



BioSynthesis

Volume 5 Issue 1 (February 2006)

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

Fall Semester Dates

FEB 18: Science and Technology Symposium, Hartline Science Center.

MAR 11—19: Spring Break

MAR 24 — 26: CPUB meeting, Kutztown University

MAR 30 & 31: Student Research and Creative Activities Poster Session, KUB

MAR 31—APR 2: PA Academy of Science meeting, Grantville, PA

APR 1: Biology & Allied Health Club Volleyball/Picnic

APR 6 & 7: Health Sciences Symposium, Understanding Cancer, KUB

APR 22: MCAT Exam



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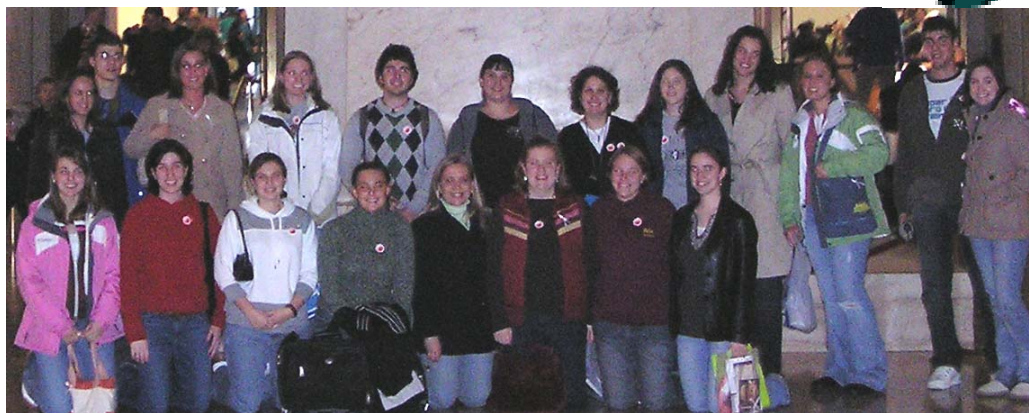
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Biology & Allied Club Explores Body Worlds at the Franklin Institute



Members and friends of the Biology & Allied Health Club trekked to Philadelphia's Franklin Institute on Saturday, February 4, to check out Body Worlds, the anatomical exhibition of real human bodies. Over 200 human specimens preserved by plastination were displayed. Many were arranged in poses reminiscent of the renaissance illustrations of Andreas Vesalius in his landmark book *De Humani Corporis Fabrica*. Exquisite dissections revealed all the body systems and related pathologies, such as heart attacks, strokes, arteriosclerosis, aneurisms, smoker's lungs, and various cancers. Some of the group's favorite exhibits were those in which blood vessels were injected with a polymer to reveal the surrounding tissues. Another exhibit demonstrated how, inside each obese person, there is a thin person. Many in the group were particularly impressed by a complete series of embryos and fetuses that showed human development and a variety of birth defects. Body Worlds will remain at the Franklin Institute until April 23. The Biology & Allied Health Club highly recommends it! Members & friends pose at the foot of a statue of Ben Franklin: (front) **Teal Ingerick, Megan Coyne, Laura Halon, Rachel Brous, Laura Yost, Becky Rugg, Talia McAlister, Maureen Dameron;** (back) **Lissa Mercado, Mike Massey, Kelly Fleming, Brianne Fester, Joel Gyimesi, Crystal Naugle, Kelley Laughlin, Liz Hoch, Julie Pershing, Elissa Cook, Chris Ayala, Kelsey Grabert.**

Biology & Allied Health Club Calendar Set

Check out the following events sponsored by the club this semester.

Saturday, March 25: Trip to the Baltimore Aquarium
Saturday, April 1: Volleyball/Picnic
Week of April 17—21: Plant Sale
Saturday, April 22: Roadside Cleanup
Sunday, April 23: Banquet



Regular meetings are held on Tuesdays at 5 p.m. in the BAHS Conference Room. All are welcome. For more information, see any club officer: President, **Val VanCleaf**; Vice-President, **Becky Rugg**; Secretary, **Rachel Brous**; and Treasurer: **Joel Gyimesi**. **Dr. Hranitz** serves as the faculty advisor.



Salute to Academic Achievement

Congratulations to Biology and Allied Health students who earned a GPA of 3.5 or greater and were named to the Dean's List for Fall Semester 2005. Great job!

B.S. Biology

Nicholas Bixler
 Sarah Bounds
 Richard Carter IV
 Cassandra Clay
 Bryan Crandall
 Nicole Dalessandro
 Justin Dion
 Maria Gallagher
 Jared Geissinger
 Kelsey Grabert
 Laura Halon (Biotechnology option)
 Jessica Hudon
 Pamela Hudock
 Elena Insinga-Krick
 Aubrey Jones
 Caitlin Kluskiewicz
 Denise Lucas
 David Lusby (and B.S. Computer Science)
 Nathan Mutic (and B.S. Secondary Education)
 Cara Shellenberger
 Sherrie Santaniello
 David Sibley
 Ashley Welikonich (and Anthropology)
 Ashley Yelinek

Secondary Education Biology

Holly Binkley
 Rachel Jacobs
 Adam Hoagland

BA Biology

Sarah Bowman
 Eileen Garvey
 Jamie Willour
 Linda Yeany

Pre-pharmacy

Donald Astleford
 Jacqueline Celluci
 Shanna Quinn
 Kaitlyn Sanders

Clinical Lab Sciences

Kimberly Maddalozzo

Pre-occupational therapy

Andrea Long

Pre-physical Therapy

Katura Andrews
 Courtney Dean
 Kimberly Dodson
 Kaylee Fischer
 Maria Johns
 Jennifer Krott
 Theresa Linnenbach
 Krista Rae Petruskevich
 Jill Thompson
 Megan Vickery
 William Young

