



In Conjunction with the American Chemical Society
Student Affiliates at the University of Pittsburgh



Volume 17, Issue 2

October 5, 2007

REGISTRATION

SET DATES:

- October 25:** Registration begins for Spring Term 2084 for **Seniors Only**.
- October 25:** Add/drop begins for Spring Term 2084.
- October 26:** Monitored withdrawal deadline-140 Thackeray Hall
- October 29:** Registration begins for Spring Term 2084 for all **other degree seeking** students.
- October 31:** Happy Halloween!
- November 16:** April 2007 (2074) graduation applications due in 140 Thackeray Hall.
- November 21-
November 25:** Thanksgiving Recess. **NO CLASSES!!
Have a great Holiday!**



IMPORTANT: WHEN SHOULD YOU SEE YOUR ADVISOR?

Advisees who already have a permanent advisor should make their registration appointments with that advisor on or after October 23. **Remember to bring a copy of your academic record with you to this meeting.**

Advisees who (via an email to be sent October 8) were asked to select their permanent advisors should do so after October 15. See George Bandik or Regina Mahouski in 107 Chevron Science Center.

New advisees (those who have **NOT** registered with the Chemistry Department before) should make an appointment with George (Room 107 Chevron) or Dr. Huston after October 22.

2007-2008 ACS-SA Officers and Staff

*Nora Jameson-Co-President
Max Osipov-Co-President
Brandon Mills-Co-Vice-President
Lauren Smith-Co-Vice-President
Erin Walsh-Secretary
Kevin Romagnoli-Treasurer
Chris Fennig-Outreach Coordinator*



*Nathan Mohny-Outreach Coordinator
Katie Hammer-Newsletter Editor
Devin Potts-Newsletter Editor
Lance Mabus-Comics
Leah Fow-Senior Affairs
Jeff McCullough-Senior Affairs*

CHEM MAJOR NEWS

Our October Schedule

Everyone is welcome to attend our weekly ACS-SA meetings. Every Friday at noon we get together in 132 Chevron Science Center to hear interesting talks, learn more about science and enjoy each other's company. Come join us for all of the following meetings.

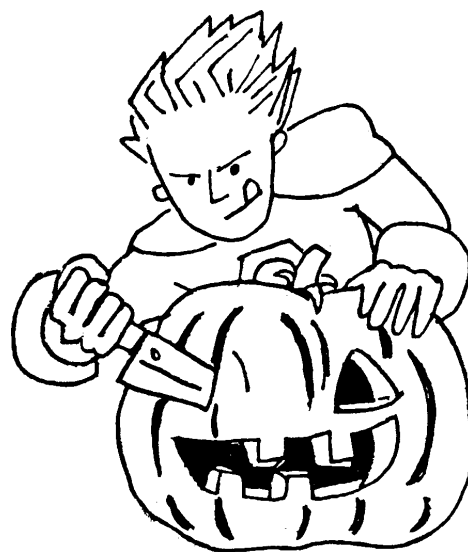
October

- 05 The Many Faces of Chemistry-Preparing for National Chemistry Week 2007
with Nathan and Chris
- 12 Pharmaceutical Chemistry at Merck
*with Mr. Chris Napolitano
BS Chemistry from Pitt*
- 19 Pumpkin Painting and Halloween Extravaganza on the Front Patio
- 26 Meet the New Faculty
A Research Talk with Professor Mike Trakselis



Halloween Pumpkin Fest

Come join the fun this October 19th as we drink apple cider and paint pumpkins on the patio in front of Chevron. Bring candles, dress up or do other Fall like things as the mood strikes you. BYOB (bring your own blankets...preferably flannel since we have a theme going and all). Come to a meeting or see George with suggestions or for more details. **Also if you have any other useful suggestions e-mail us at klh29@pitt.edu or dep24@pitt.edu.**



Who's This BEN Guy, Anyway??!!

Benzoyl Peroxide the Free Radical Man (affectionately known as Ben) is our ACS-SA mascot. You have probably seen him around the chemistry department and on our yearly ACS-SA T-shirt. From now on when you see Ben, think of the ACS-SA. Why not come to a meeting to learn more about what we are all about. Fridays at Noon in 132 CHVRN.

