

# Chesapeake Chemist

*Maryland Section  
American Chemical  
Society*



**Dr. Kathryn S. Kalasinsky**  
Infrared Imaging in Forensic Toxicology  
Thursday, February 26, Goucher College

## Dinner Meeting Schedule

Thursday, February 26, 2004  
Goucher College

6:00 - 6:45 pm	Registration and Social Reception
6:45 - 7:45 pm	Dinner at Alumni House
7:45 - 8:00 pm	Announcements and Introduction of Keynote Speaker
8:00 - 9:00 pm	Lecture: Infrared Imaging in Forensic Toxicology Kathryn S. Kalasinsky, PhD Armed Forces Institute of Pathology, Washington, DC

Cost of the dinner is \$20 for members, \$15 for retired members and nonmembers, and \$10 for students. For reservations, contact Dr. Shirish Shah at 410-323-0803(H) or via e-mail at [dr.shah@juno.com](mailto:dr.shah@juno.com).

Directions: From the Baltimore Beltway (I-695), take exit 27A-Towson (Dulaney Valley Road south). The college entrance is on the left, one-half block from exit 27A.

### Abstract

Drug distributions in biological matrices are indicative of the pharmacokinetics of the drug. Comparisons of drug values in various matrices of postmortem cases can yield an interactive picture of the overall effect of the drug on the body. We have studied a number of drugs of abuse overdose cases where blood, tissue and hair were available for comparative analysis. Human hair is a valuable matrix for the investigations of drug abuse usage, as it can yield a long-term record of use from the shaft of the hair, and the hair root bulb can give information on the drug distribution at the time of death. The other biological matrices yield short-term information. The disadvantage of using hair as a matrix for drug abuse testing is that the kinetics of drug incorporation into hair are not known. Infrared microscopy has been shown to be useful in imaging the cross sections of microtomed hair for the presence of drugs of abuse. Mapping down the shaft of a microtomed hair that exposes the inner medulla core of the hair has been able to give information as to the mechanisms of drug incorporation. Synchrotron radiation infrared microscopy yields the sensitivity and spatial resolution needed to map the hair for drug distribution to determine pharmacokinetics in hair. This information is centrally important for the drug characterization of the overdose in comparison with the other matrices.

### Overcoming Challenges Award for women undergraduates

The Overcoming Challenges Award acknowledges the efforts of women undergraduates who have overcome economic, personal and/or academic hardships in pursuit of an education in the chemical sciences. The award consists of a plaque, a \$250 honorarium, and \$1,000 for travel expenses to the ACS Fall National Meeting where the award is presented.

Award candidates must be women matriculating as an undergraduate chemical science major/minor in a two-year program or at a four-year school not granting a doctoral degree in chemical related disciplines. Nominations are due May 1, 2004, and should be sent to Women Chemists Committee, American Chemical Society, 1155 16th Street, NW, Washington, DC 20036. For additional information, contact the WCC at [wcc@acs.org](mailto:wcc@acs.org) or visit <http://membership.acs.org/W/WCC>.

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# The Johns Hopkins University 2004 Spring Chemistry Colloquium Schedule

Lectures are in Remsen Hall 233, Tuesdays, at 4:15 pm unless otherwise noted. For more information contact Rosalie Elder, 410-516-7432.

- February 3 Professor B. Patrick Sullivan, University of Wyoming  
"Carboranes as Structural and Electronic Elements in Excited State Design"
- February 10 Professor John Koh, University of Delaware  
"Complementing Genetic Mutations by Molecular Design: Chemical Rescue of Nuclear Receptor Mutations"
- February 17 Professor Jack Norton, Columbia University  
"Strength of the C-H Bond in Methyl Isobutyryl Radicals from the Rates of C/Cr H• Transfer During Chain Transfer Catalysis"
- February 24 Professor Samy El Shall, Virginia Commonwealth University  
"Nucleation, Clusters, and Nanoparticles: From the Vapor Phase to Advanced Materials"
- March 2 Professor Lisa Kelly, UMBC  
"Probing Macromolecular Structure and Interactions Using Photochemistry"
- March 9  
12:15\* Professor James Mayer, University of Washington  
"Oxidations of C-H and O-H Bonds by Metal Complexes: Proton-coupled Electron Transfer and Marcus Theory"
- 4:15\*\* Professor Cynthia Friend, Harvard University  
"Fundamental Studies of Heterogeneous Environmental Chemistry: NO<sub>x</sub> Reduction Using Metal Oxides"
- March 23 Professor Elena Galloppini, Rutgers University  
"Rigid Linkers for Sensitization of Nanocrystalline TiO<sub>2</sub>: The Effect of Saturated and Unsaturated Bridges"
- March 30 Professor Roger N.F. Thorneley, John Innes Centre, U.K.  
"Time Resolved Spectroscopy of Small Molecule Activation by Metalloproteins"
- April 7  
*Wednesday* Dr. Tom Autrey, Pacific Northwest National Labs  
"Advanced Concepts in Hydrogen Storage"
- April 20 Professor Andrew Borovik, University of Kansas  
"Effects of Non-Covalent Interactions on Metal Ion Mediated Activation of Dioxygen: Formation of Non-Heme Complexes with Terminal Oxo and HydroxoLigands"
- April 27 Professor Frank Raushel, Texas A&M University  
"The Amidohydrolase Superfamily: Function, Design, and Discovery"
- May 4 Professor Sharon Hammes-Schiffer, Pennsylvania State University  
"Hydrogen Tunneling and Protein Motion in Enzyme Reactions"