Medical Imaging

Ashley Albertson
 Ashley Boos
 Bruce Bortree
 Breanne Connors
 Megan Coyne
 Jason Craig
 Kelleigh Eckenrode
 Megan Enterline
 Stephanie Gabel
 Amy Giordon
 Susan Heckman
 Teal Ingerick
 Ryan Jones
 Lauren Keeny
 Amanda Knepp
 David Lindemann
 Tanya McFalls
 Valery Mead
 Ashley O'Gara
 Leah Redinski
 Nicole Shambach
 Danielle Swartz
 Stephanie Tinna
 Brett Wiest
 Bryan Wiest
 Kevin Wray



BAHS Student Workers Shine!

Two BAHS undergraduates were nominated for the "Student Employee of the Year Award." **Maxine Ferrante**, student secretary, was nominated by Ms. Vicki Beishline, BAHS secretary, for her reliable service, ability to work well independently, and attention to the individuals she is helping. **Michelle Sienkiewicz**, a B.A. Biology/pre-physical therapy major and student worker in the Anatomy and Physiology labs, was nominated by Dr. Surmacz. Michelle was cited for her hard work during the move to the new Hartline wing and for her cheerful and dependable service in this complex and demanding assignment. Thanks Maxine and Michelle for all your work. Congratulations!



BAHS Student Awarded Scholarship

Rachel Jacobs, Secondary Education Biology, has received a \$500 scholarship from the BU Collaborative for Excellence in Teacher Preparation (CETP-PA). Rachel's selection was based on the strength of her academic record and commitment to science teaching. Congratulations Rachel!

BAHS Students receive Kozloff Award

Two BAHS students recently received the prestigious Kozloff Undergraduate Research Awards to support their ongoing research projects. Laura Halon (left) is examining the effects of heat shock on the immune system of thermotolerant bees. Laura's mentor is Dr. Brubaker. Ashley Yelinik (right) is determining the effectiveness of tethered swimming in improving race performance in competitive swimmers. Ashley is a member of the varsity swim team and is conducting this research project for her Honors Independent Study project. Ashley's mentors in this interdisciplinary project are Dr. Surmacz (BAHS) and Drs. Rawson and Mookerjee (Exercise Science and Athletics.)



Who's Who in BAHS

Congratulations to the following BAHS students who were recently named to Who's Who Among Students in American Colleges and Universities. Selection was based on leadership ability, scholastic achievement, personal traits, societal contributions, and professional promise.

Cassandra Clay, a B.S. Biology major and Chemistry minor, is interested in becoming a physician assistant. She is a member of the pre-professional club, has shadowed healthcare professionals, and participated in the Jan Plan program at Geisinger Medical Center. Cassie has conducted research with Dr. Brubaker that examined the role of Runx2, a transcription factor involved in bone formation, in a prostate cancer cell line isolated from a cheek bone metastasis. Cassie is a member of BU's soccer team and has volunteered as a soccer coach. She was featured recently as a "rising star" on BU's web site.

Eileen Garvey, B.A. Biology, is planning to pursue a career as a physician assistant. Eileen participated in the University Honors program and served as a Husky Ambassador. She has been named to Bloomsburg University's Dean's List and the National Dean's List. Eileen has been involved in athletics, participating in varsity swimming as a freshman and intramural volleyball and softball in other years. She recently completed an internship with a physician assistant in the cardiothoracic and vascular service at Geisinger Medical Center.

Nathan Mutic, B.S. Biology and Secondary Education, is very involved in campus activities. He is a member of the University Democrats, co-president of the cycling team, and a member of the Lacrosse team. He enjoys the outdoors, participating in QUEST, and mountain biking competitions. Nathan served as a calculus tutor and has been named to the Dean's list. He has gained considerable research experience. Among his projects are a study of pholcid spider population genetics in Costa Rica, a genetic and cytological analysis of the effect of mutagens on nuclear migration during cell cycling with Dr. Ardizzi, and a study of nematodes of agricultural importance at Penn State.

Amanda Parkhurst, is pursuing a B.A. Biology major with the goal of becoming a physician assistant. Amanda has shadowed in several settings and worked as a patient-care technician at Wyalusing Personal Care Home. Amanda is a member of Theta Tau Omega and received the Greek Life Academic Achievement Award. Amanda's list of community activities is extensive. She served as a Red Cross volunteer, participated in many charity walks, prepared meals at the Ronald McDonald House, took part in the Adopt-A-Highway program, volunteered at the Bloomsburg Food Cupboard, and worked in the Kids Fun project in the SOLVE office.

David Sibley is a B.S. Biology major who is interested in pursuing a career in dentistry. Dave has been named to BU's Dean's list and the National Dean's list. He is active in the Bloomsburg Men's Rugby Club and has volunteered as an Assistant Coach at the Hatfield Hurricanes Youth Rugby Club. Dave has served as a summer camp counselor for disadvantaged children. He is a member of the Pre-Medical Sciences Club and has tutored in both biology and chemistry. Dave also finds time to work at the Student Recreation Center.

