

# Scientific Program Overview

A page reference follows the session information.

## Sunday, March 16

7:00 AM–7:45 AM

### SUNRISE CONTINUING EDUCATION COURSE

1. Mini-Pigs as an Alternative Non-Rodent Species in Toxicology and Safety Studies (p71)

8:15 AM–12:00 NOON

### MORNING CONTINUING EDUCATION COURSES

2. Introduction to Pathology for Toxicologists and Study Directors (p72)
3. Stem Cells and their Multi-Potential Uses and Potential Dangers (p72)
4. Dose-Response Modeling for Occupational and Environmental Risk Assessment (p72)
5. The Use of Transgenic Animal Technology in Toxicological Research (p73)
6. Process-Based Approaches to Modulating Gene and Protein Expression *In Vivo* and *In Vitro* (p73)
7. Basic Embryology and Developmental Toxicology (p74)

1:15 PM–5:00 PM

### AFTERNOON CONTINUING EDUCATION COURSES

8. Introduction to Pathology for Toxicologists and Study Directors (p74)
9. Nanotoxicology: The Science of Developing a Safe Technology (p74)
10. Clinical Dose Setting for Biotherapeutics (p75)
11. Use of Data for Development of Uncertainty Factors in Non-Cancer Risk Assessment (p75)
12. Essential Informatics for Toxicologists: Knowledge Management End-to-End (p76)
13. Epidemiology for Toxicologists: Introduction (p76)

## Thematic Approach

Session titles related to each theme are color coded in the Program overview.

**Developmental Basis of Disease**—understanding birth defects and how lifelong changes in health and disease may follow the exposure to hazardous chemicals during prenatal, infantile, or early childhood stages. Recent epidemiological data suggest that chronic diseases such as diabetes and hypertension may follow a particular event early in life. The cross-cutting goal is to advance scientific understanding of the source-disease outcome from intrauterine or childhood exposure to hazardous chemicals.

**Nanotechnology**—the use of nanomaterials as the building blocks for this promising new technology. Currently being utilized in many diverse areas such as engineering, information technology, and diagnostics, nanomaterials are now routinely produced and commercialized. Because little is known about their biology or the potential health impacts of these new products, these highlighted sessions will explore the potential implication(s) of their use.

**Oxidative Signaling and Redox Biology**—the importance of reactive oxygen species (ROS) in health and disease has been long recognized by toxicologists. In addition to the uncontrolled generation of ROS associated with chemical, physical, and biological toxicities, the abnormal activation of inflammatory cells is known to play an important etiologic role in many degenerative diseases. These sessions will explore how altered conditions in the cell can lead to oxidative stress, which include: 1) increased levels of transition metals or their reactive forms, 2) depletion of non-enzymatic antioxidant defenses, 3) increased generation of ROS, 4) ionizing radiation, and 5) redox cycling.

**Stem Cell Biology and Toxicology**—understanding stem cell biology and its applications and the intense debates ignited in scientific, political, and ethical spheres. The degree to which stem cells can be used in toxicological testing to replace other experimental models is still in its infancy. Given these facts, this area of research has the potential to revolutionize toxicity testing in the academic, private, and government setting. The sessions in this theme will explore some of the major challenges that must be overcome and address new issues as they arise.

**Career Development**—providing the tools and resources to toxicologists that will enhance their professional and scientific development.

## Monday, March 17

8:15 AM–9:15 AM

### PLENARY OPENING LECTURE

Perspectives on Science in the 21<sup>st</sup> Century  
Lecturer: Nobel Laureate Lee Hartwell (p87)

9:30 AM–12:15 PM

### SYMPOSIA SESSIONS

- Metals, Microglia, and Neuroinflammation (p88)
- Molecular Basis for Susceptibility to Chemical Toxicity and Disease (p88)
- New Developments in Liver Tumor Biology (p89)
- **Particle Interactions with Biomaterials: Beyond Opsonization** (p89)

### WORKSHOP SESSIONS

- Current Perspectives on Ocular and Systemic Safety Risks of Therapeutics (p90)
- LLNA: False Positives, False Negatives, and Alternative Endpoints (p90)

### PLATFORM SESSIONS

- Advancing the Science of Risk Assessment (p91)
- **Altered Reproductive Development** (p91)
- **Developmental Immunotoxicology, Host Resistance and Genomics** (p92)
- Ecotoxicity and Chemical Exposure (p93)
- **Oxidative Stress, DNA Strand Breaks, and Applications of the COMET Assay** (p93)

9:30 AM–12:30 PM

### POSTER SESSIONS

- Animal Models (p102)
- Bioinformatics and Computational Toxicology (p105)
- Chemical and Biological Weapons (p97)
- Endocrine Mechanisms of Toxicity (p94)
- Immunotoxicology (p99)
- **Inhalants: Oxidative and Redox Mechanisms** (p109)
- **Oxidative Stress Mechanisms in Chemical Carcinogenesis** (p95)
- Pesticide Metabolism and Toxicity (p107)
- Xenobiotic Biotransformation II (p110)

