that can be directly incorporated into the classroom. NABT also publishes a number of books tailored to teachers with such titles as *Biotechnology on a Shoe String*, *Investigating Plants*, *The Middle School Idea Book*, and *Biology Labs That Work*. NABT publishes position papers on topics ranging from the teaching of evolution to the use of animals in the classroom. This national organization sponsors an annual convention which features presentations by noted biologists, workshops, demonstration, and exhibits. To learn more about the NABT check out their website at www.NABT.org. Student membership is \$35 per year.

BUSTA

What is BUSTA? The Bloomsburg University's Science Teachers Association, of course. BUSTA is open to all science education members (including elementary education). This year the group is hoping to hold a science fair for local middle school students, organize a group to attend the PA Science Teachers Association conference in Hershey, and raise funds to help teachers and schools in hurricane-stricken areas. If you are interested or have any questions, please contact **Charlene Feyers** at orchid40@hotmail.com. BUSTA's advisor is Dr. Ralph Feather, Department of Education Studies and Secondary Education (rfeather@bloomu.edu).

Funds Available to Attend Teaching Conference



The NSF-CETP-PA project at BU has MONEY available to support students to attend the PA Science Teachers Association (PSTA) conference in Hershey, PA on November 30 to December 2, 2005. This year's theme, Lights Camera and the Action of Science, captures the excitement of science in the classroom. The conference is jam packed with over 130 sessions that included hands-on workshops, content updates, and field trips to Indian Echo Caverns, Hershey Foods, and the Oakes Museum. For more information, go to the PSTA website (www.pascience.org) and click on "convention." To apply for funding, contact Dr. Bruce Wilcox, Department of Chemistry, at bwilcox@bloomu.edu or X 4145. The application deadline for the PSTA meeting it is November 18, 2005.

THE BU MASTERS PROGRAM

The Department of Biological and Allied Health Sciences offers both a Masters of Science degree (M.S.) and a Master of Education (M.Ed.) in Biology. Our master's program in general biology provides opportunities for course work and research at the supraorganismal, organismal, cellular, and molecular levels of biology. The program prepares students for admission to doctoral programs or professional schools and also enhances the knowledge and experience of high school biology teachers. **For more information, contact the graduate program coordinator, Dr. Carl Hansen (270 HSC).**

SHOULD YOU GO TO GRADUATE SCHOOL?

A master's degree in the biology can open many doors! Our program prepares students for employment in a broad variety of life science professions, from laboratory technician to field biologist to pharmaceutical sales. The program is also designed to enhance knowledge, perspective, and hands-on experience for high school biology teachers. A master's degree from Bloomsburg University can also provide an appropriate intermediary step for entrance into medical, dental, and doctoral degree granting institutions.

The program offers opportunities for study at the supraorganismal, organismal, and cellular and molecular levels of biology. A broad array of subdisciplines is represented among the faculty, allowing considerable flexibility on the selection of independent research topics. Thesis research may have laboratory or field components and may be carried out on campus or at off-campus sites.



SUMMARY OF M.S. PROGRAM OPTIONS IN BIOLOGY

There are two options within the master's program in biology, thesis and non-thesis. All students must schedule and successfully complete the Master's Candidacy Exam to advance beyond 12 credit hours. Candidacy must be achieved before scheduling thesis. Biostatistics (53.546) is required of all students in the M.S. Biology program.

THESIS OPTION

Students must complete a minimum of 30 credit hours of graduate course work, which includes at least 18 semester hours at the 500 level and 6 semester hours of thesis research.

NON-THESIS OPTION

Students must complete a total of 30 credit hours of graduate course work with at least 18 credit hours at the 500 level. There are two sub-options within the non-thesis option.

A. Directed Study Sub-option

Students must complete at least 27 credit hours of graduate-level classroom course work and three credit hours of Directed Study in Biology (50.591).

B. Departmental Paper Sub-option

Students must complete at least 30 credit hours of graduate course work and complete a literature-based, written paper on a topic selected by the student and the advisor.

SUMMARY OF M.Ed. PROGRAM OPTIONS IN BIOLOGY

There are two options within the master's in education program in biology, thesis and non-thesis. All students must schedule and successfully complete the Master's Candidacy Exam to advance beyond 12 credit hours. M.Ed. in Biology students are required to take: Major Philosophies of Education (60.501) and Research in Education (79.591).

THESIS OPTION

Students must complete a minimum of 30 credit hours of graduate course work, which includes at least 18 semester hours at the 500 level and 6 semester hours of thesis research.

NON-THESIS OPTION

Students must complete a total of 30 credit hours of graduate course work with at least 18 credit hours at the 500 level and three credit hours of Directed Study in Biology (50.591).