Special Issue

Pharmacokinetic Modeling and Optimal Experimental Design: Applications and Prospects

Message from the Guest Editors

In recent years, pharmacokinetic (PK) modeling has become an essential tool in drug development, clinical pharmacology, veterinary medicine, and regulatory science. From defining optimal dosing regimens to understanding variability across populations and species, pharmacokinetic (PK) modeling provides a mechanistic framework for interpreting drug concentration-time profiles and predicting therapeutic outcomes. This Special Issue aims to bring together high-quality original research and critical reviews that advance the field of pharmacokinetic modeling and its integration with optimal experimental design (OED). Optimal design methods enable researchers to maximize the efficiency and informativeness of experiments, minimize the use of animals and humans, and accelerate the translation of science. These approaches are especially relevant in light of regulatory, ethical, and economic constraints in both human and veterinary drug development. This Special Issue aims to explore how advanced pharmacometric tools can optimize drug use, inform regulatory decisions, and foster interdisciplinary collaboration across pharmaceutical, clinical, and veterinary sciences.

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