

THE OCTAGON



Volume 86, No. 4, April 2003

Lehigh Valley Section of the American Chemical Society

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764th LVACS Meeting:

Date: Tuesday, April 15, 2003

Location: Moravian College - North Campus

Reception and Undergraduate Poster Session:

5:00 - -6:15PM Lobby Collier Hall of Science

Dinner: 6:15 PM - Saal, Bahnsen Center, Moravian Theological Seminary

Meeting: 7:30 pm Dana Lecture Hall, Collier Hall of Science

Talk: At the conclusion of the meeting - 7:30 pm Dana Lecture Hall, Collier Hall of Science

Menu: Choice of Boneless Breast of Chicken Almond Crusted w/Pineapple Orange Sauce, Flounder Florentine, or Pasta Primavera

Cost: \$20, students \$10

Contact: LouAnn Vlahovic by Noon, Thursday, April 10th. Please include your name, affiliation, and choice of dinner entree. (610-861-1300) email: melnv01@moravian.edu

Directions: Directions to Moravian can be found on the web at <http://www.moravian.edu/admission/directions.htm>.

Note that due to campus construction, Main Street is closed between Laurel and Elizabeth Avenues. Suggested parking is in Lots M, N, & O, along Locust Street, which can be accessed from New Street. New street is one block east of Main Street. A campus map is available at:

<http://www.moravian.edu/campusMaps/north.htm>.

Speaker: Ms. Valerie Kuck

Valerie Kuck received a BA in Chemistry from Saint-Mary of the Woods College in Indiana and a MS from Purdue University. In 2001 she retired from Bell Laboratories in Murray Hill, NJ, where she had worked for 34 years. Her research was in both fundamental and applied areas and has been granted 21 U.S. patents dealing mostly with coatings

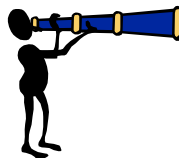
and waveguide devices. Currently, she is an adjunct professor in the Women's Study Program at Seton Hall University, South Orange, NJ. In collaboration with other faculty members, she has been conducting research on the progress women are making in academe. In 1997, Ms. Kuck became a Career Consultant for the ACS and has assisted numerous members in rewriting their resumes. In 1999 she established the North Jersey Section's Careers in Transition Group. She chairs the Group's monthly meetings which address topics such as resumes, job searching and interviews.

Talk: Writing a Winning Resume for a Tight Job Market

Abstract: The current economy requires job seekers to have attractive, concise resumes that clearly highlight valued skills and noteworthy accomplishments. To assist both experienced chemists and students, pointers and suggestions in preparing effective resumes will be presented. In addition, a resume template that many have found helpful will be discussed.

Final Spring 2003 Meeting :

May, Cedar Crest College
Date not received in time for publication.
Please check website and May issue of the Octagon.



Look For LVACS on the web at www.esu.edu/lvacs

March Meeting Minutes:

The 763rd meeting of the Lehigh Valley Section of the American Chemical Society was held at DeSales University on March 14, 2003. Section Chair Paul Bouis called the meeting to order and expressed the section's appreciation for the efforts of high school teachers as it was high school teacher's night. The treasurer's report was given by John Freeman who stated the checking account balance was \$1363.70, the scholarship balance was \$1551.91, and the ready assets were \$31,701.51. He also stated that the deficit issue could be solved by subscribing to the Octagon via email. In addition, donations to the scholarship fund were always welcome. The minutes from the February meeting were then approved as published in the Octagon. A number of special announcements were made concerning upcoming events and the scholarship opportunities available for high school and college students. Chair Paul Bouis made the announcement that the four judges for the Foundation scholarship had been named and that 7 applications have already been received. He also reminded the section that the deadline had not passed, and that there was still time for high school teachers to recommend their outstanding students. The first of hopefully many undergraduate research poster sessions will be held at Moravian College on April 15th 2003. In addition to the poster session, Valerie Kuck, a member of the ACS mentoring program will be speaking on how to write a resume in a tight job market. A special announcement was also made about the 36th annual MARM meeting that will be held at Princeton this June, which will feature Chemagination, which will test the innovative skills of high school chemistry students. For more information contact Paul Bouis. The Plastivan will be returning to the Lehigh Valley at the end of April from April 30 - May 2. High schools and middle schools can participate in a day of hands on demos. There will also be a sign up sheet for future interest. Finally, the answer to the question of the month... The question was: What was the apperative saffron of Mars? The answer was ferrous carbonate.

