

The Teratology Society Newsletter

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September 2007

Letter from the President

Thomas Knudsen

The 47th Annual Meeting of the Teratology Society was a great success. Special thanks to Elaine Faustman for her leadership as Society President in 2006-07, to the Program Committee for organizing a strong scientific program, and to the meeting attendees for loyal participation and active engagement at all of the sessions.

Please reflect for a moment on the NIH Roadmap to 21st Century Medicine (E Zerhouni, circa 2003) and its three integrated themes within the context of our Society's appreciative assets. In *New Pathways to Discovery* the modeling of molecular complexity through systems-based approaches may help us capitalize on the key advances from the human genome project to reveal hidden principles underlying the fundamental mysteries of development. Through *Research Teams of the Future* scientists and clinicians come together as interdisciplinary teams focused on problem-solving to tackle the complexity at higher informational scales. Redesigning the enterprise for 21st century medicine is completed by a nationwide infrastructure or *Translational Network* that relies on newer information technologies and techniques to

from the President

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48th Annual Meeting

Christina Chambers

The 2008 Program Committee has put together an exciting and varied program for Monterey in collaboration with the Neurobehavioral Teratology Society (NBTS) and the Organization of Teratology Information Specialists (OTIS). The preliminary program will be available for viewing on the website in October. Symposia topics include fetal hypoxia, left-right patterning in development, stem cell technology as it relates to teratology, food safety and nutrition across the developmental spectrum, childhood pesticide exposure, *in vitro* methods in teratology, vaccine safety, vascular disruptive defects, and an overview of the methods and findings of the National Birth Defects Prevention Study. Special sessions on one-generation vs. two-generation studies, and teaching teratology in the 21st century are planned, as well as an update on the National Children's Study. A workshop on pregnancy registry methods is also incorporated into the meeting, with joint sponsorship by the International Society of Pharmacoepidemiology. The Education Committee has developed an excellent course on functional teratology that is focused on CNS outcomes, and a mini-course on nano-particles. The Society will be submitting an application for continuing medical education credit for physicians.

The format of the meeting will be slightly different in 2008. In response to the recommendations of the Strategic Planning Session participants and the membership, the meeting will be condensed from five days to four, ending on Wednesday evening, July 2. The Education Course will be presented in its entirety on Saturday, June 28. An extended break will be included in the afternoon for lunch with colleagues or perhaps the XXVII Annual Volleyball game.

48th Meeting

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seamlessly integrate knowledge from basic research and health information from community-based medicine.

Sound familiar? Our Society's mission neatly aligns with these roadmap themes. These roadmap themes permeated the 47th Annual Meeting in Pittsburgh and are on-tap for the 48th Annual Meeting in Monterey, California. Tina Chambers and the Program Committee put together an outstanding program that covers a broad range of relevant topics. Plan to attend June 28 - July 2, 2008 at the Hyatt Regency Monterey and look for the connections to the NIH roadmap.

For 47 years this Society has played a critical role in improving and protecting the health of fetuses and children. During the past year several key activities have been realized that pave the road to the future of the Society. For example, the third Strategic Planning Session provides an opportunity for us to assess how far we have come in 47 years, where we need to go, and how we can better meet the needs of our membership to improve women and children's health. Through appreciative inquiry the strategic planning process has implemented several 'working groups' focused on scientific excellence and leadership, membership recruitment and retention, and outreach and partnering. Through this process we hope to involve the entire membership and particularly welcome the participation of those members having a strong passion for the discipline, new ideas to share, important concerns to address, and above all aspire to propel the Society further into 21st century medicine.

This newsletter highlights important activities and events as we move toward the 48th Annual Meeting. Thanks to the efforts of Deb Hansen and newsletter contributors, you can see some of the important activities that lie before us and, as always, we welcome your comments, inputs and insights. ■

47th Annual Meeting Photos

Huge Galdones did a terrific job of taking photos at this year's annual meeting. You can see his work at:

<http://huge-photos.com/albums/teratology/index.html>

Emeritus members are encouraged to attend the meeting and Education Courses. Reduced registration rates have been established to assist you in your continued participation in the Annual Meeting. To qualify for this rate you must be an approved Emeritus Member of the Teratology Society.