Leanne Yeagley, B.S. Biology and Secondary Education, was awarded a competitive summer fellowship at the Weis Research Center. Leanne helped design and teach hands-on science programs for area children in grades 3 to 8. Leanne has been a Resident Advisor and has assumed leadership roles in the community advisor program. She received a Board of Governor's Scholarship, participated in the Honor's Program, and been named to the Dean's list multiple times. Leanne is a member of Alpha Sigma Alpha and served the community in the Big Brother-Big Sisters program and as a Special Olympics volunteer.



Pre-professional Committee News

Register NOW for April 22 MCAT

The MCAT is a standardized exam required for admission to allopathic, osteopathic, and some veterinary schools. The exam assesses mastery in biology, general and organic chemistry, physics, scientific problem solving, critical thinking, and writing skills. Scores are provided in four categories: biological sciences, verbal reasoning, physical sciences, and writing. The exam is typically taken in the spring of the junior year or the summer between the junior and senior year.

The next exam is scheduled for APRIL 22, 2006. The registration deadline is March 17 and the late registration deadline is March 31. 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>

Register for the Computerized DAT

The Dental Admission Test (DAT) is the required test for admission to all U.S. dental schools. The test consists of four sections: 1) Survey of the Natural Sciences (Biology, General Chemistry, and Organic Chemistry); 2) Perceptual Ability; 3) Reading Comprehension; and 4) Quantitative Reasoning. The DAT is taken online at a Prometric Testing Center, operated by Sylvan. It can be scheduled on almost any date. The Dental Admission Testing Program Application and Preparation Materials booklets have arrived from ADA. Please see Dr. Ardizzi, 106 HSC, for a copy.

JAN PLAN

Geisinger Medical Center's JAN PLAN brings students into the hospital for a first hand look at the medical profession. Students shadow physicians as they rotate through various departments of the hospital. Participating in Jan Plan this year were biology major **Christopher Kashi** and biochemistry major **Brian Holsey**. Chris found JAN PLAN to be a great experience. He observed two surgeries, seeing both the insertion of ear tubes and a tonsillectomy. He rotated through oncology, hematology, internal medicine, and pediatric intensive care. He enjoyed the opportunity to be exposed to many different areas and appreciated that the physicians and physician assistants explained what they were doing. Brian observed kidney and ankle surgeries. He really liked the experience and found it to be an "eye-opener." The JAN PLAN experience can be very helpful in determining whether the medical profession is for you.

Pre-Medical Sciences Club

The pre-medical sciences club is organizing for the semester. For more information, see club officers **Nicole Dalessandro**, president; **Nick Bixler**, vice-president; and **Mallory Garnett**, secretary or Dr. Ardizzi, club advisor.

Podiatry Internships

The Ohio College of Podiatric Medicine in Cleveland, Ohio is providing summer internships for students to interact with podiatrists and podiatry students and to gain experience in podiatry in a variety of clinical settings. To be eligible, students must have completed their freshman year, be in academic good standing, and submit one letter of recommendation. Applications and additional information may be downloaded at www.ocpm.edu

Program in Veterinary Medicine

Penn State University is hosting a Northeast Regional Symposium on Saturday, April 1, 2006 for students interested in veterinary medicine. There will be a series of lectures and hands-on wet labs. There is a \$25 registration fee. Registration deadline is Friday, March 3, 2006. For more information and registration forms see Dr. Ardizzi. You may register on-line at <http://www.clubs.psu.edu/up/prevetclub/regsym.html>

Summer Programs at Howard University

Howard University announces two summer programs for pre-professional students. The Summer Medical and Dental Education Program (SMDEP) is a 6-week program for freshmen and sophomores running from June 5 to July 14, 2006. The application deadline is March 1, 2006. For applications and details, please visit www.smdep.org <<http://www.smdep.org>>. The Advanced Health Careers Opportunity Summer Enrichment Program is for juniors and seniors who have completed pre-medical/dental requirements. This 7-week program runs from June 10 to July 29, 2006. The application deadline is April 1, 2006. For more information, see <http://www.founders.howard.edu/preprof>



Be on the look-out for e-mail notices about upcoming events. See Dr. Ardizzi to register with the pre-professional committee. If you have 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).



BAHS adds three new options

BAHS is proud to announce that three new options within the B.S. Biology major have been approved. These new options will join our two existing options in Biotechnology and Microbiology. While many students are well served by the broad education provided by our general B.S. degree in biology, these additional options will expand our offerings to those seeking a more specialized education. The new options offer a more focused selection of elective and general education courses to prepare students for a chosen career. The three new options are in Pre-Medical Sciences, Environmental Biology, and Natural History.

Pre-Medical Sciences option

This option includes courses that will prepare students for entry into medical school. Specifically, this option guides students to complete courses that are either required for entry into medical schools or provide preparatory coursework for topics covered on admission exams (e.g., MCAT, GRE). For more information, see Drs. Ardizzi, Melnychuk, or Surmacz.