The guest speaker for the 763rd meeting was Catherine Bentzley, Ph.D., Asst. Prof. of Chemistry and Biochemistry, at the University of the Sciences in Philadelphia. Her talk was entitled, "Investigations of the Decomposition, Fermentation and Confirmation of Biological Systems Using Mass Spectroscopy. She began her lecture by asking if anyone knew the names of the Nobel prize winners in chemistry for this past year, who happened to have won for their individual work in the field of mass spectroscopy. They were Richard Fenn from Virginia Commonwealth University and Kochi Tanaka from Shimadzu, Kyoto Japan.

Dr. Bentzley's research interests are primarily in DNA and oligonucleotide fragment detection. She began with a general description of the purpose of mass spec, the ionization and detection of molecular ions to find out molecular mass. In mass spectroscopy, charged particles are created and migrate in a magnetic field. They have a velocity proportional to their mass. The particles are separated based upon differing mass to charge ratios. The ions created that is measured by a detector, either time of flight or quadropole. MALD (Matrix Assisted Laser Desorption) is a method amenable to biomolecule analysis because it shows limited fragmentation. MALD uses a metal matrix to desorb ions. The analyte is placed in a 1000:1 matrix (analyte:crystal) and a UV or IR range laser is used to desorb and ionize the sample. The exact mechanism of desorption is not understood. Sample preparation and the types of sample matrices is critical for successful analysis. Different matrices are appropriate for different molecules, although all matrices are aromatic acids; the substitution patterns on the aromatic rings appears to be critical, although the reason is not understood. Ferulic acid and sinapinic acid are preferable for positively charged particles and are often used in protein and peptide analysis; 3-hydroxy picolinic acid is often employed for oligonucleotide analysis.

Dr. Bentzley shared results of her work which involved sequencing oligonucleotides by determination of the mass of the base released by sequential cleavage via fragmentation. In her experiments she was able to correctly sequence up to a 24 mer, confirmed by other nucleotide sequencing methods. In addition, her group was interested in using mass spectroscopy to measure oligonucleotide degradation caused by repeated freeze-thaw cycles. Her laboratory examined samples with varied base composition, oligonucleotide length, concentration and varied freeze-thaw conditions. Under freeze-thaw conditions of liquid N₂ to 65^oC, data indicate that strands rich in T and A showed greater stability than C and G rich strands. The reasons for this may be related to the differing hydrogen bonding between A-T and C-G pairs. Also 50μM solutions showed less degradation than 1μM solutions, indicating that storage at higher concentrations is preferable. With regards to oligonucleotide length shorter 5 mers were superior to 12 mers. When compared to the extreme freeze-thaw cycles, simulated benchtop freeze-thaw conditions showed increased degradation.

In another project Dr. Bentzley's group investigated monitoring the concentrations of specific amino acids in cell media. Currently this analysis is done by HPLC and is time consuming and therefore, costly. Successful cell growth and viability is dependant upon protein production and requires a healthy supply of amino acids. Therefore, an inexpensive robust method for monitoring these concentrations would be beneficial in determination of culture health and efficiency. This analysis

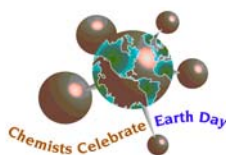
requires quantitative mass spectroscopy, and therefore different sample preparation compared to qualitative analyses. It is important that the sample matrix be applied uniformly so that any interaction of the laser with the target surface produce the same ionization profile. The first obstacle to direct quantitation of amino acids is that signal intensity of amino acids is not directly proportional to mass in general. However, Dr. Bentzley showed that for a particular amino acid, the signal intensity was proportional to the concentration of that amino acid. Therefore, quantitation could be accomplished using calibration curves established for each amino acid. Linear calibration curves were established for seven amino acids with correlation coefficients exceeding 0.9. Cell culture extracts were measured for concentrations of selected amino acids using MALD and results compared successfully with HPLC analyses, establishing MALD mass spectroscopy as an effective method for the analysis.