A Few Important Reminders:

Chem 1140-Preparative Inorganic Chemistry is our advanced inorganic laboratory course offered each Spring Term. **Chem 1130**-Inorganic Chemistry is a pre or co-requisite for this course. If you are working towards an ACS-Certified degree, this course is a degree requirement.

If you have wondered about what goes on the upper floors of our building you might want to consider registering for **Chem 1700**. This one credit seminar course allows two different faculty members each week to speak on their own research interests. Over 80% of our graduating seniors in Chemistry participate in our undergraduate research program and this course is a great way to learn more about your options and your department.

Finally, if you are interested in pursuing an honors degree in Chemistry the requirements students must have are:

- (a) an overall QPA of 3.00 or better
- (b) a chemistry QPA of 3.25 or better
- (c) have completed at least 2 credits of Chem 1710-Undergraduate Research
- (d) completed Chem 1711-Undergraduate Research Writing.

Good luck as you strive towards academic excellence!

TWO NEW COURSES JUST FOR YOU...

If you are looking for something new and different this term, why not try one of the following courses being offered this coming Spring Term (2084). Chem 1460 will be taught by Dr. Lillian Chong and Chem 1600 will be taught by Dr. Tara Meyer. Both should prove to be at the forefront of modern chemical science.

CHEM 1460-"Computational Drug Discovery"

This course for advanced undergraduates addresses the recent and emerging roles of computation in drug discovery. In addition to having the opportunity to integrate concepts from biology, chemistry, and physics toward applications in the highly interdisciplinary field of computational drug discovery, students will learn how to critically read research articles and give effective oral presentations. Students will have a hands-on introduction to the latest tools of computational drug discovery by learning how to use the MOE software package. This course will provide a valuable experience for students planning to pursue graduate school, medical school, or careers in industry. Prerequisite: Organic Chemistry.

CHEM 1600-"The Synthesis and Characterization of Polymers"

The synthesis and characterization of polymers is the focus of this course. Current methods of polymer synthesis will be surveyed. Particular attention will be paid to the practical implementation of these reactions and the kinetic consequences of particular reaction strategies in homopolymer, copolymer, and block copolymer synthesis. Techniques for the characterization of polymer molecular weight (light scattering, gel permeation chromatography, vapor pressure osmometry, viscosity, etc.), chemical composition, and stereochemistry (FT-IR, NMR, other spectroscopic and chemical methods) will be discussed. A brief treatment of polymer solution thermodynamics and selected topics of current interest in polymer chemistry will be included.



Green Chemistry

by: John Walters, Green Chemistry Contributor



**GREEN
CHEMISTRY**

Bettis Summer Intern Program

Each year, Bettis hires approximately 20 students for its summer intern program. Laboratory internships offer students a unique opportunity to participate in the important work done at Bettis and a chance to work with some of the finest technical people in the country.

Candidates for internship positions should be undergraduate (completed sophomore year) and graduate students majoring in engineering, science, or business. Specific internship opportunities are based on Laboratory hiring needs and will vary annually. Details regarding the majors for which we are hiring can be found in the summer internship position postings on our Career Site (www.bettislab.com), hosted by Monster.com. Based on our current hiring needs, the following postings will be available from September 4 thru October 12 for the 2008 summer intern program.

* "Summer Intern – Technical" – internships in engineering and science disciplines

* "Summer Intern – Business" – internships in business disciplines

Interviews are conducted in November/early December. Internships have flexible beginning and ending dates, however, interns usually work from May/June through August/September.

Questions regarding the summer intern program can be sent to the Program Coordinator at interns@bettis.gov.

All candidates must be U.S. citizens. Applicants selected will be subject to a Federal background investigation and must meet eligibility requirements for access to classified matter.

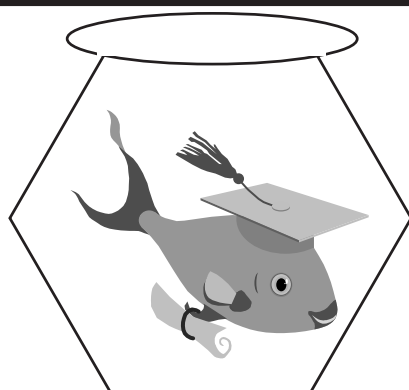
An Equal Opportunity Employer

Uncle Sam's Hoagies!!



