

- **Title**

Interpretation of biomonitoring data using physiologically based pharmacokinetic (PBPK) modeling

- **Names and affiliations for instructors**

Cecilia Tan and Harvey Clewell  
The Hamner Institutes for Health Sciences

- **Contact information for lead instructor**

Harvey Clewell  
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- **Brief biography for each instructor**

**Harvey J. Clewell III, Ph.D., D.A.B.T**

**Director, Center for Human Health Assessment**

Mr. Clewell played a major role in the first uses of PBPK modeling in cancer and non-cancer risk assessments by several Federal agencies including EPA, ATSDR, OSHA and FDA. His research interests are in the areas of environmental quality, toxicology, and chemical risk assessment.

**Cecilia Tan, Ph.D.**

**Associate Director, Center for Human Health Assessment**

Dr. Tan has applied PBPK and PBPD models in evaluating risks of environmental compounds and reconstructing exposure using biomonitoring data. Her research interest is the use of mathematical models to simulate human exposure to environmental or occupational chemicals, and the pharmacokinetics and pharmacodynamics of these chemicals in the body.

- **Description**

Biomonitoring involves the identification and measurement of the concentrations of environmental chemicals in human tissue or excreta. To interpret the health implications of biomonitoring data and to reconstruct the associated exposures requires quantitative tools to describe the exposure - internal dose - adverse effect relationship. In this course, the participants will learn how to interpret biomonitoring data using physiologically based pharmacokinetic (PBPK) modeling. The growing use of PBPK modeling in chemical risk assessment results from its ability to integrate diverse information from physiology, chemistry, and biochemistry to estimate the tissue doses resulting from complex exposure scenarios. This course will provide the participants with an understanding of the challenges associated with interpreting biomonitoring data on various classes of chemicals, and will familiarize them with the techniques that can be applied to deal with these challenges.

The format of this course will be two one-half day sessions designed to meet the needs of different audiences.

- (1) The morning session will cover the basic principles of PBPK modeling and provide an introduction to the proper interpretation of biomonitoring data, including such concepts and the “Biomonitoring Equivalent” and reverse dosimetry. This session is intended for all those who are interested in learning about the interpretation of biomonitoring data and its challenges.
- (2) The afternoon session will include “hands-on” computer exercises that will provide the participants with an opportunity to experience the interpretation of real-world biomonitoring data using PBPK models. In addition, this session will cover more advanced topics on the application of PBPK modeling to interpret biomonitoring data.

- **Target audience**

1. Industry, regulatory, and public health professionals responsible for conducting or evaluating biomonitoring studies
2. Exposure modelers
3. Environmental scientists and engineers
4. Industrial hygienists

- **Course level**

Introductory level in the morning session

Intermediate to advanced topics in the afternoon session.

- **Prerequisites or expected proficiency**

Those who plan to attend the afternoon session should (1) also attend the morning session; or (2) have basic knowledge on PBPK modeling and issues in biomonitoring.

- **Number of students**

10 to 60

- **Course length**

One full day: one morning session and one afternoon session.