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## Preface

The major reason for the elevated costs of drug development in the pharmaceutical industry is the high attrition rate. Only a minority of molecules entering the clinical phase makes it to the market, and one of the increasing causes for drug failures in recent years is “target failure.” Hence investments in better validated targets is the key to reduce attrition rates and certainly also the most cost effective. However, in most indications, validated targets are rare and the highly validated ones are also extremely competitive. This is particularly true for oncology, and therefore we focused mainly on oncology-related methods. The identification of innovative new targets is the real bottleneck of modern drug development and the challenge will be to identify new disease-associated mechanisms and spotting “drug-gable” targets while minimizing side effects.

In this book state-of-the art methods and approaches to identify and validate new targets are summarized including detailed protocols with a critical assessment of their limitations and strengths. The knowledge of these technologies is essential for any drug developer interested in target identification or validation, and certainly there should be awareness of these technologies for any executive drug development manager. A wide range of technologies relevant in the field are introduced, including *in silico* and “Omics-” related technologies, RNAi, innovative cell culture technologies as well as tailored animal models and translational applications. The chapters are ordered by major categories covering biochemical, cell-based, *in vivo* models and translational methods. Besides a complete review of the major technologies, chapters handling selected case reports are included in order to integrate the technologies to real-life experiences and to demonstrate the multiple use of more than one technology to increase knowledge on a specific target. Certainly the degree of target validation correlates with the confidence in a target, which ideally is increasing over the life cycle of a drug development project but reaches a definitive answer only when clinical proof of concept is reached.

This book is aimed at scientists in diverse fields including molecular and cellular biologists, pharmacologists, *in silico* drug developers, pathologists, geneticists, and clinical investigators. The book contains a comprehensive list of essential methods and clear protocols to follow. The contributions are going beyond typical protocols since the emphasis is on the description of most critical steps and typical pitfalls, written by experienced experts in the field. Last but not the least, this work intends also to help managers in drug development to get a quick overview of available technologies in order to improve attrition rates of their drug development portfolio.

We thank all the authors for their excellent contributions and appreciate their hard work and fruitful interactions with the final aim to make this book a success.

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Methods and Protocols

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