REGULAR BS	PRE-MEDICAL SCIENCES OPTION
Biology Core Requirement 50-114 Concepts in Biology I (4) 50-115 Concepts in Biology II (4) 50-242 Microbiology (4) 50-271 Cell Biology (4) 50-351 Ecology (3) 50-332 Genetics (3) one of five Physiology (3) 50-479 IPL (1) 50-481 Senior Biology Seminar (1)	Biology Core Requirement 50-114 Concepts in Biology I (4) 50-115 Concepts in Biology II (4) 50-242 Microbiology (4) 50-271 Cell Biology (4) 50-351 Ecology (3) 50-332 Genetics (3) 50-474 Vertebrate Systems Physiology (3) 50-479 IPL (1) 50-481 Senior Biology Seminar (1)
Chemistry Requirement 52-115 Chem for the Sciences 1 (4) 52-116 Chem for the Sciences 2 (4) 52-231 Organic Chemistry I (4) 52-232 Organic Chemistry II (4) 52-341 Biochemistry (4)	Chemistry Requirement 52-115 Chem for the Sciences 1 (4) 52-116 Chem for the Sciences 2 (4) 52-231 Organic Chemistry I (4) 52-232 Organic Chemistry II (4) 52-341 Biochemistry (4)
Physics Requirement Introductory or General Physics I (4) Introductory or General Physics II (4)	Physics Requirement Introductory or General Physics I (4) Introductory or General Physics II (4)
Mathematics / Statistics Requirement 53-123 Essentials of Calculus (3) 53-141 Introduction to Statistics (3) or 53-125 Calculus I (3) 53-141 Introduction to Statistics (3) or 53-125 Calculus I (3) 53-126 Calculus II (3)	Mathematics / Statistics Requirement 53-123 Essentials of Calculus (3) 53-141 Introduction to Statistics (3) or 53-125 Calculus I (3) 53-126 Calculus II (3)
Biology Electives 12 credits	Biology Electives 12 credits from: Embryology, Comparative Vertebrate Anatomy, Vertebrate Histology, Vertebrate Zoology, Medical Bacteriology, Immunology, Virology, Neurophysiology, Human Genetics, and Developmental Biology
Gen Ed- Values, Ethics, and Responsible Decision Making	Gen Ed- Values, Ethics, and Responsible Decision Making 28-290 Medical Ethics (3) or 50-254 Social Implications of Biology (3)

Environmental Biology Option

This option prepares students for careers in environmental biology such as fisheries biologist, field biologist, and conservation biologist. Students in this new option select courses that emphasize the interactions between organisms and their environment. They learn about the Earth's physical environments through courses in geography and geosciences and develop the quantitative and analytical skills needed by environmental biologists. Please note that the complete curriculum guide is not shown. It can be viewed at http://departments.bloomu.edu/biology/curriculum_sheets.html For more information on the Environmental Biology option, please contact Dr. Rier or Dr. Wood. To officially sign up for the option, go to the Academic Advisement Office, 216 Student Services Center. Hope to see you out in the field!



Biology Core Requirement (23 cr hrs)

50-114	Concepts in Biology I	4	<input type="checkbox"/>
50-115	Concepts in Biology II	4	<input type="checkbox"/>
50-242	Microbiology	4	<input type="checkbox"/>
50-271	Cell Biology	4	<input type="checkbox"/>
50-332	Genetics	3	<input type="checkbox"/>
50-351	Ecology	3	<input type="checkbox"/>
50-481	Senior Biology Seminar	1	<input type="checkbox"/>

Mathematics Requirement (6 cr hrs)

53-141	Introduction to Statistics	3	<input type="checkbox"/>
Choose one of the following			
53-240	Statistical Methods	3	<input type="checkbox"/>
53-342	Design and Analysis of Experiments	3	<input type="checkbox"/>
53-343	Applied Regression Analysis	3	<input type="checkbox"/>
53-446	Biostatistics	3	<input type="checkbox"/>

Geology Requirement (7 cr hrs)

51-100	Environmental Geology	3	<input type="checkbox"/>
51-101	Physical Geology	3	<input type="checkbox"/>
51-111	Physical Geology Lab	1	<input type="checkbox"/>

Physics Requirement (4 cr hrs)

54-111	Introductory Physics I	4	<input type="checkbox"/>
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Chemistry Requirement (12 cr hrs)

52-115	Chem for the Sciences I	4	<input type="checkbox"/>
52-116	Chem for the Sciences II	4	<input type="checkbox"/>
Choose one of the following			
50-230	Fundamentals of Organic Chemistry OR	4	<input type="checkbox"/>
50-321	Analytical Chemistry I	3	<input type="checkbox"/>

Science & Environmental Studies Electives

Select 21 credits, 12 credits must be in Biology or Marine Science.

Chemistry Elective Courses

52-230	Fundamentals of Organic Chemistry*	4	<input type="checkbox"/>
52-321	Analytical Chemistry I*	3	<input type="checkbox"/>

*May not count as both a Requirement and Science Elective.

Geology & Earth Science Elective Courses

51-255	Meteorology	3	<input type="checkbox"/>
51-259	Oceanography	3	<input type="checkbox"/>
51-260	Earth Materials	4	<input type="checkbox"/>
51-320	Remote Sensing of the Earth	3	<input type="checkbox"/>
51-370	Surface Hydrology	3	<input type="checkbox"/>
51-460	Aqueous Geochemistry	4	<input type="checkbox"/>

Biology Elective Courses

50-200	Dendrology	3	<input type="checkbox"/>
50-211	Invertebrate Zoology	3	<input type="checkbox"/>
50-212	Vertebrate Zoology	3	<input type="checkbox"/>
50-252	Field Zoology	3	<input type="checkbox"/>
50-253	Freshwater Biology	3	<input type="checkbox"/>
50-263	Field Botany	3	<input type="checkbox"/>
50-350	Plant Pathology	3	<input type="checkbox"/>
50-390	UG Research in Bio I	3	<input type="checkbox"/>
50-391	UG Research in Bio II	3	<input type="checkbox"/>
50-450	Mycology	3	<input type="checkbox"/>
50-451	Conservation Biology	3	<input type="checkbox"/>
50-452	Limnology	3	<input type="checkbox"/>
50-455	Environ Microbiology	3	<input type="checkbox"/>
50-457	Entomology	3	<input type="checkbox"/>
50-458	Fungal Ecology	3	<input type="checkbox"/>
50-459	Ornithology	3	<input type="checkbox"/>
50-460	Population Biology	3	<input type="checkbox"/>
50-480	Comparative Animal Physiology	3	<input type="checkbox"/>
50-490	Internship in Biology	3	<input type="checkbox"/>
50-493	Honors Indep Study I	3	<input type="checkbox"/>
50-494	Honors Indep Study II	3	<input type="checkbox"/>