Members, students and your colleagues are encouraged to plan now for abstract submission in early-February. Register prior to February 19 to take advantage of the lowest rates. We look forward to seeing you in Monterey! ■

The Entrance to the Hyatt Hotel in Monterey, CA – site of the 48th Annual Meeting.



Student/Postdoc Travel Awardees at the 2007 Annual Meeting.

From The Public Affairs Committee

Patte Bittner and Wiley Interscience

A Teratology Society Public Affairs Committee position paper that reviews the history and rationale behind the effort to change pregnancy labeling for prescription drugs and calls for the immediate approval of new rules that have been proposed by the FDA will be published in a future volume of *Birth Defects Research Part A*. (Teratology Public Affairs Committee Position Paper: Pregnancy Labeling for Prescription Drugs: Ten Years Later,” The Public Affairs Committee of the Teratology Society, *Birth Defects Research Part A*.)

<http://www.interscience.wiley.com/journal/bdr>.)

This paper, written by Tony Scialli and the Committee during 2006-2007, expresses frustration that the process of revising the pregnancy labeling for prescription drugs, begun by the FDA ten years ago, has not yet been completed.

The FDA convened a public hearing in 1997 to discuss the content and format of pregnancy labeling after the Teratology Society had held a public symposium (1992) on the issue that was followed by a position paper (1994). Presentations at the 1997 FDA hearing almost unilaterally identified the pregnancy labeling categories as a source of inaccurate counseling. An FDA summary of the meeting acknowledged that the categories are confusing, inadequate to communicate risk, create the incorrect impression that drugs within the same category have a similar toxic potential, and do not contain information on possible adverse effects based on severity, incidence, type of effect, dosage, frequency, or gestational timing of exposure.

The 1997 hearing prompted the FDA to revise its pregnancy labeling regulations by replacing the categories with clearer and more complete summaries of information on risk. The FDA has drafted proposed rules that would include information on pregnancy registries, a narrative description of the risks of using the medication, and a discussion of considerations to address inadvertent exposures. While categories would be eliminated, it is believed that standardized language would still lead to categorization, since the likelihood of risk would be categorized as none, low, moderate, high, or unknown.

Still, the FDA proposed rules still not been modified ten years later. The Public Affairs Committee believes

that this delay has resulted in anxiety on the part of physicians and patients and the unnecessary termination of wanted pregnancies.

The committee recommends immediate approval of the new rules proposed by the FDA, with release for public comment without further delay. Even with these actions, the FDA estimates that the new system will not become effective before 2010, 13 years after the FDA public hearing calling for change. In its statement, the Committee also recommends applying the categorical language flexibly; including the reasoning behind the language; and testing the new system among physicians and consumers to determine whether it is effective at communicating risk and appropriate for clinical decision-making. ■

Environmental Health Criteria 237

Principles for Evaluating Health Risks in Children Associated with Exposure to Chemicals

Elaine Faustman

A new WHO Environmental Criteria monograph has been published that is entitled “Principles for Evaluating Health Risks in Children Associated with Exposure to Chemicals”. As is evident from the title the focus of this volume is children and it is of direct relevance to the Teratology Society. In fact, you will recognize some of the contributors as Teratology members.

Previous Environmental Health Criteria publications have evaluated the potential chemical exposures to affect sensitive populations and Environmental Health Criteria 30, *Principles for Evaluating Health Risks to Progeny Associated with Exposure to Chemicals during Pregnancy* (IPCS, 1984) and Environmental Health Criteria 59, *Principles for Evaluating Health Risks from Chemicals during Infancy and Early Childhood: The Need for a Special Approach* (IPCS, 1986b) are very relevant resources. The new document was prepared and celebrates a critical time (10 year anniversary) of EPA/NIEHS funding of the Children’s Environmental Health Center (CHC) and many of the new areas of research described in this criteria report highlight research findings and lessons learned from the CHC.

WHO Report

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The WHO volume provides a clear background and rationale why children have unique biological characteristics and illustrates what this means for developmental specific susceptibility. Section 4 is organized by specific organ systems and common responses (e.g. cancer). Other chapters written include exposure assessment and methodologies for children's impact assessment. Risk management issues are addressed in the final chapter. The volume provides a nice balance of details and general information relevant for a scientist as well as an educated lay person.

