

# Society of Toxicology NEWSLETTER

OCT 06 1993

SEPTEMBER/OCTOBER 1993

## SOT Student Internships: Focus On The Future

**S**OT Student Internships provide an outstanding learning experience for young scientists seeking hands-on experience in toxicology. In 1993, 17 interns were selected from the almost 300 student respondents to the flyers and applications distributed through science departments and undergraduate advisors at colleges and universities across the United States and Canada.

The Society began its Summer Research Internship Program in 1989. Since then, 94 students have worked as summer interns, while many more students have shown an interest in the Program. Interns are asked to complete questionnaires upon completion of their internship and their comments have been very favorable.

This year, SOT thanks the following academic programs and companies for sponsoring the seventeen 1993 summer interns: CIIT; Dartmouth Medical School; Eli Lilly and Company; Michigan State University; The Procter & Gamble Company; S.C. Johnson & Son; Sphinx Pharmaceuticals Corp.; State University of New York; University of Arizona, University of Maryland, and University of Michigan.



*University of Michigan  
intern Shauna Kubose*

*Continued on page 8*



*Lilly intern Lia Haynes*



*Dartmouth intern  
Martin Moyer*

## SOT Headquarters Relocates to Reston, VA

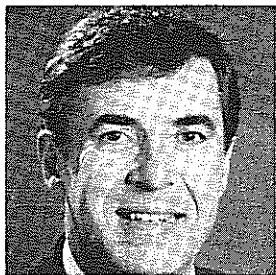
**E**ffective October 11, 1993, the headquarters office of the Society of Toxicology will be located at 1767 Business Center Drive, Reston, Virginia 22090. SOT will also have a downtown office and conference room at 1828 L Street, NW, Washington, DC, which is available for committee meetings. SOT's new home in Reston is a lovely two-story office building that adjoins park-lands and an equestrian center. If you are visiting the office after October 11 and need directions, please call the new SOT telephone number, 703/438-3115. ●

**Society of Toxicology  
1767 Business Center Drive  
Reston, Virginia 22090  
Telephone: 703/438-3115  
Fax: 703/438-3113**

## Pre-College Teaching Materials Sought

**T**he *ad hoc* Tox 90s Educational Issues Task Force has launched an initiative to make pre-college teaching materials on toxicology more available to interested members and ultimately to K-12 teachers. As an initial step, the Task Force requests that members who have prepared presentation materials aimed at the pre-college level contact **Dr. Bruce J. Kelman** at 206-883-0777. In exchange for copies of your materials and notes, the Task Force will serve as a clearing house and furnish you with appropriate copies of member-generated materials.

At the 1994 Annual Meeting, the Third Educators Forum will focus on education materials suitable for use in pre-college classes. The Forum will feature an address by a specialist in science education in the public schools, as well as a poster-discussion session on how effects of chemicals are recognized by people with all levels of pre-college background. How can toxicologists help educators and pre-college students develop the means to think critically about chemicals in their personal, occupational, community, and even global environments? The Task Force invites **YOU** to contribute a formal or informal poster and share your educational ideas with others. Posters for this session will be accepted by title only (no abstract necessary). Contributors should use the Abstract Form provided by the Society and comply with the submission date of October 1, 1993. ●



### Society of Toxicology

1767 Business Center Drive  
Reston, Virginia 22090  
Telephone: (703) 438-3115  
Fax: (703) 438-3113  
E-Mail: 73162, 506 @ CompuServe

### Deadline for next issues:

October 8, 1993  
December 10, 1993  
April 8, 1994

### 1994 Annual Meeting:

March 13-17  
Dallas, TX

### 1995 Annual Meeting:

March 5-9  
Baltimore, MD

### 1996 Annual Meeting:

March 10-14  
Anaheim, CA

### 1997 Annual Meeting:

March 9-13  
Cincinnati, OH

### 1998 Annual Meeting:

March 1-5  
Seattle, WA

## President's Message

The Annual Meeting is really taking shape. The Program Committee has selected numerous symposia and workshops, which will form the backbone of the meeting. As your abstracts are received, platform sessions, poster-discussion sessions and poster sessions will be reviewed and programmed. Because of last year's highly successful plenary session, negotiations are underway to schedule a similarly provocative keynote speaker for the 1994 Annual Meeting. A menu of Continuing Education courses is also in the final stages of development, as is a professional development course on "Communicating with the Media." These and other scientific and social events foretell an outstanding 1994 Annual Meeting. The Program Committee and I hope you will be part of this meeting.

In one respect the 1994 Annual Meeting will be the end of a tradition. It is the last meeting to be held in a hotel or, more accurately, a hotel complex. Because of the growth of the meeting in the number of attendees and exhibitors, few hotels are large enough to accommodate the SOT Annual Meeting. Future meetings (planned through the year 2000) will be housed in convention centers. That SOT is ready for this change is evidenced by the recent successes of the Seattle and New Orleans Annual Meetings, which were held in convention centers.

Many of you have suggested future sites for meeting locations by completing meeting evaluation forms, by talking to members of Council or by writing letters to SOT Headquarters. SOT staff and Council certainly consider your suggestions. However, many sites will just not accommodate an SOT meeting, while others present problems in convenience and/or finances. Examples of such problems are:

- *Insufficient hotel and/or convention center space*
- *Convention center too distant from hotels (extensive busing required)*
- *Rental rates or room rates too high*
- *High probability of inclement weather (remember the storm of 1993)*
- *Poor past experiences*

Some popular meeting sites are booked 10 years in advance, particularly during SOT's choice dates of late-February to mid-March. When it was decided, on very short notice, to move the 1993 Annual Meeting from Miami to another site, convention center space was available in New Orleans, but the best hotel package was not available. Council decided New Orleans was still the best option and decided to provide busing from the more distant hotels. In 1991 SOT was successful in obtaining the Anaheim Convention Center for its 1996 meeting only because of a cancellation. Because of SOT staff networking with other meeting planners, SOT was alerted to this opportunity and moved quickly to close the deal. Fortunately, the Anaheim Hilton Hotel and Towers was able to reschedule another group for a later date in order to provide SOT with a Headquarters Hotel. Thus, SOT will be off to Anaheim in 1996!

Meeting sites scheduled to date are: Baltimore (1995), Anaheim (1996), Cincinnati (1997), Seattle (1998), New Orleans (1999) and Philadelphia (2000). A more convenient hotel package has been arranged for New Orleans, so extensive busing will not be required in any of these cities.

