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Integration of Biological Responses and PBTK Modeling In Chemical Toxicity Assessment: A Case Study of Perfluorooctanoic Acid (PFOA) – ToxIN Project

6th December 2024

ToxIN Project

ENVIRONMENTAL CHEMICALS → naturally occurring and man-made

Human exposure is inevitable → most of these chemicals detected in human blood and other bodily fluids, hair and nails

CHEMICAL RISK ASSESSMENT

Whole animal toxicity studies

- costly and time-consuming
- ethical concerns
- uncertainty in translating data to humans
- lack of mechanistic endpoints

Epidemiological studies

- observational in nature
- associations without causality

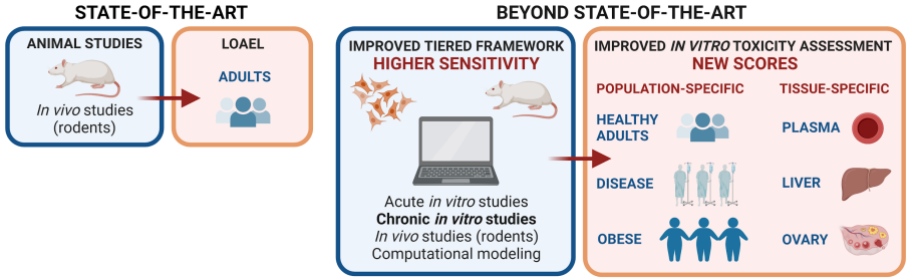
Each year, about **2,000 new chemicals are introduced** → limited or no adequate toxicological information!

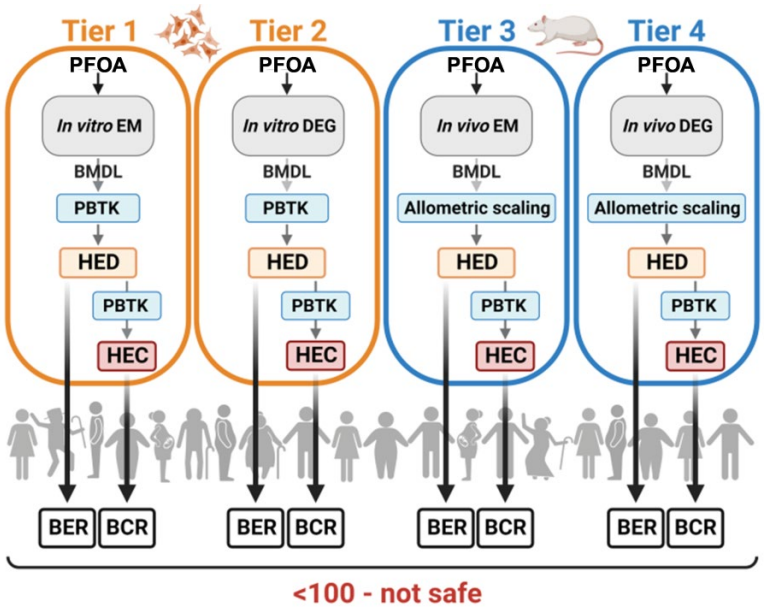
ToxIN Project

- **The main objective of the ToxIN project** is to integrate the toxicogenomic (DEG) and apical endpoint (EM) data with physiologically-based toxicokinetic (PBTK) modeling (tiered testing framework) to achieve the following project goals (PG):

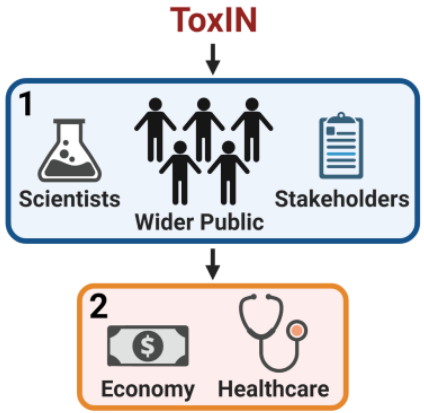
PG1. Derive bioactivity exposure ratios (BER) and novel bioactivity concentration ratios (BCR) for PFOA

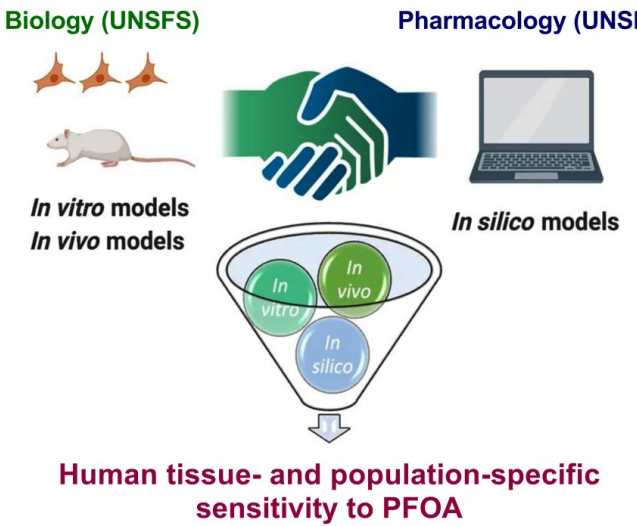
PG2. Use BER and BCR to determine sensitivity of biological assays, tissues, and specific populations to PFOA





ToxIN Project





- Innovative solution for the future screening of a wide range of environmental chemicals with limited toxicity data
- Potential novel scientific evidence to improve chemical regulation

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