Geography Science Courses (note: two of these courses can be used to partially satisfy group B requirements)

41-258	Environmental conservation	3	<input type="checkbox"/>
41-301	Water resources management	3	<input type="checkbox"/>
41-302	Land resources management	3	<input type="checkbox"/>
41-303	Soil Resources Management	4	<input type="checkbox"/>
41-304	Environmental Valuation	3	<input type="checkbox"/>
41-305	Environmental Risks and Hazards	3	<input type="checkbox"/>
41-342	Geographic Information Systems	3	<input type="checkbox"/>

Physics Elective Courses

54-112	Introductory Physics II	4	<input type="checkbox"/>
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Marine Science Courses

55-221	Marine Invertebrates	3	<input type="checkbox"/>
55-241	Marine Biology	3	<input type="checkbox"/>
55-250	Wetland Ecology	3	<input type="checkbox"/>
55-260	Marine Ecology	3	<input type="checkbox"/>
55-298	Physiology Marine Invertebrates	3	<input type="checkbox"/>
55-300	Behavior Marine Organisms	3	<input type="checkbox"/>
55-320	Marine Microbiology	3	<input type="checkbox"/>
55-330	Tropical Invertebrates	3	<input type="checkbox"/>
55-342	Marine Botany	3	<input type="checkbox"/>
55-343	Marine Ichthyology	3	<input type="checkbox"/>
55-394	Comp Phys Marine Organisms	3	<input type="checkbox"/>
55-431	Ecology of Marine Plankton	3	<input type="checkbox"/>
55-432	Marine Evolutionary Ecology	3	<input type="checkbox"/>
55-441	Biology of Molluscs	3	<input type="checkbox"/>
55-464	Biological Oceanography	3	<input type="checkbox"/>
55-491	Coral Reef Ecology	3	<input type="checkbox"/>
55-492	Marine Mammals	3	<input type="checkbox"/>
55-493	Behavioral Ecology	3	<input type="checkbox"/>



Natural History Option:

This option prepares students for careers in natural history such as museum or zoo docents, park rangers, etc. In this option, students learn how the Earth's history, ecology, and geography determine the biota of an area. Students acquire the skills needed to prepare natural history programs for the public. Students take organismal and field courses in the biology department along with courses in geosciences and anthropology. Please note that the complete curriculum guide is not shown. It can be viewed at http://departments.bloomu.edu/biology/curriculum_sheets.html For more information on the Natural History Option, please contact Drs. Klinger, Hranitz, or Corbin. To officially sign up for the option, go to the Academic Advisement Office, 216 Student Services Center.

<p>Biology Core Requirement (22 hrs) <input type="checkbox"/></p> <p>50-114 Concepts in Biology I 4 <input type="checkbox"/></p> <p>50-115 Concepts in Biology II 4 <input type="checkbox"/></p> <p>50-242 Microbiology 4 <input type="checkbox"/></p> <p>50-233 Human Genetics 3 <input type="checkbox"/></p> <p>50-351 Ecology 3 <input type="checkbox"/></p> <p>50-430 Evolution 3 <input type="checkbox"/></p> <p>50-481 Senior Biology Seminar 1 <input type="checkbox"/></p>	<p>Geological Science Requirement (8 hrs) <input type="checkbox"/></p> <p>51-120 Physical Geology 3 <input type="checkbox"/></p> <p>51-121 Physical Geology Lab 1 <input type="checkbox"/></p> <p>51-130 Historical Geology 3 <input type="checkbox"/></p> <p>51-131 Historical Geology Lab 1 <input type="checkbox"/></p> <p>Mathematics Requirement (3 hrs) <input type="checkbox"/></p> <p>53-141 Introduction to Statistics 3 <input type="checkbox"/></p>
<p>Organismal Course Requirement (6 hrs) <input type="checkbox"/></p> <p>Select two courses among biology and marine science organismal courses: 50-200, 50-211, 50-212, 50-222, 50-361, 50-450, 50-457, 50-459, 50-460, 50-461, 55-221, 55-300, 55-320, 55-330, 55-342, 55-343, 55-345, 55-431, 55-441, 55-492, and 55-493. List below.</p> <p>50-____ 3 <input type="checkbox"/></p> <p>50-____ 3 <input type="checkbox"/></p>	<p>Field Course Requirement (6 hrs)* <input type="checkbox"/></p> <p>Select two courses among biology and marine science field courses: 50-200, 50-252, 50-253, 50-263, 50-457, 50-459, and all Marine Science Courses (55 department code). List below.</p> <p>_____ 3 <input type="checkbox"/></p> <p>_____ 3 <input type="checkbox"/></p>
<p>Biology and Other Science Electives <input type="checkbox"/></p> <p>(10 hrs) Select among biology, marine science, or geology electives on p. 2. List below.</p> <p>_____ 3 <input type="checkbox"/></p> <p>_____ 3 <input type="checkbox"/></p> <p>_____ 3 <input type="checkbox"/></p> <p>_____ 3 <input type="checkbox"/></p> <p>_____ 3 <input type="checkbox"/></p>	<p>*Some courses may be used to satisfy EITHER the Organismal OR Field course requirement. Students may apply these courses to either requirement, but a single course cannot be applied to both requirements.</p>

What are you doing this summer?



