

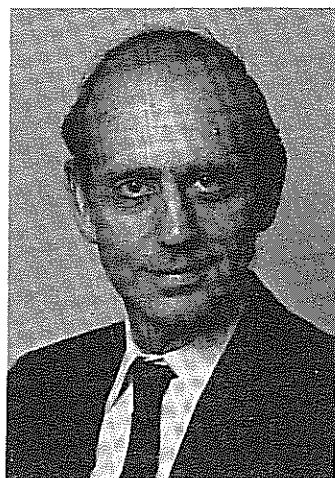
Society of Toxicology NEWSLETTER

NOVEMBER/DECEMBER 1992

Society of Toxicology NEW ORLEANS

Judge Breyer To Speak at Plenary Lecture

The Society of Toxicology is pleased to announce that Judge Stephen Breyer, Chief Judge of the United States Court of Appeals for the First Circuit, will speak at the Plenary Lecture at the Annual Meeting in New Orleans on Wednesday, March 17, 1993 from 8:30-9:30 a.m. This is the only scheduled event for this time period, so it is expected that there will be a large turnout for this first general session to be held at our Annual Meeting in many years.



Judge Breyer

Judge Breyer, a noted authority on science and the law, is the author of a just-released book titled *Breaking the Vicious Circle: Toward Effective Risk Regulation*. He will speak about the regulation of substances that create health risks. He will analyze our current regulatory system, the political causes of the problems that exist and offer solutions and recommendations for reform of the institutions involved.

Judge Breyer is a superb speaker and extremely knowledgeable about the scientific basis of laws and

regulations related to chemicals. Judge Breyer will also discuss the contributions of modern day toxicology and related health sciences, and deficiencies that need to be corrected. His lecture will be of interest to all members of the Society as he will discuss the relationship of science, regulations and politics—an issue of relevance to all scientists.●

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Deadline for next issues:
December 10, 1992
April 10, 1993
June 10, 1993
August 10, 1993
October 10, 1993

1993 Annual Meeting:
March 14-18
New Orleans, LA

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

President's Message

In the brief tenure of one year, each president of SOT reflects on the future course of the Society and attempts to chart a responsible course for the next and following years. This is done with the foreknowledge that the ship is very large, is underway, and is steaming on a course and at a speed determined by past and present events, some of which were neither directed nor anticipated.

Vice President-Elect **Meryl Karol** has been busy over the last few months participating in site visits, planning for our Annual Meetings to be scheduled in 1999 and 2000. She has gathered data and constructed graphs from which she has projected meeting attendance, number of abstracts, etc., that would allow some estimate of SOT demographics in the last few years of this century. I am indebted to her for all the numerical data and for the graphs that follow.

Shown in Figure 1 is the Annual Meeting attendance from 1964 to 1992 during which time the number of registrants grew from 247 to 3977.

A cursory examination of the data indicate that projections should be made from the right-hand portion of the curve: it is evident that the slope of the line changed dramatically in 1978. While there

was a steady growth for the first 15 years through 1977, the year-to-year changes represented only incremental increases compared to the yearly gains thereafter. From approximately 1000 attendees in 1977, the number of registrants doubled in the short span of three years to 2230 in 1980. Even though there were some downward deflections in three of the years after 1980, the overall trend is clear.

If we look at the number of abstracts for each of the same years, we see a similar upward deflection beginning about 1980.

There are two trend lines that can be drawn from the second figure, and projections from the two lines give remarkably divergent numbers, as one would surmise by inspection. We are, of course, planning for about 2300 abstracts by the turn of the century.

Something important happened during the five-year period beginning in 1977 that caused the Society to break out of its original pattern and set forth on our present course. Whatever prompted this change is worthy of inquiry if for no other reason than the fact that the driving elements continue in place. Personally, I

Figure 1 YEAR vs # OF REGISTRANTS

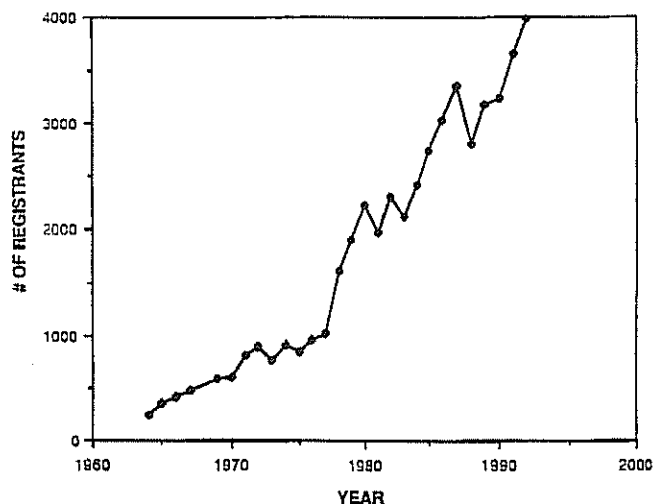
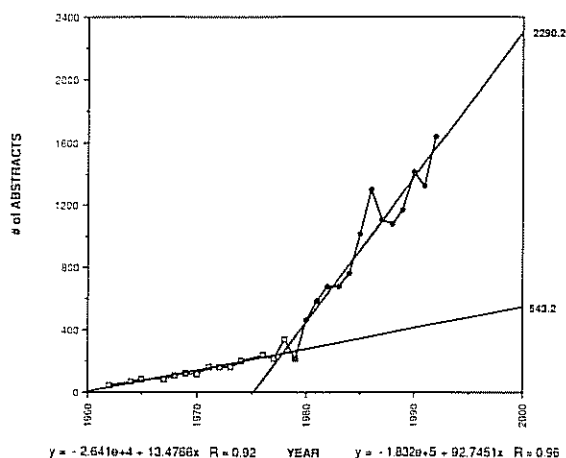


Figure 2 ABSTRACTS per YEAR



found this observation intriguing enough to read portions of the SOT History (a daunting prospect in the absence of real motivation). There are three reasons that I would cite as possible causes for the change that occurred:

1. New Classes of Members May Have Served to Invigorate the Organization

In 1981 the first associate and student members were admitted. From 1962 to 1979 there was slow, incremental growth: an average of 53 new members were added each year. During the 10 year span from 1982 to 1992, approximately 200 new members were added each year to the Society ranks.

2. A Broader Participation of Scientists in SOT Activities Was Also Fostered by the Formation of Regional Chapters and Specialty Sections

Provision was given in 1979-1980. Four Chapters and three Sections were in the early stages of development by 1981.

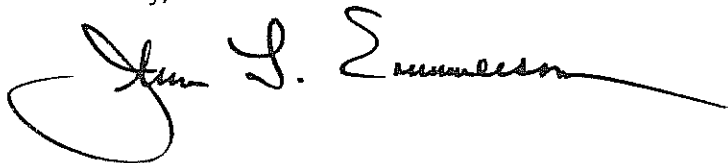
3. Governmental Regulatory Agencies Were Especially Active in Toxicological Affairs During the Period Of 1977-1982.

The FDA Good Laboratory Practice guidelines were published in 1979. The FDA, the OECD, and other agencies were busy drafting official documents to guide the design of studies for safety evaluation. Toxicology was in the news and this attention may have stimulated increased interest in the Society and its Annual Meeting.

Regarding the number of abstracts: I am not aware of any change in the rules for the submission of abstracts around that time that would account for the yearly increases in abstracts submitted after 1980. There was also a significant increase in the number of abstracts per registrant. In 1979 there was one abstract for every ten registrants; in 1992, there were four for every ten. This, I think, is a direct indication of a greater degree of participation by those who register for our Annual Meeting.

All the trend lines are headed north. We should be heartened by the evidence of the general vitality of the Society as we begin the trek through the 1990s. In order to build on what we are doing right, we need, however, to know what that is. I would be pleased to hear your ideas.

Sincerely,



John L. Emmerson

Committees Participate in Annual Meeting Programming

Although SOT committees have always played a role in the program development of the Annual Meeting, 1993 attendees will have the opportunity to attend an unprecedented ten special sessions sponsored by committees. These sessions feature topics of current relevance and speakers who are at the forefront of their fields.

The Continuing Education Committee has once again scheduled a fine slate of courses, and the Program Committee has organized outstanding symposia (many with Specialty Section input), as well as platform, poster discussion, and poster sessions. The Placement Service Seminar provides assistance to job seekers; the Education Committee provides attendees with information on grantsmanship, and works with the ad hoc Tox 90s Educational Issues Task Force on programs for minority and visiting students and the second annual forum on undergraduate toxicology education issues.

New committee input in 1993 comes from the Committee on Public Communications, the Regulatory Affairs and Legislative Assistance Committee, and the Animals in Research Committee.

- The Committee on Public Communication brings forward a case study on public perception of toxicology-related problems. Their Monday workshop, "Facts and Perception of Health Concerns in Louisiana," uses the Annual Meeting host state, Louisiana, as a model. Input will be provided by academia, industry, and state and federal agencies, including Dr. Kenneth Olden, Director of NIEHS.
- The Regulatory Affairs and Legislative Assistance Committee presents noted adjudicator, speaker, and author, the Honorable Stephen Breyer at the Wednesday plenary lecture, "Breaking the Vicious Circle: Rethinking Risk Regulation."
- The Animals in Research Committee seeks to focus Society attention on the use of animals in research. They have planned for three speakers during a special SOT Issues Session on Thursday: Dr. Franklin Loew, Dean and Foster Professor at Tufts University; Dr. Nelson Garnett, Acting Director of the Division of Animal Welfare at NIH; and Dr. Robert A. Whitney, Deputy Surgeon General of the United States. SOT members will have 30 minutes for questions and interaction.

Plan on making time during your busy Annual meeting week to attend these exciting sessions planned by your Society committees. ●



1993 Special Sessions

Foundations for General Education in Toxicology: Second Forum on Undergraduate Education Issues Session

March 13, 1:00 p.m. - 4:00 p.m.

Chairpersons: R. Krieger and P. Ferguson, Technical Assessment Systems, Inc., Washington, DC, and Northeast Louisiana University, Monroe, LA.

Sponsored by the ad hoc Tox 90s Educational Issues Task Force

As society continues to question and define relationships between chemical exposures and the quality of life, it is imperative that more people be introduced to principles of toxicology and their application to balanced science policies. Undergraduates become acquainted with the interdisciplinary science of toxicology through elective coursework, research internships or by selecting toxicology as a major field of study. Unfortunately, probably fewer than 1,000 U.S. college undergraduates annually complete coursework in toxicology. This session brings together a cross-section of professionals to address current strategies for extending toxicology education and training in the undergraduate arena.

Toxicology Instruction in the Basic Sciences, G. Winston, LSU Department of Biochemistry, Shreveport, LA

Principles for Elementary and Secondary Educators, M. Kamrin, Michigan State University, East Lansing, MI

Bioresource Undergraduate Research Program, D. Buhler, Oregon State University, Corvallis, OR

Discussion of Toxicology as an Element of the Public Perception of Toxic Chemical Issues, J. Spann, WBRZ-TV, Baton Rouge, LA

Expert Witnessing Workshop

Saturday, March 13, 2:00 p.m. - 5:00 p.m.

