Scientific Program Overview

Sunday, March 12
7:00 AM to 7:45 AM
CONTINUING EDUCATION SUNRISE MINI-COURSE
SR01 Molecular Imaging for Toxicologists (p91)

8:15 AM to 12:00 Noon
CONTINUING EDUCATION MORNING COURSES
AM02 Adding Up Chemicals: Component-Based Risk Assessment of Chemical Mixtures (p91)
AM03 Current Principles for Nonclinical Chronic Toxicity/ Carcinogenicity Testing of Environmental Chemicals (p92)
AM04 Navigating Drug-Induced Vascular Injury in Preclinical and Clinical Development of Novel Therapeutics (p92)
AM05 New Concepts and Technologies in Metals Toxicology (p93)
AM06 Reproductive Toxicity: Challenges and Practical Approaches to Determine Risk in Drug Development (p93)
AM07 Technologies and Applications of Stem Cells for Use in Toxicology (p94)

1:15 PM to 5:00 PM
CONTINUING EDUCATION AFTERNOON COURSES
PM08 Detecting Cancer Risk in Drugs: Design, Conduct, and Interpretation of Carcinogenicity Studies for Regulatory Approvals (p94)
PM09 Developmental and Reproductive Toxicology (DART) and Risk Assessment of Environmental Chemicals: Applications, Complexities, and Novel Approaches (p95)
PM10 Emerging Approaches in Genetic Toxicology for Product Development (p95)
PM11 Extrapolation in the Airways: Strategies to Incorporate In Vivo and In Vitro Data to Better Protect Human Health (p96)
PM12 Health-Based Limits for Toxicological Risk Assessment: Setting Acceptable Daily Exposures for Pharmaceutical and Chemical Safety (p96)
PM13 Read-Across: Case Studies, New Techniques, and Guidelines for Practical Application (p97)

Monday, March 13
8:00 AM to 9:20 AM
DAILY PLENARY SESSION
• Data Science
Lecturers: Peter Sorger, Harvard Medical School; and Lara Mangravite, Sage Bionetworks (p101)

9:30 AM to 12:15 PM
SYMPOSIUM SESSIONS
• Early-Life Inorganic Arsenic Exposures and Later-in-Life Effects (p102)
• Organs-on-a-Chip, Tissue Bioprinting, and 3D Cultures: Next Generation Models for Toxicology in the 21st Century (p103)
• Translational Control in Disease Progression and Xenobiotic-Mediated Toxicity (p103)

WORKSHOP SESSIONS
• Cross-Industry and Regulatory Approach for the Identification and/ or Qualification of Novel Safety Biomarkers of Drug-Induced Vascular Injury (DIVI) (p104)
• Fit for Purpose: Using Computational Models for Risk (p104)
• Scientific, Regulatory, and Safety Considerations for Probiotics and Microbiome Targeted Therapeutics (p105)

PLATFORM SESSIONS
• Investigating Mode of Action in Chemical Carcinogenesis (p105)
• Ozone and Inflammation (p106)

9:30 AM to 12:45 PM
POSTER SESSIONS
• Carcinogenesis I (p106)
• Carcinogenesis II (p108)
• Developmental and Juvenile Toxicity (p114)
• Epidemiology and Public Health (p118)
• Epigenetics (p121)
• Liver: In Vivo and In Silico Approaches (p116)
• Mixtures (p109)
• Nanotoxicology: In Vivo (p120)
• Neurotoxicology: Metals—Cd, Pb, and Others (p111)
• Neurotoxicology: Metals—Mercury (p110)
• Receptors, Gene Regulation, and Signaling (p111)
• Reproductive Toxicology (p113)

9:30 AM to 3:00 PM
RESEARCH FUNDING INSIGHTS
• Network with Program Officers (p123)

