



EPA's Society of Toxicology Annual Meeting Participation

Workshops, Symposia, Roundtable Sessions,
Awards and Honors, etc.

Please visit epa.gov/research/sot for more
information

- **Overview of EPA Computational Toxicology Research at SOT**
 - Monica Linnenbrink
- **Overview of EPA Booth Activities**
 - Christina Baghdikian
- **Organotypic Cell Grant Announcement and Kickoff Meeting**
 - Intaek Hahn





SOT Honors and Awards, Sunday March 22

- **Best Paper in Toxicological Sciences Award (Thomas et al)**
- **Best Postdoctoral Publication Award (Powers et al & Kim et al)**

Related Symposia

- **Alternative Models to Study Classical Toxicants: A Mechanistic View- Tuesday March 24 (VanDuyn and Truong)**
- **Incorporating In Vitro Pharmacokinetic Data and Tools into Toxicity Testing and Risk Assessments: State of the Science – Tuesday March 24 (Lipscomb & Wambaugh)**
- **Exposure Assessment in the 21st Century: Needs and Challenges Facing High-Throughput Exposure Modeling – Thursday March 26 (Knott and Wambaugh)**



Some Featured Sessions

- **Meet the Directors, Monday March 23 (Jim Jones, EPA Assistant Administrator)**
- **Chemical Safety for Sustainability/NCER STAR Grant Awards Announcement and Kick-Off Meeting: Organotypic Cell Culture Models for Predictive Toxicology Wednesday March 25 (<http://epa.gov/ncer/events/#mar2515>)**
- **Center for Alternatives for Animal Testing, The Human Toxome Project and the Human Toxicology Project Consortium “Updates on Activities Related to 21st Century Toxicology and Evidence-based Toxicology” Satellite Meeting, Thursday March 26 (Thomas and Dix)**



Dr. Jim Jones



CompTox Research Highlighted at SOT

Some Workshops

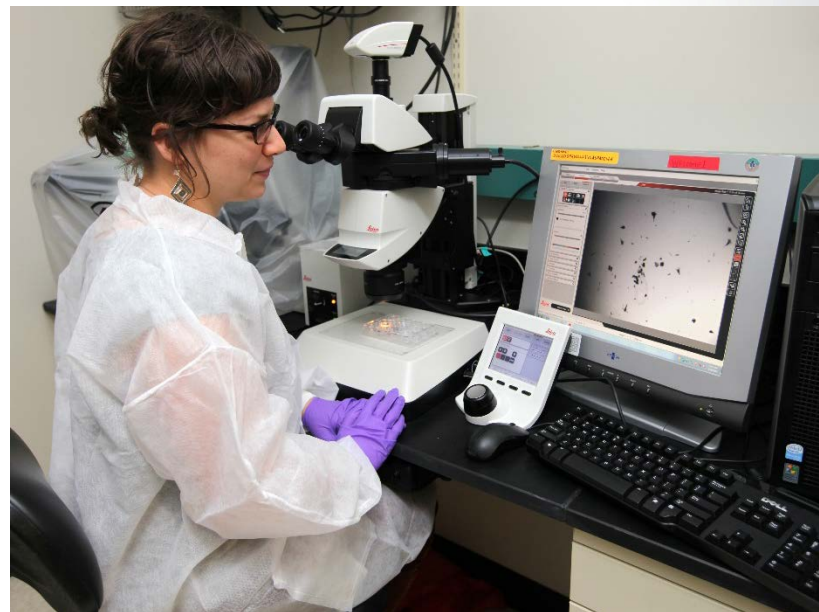
- **US Tox21 Collaboration: Advances Made and Lessons Learned, Monday March 23 (Bob Kavlock-Chair and Linda Birnbaum-Chair; Tina Bahadori-Presenter and Russell Thoms-Presenter)**
- **Considering Pharmacokinetics As a Mechanistic Basis to Link Chemical Exposures to Adverse Outcome Pathways, Tuesday March 24 (Edwards & Tan)**
- **The EDSP Screening Battery: A Work in Progress for Prioritizing Compounds for Quantitative Risk Assessment, Tuesday March 24 (Browne & Gray)**
- **Application of High-Throughput In Vitro Assays in Assessing Small Molecule Safety, Wednesday March 25 (Thomas)**
- **Integrating Gene Expression Profiling into High-Throughput Toxicity Testing, Wednesday March 25 (Corton, Thomas & Wambaugh)**
- **Microphysiological Models of the Developing Nervous System: Biologically Driven Assembly Inspired by Embryology and Translated to Human Developmental Toxicology, Thursday March 26 (Knudsen, Chair)**
- **Painting the Future of Repeat-Dose Systemic Toxicity Testing: Progress from the European SEURAT-I Project, Thursday March 26 (Thomas, Chair)**