The need to present technical information to judges and juries places a significant burden on toxicologists to communicate their expertise in a manner that is both interesting and understandable. Miscommunication can have far reaching effects with telling consequences. This three-hour workshop is interactive and participatory, with opportunities for each attendee to role-play and be reviewed and critiqued. Discussion will include an overview of the legal system and a glossary of legal terminology. Instruction in organizing content with an eye towards the use of simplifying analogies and examples will also be presented. Attendance is limited. COST - \$50

Educational Program for Minority Students

Sunday, March 14, 2:00 p.m. - 5:30 p.m.

SOT members, undergraduate and graduate students, and others interested in toxicology education and recruitment of minority students are invited to attend this program, which is sponsored by the SOT Education Committee. Presentations include information on career opportunities in government, academia and industry.

Placement Service Seminar

Sunday, March 14, 5:30 p.m. - 6:30 p.m.

A panel of guest speakers will present their views on the present and future career opportunities and necessary requirements for entry into the areas of academic, industrial, or government toxicology. The speakers will also present an overview of what an employer looks for in a candidate interview, an employer's expectations of job performance, and the potential remunerations. A professional career planner will address strategies and approaches and some of the mechanics of pursuing the position for which a candidate is best suited.

Special Poster Session for Visiting Students

Monday, March 15, 9:30 a.m. - 11:30 p.m.

This session, sponsored by the ad hoc Tox 90s Educational Issues Task Force and the SOT Education Committee, provides an overview of research in toxicology by minority scientists and others. The session is organized to demonstrate the diversity of the discipline of toxicology to minority undergraduates and others attending the Annual Meeting who are interested in learning about a variety of areas associated with toxicological investigations.

Facts and Perceptions of Health Concerns in Louisiana Workshop

Monday, March 15, 1:30 p.m. - 4:30 p.m.

Chairpersons: Joanne Zurlo, Johns Hopkins University, Baltimore, MD and Barbara Shane, Louisiana State University, Baton Rouge, LA

The purpose of this open public workshop, sponsored by the SOT Committee on Public Communications, is to address the perceptions and concerns of the public toward a local toxicological problem and to provide factual information about environmental health risks and disease prevention.

Contradictory perceptions and facts exist concerning the impact of pollutants on the health of citizens in Louisiana. Environmentalists suggest that pollution generated by petrochemical and other industries contributes to the high incidence of cancer and respiratory disease in the state. In addition, Louisiana has the highest number of abandoned waste sites per square mile in the country, and vies with Texas for first place in the emission of toxic compounds.

On the other hand, industries have made a conscious effort in the past five years to limit their discharges into the environment and suggest that life-styles in Louisiana, including cigarette smoking, are a major contributor to the high incidence of cancer. The perception of health and pollution-related problems by State and Federal agencies may differ yet from those of the other groups, given the fact that there are numerous public health problems in the state. Louisiana has a high infant mortality rate. This may be due to the large population who do not seek health care during pregnancy or only have access to limited health care because of economic constraints. These factors have also affected the diagnosis and treatment of patients with diseases such as cancer.

As a means of understanding the contribution of each of these factors to health outcomes, scientists and physicians in Louisiana are pursuing various avenues of both basic and applied research. Included in these efforts are toxicological and related research projects that are underway at the six major universities in Louisiana to evaluate the role of environmental pollutants in disease causation. In this workshop, five speakers representing academia, industry, and State and Federal agencies will address SOT meeting participants and an invited public audience to provide a broader knowledge base of the problem, as well as advice on treatment and prevention.

Facts and Figures Relating To The Environment and Health in Louisiana, B.S. Shane, Louisiana State University, Baton Rouge, LA

Survey of the Perception of Environmental and Health Issues in Louisiana, R. Kleiner, Louisiana Chemical Association, Baton Rouge, LA

Industrial Perspectives of Health Outcomes in Louisiana, G. Olsen, Dow Chemical Company, Midland MI

Cancer in Louisiana: Descriptive and Analytical, E. Fontham, Louisiana State University School of Medicine, New Orleans, LA

Health Issues in Louisiana, L. Helbert, Department of Health and Hospitals, Baton Rouge, LA

Issues of Public Significance, K. Olden, National Institute of Environmental Health Sciences, Research Triangle, NC

SOT/EUROTOX Debate: Impact of New Scientific Findings on Regulatory Approaches to Dioxin

Tuesday, March 16, 12:00 noon - 1:30 p.m.

Sponsored by: SOT and the European Society of Toxicology (EUROTOX)

Chairperson: Linda S. Birnbaum, U.S. EPA, Research Triangle Park, NC

Dioxin is a ubiquitous, persistent, environmental contaminant of no use. Recently, scientists investigating the toxicity of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD, "dioxin") have reached general agree-

ment that: a specific cellular protein known as the Ah receptor is necessary but not sufficient for the effects of dioxin; humans respond in a similar manner as do animals to dioxin; and dioxin is but one of a family of chemicals that cause the same spectrum of effects. What are the implications of these new understandings to the risk assessment of dioxin? Can biologically based risk assessment models be developed in place of the default assumptions? Is cancer the endpoint of major concern or are noncancer effects likely to drive the assessment? Regulatory agencies in the U.S.A. and Europe have tended to take different approaches. The U.S. has modeled cancer with a linear approach, while the members of the European Community have taken a safety-factor approach. What are the implications of the new data and the mechanistic understanding to the use of these approaches? Do current exposures of the general population result in body burdens that could be expected to result in biochemical responses to dioxin? To adverse effects? If so, what should be the regulatory agenda? If not, what about populations at special risk, either due to special sensitivity or enhanced exposure?

The following speakers will present these new findings, attempt to answer these questions, and debate their regulatory impact.

Impact of New Scientific Findings on Regulatory Approaches to Dioxin: Introduction, L.S. Birnbaum, U.S. EPA, Research Triangle Park, NC

U.S. Approaches to the Regulatory Decisions, W. Farland, U.S. EPA, Washington, DC

The European Approach, U.G. Ahlborg, Institute of Environmental Medicine, Karolinska Institute, Stockholm, Sweden

Burroughs Wellcome Toxicology Scholar Award

Wednesday, March 17, 12:00 noon - 1:00 p.m.

Toxicity and Tissue Repair: Implications for Medicine and Public Health

by Harihara Mehendale, Ph.D., Division of Pharmacology & Toxicology, College of Pharmacy and Health Sciences, Northeast Louisiana University, Monroe, LA

Exposure to subthreshold doses of toxic chemicals can result in impaired tissue repair when cellular protective mechanisms are overwhelmed. In parallel with tissue injury, a biological response is elicited in the form of stimulated tissue repair. This sequel accounts for recovery from acute toxic injury inflicted by an episode of low dose toxicant exposure. Studies with model hepatotoxicants indicate that combination exposure to a second chemical can result in inhibition of tissue repair, which in turn leads to a progression of injury. A large dose of a toxicant also results in suppression of the otherwise stimulated tissue repair, with the consequent and predictable ultimate toxicity. These insights were revealed during a mechanistic inquiry of the 67-fold amplification of hepatotoxic and lethal effects of CC14 by dietary exposure

to a nontoxic dose of chlordecone. Additional experiments have revealed a pivotal role for tissue repair as the determinant of the ultimate expression of toxicity. These findings have formed the basis of a hypothesized two-stage model of toxicity.

Stage I can be identified as the inflicative stage of tissue injury and Stage II as the progressive stage. Currently understood "mechanisms of toxicity" satisfactorily predict infliction of injury, but the ultimate outcome of acute toxicity is determined by whether stimulation of tissue repair is permitted to occur. These concepts point to the possibility that species differences in tissue repair might be measured to minimize the uncertainty in extrapolation of data from one species to another. Understanding the molecular mechanisms involved in toxicant stimulation or inhibition of tissue repair will likely open up new avenues for therapy, further advances in biomedicine, and a refined assessment of risk to public health will likely open up new avenues for therapy further advances in bio medicine, and a refined assessment of risk to public health.

Forum on Grantsmanship and Sources for Research Support (formerly, the Forum for New Investigators)

Thursday, March 18, 2:00 p.m. - 4:00 p.m.

Chairperson: Steven D. Cohen, University of Connecticut, Storrs, CT

The SOT Education Committee sponsors this forum for researchers seeking financial support for research and training. This program includes presentations by representatives of NIH and three alternative funding sources: CAAT, ILSI, and PMA. Following the presentations, the speakers will be joined by additional NIH representatives to respond to questions from the audience.

Forum on Grantsmanship and Sources for Research Support: Introduction, S.D. Cohen, University of Connecticut, Storrs, CT

NIH Grant Programs; Initial Processing of Proposals: Assignment to a Study Section, F. Calhoun, Deputy Chief for Review, NIH Division of Research Grants, Bethesda, MD

Operation of the Study Section—Scientific Merit Review Process, F. Marozzi, Scientific Review Administrator, NIH Toxicology Study Section, Bethesda, MD

Grantsmanship—Securing an Initial Award and Maintaining Continued Support: Dos and Don'ts of Proposal Preparation and Grant Management, D. Carter, University of Arizona, past chair of the Toxicology Study Section, Tucson, AZ

Alternative Sources of Funding—Research Grants:

- Pharmaceutical Manufacturers Association (PMA), G. Fuller, Wayne State University, PMA Science Advisory Board, Detroit, MI

- International Life Sciences Institute, S. Olin, Associate Director, ILSI, Washington, DC

- Johns Hopkins Center for Alternatives to Animal Testing, A. Goldberg, Director, CAAT, Baltimore, MD

Panel Discussion—Questions and Answer Session, Additional Panel Members, NIH Program Administrators: Annette Kirscher and Michael Galvin; Anne Sassemann, NIEHS; and Rochelle Long, NIGMS.

Issues Session: Animals in Biomedical Research and Safety Evaluation

March 18, 12:00 noon - 1:30 p.m.

Chairperson: John L. Emmerson, President, Society of Toxicology

Moderator: Franklin M. Loew, Tufts University, North Grafton, MA

Animals play an essential role in research, teaching and education for continued improvement in the health and welfare of humans and of animals. Humane care and appropriate use of animals is an integral part of these activities, yet certain activists have vandalized laboratories and promoted active opposition to the use of animals in research testing.

The purpose of the 1993 Society of Toxicology Issues Session, sponsored by the SOT Animals in Research Committee, is to focus the attention of the Society on this important issue and to make recommendations for education of toxicologists as well as the public concerning the use of animals in toxicology. At least 30 minutes have been reserved for SOT members' questions and comments on this most important public and scientific issue. Three speakers will present brief descriptions of their experiences, their personal views, and discuss the practical benefits, problems and ethical considerations involved in the use of animals in biomedical science.

