S12-1 In silico prediction of pharmacokinetic properties by QSAR approaches

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Drug metabolism and disposition is closely related to efficacy and safety of drug, so that it can be a key determinant of drug development. It is also known to be a cause of drug-drug interaction following administration of plural drugs. Therefore, it is an important issue to clarify the disposition characteristics of exploratory compounds or drug candidates as early in drug R&D as possible. At present, in vitro ADME screening is routinely being conducted in the early stage of drug exploratory studies. In addition, increasing attention has been paid to in silico techniques that could accelerate efficiency and streamlining of drug discovery by excluding inappropriate compounds during the design of chemical library. To deal with the massive amount of data obtained from HTS and find a relationship of the drug properties with their chemical structure, establishment of pharmacometric approaches based on statistics and informatics should be required. We have established the method for modeling quantitative structure/property relationship by adopting modern informatic techniques such as artificial neural network and genetic algorithm, and developed the models for various pharmacokinetic properties. Besides these, we developed large-scale information visualization techniques that can reduce dimensionality of multi-dimensional structural properties effectively and simultaneously visualize a whole bunch of data. These techniques help us to evaluate goodness of prediction models or give a go/no-go decision in drug R&D. This presentation aims to discuss importance of pharmacometric approaches in predicting pharmacokinetic behaviors.