



# BioSynthesis

Volume 7, Issue 3 (October 2008)

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

## Fall Semester Dates

**OCT 13:** BAHS Club, 8 p.m., 178 HSC  
**OCT 15:** Tri-Beta Tutoring, 4 p.m., 1st floor Columbia  
**OCT 20:** Deadline to apply for Tri-Beta membership; Pre-Medical Sciences Club Speaker, 5:30 p.m., 178 HSC, Clinical Doctoral program in Audiology, Dr. Richard Angelo  
**OCT 22:** Thomas Jefferson University visit, 2 p.m., 142 HSC; Tri-Beta Tutoring, 4 p.m., 1st floor Columbia  
**OCT 27:** BAHS Club, 8 p.m., 178 HSC  
**OCT 29:** Tri-Beta Tutoring, 4 p.m., 1st floor Columbia  
**OCT 30 and 31:** Halloween Bake Sale, Pre-Med Club, HSC lobby  
**NOV 5:** Tri-Beta tutoring, 4 p.m., first floor Columbia  
**NOV 9:** Tri-Beta Initiation; 3:00 p.m. Schweiker Room, Andruss Library  
**NOV 10:** BAHS Club, 8 p.m. 178 HSC  
**NOV 14:** Deadline to apply for a spring semester internship scholarship.  
**NOV 16:** Practice MCAT, 9 a.m.



## Look what's inside:

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## Are you ready, willing, & ABLE?

ABLE, short for Academic Biology Learning Environment is a new resource area in the Science and Health Science Living-Learning Community Room on the first floor in Columbia Residence Hall. ABLE provides a place and resources for students in introductory biology courses to study individually and in groups together and with faculty. ABLE contains a variety of learning resources such as bones and skeletons; biological models; manipulatives for studying complex processes (protein synthesis, inheritance, mitosis and meiosis, etc.); microscopes and slides from lab courses; charts and posters; computer software; books and workbooks; and more! Many BAHS faculty hold office hours at ABLE. Tutoring and review sessions are also available. This new initiative is funded through a grant from the TALE, the Teaching and Learning Enhancement Center. ABLE's inauguration was celebrated at an Open House in September. At right, **John Harrison** and **Corey Scheeler** check out the protein synthesis simulation kit. ABLE is open daily from 9 to 5:30 p.m.



## Radiologist Assistant Program Receives ARRT Recognition

Bloomsburg University was notified this summer that our Radiologic Assistant Program (ARRT) has been recognized by the American Registry of Radiologic Technologists (ARRT) Board of Trustees. This means that the program meets ARRT recognition criteria and that BU students are now automatically eligible for ARRT certification. BU is among the first in the nation to offer this new health care program. The RA bridges the gap between radiologic technologists and radiologist physicians. RAs work under the supervision of a radiologist to perform certain radiology procedures that are currently conducted by a radiologist, to interact with patients, and to participate in the analysis of the quality of patient care in radiology. BU graduated its first RA student in August 2008. Shown above is **Brianna Wilkins** being hooded by **Dean Robert Marande**, College of Science and Technology, and **Mrs. Christine Mehlbaum**, RA program coordinator, at the May 2008 Graduate Commencement Ceremony. Special congratulations to Mrs. Mehlbaum for her efforts in achieving ARRT recognition.





## Celebrating Student Success

### Dean's List

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 Spring Semester 2008. Great job!

**Medical Imaging:** Andre Acevedo, Jillian Anthony, Christopher Arbogast, Lindsay Cartin, Matthew Fickinger, Elyssa Goldstein, Kristin Gross, Rashel Hagmayer, Hannah Koch, David Kolk, Jennifer Kubilus, Christine Lucasti, Amanda Malles, Kaitlyn Manley, Ashley Moro, Rose Novinger, Laura Ogle, Justine Okurowski, Grant Poppenwimer, Jenna Ruppert, Nicole Seward, Alexandra Shierant, Justin Singer, Laura Stanko, Neil Sullivan, Susan Wade, Taylor Washburn, Amanda Worsham

**Pre-Occupational Therapy:** Grace Crispell, Samantha McAteer, Lauren Petrun, Aubrey Schmidt

**Clinical Lab Science:** Debon Berger, Kristin Day, Laura Gedman, Sean Scubelek

### Biology

**B.S. Biology:** Emily Barkanic, Denise Beyer, Michael Bierds, Samantha Bussanich, Anh Hong Ho, Michael Hollman, Christopher Krum, Jared May, Sandra Newell, Stephanie Simpson, Arifah Uqdah

**B.S. Biology, Pre-Medical Sciences Option:** Andrew Ackerman, Kyle Bartol, Jennifer Candelora, Travis Castleberry, Kyle Correll, Ryan Dorkoski, Catherine Holtmaster, James Kearns, Allen Petros, Michelle Stipanovic, Kristen Tinney, Broc Wenrich

**B.S. Biology, Microbiology Option:** Krysta Whitmoyer

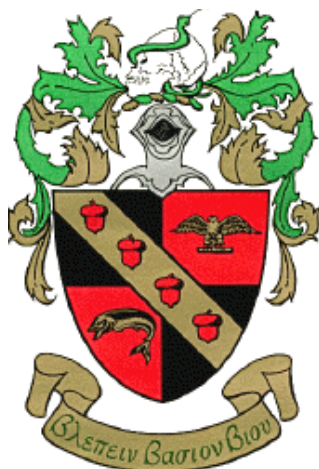
**B.S. Biology, Natural History Option:** Heather Zipprian

**B.A. Biology:** Erinda Como, Kelsey Grabert, Cynthia Kurtek

**B.A. Biology, Pre-physician Assistant:** Joelle Bittner, Ashley Erdman, Timothy Faust, Erica Kocher, John Pavese, Alyssa Seelye

**B.A. Biology, Pre-Physical Therapy:** Justin Blessing, Melanie Dimartino, Allison Grimm, Amber Kolk-Pelley, Jennifer Krott, Julia Rush, Kenneth Thomas, Danielle Yoder