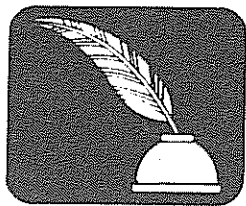
The Facts About Animal Research, F. Loew, Dean and Foster Professor of Comparative Medicine, School of Veterinary Medicine, Tufts University, North Grafton, MA

Current Public Health Service Activities in Animal Welfare, N. Garnett, Acting Director, Division of Animal Welfare, NIH, Bethesda, MD

The Importance of Animals in Research, Testing and Education, R.A. Whitney, Jr., Deputy Surgeon General of the United States, Rockville, MD●

Golf Tournament

Anyone wishing to participate in the Annual Exxon Golf Tournament at this year's SOT Annual Meeting should contact Mike Kangiser at (908) 873-6040. This year's tournament will be held on Saturday, March 13, 1993, and as in previous years will be a Captain and Crew format.●



1993 Symposia

Immunotoxicology of Regional Lymphoid Tissue: The Respiratory and Gastrointestinal Tract and Skin

Sponsored by the Immunotoxicology Specialty Section

Chairpersons: Thomas T. Kawabata, The Procter & Gamble Co., Cincinnati, OH, and Gary R. Burleson, U.S. EPA, Research Triangle Park, NC

Lymphoid tissue of mucosal surfaces and skin are exposed to a wide variety of chemicals. The immune response of these tissues play an important role in host resistance against infectious and neoplastic disease. However, studies which examined the effects of locally administered chemicals on the regional immune responses have been limited. Since most of the immunotoxicity assays currently used or being developed primarily involve examining systemic immunity (i.e., spleen, thymus), the objective of this symposium is to increase the awareness and importance of examining the effects of xenobiotics on the local mucosal immune response. The speakers will present an overview of the rapidly growing field of regional immunology with emphasis on the respiratory tract, gut and skin. The mechanisms involved in humoral and cellular-mediated immunity of these tissues will be reviewed. The complex intercellular distribution and limited number of immune cells within the various regional lymphoid tissue have resulted in the use of a variety of methods to study the immune response of these tissues. These methods and results of studies which examined the effects of chemicals and UV light on the regional immune response will be discussed.

Immunotoxicology of Regional Lymphoid Tissue: The Respiratory and Gastrointestinal Tract and Skin: Introduction, T. Kawabata, The Procter and Gamble Co., Cincinnati, OH

Heterogeneity of Immunological Effector Cells in Mucosal Tissues, P. Ernst, University of Texas, Galveston, TX

Mucosal Immunology of the Respiratory Tract: Immunotoxicity of Phosgene, G. Burleson, U.S. EPA, Research Triangle Park, NC

Toxicology of the Gastrointestinal Mucosal Immune Response, T. Kawabata, The Procter and Gamble Co., Cincinnati, OH

Skin Immunology and UV-Induced Immunotoxicity, S. Ulrich, M.D. Anderson, Houston, TX

Immunomodulation by Metals

Sponsored by the Immunotoxicology and Metals Specialty Sections

Chairpersons: Judith T. Zelikoff, NYU Medical Center, New York, NY, Ralph J. Smialowicz, U.S. EPA, Research Triangle Park, NC, and Donald E. Gardner, Mantech Environmental, Research Triangle Park, NC

The immune system is a sensitive target for the toxic effects of many xenobiotics including metals. Because of the complex nature of the immune response and the delicate interrelationship between its cells, immunotoxicants can act to produce several different types of adverse effects. Reduced immunocompetence may lead to a decrease in host resistance to encountered pathogens, while overly enhanced immunologic functions may result in the development of allergic (i.e., hypersensitivity) or autoimmune reactions (hyperimmune responses of the host against "self"). Toxicants that produce alterations leading to immunoenhancement or immunosuppression, may induce a cascade of detrimental secondary events, including tissue damage, and organ pathologies, including cancer. In this symposium the first speaker will present an overview of metal toxicity. Subsequent presenters will focus on how specific metals may act to induce these major adverse immunological consequences. Although many metals are known to modulate immune functions, this symposium will concentrate primarily on cadmium (Cd), chromium (Cr), lead (Pb), mercury (Hg), and nickel (Ni).

Immunomodulation by Metals: Introduction, J.T. Zelikoff, NYU Medical Center, New York, NY

Pathogenesis of Metal Toxicity, R.A. Goyer, University of Western Ontario, London, Canada

Metal Allergic Contact Dermatitis (ACD) and Contact Urticaria Syndrome (CUS): A Risk Assessment, H.I. Maibach, University of California Medical School, San Francisco, CA

Metal-Induced Autoimmunity: A Review, P.E. Bigazzi, University of Connecticut Health Center, Farmington, CT

Metalloimmunosuppression, D.A. Lawrence, Albany Medical College, Albany, NY

Chemical-Induced Vasculature Injury

Sponsored by the Mechanisms Specialty Section

Chairperson: Konrad E. Tomaszewski, Pfizer, Sandwich, Kent, England

The vasculature represents a body system that is frequently affected by administration of xenobiotics, and in which a diverse spectrum of reactions may be induced. The investigation of these pathological changes is a classic example of the value of multi-disciplinary approaches to the study of mechanisms of toxicity. This symposium will address how innovative investigators have

explored the concept of the vasculature as a distinct target organ.

The role of the vascular endothelium as a protective barrier is addressed in the first two presentations. Endothelial cells represent the first line of defence against damage and mediate repair processes; the nature of endothelial cells and their response to changes in their environment will be introduced in the first presentation. The specific changes in pulmonary vascular endothelial cell function after exposure to monocrotaline and its metabolites will then be discussed. The role of metabolism in the toxicity of primary amines, such as allylamine, to large and medium-sized arteries will be considered in the third presentation. Finally, investigations of the pathogenesis of the arteriopathy associated with administration of dopamine agonists and phosphodiesterase inhibitors to animals, and its relationship to pharmacodynamic changes will be presented.

Chemical-Induced Vasculature Injury: Introduction, K.E. Tomaszewski, Pfizer Central Research, Sandwich, Kent, UK

The Mechanisms of Endothelial Repair, A.I. Gotlieb, University of Toronto, Toronto, Canada

Progressive Pulmonary Vascular Injury from Monocrotaline Pyrrole, R.A. Roth, Michigan State University, East Lansing, MI

Toxicity of Primary Amines to the Vascular Media, P.J. Boor, University of Texas Medical Branch, Galveston, TX

Drug-Induced Arterial Lesions in the Rat and Dog, E.C. Joseph and W.D. Kerns, Sterling Winthrop Pharmaceuticals Research and Development, Alnick, Northumberland, UK and Smith Kline Beecham, King of Prussia, PA

Selective Inhibitors of Cytochromes P450

Sponsored by the Mechanisms Specialty Section

Chairperson: James R. Halpert, University of Arizona, Tucson, AZ

Despite the impressive recent advances in the molecular characterization of cytochromes P450, many questions remain to be answered about the roles of individual forms of the enzyme in the bioactivation and detoxification of potentially dangerous chemicals. In addition, the idea of manipulating the activities of individual human cytochromes P450 for therapeutic purposes, although an attractive one, remains largely speculation. A major reason for the slow progress in these areas has been the lack of specific inhibitors that could be used to probe and modulate the function of the individual cytochromes P450 *in vivo*. In the last five years, knowledge about the selectivity of cytochrome P450 inhibitors has increased dramatically, and a number of highly selective compounds have been identified in experimental animals and humans. Many of these compounds are mechanism-

based and owe their specificity to metabolism by the target enzyme. The selective P450 inhibitors identified are now beginning to achieve widespread use and acceptance. This symposium will emphasize the advantages of using specific inhibitors, compounds available for blocking individual P450 forms, and potential applications and physiological consequences of P450 inhibition.

Selective Inhibitors of Cytochromes P450: Introduction, J.R. Halpert, University of Arizona, Tucson, AZ

Mechanism-Based Inactivation of Cytochrome P450 1A2 and 3A4 Enzymes by Ethynyl Compounds, F.P. Guengerich, Vanderbilt University, Nashville, TN

Isozyme Selective Mechanism-Based Inhibitors of Pulmonary Cytochrome P450, J.R. Bend, University of Western Ontario, London, Ontario, Canada

Drug-Mediated Heme-Modification of Cytochrome P450 (P450) Apoproteins: Structural Characterization and Physiological Implications, M.A. Correia, UCSF, San Francisco, CA

Structural Basis of P450 Inactivation, J.R. Halpert, University of Arizona, Tucson, AZ

The Effect of Oxidants on Plasma Membrane Functions

Sponsored by the Mechanisms Specialty Section

Chairperson: Andrew T. Canada, Duke University Medical Center, Durham, NC

There is increasing interest in the sublethal effects of toxicants on organs and cells. In addition to the well known effects of toxicants on DNA leading to carcinogenic and mutagenic outcomes, alterations of other cellular functions may also have detrimental effects on the affected tissue. Occasionally, chemicals may actually produce positive effects by initiating processes which will hasten the removal or detoxification of the chemical, e.g. P450 induction. The production of oxidant stress is a by-product of many environmental exposures to xenobiotics and disease processes. Among these are: oxygen toxicity, exposures to free-radical producing compounds such as bleomycin, acetaminophen overdoses, and physiologic processes such as ischemia-reperfusion injury and inflammatory reactions. Recent studies have extended these observations to the plasma membrane effects. As would be expected, the functions that appear to be affected are: electrolyte secretion, activation of second messengers, both activation and inactivation of receptors, increased import of xenobiotics, and inactivation of surface enzymes. Other indirect effect of oxidants include the effect of glutathione depletion on t-cell activation and on oxidation-reduction activation of enzymes. This rapidly emerging field suggests potential applications for oxidant stress in the modulation of normal and abnormal cellular functions.

The Effect of Oxidants on Plasma Membrane Functions: Introduction, A.T. Canada, Duke University Medical Center, Durham, NC

Hydrogen Peroxide Stimulates the Secretion of Colonic T84 Cells, T.D. Nguyen, VA Medical Center, Durham, NC

Inhibition of Matalon Uptake in Alveolar Type II Cells by Reactive Oxygen Species and Peroxynitrite, S.M. Matalon, University of Alabama, Birmingham, AL

Oxidant-Induced Modulation of Plasma Membrane-Dependent Functions, J.M. Patel, University of Florida, Gainesville, FL

Effect of Oxidant Stress on Signal Transduction, H.J. Forman, Childrens Hospital, Los Angeles, CA

Reactive Oxygen Metabolites Modulate Leukocyte Adhesion in Postcapillary Venules, D.N. Granger, LSU Medical Center, Shreveport, LA

Use of Mechanistic Toxicologic Data in Risk Assessment and Regulation

Sponsored by the Carcinogenesis and Risk Assessment Specialty Sections

Chairperson: James A. Popp, CIIT, Research Triangle Park, NC

In recent years, we have seen increasing emphasis on the merging of mechanistic research to specifically address toxicity identified in animal studies for the purpose of producing better risk assessments and regulatory decisions. The U.S. Environmental Protection Agency has been evaluating the use of mechanistic data in carcinogen classification and developing risk assessments. The International Agency for Cancer Research has recently addressed the issue of incorporating mechanistic data into carcinogen classification. However, the appropriate use of mechanistic research data and the identification of mechanistic research needs to impact the risk assessment process are not uniformly agreed upon at this time.