12:15 PM–1:30 PM

### ROUNDTABLE SESSIONS

- **The Future of Toxicology** (p113)
- Risk Assessment for Biotherapeutics (p112)

12:30 PM–1:20 PM

### MERIT AWARD LECTURE

The Dose Makes the Toxicologist—*Paracelsus* as Seen from Switzerland  
Lecturer: Hanspeter Witschi (p114)

1:00 PM–4:30 PM

### POSTER SESSIONS

- Alternative Ocular and Dermal Models (p114)
- Apoptosis: Mechanisms and Methods (p116)
- Biomarkers (p118)
- Food Safety I (p126)
- Genetic Polymorphisms (p120)
- Kidney (p124)
- Modulators of Cell Proliferation in Chemical Carcinogenesis (p129)
- **Nanoparticles: Testing Approaches, Geno- and Ecotoxicity** (p122)
- Receptors (p130)
- Safety Assessment, Non-Pharmaceutical (p128)
- **Stem Cell Biology and Toxicology** (p117)

## 1:30 PM–4:15 PM

### SYMPOSIUM SESSIONS

- Drug-Induced Mitochondrial Toxicity: Novel Insights—Novel Tools (p133)
- Environmental Influence on Female Puberty and Breast Tumorigenesis (p133)
- Oxidant Air Pollution and Childhood Asthma (IAT) (134)
- Stem Cells: New Tools for Neurotoxicologists (IAT) (p134)

### WORKSHOP SESSIONS

- Getting the Most Out of Model Organism Databases: From the Basic to the Complex (p135)
- Mixture Exposures to Metals/Metalloids and Related Health Effects (p136)
- Where the Rubber Meets the Road: Current Application of Genomic Tools in Product Development and Decision Making (p136)

### INFORMATIONAL SESSION

Future Paths for Puget Sound: Contaminants, Cultures, and Ecosystem Risk Characterization—A Special Regional Interest Session (p137)

### PLATFORM SESSIONS

- APC's, B Cells and Haematopoiesis (p137)
- Disposition/Pharmacokinetics (p138)
- Frontiers in Liver Toxicology Research (p138)

## 4:30 PM–5:50 PM

### ROUNDTABLE SESSION

Immunotoxicity Testing: Should Elevated Antibody Responses be Interpreted as an Indicator of Immunotoxicological Hazard? (p140)

### HISTORICAL HIGHLIGHT SESSION

Ozone Toxicology: Historical Perspectives of the Science that Shaped the Regulatory Standards (p140)

### INFORMATIONAL SESSION

Putting Your Best Foot Forward: Job Interviewing Workshop for Early-Career Scientists (p141)

## Tuesday, March 18

## 7:30 AM–8:50 AM

### ISSUES SESSION

Over-the-Counter Cough and Cold Medications in Children: Efficacy, Safety, and Use (p142)

### ROUNDTABLE SESSIONS

- Breaking the Log-Jam: Public-Private Partnerships as a Way to Discover and Advance Biomarkers of Drug-Induced Toxicity (p143)
- Reproductive Toxicity Studies: One Generation versus Two Generations (p143)
- The 2007 Pet Food Related Toxic Nephropathy in Dogs and Cats (p144)

### INFORMATIONAL SESSION

Detection of Biological Free Radicals in Time and Space (p144)

## 8:00 AM–8:50 AM

### DEBATE

SOT/EUROTOX Debate: *In Vitro* Toxicology Is Useful for Regulatory Purposes (p145)

## 9:00 AM–11:45 AM

### SYMPOSIUM SESSIONS

- Molecular and Genomic Insights into the Nrf2-Regulated Oxidative Stress Response: Impact on Carcinogenesis (p146)
- New Concepts in the Etiology of Breast Cancer: From Genes to Environment and Back Again (p146)

### WORKSHOP SESSIONS

- Drug-Related Torsades de Pointes: Advancements in Preclinical Modeling of Potential Cardiac Toxicity (p147)
- The Allergic March: The Role of Chemicals in the Increasing Prevalence of Allergy and Asthma (p147)
- To Dye or Not to Dye: Safety of Oxidative Hair Dyes (p148)

### INFORMATIONAL SESSION

Professional Career Development as a Toxicologist (p148)

## PLATFORM SESSIONS

- Accelerating Discoveries in Toxicology Through 'Omics Research (p149)
- Chemical and Biological Weapons: Molecular Basis for Detection and Therapeutic Potential (p150)
- Developmental Basis of Disease (p150)
- Health Risks and Food Safety (p151)
- Manganese Neurotoxicity: From Worms to Primates (p152)