Remember...The ACS-SA will be selling hoagies every Tuesday. Please support our ACS-SA.

STOP AND GAIN!



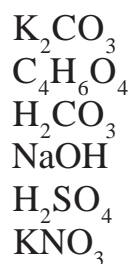
The fishbowl is a great place to gain information about internships, job opportunities and other things of interest to science majors. Stop and check the bulletin boards for the latest information. Things are added on a regular basis.

Before They Were Famous: Modern Forms and Ancient Names!

We all know that Brad Pitt used to sell popcorn at baseball games before he starred in *Seven*, and that Angelina Jolie was once known only as Billy Bob Thornton's hot wife until she made it big and started saving refugees.

However, The E! Channel doesn't have many specials on Lavoisier, and you probably wouldn't recognize the ancient name of a chemical if you saw it written on the stock bottle. So for all of you reading this during class here's the game: match these now famous chemical formulas with their names before Mendeleev's periodic table and you can win *Before they were famous!* Good Luck!

1. Vitriolic Acid
2. Fixed Air
3. Potash
4. Caustic soda
5. Saltpetre
6. Volatile Salt of Amber



Rip a page out of your notes and hand in those answers at the chemistry office. Check back in next month's newsletter for the answers and find out if you've won a **FREE HOAGIE!**



Special congratulations to our ACS-SA who received an Outstanding Chapter Award from the American Chemical Society for 2007. This is our 19th consecutive year to receive national recognition! Thanks to everyone.

Way to go ACS-SA!

COMEDY CORNER....



A Research Experience Eliminates Uncertainty for a Declared Major

by: Lauren Smith

According to the Office of Admissions and Financial Aid's website, approximately 20% of incoming freshmen begin their experience at the University of Pittsburgh as undecided majors while considerably more students switch their major no less than once. I was included in the 80% of freshman entering Pitt with a definite major (chemistry) and, as a senior, have yet to change. Don't be misled by my previous statement; my career objectives have not remained unmodified since I graduated high school. Although I have been a chemistry major for the entirety of my college career, I conclusively decided on my post-undergraduate plans only recently after ten weeks of cancer genetics research at Roswell Park Cancer Institute in Buffalo, New York.

I was employed by Roswell Park Cancer Institute (RPCI) as an undergraduate research student between June and August this past summer in the laboratory of Dr. Hiroki Nagase, MD, PhD. The Nagase laboratory utilizes mouse models of human cancers to classify genes and epigenetic features (such as DNA methylation) that are predisposing to cancer, specifically skin cancer. The identification of homologous human genes has the potential to improve future cancer treatment and diagnosis strategies. The objectives of my specific research were to investigate DNA methylation changes occurring 1) during differentiation of pluripotent cells, or cells possessing the potential to become a variety of different types of cells (similar to stem cells) and 2) in skin cancer initiation and progression stages.

DNA methylation is a modification of DNA that does not alter the DNA sequence and is involved in regulating the transfer of information from DNA to mRNA. Changes in DNA methylation patterns are critical to development and differentiation, the process by which cells become specialized. In order to improve current knowledge of methylation changes occurring during differentiation, dedifferentiated fat (DFAT) cells were analyzed at various stages of differentiation. DFAT cells are similar to embryonic stem (ES) cells, however are derived from mature fat cells. The applications of DFAT cells have the potential to exceed those of ES cells, particularly in the areas of cosmetic surgery and tissue replacement. Further-

more, DNA methylation has been observed in various cancers. It is estimated that half of the genes with heritable mutations in familial cancers are unexpressed due to methylation in assorted sporadic, or non-familial, cancers. One such gene is BRCA1 which was discovered to be over-methylated in 10-15% of sporadic, early onset breast cancer cases. DNA methylation changes occurring during differentiation and in skin cancer were evaluated by restriction landmark genome scanning (RLGS), an analytical technique for quantifying genomic DNA methylation. RLGS utilizes a methylation-sensitive restriction enzyme that cleaves DNA when the enzyme's recognition site is not methylated and leaves DNA intact when methylated. The methylation-sensitive nature of the enzyme enables the identification of a differentially methylated spot by the spot's absence or presence upon comparison of profiles from different samples (ex. "normal" and cancerous skin samples).