As in the past, please provide Council or staff with meeting site suggestions. SOT staff can usually determine very quickly whether or not a site will meet the needs of SOT. As you attend meetings hosted by other organizations, provide feedback. We would welcome any positive or negative information on your experiences with meetings hosted by the cities mentioned above.

Since convention centers and hotels are being built or remodeled, SOT may have other options in the future. It is unlikely that we can return to Williamsburg, where many of us started our association with SOT. It will also be difficult to return to the Loews Anatole in Dallas, which will have hosted three SOT Annual Meetings. We have outgrown these wonderful facilities.

See you in Dallas.

Sincerely,



I. Glenn Sipes, Ph.D.

## Member News

**Al P. Li, Ph.D.**, formerly Senior Fellow and Head of Liver Biology, Monsanto Company, St. Louis, has recently been appointed Director and Research Professor, Surgical Research Institute, Department of Surgery, St. Louis University Medical Center. In this new position, Dr. Li will continue to pursue research in Toxicology and Drug Metabolism using human cells and tissues.

The American Industrial Hygiene Association, at its May annual meeting in New Orleans, presented **William E. McCormick, Ph.D.**, with its Borden Award. This award, sponsored by the Borden Co., is given annually to an individual for outstanding service to the industrial hygiene profession.

SOT President **I. Glenn Sipes, Ph.D.**, has been named head of the department of pharmacology at the College of Medicine of the University of Arizona. Dr. Sipes is also professor and head of the department of pharmacology and toxicology at the UA College of Pharmacy, and is professor of pharmacology and anesthesiology at the College of Medicine. ●

## ICT-VII News

The VII International Congress of Toxicology (ICT-VII) will be hosted by the Society of Toxicology (USA). The theme of the meeting is "Horizons in Toxicology: Preparing for the 21st Century." Topics being developed by the Program Committee include: Safety Evaluation of Recombinant Products; Impact of Maximum Tolerated Dose Bioassays on Risk Assessment; Chemically-Induced Neurotoxicity; Regulation of Gene Expression; Biological Mechanisms-based Human Risk Assessment; Receptor-mediated Toxicity; Indoor and Outdoor Air Pollution; Ozone Toxicity; Biological Markers of Exposure; Agricultural Chemical Use and Hazard Assessment; Mechanisms of Pesticide Resistance; Human Toxicity; Carcinogenicity; Mechanisms and Models of Risk Assessment; Ototoxicity and Toxicology Evaluations of Chemicals; Physiologically-based Pharmacokinetic Modeling; Transgenic Animals; New Approaches to Toxicology with Molecular Biological Techniques.



Please contact **Dr. Donald J. Reed**, Chairperson, ICT-VII Program Committee, c/o Biochemistry and Biophysics Department, Oregon State University, Corvallis, OR 97331, fax (503) 737-0471, or any member of the ICT-VII Scientific Program Committee, if you have additional suggestions for the Scientific Program. ●

## Travelling Lectureship Award

*Dr. Terrence Monks, with his wife Dr. Serrine Lau, being welcomed by Dr. Iain Purchase (right) and Dr. Edward Lock (left) during his recent visit to Zeneca Central Toxicology Laboratory in England, as one of*



*two recipients of the 1993 Zeneca Travelling Lectureship Award. The award, presented by the Society of Toxicology, is designed to promote greater collaboration between European and North American toxicologists, and enables a North American toxicologist to make a three to four week lecture tour of Europe. Dr. Monks, who is in the Division of Pharmacology and Toxicology in the School of Pharmacy at the University of Texas at Austin, spent three weeks in Europe visiting institutions in England, Scotland, Norway, Sweden, Germany, Switzerland and the Netherlands. ●*

# SOCIETY OF TOXICOLOGY

## 1994 Annual Meeting: March 13-17, Dallas

While planning continues at Headquarters and among various committees for the 1994 Annual Meeting in Dallas, SOT members should begin thinking about their own plans for the meeting. The Preliminary Program, which includes a reservation form, hotel and travel registration forms, will be sent to members in December. Continuing Education course descriptions are included in this newsletter; Symposia and Special Session descriptions will be published in the November/December Newsletter. The Final Program and *Toxicologist* will be mailed to members in February.

### *Reserving Space for Ancillary Meetings*

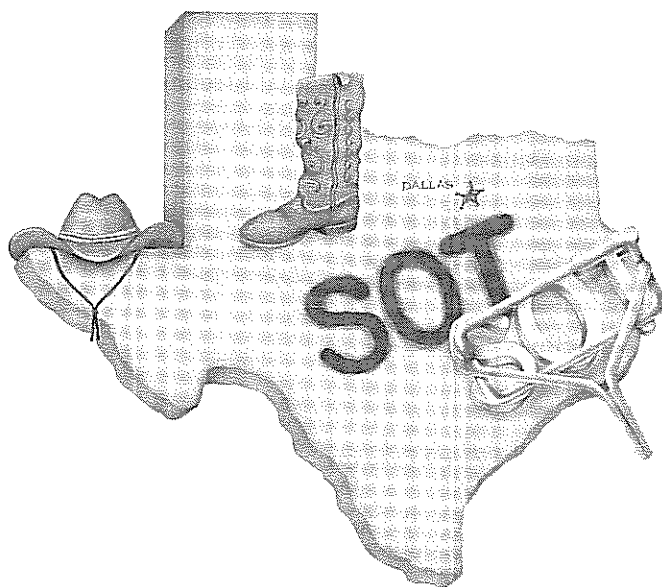
Committees, Specialty Sections, Chapters, alumni organizations, and others who wish to hold a meeting or social function during the week of the meeting should complete the Ancillary Meeting Form included with this newsletter and return it to Clarissa Russell at SOT Headquarters no later than **November 19, 1993**. Space will be assigned on a first-come, first-served basis, after SOT scientific and social programs have been accommodated.

### *Placement Service*

The Society of Toxicology Placement Service provides employers and candidates seeking jobs with an opportunity to establish contacts relating to their specific needs and areas of interest. Placement forms are included in this newsletter. The pre-registration deadline is **January 10, 1994**.

### *Pre-Meeting*

Both employers and job candidates must register with the SOT Placement Service and pay a nominal fee. Employers complete job description forms and candidates complete narrative resumes and computer forms. Information provided on the computer forms is used to help "match" candidates with positions described by employers. Employers registering before **January 10, 1994** receive packets with resumes of registered candidates and "matches" for specific positions one month prior to the Annual Meeting.