## 9:00 AM–12:30 PM

### POSTER SESSIONS

- Adverse Effects of Natural Products (p152)
- Alternatives to Mammalian Models (p165)
- Liver I: *In Vivo* (p161)
- Mechanisms and Chemoprevention of PAH and Tobacco-Related Carcinogenesis (p164)
- Particulate Matter and the Cardiovascular System (p153)
- Persistent Organic Pollutants (POPs) (p158)
- Regulatory Risk Assessment (p167)
- Xenobiotic Biotransformation I (p156)

## 12:00 NOON–1:20 PM

### TOWN HALL MEETING

SOT Strategic Plan—Defining the Future of SOT (p171)

## 12:30 PM–1:20 PM

### DISTINGUISHED TOXICOLOGY SCHOLAR AWARD LECTURE

Half a Century of Progress in Neurotoxicology: Past, Present, and Future  
Lecturer: Toshio Narahashi (p171)

## 1:00 PM–4:30 PM

### POSTER SESSIONS

- Applications of Biological Modeling (p175)
- Assessment of Ecological Toxicology (p193)
- Breast Cancer: Mechanisms, Biomarkers, and Chemoprevention (p180)
- Inhalation Toxicology (p181)
- Liver II: *In Vitro* (p191)
- Nanoparticles: Target Organs (p177)
- Pharmacokinetics and Disposition (p172)
- Regulation/Policy (p174)
- Reproductive System (p186)
- Risk Assessment Research (p188)
- Signal Transduction and Gene Regulation (p183)

## 1:30 PM–4:15 PM

### SYMPOSIUM SESSIONS

- Endothelial Dysfunction: More Than Just a 'No NO' Phenomenon (p195)
- Neurotoxicant-Induced Alterations in Developmental and Adult Neurogenesis: Structure-Function Studies and Clinical Relevance (p196)
- Novel Biomarkers of Drug-Induced Toxicity: Outcomes of Predtox and the Predictive Safety Testing Consortium (p197)

### WORKSHOP SESSIONS

- Dermal Toxicological Assessment of Nanomaterials and Nanodevices (p197)
- Host Susceptibility and Chemical Safety Testing: New Approaches to Estimate Risks in the Human Population (ITS) (p198)
- Molecular Mechanisms and Molecular Biology of Metal Carcinogenesis (p198)
- Strategies for Assessing Developmental and Reproductive Toxicology of Bio-Pharmaceuticals (p199)

### ROUNDTABLE SESSION

Human Health Risk Assessment for Pharmaceuticals in the Environment (PIE) (p200)

### PLATFORM SESSIONS

- Arsenic Toxicity (p200)
- Mechanisms of Hypersensitivity (p201)
- Mechanisms of Pesticide Toxicity (p201)

## Wednesday, March 19

7:30 AM–8:50 AM

### ROUNDTABLE SESSIONS

- Hazard vs. Risk for Chemical Regulation (p203)
- Reconciling Scientific and Ethical Concerns in the Use of Animals for Toxicological Research (p204)
- Toxicology Training Needs: New Faces and New Tools for the 21<sup>st</sup> Century (p204)

### INFORMATIONAL SESSIONS

- Cross-Cultural Understanding of Asian and Western Cultural Values in the Workplace (p205)
- Toxicological and Public Health Challenges in Africa (p205)

8:00 AM–8:50 AM

### KEYNOTE MRC LECTURE

Biological Energy Conversion and its Toxic Consequences  
Lecturer: Nobel Laureate Professor Sir John E. Walker (p206)

9:00 AM–11:45 AM

### SYMPOSIA SESSIONS

- **Developmental Basis of Health and Disease: Persistent Effects of Tobacco Smoke Exposure (IAT) (p206)**
- Unusual Manifestations of On-Target and Off-Target Toxicity: Toxicity of Kinase Inhibitors (p207)

### WORKSHOP SESSIONS

- Natural Killer Cells as Targets of Drugs, Toxicants, and Biologicals (p207)
- Safe Approaches to Topical Product Development (p208)
- Threshold of Toxicologic Concern: Historical Perspectives and Future Applications (p208)
- Use of Behavioral and Non-Routine Neurological Approaches in Drug Discovery Toxicology (p209)

### INFORMATIONAL SESSION

Globally Harmonized System of Classification and Labelling of Chemicals (GHS): A New Language for Toxicologists (p209)

### PLATFORM SESSIONS

- Advances in Biological Modeling (p210)
- **Mechanisms of Reproductive Toxicity (p210)**
- Modulating Apoptosis for Beneficial Outcomes (p211)
- **Nanoparticles: Cellular and Organ Disposition (p212)**

