Special Issue

Recent Advances in Physiologically Based Pharmacokinetics

Message from the Guest Editor

The physiologically based pharmacokinetic (PBPK) model employs differential equations to analyze drug dynamics across various body tissues. Focusing on accurately forecasting alterations in enzyme and transporter protein functions within organs, PBPK modeling offers significant advantages for studying special populations, including the elderly, pregnant women, neonates, and patients with hepatic or renal dysfunction, as well as for assessing drug-drug interactions. Recently, pharmacometrics has become a standard regulatory tool, facilitating analyses of surrogate endpoints to support accelerated drug approvals. Furthermore, it plays a pivotal role in critical trial phases for dose selection, dosing strategies for special populations (e.g., pediatric patients), dose regimen optimization, efficacy predictions, and dosing in unstudied patient populations. Furthermore, the PBPK model integrates in vitro mechanistic data to predict exposure profiles of new drug formulations. It can also incorporate individual patient characteristics to optimize personalized treatment regimens, thereby reducing the risk of adverse reactions, even toxic side effects.

Guest Editor

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