

Risk Assessment Tools: Some Legacy Products

Julia S. Kimbell. *The Hamner Institutes for Health Sciences*.

CIIT scientists will transform key research findings and dosimetry models into user-friendly tools that will be available to chemical industry scientists and regulators to aid in performing quantitative health risk assessments. The tools will be useful to predict deposition of inhaled chemicals in the respiratory tract, fate of chemicals in the body, responses of tissues to chemicals, and the health implications of biomonitoring data.

Over the past decades, CIIT staff members have developed a variety of computational/risk assessment technologies that are published in research papers and reports. These methodologies will be made more accessible to chemistry industry and regulatory scientists. These technologies include the quantitative dosimetry modeling tools that support estimating regional dose in the respiratory tract and physiologically based pharmacokinetic (PBPK) modeling approaches for estimating dose to various tissues throughout the body. Over the past three years, CIIT has conducted short-courses on “PBPK Modeling in Risk Assessment” and on “PBPK Tools for Interpreting Biomonitoring Results.” Each of these courses has produced a comprehensive manual with lectures on key topics and hands-on exercises with computer code.

There will be four products associated with this project. (1) CIIT staff will develop and offer a four- to five-day workshop on “Respiratory Tract Dosimetry and Inhalation Risk Assessment”, leading to a course book containing both lectures and practical modeling examples. (2) The materials for the course on “PBPK Modeling in Risk Assessment” will be updated and this course will be offered in winter 2008. Following the course, staff from the Center for Human Health Assessment (CHHA) will convert the course manual into a monograph, “Physiologically Based Pharmacokinetic (PBPK) Modeling in Risk Assessment.” (3) CIIT staff offered a short version of the “PBPK Tools for Interpreting Biomonitoring Data” at the 17th Annual Conference of the International Society for Exposure Analysis in October 2007. During 2008, the course materials for the week-long biomonitoring course will be updated. (4) Over the past 5 years, CIIT staff has been developing systems biology tools to assist in contemporary health risk assessments with environmental chemicals. In fall 2008, the CHHA staff, led by Dr. Zhang and Dr. Andersen, will provide a four- to five-day workshop on systems biology in dose-response modeling.

Implications: Past investments in research at CIIT and The Hamner Institutes for Health Sciences have resulted in many state-of-the-art computational/risk assessment technologies that have made substantial impacts on toxicology, human health risk assessment, and regulatory decision-making, primarily via the peer-reviewed literature. In recognition of this investment, these technologies will be made more widely accessible through a series of courses focusing on the latest technologies and tools available in dosimetry and pharmacokinetic modeling today. Software and template modeling files as well as hands-on experience and information will be provided by instructors who have been instrumental in developing and implementing these state-of-the-art products.

Start and end date: January 2008 – December 2008

Presentation(s):

(2007). PBPK tools for interpreting biomonitoring data. Course offered at the 17th Annual Conference of the International Society for Exposure Analysis, Durham, NC, October 14-18, 2007.

(2008). Modeling and risk assessment workshop (2008). Course held at The Hamner: Physiologically Based Pharmacokinetic (PBPK) Modeling and Risk Assessment Workshop, Research Triangle Park, NC, February 11-15, 2008.

Peer-reviewed publication(s): None to date.

Other publications:

(2008). Physiologically Based Pharmacokinetic Modeling in Risk Assessment. (Course book and CD)

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