CompTox Research Highlighted at SOT

Poster Examples

- **Identification of Chemical Vascular Disruptors during Development Using Integrative Predictive Toxicity Model, Zebrafish and In Vitro Angiogenesis (Tal, Poster #402, March 23)**
- **Tutorial Video Series: Using Stakeholder Outreach to Increase Usage of ToxCast Data (Baghdikian, Poster #517, March 24)**
- **Integration into Big Data: First Steps to Support Reuse of Comprehensive Toxicity Model Modules (Watford, Poster #435, March 25)**





EPA Events at SOT: Booth Events and Activities

Demo Sessions, Meet the Directors,
Materials, Etc.



EPA Booth #2133

- **Meet EPA Directors**
- **Demonstrations of Online Tools**
- **Materials about EPA research, job opportunities, funding opportunities, chemical safety programs and more**





Meet the EPA Directors at Booth

● EPA Directors

- **Dr. Thomas Burke, Deputy Assistant Administrator & Science Advisor**
- **Dr. Robert Kavlock, Deputy Assistant Administrator for Science**
- **Dr. Tina Bahadori, Chemical Safety for Sustainability National Research Program Director**
- **Dr. William Benson, National Health and Environmental Effects Research Lab Director**
- **Dr. Jennifer Orme-Zavaleta, National Exposure Research Lab Director**
- **Dr. Russell Thomas, National Center for Computational Toxicology Director**
- **Dr. David Dix, Office of Chemical Safety and Pollution Prevention/Office of Science Coordination and Policy Director**



Dr. Thomas Burke



Dr. Robert Kavlock



Dr. William Benson



Dr. David Dix



Dr. Tina Bahadori



Dr. Jennifer Orme-Zavaleta



Dr. Russell Thomas



Demo Sessions

- **Demonstration sessions of EPA tools (Mon-Wednesday)**
 - **Endocrine Disruption Screening Program in the 21st Century Dashboard**
 - **Chemical Product Category Database**
- **Conducted by scientists, small groups, informal setting and opportunity to talk with those with in-depth knowledge of the tools**





Demo Sessions

Monday

Demonstration Name	Presenter	Date	Time	Location
eLibraries/Litsearch Tools	Nancy Baker	Monday, March 23	1:00 PM to 1:45 PM	EPA Exhibit Booth
Virtual Embryo	Tom Knudsen	Monday, March 23	2:15 PM to 3:00 PM	EPA Exhibit Booth
iCSS Dashboard	Sean Watford	Monday, March 23	3:30 PM to 4:15 PM	EPA Exhibit Booth

Tuesday

Demonstration Name	Presenter	Date	Time	Location
HTTK R Package	John Wambaugh	Tuesday, March 24	9:30 AM – 10:30 AM	EPA Exhibit Booth
CPCat Database	Chantel Nicolas	Tuesday, March 24	11:00 AM – 12:00 PM	EPA Exhibit Booth
ToxCast Data Download Page	Dayne Filer	Tuesday, March 24	1:00 PM to 1:45 PM	EPA Exhibit Booth
AOP Wiki	Steve Edwards	Tuesday, March 24	2:15 PM to 3:00 PM	EPA Exhibit Booth
ToxCast Pipeline R Package	Dayne Filer	Tuesday, March 24	3:30 PM to 4:15 PM	EPA Exhibit Booth

Wednesday

Demonstration Name	Presenter	Date	Time	Location
ToxCast Data Download Page	Agnes Karmaus	Wednesday, March 25	9:30 AM – 10:30 AM	EPA Exhibit Booth
EDSP21 Dashboard	Kamel Mansouri	Wednesday, March 25	11:00 AM – 12:00 PM	EPA Exhibit Booth
iCSS Dashboard	Kristin Connors	Wednesday, March 25	1:00 PM to 1:45 PM	EPA Exhibit Booth
EDSP21 Dashboard	Matt Martin	Wednesday, March 25	2:15 PM to 3:00 PM	EPA Exhibit Booth
iCSS Dashboard	Jill Franzosa	Wednesday, March 25	3:30 PM to 4:15 PM	EPA Exhibit Booth

