Pharmacometrics in Big Data Era - Mission possible to find the needle in a haystack

Co-Chairs

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Description

Lectures with time for audience questions. Pharmacometrics has been defined as the science of developing and applying mathematical and statistical methods to delineate a drug's pharmacokinetic and pharmacodynamic behavior, as well as the uncertainty about that behavior, to rationalize decision making in the drug development process and pharmacotherapy. In effect, pharmacometrics is the pharmacological science based on quantitative analytical methods and modeling. As arrival of the big data era, many commonly-used conventional analytical methods (e.g., multivariate linear regression) are unprecedentedly challenged for their applications to high-dimension, nonlinear and high-order data. Meanwhile, the big data toolsets have been being quickly developed and deployed (e.g., machine learning methodologies) to fulfill the needs for such data analysis demand and many of them are freely available. It is in good timing for the community of pharmacometrics to assess and take advantage of the emerging big data toolsets to aid drug development and regulatory decision making. This proposed session will showcase the pioneering works that integrate the big data toolsets into practice under the frame of quantitative pharmacology. The aim of this session is to draw attention of pharmacometrics community to those advanced quantitative toolsets and to inspire more innovative developments and applications in the field.

Learning Objectives

1. Understand the advantages of various big data toolsets in processing complex data, e.g., high-dimension, nonlinear and high-order.

2. Learn the opportunities to apply the advanced data analytical tools to address the pharmacometrics-related questions.
Session Speakers and Presentations

Tawanda Gumbo - Supervised Machine-Learning Reveals That Old and Obese People Achieve Low Dapsone Concentrations

Lee Lancashire - Big data to smart data in Alzheimer's disease: Real-world examples of advanced modeling and simulation.

Meng Hu - Big Data Toolsets to Pharmacometrics: Application of Machine Learning for Time-to-Event Analysis

Avi Ma’ayan - Drug-Induced Transcriptomics, Data Integration, and Machine Learning to Accelerate Drug and Target Discovery