\*Lunch/drinks will be provided.

\*\*Tea 4:00 pm

# University of Maryland, Baltimore County, Department of Chemistry and Biochemistry and Howard Hughes Medical Institute Spring 2004 Seminar Schedule

Seminars are held at 3:45 p.m. in Biological Sciences, room 004 (refreshments are served at 3:30 p.m.). For information contact Professor Brian Cullum at 410-455-2833.

- February 3 Professor Gregory Robinson, Dept. of Chemistry, University of Georgia  
“Do We Completely Understand Chemical Bonding? Novel Findings From Organometallic Chemistry”
- February 10 Professor William Heineman, Dept. of Chemistry, University of Cincinnati, “Sensors Based on Spectroelectrochemistry”
- February 17 Dr. Basil Rigas, Institute for Cancer  
“No-releasing NSAIDs and Cancer Prevention”
- February 24 Professor Lars Konermann, Dept. of Chemistry, University of Western Ontario, TBA
- March 2 Professor Karl Booksh, Dept. of Chemistry & Biochem, Arizona State University, “Design and Application of Fiber Optic Surface Plasmon Resonance Sensors”
- March 9 Dr. Chris Michejda, Frederick Cancer Research and Development Facility, NCI, “Novel and Potent Agents against Gastrointestinal Cancer: Chemistry, DNA Binding and Mechanism of Action”
- March 16 Professor Wade Sisk, Dept. of Chemistry, University of NC - Charlotte  
“Photostability Enhancement of 1,3,5,7,8-pentamethyl-2,6 diethylpyrromethene-difluoroborate complex (PM-567) via Boldine, Brucine, and Nicotine”
- March 30 Professor Charles Scott, Thomas Jefferson University  
“Cyclic Peptide Biosynthesis as a Tool for Drug Discovery and Chemical Genetics”
- April 6 Professor Steve Scheiner, Dept. of Chemistry, Utah State University  
TBA
- April 7\* Professor Jean Cadet, France  
“Lesions des Acides Nucleiques”
- April 13 Professor Valeria Culotta, Johns Hopkins University  
TBA
- April 20 Professor Vasu Nair, Dept. of Medicinal and/or Phar. Chem  
University of Georgia, “The Quest for Novel Antiviral Agents: Discovery, Chemistry and Chemical Biology”
- April 27 Professor Karolin Luger, Colorado State University  
“Nucleosome Structure and Dynamics”
- May 4 Professor Susan Lunte, Dept. of Chemistry, University of Kansas  
TBA

\*This seminar will be held in PH 401 at 1:00 p.m.

## February Historical Events in Chemistry

by Leopold May, The Catholic University of America, Washington, D.C.