- **Research program and project factsheets**
- **Funding and employment opportunity information**
 - **Fellowship, Post-doc, student information**
 - **STAR Grant**





**The U.S. Environmental Protection Agency
Presents the
Organotypic Culture Models for Predictive
Toxicology
STAR Research Centers**

**SOT 2015 Annual Meeting
San Diego Convention Center, Room 5B
March 25, 5-7 PM**



Organotypic Culture Models for Predictive Toxicology Centers (OCMs) Centers

- **EPA's Science to Achieve Results (STAR) grants program requested proposals for Research Centers to develop *in vitro* systems of cell culture methodologies able to replicate human biological functions and interactions within complex tissues or organs – “Organotypic Culture Models” (OCMs)**
- **Advances in nanotechnology, cell culture technology, computational power and micro-engineering and fluidics are enabling the transformation of toxicity testing platforms.**
- **Organotypic Culture Models (aka organ on a chip, bioengineered platforms or microphysiological systems) are emerging as a means of addressing the diversity, complexity, and integration of biological responses to environmental exposures.**





Why OCMs are Needed?

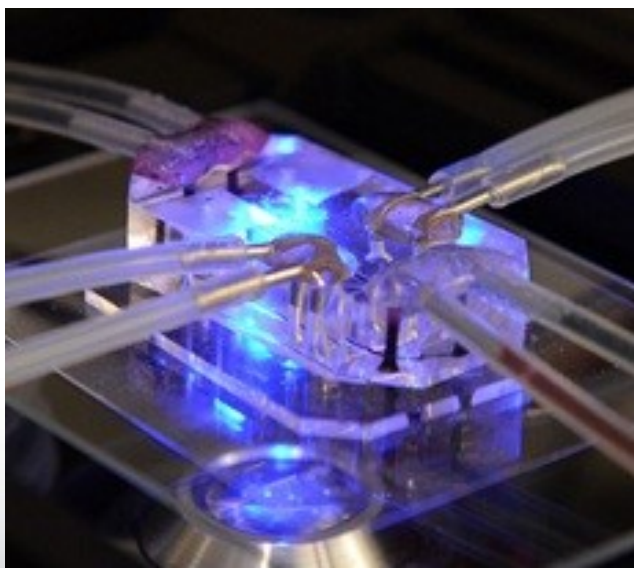
- **>10,000s of chemicals currently in use only have minimal toxicity data available**
- **Need for better lab models that mimic whole human organ function**
- **Desire to replace animal testing**
- **Testing a single chemical compound can cost millions of dollars**
- **And take years to complete**
- **While results don't always predict real world responses**



OCM Goals

- **Capture complex cell-cell and cell-extracellular matrix interactions**
- **Provide innovative 3D tissue mimetics or microphysiological systems**
- **Advance the understanding of the underlying pathophysiology & multicellular consequences linking molecular initiating events to Adverse Outcome Pathways relevant to chemical risks**
- **Lead to mid- to high-throughput assays capturing physiological responses to chemicals or their metabolite;**
- **Simulate complex biological systems' response to chemical substances.**

- **Innovative advanced cell culture techniques that can recapitulate organ system structures and exhibit finely differentiated responses to environmental exposures.**
- **Complex cell or tissue culture models which can characterize the physical and chemical properties that influence pharmacokinetics, bioavailability, and bioactivity of adverse biological effects of chemicals toxicity specific to organ systems.**
- **Description of biomarkers which can link key dynamic cellular changes resulting from chemical exposure to organ system or higher level *in vivo* effects.**
- **Refined characterization of the complex relationship between specific environmental chemical stressor exposure, internal dose, and adverse outcomes.**





OCM Outcomes

- **Better identification** of key connections in the continuum between the production of chemical substances and adverse outcomes in humans so that sustainable approaches can be scaled up for risk management purposes.
- More reliable **identification and delineation** of toxicity pathways from biologic interactions at target tissues or early cellular changes that lead to cell injury and systemic perturbations.
- **Transformation** of chemical toxicity testing that takes advantage of advances in biology and computer modeling to reduce reliance on whole animal toxicity testing while at the same time providing for more efficient and cost-effective methods for characterizing hazards (or lack thereof) associated with the thousands of environmental chemicals lacking toxicity data.
- **Implementation** of quantitative risk assessment techniques that reduce uncertainties in extrapolation from *in vitro* systems to *in vivo* outcomes.
- Improved **understanding** of the control of complex biological systems through autocrine, paracrine, and endocrine modes of regulation.



EPA @ SOT Webpage

epa.gov/research/sot