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Metabolomics reveals the novel mechanism of drug toxicity

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Abstract

Drug-induced toxicity is a big issue in the clinical practice. Most drugs may cause adverse drug reactions, in small portion of patients.Understand the mechanism could help us to predict, prevent, and treat the drug-induced toxicity. Although lot of researches have been done in this field. Unfortunately, very few mechanisms are known.In recent couple decades, different "-omics" are used to investigate the mechanism of drug-induced toxicity, for example, genomics and proteomics. These omics could provide us the information at gene and protein level, respectively. The newly emerging metabolomicshas been employed, which could tell us what already happened at molecular level.Currently, my researches integrate LC-MS-based metabolomics and mouse models to investigate the mechanism of drug induced toxicity and drug metabolism.Using a metabolomic approach and Pregane X receptor (PXR)-humanized mice, I found that co-treatment with rifampicin and isoniazid (anti-tuberculosis drugs)causes accumulation of the endogenous hepatotoxinprotoporphyrin IX in the liver through PXR-mediated alteration of the heme biosynthesis pathway. The novel mechanism provides insight into the mechanism of liver injury associated withco-therapy. Mechanisms of drug induced toxicity are very complicated, because drug combination, species differences, and individual difference make them more complex. In the future, integration of different omics and animal models are beneficial to investigate the mechanism of drug induced toxicity.

Biography

Feng Li has completed his PhD in Organic Chemistry from Universität Stuttgart, Germany. From 2007 to 2009, He worked in Medicinal Chemistry at National Institute on Drug Abuse (NIDA), National Institutes of Health (NIH) as a visiting fellow. Currently he is a research assistant professor in the Department of Pharmacology at the University of Kansas Medical Center. He has published more than 22 papers in the reputed journals and has been serving as reviewer of several reputed journals.