



Science Highlight from the ACC LRI | June 23, 2021

Step-By-Step User Guides for Applications of the PLETHEM Physiologically Based Pharmacokinetic (PBPK) Model

Making PBPK modeling easier and more transparent through improved User Guides with case examples

[Click here to access the User Guides](#)

The Population Life-course Exposure to Health Effects Model (PLETHEM) is a modular PBPK modeling platform that provides users the ability to rapidly predict chemical dosimetry to support a range of risk evaluations — from high-throughput screening to in-depth risk assessments. The PLETHEM software platform, which is built around a core open-source package for PBPK modeling (written in R), is an ACC LRI research project led by ScitoVation scientists. Additional features of PLETHEM include:

- Provides a quantitative bridge between external chemical exposure and internal dose to better understand and evaluate potential health effects at realistic levels of exposure.
- Integrates PBPK modeling workflows in an easy-to-use and intuitive user interface.
- Contains a database of chemicals, QSAR models, life-stage specific physiological and metabolic parameters to parameterize PBPK models.

The PLETHEM modules have recently completed beta testing and implemented improvements in the program, software and user guides based on the feedback received. A workflow tutorial series, with a step-by-step approach, is available for each module:

- [Forward dosimetry and route-to-route extrapolation](#)
- [Deriving biomonitoring equivalents](#)
- [Reverse dosimetry](#)
- [High-throughput in vitro to in vivo extrapolation](#)
- [Developing a kinetically derived Maximum Tolerated Dose for toxicity testing](#)

PLETHEM has an ability to link to various EPA, OECD and other exposure estimation modeling programs. Outputs from these exposure models, which can estimate exposures in the workplace, in the general population, or in highly susceptible groups, can be used with PLETHEM PBPK modeling to derive internal exposures to support a range of different types of risk evaluations.

To learn more about PLETHEM and to access the user guides and case examples, visit [ScitoVation](#) or the [ACC LRI Scientific Tools and Methods site](#).

This Science Highlight was prepared by Richard A. Becker Ph.D. DABT of the ACC LRI. The views expressed are his alone. Reference to commercial products, services, or links does not imply ACC endorsement. To learn more about the ACC LRI visit our website <https://lri.americanchemistry.com/>