**B.S. Secondary Education in Biology:** Kimberly Dash, Carrie McClure, Jeff Pfeiffer



### Tri-Beta Biology Honor Society

Beta Beta Beta (Tri-Beta) is an honor society for biology students who achieve superior academic records and who display an aptitude for and interest in the life sciences. Its mission is to stimulate scholarship, to disseminate scientific knowledge, and to promote biological research. In the past year, our local chapter hosted a reception for graduating seniors, supplied coffee and donuts during finals week, attended the College of Science and Technology Honors banquet, held weekly tutoring sessions for students in introductory biology courses, interacted with prospective students at the College of Science and Technology Symposium, visited the Biology Labs at the Berwick Nuclear Power Plant, helped with the Science Iditarod, and provided "biology games" at the Siblings & Children's Weekend. This year's officers are President, **Chris Ort**; Vice-President, **Kyle Bartol**; Secretary, **Danielle Yoder**; Treasurer, **Stephanie Solomon**; Historian, **Kelsey Grabert**. **Dr. Surmacz** is the Tri-Beta advisor. The chapter recently sent out membership invitations to eligible juniors, seniors, and graduate students. The deadline to submit completed applications to Dr. Surmacz is October 20, 2008. The Tri-Beta Initiation Ceremony and Reception will be held on Sunday, Nov. 9 at 3 p.m. in the Schweiker Room, Andruss Library. Family and friends are invited to attend. See any officer or Dr. Surmacz for more information.



## News from BAHS Clubs

### Pre-Medical Sciences Club

The Pre-Medical Sciences Club welcomes all students interested in any of the medical sciences (allopathic or osteopathic medicine, optometry, podiatry, dentistry, veterinary medicine, etc.) The club plans to sponsor a variety of activities this year including guest speakers, visits to professional schools, community service, and review sessions for the MCAT. The group is currently designing a club T-shirt and is planning to have a Halloween bake sale on Oct 30 and 31 in Hartline lobby. The club also plans to invite guest speakers to share information about various health professions. The first of these will be on October 20 at 5:30 p.m. in 178 HSC. Dr. Richard Angelo, Chairperson, Department of Speech Pathology and Audiology, will discuss the clinical doctoral program in audiology (Au.D.). Serving as officers this year are: **Kyle Bartol** (President), **Essie Reed** (Vice President), **Laura McCourt** (Treasurer), **Samantha Bussanich** (Secretary), and **Courtney Waltmyer** (Public Relations). Please contact **Kyle Bartol** if you are interested in participating in any of the club activities (kdbartol@bloomu.edu).

### Biology and Allied Health Sciences Club

The Biology and Allied Health Club welcomes all interested students to join in club activities. The club recently kicked off the year by hosting a gathering to "Meet the Professors." The Biology and Allied Health Sciences Club will be meeting the 2nd and 4th Mondays of each month at 8:00 p.m. in 178 HSC. Club meetings for the fall semester are October 13 and 27; November 10 and 24; and December 8. Come out to hear about fun activities planned for the year, interviewing tips for graduate schools and clinical sites, volunteer opportunities, outdoor activities, and much more! This year's club officers are: President, **Erin Buckwalter** (ekbuckwa@bloomu.edu); Vice-President: **Andrea Marino** (ammarino@bloomu.edu); Secretary, **Emily Barkanic** (esbarkan@bloomu.edu); and Treasurer, **Sarah Marino** (srmarino@bloomu.edu). Club advisors are **Drs. Hranitz, Brubaker, and Corbin**. For more information on the club, contact any Biology and Allied Health Science Club officer.



## Faculty Updates

**Dr. Kris Brubaker** and **Dr. Clay Corbin** were notified this summer that they were granted tenure and were promoted to associate professor. Congratulations!

**Dr. Kris Brubaker** received a COST Research/Scholarship award to fund "A Proposal for Generating cDNA Libraries for Two Hybridoma Cell Lines and Two Solitary Bee Populations."

**Dr. Clay Corbin** presented a poster "Patterns of morphological evolution in the Accipitridae under different phylogenetic hypotheses" at the 2008 Raptor Research Foundation meetings in Missoula, Montana. Dr. Corbin's collaborators in the project were Chris Criqui and Marshall McCollom, local high school students. This work involves phylogenetic constraint and correlated evolution in the skull and limb morphology of Accipitrid raptors.

**Dr. George Davis** is on sabbatical this semester conducting research in the lab of Dr. David Lightfoot at Southern Illinois University. Dr. Davis is investigating the putative phytosiderophore transporter gene. He also received a COST Research/Scholarship Fund award to support "The Synthesis and Screening of Hybridoma cDNA Libraries Toward the Development of an 'Induced Autoimmunity' Cultivar in Arabidopsis."

**Dr. Carl Hansen** served as an instructor this summer for "Fun with Science" and "Fun with DNA," hands-on science programs for area children sponsored by the Weis Research Center, Geisinger Clinic, Danville, PA.

**Dr. Angela Hess** presented a paper entitled "EphA2 as a promoter of melanoma tumorigenesis" at the Eph/Ephrins and Cancer Conference held in Winston-Salem North Carolina from June 25-26.

**Dr. John Hranitz** traveled to Lesbos, Greece and Bursa, Turkey this summer to conduct research on bee communities. This research expedition was conducted as part of the National Science Foundation Research Experiences for Undergraduates (NSF-REU) program. Read more about Dr. H's adventures in the next issue of *BioSynthesis*.

**Drs. John Hranitz and Cindy Surmacz** received a collaborative faculty research grant for \$1194 to study "Toxicity in Blackworms: Understanding stress responses in a bio-indicator."

**Mrs. Chris Mehlbaum** presented her research on "Evaluation of the Radiologist Assistant Curriculum in Preparing Students for Clinical Practice" at a roundtable discussion at a conference in Orlando Florida in July. She recently attended the Radiologist Assistant Education Council Meeting in October at the University of Arkansas, Little Rock.

**Dr. Kevin Williams** recently traveled to Lock Haven University's Sieg Conference Center to represent the department at the fall directors' meeting of the Commonwealth of PA University Biologists (CPUB). CPUB, is an organization of biology faculty



# WELCOME

BAHS welcomes three faculty members to the classroom this semester:



## Dr. Zareen Amin

Dr. Zareen Amin is teaching Human Sexuality and Anatomy and Physiology labs this academic year. Dr. Amin holds a B.Sc. with Honors in Biochemistry and Nutrition from the University of Dhaka and a Bachelor of Medicine and Bachelor of Surgery (M.B.B.S.) degree from Dhaka Medical College, Bangladesh. She also earned a master's in Health Education from Kent State University. Dr. Amin worked as Project Manager with the American School Health Association. She worked on health projects sponsored by the Cleveland Clinic Foundation and the U.S. Dept of Education. Dr. Amin and her husband Shah (a member of the Department of Geography and Geosciences) have three children. She is an active member of the Bangladesh Association of Bloomsburg Area.