12:30 PM to 1:20 PM
MERIT AWARD LECTURE
• Cell Proliferation and Carcinogenesis: Bad Luck and the Environment
Lecturer: Samuel M. Cohen, University of Nebraska Medical Center (p125)
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:30 PM to 1:50 PM</td>
<td><strong>ROUNDTABLE SESSION</strong></td>
<td>• Bias and Conflict of Interest in Conducting Research and Risk Assessments: Perspectives from Academia, Government, Industry, and Others (p125)</td>
</tr>
<tr>
<td>1:15 PM to 4:30 PM</td>
<td><strong>INFORMATIONAL SESSIONS</strong></td>
<td>• Advances in Preclinical Safety Testing: Progress in Implementation of ICH Guidances (p126)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Supporting Open Data in Toxicology (p126)</td>
</tr>
<tr>
<td>1:30 PM to 2:30 PM</td>
<td><strong>MEET THE DIRECTORS</strong></td>
<td>• A Conversation with Linda S. Birnbaum and Robert J. Kavlock</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Panelists: Linda S. Birnbaum, NIEHS; and Robert J. Kavlock, US EPA (p137)</td>
</tr>
<tr>
<td>2:00 PM to 4:45 PM</td>
<td><strong>SYMPOSIUM SESSIONS</strong></td>
<td>• Cell Health and Mechanistic Assays for the In Vitro Prediction of DILI (p138)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Circadian Rhythms in Air Pollution-Induced Pulmonary and Cardiovascular Disorders: A Race against the Clocks (p138)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lifespan Neuroimmunotoxicology: Age-Dependent Neuroimmune Dyshomeostasis Caused by Pollutants, Pathogens, and Psychoactive Substances (p139)</td>
</tr>
<tr>
<td>3:00 PM to 4:30 PM</td>
<td><strong>RESEARCH FUNDING INSIGHTS SESSION</strong></td>
<td>• Research Funding 101: Multiple Perspectives on the NIH Grant Process (p143)</td>
</tr>
<tr>
<td>4:45 PM to 6:00 PM</td>
<td><strong>SOT/EUROTOX DEBATE</strong></td>
<td>• Toxicology Testing of Drug Combinations Does Not Add Significant Value to Human Risk Evaluation Beyond What Is Known for the Individual Agents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lecturers: Kenneth L. Hastings, Hastings Toxicology Consulting LLC; and Philip Bentley, Toxicodynamix International LLC (p144)</td>
</tr>
<tr>
<td>8:00 AM to 9:20 AM</td>
<td><strong>DAILY PLENARY SESSION</strong></td>
<td>• Precision Medicine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lecturers: Jun J. Yang, St. Jude Children’s Research Hospital; and Richard Barker, University of Oxford (p147)</td>
</tr>
<tr>
<td>9:30 AM to 12:15 PM</td>
<td><strong>SYMPOSIUM SESSIONS</strong></td>
<td>• Cardiopulmonary Consequences of Gestational Toxicant Exposure: Getting to the Heart of the Matter (p148)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Contribution of Gene Transcription to Spontaneous Mutation and Genotoxic Outcomes: LTS I (p148)</td>
</tr>
<tr>
<td>9:30 AM to 12:45 PM</td>
<td><strong>POSTER SESSIONS</strong></td>
<td>• Incorporating In Vitro Reproductive and Developmental Assays into Regulatory Risk Assessment (p149)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Opportunities for Read-Across Development and Application Using QSAR Approaches (p149)</td>
</tr>
<tr>
<td>10:45 AM to 2:30 PM</td>
<td><strong>INFORMATIONAL SESSION</strong></td>
<td>• Thresholds of Toxicological Concern: 21st Century Safety Assessment (p150)</td>
</tr>
<tr>
<td>1:30 PM to 4:55 PM</td>
<td><strong>PLATFOM SESSIONS</strong></td>
<td>• Chemical and Biological Weapons (p150)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Endocrine Toxicology (p151)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Mechanisms of Toxicity: SPC Highlights Emerging Scientists (p151)</td>
</tr>
<tr>
<td>2:00 PM to 4:45 PM</td>
<td><strong>WORKSHOP SESSIONS</strong></td>
<td>• Toxicology Testing of Drug Combinations Does Not Add Significant Value to Human Risk Evaluation Beyond What Is Known for the Individual Agents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lecturers: Kenneth L. Hastings, Hastings Toxicology Consulting LLC; and Philip Bentley, Toxicodynamix International LLC (p144)</td>
</tr>
<tr>
<td>3:00 PM to 4:45 PM</td>
<td><strong>WORKSHOP SESSIONS</strong></td>
<td>• Bispecific Molecules: Nonclinical and Clinical Development Challenges (p139)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Controversies in Pesticide Toxicology (p140)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Improving Public Health through Innovations in Exposure Science (p141)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Modernizing Toxicological Risk Assessment for Compounds Released from Pharmaceutical, Consumer, Medical Device and Combination Products: Alternative Tools and Methods (p141)</td>
</tr>
<tr>
<td>4:45 PM to 7:00 PM</td>
<td><strong>DAILY PLENARY SESSION</strong></td>
<td>• Dose-Response Assessment and Toxicity Reference Value Derivation (p162)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Exposure Assessment and Biomonitoring (p164)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Immunotoxicology (p169)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Kidney (p160)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Metals I: Arsenic and Lead (p159)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Neurotoxicology: General Neurotoxicity (p156)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Non-Pharmaceutical Safety Assessment (p163)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ocular Toxicology (p158)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Oxidative Injury and Redox Biology (p168)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pharmaceutical Safety: Drug Development (p153)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pharmaceutical Safety: Drug Discovery (p152)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tobacco Products (p166)</td>
</tr>
</tbody>
</table>
9:30 AM to 4:30 PM

