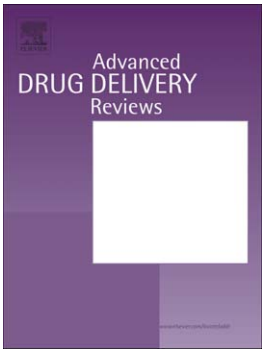

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Prediction of Drug-ABC Transporter Interaction - Recent Advances and Future Challenges

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Abstract
With the discovery of P-glycoprotein (P-gp), it became evident that ABC-transporters play a vital role in bioavailability and toxicity of drugs. They prevent intracellular accumulation of toxic compounds, which renders them a major defense mechanism against xenotoxic compounds. Their expression in cells of all major barriers (intestine, blood-brain barrier, blood-placenta barrier) as well as in metabolic organs (liver, kidney) also explains their influence on the ADMET properties of drugs and drug candidates. Thus, *in silico* models for the prediction of the probability of a compound to interact with P-gp or analogous transporters are of high value in the early phase of the drug discovery process. Within this review, we highlight recent developments in the area, with a special focus on the molecular basis of drug-transporter interaction. In addition, with the recent availability of X-ray structures of several ABC-transporters, also structure-based design methods have been applied and will be addressed.

Keywords
ABC transporters, computational models, bioassays, machine learning, pharmacophore modeling, transport inhibition

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