### *On-Site*

The SOT Placement Service will be open on Sunday, March 13, from 10:00 a.m. to 3:30 p.m. for registration of employers and candidates, and Monday-Wednesday for full Placement Services. Although pre-registration is encouraged, registration for the Placement Service will be accepted at the Annual Meeting at somewhat higher fees. During the Annual Meeting, employers scan the complete packets of resumes at the Placement Service Suite. Candidates review up-to-date job listings in a room adjacent to the Placement Service Suite. Contacts are made via a message board. The Placement Service does not arrange interviews. Neither employers nor candidates need be present; however, both are urged to use this opportunity for personal contact. Due to a shortage of meeting space, the Placement Service will not provide interview booths in 1994.

All job placement will be carried out via the Placement Service. No employer will be allowed to advertise positions elsewhere at the Annual Meeting. ●

## 1994 Continuing Education Courses Sunday, March 13

The Continuing Education Committee, Michael A. Trush; Lawrence R. Curtis; Lois Lehman-McKeeman; Mary Jo Miller; Raymond Novak, Jon C. Cook (Chairperson) and William F. Greenlee (liaison), is pleased to offer the following slate of Continuing Education courses.

### Molecular Mechanisms Controlling Gene Expression

*Chairperson: Ronald N. Hines, Wayne State University School of Medicine, Detroit, MI*

It is becoming increasingly apparent that many toxicants exert their action by perturbing normal gene expression. This may be a direct effect wherein the toxicant acts to alter the spectrum of active genes or indirectly by interfering with normal regulatory pathways. Our understanding of this aspect of toxicology has been preceded by an explosive and continuing growth in our knowledge of molecular mechanisms controlling gene expression. The objective of this course is to provide the participants with a current overview of the cellular machinery regulating gene expression. The four general areas to be covered will be: (1) transcription and assembly of active transcription complexes; (2) RNA processing and splicing; (3) translational control and efficiency; and (4) signalling pathways transmitting information effecting transcriptional and/or translational machinery.

**Transcription and Assembly of Active Transcription Complexes**, R. N. Hines, Wayne State University School of Medicine, Detroit, MI

**Translational Control and Efficiency**, T. A. Kocarek, Wayne State University, Detroit, MI

**RNA Processing and Splicing**, H. W. Schaup, Oregon State University, Corvallis, OR

**Signalling Pathways Transmitting Information Affecting Transcriptional and/or Translational Machinery**, J. J. Reiners, Wayne State University, Detroit, MI

### Toxicokinetics: Study Design and Data Analysis

*Chairpersons: Glenn F. Rush, Lilly Research Laboratories, Indianapolis, IN and John Newton, Sterling-Winthrop Corporation, Rensselaer, NY*

The term toxicokinetics is used to describe the pharmacokinetics of a drug or chemical under conditions of a toxicology study. Toxicokinetic data are generated in an attempt to reach a better understanding of

how exposure to a drug or chemical may relate to toxicity. The goal of this continuing education course is to review toxicokinetic and pharmacokinetic concepts as well as to discuss the practical considerations of study design. This course is designed to meet the following objectives:

(1) provide an overview of basic pharmacokinetic concepts; (2) review the physiological factors which may impact the pharmacokinetics of a drug and its toxicity; (3) provide an overview of the available designs and analyses of toxicokinetic data; and (4) present an example of the application of toxicokinetic data to study interpretation. Information presented in this course is intended for those involved in the design and interpretation of toxicology studies.

**Theoretical and Practical Considerations in Analysis of Pharmacokinetic Data**, G. Lockwood, Sterling-Winthrop Corporation, Rensselaer, NY

**Interpretation of Pharmacokinetic Data Derived from Toxicology Studies**, J. F. Newton, Sterling-Winthrop Corporation, Rensselaer, NY

**Methodologies for Toxicokinetic Analysis**, S. Allerheiligen, Lilly Research Clinic, Indianapolis, IN

**Pharmacokinetics Can Be Limited in the Absence of Pharmacodynamics**, A. M. Monro, Pfizer Central Research, Groton, CT

### Molecular Biomarkers in Toxicology

*Chairperson: Thomas W. Kensler, Johns Hopkins University, Baltimore, MD*

The objective of this course is to describe the application of recent advances in laboratory methodologies to the identification, development and validation of intermediate biological markers for use in toxicological studies. Biomarkers, defined as molecular, biochemical or cellular alterations that are measurable in biological matrices, such as human fluids, cells or tissues, can be used to identify specific exogenous agents and/or host factors that play a role in human diseases. The first lecture will provide an overview of the application of biomarkers to both experimental and epidemiologic studies in toxicology. Characteristics of ideal biomarkers and strategies for validating biomarkers will be presented. The second lecture will focus on the use of biomarkers as internal indicators of exposure and the biologically effective dose of xenobiotics. The third lecture will highlight the use of biomarkers as indices of early, subclinical adverse health effects of toxicants. The fourth lecture will discuss strategies for defining the innate susceptibility of the human host to extrinsic agents and the genetic basis for inter-individual variability in toxicity outcomes. Overall, the course will highlight the potential of biomarkers to improve the understanding of exposure to disease relationships and their utility in preventive interventions.

**Development, Validation and Application of Biomarkers: An Overview**, T. W. Kensler, Johns Hopkins University, Baltimore, MD

**Molecular Dosimetry of Toxic Agents,**  
J. D. Groopman, Johns Hopkins University,  
Baltimore, MD

**Molecular Markers of Adverse Effects,** G. N. Wogan,  
Massachusetts Institute of Technology, Cambridge,  
MA

**Markers of Individual Susceptibility,** F. F. Kadlubar,  
National Center for Toxicological Research,  
Jefferson, AR

## International Harmonization: Update on Scientific and Regulatory Issues

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### Part I: Foods, Drugs, Cosmetics, and Devices.