## Mrs. Melinda Diltz

Mrs. Melinda Diltz is back again this semester to teach Concepts in Biology I lab. She holds a master's degree in biology from Millersville University and a bachelor's in biology degree from Bloomsburg University. She and her husband Mike have two sons. Mrs. Diltz serves as a Cub Scout leader and a Boy Scout Committee member. In her spare time she enjoys gardening, camping, fishing, and making stained glass windows.



## Dr. Sandra Field



Dr. Sandy Field holds an associates degree in Biology from Diablo Valley Community College (Pleasant Hill, CA), a BS in Genetics from the University of California, Davis and a Ph.D. in Biochemistry, Molecular and Cell Biology from Cornell University. She has conducted post-doctoral research in biochemistry at Stanford University. Her doctoral research involved studying the role of low molecular weight GTPases of the Ras family in growth factor signal transduction. These "molecular switches" are important in the regulation of many different cellular processes and can be involved in the development of cancer when they don't work properly. Her postdoctoral work focused on the bacterial pathogen, *Shigella flexneri*, that causes bacterial dysentery. She has previously taught microbiology and organismal and cellular biology lab at Bucknell University. Dr. Field has broad interests ranging from cell biology and clinical oncology to evolution and infectious disease. She runs a freelance science and medical writing business (check out <http://www.fieldscientific.com>) She is an avid bicyclist and is working toward her third-degree black belt in Tae Kwon Do. She also loves to travel, read, and cook.

## Who's Who in BAHS?

Department Chairperson: Dr. George Chamuris, 126 & 105 HSC

Assistant Chairperson: Dr. Marianna Wood, 104 HSC

Allied Health Coordinator: Dr. Judith Kipe-Nolt, 269 HSC

Graduate Program Coordinator: Dr. Kristin Brubaker, 177 HSC

Radiologist Assistant Program: Coordinator Mrs. Christine Mehlbaum, 265 HSC

Department Webmaster: Dr. Marianna Wood, 104 HSC

Department Pre-professional Committee: Dr. Joseph Ardizzi, 106 HSC and Dr. Mark Melnychuk, 266 HSC

## Introducing our Office and Lab Staff

The BAHS department office is housed in 125 Hartline (the room with the large picture window!) We welcome back **Ms. Vicki Beishline**, our department secretary. Our new part-time student secretaries are **Ghaith Ibrahim, Nikitah Farver, Vanessa Tyler** and **Emily Pendse**. **Mrs. Melinda Diltz** is our Lab Coordinator. Undergraduate lab assistants are **Michael Hollman** and **Carrie McClure**.

# Check out the B.S. Health Sciences degree

## Change in degree name for CLS and new recommended tracks for Pre-PT and Pre-PA

The B.S. Clinical Laboratory Science degree program has been changed to B.S. Health Sciences, Clinical Laboratory Science Option. The curriculum has been changed to include the new hospital program requirement for Anatomy & Physiology. Advisement tracks have also been defined in this degree program for pre-physical therapy and pre-physician assistant students. Below are the science requirements for each program. See the complete curriculum guides in the office or on the department's website for details. Students currently in the CLS degree or in the BA Biology degree, who wish to change their majors and complete the requirements for the new degree program, will need to go to Academic Advisement and officially change their majors. **BE SURE TO DISCUSS THE OPTIONS WITH YOUR ADVISOR FIRST!**

### B.S. HEALTH SCIENCES

#### Clinical Laboratory Science Option

The CLS program consists of a minimum of 90 credit hours at Bloomsburg University, followed by one calendar year (30 credit hours) of clinical education. See your advisor for a list of clinical affiliates.

Health Science Core Requirements (24 cr hrs)			Related Core Requirements (19 cr hrs)		
50-107	Medical Terminology	1	52-115	Chem for the Sciences I	4
50-114	Concepts in Biology I	4	52-116	Chem for the Sciences II	4
50-242	Microbiology	4	52-230	Fund Organic Chemistry	4
50-271	Cell Biology	4	52-341	Biochemistry	4
50-233	Human Genetics OR				
50-333	Molecular Biology	3			
50-173	Anatomy & Physiology I	4			
50-174	Anatomy & Physiology II	4	53-141	Intro Statistics	3

#### Other Requirements (6 cr hrs)

50-342	Medical Microbiology	3
50-343	Immunology	3

#### Clinical (30 cr hrs)

86-401	Clinical Microbiology	6-10 credits
86-402	Clinical Hematology/Coagulation	6-10 credits
86-403	Clinical Chemistry	6-10 credits
86-404	Clinical Immunohematology	3-6 credits
86-405	Clinical Immunology/Serology	2-4 credits
86-406	Clinical Seminar	1-6 credits

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### B.S. HEALTH SCIENCES

#### Pre-Physical Therapy Advisement Area

05/08 JKN

Health Science Core Requirements (24 cr hrs)			Related Core Requirements (19cr hrs)		
50-107	Medical Terminology	1	52-115	Chem for the Sciences I	4
50-114	Concepts in Biology I	4	52-116	Chem for the Sciences II	4
50-242	Microbiology	4	54-111	Intro Physics I	4
50-271	Cell Biology	4	54-112	Intro Physics II	4
50-233	Human Genetics OR				
50-333	Molecular Biology	3	53-141	Intro Statistics	3
50-173	Anatomy & Physiology I	4			
50-174	Anatomy & Physiology II	4			

#### Other Requirements (11 cr hr)

53-116	Algebra for Health Sci	3
50-205	Nutrition	3
50-474	Vert. Sys. Physiology OR	
50-480	Comp. Animal Phys.	3
50-479	Integrated Physiology Lab	1
50-481	Senior Bio Seminar	1

#### Health Science Electives (15 cr hrs)

50-332	Genetics	3	50-442	Virology	3
50-333	Molecular Biology*	3	50-445	Intro Pharmacology	3
50-342	Medical Microbiology	3	50-470	Parasitology	3
50-343	Immunology	3	50-472	Animal Cell Physiology	3
50-361	Comp. Vert. Anatomy	3	50-474	Vert. Sys. Physiology*	3
50-364	Vertebrate Histology	3	50-476	Neurophysiology	3
50-411	Radiation Biology	3	50-480	Comp. Animal Phys.*	3
50-431	Developmental Biology	3	50-489	Curr. Topics Bio. (Health)	3
50-490	Internship in Bio. (Health)	3			

