Drug Delivery to the Brain
Physiological Concepts, Methodologies and Approaches

This book describes the different approaches for drug delivery to the brain with an emphasis on the physiology of the blood-brain barrier (BBB) and the governing principles and concepts for drug delivery across the BBB. It contains cutting-edge methods for studying drug delivery and administering drugs into the brain. The book also explores different approaches for predicting human brain concentrations as well as the influence of disease and drug industry perspectives. In addition to wide-ranging coverage of physiological concepts relevant to central nervous system (CNS) drug delivery, a detailed review of brain structure, function, blood supply and fluids is also provided. In each chapter, descriptions of future challenges and unresolved questions are combined with points for discussion. This unique combination of material makes this book a valuable resource for students and for established academic and industry scientists looking to learn about state-of-the-art drug delivery research. It is also a source for stimulating new ideas among experts already performing CNS drug delivery research or working in related areas.

Margareta Hammarlund-Udenaes (Ph.D.) is a Professor in Pharmacokinetics and Pharmacodynamics (PK/PD) at Uppsala University and the Head of the Translational PK/PD Group. Her research is focused on studying pharmacokinetic aspects of BBB transport of drugs in relation to CNS effects, and it has led to the development of new concepts and methods within the BBB transport area, focusing on unbound drug relationships.

Elizabeth C.M. de Lange (Ph.D.) is Head of the Target Site Equilibration Group at the Division of Pharmacology of the Leiden Academic Center for Drug Research (LACDR). Her research program focuses on the development of generally applicable predictive PK/PD models on CNS drugs using advanced in vivo animal models and mathematical modeling techniques, with a number of recent successes.

Robert G. Thorne (Ph.D.) is an Assistant Professor in Pharmaceutical Sciences at the University of Wisconsin-Madison School of Pharmacy. He was previously a research scientist and faculty member in the Department of Physiology & Neuroscience at the New York University School of Medicine. His research focuses on diffusive and convective transport within the CNS and the development, refinement and optimization of strategies for delivering biologics into the brain.