**RESEARCH FUNDING INSIGHTS**
- Network with Program Officers (p171)

1:15 PM to 4:30 PM

**POSTER SESSIONS**
- Biomarkers (p173)
- Biotransformation (p186)
- Cell Death Mechanisms (p177)
- Chemical and Biological Weapons (p175)
- Genetic Toxicity (p186)
- Medical Devices (p181)
- Metals II: Cadmium and Mercury (p178)
- Metals III: Various Metals and Mixtures (p179)
- Nanoparticle Exposure, Dosimetry, and In Silico Modeling (p188)
- Regulation and Policy (p182)
- Skin (p183)
- The Developmental Basis of Adult Disease (p184)

2:00 PM to 4:45 PM

**SYMPOSIUM SESSIONS**
- Big Data, Meet Chemical Carcinogenesis! Are There New Solutions for an Old Problem? (p190)
- Chemically-Induced Neuroinflammation and “Sickness Behavior” Disorders (p190)
- Emerging Concepts in Nonclinical Development of Immuno-Oncology Agents: Enabling Translation of Nonclinical Pharmacology and Safety Information to First-in-Human Clinical Trials (p190)
- Lost in Translation: Bringing the Real World to In Vitro Data (p191)
- miRNAs As Translational Biomarkers of Kidney Injury (p191)

**WORKSHOP SESSIONS**
- Low Dose Non-Monotonic Responses (p192)
- Safety or Prediction? What is the Future of Regulatory Toxicity Testing? (p192)

**PLATFORM SESSION**
- Particulate Matter and Cardiovascular Impairment (p193)

4:45 PM to 6:15 PM

**SOT ANNUAL BUSINESS MEETING**
- SOT Members are encouraged to attend (p194)

5:00 PM to 6:20 PM

**EDUCATION-CAREER DEVELOPMENT SESSION**
- Careers for Toxicologists at Primarily Undergraduate Institutions: Everything You Need to Know About the Job, Hiring Process, and Strategies for Success in Teaching and Research (p194)

