The Board of Publications (BOP) Best Paper Award is given to a paper published in Toxicological Sciences from the July issue of the previous year through the June issue of the calendar year preceding the Annual Meeting at which the award is presented. The Editor-in-Chief and 2 Associate Editors review all papers from that time period and nominate papers for consideration. The Associate Editors then vote to identify up to 6 of the most worthy papers. These papers, along with others nominated from the Society membership, are then forwarded to the BOP to determine the overall winner and to identify any honorable mentions. Papers that include Associate Editors or BOP members are excluded from consideration. At the Society of Toxicology Annual Meeting held in San Diego the Best Paper Award was presented to:

TOXICOLOGICAL SCIENCES 134(1), 180–194 2013

IGNORANCE IS BLISS?
Chemical risk assessment relies on sound information. Specifically, for regulatory agencies it is necessary to have comprehensive reviews on which to draw values for risk assessment. There are over 100,000 industrial chemicals that exist in our environment, yet the EPA has fewer than 600 chemicals in their Integrated Risk Information System and the Office of Pesticide Programs has evaluated just over 600 chemicals. What about the other 98,000 chemicals?

Surprisingly, the current model deems that if we have no reliable toxicity data for a given chemical then it must be assumed to be safe. Although we may be blissfully ignorant of the toxicity this could indeed be very dangerous for the health of the human race and for the planet.

Biological science has undergone an -omic renaissance over the past several years. We can measure transcripts, proteins, lipids, and metabolites in the hundreds of thousands, if not millions. These modern-day techniques, which are commonly used by toxicologists, are being under-utilized when it comes to risk assessment. Although data from -omic approaches play supportive roles in helping identify pathways of toxicity and providing weight of evidence, they are not integrated into the risk assessment models. In the paper by Thomas and coworkers, the authors attempt to show that data from transcriptomics, using gene expression microarrays, can be used in a meaningful way in risk assessment models for cancer and non-cancer endpoints.

The authors examined 6 thoroughly studied chemicals and performed standard necropsy and histology, along with microarrays to identify benchmark dosing. The authors then analyzed tissue samples using microarrays from 5 days to 14 weeks and compared results with standard 2-year rodent bioassays. Their analysis revealed that transcriptomics provided highly accurate information rivaling traditional approaches.

Risk assessment must rely on strong data from well thought-out studies. Regulatory agencies are notoriously slow to adopt more innovative approaches, but this paper suggests that the time is drawing near for the integration of -omic technology. This paper provides a strong foundation for the use of transcriptomics in risk assessment, indeed, the authors propose a framework for how this can be done. I, for one, would rather have a transcriptomic-based toxicological risk assessment for 20,000 chemicals that go with the ignorance approach we currently employ for the majority of our chemical space. Moreover, the generation of these types of data on thousands of chemicals would help populate computational models that may allow us to provide useful predictions on the other 80,000 chemicals.

In toxicology and risk assessment, ignorance is not bliss. Bliss comes from the generation of high-quality data and sophisticated and validated models of prediction on all of the chemicals that reach the marketplace. The paper by Thomas et al. represents a major step forward in spanning our gap of...
ignorance. Based on this, the BOP is pleased to award the Best Paper of the Year Award.

This year the Board also identified 3 honorable mentions, covering topics from ecstasy and mitochondrial dynamics, to phenobarbital effects on humanized adrostane and pregnane X receptors, to nonalcoholic steatohepatitis in obesity. I encourage you to read these papers, which represent some of the best work in the field.

HONORABLE MENTIONS

TOXICOLOGICAL SCIENCES 139(2), 407–420 2014
The mixture of “ecstasy” and its metabolites impairs mitochondrial fusion/fission equilibrium and trafficking in hippocampal neurons, at in vivo relevant concentrations
Daniel José Barbosa, Román Serrat, Serena Mirra, Martí Quevedo, Elena Goméz de Barreda, Jesús Ávila, Luísa Maria Ferreira, Paula Sério Branco, Eduardo Fernandes, Maria de Lourdes Bastos, João Paulo Capela, Eduardo Soriano, and Félix Carvalho

TOXICOLOGICAL SCIENCES 139(2), 501–511 2014
Phenobarbital induces cell cycle transcriptional responses in mouse liver humanized for constitutive androstane and pregnane X receptors

TOXICOLOGICAL SCIENCES 134(2), 291–303 2013
Environmental toxin–linked nonalcoholic steatohepatitis and hepatic metabolic reprogramming in obese mice
Ratanesh Kumar Seth, Ashutosh Kumar, Suvarthi Das, Maria B. Kadiiska, Gregory Michelotti, Anna Mae Diehl, and Saurabh Chatterjee