- February 3, 1900 Crompton & Knowles, Inc., was incorporated on this day.
- February 6, 1860 Birthdate of Nikolai D. Zelinsky, a researcher on catalysis of the disproportionation reactions of hydrocarbons and the bromination of fatty acids (Heil-Volhard-Zelinsky reaction).
- February 7, 1850 Birthdate of John B. F. Herreshoff, who developed the method for manufacturing sulfuric acid.
- February 8, 1866 Birthdate of Moses Gomberg, who synthesized the first stable free radical (triphenylmethyl). He also did research on tautomerism.
- February 10, 1897 John F. Enders, 50 years ago, shared the Nobel Prize in Physiology or Medicine in 1954 with T. H. Weller and F. C. Robbins, for their discovery that the polio virus can grow in various types of tissue.
- February 11, 1839 Josiah W. Gibbs, who was born on this date, devised the Phase Rule and did research in thermodynamics.
- February 14, 1873 Dennis Searle, Dennis and E. M. Skillings discovered deposits of borax and other soluble salts in San Bernadino, California.
- February 15, 1873 Birthdate of Hans K. A. S. von Euler-Chelpin, who shared the Nobel Prize (1929) with Arthur Harden for their investigations on the fermentation of sugar and fermentative enzymes.
- February 18, 1913 Frederick Soddy coined the phrase “isotopic elements” for elements that share the same place in the periodic table.
- February 20, 1901 Birthdate of Henry Eyring, who developed the transition-state theory of chemical kinetics and constructed the first potential energy surface for a reaction.
- February 23, 1884 Casimir Funk was born on this day. He did research on vitamins and was responsible for naming them.
- February 24, 1981 Observation of the first atom of element 107 at GSI Laboratory, Darmstadt, Germany, was made on this day.
- February 25, 1896 Ida E. Noddack, who was born on this day, discovered rhenium in 1925 with her husband, Walter K. F. Noddack, and O. Berg.
- February 26, 1946 Birthdate of Ahmed H. Zewail, who received the Nobel Prize in 1999 for pioneering investigation of chemical reactions using femtosecond spectroscopy.
- February 27, 1869 Birthdate of Alice Hamilton, the first woman professor at Harvard Medical School. She researched toxic substances in the workplace.
- February 28, 1901 Birthdate of Linus C. Pauling. Pauling received the Nobel Prize 50 years ago for his research into the nature of the chemical bond and its application in the elucidation of the structure of complex substances. He also received the Nobel Prize in 1962. He was a researcher on structure of molecules, valency, and resonance.

# Maryland's Damascus High School students come up winners in national Chemagination contest

Marisa Burgener, National Chemagination Coordinator

The ACS Office of Community Activities thanks everyone who participated in the national Chemagination contest! You are all to be commended for your efforts and hard work. Your articles and videos were sent to a team of nine judges around the country, who evaluated your entries. We are pleased to announce the national winners for Chemagination!

**Biotechnology:** Eazy Eyez — Contact lenses that are dissolvable.

Damascus High School, Damascus, MD

Students: Elizabeth Barry, Nicole Corrado, and Amanda Harris

Advisor: Elena Pisciotta

**Medicine/Healthcare:** Sleep Smarter Not Harder — A study of sleep cycles for the purpose of perfecting sleep.

North Springs High School, Atlanta, GA

Students: Simon Cartoon, Michael D. Moxley, Jr., and Heather Post

Advisor: Sol Aboulafia

**New Materials:** Self-Healing Fabric — Fabric that when it's ripped, seals the rip back up on its own.

Damascus High School, Damascus, MD

Students: Joe Crane, Brice Farrell, and Katie Goldstein

Advisor: Elena Pisciotta

**Transportation/Environment:** Algae + Bioethanol + Carbonal = 1 Xtreme Car —

The invention of carbonal, which increases the vapor pressure of ethanol and helps reduce pollution.

Albert Einstein High School, Kensington, MD

Students: Daniel Mosier and Christopher Odell

Advisor: Ann Coren

Advisors of winning teams will be receiving information to distribute to the students in order to receive their shared \$600 U.S. Savings Bond prize. All entrants in the national contest will receive, through their advisors, a certificate of participation in the contest.

## Chemists Celebrate Earth Day, April 22, 2004

Members of the ACS's Committee on Community Activities invite you to participate in Chemists Celebrate Earth Day on April 22, 2004. The program, a joint effort of the ACS Committee on Community Activities, the Committee on Environmental Improvement, and the Green Chemistry Institute, provides volunteers with an opportunity to showcase chemistry's contributions to sustaining a healthy planet and environment as part of the annual Earth Day celebration.

The 2004 theme is "What do you know about H<sub>2</sub>O?" The ACS is sponsoring a contest encouraging students in grades K-12 to produce a music video best illustrating the theme "What Do You Know About H<sub>2</sub>O?" Local sections are asked to participate in "Testing Rain Water," an activity designed to measure the acidity of rainwater in area communities and to compare results online to national findings. Hands-on activities, as well as a sample press release and templates, are available at <http://chemistry.org/earthday>.

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