*Chairperson: Frances A. Mielach, US FDA, Rockville, MD*

This has been a banner year for international harmonization meetings addressing critical scientific and regulatory issues in several fields of toxicology. The scientific and policy decisions from these meetings will impact on the present and future work of toxicologists. This timely course will provide the latest information on the outcomes of these meetings. For their respective areas, each instructor will discuss (1) the key issues with their histories; (2) a summary of any issues that have been agreed upon in harmonization; and (3) a summary of any issues yet to be agreed upon, with the general direction that the negotiations appear to be taking. The viewpoints of the United States, the European Community (EC), and Japan will be compared and contrasted. Part I will cover harmonization issues related to (1) drugs (including carcinogenicity and mutagenicity testing, reproduction guidelines, and toxicokinetics); (2) direct food and color additives (including the FDA Red Book guidelines and immunotoxicology); (3) devices (including ISO 10993 standards, biocompatibility testing and related aspects); and (4) cosmetics, fragrances, and flavors (including EC directives for cosmetics legislation and worldwide flavor legislation).

**Introduction,** F. A. Mielach, US FDA, Rockville, MD

**Scientific and Political Aspects of International Harmonization of Drug Safety,** R. E. Stoll,  
Boehringer Ingelheim Pharmaceuticals, Inc.,  
Ridgefield, CT

**Perspectives for Expanded Toxicological Testing Applied to Direct Food and Color Additives with Emphasis on Immunotoxicology,** D. M. Hinton,  
US FDA, Laurel, MD

**Medical Devices: Standardization Process and Players,** S. J. Northup, Baxter Healthcare, Inc.,  
Round Lake, IL

**International Harmonization: Cosmetics, Fragrances and Flavors,** K. R. Schrankel, International Flavors and Fragrances, Inc., Union Beach, NJ

## International Harmonization: Update on Scientific and Regulatory Issues

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### Part II: Toxic Substances and Environmental Issues.

*Chairperson: Frances A. Mielach, US FDA, Rockville, MD*

Part II of the International Update on Scientific and Regulatory Issues will cover harmonization issues related to (1) chemical toxicity testing (including new EC legislation for new chemical introduction); (2) pesticide regulation (including OECD Pesticide Forum projects on registration issues); (3) risk assessment methodologies for human health (including international initiatives, and similarities and differences in risk assessment by national regulatory bodies); and (4) ecotoxicology and pesticide exposure (including environmental fate and new guidelines developments). This course is intended to provide participants with the necessary background material for the SOT Roundtable Discussion entitled "Toxicologic Approaches to International Harmonization in Risk Assessment."

**Introduction,** F. A. Mielach, US FDA, Rockville, MD

**International Harmonization of Chemical Toxicity Testing: Recent Advances,** F. R. Johannsen,  
Monsanto Services International, Brussels, Belgium

**The International Harmonization of Pesticide Regulation,** A. Lindsay, US EPA, Washington, DC

**Prospects for International Harmonization of Risk Assessment Methodologies for Human Health,**  
P. Fenner-Crisp, US EPA, Washington, DC

**International Harmonization of Guidelines for Evaluating Ecotoxicology and Exposure of Pesticides,**  
A. Rispin, US EPA, Washington, DC

## In Vitro Neurotoxicology: Principles, Practice and Paradigms

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*Chairperson: M. Anthony Verity, Department of Neuropathology, Brain Research Institute, UCLA School of Medicine, Los Angeles, CA*

While it is recognized that functional or behavior assessment paradigms more accurately reflect the final output of the nervous system, *in vitro* analysis, e.g. cell suspensions, cell cultures, provides an acceptable alternative with special reference to mechanistic studies and provides a bridge for the toxicologist to pursue molecular neurobiological questions. We will describe a variety of *in vitro* models used in neurotoxicology, concentrating on systems representing the Schwann cell, cerebral-derived endothelial cells, the astrocyte and neuron. Principles underlying the utilization and advantages of these *in vitro* systems will be discussed and experiments pertain-

ing to mechanisms of neurotoxic perturbation in morphological, ionic, electrophysiological and molecular systems will be described. Attempts to relate the interaction of these neural-derived systems in co-cultured environments, e.g. Schwann cell-axon, astrocyte-neuron, will be illustrated. Finally, a case will be made for developing and validating *in vitro* models as paradigms for investigation of neurotoxic potential and their application in screening or risk assessment.

**Schwann Cells In Vitro: Studies on Schwann Cell-Axonal Interaction**, G. H. DeVries, Department of Biochemistry, Medical College of Virginia, Richmond, VA

**Cerebral Endothelial Cell: Endothelial-Glial Interaction as a Blood-Brain Barrier Paradigm**, G. Goldstein, Kennedy Institute, Baltimore, MD

**The Astrocyte**, M. Aschner, Department of Pharmacology and Toxicology, Albany Medical College, Albany, NY

**The Neuron**, M. A. Verity, Department Neuropathology, Brain Research Institute, UCLA, CA

## Target Organ Toxicology: Respiratory Tract Dosimetry and Response to Inhaled Toxicants

*Chairpersons: Kevin E. Driscoll, The Procter and Gamble Company, Cincinnati, OH and Richard B. Schlesinger, New York University Medical Center, Tuxedo, NY*

This course will provide an overview of respiratory tract structure, dosimetry and responses to inhaled toxicants; areas of understanding necessary to perform risk assessments on inhaled materials. Special emphasis will be placed on interspecies differences in structure and dosimetry and how these differences influence the reliability of extrapolation across species. The first lecture will discuss the anatomy of the various regions of the respiratory tract in humans and laboratory animals commonly used in toxicologic studies stressing features that influence the ultimate toxicity of inhaled chemicals. The next two lectures will review factors influencing the deposition, uptake and clearance of inhaled particles and gases, stressing responses occurring within the differences between species. The fourth lecture will provide an overview of the types of responses occurring within the different regions of the respiratory tract, using examples of toxicants of current concern. The final lecture will discuss possible methods by which the preceding information can be used in risk assessment strategies for human exposure scenarios, and inherent shortcomings of these methods.

**Structure of the Respiratory Tract**, K. Pinkerton, University of California-ITEH, Davis, CA

**Particle Dosimetry**, R. Schlesinger, New York University Medical Center, Tuxedo, NY

**Gas Dosimetry**, J. B. Morris, University of Connecticut, Storrs, CT

**Types of Responses to Toxicants**, J. Harkema, Inhalation Toxicological Research Institute, Albuquerque, NM

**Extrapolation Modeling: Basis for Risk Assessment**, G. Oberdoerster, University of Rochester, Rochester, NY

## Strategies for Cloning Toxicant-Inducible Genes

*Chairperson: James L. Stevens, W. Alton Jones Cell Science Center, Lake Placid, NY*

This course is designed to provide a summary of various strategies for cloning one or a battery of genes activated by toxicants. The mechanisms underlying many of these biological responses are rooted in complex genomic responses to toxicant exposure. It is increasingly important to identify toxicant-responsive genes in order to determine their role in these complex responses. Four strategies will be covered: (1) protein-chemical approaches; (2) genetic approaches; (3) interaction cloning; and (4) differential hybridization. The course is designed for toxicologists with limited knowledge of cloning techniques.