Finally Dr. Bentzley shared recent work involving electrospray mass spectroscopy. In ES, the sample is pumped through a steel capillary and exposed to a 2-3 kV potential. The charged spray formed is exposed to a heated environment causing solvent evaporation. The resulting charge present on the analyte causes Coulombic repulsion and the molecular ion and fragments are detected using a quadropole. The advantage of electrospray is that large molecules (16,000amu) can be detected because the method produces a favorable mass/charge ratio for detection. Electrospray has been used to monitor conformation of proteins as the charge envelope changes with conformational changes. Dr. Bentzley is investigating using these methods to investigate higher order structure in oligonucleotides. Initial results indicate that for a short sequence hair pin structures can be located using mass spectroscopy. Comparison to traditional melting curves established by UV spectroscopy show that the highest T_m values (obtained for hairpin structures compared to linear structures) correspond to the highest percent areas obtained using electrospray mass analysis.

Dr. Bentzley acknowledged her research team and financial sponsor and answered questions. She was presented with a gift of appreciation by Chair Paul Bouis. The meeting was adjourned at 8:55 PM.

Respectfully Submitted,
T. Michelle Jones-Wilson,
Alternate Councilor
LVACS, 20-March-2003

Chemists Celebrate Earth Day, April 22, 2003



The American Chemical Society, Office of Community Activities, is pleased to invite you to join us as we celebrate Chemists Celebrate Earth Day on April 22, 2003. The program is a joint effort between the National Chemistry Week Task Force, the Committee on Environmental Improvement, and the Green Chemistry Institute. Chemists Celebrate Earth Day 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 theme for Chemists Celebrate Earth Day 2003 is *ChemisTree*. As part of the celebration, the Office of Community Activities is sponsoring a poetry competition for students in grades K-12. Students in grades 3-12 are invited to write a poem in the haiku format related to the chemistry of trees. Students in grades K-2 may use any poetic style. As the unifying event, local sections are being asked to sponsor a tree planting ceremony in their community. Hands-on activities, as well a sample press release, are available online at <http://chemistry.org/earthday>. For additional information, contact the ACS Office of Community Activities at 1-800-227-5558, ext. 6078.

LVACS Organic Chemistry Undergraduate Scholarship Information

Submitted by John Freeman (reprinted from March Issue)

The Lehigh Valley Section of the American Chemical Society's Scholarship for Organic Chemistry competition takes place on the 26th of April at Muhlenberg College. The competition entails taking the American Chemical Societies organic chemistry examination, a letter of recommendation from the students' organic chemistry professor, and a 3-page essay on a topic in organic chemistry. Details for the letter and the essay follow. The student should be a rising junior, attending college at an institution in the section. Students should indicate their interest in the scholarship in advance to John Freeman or Steven W. Weiner at the addresses below.

John Freeman 522 Raub St Easton PA 18042 jcf2@rcn.com	Steven W. Weiner Dept. of Chemistry Muhlenberg College 2400 Chew Street, Allentown, PA 18104. sweiner@muhlenberg.edu
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Letters of Recommendation: When writing a letter of recommendation on behalf of a student applying for the LVACS Scholarship, please speak to the student's skills in lecture and laboratory from Organic Chemistry I and Organic Chemistry II. In addition to performance on written exams and a course grade for Organic Chemistry I, it would be helpful to comment on the student's proficiency in organic lab and his or her participation in recitations. We would also like, if possible, the letter to address the student's quantitative skills by commenting on performance in quantitative analysis or its local equivalent. Please place your letter of recommendation in a sealed plain envelope and place your signature over the seal. The student will be required to bring the sealed letter to the ACS Organic Chemistry Standardized Exam on April 26, 2003.

Essay: The student should choose a molecule, a group of molecules or a process in organic chemistry. The essay should address the development of the molecule or process, its impact on society, and the student's personal interest in the process or molecule. The essay should run 3 pages \pm a quarter page either double-spaced typed or in a readable 12 point font with 1 inch margins on all sides. An additional page with references should be included. The Essay will be judged on:

- CEase of reading, this includes items of grammar, spelling, and logical flow of the material. 25%
- Appropriate depth of coverage on both the development of the molecule and the impact on society. 60%
- Appropriate foot notes and references 5%
- Cability to follow the formatting rules 10%

LVACS Officers:

Chair: Paul Bouis

Mallinckrodt Baker Inc., Phillipsburg, NJ 08865
paul.bouis@tycohealthcare.com 908-859-9443

Chair Elect: Steve Weiner

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mjwilson@po-box.esu.edu 570-422-3446

Alternate-Councilor: Carol Baker Libby

Moravian College, Allentown, PA 18018
cblibby@cs.moravian.edu 610-861-1629

Question of the Month:

When and where was the first official (albeit organizational) meeting of the ACS?

