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Drug Transporters in Drug Disposition, Effects and Toxicity

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Preface

Drug transporters are well-recognized determinants of drug disposition and effects/toxicity. These are divided into solute carrier (SLC) family and ATP-binding cassette (ABC) family. Functionally, they mediate drug uptake into cells and export drugs out of cells, respectively.

Each transporter has a specific pattern of tissue expression. Transporters expressed in the small intestine, liver, and kidney are very important for drug disposition and drug-drug interactions, while transporters expressed in blood-tissue barriers, such as blood-brain barrier and maternal-fetal barrier, protect sensitive tissues from toxic compounds. Drug transporters are essential in maintaining cell homeostasis, and gene mutations often cause or contribute to several human genetic disorders including cystic fibrosis, neurological disease, retinal degeneration, cholesterol and bile transport defects, anemia, and drug response. Some diseases alter transporter function and expression, in turn, aggravating disease process.

Overexpressions of some ABC transporters are also potential contributors to multidrug resistance (MDR) development for anticancer drugs. Several ways are being tried to overcome MDR. One way is to develop ABC transporter inhibitor to sensitize cancer cells to chemotherapeutic drugs. Another way is to develop no substrates of ABC transporters to gain therapeutic benefit in multidrug-resistant tumors. microRNA and other epigenetic methods are also considered to be useful tools to modulate transporter expressions and functions.

This book will focus on the roles of drug transporters in drug disposition and effects/toxicity. It will also cover drug-drug interaction and recent great progress on transporters. The provided information is great for graduate students and professionals who are looking to refresh or expand their knowledge in this field.

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