\* if these are used above as "requirements" they cannot be used as electives

### B.S. HEALTH SCIENCES

#### Pre-Physician Assistant Advisement Area

05/08 JKN

Health Science Core Requirements (24 cr hrs)			Related Core Requirements (19cr hrs)		
50-107	Medical Terminology	1	52-115	Chem for the Sciences I	4
50-114	Concepts in Biology I	4	52-116	Chem for the Sciences II	4
50-242	Microbiology	4	52-230	Fund Organic Chemistry	4
50-271	Cell Biology	4	52-341	Biochemistry	4
50-233	Human Genetics OR				
50-333	Molecular Biology	3			
50-173	Anatomy & Physiology I	4	53-141	Intro Statistics	3
50-174	Anatomy & Physiology II	4			

#### Other Requirements (11 cr hr)

53-116	Algebra for Health Sci	3
50-205	Nutrition	3
50-474	Vert. Sys. Physiology OR	
50-480	Comp. Animal Phys.	3
50-479	Integrated Physiology Lab	1
50-481	Senior Bio Seminar	1

#### Health Science Electives (15 cr hrs)

50-332	Genetics	3	50-442	Virology	3
50-333	Molecular Biology*	3	50-445	Intro Pharmacology	3
50-342	Medical Microbiology	3	50-470	Parasitology	3
50-343	Immunology	3	50-472	Animal Cell Physiology	3
50-361	Comp. Vert. Anatomy	3	50-474	Vert. Sys. Physiology*	3
50-364	Vertebrate Histology	3	50-476	Neurophysiology	3
50-411	Radiation Biology	3	50-480	Comp. Animal Phys.*	3
50-431	Developmental Biology	3	50-490	Internship in Bio. (Health)	3
50-489	Curr. Topics Bio. (Health)	3			

\* if these are used above as "requirements" they cannot be used as electives





## Bridging the Gap: Molecular and Cellular Biology Summer Research Experiences 2008

This summer, BAHS hosted an outreach program to promote collaboration between area high schools and BU to help “bridge the gap” in science education. Five area high school students were invited to join with BAHS faculty and undergraduate students in a 6-week summer program of cellular and molecular biology research. Students participated in all phases of the scientific process and had the opportunity to develop research skills in the life sciences such as designing experiments, learning lab techniques, collecting and analyzing data, and interpreting results. The project was supported by two grants. **Drs. Hranitz and Brubaker** received a \$20,000 grant from Cherokee Pharmaceuticals division of PRWT (formerly Merck, Inc). A second grant of \$4960 from the Special Projects in Academic Affairs program was awarded to **Drs. Brubaker, Hranitz, and Surmacz** to fund student stipends. Students conducted research in the areas of stress protein research, cancer biology, and wildlife genetics in the labs of **Drs. Brubaker, Hess, Hranitz, and Surmacz**. The students will present the results of their summer research projects at the College of Science and Technology Research Day at the end of the semester.



### Summer Research Projects.

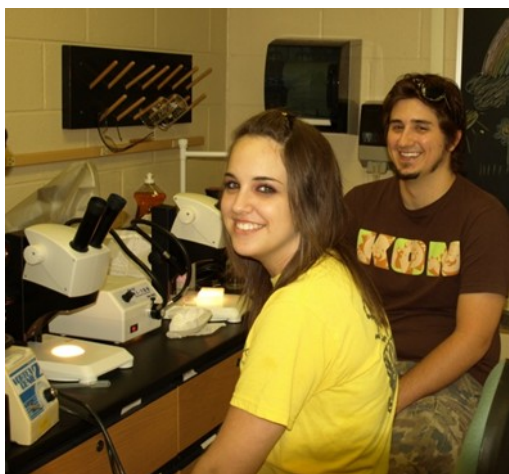
**Katie O'Blosser**, a senior at Central Columbia High School, is shown at left with her research mentor **Dr. Hess**. Katie investigated the differential expression of ephrin-A1 using reverse transcription polymerase chain reaction (RT-PCR) between aggressive human melanoma tumor cells and poorly aggressive human melanoma tumor cells. Signal transduction events mediated between ephrin-A1 and its membrane bound receptor, Eph A-2 may be important for promoting melanoma tumorigenesis.

**Kelsey Davis** joined the summer research program from Central Columbia High School and worked with **Dr. Brubaker**. Kelsey learned how to design primers to amplify fragments of the gene for Daf-16, using the mRNA and protein sequences published for humans, mice, *C. elegans* and fruit flies. These primers were designed against regions of highest homology because we were trying to amplify the sequence from two different solitary bees, *Megachile apicalis* and *M. rotundata*, where the sequence information is unavailable.

**Mariena Hurley** from Southern Columbia High School studied the stress response of honey bees during experimental handling. She worked with undergraduate researcher **Richard Carter IV**. Together they showed that experimental manipulation used in pesticide and ethanol studies does not induce significantly higher stress responses than occur naturally in the field. **Dr. Hranitz** was their research mentor.

**Nicholas Serra**, a student from Berwick Area High School, investigated the microsatellite variation in a sample of collared lizards from 2003. His study, under the supervision of **Dr. Hranitz**, is part of an analysis of how genetic variation has changed over time in a population of lizards from Oklahoma.

**Cassandra Lex**, a senior at Central Columbia High School, worked with **Jeremy Vilcheck**, a nursing major and member of the honors program, and **Drs. Hranitz and Surmacz**. Cassie and Jeremy are shown at left measuring pulse rates in the black worm, *Lumbriculus variegatus*. The goal of their project was to understand cellular stress responses in the black worm. They investigated whether black worms express the stress protein HSP-70 and whether HSP 70 levels can be used to predict changes in observed biological and behavioral responses.