Come to the April Meeting for the Answer

This Month in the History of Chemistry¹

(A very busy month for chemists!)

April 1: *Julian Stone reported in Applied Physics Letters that a new quartz fiber filled with tetrachloroethylene may be able to carry light, 1972.

April 2: *Francis Crick and James Dewey Watson mailed brief article on the double-helix structure of DNA to Nature in 1953.

*Charles Martin Hall obtains US patent 400,766 for an electrolytic process for producing aluminum in 1886.

April 4: *Ira Remsen was awarded the first Priestley Medal in 1923.

*Synthesis of vitamin B6 announced by Merck, Sharp & Dohme in 1939.

April 5: *Marshall Gates and G. Tschudi announced synthesis of morphine, 1956.

April 6: * Roy Plunkett accidentally polymerized Freons producing polytetrafluoroethylene, better known as Teflon, 1938.

April 7: *New law established metric system and nomenclature in France, 1795.

*Joseph Priestley left England to move to the United States, 1794. A mob hostile to his politically and religiously liberal views had destroyed his home and made him unwelcome in Birmingham.

April 9: *Ignacio Tinoco, Jr., proposed a simple method for deducing secondary structure of ribonucleic acid (RNA) from nucleotide sequence, 1971.

April 10: *Arnold Collins made the synthetic rubber called polychloroprene (also known as neoprene), 1930.

April 11: *Ernest Volwiler and Donalee L. Tabern received US patent number 2,153,729 for sodium pentothal as a general anaesthetic, 1939.

*Robert Burns Woodward and William von Eggers Doering reported a formal synthesis of quinine in 1944.

April 12: * Marie Curie watched as one of her professors, Gabriel Lippmann, presented her exhaustive survey of radioactivity in natural substances, which presents evidence for substances much more radioactive than uranium, 1898.

April 13: * Torbern Bergman confirmed Müller von Reichenstein's finding that the substance isolated from a bismuth ore was a new element, tellurium (Te, element 52), 1784.

April 14: *NASA's Nimbus III weather satellite made first civilian use of nuclear batteries, 1969.

April 15: *Johann Balmer publishes the observation that certain spectral frequencies of hydrogen are related by a simple mathematical formula (Balmer series), 1885.

*Albert Ghiorso announced the discovery of Rutherfordium (Rf, element 104) with coworkers (Ghiorso at right) at the University of California, Berkeley, in 1969.

*Ernest Solvay received patent entitled "Industrial Production of Sodium Carbonate by Means of Marine Salt,

Ammonia, and Carbon Dioxide" (Solvay process) in 1861.

April 16: * Humphry Davy performed first physiological experiment on nitrous oxide by inhaling it, 1799. (Don't try this at home!)

*Albert Hofmann discovered the hallucinogenic effects of lysergic acid diethylamide (LSD), 1943.

April 17: *First oil well fire, at Little and Merrick well, Oil City, PA, 1861.

April 18: *Joseph Priestley ignited a mixture of "inflammable air" (hydrogen) and common air, 1781, and noted that the explosion was not as powerful as can be obtained from gunpowder. He failed to recognize (as Cavendish, Lavoisier, and Watt did soon afterwards) that the two gases combine to form water.

April 19: *Antoine Lavoisier claimed the right to the discovery of oxygen (O, element 8), arguing that he and Joseph Priestley discovered the same facts, but that he recognized oxygen as an element while Priestley explained it in terms of phlogiston theory, 1776.

*Monsanto (part of Pharmacia corporation as of April 2000) incorporated, 1933.

April 21: *Pfizer incorporated, 1900.

April 22: * First modern use of chemical weapons: chlorine gas at Ypres, 1915.

*First Earth Day, 1970.

April 23: *Rohm & Haas incorporated, 1917.

April 25: * "Molecular Structure of Nucleic Acids: A Structure for Deoxyribose Nucleic Acid", by James D. Watson and Francis Crick, published in Nature, 1953.