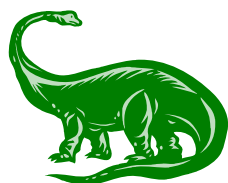
BAHS Summer College Offerings

The following courses will be offered by BAHS during summer 2006:
 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)

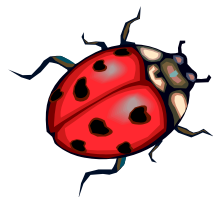
Check out the Biology Elective Offerings this Summer!



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 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 either 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.



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.



Field Zoology (50.252), 3 Credits

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

This course provides an introduction to the natural history of animals with an emphasis on vertebrates identification and field research techniques. What better way to become familiar with animals than to spend three weeks in the summer finding them in nature and seeing them in action? This is a hands-on approach (roll up your sleeves and get dirty) to the study of animals of Pennsylvania and coastal marine habitats with students collecting live animals in the field for observations in the laboratory and by making observations in the field. Field trips will be taken to as many of Pennsylvania's exotic locales (forests, bogs, barrens, ponds, streams, and much more) as we can possibly tolerate! The course features a field trip to coastal marine habitats (an additional student expense), possibly including boat trips and experience with other coastal habitats (barrier islands, salt marshes, bays, intertidal zones). For additional information see Dr. Hranitz's web page: <http://facstaff.bloomu.edu/jhranitz/Courses/fieldzool.htm>

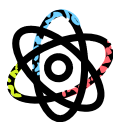
Study at the Ocean this Summer....

Marine Science Consortium Offerings

<p>Session I: May 25—June 2 52.241 Marine Biology 55.491 Coral Reef Ecology</p> <p>Session II: June 5—June 23 55.211 Field Methods in Oceanography 55.343 Marine Ichthyology 55.431 Ecology of Marine Plankton</p> <p>Session IV: July 17—August 4 55.221 Marine Invertebrates</p>
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For more information, contact Drs. Klinger, Hranitz, or Corbin. Hurry—courses fill up quickly!



Chemistry and Physics Offerings

The Chemistry Department at Bloomsburg University plans to offer the following courses this summer: Intro. Chem (50.101), Chemistry for the Sciences I (52.115), and Chemistry for the Sciences II (52.116). The Physics Department will offer Intro. Physics I (54.111) during Session I and Intro. Physics II (54.112) during Session III.



Summer Internships and Employment Opportunities

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. Clay Corbin**, 131 HSC, Phone 4134, e-mail ccorbin@bloomu.edu

Externship Program for Clinical lab Science Students

Are you considering a career in a hospital clinical lab? Then you may be interested in this 10 week summer program at the York Hospital Department of Laboratory Services. This program acquaints students with a clinical lab in a community hospital and the role of a clinical lab scientist in this setting. Students will have the opportunity to develop lab skills in the area of blood banking services, clinical chemistry, clinical microbiology, hematology, coagulation, urinalysis, and anatomic pathology. These are paid positions; no on-site housing is available. To be eligible, students must be enrolled in a bachelor's degree program in clinical lab science or a related field. For more information, see Dr. Kipe-Nolt or Mrs. Diltz. Applications will be accepted through the end of February.

Employment Opportunity at Raystown Lake

Would you enjoy spending time outdoors this summer? Then a position as park ranger at Raystown Lake may be just the ticket! Park rangers assist visitors, conduct summer projects, provide interpretative services, and manage park resources. Applicants are preferred with a background in biology or a related field. For more information, see the flyer on the BAHS bulletin board.

Summer Research Internships at The Weis Center for Research

The Weis Center for Research, Geisinger Health System in Danville, PA is sponsoring a 10- week summer research intern program. Interns will have the opportunity to do hands-on scientific research under the direct supervision of a Weis Center scientist on topics related to the molecular, cellular, and genetic basis of human disease. Interns will receive a stipend of \$8 per hour. The deadline for applications is February 16, 2005. A flyer detailing the application procedure is located on the BAHS bulletin board on the green floor adjacent to the elevator.

Paid Internships in Area Counties

The Degenstein Foundation of Sunbury and PHEAA are collaborating to provide 200 paid internships for college students in Columbia, Montour, Snyder, Northumberland, and Union Counties. Most of the internships are at non-profits and government agencies. Certain qualifications must be met. For more information, see www.internsplus.com

The Reading Lamp: Current Topics in Evolutionary Biology

George Chamuris, Professor



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

How Long Does Speciation Take?

It varies with the taxonomic group, and probably occurs more quickly in some environmental scenarios than others. The question of the duration of speciation in primates has received little attention until recently. Darren Curnoe and Jack Coate (University of New South Wales), and Alan Thorne (Australian National University) have recently published a paper addressing speciation duration and taxon longevity in anthropoid (non-prosimian) primates (Curnoe et al., 2005).

The authors surveyed recent (past 10 years) published research employing molecular clock data to calculate genus, species and phylogroup divergence times in anthropoid primates. Of course the generic and specific taxonomic definitions of the sampled papers varied, so the authors compared divergence times among extreme and moderate taxonomic schemes. The scheme of Fleagle (1999) provided the backdrop for median divergence times, and served as the standard for this paper.

