Attrition of drug candidates during pre-clinical development due to toxicity, especially hepatotoxicity and nephrotoxicity, is an important and continuing problem in the pharmaceutical industry. The reasons for this trend may be multifactorial and there is a need to improve toxicity testing paradigms within the industry. Microarray technologies have the ability to generate massive amounts of gene expression information as an initial step to decipher the molecular mechanisms of toxicologic changes, i.e. toxicogenomics. In the context of the eTOX consortium, one of public private partnership within the framework of the European Innovative Medicines Initiitative (IMI), we will discuss here how the integration and analysis of toxicogenomics data can help to understanding the mechanism of toxicity of a compound and so reduce the risk of late-stage failure in pharmaceutical development.