### Spring Biology Electives



Here's a “heads up” on the BAHS biology elective offerings for Spring Semester: Freshwater Biology (**Dr. Rier**); Global Climate Change (**Dr. Rier**); Current Topics- Biological Clocks and Calendars (**Dr. Wassmer**); Molecular Biology (**Dr. Brubaker**); Parasitology (**Dr. Henry**); Invertebrate Zoology (**Dr. Klinger**); and Introductory Pharmacology (**Dr. Till**). Writing in Biology (**Dr. Ardizzi**) will also be offered. The spring physiology offerings are: Plant Physiology (**Dr. Williams**), Animal Cell Physiology (**Dr. Hess**), and Integrated Physiology Lab (**Drs. Hansen and Williams**). Summer biology electives are Immunology (**Dr. Brubaker**) and Medical Microbiology (**Dr. Henry**.) **Dr. Chamuris** has prepared a nifty grid showing the schedule of BAHS electives and core courses. Check it out on the BAHS bulletin board next to the elevator on the green floor.





## BAHS Interns Gain Hands-On Experience

Internships are a great way to get on-the-job experience and earn credits at the same time! BAHS offers 50.490, Internship in Biology, to eligible juniors and seniors. While internships may vary from 3 – 15 credits, no more than 3 credits may be applied as biology electives. Internships may be paid employment or may be volunteer. To learn about internship opportunities and procedures, contact your academic advisor. Some of the recent BAHS internships are described below. Note the great diversity of settings and opportunities.

### Geisinger Medical Imaging Internships

**Erin Linkoski, Martin Rosenkranz, Susan Wade, and Amanda Worsham** were GMC Medical Imaging interns this summer and **Chris Arbogast** and **Kyle Concini**, are interning Fall semester. As interns, each student completed 120 hours of hands-on experience and observation at GMC followed by a written report and journal. They each observed in multiple areas in radiography including: diagnostic radiography, orthopedic radiography, fluoroscopy, nuclear medicine, sonography, and mobile radiography. Applications for two Spring 2009 GMC internship positions will be announced later this fall.

### Pre-Physical Therapy Internships

Several BAHS students have conducted internships in physical therapy. **Megan Krajewski** served as an intern at Somerset Spine and Wellness Group in Raritan, NJ this summer. **Scott Pfaff** headed to Bucks Physical Therapy and Sports Rehabilitation in Reading to intern. **Allison March** conducted her internship in physical therapy at the Children's Development Center in Williamsport, PA. Phoenix Rehabilitation and Physical Therapy, Bloomsburg, PA, was the internship site for **Alex Hilderbrandt**, this summer and for **Jennifer Beagle** and **Alex Lavo** this fall semester. PT interns have the opportunity to learn how orthopedic and neurological patients are diagnosed and treated, how specific therapeutic techniques are used to restore or improve function, how A & P are used in PT evaluations, and the professional aspects of career in physical therapy.

**Michael Bierds** completed an internship at Synthes a company in West Chester, PA. Synthes develops, produces and markets instruments, implants and biomaterials for the surgical fixation, correction and regeneration of the skeleton. Mike worked in a lab dedicated to testing technologies used to treat degenerative spine disorders and spine traumas.

**Sara Barker** conducted an internship at Geisinger Medical Center this summer in the Department of General Surgery under the supervision of Dr. Udekwu. Sara observed hospital rounds, general and trauma surgeries, patient care, and the administrative aspects of operating a general surgery department.

**Britnie Spaunhorst** was an intern at the Clinical Microbiology and Immunology Center at the University of Scranton. Her projects included a PCR screening test for MRSA (methicillin resistant *Staphylococcus aureus*), microbiology procedures for dairy and food safety, and a research project on a new antibiotic, Tigecycline (GAR 936), a product of Wyeth Pharmaceuticals.

**Maggie Yesalavage** served as an intern at the Weis Research Center, Geisinger Clinic, this summer in the lab of Dr. Sandra Hill-Felburg. Maggie used histological, immunological, and imaging techniques to research the progression of brain tumors.

**Cassandra Newcomer** applied her botanical knowledge to the field of horticulture by completing an internship at Bailey's Farm Market near Selinsgrove. During this internship, Cassie did a study that examined the effects of different fertilizer application regimes on pumpkin growth.

**Deborah Hunsberger** and **Melissa Scubelek** were interns this summer with Operation Wallaceae, an organization that maintains a number of biological and conservation management research programs in remote locations around the world. Debbie and Melissa traveled to Africa where their work focused on wildlife conservation. Debbie took some stunning photos that will be featured in the next issue of *BioSynthesis*.

## Plan ahead: INTERNSHIP SCHOLARSHIPS AVAILABLE

Scholarships of \$250 - \$1,000 are available to encourage student internships by helping to defray expenses associated with internships. Funds may be used for travel expenses, the purchase of required insurance or clearances, immunizations, lab coats or safety devices, and necessary software or resources. Application deadlines are November 14, 2008 for spring semester internships and March 20, 2009 for summer and fall semester internships. For applications, contact Ms. Alison Stone-Briggs, Director of Community Outreach and Academic Internships, 140 Student Services Center, (389-4962) or [astbriggs@bloomu.edu](mailto:astbriggs@bloomu.edu).



## Pre-professional Committee UPDATES

### What is the pre-professional committee?

The BU pre-professional committee assists students in gaining admission to professional schools such as allopathic, osteopathic, podiatric, or veterinary medicine, as well as dentistry, optometry, podiatry, and chiropractic medicine.

The committee's mission is to provide advisement, assist with the application process, evaluate student credentials, prepare committee recommendation letters, obtain resources for students relating to professional schools, and establish relationships with professional schools. The committee recently hosted a meeting at ABLE in the Columbia Science and Health Science Living Learning Community Room for all students interested in the pre-medical sciences. The co-chairs of the committee are **Drs. Joseph Ardizzi** and **Mark Melnychuk** from BAHS. Other committee members include **Dr. Cindy Surmacz** (BAHS) and **Drs. John Morgan** and **Toni Trumbo-Bell** from Chemistry. For more information on pre-medical sciences at BU, students are encouraged to check the committee's website (<http://departments.bloomu.edu/biology/preprof.htm>) and the bulletin board outside room 106 HSC. You are also encouraged to join the Pre-professional /Graduate Community on Blackboard by contacting Dr. Trumbo-Bell ([tbell2@bloomu.edu](mailto:tbell2@bloomu.edu)).