April 27: *Albert Ghiorso and coworkers announced in 1970 discovery of element 105 (eventually named dubnium, Db) produced by bombarding californium-249 with nitrogen-15.

*Antoine Lavoisier reported in 1775 that heated mercury forms red calx (HgO), while the surrounding air is reduced in volume and no longer supports combustion; heating the calx liberates oxygen.

April 29: *Atlantic Richfield Company incorporated, 1870.

April 30: *Albert Ghiorso and coworkers announced the discovery of mendelevium (Md, 101) at the University of California, Berkeley, 1958.

*Joseph John Thomson announced in 1897 the discovery of a body lighter than all known elements and a constituent of them all - the electron.

¹Thanks to Carmen Giunta, for his Classic Chemistry website <http://webserver.lemoyne.edu/faculty/giunta/>

Advertising/Article Policy

All articles of interest to LVACS members including local news and meeting details will be printed on a priority basis over ad copy. All ads for job openings and seminars with free admission of interest to LVACS members will be printed free as space is available. All ads for goods or services available at a cost will be printed for a fee. Please contact the editor for the fee structure. The editor reserves the right to reject inappropriate copy. All article copy must be submitted 5 weeks prior to the meeting date. Electronic format (ms word, word perfect email or simple text) is preferred but not required. Information can be emailed, posted or faxed to the editor. Images can be submitted electronically in either gif, jpg, tiff, or bmp format. Images submitted as hardcopy may be scanned and compressed for insertion. The editor reserves the right to make minor changes to copy in the interest of space prior to publication. Significant changes will be communicated to the author before print.

Article/Copy Submission Guidelines:

Please address all correspondence concerning this publication to the editor.

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Fax: 570-422-3908

Applications for membership in the American Chemical Society should be sent to the LVACS Secretary. This publication, founded in 1918 is devoted to the interests of the Lehigh Valley Section of the American Chemical Society. It is published eight times each year (January through May and September through November) and provided free to members of the local section: subscription fee to non members is \$10 yearly.

News from National ACS

2003 ChemCom Teacher Training Workshops

ACS sponsors one-week, residential summer workshops for teachers using or intending to use *ChemCom*. Apply today for one of this summer's workshops, or pass this information along to a chemistry teacher. In each workshop, experienced *ChemCom* Teacher Leaders guide

participants through the *ChemCom* text and provide hands-on experience with many of the laboratories, modeling exercises, and culminating activities. Participants are also introduced to the many ancillaries new to the most recent edition of *ChemCom*. Teachers using previous editions of *ChemCom*, or any other textbook, who intend to use *ChemCom* in the future, are also invited to apply. The locations and dates of the 2003 week long workshops are listed below.

June 8-13, 2003 Dallas, TX; July 6-11, 2003 Lake Forest, IL; July 20-25, 2003; Lawrenceville, NJ; August 3-8, 2003 Malibu, CA

ACS coordinates and pays for lodging, meals, and all workshop expenses during the workshop. Attendees arrange and pay for their own travel to and from the workshop site and pay a \$50 registration fee. Each workshop begins on a Sunday afternoon and is completed at noon on Friday.

In addition to the workshops listed above, this summer ACS will offer several **three-day, non-residential workshops**. These workshops will take place at locations around the country during June, July, and August. Participants will have many of the same experiences as in the week long workshops and will commute to the site each day. A \$50 registration fee is required and lunch is provided daily. If your organization is interested in hosting a three-day ChemCom workshop, please call 202-872-6383 or email chemcom@acs.org. The following three-day ChemCom workshops are currently scheduled: June 2-4, 2003, Jacksonville, FL; June 23-25, 2003, Chatsworth, CA

The latest workshop information and workshop applications and are available online at:

<http://chemistry.org/chemcom/workshops.html>



Interested in working with students? Hoping to involve more teachers in section activities? We are seeking people with connections to high school chemistry teachers and/or an

interest in motivating high school students in the field of chemistry to be part of a Chemagination committee and to run a contest in the area.

Chemagination is a chemistry essay and poster contest for students in grades 9-12. Students look 25 years into the future and write an article that they believe could appear in "ChemMatters" magazine about an innovation or breakthrough in the field of chemistry that they think will be important in the lives of teenagers at that time. Student articles focus in one of four categories: Biotechnology, Medicine/Healthcare, New Materials or Transportation/Environment.

