



# HESI

ILSI Health and Environmental Sciences Institute

**DEVELOPMENT OF METHODS FOR A TIERED APPROACH TO ASSESS  
BIOACCUMULATION OF CHEMICALS SUBCOMMITTEE  
IN VITRO ADME WORKSHOP  
MARCH 3-4, 2006**

**Breakout Session II: Application of In Vitro Data**

Goals of the session:

- Review the current use of *in vitro* data in bioaccumulation models for fish. -  
Discuss potential new applications of *in vitro* information.
- Identify knowledge gaps that preclude expanded use of this data.
- Suggest experimental or other approaches to fill these gaps.

Key questions:

1. What are the primary mathematical models that could incorporate *in vitro* data?
2. How is information from *in vitro* systems currently being used in bioaccumulation models for fish (e.g., phase partitioning, binding constants)?
3. What are the limitations on bioaccumulation models for fish, and can we use *in vitro* data to address some of these limitations?
  - Absorption
  - Metabolism (presence/absence, rate)
  - Distribution (esp. “complex” behaviors such as transporters, high affinity binding, etc.)
4. What are the barriers to expanded use of *in vitro* data in bioaccumulation models for fish (if no. 2 is possible, why hasn't it been done)?
  - Knowledge gaps
  - Technical limitations
  - *In vitro-in vivo* extrapolation
  - Communication/publication of concepts or supporting data
5. What research is required to fill knowledge gaps identified in no. 3 and/or support *in vitro-in vivo* extrapolation?
6. What research is required to “validate” predictions based on *in vitro* data?
7. Based on need and feasibility, what is the order of priority for research identified under nos. 4 and 5?
8. How can *in vitro* research be structured to support the development of empirical (e.g., QSAR) and/or mechanistic (e.g., hepatic clearance) (sub)model development?
9. How can *in vitro* research be structured to support the extrapolation of this information among chemicals and species.

Expected outcomes:

Rational and prioritized list of research needed to advance the use of *in vitro* data in bioaccumulation models for fish.