The speakers of this symposium will address the questions of how mechanistic research should be used in risk assessment process. The speakers will discuss specific issues or types of mechanistic data that may be used in risk assessment. However, to provide a coherent theme to the symposium, each speaker will address (a) the use of metabolic data for the purpose of extrapolating rodent data to humans, (b) the use of rodent cell proliferative data for evaluating potential effects in humans, and (c) the interpretation of chemically induced hormonal changes in rodents associated with tumor formation in relation to potential effects in humans.

The Use of Mechanistic Toxicologic Data in Risk Assessment and Regulation: Introduction, J. Popp, CIIT, Research Triangle Park, NC

Obtaining Mechanistic Data in the Laboratory for the Purpose of Impacting Chemical Regulation, J.A. Swenberg, University of North Carolina, Chapel Hill, NC

Use of Mechanistic Data for Improving Quantitative Risk Assessments, R. B. Conolly, CIIT, Research Triangle Park, NC

The Use of Mechanistic Data in Risk Assessment Limitations, L. Zeise, California EPA, Berkeley, CA

Use of Mechanistic Data for Identifying Carcinogens in the IARC Monographs, H. Vainio, International Agency for Research on Cancer, Lyon, France

Current Views on the Use of Mechanistic Data in Risk Assessment at the U.S. EPA, W.H. Farland, U.S. EPA, Washington, DC

Transgenic Animals in Toxicology

Sponsored by the Carcinogenesis and Molecular Biology Specialty Sections

Chairperson: Thomas L. Goldsworthy and Iain F. Purchase, CIIT, Research Triangle Park, NC, and ICI, Cheshire, England

Recent advances have been made in the characterization of a number of transgenic animal models. These animal models have provided a powerful toxicological tool for studying *in vivo* chemical effects and have increased our understanding of the role of specific genetic alterations as predisposing factors for chemical carcinogenesis.

The goal of this symposium is to introduce the development of transgenic animals and the utilization of transgenics in toxicology research. The focus will highlight our recent understanding of tissue-specific mutation, chemical effects and cancer. The production of transgenic animals, including gene insertions and gene knockouts, will be presented. The utilization of transgenic technology for studying multi stage carcinogenesis and tumor suppressor genes will be covered. Data on the application and implications of transgenics as a genetic endpoint will be discussed. The use of transgenic animals in toxicology should improve our understanding of the role of specific genetic alterations in the carcinogenic process and lead to improved estimations of human risks.

Transgenic Animals in Toxicology: Introduction, I.F.H. Purchase and T.L. Goldsworthy, ICI, Cheshire, England and CIIT, Research Triangle Park, NC

Construction of Transgenic Animals: Principles and Applications, L. Recio, CIIT, Research Triangle Park, NC

Transgenic Animals in Multistage Carcinogenesis, K. Brown, Beatson Institute for Cancer Research, Glasgow, UK

Tumorigenesis in p53-Deficient Mice, L.A. Donehower, Baylor College of Medicine, Houston, TX

Transgenic Animal Models for Detection of In Vivo Mutations, J.C. Mirsalis, SRI International, Menlo Park, CA

Chemical Effects in Transgenic Mice: Implications for Risk Analysis, R.W. Tennant, National Institute of Environmental Health Sciences, Research Triangle Park, NC

The Mammalian Flavin-Containing Monooxygenases: Molecular Characterization and Regulation of Expression

Sponsored by the Molecular Biology Specialty Section

Chairpersons: Ronald Hines and David E. Williams, Wayne State University, Detroit, MI and Oregon State University, Corvallis, OR

The presence of a cytochrome P450-independent monooxygenase in liver microsomes was first reported in 1964 by Kampffmeyer and Kiese. The exact nature of the new monooxygenase was resolved with the purification and characterization by Ziegler and coworkers of a distinct flavin-containing monooxygenase (FMO) from porcine liver. The enzyme has subsequently been purified from several mammalian hepatic sources and similar activity detected in several others including the human. Although more limited in substrate specificity than the cytochromes P450, a variety of xenobiotics are metabolized by FMO, including tertiary and secondary alkyl- and arylamines, many hydrazines, thiocarbamides, thioamides, sulfides, disulfides and thiols. Although some of these compounds are oxidized to less active derivatives, several examples of metabolic activation to pathological intermediates also exist. Thus, FMO plays an important role in the early steps of chemical toxicity. This topic will be further addressed by the first two speakers, who will also elucidate features of the enzyme controlling substrate specificity and discuss some unique aspects of the human enzymes. With the purification and characterization of FMO from other tissues, largely in the independent studies of Williams and Philpot, it became apparent that more than one FMO existed and that there would be tissue- and species-specific differences in expression. The elucidation of some of these differences and some of the properties of each isoform will be the subject of our last two talks.

The Mammalian Flavin-Containing Monooxygenases: Molecular Characterization and Regulation of Expression: Introduction, R. Hines, Wayne State University, Detroit, MI

Contribution of Flavin-Containing Monooxygenases to the Bioactivation of Functional Groups Bearing Sulfur or Selenium, D.M. Ziegler, The University of Texas at Austin, Austin, TX

Human Flavin-Containing Monooxygenase: Hepatic Metabolism of Nicotine, J.R. Cashman, IGEN Research Institute, Seattle, WA

Tissue- and Developmental-Specific Expression of Flavin-Containing Monooxygenase in the Rabbit, R.N. Hines, Wayne State University, Detroit, MI

The Mammalian Flavin-Containing Monooxygenases: Molecular Characterization and Regulation of Expression, R.M. Philpot, National Institute of Environmental Health Sciences, Research Triangle Park, NC

Biochemical and Neurochemical Bases of Behavioral Toxicity

Sponsored by the Neurotoxicology Specialty Section

Chairman: Deborah A. Cory-Slechta, University of Rochester Medical School, Rochester, NY

Our understanding of neurotransmitter system functions and their respective involvements in various behavioral processes has advanced rapidly in recent years. Neurotransmitter systems play a key role in behavioral function and disturbances of these systems are primary features of central nervous system diseases, which include manifestations such as dementia, learning disabilities and motor disorders, among others. This symposium will focus on the relationships between specific neurotransmitter systems and behavior, how these relationships can be altered by exposures to neurotoxicants, and the consequent impact on behavioral processes. Its speakers will address the current understanding of aspects of the anatomy, biochemistry and pharmacology of dopaminergic, serotonergic and excitatory amino acid systems, describe the impact of various neurotoxicants at different levels of these systems, and relate these effects to changes in behavioral function.

Biochemical and Neurochemical Bases for Behavioral Toxicity: Introduction, D.A. Cory-Slechta, University of Rochester Medical School, Rochester, NY

Dopaminergic (DA) and Glutamatergic (NMDA) Involvement in Lead-Induced Behavioral Toxicity, D.A. Cory-Slechta, University of Rochester School of Medicine, Rochester, NY

Excitatory Amino Acid (EAA) System Neurotoxicity, H.A. Tilson, U.S. EPA, Research Triangle Park, NC

The Role of Serotonergic Systems in Behavioral Toxicity, W. Slikker, Jr., NCTR/FDA, Jefferson, AR

Exposure to Polychlorinated Biphenyls Alters Dopamine Function, R.F. Seegal, Wadsworth Center, Albany, NY

Emerging Perspectives on New Transportation Fuels: Methanol

Sponsored by the Risk Assessment and Inhalation Specialty Sections

Chairpersons: Judith A. Graham and J. Michael Davis, U.S. EPA, Research Triangle Park, NC

The growing use of methanol in alternative fuels raises questions about the potential health risks this alcohol could pose to human health under certain exposure conditions. This symposium features recent work on methanol exposure, pharmacokinetics, and health effect, with emphasis on the inhalation route of exposure. Human activity patterns and micro-environments have been a particular focus of attention in assessing methanol fuel-related exposure, with some "worst case" estimates of methanol vapor amounting to a few hundred parts per

million. Pharmacokinetics data are fundamental to a better understanding of methanol toxicity, the bases for possible differences in susceptibility to such toxicity, and the uncertainties in extrapolating from animals to humans from high to low exposure levels, across different durations of exposure, and across exposure routes. Health effects studies indicate the qualitative types of methanol toxicity (e.g., developmental, reproductive, neurological) and the exposure/dose-response characteristics of such effects. Information presented in this symposium is likely to figure into quantitative assessments of the risks and benefits of methanol in alternative fuels.

Emerging Perspectives on New Transportation Fuels: Methanol: Introduction, J.M. Davis, U.S. EPA, Research Triangle Park, NC

Impact of Methanol Fuels on Human Exposure to Air Toxics and Criteria Pollutants, P.J. Liroy, Environmental and Occupational Health Sciences Institute (EOHSI), Piscataway, NJ

Methanol and Formate Disposition in Rats, Nonhuman Primates, and Humans, M.A. Medinsky, CIIT, Research Triangle Park, NC

Neurotoxicity of Methanol, B. Weiss, University of Rochester School of Medicine and Dentistry, Rochester, NY

Developmental Effects of Methanol, J.M. Rogers, U.S. EPA, Research Triangle Park, NC.

Effects of Methanol on the Endocrine Control of Reproduction in the Rat, R.L. Cooper, U.S. EPA, Research Triangle Park, NC

Health Risk Issues of Methanol in Alternative Fuels: Research Needs and Summary, J.A. Graham, U.S. EPA, Research Triangle Park, NC

Molecular Mechanisms in Hormonal Carcinogenesis: Update and Challenges for Future Research

Sponsored by the Carcinogenesis and Reproductive and Developmental Specialty Sections

Chairpersons: James C. Lamb, Elaine Faustman, and Dharm V. Singh, Jellinek, Schwartz & Connolly, Inc., Washington, DC, University of Washington, Seattle, WA and U.S. EPA, Washington, DC

Forty to sixty percent of all human cancers have been estimated to be etiologically associated with sex hormone exposure (Li et al., 1991). Tens of millions of people are exposed to exogenous sex hormones annually including estrogenic, androgenic and/or progestational agents. Cancers associated with sex hormone exposure include breast, liver, prostatic, endometrial, vaginal and cervical. Thus, there is continuing concern, interest and research about hormones in carcinogenesis processes. Despite these facts, there are large gaps in our knowledge about the underlying biochemical and molecular mechanisms involved in hormone-induced neoplastic

events. The purpose of this symposium will be to: a. integrate and evaluate findings from the diverse research disciplines concerning the magnitude of the problem of hormone disruptions; b. identify the conclusions that can be drawn with confidence from existing data; and c. establish research goals to clarify uncertainties remaining in the field. We will present current information on experimental models, hormone metabolism, and mechanisms of hormonal carcinogenesis to address these issues.