**Protein-Chemical Approaches to Obtaining Sequence for Oligonucleotide Construction**, J. Crabb, W. Alton Jones Cell Science Center, Lake Placid, NY

**Genetics and Complementation Approaches to Cloning Genes**, V. Culotta, Johns Hopkins University, Baltimore, MD

**Interaction and Expression Cloning**, J. Van den Heuvel, Purdue University, West Lafayette, IN

**Differential Hybridization Approaches to Isolate cDNA Clones Representing Genes Responsive to Chemical and Physical Agents**, T. W. Sutter, Johns Hopkins University, Baltimore, MD

## Sensory System Toxicology

*Chairperson: Laurence D. Fechter, University of Oklahoma Health Sciences Center, Oklahoma City, OK*

This course will characterize toxicity in the auditory, visual, olfactory, and somatosensory systems with respect to causes, patterns of dysfunction, mechanisms, and sites of impairment. The objectives are to identify specific compounds and families of compounds that are toxic to each system, to characterize the nature and basis of the impairment, and to discuss issues of recovery of function and regeneration. Common methods for evaluating dysfunction and identifying the targets of toxicity in humans and animals will be considered. Each speaker will provide a brief review of the anatomy and physiology of each system and note the targets of toxicity. Similarities and differences among the sensory systems will be identified. The course is intended for non-experts although some background in nervous system toxicology would be helpful. The course is intended to give participants assistance in predicting whether a compound

might produce sensory system injury and in gathering or evaluating evidence for such effects.

**Auditory System**, L. D. Fechter, University of Oklahoma Health Sciences Center, Oklahoma City, OK

**Visual System**, W. K. Boyes, US EPA, Research Triangle Park, NC

**Olfactory System**, K. T. Morgan, CIIT, Research Triangle Park, NC

**Somatosensory System**, J. Arezzo, Albert Einstein College of Medicine of Yeshiva University, Bronx, NY

## Genetic Toxicology: Current Regulatory Guidelines and New Technologies

*Chairpersons: Frederick B. Oleson, Jr., Biogen, Inc., Cambridge, MA and Gregory S. Probst, Lilly Research Laboratories, Greenfield, IN*

The field of genetic toxicology has undergone significant changes in the last 5 to 10 years, especially in terms of testing requirements and new technologies to better define genotoxic effects. This course will synthesize the current state of genetic toxicology and provide an update on the major new advances and technologies in this field. The first lecture will summarize the purpose of genetic toxicology testing and the overall findings of the NTP validation program. An update will then be provided on the changes in the international guidelines for testing batteries and designs, along with the ICH-2 working group consensus recommendations. Strategies for follow-up testing to assess the significance of positive mutagenicity test results and human risk potential will then be presented. The last speaker will provide an overview of the most promising new technologies (molecular, transgenics) for detecting true genotoxic agents with emphasis on those endpoints which can be integrated into standard repeated-dose toxicology studies.

**Introduction**, F. B. Oleson, Jr., Biogen, Inc., Cambridge, MA

**Objectives of Genetic Toxicology Testing**, M. D. Shelby, NIEHS, Research Triangle Park, NC

**International Guidelines (Batteries/Design)**, G. S. Probst, Lilly Research Laboratories, Greenfield, IN

**Strategies for Follow-up Testing of Positive Findings**, S. M. Galloway, Merck Research Laboratories, West Point, PA

**New Technologies/Testing Design**, J. T. MacGregor, SRI International, Menlo Park, CA

## Pulmonary Immune Responses

*Chairperson: Judith T. Zelikoff, New York University Medical Center, Tuxedo, NY*

The objective of this course is to familiarize and update the audience with the defense mechanisms of the lungs. The lung is the primary target organ for inhaled antigens and xenobiotics. As a result, it has evolved a complex immunological defense system. This course will provide an overview of pulmonary defense mechanisms and provide the groundwork to explain how inhaled toxicants may act to bring about respiratory infections, pathogenesis, and/or cancer. The first presenter will discuss the process of antigen processing and presentation by lung macrophages and dendritic cells to other pulmonary cells in the immune network. The second presenter will address the role of adhesion molecules for antigen presentation and for cell to cell interactions in helping to bring about immunological responses in the lung. The remaining presenters will discuss cytokine release/metabolism by pulmonary lymphocytes and their role in maintaining host immunocompetence. This course is designed to provide basic information on lung immunology to a diverse audience.

**Introduction and Overview**, J. T. Zelikoff, New York University Medical Center, Tuxedo, NY

**Antigen Presenting Cells of the Lung**, M. Lipscomb, University of Texas Southwestern Medical Center, Dallas, TX

**Cell Adhesion Molecules in the Lung**, C. Wegner, Boehringer Ingelheim Pharm., Inc., Ridgefield, CT

**T Cell-Mediated Immunity and Receptors**, S. Becker, TRC Environmental Corporation, Chapel Hill, NC

**Cytokines and Pulmonary Defense**, B. Devlin, US EPA, Research Triangle Park, NC ●

### *Student Internships - Continued from page 1*

The Society of Toxicology and the *ad hoc* Tox 90s Educational Issues Task Force encourage members to invest in the future of toxicology by participating in the Summer Internship Program.

SOT members interested in supporting one or more interns in 1994 should complete the internship form enclosed in this newsletter. Responses must be received at SOT Headquarters by **January 1**. Student applicants will respond directly to participating programs by February 1. ●



## SOT Education Committee Continues Highly Successful Minority Student Programs

The Minority Student Programs of the Education Committee were again highly attended and well received by minority students, advisors and SOT host/mentors at the SOT meeting in New Orleans. A total of 49 students and seven advisors were supported by a grant from NIH through the MARC program, the R.W. Johnson Pharmaceutical Research Institute and the Colgate-Palmolive Company. Eighteen toxicologists kindly served as host/mentors for the students and advisors and airport greeters were provided by Dr. Brian Howard of Xavier University. Programs at New Orleans included: 1) a bus tour of New Orleans sponsored by Exxon Biomedical Sciences; 2) an Educational Program for Minority Students on Sunday afternoon that was attended by 200 people, with pizza provided by SmithKline Beecham; and 3) a Poster Session for Visiting Students on Monday morning, attended by over 100 people, with refreshments provided by Rhone-Poulenc. The students, advisors and hosts also attended the Graduate Student Luncheon on Monday.