**Wednesday, March 15**

8:00 AM to 9:20 AM

**DAILY PLENARY SESSION—KEYNOTE MEDICAL RESEARCH COUNCIL (MRC) LECTURE**
- The Exposome: Challenges and Opportunities
  Lecturer: Paul Elliott, Imperial College (p221)

9:30 AM to 12:15 PM

**SYMPOSIUM SESSIONS**
- Investigating Metabolic Diseases Using Integrated ‘Omics Approaches (p197)
- The Skin As a Metabolic and Immune-Competent Organ: Implications for Pharmaceutical Development and Safety Assessment (p198)

**WORKSHOP SESSIONS**
- 3D Cell Platforms to Advance Toxicological Sciences (p198)
- Challenges and Novel Approaches Evaluating Developmental and Reproductive Toxicity of Biotherapeutics (p199)
- Circulatory Mechanisms Underlying the Systemic Effects of Inhaled Nanoparticles and Complex Combustion Mists: Common Pathways for Diverse Toxicants (p199)
- Increasing the Utility and Acceptance of Chemical Specific Adjustment Factors—International Experience (p200)
- Measurement and Prediction of Chemicals in Consumer Products (p200)

9:30 AM to 12:15 PM

**SYMPOSIUM SESSIONS**
- Investigating Metabolic Diseases Using Integrated ‘Omics Approaches (p197)
- The Skin As a Metabolic and Immune-Competent Organ: Implications for Pharmaceutical Development and Safety Assessment (p198)

**WORKSHOP SESSIONS**
- 3D Cell Platforms to Advance Toxicological Sciences (p198)
- Challenges and Novel Approaches Evaluating Developmental and Reproductive Toxicity of Biotherapeutics (p199)
- Circulatory Mechanisms Underlying the Systemic Effects of Inhaled Nanoparticles and Complex Combustion Mists: Common Pathways for Diverse Toxicants (p199)
- Increasing the Utility and Acceptance of Chemical Specific Adjustment Factors—International Experience (p200)
- Measurement and Prediction of Chemicals in Consumer Products (p200)

9:30 AM to 12:15 PM

**SYMPOSIUM SESSIONS**
- Investigating Metabolic Diseases Using Integrated ‘Omics Approaches (p197)
- The Skin As a Metabolic and Immune-Competent Organ: Implications for Pharmaceutical Development and Safety Assessment (p198)

**WORKSHOP SESSIONS**
- 3D Cell Platforms to Advance Toxicological Sciences (p198)
- Challenges and Novel Approaches Evaluating Developmental and Reproductive Toxicity of Biotherapeutics (p199)
- Circulatory Mechanisms Underlying the Systemic Effects of Inhaled Nanoparticles and Complex Combustion Mists: Common Pathways for Diverse Toxicants (p199)
- Increasing the Utility and Acceptance of Chemical Specific Adjustment Factors—International Experience (p200)
- Measurement and Prediction of Chemicals in Consumer Products (p200)

12:30 PM to 1:20 PM

**DISTINGUISHED TOXICOLOGY SCHOLAR AWARD LECTURE**
- Dioxins and the Ah Receptor: Synergy of Discovery
  Lecturer: Linda S. Birnbaum, NIEHS (p222)

12:30 PM to 1:50 PM

**ROUNDTABLE SESSIONS**
- Designing a Carcinogenic Mode-of-Action Research Program Useful for Regulatory Decision Making: Challenges and Lessons Learned (p222)
- Herbo-Metallic Mixtures in Traditional Medicines (p223)

**INFORMATIONAL SESSIONS**
- Communicating Toxicology to the Public (p223)
- Data Science to Generate Toxicity Signatures (p224)

**HISTORICAL HIGHLIGHTS SESSION**
- NIEHS Superfund Research Program: A History of Cutting-Edge Science and Innovative Technologies (p224)
### POSTER SESSIONS