For all taxa sampled, the median maximum duration of speciation is approximately 1.1 Ma, ranging from 1.74 Ma in New World monkeys, to 0.66 Ma for hominoids (apes and humans). These durations are much longer than for other vertebrates, such as 2.0 Ma for birds, and 2.2 Ma for nonprimate mammals (Avice et al., 1998). The median genus age for all anthropoids was estimated to be 5.29 Ma, and about 5 Ma for hominoids.

Fitzpatrick (2004) estimated that the evolution of hybrid inviability (a post-zygotic isolating mechanism) in mammals takes between 2 and 4 Ma. Curnoe et al. (2005) then reasoned that the trend in primates may be that pre-zygotic isolation is more important in speciation than post-zygotic isolation. After assessing reports of interspecific hybridization among congeneric species of primates, Curnoe et al. (2005) suggested that the molecular clock divergence estimates in the literature reflect the start of pre-zygotic isolation, rather than the completion of reproductive isolation to form “official,” reproductively isolated species.

Published estimates for the last common ancestor of *Pan* (chimpanzees) and *Homo* (humans) puts the divergence of these lineages, based on the fossil record, at about 7 Ma (e.g. Pickford and Senut, 2001). Since such estimates are older than hominoid genera (5 Ma), previous suggestions (e.g. by Curnoe and Thorne, 2003) that chimpanzees and humans should be classified in the same genus, are no longer tenable.

Avice, J.C., D. Walker, and G.C. Johns. 1998. Speciation durations and Pleistocene effects on vertebrate phylogeography. *Proceedings of the Royal Society of London, B*. 265:1701-1712.

Curnoe, D., and A. Thorne. 2003. Number of ancestral human species: a molecular perspective. *Homo – Journal of Comparative Human Biology* 53:201-224.

Curnoe, D., A. Thorne, and J.A. Coate. 2005. Timing and tempo of primate speciation. *Journal of Evolutionary Biology* 19:59-65.

Fleagle, J.G. 1999. *Primate Adaptation and Evolution*. 2nd Ed. Academic Press. California and London.

Pickford, M., and B. Senut. 2001. ‘Millennium Ancestor,’ a 6-million-year-old bipedal hominid from Kenya. *South African Journal of Science* 97:22-27

578

BAHS by the Numbers!

BAHS is home to 578 students as of Fall Semester 2005. Students were enrolled in the following programs: 248, B.S./B.A. general program; 2, B.S. Biology, Biotechnology option; 59 B.A. Biology, pre-physical therapy; 7, B.A. Biology, Marine Science Option; 221, Medical Imaging; 24, Clinical Lab Science; 11 pre-pharmacy; 1, pre-cytotechnology; 5 pre-occupational therapy.



Allied Health Updates

Health Sciences Symposium to Focus on Cancer

The Annual Health Sciences Symposium is slated for April 6 and 7, 2006 at Kehr Union. The symposium is an opportunity for the campus and community to explore contemporary health issues in a multidisciplinary setting. The keynote speaker is Dr. Lynn Matrisian, '75, professor of cancer biology at Vanderbilt University School of Medicine. Dr. Matrisian is a research scientist who studies the communication pathways between cancer cells and their environment in order to gain clues into the spread of cancer. Dr. Matrisian has a B.S. from Bloomsburg University, a M.S. from Hershey Medical Center, and a Ph.D in molecular biology from the University of Arizona. She recently completed a year term as president of the American Association for Cancer Research, a professional organization of over 24,000 scientists. Dr. Matrisian will present the keynote address, "Understanding Cancer: How Research Can Help You" on Thursday, April 6, 2006, 7:30 p.m. in Kehr Ballroom. On Friday, April 7, 2006 at 8:30 a.m. in Kehr Ballroom, she will lead a workshop on "The Ins, Outs, and the Impact of Cancer Research." In addition to the featured speaker, the symposium will feature posters and presentations by graduate students, undergraduates, and faculty. Awards will be given for outstanding undergraduate student posters. The symposium will also feature a Wellness Fair, including over 50 exhibits, demonstrations, and booths on a variety of health and wellness topics. This is always a big hit! The symposium is sponsored by the School of Health Sciences, the Central Susquehanna Community Foundation, the Provost's Lecture Series, and the University Health Center.

It's Interview Season!

Many medical imaging students are currently interviewing for clinical programs for the coming academic year. Good luck and remember to be yourself! Once you have made a decision, please see Dr. Kipe-Nolt to finalize your plans and complete the appropriate forms.



Medical Imaging Interns

Kelley Laughlin and **Susan Heckman** completed medical imaging internships at Geisinger Medical Center (GMC, Danville, PA) in the fall semester. **Pat Spadaro** served as an intern at Bloomsburg Hospital in the fall semester. **Katie Horoshock** and **Amy Mauer** are currently enrolled in medical imaging internships at GMC while **Erik Funk** and **Ali Lewis** are registered in medical imaging internships at BH. Interns have the opportunity to observe different medical imaging modalities and to understand the role of the medical imager in the healthcare team. Applications for summer internships will become available after spring break.

Attention Pre-Physician Assistant Students!

Pre-physician assistant is now an official area of advisement within the B.A. Biology curriculum. Pre-physician assistant students should officially declare this advisement area by signing up at the Academic Advisement Office, 216 Student Services Center.



You are invited!

