Advances in biomarker development in acetaminophen toxicity

Laura P. James, Mitchell R. McGill, Dean W. Roberts, Jack A. Hinson, William M. Lee

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Abstract

Acetaminophen liver injury is the most common cause of acute liver injury in the United States and several other countries. Diagnosis of acetaminophen-induced acute liver injury in the clinic is challenging due to the lack of validated and specific biomarkers. The following chapter provides an overview of recent advances evaluating candidate biomarkers in development for acetaminophen acute liver injury. Relationships of biomarkers to mechanisms of acetaminophen toxicity and their potential role in confirming the diagnosis and/or predicting evolving toxicity are addressed.
Furthermore, sources of error and data variability among Centers and methods to accommodate this variability were identified by coupling gene expression with extensive toxicological evaluation of the toxic responses. We show that phenotypic anchoring of gene expression data is required for biologically meaningful analysis of toxicogenomic experiments. Advances in biomarker development in acetaminophen toxicity. Chapter. Apr 2020.

In the early 1970s the development of an assay for paracetamol, and presence of a body of patients who had ingested paracetamol in overdose in Edinburgh, lead to the development of nomograms in man that illustrated the dose-response relationship of paracetamol toxicity. (Fig 1) (10,11) This approach thus facilitated the development of antidotes, as it allowed comparison of outcomes in patients in pre-defined risk categories. Acetylcysteine in paracetamol poisoning: A perspective of 45 years of use. Article. Advancing the Metabolic theory of Ecology. Past Projects. Publications Ecological Modeling. These new technologies are used for generation of large-scale data for the identification of biomarkers in the context of toxicology assaying. Of specific interest are biomarkers for prediction of cardiac- and hepatic toxicity caused by pharmaceutical compounds. In the project, cells are exposed to e.g. doxorubicin and other antracycline drugs that are used as chemotherapy, to model the toxic response in human stem cell-derived cardiomyocytes (hiPSC-CM). transcriptional biomarkers for pharmaceutical induced toxicity. protein biomarkers for pharmaceutical induced toxicity. multipanel biomarkers with higher predictability for toxicity than a single biomarker.