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Authors: Neha Saini, Shikha Bakshi, Sadhna Sharma

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In-silico approach for drug induced liver injury prediction: Recent Advances

Neha Saini[1], Shikha Bakshi[2] and Sadhna Sharma[3]*

Department of Biochemistry, Post Graduate Institute of Medical Education and Research, Chandigarh-160012, India
[1]nehavaid57@gmail.com [2]mycobactuberculosis@gmail.com [3]sadhnabiochem@gmail.com

Highlights

- Drug induced liver injury is the predominant form of drug induced damage, sometimes leading to death.
- Bioinformatics approach can be used for the identification of drug induced pathogenesis pathways.
- Identification of prognostic markers for liver toxicity is crucial for early detections.
- Classification of drugs in terms of toxicity provides ways to predict toxicity before clinical trials.
- Continuous attempts have been made to develop robust DILI prediction tools in the recent years.

Abstract

Drug induced liver injury (DILI) is the prime cause of liver disfunction which may lead to mild non-specific symptoms to more severe signs like hepatitis, cholestasis, cirrhosis and jaundice. Not only the prescription medications, but the consumption of herbs and health supplements have also been reported to cause these adverse reactions resulting into high mortality rates and post marketing withdrawal of drugs. Due to the continuously increasing DILI incidences in recent years, robust prediction methods with high accuracy, specificity and sensitivity are of priority. Bioinformatics is the emerging field of science that has been used in the past few years to explore the mechanisms of DILI. The major emphasis of this review is the recent advances of *in silico* tools for the diagnostic and therapeutic interventions of DILI. These tools have been developed and widely used in the past few years for the prediction of pathways induced from both hepatotoxic as well as hepatoprotective Chinese drugs and for the identification of DILI specific biomarkers for prognostic purpose. In addition to this, advanced machine learning models have been developed for the classification of drugs into DILI causing and non-DILI causing. Moreover, development of 3 class models over 2 class offers better understanding of multi-class DILI risks and at the