The Philadelphia College of Osteopathic Medicine, Philadelphia, PA is holding an Open House on Thursday, March 2 from 6:30 to 8:30 p.m. The session will focus on the following graduate programs: M.S. Physician Assistant Studies; M.S. Forensic Medicine, and M.S. Biomedical Sciences. For additional information see www.pcom.edu.

BAHS Student Teachers

Several students have headed into area classrooms for student teaching in biology. The students and their placements are: **Holly Binkley** (Freeland Elementary/Middle School and Hazleton Area High School); **Krystle Brown** (Southern Columbia High School and Millville Junior-Senior High School; co-op teacher is BU alumna **Kristin Vitkauskis**); **Leo Colgan** (Berwick Area Middle School and Bloomsburg Middle School); **Paul Farley** (Drums Elementary/Middle School and Hazleton Area High School); **Charlene Feyers** (Southern Columbia High School); **Kimberly Garrison** (Berwick School District); **Joseph Holland** (Hatboro High School); **Rachel Kaskie** (Mount Carel Area Junior Senior High School); **Leanne Yeagley** (Shamokin Area High School and Southern Columbia High School; co-op teacher is BU alumna **Kristin Vitkauskis**); **Michael Yohn** (Warrior Run School District; co-op teacher is BU master's candidate, **Patrice Har-ringer**); and **Sabrina Ziemer** (Sandburg Middle School and Neshaminy High School).



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).**

Graduate Student Updates

We have several new graduate students this semester. We welcome **Erika Dittel**, **Jane Chandy**, **Laura Bauman**, and **Usha Manapati**. **Jennifer Biddinger**, our graduate assistant for Anatomy and Physiology, successfully passed her candidacy exam and is beginning her thesis research on stream ecology with Dr. Steven Rier. **Jithender Gundawar**, our graduate assistant for Cell Biology and Integrated Physiology lab is completing his candidacy exam and preparing to start his thesis research on heat shock proteins in bees. He will be mentored by Drs. John Hranitz and Kristen Brubaker. **Stephanie Benfer** is finishing up her research on stream ecology with Dr. Rier. **Stacy Rogers** is in the final stages of finishing her Thesis, mentored by Drs. Gary Wassmer and Clay Corbin.

Alumna's Research featured in *Science*

Soniya Sinha, M.S. Biology, was part of an international team of researchers that identified a gene in zebrafish that appears to determine pigmentation in both zebrafish and humans. The gene codes for a cation exchange protein located in the membranes of melanosomes, the pigmented organelle that resides in melanocytes. This gene accounts for much of the difference in skin color between African and European populations. This work was featured on the cover of the December 16, 2005 edition of *Science*. The article "SLC24A5, a Putative Cation Exchanger, Affects Pigmentation in Zebrafish and Humans," appears on pages 1782-1786. Soniya is currently in the Ph.D. program in Cellular and Molecular Physiology at Hershey Medical Center, Penn State University. She completed her M.S. at Bloomsburg University with mentor Dr. Carl Hansen.



SICB in Orlando: Who Ordered the Weather?

Close your eyes and picture Orlando, Florida in January. Did you envision bright sunshine, warm temperatures, and palms swaying in the breeze? Except for the first and last days of the meeting, it was cold and rainy! Despite the weather, Drs. Corbin, Croll, Surmacz, and I (Dr. Hranitz) thoroughly enjoyed the annual meeting of the Society for Integrative and Comparative Biology (SICB). Dr. Corbin presented a poster entitled "Age of evolutionary origin or ecological diversity: which better explains the morphological disparity of New World flycatcher clades?" This presentation was co-authored by his doctoral advisor, Dr. Miles, and BU student **Nicholas Ernst**. Dr. Corbin also presented a poster for **Stacy Rogers**, a BU master's student, co-authored with Dr. Wassmer. Stacy's presentation was called "Prevalence of nest parasites is independent of group size and nest density in barn swallows (*Hirundo rustica*)." Dr. Surmacz presented "Animal locomotion: bringing structure-function relationships to life in the introductory biology lab." I presented research entitled "Effective population size of a colony of collared lizards: another look after three generations." This presentation was co-authored with a colleague from Oklahoma, Dr. Baird, and BU graduate (Class of 2005) **Mary Jo Melichercik**. Next January's SICB meeting is in Phoenix, AZ. What are the chances we will need an umbrella?

Mark Your Calendars!

There are a number of local, state, and regional meetings planned for spring semester. This is a great opportunity to attend a scientific meeting and to present the results of your undergraduate research projects.

The 17th Annual Sigma Xi Student Research Symposium will be held on Saturday, April 22, 2006 at St. Joseph's University, Philadelphia. The featured speaker is Kathleen McGinty, Secretary, PA Department of Environmental Protection. Students are invited to submit abstracts for posters or talks. Abstracts are due March 22. For more information, see <http://www.sju.edu/srs>

The Pennsylvania Academy of Science meeting is scheduled for March 31 - April 2 near Harrisburg, PA. Several BAHS students and faculty are planning to present research talks and posters. Look for details in future issues of BioSynthesis.

Kutztown University is hosting this year's annual meeting of the Commonwealth of Pennsylvania University Biologists (CPUB) on March 24—26. The featured speaker is Scott Weidensaul, naturalist and author of over 2 dozen books. Students are invited to present posters or talks. Abstracts are due March 3, 2006. For more information, contact your research mentor.

Bloomsburg University's annual Student Research and Creative Activities Poster Session will be held March 30 & 31 in KUB, Multipurpose Rooms A & B. Application packets are available at the Office of Research and Sponsored Program, CeH, 212. Deadline for applications is Monday, March 20, 2006.