Personalized Medicine-2013
OMICS Group Conferences
Accelerating Scientific Discovery
International Conference on
Predictive, Preventive and Personalized Medicine & Molecular Diagnostics
August 5-7, 2013 Holiday Inn Chicago-North Shore, USA

Pharmacogenomics of drug transporters and clinical applications

Toshihisa Ishikawa

RIKEN Yokohama Institute, Japan

Abstract

Accumulating evidence strongly suggests that genetic polymorphisms in drug-metabolizing enzymes, transporters, receptors, and other drug targets are linked to inter-individual differences in the efficacy and toxicity of many medications. During past two decades, the role of carrier-mediated transport in determining the pharmacokinetics of drugs has becoming increasingly evident with the discovery of genetic variants that affect expression and/or function of a given drug transporter. Drug transporters are expressed at numerous epithelial barriers, such as intestinal epithelial cells, hepatocytes, renal tubular cells and at the blood-brain barrier. Pharmacogenomic studies are rapidly elucidating the inherited nature of differences in pharmacokinetic and pharmacodynamic effects, thereby enhancing drug discovery and providing a stronger scientific basis for optimizing drug therapy on the basis of each patient's genetic constitution. Hitherto researchers have associated alterations in drug uptake and/or disposition with the presence of genetic polymorphisms. The International Transporter Consortium (ITC) has most recently published the FDA Whitepaper as a report from the FDA Critical Path Initiative-sponsored Drug Transporter Workshop (*Nature Review Drug Discovery*, 9, 215-236, 2010). The pharmaceutical regulatory authorities are now requesting that drug companies integrate genetic information into their clinical trial design. In this context, pharmacogenomics of drug transporters is recognized increasingly important. A key requirement for the development of personalized medicine, however, is the ability to rapidly and conveniently test patients for genetic polymorphisms and/or mutations. We will discuss pharmacognomics of drug transporters as well as emerging new technologies for SNP detection and clinical applications.

Biography

Dr. Toshihisa Ishikawa was Professor of Biochemistry, Molecular Biology and Pharmacogenomics at Tokyo Institute of Technology (200-2009) and is Senior Scientist at Omics Science Center RIKEN Yokohama Institute (2009-present) in Japan. He served as a member of the Steering Committee of the FDA Critical Path Transporter Workshop in 2008. Presently, Dr. Ishikawa is a member of the Emerging Issues Committee of the International Transporter Consortium. Most recently, Dr. Ishikawa has been elected as Chairman for the 2015 Gordon Research Conference on "Multi-Drug Efflux Systems."

toshihisa.ishikawa.r@gmail.com