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Drug Discovery; 5.1. INTRODUCTION; 5.2. TYPICAL DRUG DISCOVERY PARADIGM; 5.3. INTEGRATED DRUG DISCOVERY 5.4. DRIVERS OF THE DISEASE PHENOTYPE: CLINICAL ENDPOINTS AND HYPOTHESES 5.5. EXTRACELLULAR DISEASE DRIVERS: MECHANISTIC BIOTHERAPEUTIC MODELS; 5.6. RELEVANT CELL MODELS FOR CLINICAL ENDPOINTS; 5.7. INTRACELLULAR DISEASE DRIVERS: SIGNALING PATHWAY QUANTIFICATION; 5.8. TARGET SELECTION: DYNAMIC PATHWAY MODELING; 5.9. CONCLUSIONS; REFERENCES; CHAPTER 6: Lead Identification and Optimization; 6.1. INTRODUCTION; 6.2. THE SYSTEMS BIOLOGY TOOL KIT; 6.3. CONCLUSIONS; REFERENCES; CHAPTER 7: Role of Core Biological Motifs in Dose-Response Modeling: An Example with Switchlike Circuits 7.1. INTRODUCTION: SYSTEMS PERSPECTIVES IN DRUG DISCOVERY 7.2. SYSTEMS BIOLOGY AND TOXICOLOGY; 7.3. MECHANISTIC AND COMPUTATIONAL CONCEPTS IN A MOLECULAR OR CELLULAR CONTEXT; 7.4. RESPONSE MOTIFS IN CELL SIGNALING AND THEIR ROLE IN DOSE RESPONSE; 7.5. DISCUSSION AND CONCLUSIONS; REFERENCES; CHAPTER 8: Mechanism-Based Pharmacokinetic-Pharmacodynamic Modeling During Discovery and Early Development; 8.1. INTRODUCTION; 8.2. CHALLENGES IN DRUG DISCOVERY AND DEVELOPMENT; 8.3. METHODOLOGICAL ASPECTS AND CONCEPTS; 8.4. USE OF PK-PD MODELS IN LEAD OPTIMIZATION 8.5. USE OF PK-PD MODELS IN CLINICAL CANDIDATE SELECTION 8.6. ENTRY-INTO-HUMAN PREPARATION AND TRANSLATIONAL PK-PD MODELING; 8.7. USE OF PK-PD MODELS IN TOXICOLOGY STUDY DESIGN AND EVALUATION; 8.8. JUSTIFICATION OF STARTING DOSE, CALCULATION OF SAFETY MARGINS, AND SUPPORT OF PHASE I DESIGN; 8.9. PHASE I AND BEYOND; 8.10. SUPPORT OF EARLY FORMULATION DEVELOPMENT; 8.11. OUTLOOK AND CONCLUSIONS; REFERENCES; PART III: APPLICATIONS TO DRUG DEVELOPMENT; CHAPTER 9: Developing Oncology Drugs Using Virtual Patients of Vascular Tumor Diseases; 9.1. INTRODUCTION; 9.2. MODELING ANGIOGENESIS 9.3. USE OF RIGOROUS MATHEMATICAL ANALYSIS TO GAIN INSIGHT INTO DRUG DEVELOPMENT

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Sommario/riassunto

The first book to focus on comprehensive systems biology as applied to drug discovery and development Drawing on real-life examples, Systems Biology in Drug Discovery and Development presents practical applications of systems biology to the multiple phases of drug discovery and development. This book explains how the integration of knowledge from multiple sources, and the models that best represent that integration, inform the drug research processes that are most relevant to the pharmaceutical and biotechnology industries. The first book to focus on comprehensive systems biology and its a

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