- Alternatives to Mammalian Models I: Liver, Ocular, and Skin Alternatives (p225)
- Alternatives to Mammalian Models II (p227)
- Autoimmunity/Hypersensitivity (p236)
- Cardiovascular and Hemodynamics Toxicity (p241)
- Ecotoxicology (p231)
- Education, Ethical, Legal, and Social Issues (p240)
- General Toxicology (p239)
- Inflammation in Disease (p238)
- Inflammation: Methods and Mechanisms (p239)
- Nanotoxicology: General (p233)
- Neurotoxicology: Pesticides (p232)
- Quantitative Systems Toxicology (p234)
- Risk Assessment Strategies and Applications (p229)

### SYMPOSIUM SESSIONS

- Enhancing the Clinical Benefit of Cancer Drugs: Toxicity As a Therapeutic Target (p243)
- Increasing Confidence in Safety Assessment Decisions: The Inclusion of Metabolism in Toxicity Testing Strategies (p243)
- Novel In Vitro and In Silico Platforms for Modeling Developmental and Reproductive Toxicity (ITS) (p244)

### WORKSHOP SESSIONS

- Data Standardization Across 'Omic Platforms in Regulatory Toxicology (p245)
- Is There a Concern for Neurotoxicity from Replacement Organophosphorus Flame-Retardants?: Insights Using Molecular Approaches, Systems Biology, and Human Exposure (p246)

### 5:00 PM to 5:50 PM

#### TRANSLATIONAL IMPACT AWARD LECTURE

**Development of a Clinical Diagnostic Test for Acetaminophen Liver Injury**

*Lecturer: Laura P. James, University of Arkansas for Medical Sciences, Arkansas Children’s Hospital (p247)*

### 5:00 PM to 6:20 PM

#### SOCIETY OF TOXICOLOGY AND JAPANESE SOCIETY OF TOXICOLOGY MINI-SYMPOSIUM

**Immune Factors in Drug-Induced Liver Injury**

*Lecturers: Robert A. Roth, Michigan State University; and Tsuyoshi Yokoi, Nagoya University Graduate School of Medicine (p247)*

### ROUNDTABLE SESSION

**Implementing Developmental Thyroid Toxicity Guidance into Practice: What’s Working, What’s Not, and How Can We Do Better?** (p248)

### INFORMATIONAL SESSIONS

- Addressing Rigor and Transparency in Research and Journal Publications (p248)
- Bioinformatics Tools for Accelerated Hypothesis Generation and Mechanistic Insights (p249)

### EDUCATION-CAREER DEVELOPMENT SESSION

**Mastering Soft Skills to Advance Your Scientific Career** (p249)

### Thursday, March 16

### 8:30 AM to 11:15 AM

#### SYMPOSIUM SESSIONS

- Evaluating the Reproductive and Developmental Effects of Botanical Dietary Supplements (p251)
- *In Vitro* and Alternative Methods in Ocular Toxicology: The “Eyes” Have It (ITS) (p252)
- Quantitative Systems Toxicology for Chemical Safety Assessment (ITS) (p252)
- The Next Technology Wave: Biosensors, Extreme Computing, and Organ Chips for Predicting Cardiovascular Toxicity (ITS) (p253)

#### WORKSHOP SESSIONS

- Biological Advances to Help Navigate the Nonclinical Safety Assessment Strategy in Cancer Immunotherapy: Utility, Limitations, and Future Direction (p253)
- Microparticles and Exosomes in Cardiopulmonary System-Stem Cell and Microenvironment Regulation by Toxicants (p254)
- New Findings on Pyrethroid Developmental Neurotoxicity: An Alternate Approach to Charactering Age-Related Differences to Hazard Identification (p254)

### 8:30 AM to 11:45 AM

#### POSTER SESSIONS

- Alternatives to Mammalian Models III (p255)
- Biological Modeling (p256)
- Emerging Technologies (p259)
- Systems Toxicology (p258)
- Late-Breaking Poster Sessions—Session topics available via Mobile Event App or Online Planner.