Molecular Mechanisms in Hormonal Carcinogenesis: Update and Challenges for Future Research Introduction, James C. Lamb, Jellinek, Schwartz & Connolly, Inc., Washington, DC

Transplacental Hormonal Carcinogenesis: Animal and Human Evidence, J.A. McLachlan, NIEHS, Research Triangle Park, NC

Estrogens in Liver Growth and Carcinogenesis, J.D. Yager, Johns Hopkins School of Hygiene and Public Health, Baltimore, MD

Receptor-Mediated Mechanisms of Carcinogenesis, G.W. Lucier, NIEHS, Research Triangle Park, NC

Estrogen Metabolism and Carcinogenesis, J.G. Liehr, University of Texas Medical Branch, Galveston, TX

Role of Metallothionein in Carcinogenesis

Sponsored by the Carcinogenesis and Metals Specialty Sections

Chairperson: Curtis D. Klaassen, University of Kansas Medical Center, Kansas City, KS

Metallothionein (MT) is a small molecular weight protein (6800 daltons) and one-third of its amino acids are cysteine residues. The 20 cysteines coordinate 7 metal atoms (zinc, copper, and/or cadmium). This protein is extremely inducible by metals as well as by a number of organic compounds. MT is thought to be an important intracellular storage site for zinc. In addition, tolerance to cadmium toxicity is due to induction of MT which binds cadmium and lowers its concentration at critical intracellular sites. Recently it has been proposed that MT might play roles in chemical carcinogenesis. Dr. Cherian will discuss the expression of MT in various human tumors and its use as a potential marker of cell proliferation. Dr. Imura will provide data illustrating that induction of MT can be used as an adjunct in cancer chemotherapy, in preventing the toxicity caused by gamma irradiation, cisplatin, etc. Induction of MT has been suggested to be an important mechanism of resistance of tumor cells to chemotherapeutic agents. This is controversial, and various views will be presented by Drs. Howell, Lazo and Koropatnick. The last lecture will be given by Dr. Waalkes who will discuss the role of MT in the carcinogenic and anticarcinogenic effects of cadmium.

Role of Metallothionein in Carcinogenesis: Introduction, C.D. Klaassen, University of Kansas Medical Center, Kansas City, KS

Cellular Localization of Metallothionein in Mammalian Development and Human Tumors, M.G. Cherian, University of Western Ontario, London, Ontario, Canada

Metallothionein as an Adjunct in Cancer Chemotherapy, N. Imura, Kitasato University, Tokyo, Japan

Mechanisms of Tumor Cell Resistance to Metallic Chemotherapeutics, S.B. Howell, University of California at San Diego, La Jolla, CA

Metallothionein and Tumor Cell Resistance to Anticancer Metallochemotherapeutics, J.S. Lazo, University of Pittsburgh School of Medicine, Pittsburgh, PA

Metallothionein and Other Factors in Cellular Drug Resistance, J. Koropatnick, University of Western Ontario, London, Ontario, Canada

Role of Metallothionein in the Carcinogenic and Anticarcinogenic Effects of Cadmium, M.P. Waalkes, National Cancer Institute-FCRDC, Frederick, MD

Apoptosis: Molecular Control Point in Toxicity

Chairpersons: Lori A. Fix and George B. Corcoran, Frito-Lay, Inc., Irving, TX and University of New Mexico School of Pharmacy, Albuquerque, NM

Apoptosis, programmed cell death, provides a molecular point of control for many physiological processes through cell selection. The role of apoptosis in non-necrotic acute toxicity and carcinogenesis is just beginning to be elucidated and integrated into current thought on mechanisms of toxicity. Evidence is building that unbalanced hormonal or cellular signalling can result in apoptosis. When the p53 suppressor gene is inappropriately expressed in prostrate cells, androgen withdrawal initiates a switch from the cell cycle to apoptosis. Transforming growth factor B1 (TGF-B1) has been found to be an endogenous signal triggering apoptosis in the liver. In contrast, some liver tumor promoters inhibit preneoplastic cell apoptosis which may accelerate liver cancer development. Apoptosis suppression by proto-oncogene bcl-2 has been associated with oncogenesis. Recently a continuum of oxidant levels has been shown to control cellular proliferation by potentiating growth signals at moderate levels while higher levels activate apoptosis. Non-necrotic acute toxicity from chemicals such as acetaminophen, and nitrosamine dimethyl is also associated with apoptosis. Acute cell injury may result in necrosis or apoptosis, which may share similar or parallel DNA fragmentation events. There is a regulatory need for the development of reliable, simple screens for non-necrotic cell injury and nongenotoxic carcinogenesis. Apoptosis detection could evolve into such a pivotal screen providing toxicologists with a valuable time and cost-saving tool in the regulatory process.

Apoptosis: Molecular Control Point in Toxicity: Introduction, L.A. Fix, Frito-Lay, Inc., Irving, TX

Active Cell Death by Apoptosis: Final Control Point in Cell Biology, G.T. Williams, University of Birmingham Medical School, Birmingham, AL

Detection and Measurement of Apoptosis, M.T. Moslen, University of Texas Medical Branch, Galveston, TX

Proliferation, Apoptosis, Necrosis: A Disturbance in Cell Signalling, P. Nicotera, Karolinska Institutet, Stockholm, Sweden

Apoptosis vs Necrosis Induced by Hepatotoxic Drugs and Chemicals, G.B. Corcoran, University of New Mexico School of Pharmacy, Albuquerque, NM

Role of Apoptosis in Initiation and Promotion of Chemical Carcinogenesis, R. Schulte-Herman, Institute of Tumorbiology-Cancer Research, University of Vienna, Vienna, Austria

Castration-Induced Apoptosis: Cell Cycle Transition with Elevated p53 Suppressor Protein, R. Buttyan, Columbia University, New York, NY

Issues in the Safety Evaluation of Breast Implantation Materials

Chairpersons: Mary Davis and Al Munson, West Virginia University Medical Center, Morgantown, WV and Medical College of Virginia, Richmond, VA

The issues surrounding the benefit:risk of silicone breast implants were brought to the public in the last two years. This symposium addresses some of the issues associated with safety evaluation of these materials. For convenience, the issues can be listed in the following categories: capsular contraction, breast disease detection, carcinogenesis, host responses to implant material and immune mediated disease. The first speaker will provide the basic information by describing the types of material that are used in breast implant material. He will present information on the physical and chemical makeup of the material and chemicals that may be associated with the material. The second presentation will provide information related to tissue reactions to implant materials and will focus on polyurethane material which has been used to inhibit capsular formation. Solid state carcinogenicity in rodent species has been known for many years, and the third speaker will give the present understanding of this response and discuss the potential carcinogenicity of implant material. Immunotoxicology studies on breast implanted materials in rodents will be the fourth presentation. National Toxicology Program protocols were used to determine the immune status of mice with implants for up to six months. Epidemiological studies being conducted by the National Cancer Institute will be the final presentation. A summary of the symposium and present views on the problems associated with risk assessment of implanted materials will round out the symposium.

Issues in the Safety Evaluation of Breast Implantation Materials: Introduction, A.E. Munson, Medical College of Virginia, Richmond, VA

Description of Materials Used in Silicone Breast Implants, R.R. LeVier, Dow Corning Corporation, Midland, MI

Tissue Reactions to Implanted Materials, S. Rehm, National Cancer Institute, Frederick, MD

Immunotoxicological Studies in B6C3F1 Female Mice with Hosting Breast Implant Materials, A.E. Munson, Medical College of Virginia, Richmond, VA

Carcinogenic Potential of Implanted Materials, J.M. Rice, National Cancer Institute, Frederick, MD

Issues in the Safety Evaluation of Breast Implantation Materials: Epidemiology, L.A. Brinton, National Cancer Institute, Bethesda, MD

Summary, M. Davis, West Virginia University Medical Center, Morgantown, WV

Male Mediated Developmental Toxicity: Fact or Fiction?

Sponsored by the Reproductive and Developmental Specialty Section

Chairpersons: Donald R. Mattison and Hal Zenick, University of Pittsburgh, Pittsburgh, PA and U.S. EPA, Research Triangle Park, NC

The etiology of the majority of human birth defects and cancer in children is uncertain. Although there are some known and many suspected explanations, recent laboratory and epidemiologic data have suggested that male-mediated effects may be more important than previously suspected. This progress has raised new questions about underlying mechanisms and the relative contributions of paternal genetic and environmental factors to adverse reproductive outcome. The purpose of this symposium is to examine the evidence for male-mediated teratogenesis from the perspectives of both laboratory researchers and epidemiologists. It is hoped that the symposium will yield a synthesis of the current knowledge and suggested avenues for future research.

Male Mediated Developmental Toxicity: Fact or Fiction?: Introduction, D. Mattison, University of Pittsburgh, Pittsburgh, PA

Animals Models for Examining Paternally Mediated Effects: Transgenic Animals Models, A. Wyrobek, Lawrence Livermore National Laboratory, Livermore, CA

Epidemiological Evidence, A. Olshan, University of North Carolina, Chapel Hill, NC

Mechanisms of Male Mediated Developmental Toxicity: Evidence for Genetic Versus Nongenetic Mechanisms, M. Shelby, NIEHS, Research Triangle Park, NC

Male Mediated Developmental Toxicity: Risk Assessment and Science Policy Implications, H. Zenick, U.S. EPA, Research Triangle Park, NC

Summary and Identification of Future Research Directions, D. Mattison, University of Pittsburgh, Pittsburgh, PA

Space Exploration and Toxicology: A New Frontier

Sponsored by the Inhalation Specialty Section

Chairpersons: G. Oberdörster and R.D. Thomas, University of Rochester, Rochester, NY and National Research Council, Washington, DC

Astronauts living in habitats outside the earth's gravitational field and the earth's protective atmosphere will be exposed to potentially toxic contaminants persisting and possibly accumulating in a small, tight living space. In addition to chronic low level exposures, acute high level exposures in case of accidents may occur. As a consequence of the altered physiological status under microgravity, the organism's response to these contaminants and toxicants may be quite different from what we know from earth-based studies. A new specialty - space-toxicology - is emerging which is concerned with investigating such effects with the ultimate goal of protecting the astronauts' health and well-being and to ensure the success of manned space missions. This symposium will give a broad overview of the multifaceted issues surrounding space-toxicology as well as deal with specific results from a still limited database. Numerous adaptations and changes occur in the physiological responses of the organism to the microgravity environment during short as well as extended stays in outerspace. Knowledge of these responses is important in addressing environmental health issues in astronauts and for developing Spacecraft Maximum Allowable Concentration (SMACS) for space contaminants. Current knowledge of the physiological responses in astronauts exposed to chemicals in microgravity environments will be described in this symposium. Changes in immune responses occurring during space missions and differences in the pharmacodynamics and metabolism of drugs will also be discussed as examples of altered physiological responses.