For information about the contest, visit <http://chemistry.org/chemagination>, call 1-800-227-5558 ext. 4458 or email chemagination@acs.org

Career Services at ACS Regional Meetings

Visit the Career Resource Center at these ACS regional meetings for an array of professional development programs and services. Features may include an employment clearinghouse (RECH), career management workshops and one-on-one resume critiques.

Great Lakes Regional Meeting

May 31 – June 1, Chicago, IL

Middle Atlantic Regional Meeting

June 8-11, Princeton, NJ

Northwest Regional Meeting

June 12-14, Bozeman, MT

Northeast Regional Meeting

June 15-18, Saratoga Springs, NY

For more information, job seekers and employers may visit the ACS website:

www.chemistry.org/careers/calendar.html or call 1-800-227-5558 x6208.

Computer Virus Alerts

You can always check out any virus warning you receive by going to Symantec (the distributors of Norton Antivirus) and checking out their Web site (<http://www.symantec.com/>). They keep lists of the various virus messages real and hoax.

It's always recommended that you check out any message that asks you to delete a file on your computer, as these often ask you to delete legitimate files in your operating system.

Background information on this particular hoax is available at

<http://securityresponse.symantec.com/avcenter/venc/data/jdbgmgr.exe.file.hoax.html>

If you have already deleted that particular file off of your computer, the above link will also provide information on how you can locate a new copy of the Java debugger program (which is the executable the hoax asked you to delete) for your computer.

Legislative Action Network

Are you concerned about federally supported R&D? Are you concerned about the future of K-12 science education? If yes, then JOIN the ACS's Legislative Action Network (LAN) and let your concerns be heard.

The LAN gives ACS members an easy, effective way of providing sound, nonpartisan advice to elected officials. Participating LAN members will receive approximately *six* e-mail alerts per year prior to key congressional decisions. These alerts explore the issue's background, the potential effect it might have on the scientific enterprise, and the position ACS holds. By clicking on a link, members have direct access to the ACS Legislative Action Center where they can review action

alerts, edit sample letters, and send them to their legislators within minutes. In addition, monthly e-mail news summaries keep members up-to-date on decisions being made in both the Congress and the White House.

You can sign up for the LAN online at www.chemistry.org/government/action. If you have any questions regarding the LAN, please contact Brad Smith in the ACS Office of Legislative and Government Affairs at 1-800-227-5558, extension 4479.

Member-Get-A-Member Sweepstakes!

This year's Member-Get-A-Member drive is a Sweepstakes campaign, with the top prize being an all expense paid trip the Spring 2004 meeting in Anaheim, the Fall meeting in Philadelphia, or a vacation to Washington, DC. It's valued at over \$1,500!

Each new member you recruit will give you one chance at this valuable prize. So, the more members you recruit, the better your odds of winning.

Plus, your efforts will earn a BONUS for your Local Section-- MOLE DOLLARS! ACS "money" you can use to buy prizes and recognition awards for your members.

MGM recruitment kits will be available AFTER the national meeting in March. All Local Sections will receive a mailing explaining the program and enabling them to request Member-Get-A-Member kits.

Patents — What Every Chemist Should Know

A new patent is granted every 3 minutes – 155,000 were granted by the U.S. government last year. The chemical sciences account for a significant portion of those patents. And for people in the chemical sciences, knowing how to register a patent or protect a patent is an important aspect of their professional skills.

To help chemists master the basics of intellectual property protection, the ACS Committee on Patents and Related Matters has released the printed version of the recently updated booklet, *What Every Chemist Should Know about Patents*. The booklet introduces important topics such as the basis for U.S. patent rights, an overview of the U.S. patenting process, how to obtain a patent, and how to extend patent protection to other countries.

Copies are available through the ACS Office of Society Services by calling 800-227-5558. The first copy is free, and additional copies are \$5 per copy. Bulk orders of more than 25 copies are \$3 each. The booklet is also available on the ACS Office of Legislative & Government Affairs Web site at <http://www.chemistry.org/government/patentprimer.pdf>

If your ship doesn't come in, swim out to it.
--Jonathan Winters, Comedian