The volume is available online at <http://www.who.int/ipcs/publications/ehc/en/index.html> ■

Website Committee Update

Ed Carney

In the last year, the Website Committee has increased both its membership as well as its activity level, with some exciting projects in the works. The committee has developed a list of short and long-term goals which we hope will result in a much more vibrant and dynamic site, and one that will play a central role in communicating the work of the society to our members and the world. Activities currently in progress include:

- a thorough "housecleaning" to remove dead links, outdated content, and identification of opportunities for updated content;
- initiation of a regular site monitoring plan so that content remains current;
- development of a new Student Page;
- assessment of the site map and organizational structure to identify key navigational problems;
- reorganization of the site map to improve navigation and better position critical content.

In addition to these specific activities, the committee will be working over the next few months to develop a **comprehensive proposal to revamp the site**. Elements of this proposal will include, but not be



Duop Performance by Participants of the 3rd Strategic Planning Session.

limited to: types of content to add, retain or eliminate; enhanced functionalities (e.g., bulletin boards); more attractive and inviting appearance; improved presentation of the Teratology Society's image to the public; and, of course, the cost associated with such changes. The committee will be working closely with Council and the Strategic Planning Communications Work Group to advance these initiatives. ■



One of two very busy poster sessions at the 2007 Annual Meeting in Pittsburgh.

FASEB Update

John DeSesso

The Teratology Society has been a member of FASEB for nearly a decade. As the Society's liaison, I have had the privilege to observe and participate in FASEB's efforts to improve the scientific life of scientists through a variety of efforts aimed at educating Congress, improving communication among scientists, and sharing the excitement of science with the public. These activities require keeping abreast of up-to-the-minute changes in legislation concerning funding initiatives, animal welfare, conflict of interest and the funding structure for the NIH. A few of the accomplishments that impact each of us as scientists are listed below.

Shaping the Future of NIH: One of the final actions of the 109th United States Congress was to pass the National Institutes of Health Reform Act, a landmark piece of legislation that reauthorized the NIH for the first time in more than 13 years. FASEB played a major role in shaping, improving and ultimately passing the NIH reauthorization bill, having exclusive input into the developing legislation, resulting in a vision for NIH that emphasized investigator initiated research, improved transparency, and sustainable funding levels.

Historic Animal Rights Terrorism Legislation: President Bush recently signed S. 3880, the "Animal Enterprise Terrorism Act (AETA)," into law. FASEB worked actively to pass this legislation, which increases protections for researchers targeted by animal rights extremists, who advocate arson, personal violence, and vandalism as appropriate means to end the use of animals in research.

Conflict of Interest Initiative: In response to growing concern over ethical issues related to academic-industry-government relations, FASEB launched a major proactive effort to address conflict of interest issues from the perspective of the extramural research scientist. Funded by the Office of Research Integrity and the Association of American Medical Colleges, the FASEB initiative has resulted in publication of a report, *Shared Responsibility, Individual Integrity: Scientists Addressing Conflicts of Interest in Biomedical Research*, which has gained national attention, as well as development of a toolkit with recommendations to improve the management of academic-industry relationships and promote investigator education. Currently, FASEB is leading the way towards a consistent national guideline for management of

conflicts of interest.

Tools for Scientists: FASEB has designed and makes freely available a number of tools and materials for scientists to use in their own advocacy or science policy efforts. These include customizable state-specific slides to make the case for NIH funding, advocacy toolkits on evolution and conflict-of-interest, data on trends in training of scientists and research funding, and educational publications, like the *Breakthroughs in Bioscience* series, which explains the connection between basic research and technological advancement for non-scientists. FASEB Society member scientists can also sign up on the FASEB website to receive legislative action alerts, when urgent action is needed, or the FASEB biweekly electronic newsletter, *FASEB Washington Update*, to keep abreast of the latest science policy news from Washington. ■

Book Review

Your Genealogy Affects Your Health

By F. Clarke Fraser, Ph.D., M.D.