The Education Committee will continue these programs in Dallas with the help of sponsors. In addition, we need the help of SOT members! Below, we have included a call for host/mentor volunteers for the meeting in Dallas. Please contact Trish Strong at the SOT office if you would be willing to serve in this capacity. ●

## Wanted: "Host/Mentors" for Minority Student Programs

The SOT Education Committee will be making a strong effort to introduce toxicology to minority undergraduate science majors and their advisors at the 1994 SOT Annual Meeting in Dallas. For this effort, the Education Committee is requesting assistance from SOT members, postdoctoral students and others willing to serve as "host/mentors" for these students between their arrival on Saturday and departure on Monday. An Introductory Session will be held Saturday evening, March 12 for which all mentors will need to be available. Other sessions include an educational program for minority students on Sunday, and the student luncheon on Monday. Host/mentors will help students find the rooms in which their special sessions will be held on Sunday and Monday, and will generally make these students feel welcome at SOT. This program received high marks from the students and their advisors who attended the 1993 SOT Annual Meeting in New Orleans.

About 15-30 volunteers are needed with responsibility for two or three students each. Anyone willing to volunteer for this important responsibility should contact Trish Strong at the SOT Headquarters office, (202) 371-1393. ●

## Publications of Interest

*Breaking the Vicious Circle: Toward Effective Risk Regulation*, Stephen Breyer, Harvard University Press, 79 Garden Street, Cambridge, MA 02138, Telephone: 800/448-2242, Fax: 617/495-8924.

*Cowan and Steel's Manual for the Identification of Medical Bacteria*, G.I. Barrow, R.K.A. Feltham, Cambridge University Press, 40 West 20th Street, New York, NY 10011-4211.

*Drug Toxicokinetics*, Peter G. Wells, Felix A. De La Iglesia, Marcel Dekker, Inc., 270 Madison Avenue, New York, NY 10016, Telephone: 212/696-9000.

*Enzymology and Molecular Biology of Carbonyl Metabolism 4*, Henry Weiner, David W. Crabb, T. Geoffery Flynn, Penum Press, 233 Spring Street, New York, NY 10013.

*In the Name of Science: Issues in Responsible Animal Experimentation*, F. Barbara Orlans, Ph.D., Oxford University, 200 Madison Avenue, New York, NY 10016, Telephone: 212/679-7300, ext. 7117.

*Risk Assessment and the Environment: Improving Regulatory Decision Making*, Carnegie Commission on Science, Technology and Government, 1616 P Street, NW, Suite 400, Washington, DC 20036, Telephone: 202/332-2221, Fax: 202/332-2226.

*SCAW Proceedings: Refinement and Reduction in Animal Testing*, 4805 St. Elmo Avenue, Bethesda, MD 20814, Telephone: 301/654-6390, Fax: 301/907-3993.

*Skin Permeation: Fundamentals and Application*, Joel L. Zatz, Ph.D., Allured Publishing Corporation, 362 S. Schmale Rd., Carol Stream, IL 60188, Telephone: 708/653-2155, Fax: 708/653-2192.

*Veterans and Agent Orange: Health Effects of Herbicide Used in Vietnam*, National Academy Press, 2101 Constitution Avenue, NW, Box 285, Washington, DC 20055, Telephone: 1-800-624-6242 (In the Washington, DC area, 202/334-3313). ●

## Upcoming Conferences

**Toxicology in Drug R&D: Scientific, Regulatory and Project Strategies**, October 14-15, 1993, Glenister Lecture Theatre, London, England. Contact: IBC Technical Services, Ltd., Gilmoora House, 57-61 Mortimer Street, London WIN 7TD. Telephone: 071/637-4383, Fax: 071/631-3214.

**International Society for the Study of Xenobiotics**, 5th North American Meeting, October 17-21, 1993, Hosted by Center for Toxicology, University of Arizona, Sheraton El Conquistador Resort Hotel, Tucson, AZ. Contact: Bert Sanchez, Telephone: 602/626-2433.

**Occupational and Environmental Lead Exposure**, October 21, 1993, Seattle, Washington. Contact: Sharon Morris, University of Washington, SC-34, Seattle, WA 98195. Telephone: 206/543-1069.

**Biological Mechanisms in Quantitative Risk Assessment**, November 1-4, 1993, Research Triangle Park, NC. Contact: E. Colleen Rose, Project Director, Research and Evaluation Associates, Inc., 100 Europa Drive, Suite 590, Chapel Hill, NC 27514-2355, Telephone: 919/968-4961, Fax: 919/967-4098.

**The Human/Research Animal Relationship in the Laboratory**, November 16, 1993, Nashville, Tennessee. Contact: SCAW, 4805 St. Elmo Avenue, Bethesda, MD 20814. Telephone: 301/654-6390, Fax: 301/907-3993.

**Methodologies for Drug Testing**, December 2-3, 1993, Holiday Inn Crowne Plaza, Montreal, Canada. Contact: Gordon Krip, Ph.D., Executive Director, Society of Toxicology of Canada, CP/PO Box 517, Beaconsfield, Quebec, H9W 5V1, Canada.

**The Well-Being of Birds in Laboratory and Field Research**, December 3, 1993, The Doubletree Hotel, Arlington, Virginia. Contact: Conferences, SCAW, 4805 St. Elmo Avenue, Bethesda, MD 20814. Telephone: 301/654-6124, Fax: 301/907-0883.

**Risk Assessment in Environmental Carcinogenesis**, January 17-22, 1994, Whistler Conference Center, British Columbia, Canada. Contact: Special Conference Information, American Association for Cancer Research, Public Ledger Building, 620 Chester Street, Suite 816, Philadelphia, PA 19106. Telephone: 215/440-9300, Fax: 215/440-9313.

**Society of Toxicology 1994 Annual Meeting**, March 13-17, 1994, Loews Anatole Hotel, Dallas, TX. Contact: Dawn Caruso, Society of Toxicology, 1767 Business Center Drive, Reston, VA 22090. Telephone: 703/438-3115.