9:00 AM–12:30 PM

### POSTER SESSIONS

- Application of ‘Omics Research Tools in Toxicology (p225)
- Cardiovascular System: Cardiac Effects (p231)
- **Developmental Toxicology (p221)**
- DNA Damage and Repair: Mechanisms and Agents (p233)
- Epidemiology and Exposure Assessment (p217)
- Gene Regulation and Genomic Approaches (p214)
- Mechanisms of Carcinogenesis (p213)
- Metals I (p228)
- **Nanoparticles: Inhalation and Respiratory Cell Injury (p219)**
- Respiratory and Skin Hypersensitivity (p215)
- Skin Penetration and Toxicity (p223)

12:00 NOON–1:20 PM

### INFORMATIONAL SESSION

Mentoring 101—How to Mentor, and How to be Mentored (p236)

### MEET THE DIRECTORS: A CONVERSATION WITH THE DIRECTORS

NIEHS Strategic Plan  
Lecturer: Samuel Wilson (p235)

1:00 PM–4:30 PM

### POSTER SESSIONS

- Biomarkers: Methods (p241)
- **Developmental Neurotoxicity (p237)**
- Human Biomarkers (p240)
- Juvenile Toxicity (p242)
- Metal Neurotoxicology: Experimental Models and Mechanisms (p248)
- Neurotoxicity: Miscellaneous Compounds, Models, and Mechanisms (p245)
- **Oxidative Injury and Redox Biology I: *In Vivo* (p255)**
- Pharmaceuticals (p251)
- Risk Assessment Applications (p243)
- Safety Assessment, Pharmaceutical—Liver, Kidney, Immune System (p253)

1:30 PM–4:15 PM

### SYMPOSIA SESSIONS

- Arsenic and Cardiovascular Disease (p257)
- **Nanomaterial Pharmacokinetics: Where We Are and Where We Need to Go (p258)**

### WORKSHOP SESSIONS

- Advances in Technology and Increasing Acceptance for Zebrafish Use in Drug Discovery (p258)
- Chlorotriazine Herbicides and their Common Degradation Products of Concern: Disposition and Potential Health Effects (p259)
- Interdisciplinary Approaches for Improving Chemical Hazard Testing Paradigms (p259)

### PLATFORM SESSIONS

- Apoptosis: Cardiopulmonary Targets (p260)
- Immunotoxicology: T Cells (p261)
- Issues in Regulatory Risk Assessment (p261)
- **New Insights for Developmental Toxicology (p262)**
- Nrf2 Induced Gene Regulation (p262)
- Selective Dopaminergic Neurotoxicity: Genetics and Mechanisms (p263)

4:30 PM–5:50 PM

### ROUNDTABLE SESSION

A Case Study on the Risks and Benefits of Deca-BDE—a Major Brominated Flame Retardant (p264)

### INFORMATIONAL SESSIONS

- Implementation of the ICH S8 Immunotoxicity Testing Guideline (p264)
- **NIEHS Outstanding New Environmental Scientists (ONES) Awardees (p265)**

## Thursday, March 20

7:30 AM–8:50 AM

### ISSUES SESSION

2007 National Research Council-National Academy of Sciences Reports: Impact on the Future of Toxicology (p266)

### ROUNDTABLE SESSION

Biofuel Combustion: An Emerging Health Problem? (p266)

8:30 AM–12:00 NOON

### POSTER SESSIONS

- AHR Mechanisms (p275)
- Cardiovascular System: Vascular Effects (p278)
- Chemoprevention (p276)
- Fish Alternative Models of Toxicity (p277)
- Food Safety II (p280)
- High Throughput, High Content Approaches to Assessing Genotoxicity (p282)
- Metals II (p269)
- Method Development, Autoimmunity, and Disease Mechanisms in Immunotoxicology (p272)
- **Oxidative Injury and Redox Biology II: *In Vitro* (p266)**
- Pesticide Neurotoxicity (p283)
- Safety Assessment, Pharmaceutical—Techniques, Pulmonary, Cardiovascular (p286)

9:00 AM–11:45 AM

### SYMPOSIA SESSIONS

- Cellular Redox Status and Zinc Signaling (p288)
- **Perinatal Exposure to Nucleoside Reverse Transcriptase Inhibitors (NRTIs) Induces Transplacental Genotoxicity and Mitochondrial Toxicity (p288)**
- **Stem Cells in Developmental and Reproductive Biology and Toxicology (p289)**

### WORKSHOP SESSIONS

- Genotoxicity Testing from Early Discovery through Regulatory Submission: A Comprehensive Primer (p290)
- Incorporation of Mode-of-Action into Mechanistically-Based Quantitative Models (p290)
- **Pulmonary Toxicity Testing of Nanoparticles (p291)**

### INFORMATIONAL SESSION

REACH: Implementation, Chemical Safety, and Information Requirements (p291)