Professor Emeritus, McGill University, Montreal, Canada

This book is a MUST READ! Written by Dr. F. Clarke Fraser, a founder of the Teratology Society, the field of genetic counseling and a world-renown teacher and researcher, it encapsulates a wealth of knowledge in a small fascinating book. Researchers, medical doctors and students will find it an invaluable reference that can be used to quickly update their current knowledge on genetics and authoritatively address frequently asked questions about the relationship of genetics to disease susceptibility. The book is divided into four chapters. The first is an overview of genetics and the next three address genetic traits in alphabetical order. There is also a glossary and a list of recommended books and Internet sites for those wanting more detailed information.

Chapter 1, *Genetics in a Nutshell*, provides an easy to understand overview of this complicated field. The descriptions of the *Double Helix*, the gene, the genome, and the three main ways genes can cause disease make this chapter one that should be required reading for the general public, legislators and clergy. Seldom are these complex sensitive issues so critical to research and human health so well communicated.

Book Review

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Chapter 2, *Family Resemblances: Common and Normal Traits*, answers many questions we're sometimes afraid to ask. Subjects range from the amount of risk for genetic problems in children of related couples, to descriptions of the biology of eye and hair color, to the genetics of homosexuality, intelligence and longevity.

Chapter 3, *Genetics of Common Physical Disorders*, describes genetic associations with such varied disorders as Alzheimer's, autism, bedwetting, bulimia, heart disease, diabetes, cancers, obesity, Parkinson's and restless leg syndrome.

Chapter 4, *Genetics of Behavior: Normal and Abnormal*, addresses such complex subjects as alcoholism, attention deficit-hyperactivity, compulsiveness and suicidal behavior.

Every member should have this authoritative concise approach to genetics on their reference shelf. ■

Review submitted by Mildred S. Christian



Dr. F. Clarke Fraser at the 2007 Annual Meeting.

A New Era in Toxicity Testing

Contributed by Steven Gibb

Program Officer for Strategic Communications
Environmental Studies and Toxicology
National Research Council

Toxicity testing is about to enter an exciting period of change, built on scientific advances in areas such as biology, biotechnology, and other fields.

Toxicity tests are conducted to evaluate chemicals for their potential to cause birth defects, cancer, and other adverse health effects. At present, the human environment contains some tens of thousands of chemical substances, the majority of which have not been evaluated by rigorous toxicity tests.

Current test methods are largely conducted using laboratory animals, such as rats and mice. Such tests are expensive and time consuming, placing limitations on the number of chemicals that can be tested. The use of animals for toxicity testing also involves extrapolations to humans.

Recognizing that the time has come for more innovative approaches to toxicity testing, the U.S. Environmental Protection Agency (EPA), asked the National Research Council (NRC) to develop a long-range vision and a strategy to advance toxicity testing. The recent report of the NRC *Committee on Toxicity Testing and Assessment of Environmental Agents* presents an exciting new vision for toxicity testing that has the potential to result in dramatic improvements in the way in which the health risks posed by chemicals in our environment are evaluated.

The committee's vision takes full advantage of the ongoing revolution in biology and biotechnology, which is making it possible to study the effects of chemicals using cells, cellular components, and tissues—preferably of human origin—rather than whole animals. The report envisions a new toxicity-testing system that relies mainly on understanding “toxicity pathways”—the cellular response pathways that can result in adverse health effects when sufficiently perturbed.

New era

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New era

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The key elements of the committee's vision for the future of toxicity testing are identified in the figure below which encompasses both the assessment of toxicity pathways and "targeted testing," which is designed to clarify and refine information from toxicity pathway tests for use in chemical risk assessments.

For the foreseeable future, some targeted testing in animals will need to continue, as it is not currently possible to understand sufficiently how chemicals are broken down in the body using tests in cells alone.

At the bottom of the figure, dose-response and extrapolation modeling will enable the translation of cellular tests to humans. Specifically, the modeling will estimate environmental exposures that would lead to significant perturbations of toxicity pathways observed in the cellular tests.