### Sign up for the Pre-Medical Science Option

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

### Check out these Upcoming Events

- The Philadelphia College of Osteopathic Medicine (PCOM) hosts its Annual Doctor of Osteopathic Medicine Open House on Friday, October 17, 2008 from 5:30 until 7:30 p.m. Dinner and registration are from 4:00 to 5:30 p.m. You will have the opportunity to learn about osteopathic medicine, life at medical school, osteopathic manipulative therapy, meet PCOM students, and tour the campus. To reserve a place, please call 1-800-999-6998 or email [admissions@pcom.edu](mailto:admissions@pcom.edu) by October 8, 2008. 8 or email [admissions@pcom.edu](mailto:admissions@pcom.edu)
- The Pennsylvania State University College of Medicine at Hershey invites you to its annual Primary Care Day at 9:00 a.m. on Saturday, October 25, 2008. This program provides an opportunity to learn about the primary care disciplines and practice, medical school, the application process, and student life. The attendees may also interact with medical students, primary care physicians, and faculty. Registration forms are due by **October 20, 2008** and can be obtained from Dr. Ardizzi, 106 HSC. For a schedule, please see one of the pre-professional advisors.

### 2009 MCAT Dates are Posted

The Medical College Admission Test, MCAT is a computerized exam required for admission to medical school. It is administered over 20 times per year with your choice of a morning or afternoon testing session. Score reports will be available in 30 days. Dates for 2009 are: January 30, 31; March 28; April 4, 18 and 24; May 1, 2, 22, 28; June 18; July 2, 17; August 5, 6, 14, 21, 25; Sept 3, 4, 10, 12. Additional information can be found at <http://www.aamc.org/students/mcat/>

### Practice MCAT!

The Pre-professional Committee will offer its annual Mock MCAT exam on **Saturday, November 16, 2008 at 9:00 a.m.** MCAT, a test developed by the Association of Medical Colleges, is the standardized test required for medical school admission. 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 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. A registration form for the practice MCAT and additional information is found on Blackboard in the "Pre-Professional/Graduate Community." To join this community, contact Dr. Trumbo-Bell ([tbell2@bloomu.edu](mailto:tbell2@bloomu.edu)).

### Alumnus Shares Experiences with Pre-Med Students

BAHS was delighted to welcome back **Michael Kaminsky**, B.S. Biology, 2005. Mike, a fourth year medical student at Philadelphia College of Osteopathic Medicine, visited with pre-medical science students and freshmen seminar classes during career week. He discussed his experiences as a medical student and with the medical school admission process. Mike plans to pursue an internship and residency in surgery and is the recipient of a Navy scholarship.





## Allied Health News

### BAHS MI Students visit Johns Hopkins

**Drs. Hess and Rier** accompanied an enthusiastic group of Medical Imaging students to visit Johns Hopkins Hospital in Maryland last month. The students learned about clinical programs in Radiography, Nuclear Medicine, Diagnostic Medical Sonography, and Interventional Radiography/CT/MRI. Career opportunities at Johns Hopkins and the application process were also discussed. The students toured the hospital, observed various imaging modalities, and talked with current and former students. Students visiting Johns Hopkins re pictured at right: **Lucas Sparta, Jessica McFee, Vicki White, Sonya Wolfe, Kyle Concini, Gary Oster, Rachel Stoehr, Nicole Zapotosky, Amy Palmisano, Grace Goode.**



### BAHS Students Head to Clinical Programs

Over 50 BU students have entered clinical programs this semester. Their clinical sites and specialties are listed below (Key: R, Radiologic Technology; RT, Radiation Therapy; MRI, Magnetic Resonance Imaging; CT, computerized tomography; NM, Nuclear Medicine; S, Sonography; CVT, Cardiovascular Technology; CLS, Clinical Lab Science.)

Johns Hopkins Hospital: **Jillian Anthony, Lindsay Cartin, Morgan Fox, Hanna Koch, Amanda Malles (R/CT); Rashel Hagmayer and Justin Singer (R); Erin Laedlein (R/CT); Grant Poppenwimer (NM); Jenna Ruppert (S); and Nicole Seward (R/MRI).** Abington Memorial Hospital: **Amanda Peterman and Brittany Sheehan (R);** College Misericordia: **Elle Daniels, Laura Labiak, and Kaitlyn Manley (S).** Wyoming Valley Hospital, Wilkes Barre: **Leslie Antolick, Brenda Bride, Jason Dockery, Jessica Johnson, Logan Karas, Michelle Morgis, Rebecca Slavoski, Jamie Whitenight, Danielle Whitley (R); Nicole Lopata and Ashley Moro (S).** Albert Einstein Hospital, Philadelphia, PA: **Lisa Gifford and Jayme Snavelly (R).** Clearfield Hospital, Clearfield, PA: **Nicole Monroe (R).** Reading Hospital: **Amanda Decker, Rachel Howells, Jessica Kloc, Christine Lucasti, Briana Miller (R).** St. Christopher's Hospital, Philadelphia, PA: **Megan Patzuk (R).** Arnot Ogden Medical Center, Elmira, NY: **Cy McKee (R).** University of Pittsburgh Medical Center: **Andrew Erdman (R).** West Boca Medical Center, Boca Raton, FL: **Steven Goldberg (RT).** Geisinger Medical Center: **Rebekah James (CVT); Heather Gladfelter, Elyssa Goldstein, Jacob Hiller, Cory Hoffman, Jennifer Kubilus, Erin Linkoski, Heidi Portzline, Natasha Puskvich, Kristina Slabonik, Amanda Worsham (R).** Thomas Jefferson University, Philadelphia, PA: **Amber Donbach (RT) and Lisa Moore (R/CT).** Lancaster General Hospital: **Jenna Peters (CLS).** Susquehanna Health System, Williamsport, PA: **Catherine Stone (CLS).** York Hospital/Wellspring, York, PA: **Phillip Zak (CLS).**

### Interested in Pharmacy, Occupational Therapy, or Physical Therapy?



Mr. Don Sharples, Director of Admissions, Thomas Jefferson University, College of Health Professions, will visit on Wednesday, October 22 at 2:00 p.m. in 142 Hartline. Students will have the opportunity to learn about Thomas Jefferson University; their programs in pharmacy, occupational therapy, and physical therapy; admission policies; and application procedures. We hope to see you there!

## Student Researchers

The research labs in Hartline are certainly busy this semester! The following students are working on research projects either as part of Research in Biology I or II, Honors Independent Study I or II, or as volunteers to gain valuable experience. We look forward to learning the results of their studies at various local or state meetings.