**Second International Symposium on Irritant Contact Dermatitis**, April 14-16, 1994, Zurich, Switzerland. Contact: PD Dr. P. Elser, Department of Dermatology, University Hospital, Gloriatrasse 31, CH 8091 Zurich, Switzerland. Telephone: +44-1-255 3305, Fax: +41-1-255 4412.

**Research Animal Anesthesia, Analgesia and Surgery**, May 12-13, 1994, Atlanta, Georgia. Contact: SCAW, 4805 St. Elmo Avenue, Bethesda, MD 20814. Telephone: 301/654-6390, Fax: 301/907-3993.

**ICT VII**, July 2-5, 1995, Seattle, WA. Contact: Jada Hill, The Sterling Group, Corporate Woods Building #51, 9393 West 110th Street, Suite 253, Overland Park, KS 66210. Telephone: 913/345-2228. ●

## SOT E-Mail Number

**Y**ou can now communicate with SOT via electronic mail. The E-Mail number is 73162, 506 @ CompuServe. If accessing the number from InterNet, please type the following at the prompt:

"73162.506@Compuserve.com" ●

## Positions Vacant

### Assistant Professor and Research Associate Positions

**T**he Department of Environmental and Occupational Health, Graduate School of Public Health, University of Pittsburgh, invites applications for 5 positions to participate in ongoing sponsored research. Participation in teaching and training of graduate students is expected of the 3 faculty positions. Opportunities for independent research will be available.

Three Assistant Professorships outside the tenure stream are available:

(1) The individual should have expertise in Toxicology and Risk Assessment. A PhD or equivalent degree in Toxicology is required. In addition, the applicant should have several years of post-doctoral training in Biostatistics or a PhD in Biostatistics with several years post-doctoral training in Toxicology. Responsibilities include determination of animal models for risk assessment, risk assessment methodology, mathematical/statistical techniques for risk assessment, and physiologically-based pharmacokinetics.

(2) Candidates are expected to have expertise in Health Hazard/Exposure Assessment. A PhD or equivalent degree with several years of post-doctoral training in the field of Chemistry is required; specialization in Toxicology is preferred. Responsibilities include the determination in modeling of the potential environmental transformations of chemicals present in the environment and the workplace.

(3) The individual should have expertise in Biostatistics/Modeling. A PhD or equivalent degree is required. Responsibilities include computer modeling, database management, modeling of exposed worker populations, statistical analysis of data, and quality control procedures.

Two research associate positions are also available. A PhD degree or equivalent is required for each position:

(1) This position requires an expert in SAR modeling of Toxicology. Experience and/or post-doctoral training in Toxicology and/or Chemistry for modeling of toxicological activities including familiarity with computer work is preferred. Responsibilities include applying structural concepts to the action of noxious chemicals; establishing, validating and maintaining data bases used in the research and creating toxicological profiles of the chemicals.

(2) Expertise in Health Hazard/Exposure Assessment is required for this position. Experience and/or post-doctoral training in the field of Chemistry with specialization in Toxicology is preferred. Responsibilities include the determination in modeling of the potential environment transformations of chemicals present in the environment and workplace.

These positions are available immediately. Applicants should send a curriculum vitae, a summary of research activities and plans, together with three letters of recommendation to: Herbert S. Rosenkranz, PhD, Chairman, Department of

Environmental and Occupational Health, Graduate School of Public Health, University of Pittsburgh, RIDC Park, 260 Kappa Drive, Pittsburgh, PA 15238, or facsimile to (412) 624-1020. Please be certain to indicate the position of interest: Assistant Professor Toxicology, Assistant Professor Health Hazards, Assistant Professor Biostatistics/Modeling, Research Associate Toxicology or Research Associate Health Hazards. The University of Pittsburgh is an affirmative action/equal opportunity employer.

### Associate Director- Reproductive Toxicology

**W**yth-Ayerst Research, a Division of a Fortune 100 Corporation, presently seeks a qualified candidate for the Drug Safety and Metabolism facility in Chazy, NY to be responsible for directing the activities and supervising the staff of the Reproductive Toxicology section. The section will assure that current, validated methodologies in predictive and prospective reproductive toxicology are utilized to determine the potential effect of new drug substances on the reproductive function of laboratory animals. A Doctoral degree in Developmental Biology/Teratology or related field and 10 years experience, at least 5 years of which is in an industrial/pharmaceutical environment is required, as well as technical scientific experience in reproductive toxicology and management. Contact Mr. Gary Wagoner at (518) 297-8265 or send a resume to Wyeth-Ayerst Research, HR Department, 64 Maple St., Rouses Point, NY 12979. Equal Opportunity Employer, M/F/D/V.

### Postdoctoral Training In Laboratory Animal Medicine

**T**he University of Illinois at Chicago, Biologic Resources Laboratory and Bristol-Myers Squibb Pharmaceutical Research Institute announce the availability of a jointly sponsored post-doctoral fellowship in laboratory animal medicine. The program includes a three-year period of training in clinical management, and research components centered at the University of Illinois at Chicago Biologic Resources Laboratory and Bristol-Myers Squibb Pharmaceutical Research Institute. The program is designed for graduate veterinarians interested in careers in the pharmaceutical industry. Requirements: DVM or equivalent degree; eligibility for Illinois license; U.S. citizenship or permanent residency status. The post-doctoral training program requires three years to complete and includes clinical and managerial experience in a large full-service animal care program, training in laboratory animal science and medicine, formal course work, special training and experience in research methodology, and teaching technical and graduate level courses. The program is designed to provide the fellows with didactic and experiential training necessary to prepare them to pursue a career in laboratory animal medicine and obtain ACLAM certification. Annual stipends of \$18,600 to \$32,300 depending upon experience. Weekend, holiday and irregular duty hours on rotation. Appointment is for one year, renewable for a second and third year. To apply, send a resume, academic transcripts, a description of your interest in laboratory

animal medicine and your career goals, along with the names, addresses and telephone numbers of three persons who may be contacted as references. Contact Dr. B.T. Bennett, Biologic Resources Laboratory, 1840 W. Taylor St., M/C 533, Chicago, IL 60612; Telephone 312-996-7040. The University of Illinois at Chicago and Bristol-Myers Squibb are affirmative action/equal opportunity employers.