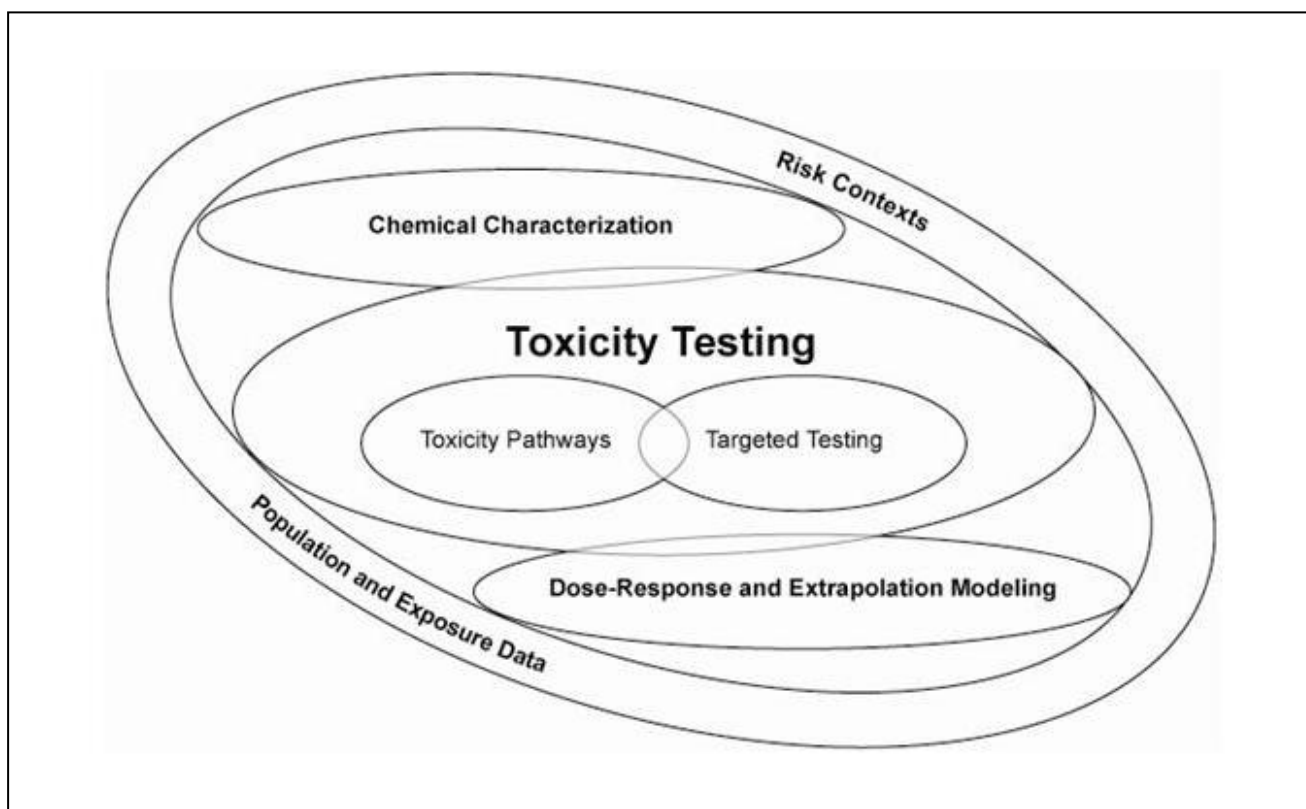
Population-based and human exposure data are also key elements of the vision. Collection of biomonitoring data will aid in identifying markers of

human exposure, health effects, and susceptibility that can aid scientists in assessing and responding to chemicals of concern in the environment.

The report emphasizes the importance of evaluating risk contexts—common decision-making scenarios—for which toxicity testing is being conducted. Some risk contexts require rapid screening of thousands of environmental agents, while others require highly refined dose-response modeling for an individual agent.

Implementation of the vision will require coordinated efforts over the next several decades by scientists from government, industry, and universities. A significant funding commitment is needed to create a new national program to conduct the research that will provide the scientific foundation for the next generation of toxicity tests.

Full details of the committee's vision for toxicity testing in the 21st century can be found at: <http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=11970> ■



The committee's vision for toxicity testing is a process that can include chemical characterization, toxicity testing, and dose-response and extrapolation modeling as part of broader agency decision-making.