**Shannon Carper** (right in the photo) worked as an undergraduate research assistant with **Dr. Angela Hess** this summer. Shannon worked on a project that aims to develop strategies directed toward the down regulation of EphA2 as a potential therapeutic modality for the treatment of malignant melanoma. This project is in collaboration with Drs. Naira Margaryan and Mary Hendrix from the Children's Memorial Research Center in Chicago IL. Shannon analyzed the expression of EphA2 in melanoma tumors harvested from mice that were treated with small interfering RNA (siRNA) directed toward EphA2. Shannon confirmed that intravenous delivery of siRNA directed toward EphA2 results in the downregulation of EphA2 in human melanoma tumors growing subcutaneously on the backs of mice. The next experiment will be to test the effects of siRNA directed toward EphA2 to inhibit further growth of the melanoma tumor and possibly promote tumor regression. Additionally, Shannon has begun to characterize poorly aggressive melanoma tumor cells engineered to over-express EphA2 for their ability to form colonies in soft agar, a property commonly associated with highly invasive and metastatic melanoma tumor cells.

**Katie Raymis** (left in the photo) worked as an undergraduate research assistant with **Dr. Angela Hess** this summer. Katie worked on examining the expression of Ephrin-A1 in human melanoma cells. Ephrin-A1 is the

ligand for EphA2, a receptor tyrosine kinase normally expressed by epithelial cells. Increased EphA2 expression and activity has been associated with numerous tumor types including those arising from the breast, prostate, ovaries, colon, lungs and pancreas, and is believed to play various roles in promoting aggressive behavior of these tumors. Recently, EphA2 has been found to be over expressed in highly aggressive melanoma. Moreover, EphA2 is necessary for aggressive melanoma cells to form tumors and metastasize in a mouse model for cutaneous melanoma. Interestingly, it has been reported that addition of ephrin-A1 to EphA2 expressing tumor cells negates the tumor promoting properties of EphA2 by down regulating EphA2 expression. Katie is analyzing the expression of ephrin-A1 using western blotting and RT-PCR techniques in poorly aggressive melanoma tumor cells that do not express EphA2 as well as those that have been engineered to over express EphA2. Additionally, Katie will analyze the expression of ephrin-A1 in highly aggressive melanoma tumor cells that express EphA2 as well as those that have down-regulated expression of EphA2.

**Laura McCourt** began working with **Dr. Henry** during the summer and is attempting to knock out the *PDHI* gene in *C. glabrata*. *PDHI* encodes for a cellular efflux pump that has been found to be overexpressed in drug-resistant clinical isolates. Once deleted, she will use this strain to examine substrate specificity for this efflux protein by comparing sensitivity to a variety of antifungal and general cellular inhibitors. A better understanding of the products that this pump is able to remove from the interior of the cell will could provide additional evidence for this protein in clinical drug resistance.

**Jared May** is investigating the mechanisms by which genes that encode multidrug resistance (MDR) pumps are regulated at the transcriptional level. Using strains generated in the lab which lack genes for certain transcriptional regulators, Jared will be able to test for changes in drug sensitivity and MDR gene expression. In addition, he will be using drug-resistant clinical isolates to test the effect of inhibitors of specific types of transcriptional regulators on resistance and MDR gene expression. Since several of these inhibitors are being used clinically to treat cancer patients. Positive results could provide the basis for their testing as novel co-therapeutics in the treatment of opportunistic fungal infections. **Dr. Henry** is his research mentor.

**Shanna Quinn** is studying the role of Heat Shock Factor-1 (HSF-1) in thermotolerant solitary bees. HSF-1 is a transcription factor which regulates the expression of heat shock proteins in response to stresses such as increased temperature or disease. We have cloned a fragment of the DNA binding domain of this transcription factor and are currently probing RNA samples for HSF-1 gene expression after heat shock. Interestingly, HSF-1 was shown to play a role in protecting *C. elegans*, a type of worm, from various bacterial infections. **Dr. Brubaker** is her research mentor.

**Broc Wenrich** presented the poster entitled, "Bradford assay interference: Binding of Coomassie Blue G-250 to DNA" at the American Chemical Society Fall 2008 Meeting in Philadelphia. **Dr. Trumbo-Bell**, Department of Chemistry and Biochemistry is his research mentor.

**Paige Ricci** is volunteer researcher in **Dr. Hranitz's lab**. She is genotyping collared lizards and is learning to score each lizard for eight microsatellite loci.



## More Student Research

**Emily Barkanic** (pictured at right) completed a funded internship through the Susquehanna Heartland Coalition for Environmental Studies. During this internship, documented the effects of acid mine drainage on riparian bird communities. This research, "Nesting insectivores, avian community diversity, and acid mine drainage along tributaries of the Susquehanna River" was presented at the 2008 Susquehanna River Symposium (co-authors **Emily Barkanic, Clay Corbin, Nicholas Ernst, and Steven Rier**) Emily also spent two weeks working with **Dr. Rier** and his collaborators from Bucknell and Stroud Water Research Center doing nutrient spiraling and ecosystem metabolism studies on three streams (Reference, AMD-impacted, and Remediated) in Schuylkill County. Emily is a Susquehanna Field School Fellow.



**Christopher Krum** is enrolled in Research in Biology I with **Dr. Hranitz**. Chris is studying genetic variation in leafcutting bees collected from native populations in Greece and invasive population of Santa Cruz Island, California. He designed primers for an HSP70 intron. He will optimize PCR conditions, obtain DNA sequences, and measure nucleotide variation between the two populations. **Dr. Hranitz** is his research mentor.

**Emily Kinkead** is studying genetic variation in gooseneck barnacles from the tropical Pacific Ocean in Research in Biology I. This is the second phase of her research. Last spring, Emily worked with Dr. Venn to determine morphological variation between barnacles of two N-S transects. This semester she will determine the genetic variation between the transects of barnacles. **Dr. Hranitz** is her research mentor. **Dr. Venn** from Geography & Geosciences collaborates on the project.

**Dave Kessler** volunteers his time in a study of genetic variation of African Blue Flycatchers. He is sequencing DNA from museum samples collected by Dr. Corbin in a collaboration with **Dr. Hranitz**.