### Toxicologists

**T**he California Environmental Protection Agency Office of Environmental Health Hazard Assessment is recruiting for Staff Toxicologist and Associate Toxicologist for immediate openings. An employment examination is scheduled for December 1993. The examination will be based 100 percent on interviews. Telephone interviews are permissible. Vacancies exist in Sacramento and Berkeley. The annual salary for the Associate Toxicologist will start at \$41,832 - \$55,416. The annual salary for the Staff Toxicologist will start at \$55,416 - \$67,044.

To qualify for the Associate Toxicologist exam you must have a Doctoral Degree in toxicology or closely-related specialty; or possession of a Master's Degree in Toxicology or closely-related specialty and three years experience past the Master's Degree in the area of Toxicology; or certification as a Diplomate of the American Board of Toxicology. To qualify for the Staff Toxicologist exam, you must have a Doctoral Degree in Toxicology, Biochemistry, Pharmacology or a closely-related specialty and three years post-doctoral experience in Toxicology. Please send resume to: Office of Environmental Health Hazard Assessment, 601 North 7th Street, P.O. Box 942732, Sacramento, CA 94234-7320, Attention: Donna Rowe.

The final filing date for the next exam is November 1, 1993. Resumes received after that date will be considered in the next examination. For assistance or further information, call Donna Rowe at (916) 324-2234. Equal employment opportunity to all regardless of sex, race, religion, ancestry, disability, age, or sexual orientation.

### Toxicologists

**A**llergan, Inc., a Fortune 500 pharmaceutical company, is expanding its R&D effort in the area of synthetic retinoids, with potential applications in oncology, ophthalmology, cardiology and dermatology. A multi-disciplinary team encompassing the disciplines of molecular biology, cell biology, pharmacology, and medicinal chemistry is already in place.

We seek a broadly trained PhD Toxicologist with two or more years of experience, capable of undertaking original in-house research on systemic retinoid effects. Experience in whole animal studies and histopathology is essential.

The position is ideal for a hands-on scientist with a good research background and an interest in exploring the frontiers of retinoid toxicology. Please send CV to: Allergan, Inc., Human Resources Dept. JS-RETS-ST, 2525 Dupont Drive, Irvine, CA 92715 ●

## Section Awards Announcements

### Immunotoxicology

The Awards Committee of the Immunotoxicology Specialty Section of the Society of Toxicology is pleased to announce its intention to confer up to five monetary awards in recognition of scientific excellence and achievement for the best papers in immunotoxicology by graduate students and/or postdoctoral fellows submitted for presentation at the SOT Annual Meeting in Dallas, Texas, March 13-17, 1994. Candidates for these awards are requested to submit copies of their abstract, all figures and data tables, and a brief summary and conclusions. The summary should include a discussion of the rationale for the studies performed, a brief description of methods and the significance of the results as they relate to the area of immunotoxicology studied. The summary and conclusions should not exceed four pages of double-spaced text. It is important that all of this information be submitted by the candidate, since this material will be evaluated by the Awards Committee for the selection of winners. Winners will be announced at the annual meeting of the Immunotoxicology Specialty Section.

All materials should be submitted to the address listed below by **November 30, 1993**, and will be treated as confidential information. Contact: **Dr. Ralph J. Smialowicz**, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711, Telephone: 919/541-5776, Fax: 919/541-4324.

### Carcinogenesis

The Carcinogenesis Specialty Section of the Society of Toxicology will offer three awards for the best abstracts presented at the 1994 Annual Meeting in Dallas. Cash awards: first (\$500), second (\$300), and third (\$200) for ranked abstracts will be presented with a framed certificate at the meeting of the Carcinogenesis Specialty Section in Dallas. It is expected that the recipients will be present to receive their award.

A cover letter and the abstract to the national meeting of the SOT, **both** in triplicate, will constitute application for a student award. It is expected that the student will be the primary author of the abstract. An abstract can only be submitted to one Specialty Section. The cover letter from the sponsoring member of the SOT should indicate the student's role in the project and may expand upon the importance of the work in the context of carcinogenesis.

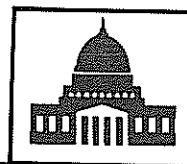
Interested candidates should submit in triplicate both their abstract and cover letter by **January 10, 1994** to: **Dr. B.D. Roebuck**, Department of Pharmacology and Toxicology, Dartmouth Medical School, 7650 Renssen, Hanover, New Hampshire 03755-3835. Concerns regarding the application procedures should be addressed to Dr. Roebuck at 603/650-1676, Fax: 603/650-1129. ●

## Graduate Program Recruiting Materials Sought

During the Minority Student Program and the Visiting Student Poster Session at the Dallas Annual Meeting, the Education Committee will provide space for literature about individual graduate programs. This year, the Minority Student Program, a program for minority students and their advisors, will be held on Sunday afternoon, March 13, 1994. The session will include information about graduate training in toxicology and will provide tables for colleges and universities to display literature describing their graduate programs in toxicology.

Representatives of the programs are welcome to attend the session and answer questions about graduate opportunities during an informal gathering after the program. Additionally, there will be tables available during the Visiting Student Poster Session on Monday morning and we invite you to attend this interesting session and be available for questions. These are two outstanding opportunities to recruit minority students to your programs! ●

### Watching Washington



*Commerce Control List Revised* — The Bureau of Export Administration maintains the Commerce Control List (CCL). The CCL was amended by revising Export Control Classification Numbers (ECCNs) 1C60C and 1C61B, which control dual-use items that can be used in the production of chemical and biological weapons (CBW). The changes made by this rule are intended to conform the list of CBW related items agreed to an adopted by countries participating in the Australia Group. The toxins are: Botulinum toxins, Clostridium perfringens toxins, Conotoxin, Mrocrocystin, (cyanogenosin), Ricin, Saxitoxin, Shiga toxin, Stephylococcus aureus toxins, Tetrodotoxin, and Verptoxin. For questions on foreign policy controls, call Toni Jackson, Office of Technology and Policy Analysis, Bureau of Export Administration, 202/482-4531.

*FDA Extends Deadline for Comments on Red Book* — The FDA has extended the deadline for comments on the "FDA Red Book II, Toxicological Principles for the Safety Assessment for Food and Color Additives Used in Food" to January 27, 1994. Comments from SOT members (needed by **October 31, 1993**) are being coordinated by the Food Safety Specialty Section, c/o **Dr. Jerry Exon**, 208/885-7081. For information on how to order a Red Book, call Dawn Caruso, SOT Headquarters, 202/371-1393. ●