Space Exploration and Toxicology: A New Frontier: Introduction, G. Oberdörster, University of Rochester, Rochester, NY

Space Toxicology; New Era; New Challenge; New Risks, R.J. White, National Aeronautic and Space Administration, Washington, DC

Physiological Changes in Zero Gravity, F.A. Gaffney, Vanderbilt University Medical Center, Nashville, TN

Research and Training in Space Environmental Health, T.W. Clarkson, University of Rochester, NY

Spacecraft Maximum Allowable Concentrations (SMACS), D.E. Gardner, ManTech Environmental Technology, Research Triangle Park, NC

Immune Changes Associated with Space-Flight and Ground-Based Model Systems, G.R. Taylor, NASA/Johnson Space Center, Houston, TX

Pharmacokinetic and Pharmacodynamic Consequences of Space Flight, L. Putcha, NASA/Johnson Space Center, Houston, TX

Space Exploration and Toxicology: A New Frontier: Summary, R.D. Thomas, National Research Council, Washington, DC

Synthesis, Mode of Action, and Toxicity of Nitric Oxide

Chairperson: Donald J. Reed, Oregon State University, Corvallis, OR

Nitric oxide, a combustion product of fossil fuels that contributes to the formation of photochemical smog and acid rain, is now known to have biological functions that are both regulatory and cytotoxic. The presence of nitric oxide has implications for cardiovascular and respiratory diseases, hypertension, neuronal injury, ischemia, endotoxic shock, and impotence. Biosynthesis of nitric oxide occurs in many cell types as an oxidative process involving L-arginine and one or more isoforms of nitric oxide synthase, an unusual form of cytochrome P450. Inflammatory cells, including macrophages, can produce high levels of nitric oxide that can lead to damage of cellular macromolecules including DNA. Cytokine-induced nitric oxide synthesis is implicated in cell-mediated immunity that provides a basis for an efficient defense against pathogens. Because of the rapid reaction between nitric oxide and superoxide to form chemically unstable peroxynitrite anion, activated macrophages are a source of hydroxyl radical-like oxidant. Peroxynitrite in the presence of superoxide dismutase and transition metals can form a nitrating species with reactivity similar to the nitronium ion. Nitric oxide production in a variety of cell types from different tissues including the lung, liver, bone marrow and skin is now observed as a response to inflammatory mediators. In each of these tissues, nitric oxide production appears to play a role in the regulation of growth and/or in tissue injury. Chemically modulated production of nitric oxide is thought to be important in the consideration of the Janus-faced roles of this molecule.

Synthesis, Mode of Action, and Toxicity of Nitric Oxide: Introduction, D.J. Reed, Oregon State University, Corvallis, OR

Origin of In Vivo Nitrite and Nitrate and Their Interactions With Nucleic Acids, S.R. Tannenbaum, Massachusetts Institute of Technology, Cambridge, MA

Synthesis of Nitric Oxide by a Self-contained Cytochrome P450 Enzyme, Nitric Oxide Synthase, M.A. Marletta, University of Michigan, Ann Arbor, MI

Cytocidal Actions of Nitric Oxide, J.B. Hibbs, Jr., University of Utah School of Medicine, Salt Lake City, UT

Role of Nitric Oxide in Superoxide Dependent Pathology, J.S. Beckman, The University of Alabama, Birmingham, AL

Role of Nitric Oxide in Chemically Induced Tissue Injury, D.L. Laskin, Rutgers University, Piscataway, NJ



1993 Continuing Education Courses

Immunology of Chemical Hypersensitivity

Chairpersons: G.F. Gerberick, Procter & Gamble, Cincinnati, OH and I. Kimber, ICI Central Toxicology Labs, Macclesfield, Cheshire, England

- Principles of the Adaptive Immune Response, Ian Kimber, ICI Central Toxicology Labs, Macclesfield, Cheshire, England
- Contact Hypersensitivity, G. Frank Gerberick, Procter & Gamble, Cincinnati, OH
- Respiratory Hypersensitivity, Kathy Sarlo, Procter & Gamble, Cincinnati, OH
- Drug-induced Systemic Hypersensitivity and Autoimmune Disorders, Michael E. Kammuller, Sandoz Pharma Ltd., Basle, Switzerland

Molecular Biomarkers in Toxicology

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

- Development, Validation and Application of Biomarkers: An Overview, Thomas W. Kensler, Johns Hopkins University, Baltimore, MD
- Molecular Dosimetry of Toxic Agents, John D. Groopman, Johns Hopkins University, Baltimore, MD
- Molecular Biomarkers of Adverse Biological Effects, Gerald N. Wogan, Massachusetts Institute of Technology, Cambridge, MA
- Markers of Individual Susceptibility, Fred F. Kadlubar, National Center for Toxicological Research, Jefferson, AR

Coping with Nongenotoxic Carcinogens: Mode of Action, Detection and Risk Assessment

Chairperson: Byron E. Butterworth, CIIT, Research Triangle Park, NC

- Introduction: Byron E. Butterworth, CIIT, Research Triangle Park, NC
- Cytotoxic Liver Carcinogenesis, Douglas C. Wolf, CIIT, Research Triangle Park, NC
- X2U-Globulin Mediated Male Rat Kidney Carcinogens, James A. Swenberg, University of North Carolina, Chapel Hill, NC
- Secondary Thyroid Carcinogens, Charles C. Capen, Ohio State University, Columbus, OH
- Peroxisome Proliferator Carcinogens, James A. Popp, CIIT, Research Triangle Park, NC

Advanced Behavioral and Neurophysiological Testing for Neurotoxicity

Chairpersons: W. Kent Anger, Oregon Health Sciences Center, Portland, OR and Deborah Cory-Slechta, University of Rochester, Rochester, NY

- Human Behavioral Tests and Standardized Test Batteries Used Internationally, W. Kent Anger, Oregon Health Sciences Center, Portland, OR
- Reflex Methods to Assess Sensory and Cognitive Deficits in Animals and Humans, J. Ison, University of Rochester, Rochester, NY
- Operant Techniques for Testing Complex Behaviors in Animals and Humans, Deborah Cory-Slechta, University of Rochester, Rochester, NY and Merle Paule, National Center for Toxicological Research, Jefferson, AR
- Neurophysiological Methods Used to Assess Complex Nervous System Processes in Animals and Humans, William Boyes, U.S. EPA, Research Triangle Park, NC

Insecticides: Mechanisms of Action, Metabolism and Toxicology in Vertebrates

Chairperson: Janice E. Chambers, Mississippi State University, Mississippi State, MS

- Overview: Janice E. Chambers, Mississippi State University, Mississippi State, MS
- Anticholinesterase Insecticides: Organophosphates and Carbamates, Lester G. Sultatos, UMDNJ-New Jersey Medical School, Newark, NJ
- Organochlorine, Pyrethroid and Newer Insecticides, Jeffrey R. Bloomquist, Virginia Polytechnic Institute and State University, Blacksburg, VA
- Chronic Effects and Environmental Effects, Michael J. Hooper, Clemson University, Pendleton, SC

Experimental Approaches to Assess Chemically-Induced Alterations in Gene Expression

Chairperson: Jay I. Goodman, Michigan State University, East Lansing, MI

- Introduction: Jay I. Goodman, Michigan State University, East Lansing, MI
- Analysis of Point Mutations Using the Polymerase Chain Reaction (PCR) and DNA Sequencing: The Ha-ras Oncogene as an Example, Katherine K. Richardson, Lilly Research Laboratories, Greenfield, IN
- Hypomethylation of DNA: A Cell Proliferation-Linked Mechanism that Can Facilitate Aberrant Gene Expression, Jay I. Goodman, Michigan State University, East Lansing, MI
- Cytoplasmic Receptor-Mediated Regulation of Gene Expression: The Dioxin Receptor as an Example, Michael S. Denison, Michigan State University, East Lansing, MI
- Methods for Detection of Allelic-Specific Gene Expression, David G. Beer, University of Michigan, Ann Arbor, MI

Application of Advanced Technologies to Problems in Toxicology

Chairperson: James L. Stevens, Walton Jones Cell Science Center, Lake Placid, NY

- Application of Mass Spectrometry in Toxicology, Deanne Dulik, SmithKline Beecham Pharmaceuticals, King of Prussia, PA
- Application of Electron Spin Resonance in Toxicology, Ronald P. Mason, NIEHS, Research Triangle Park, NC
- Application of Nuclear Magnetic Resonance Spectroscopy in Toxicology, Susan Sumner, CIIT, Research Triangle Park, NC
- Application of Fluorescent Imaging in Toxicology, Martin Poenie, University of Texas, Austin, TX

Basics of Risk Assessment

Chairpersons: Michael Dourson, US EPA, Cincinnati, OH, Richard Cothorn, U.S. EPA, Washington, DC

- A Risk Assessment Paradigm, Richard Thomas, National Academy of Sciences, Washington, DC
- How Toxicity Data Are Used in the Process of Hazard Identification and Dose-Response Assessment, Michael Dourson, US EPA, Cincinnati, OH and Barbara Beck, Gradient Corporation, Cambridge, MA
- Designing Studies for Maximum Impact on the Risk Assessment Process, Frederick Johannsen, Monsanto Co., St. Louis, MO
- How Exposure Assessments Temper the Use of Toxicity Data in Risk Characterization, Dennis Paustenbach, McLaren/Hart Environmental Engineering, Alameda, CA

Advanced Topics in Risk Assessment

Chairperson: George P. Daston, Procter & Gamble, Cincinnati, OH

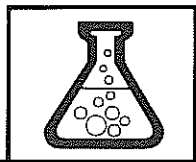
- Benchmark Dose: Concept and Use with Developmental Toxicity, Elaine Faustman, University of Washington, Seattle, WA
- Inhalation Reference Concentration (RfC): Dosimetric Adjustments to Effective Concentrations Across Species for Response Analysis of Inhaled Air Toxics, Annie M. Jarabek, U.S. EPA, Research Triangle Park, NC
- Risks Based on Receptor Modelling Using Dioxin as a Case Study, Michael A. Gallo, UMDNJ-Robert Wood Johnson Medical School, Piscataway, NJ
- Modifying Uncertainty Factors for Noncancer Endpoints, Michael L. Dourson, US EPA, Cincinnati, OH

Mechanisms of Cell Death

Chairperson: Rick G. Schnellmann, Univ. of Georgia, Athens, GA

- Apoptosis, Dean P. Jones, Emory University, Atlanta, GA
- Necrosis, Rick G. Schnellmann, University of Georgia, Athens, GA
- Digitized Video Microscopy of Cell Injury, John J. Lemasters, University of North Carolina, Chapel Hill, NC
- Excitatory Neurotoxicity, Mary DeLong, Emory University, Atlanta, GA

Placement Services



REGULATORY TOXICOLOGIST

The Effects Evaluation Division of the Texas Air Control Board located in Austin, Texas has openings for health scientists specializing in Regulatory Toxicology. These positions offer an opportunity to interface between sciences and policy management in a regulatory setting. Duties involve evaluating toxicologic and epidemiologic data to identify potential adverse health and welfare effects associated with exposure to air contaminants. Additionally, these positions involve serving as a health effects expert in public meetings, hearings, and court proceedings. Excellent oral and written communication skills are necessary. The ideal candidate will possess a M.S. or Ph.D. degree with a strong background in toxicology, epidemiology, pharmacology, public health, environmental science, risk assessment, or closely related specialties. Interested applicants should contact JoAnn Wiersema, Director, (512)908-1782.