As a freshman and sophomore, I had considered applying to medical school. Rather than attend medical school, I determined in my junior year I might enjoy studying organic chemistry in graduate school to eventually pursue a career in pharmaceutical research. After participating in the summer undergraduate research program at RPCI, however, I realized that neither of my previous potential career paths agreed with my interests as does studying cancer biology or human genetic diseases at the graduate level. I recommend undergraduate research to any student believing they may be interested in pursuing a research career, however, strongly advise engaging in summer research in addition to research during the school semester. The summer program at Roswell Park was an experience completely different from that which I had as a student researcher during the school term, allowing me to understand and appreciate participating in research in the absence of class work.

I was introduced to the Research Experiences for Undergraduates program by a chemistry graduate student at Pitt, who directed me to the following website: http://www.nsf.gov/crssprgm/reu/reu_search.cfm. The National Science Foundation sponsors summer research programs at institutions across the United States (and several abroad) in fields such as chemistry, biological sciences, engineering, social, behavioral and economic sciences and even polar programs.

The Chemistry of Energy Drinks

by: Katie Hammer, *Co-Editor*

We conquered the first month of the semester, but now our classes start demanding more time and attention. We sleep less, study more, stress out, and drink. No, I'm not talking about beer, but energy drinks. There's Red Bull, Monster, Rip It, Rockstar, Jolt, and many other varieties, plus any flavor you can imagine. Sugarless or sugar-full, they all claim to pack an energetic punch. But how do these beverages really increase our levels of energy?

You could think of the drinks as a combination of soft drinks and energy supplements. Most of the boost results from the high quantities of caffeine and sugar. Caffeine blocks the effects of adenosine, a brain chemical involved in sleep. This causes neurons in the brain to fire, which sends emergency signals to our body that release adrenaline. The liver releases extra sugar into the blood stream to increase energy levels. Caffeine also increases our levels of dopamine that control the brain's pleasure center. Other major ingredients in energy drinks can include ephedrine, taurine, ginseng, B-vitamins, guarana seed, carnitine, creatine, inositol, and ginkgo biloba.

Ephedrine stimulates the central nervous system. Taurine, a natural amino acid produced by our bodies, regulates heart beat and muscle contractions. Ginseng is a root that is believed to have medicinal properties such as reducing stress and increasing energy levels. B-vitamins convert sugar to energy and improve muscle tone. Guarana seed is a stimulant that comes from a small shrub native to Venezuela and Brazil. Carnitine, an amino acid, assists in fatty acid metabolism. Creatine, an organic acid, helps to supply energy for muscle contractions. Inositol is a member of the vitamin B complex though not a vitamin itself because the body can synthesize it, which helps to carry messages between cells in the body. Ginkgo biloba is made from seeds of the ginkgo biloba tree and believed to enhance memory.

Whether or not any of these nutritional supplements actually give the boost they claim is up for debate. Some people feel no effect from energy drinks. Others react too strongly to the high levels of caffeine. Many people crash hard after the immediate buzz. Energy drinks can also make you feel very jittery and irritable (which actually decreases your ability to focus and comprehend material) since there are such high levels of stimulants in each can. Energy drinks can also lead to dehydration since caffeine is a diuretic; it causes the kidneys to remove extra fluid into the urine. Drinking too many of these energy drinks can actually speed up your heart rate so fast that it over exerts itself and stops working, resulting in death. That's why you'll find warnings on many cans to not drink more than four per day, or not recommended for consumption by pregnant women or children. Addiction and abuse of caffeine are also why many energy drinks have been banned around the world.

So the next time you pull an all-nighter and need that extra boost of energy to push through, or stop at 7-11 just to stay awake during class, think about the chemistry behind that can of Red Bull or Monster.

Sources:

HowStuffWorks: How do energy drinks work? By Stephanie Watson <http://recipes.howstuffworks.com/energy-drink.htm>

Higher Education Center Infofacts Resources: Ephedra and Energy Drinks on College Campuses by Daniel Ari Kapner <http://www.higheredcenter.org/pubs/factsheets/energy-drinks.html>