**Shirshendu Saha, Essie Reed, and Heather Pursel** had a productive summer working in the lab of **Dr. Davis**. The students optimized procedures for isolating RNA from iron-starved oat roots which will be used to make a cDNA library. Shirshendu also isolated protein from Arabidopsis roots that will be used in screening hybridoma lines.

**Kyle Bartol** conducted research as part of the summer internship program at the Weis Research Center, Geisinger Clinic. Kyle investigated the expression of the G protein Gamma 11 subunit in senescence in the laboratory of Dr. Janet Robishaw.

## Congratulations!

**Chris Krum and Amy Savitsky** won the award for Best Science and Technology Poster at the Office of Research and Sponsored Programs Poster Session held in May 2008. The poster was entitled "Megachild Solitary Bees Sequences Among Three Megachild Solitary Bees." The students' advisors are **Dr. John Hranitz, Dr. Kristin Brubaker, Dr. John Barthell** University of Central Oklahoma, and George Yokum, U.S. Department of Agriculture.

## Alumni Updates

**Kristi Brinckman** (B.A. Biology, 2007) is working at Merck in West Point, PA as a biotechnician. She prepares solutions for vaccines like Gardasil, a HPV vaccine, and Recombivax HB, a Hepatitis B vaccine. In her free time, Kristi likes to cruise around in her 1997 Dodge Viper!

**Kimberly Dodson** (B.A. Biology, 2008) sends greetings from the University of Maryland School of Medicine. Kim just finished the first block of her physical therapy curriculum including the anatomy portion and has just started physiology. Kim is loving Baltimore!

**Jennifer Krott** (B.A. Biology, 2008) has started her physical therapy program at Shenandoah University (and is really enjoying it).

**Amanda Schompert** (B.S. Biology, 2004) graduated from the Philadelphia College of Osteopathic Medicine this past June. Dr. Shompert will have an internship with the Geisinger Health System.

**Brock Spinks** (B.S. Biology, 2008) has begun working at BASF corporation and is involved in product testing.

**Tammy Stump** (B.A. Psychology, Biology minor, 2008) has begun the M.S. program in psychology at Villanova University. In addition to her classes, Tammy has a graduate assistantship and is involved in conducting research investigating the relationship between self-perceptions and healthy behaviors.

**Neil Trautman** (B.S. Biology, 2006) is working at Sanofi Pasteur as a sterility-assurance environmental monitoring technician.

**Alumni: Any news to share? Please drop Dr. Surmacz a line at [csurmacz@bloomu.edu](mailto:csurmacz@bloomu.edu)**



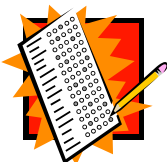
## Graduate Program Updates

### M.S. BIOLOGY STUDENT NEWS

- Please welcome our two new graduate students **Emily Pendse** and **Leah Mangan**. Emily is a graduate of Dominican University in Illinois and is interested in neuroscience. Leah, a King's College graduate is interested in stream ecology.
- Our Graduate Assistant's this semester are **Deb Walters** (A & P laboratories), **Aaron Raski** (Microbiology labs), **Di Zhou** (Cell Biology/Integrated Physiology Lab), and **Joe Margotta** (Concepts in Biology). Welcome aboard!
- Several graduate students have been focusing on their thesis research. **Chelsea Barnes** conducted a study of stream salamander communities in Northeastern Pennsylvania and plans to defend her thesis this fall. Watch for thesis defense announcements. All are welcome to attend! **Dr. Hranitz** is her mentor. **Joe Margotta** is currently writing his thesis proposal, research focusing on the 70 and 90 kD stress protein genes in the invasive leafcutting bee. He plans to obtain DNA sequences of stress protein domains outside of the ATPase domain. **Melissa Tomcavage** worked on her master's research this summer sequencing the putative phytosiderophore transporter gene. **Dr. Davis** is her research mentor. **Debra Walter**, a second year master's student began her thesis research this summer with **Dr. Hess**. Deb is exploring the role of EphA2 in promoting the growth of melanoma tumor cells. Deb is characterizing the *in vitro* proliferation rates of highly aggressive melanoma cells that express EphA2 compared to poorly aggressive melanoma cells that do not express EphA2. Deb will then investigate changes in proliferation associated with increased expression of EphA2 in poorly aggressive melanoma cells. Additionally, she will study the effects of ephrin-A1 in promoting or inhibiting the proliferation rates of melanoma tumor cells. Lastly, Deb is planning to investigate various signal transduction pathways associated with cell cycle regulation as a means to identify the mechanism by which EphA2 promotes growth in melanoma.
- Two graduate students **Debra Walters** and **Chelsea Barnes** have received grants to support their masters work. Deb has received a Commonwealth of Pennsylvania University Biologists Student Grant for Research in Biology to help fund her project titled "Signaling pathways and proliferation in both highly and poorly aggressive human cutaneous melanoma: a role for EphA2." Chelsea is the recipient of a travel grant from BU's Graduate School to support her field work.
- BAHS is pleased to announce that **Dr. Brubaker** is our new graduate program coordinator. Please direct questions regarding the master's degree in biology to her (kbrubake@bloomu.edu). Special thanks to Dr. **Hansen** for his years of leadership and service as graduate program coordinator.

### RA PROGRAM STUDENT NEWS

- The RA program welcomes the following new students: **Ji Hyun (Jina) Jung** from Baltimore MD.; **Calvin Mahoski** Philadelphia; and **Rhyan Kleiner**, Milton, PA.
- Current students (Class of 2007-09) started clinical this semester: **Ross Klausing** –University of Cincinnati, Cincinnati, Ohio; **Andre Pascal**- Center for Diagnostic Imaging, Forty Fort, Pa.; **Joshua Tussing**—University of Pittsburgh, Pittsburgh, PA.
- **Brianna Wilkins** completed the program August 2008 and will be taking her ARRT radiologist assistant boards in September. Brianna participated in May commencement exercises.



### REMINDER TO GRADUATING SENIORS

All BS and BA Biology majors graduating in December must take the Major Field Test in Biology. Sign up for a test time when submitting your application for graduation to the department office.

### Need Help in your Introductory Biology Course?

Check out the tutoring session offered by Tri-Beta Honor Society each Wednesday at ABLE, first floor Columbia, each Wednesday from 4 p.m. to 5 p.m. Students in Anatomy and Physiology; Concepts in Biology; Human Biology; Cells, Genes, and Molecules; and Ecology and Evolution are welcome to drop in.