POSTDOCTORAL FELLOW

The Pathology and Experimental Toxicology Department of the PARKE-DAVIS Pharmaceutical Research Division, Warner-Lambert Company, is seeking a qualified individual for a postdoctoral fellowship in biochemical toxicology. The fellow will investigate mechanisms of nephrotoxicity induced by platinum-based chemotherapeutic agents. Applicants should possess a Ph.D. in toxicology or a related discipline and have experience with tissue culture and *in vitro* methodologies. Additional Experience with renal transport studies, atomic absorption spectrometry, autoradiography, use of fluorescent probes and /or confocal microscopy would be desirable. Interested individuals should send their CV and list of references to Box JDM-69, Human Resources Department, PARKE-DAVIS Research Division, Warner-Lambert Company, 2800 Plymouth Road, Ann Arbor, MI 48105. "Smoke-Free Work Environment" "Equal Opportunity in Action"

RESEARCH ASSOCIATE - RAPTOR/ENVIRONMENTAL TOXICOLOGIST

The Raptor Center at the University of Minnesota is seeking a Research Associate/Toxicologist. Responsibilities include development of clinical and research programs in environmental toxicology with significance to raptors. Applicants must have doctoral degree in toxicology-related fields. Publications in avian toxicol-

ogy, DVM degree, or two to four years post-doctoral work in environmental toxicology are desirable. Salary is competitive. Submit curriculum vitae, transcript of graduate coursework, and three letters of recommendation to: Dr. Patrick Redig, Director, The Raptor Center, 1920 Fitch Ave., St. Paul, MN 55108. Deadline is March 1, 1993. The University of Minnesota is an equal opportunity educator and employer.

TOXICOLOGY FACULTY POSITION

Toxicology faculty position within a department of chemistry: Assistant/Associate Professor rank, tenure-track, beginning fall 1993: Toxicologist wanted with strong chemistry or biochemistry background. Minimum Master's degree plus 18 hours in appropriate area of specialization for Assistant Professor rank; however, PhD strongly preferred. PhD required for Associate Professor rank. Evidence of excellence in both teaching and research necessary. Responsibilities include teaching chemistry courses at introductory level as well as undergraduate and graduate courses (MS level) in area of specialization and developing a research program. Send letter of application with name of three references, resume, undergraduate and graduate transcripts (copies acceptable), statement of teaching philosophy and interests, and statement of research interests and equipment requirements. Have three letters of recommendation and all above requested materials sent to Toxicology Faculty Position, 204 King Hall, Eastern Michigan University, Ypsilanti, MI 48197. Deadline for receipt of applications is Dec. 1, 1992. Women and members of minority groups are strongly encouraged to apply and to identify themselves. AA/EOE.

LILLY RESEARCH LABORATORIES

The research division of Eli Lilly Company, seeks two research associates to join the Pharmacological Evaluation Laboratory in Toxicology. This laboratory is responsible for conducting GLP regulatory studies on the acute cardiovascular, gastrointestinal, central nervous system, and smooth muscle effects of Lilly compounds. Candidates for these positions must have a BS/MS degree in the Life Sciences and have research experience with tissue bath preparations or gastrointestinal system/small animal surgery. We are seeking candidates with a strong background in general pharmacology, anatomy, animal handling, statistics, lab equipment, and scientific report writing. This position offers the opportunity to develop new techniques and to collaborate with other scientists. We offer an attractive salary and benefits package. Please send resume to: Katie Carson, Corporate Recruitment, Dept SOT-92, Eli Lilly and Company, Lilly Corporate Center, Indianapolis, IN 46285. We are an equal opportunity employer and value diversity in the work force.

PH.D/MASTERS-TOXICOLOGISTS

Sandoz Pharmaceuticals, Ltd., Japan is one of the leading subsidiaries of the world-wide Sandoz group headquartered in Switzerland. In 1993, the Japanese affiliate will open a new Research Institute located in Tsukuba City.

To prepare for his planned expansion, Sandoz Ltd., Japan seeks qualified and experienced Reproductive Toxicologists at the Doctoral and Masters level to join in the unique and challenging opportunity. For consideration send resume to: Mr. John F. McGough, Box 301, Mt. Freedom, NJ 07970.

ASSISTANT PROFESSOR, EXTENSION FOOD SAFETY

The Department of Food Science and Nutrition, University of Minnesota seeks an Assistant Professor, Extension Food Safety for a 12 month, tenure track position.

QUALIFICATIONS: Ph.D. with emphasis in food/environmental toxicology, food science/microbiology/technology or related field; strong oral and written communication skills and demonstrated research skills are required. Industrial and/or government/regulatory agency; post doctorate research; computer; previous participation/leadership in interdisciplinary team projects; development of educational materials experiences are preferred.

RESPONSIBILITIES: Develop Extension educational programs/materials and instruct in food safety related to industrial processing. Interface with commercial food processing and allied industries, regulatory agencies and other food safety-related interests within the University. Function as a content resource person for Extension staff and participate in interdisciplinary team projects. Interpret research findings, instruct and support/collaborate with county Extension faculty, and prepare and disseminate information through various media. Develop ongoing research program, advise graduate students, publish in refereed journals and acquire external funds.

TO APPLY: By January 31, 1993, send 1) letter stating reasons for interest in the position and major strengths of the applicant, 2) a detailed resume addressing qualifications and including a publications list; 3) transcripts of all academic work and degrees completed; 4) three reference appraisal letters evaluating applicant's abilities for this position; and 5) a reprint of one technical publication reflecting research skills of the applicant, to Dr. William Schafer, Chair, Search Committee, Department of Food Science and Nutrition, University of Minnesota, 1334 Eckles Avenue, St. Paul, MN 55108. ●

Upcoming Conferences

International Symposium on Spectral Sensing Research, November 15-20, 1992, Kauai, HI. Contact: Science and Technology Corporation Meetings Division, Attn.: ISSSR, 101 Research Drive, Hampton, VA 23666, 804/865-7604.

Chemical Mechanisms in Toxicology, November 16-17, 1992, Clearwater, FL. Contact: Ms. Pamela McAnnaly, American Chemical Society, Continuing Education Division, 1155 16th St., NW, Washington, DC 20036, 202/872-4507.

Toxicology for Chemists, November 18-20, 1992, Clearwater, FL. Contact: Ms. Pamela McAnnaly, American Chemical Society, Continuing Education Division, 1155 16th St., NW, Washington, DC 20036, 202/872-4507.

Society of Toxicology of Canada 25th Annual Symposium, December 3-4, 1992, Holiday Inn Crowne Plaza, Montreal, Quebec. Contact: Gordon Krip, STC Executive Director, C.P./P.O. Box 517, Beaconsfield, Quebec H9W 5V1 Canada.

Environmental Chemistry of Organic Pollutants: Risk Assessment of Chemicals, December 6-9, 1992, Siena, Italy. Contact: European Environmental Research Organisation, P.O. Box 182, 6700 AD Wageningen, The Netherlands, 31/8370-84924.

Society For Risk Analysis 1992 Annual Meeting, December 6-9, 1992, Hotel del Coronado, San Diego, CA. Contact: SRA Secretariat, 8000 Westpark Drive, Suite 130, McLean, VA 22102. 703/790-1745.

Arkansas Toxicology Symposium, honoring the research and contributions of Drs. Elizabeth C. Miller and James A. Miller, December 10-11, 1992, Little Rock, AR. Contact: Dr. J.A. Hinson, Division of Toxicology, UAMS, Slot 638, 4301 W. Markham, Little Rock, AR 72205, 501/686-5521.

Introduction of Genetically Modified Organisms into the Environment: Biosafety Aspects, December 10-18, 1992, Wageningen, The Netherlands. Contact: European Environmental Research Organisation, P.O. Box 182, 6700 AD Wageningen, The Netherlands, 31/8370-84924.

International Conference on the Health and Disease Effects of Essential and Toxic Trace Elements, February 8-12, 1993, New Delhi, India. Contact: Mohammad Athar, Convener, International Congress, Fax: 011 6474514.

National Academy of Engineering Environmental Regulations Symposium, February 11-12, 1993, National Academy of Sciences Auditorium, Washington, DC. Contact: Myron Uman, NAE, 2101 Constitution Avenue, NW, Washington, DC 20418, 202/334-3200.

Environmental Regulation: Accommodating Changes in Scientific Technical and Economic Understanding, February 11-12, 1993, Washington, DC. Contact: Ms. Terrie Noble, 2101 Constitution Avenue, NW, Washington, DC 20418, 202/334-2154. ●

Ancillary Meetings

Annual Meeting attendees who wish to hold an ancillary meeting should contact Clarissa Russell at SOT Headquarters, 202/371-1393, as soon as possible. Space is available on a first-come, first-served basis, after SOT scientific and social programs have been accommodated.

Guest Hospitality Program

The Hospitality Center at the Hyatt Regency Hotel, staffed Sunday through Wednesday, 9:00 a.m.- 4:00 p.m., and Thursday, 9:00 a.m.-12:00 noon, will provide guest participants with a place to meet and socialize with other guests. The Hospitality Center will also provide information on local attractions, rental cars and tours.

Guests must be registered for the Annual Meeting to have access to the Hospitality Center and be eligible for the discounted tour rates. Guests can register for the Hospitality Program by using the Annual Meeting registration form in the Preliminary Program mailed to members in December.

Regional Chapters and Specialty Sections

Chapter Meetings will be held on Wednesday, March 17 from 5:30 p.m.- 7:00 p.m., at the Hyatt Regency Hotel immediately before the SOT Banquet and Awards Presentation.

The Mechanisms, Risk Assessment, and Molecular Biology Specialty Sections will meet on Tuesday, March 16, from 6:30 p.m.- 8:00 p.m. Other Specialty Sections will meet on Monday, March 15 from 5:00 p.m. - 6:30 p.m. All Specialty Section meetings are at the Hyatt Regency Hotel.

Bussing

Although all SOT hotels are within a 10-block walk of the convention center, The Society will provide two bussing service routes between most SOT hotels and the convention center during peak morning and afternoon hours of the Annual Meeting. If you have special transportation needs, please contact Clarissa Russell at SOT Headquarters at (202) 371-1393.●

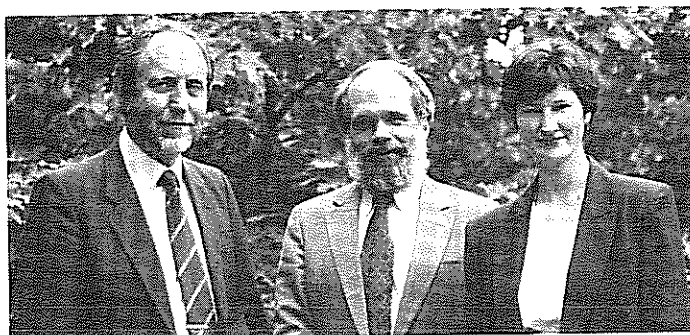
Sponsorship Opportunities Available at Annual Meeting

Event sponsoring opportunities are available for the 1993 SOT Annual Meeting, March 14-18, 1993, at the New Orleans Convention Center. Events to be sponsored include student, minority program, and general sessions. Co-sponsoring opportunities are available for as little as \$500.

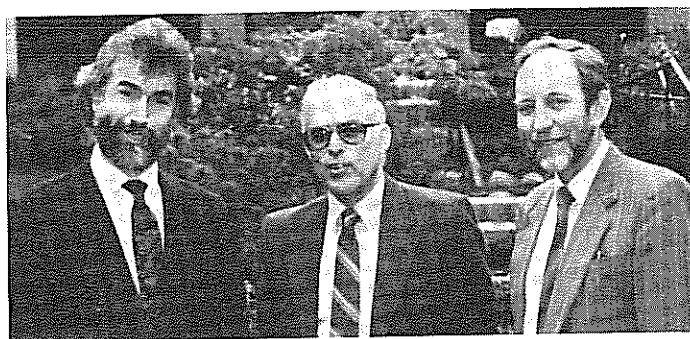
Participating companies will be recognized in the on-site SOT Program, Calendar and Exhibitor Directory (distributed to 4,000+ attendees); the January/February and May/June SOT Newsletters (mailed to 3,400 SOT members); and through signage on-site. If you are interested in the SOT Sponsorship Program, please contact Mary Guthrie at SOT Headquarters for a list of available events.●

ICI Travelling Lectureships

Dr. Charles (Skip) V. Smith and Dr. Jerold A. Last were the recipients of the two 1992 ICI Travelling Lectureships that were awarded at the 1992 SOT Annual Meeting in Seattle, Washington. The Award, presented by the Society of Toxicology, is designed to promote greater collaboration between European and North American toxicologists, and enables North American toxicologists to undertake a three-to-four week lecture tour of Europe.



Dr. Smith (center) with Dr. Purchase (left) and Dr. Brady



Dr. Last (center) with Drs. Wheeldon and Purchase

During Dr. Smith's ten week European trip he participated in several timely scientific conferences, including the Sixth International Conference on Toxicology in Rome. Midway through his trip he visited ICI Central Toxicology Laboratory (CTL), in Cheshire, UK, where Dr. Iain Purchase, Director and Dr. Angela Brady acted as hosts for his visit. CTL was just one of several European institutes to host Dr. Smith, enabling him to present a variety of lectures on his work in the area of oxidant-mediated cell damage and to meet with colleagues and other distinguished scientists in his field to discuss areas of common interest.

Dr. Last, who is Professor of Internal Medicine and Director of the Toxic Substances Research and Training Program, University of California, Davis, spent three weeks in Europe, visiting institutions in England, Wales, Netherlands, Germany and Sweden.

Individuals wishing to be considered for future ICI Travelling Lectureships can obtain further information from SOT Headquarters.●

Chapter News

Southern California Chapter

Jim Adams, **Debbie Herron** and Teri Copeland were recently elected Councilors for the 1992-93 program year by the Southern California Chapter. **Alex Sevanian** is finalizing the program agenda for the chapter's Annual Meeting on November 13th on the University of Southern California campus. A principal focus of the meeting is advances in *in vitro* testing with presentations and exhibits of various test methods. **Alan Goldberg**, director of the Center for Alternatives to Animal Testing, is the keynote speaker.

Mountain West Chapter

The Annual Meeting of the Mountain West Chapter of the Society of Toxicology was organized by **Steve Aust** and hosted by the Center for Environmental Toxicology at Utah State University in Logan, UT. It marked the tenth anniversary of the regional chapter. The busy two-day meeting on September 17-18, 1992 drew over 110 registrants, many from as far away as 800 miles.

The meeting included symposia on Plant Toxins and Cytochrome P450, well-attended platform and poster sessions, a retrospective on the Chapter inception and history, and a dutch oven cookout high in the Cache mountains. Of 18 slide talks and 4 poster presentations, more than two-thirds were delivered by graduate students.

Donald R. Buhler of Oregon State University, presented the meeting keynote address, "Toxicology of Pyrrolizidine Alkaloids."

Four awards were given to graduate students in recognition of the top place and second place platform and poster presentations. Platform awards went to Stacie L. Glowaz (University of Arizona) and Susan J. Carpenter (University of New Mexico) and poster awards went to Chien-Chung Chao (Utah State University) and Dylan P. Hartley (University of Colorado). During the Chapter business meeting, plans were finalized to hold the Eleventh Annual Meeting of the Mountain West Chapter in Tucson, Arizona in conjunction with the Fourth North American ISSX Meeting, which will take place October 17-21, 1993.●

Member News

Enriching the Future of the Land Grant System: A Dialogue on Environment and Society was the symposium theme of a recent meeting of the Board on Agriculture and Professional Scientific Societies held in Irvine, California. The Society of Toxicology was represented at the meeting by **Dr. Dan Menzel**.

Carol Henry, formerly of ILSI Risk Science Institute, has been appointed by Governor Wilson to be Director, Office of Environmental Health Hazard Assessment at the California EPA Office of Environmental Health and Hazard Assessment.●

Student Awards Program of Carcinogenesis Specialty Section

The Carcinogenesis Specialty Section of the Society of Toxicology will offer awards for the best carcinogenesis abstracts presented by students at the 1993 SOT Annual Meeting in New Orleans. Cash Awards: [first (\$500), second (\$300), and third (\$200)] and a framed certificate will be presented at the meeting of the Carcinogenesis Specialty Section in New Orleans. It is expected that the recipients will be present to receive their award.

The abstract to the Annual Meeting of the SOT and a covering letter, both in triplicate, will constitute application for a student award. Interested candidates should submit their abstract and covering letter by January 15, 1993 to: **Dr. B.D. Roebuck**, Department of Pharmacology and Toxicology, Dartmouth Medical School, 7650 Reimsen, Hanover, NH 03755-3835. 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 on the importance of the work in the context of carcinogenesis.●

1991-92 Annual Reports Available

The 1991-92 Annual Report will be available upon request from the SOT Headquarters office. Please contact Trish Small in the Headquarters office if you would like a copy.●

Wanted: "Host/Mentors" for Minority Student Programs at Annual Meeting

As recipients of an NIH-sponsored grant, the SOT Education Committee will be making a strong effort to introduce toxicology to minority undergraduate science majors and their advisors at the 1993 SOT Annual Meeting in New Orleans. 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 13 for which; all mentors will need to be available. Other sessions include an educational program for visiting 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 1992 SOT Annual Meeting in Seattle.●

1993 Annual Meeting Schedule-At-A-Glance

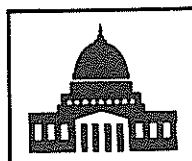
SATURDAY March 13	MONDAY March 15	TUESDAY March 16	WEDNESDAY March 17	THURSDAY March 18
1:00 p.m. - 4:00 p.m. 2nd Forum on Undergraduate Education	8:30 a.m. - 4:30 p.m. Exhibits Open	8:30 a.m. - 4:30 p.m. Exhibits Open	8:30 a.m. - 4:30 p.m. Exhibits Open	8:30 a.m. - 11:30 a.m. Scientific Sessions
4:00 p.m. - 7:00 p.m. Registration	8:30 a.m. - 11:30 a.m. Scientific Sessions	8:30 a.m. - 11:30 a.m. Scientific Sessions	8:30 a.m. - 9:30 a.m. Plenary Lecture: Hon. Stephen Breyer, Chief Judge, U.S. Court of Appeals	9:00 a.m. - 12:00 noon Guest Hospitality
2:00 p.m. - 5:00 p.m. Expert Witnessing Workshop	9:00 a.m. - 4:00 p.m. Guest Hospitality	9:00 a.m. - 3:30 p.m. Placement Service	9:30 a.m. - 11:30 a.m. Scientific Sessions	12:00 noon - 1:30 p.m. SOT Issues Session: Animals in Biomedical Research and Safety Evaluation
SUNDAY March 14	9:00 a.m. - 3:30 p.m. Placement Service	9:00 a.m. - 4:00 p.m. Guest Hospitality	9:00 a.m. - 3:30 p.m. Placement Service	1:30 p.m. - 4:30 p.m. Scientific Sessions
8:00 a.m. - 12:00 noon Continuing Education Courses	9:30 a.m. - 11:30 noon Poster Session for Visiting Students	12:00 noon - 1:30 p.m. SOT/EUROTOX Debate	9:00 a.m. - 4:00 p.m. Guest Hospitality	
9:00 a.m. - 3:30 p.m. Guest Hospitality	12:00 noon - 1:30 p.m. Graduate Student Luncheon	1:30 p.m. - 4:15 p.m. Scientific Sessions	12:00 noon - 1:00 p.m. Burroughs Wellcome Lecture by Harihara Mehendale	
10:00 a.m. - 4:00 p.m. Placement Service Registration	1:30 p.m. - 4:30 p.m. Facts and Perceptions of Health Concerns in Louisiana Workshop	4:30 p.m. - 6:00 p.m. SOT Annual Business Meeting	1:30 p.m. - 4:30 p.m. Scientific Sessions	
1:30 p.m. - 5:30 p.m. Continuing Education Courses	1:30 p.m. - 4:30 p.m. Scientific Sessions	6:30 p.m. - 8:00 p.m. Mechanisms Risk Assessment and Molecular Biology Specialty Section Meetings	2:00 p.m. - 4:00 p.m. Grantsmanship and Sources for Research Support Forum	
2:00 p.m. - 5:30 p.m. Education Program for Minority Students	5:00 p.m. - 6:30 p.m. Specialty Section Meetings (except Mechanisms, Risk Assessment, and Molecular Biology Specialty Sections)		5:30 p.m. - 7:00 p.m. Chapter Meetings	
5:30 p.m. - 6:30 p.m. Placement Service Seminar			7:00 p.m. - 10:00 p.m. SOT Banquet and Awards Presentation	
5:30 p.m. - 7:00 p.m. SOT Welcoming Reception				

NOTE:

Attendees are encouraged to register on Saturday, March 13.

A cash-bar mixer will be offered at the Convention Center, Saturday, 4-7 p.m.

Watching Washington



Governor Signs Anti-Dissection Law In Pennsylvania

A bill that grants students in grade 12 and below the right to refuse to dissect, vivisect, or otherwise harm or destroy animals has been signed into law in Pennsylvania. The new law also states that a student who elects not to participate in or observe such activities must be offered an alternative means to obtain the knowledge, information or experience required by the course of study. Pupils shall not be penalized or discriminated against because they chose an alternative educational option. Pennsylvania now joins California, Florida, Maine and Massachusetts as states that have passed laws restricting the use of animals in education. ●

Publications of Interest

Cell Biology Labfax, G.B. Dealtry & D. Rickwood, Bios Scientific Publishers, HBJ Troy, 465 South Lincoln Drive, Troy, MO 63379.

Institutional Animal Care and Use Committee Guidebook, Applied Research Ethics National Association, 132 Boylston Street, Boston, MA 02116.

Natural Toxins Research Journal, Wiley-Liss, 605 Third Avenue, New York, NY 10158-0012, 212/850-6543.

Pharmacology: Examination on & Board Review, Third Edition, Bertram G. Katzung, Anthony J. Trevor, Appleton & Lange, Norwalk, CT.

Science Sources 1992, Office of Communications, American Association for the Advancement of Science, 1333 H Street, NW, Washington, DC 20005, 301/645-5643.

Teratogenesis, Carcinogenesis and Mutagenesis, Wiley-Liss, 605 Third Avenue, New York, NY 10158-0012, 212/850-6543. ●