

Preface

Chemical Genomics provides a starting point for scientists and students who are interested in the discovery and application of active chemical compounds for the interrogation of biological systems and improvement of human health in the genomics era. Despite the clear realization of the immense power of chemical strategies in biology and medicine, the discovery of effective small molecule modulators for a particular biological target or phenotype remains a daunting challenge. While “omics” studies have revealed an expansive landscape of various biological systems and disease models, only a limited number of defined, biologically active compounds are available for functional exploration and for therapeutic discovery. Meanwhile, an expanding research area that uses information from genomes to develop chemical modulators for biology and therapeutics is rapidly developing due to major advances in chemistry, biology, and genomics, coupled with laboratory automation and computational technologies. This new field, chemical genomics, holds promise for transforming biological research and medicine using the power of chemistry.

The book *Chemical Genomics* offers a collection of insightful contributions from international experts in the field and aims to further the study of chemical genomics. It covers a range of essential topics, includ-

ing the basic principles of chemical biology and chemical genomics (Section One: Overviews), the fundamentals of chemical libraries (Section Two: Molecules for Chemical Genomics), the essentials of high-throughput screening and high-content screening (Section Three: Basics of High-Throughput Screening), and the design of innovative biochemical, cellular, and organismal bioassays and computational screening approaches (Section Four: Chemical Genomics Assays and Screens). The final section (Section Five: Chemical Genomics and Medicine) includes chapters that link chemical genomics with the movement toward personalized medicine and the druggable genome of the future. In selected chapters, a resource section is presented for further information. My hope is that this book provides an introduction to the principles of chemical genomics; serves as a resource for the associated technologies; and gives readers general concepts, useful vocabulary, practical techniques, and broad, forward-thinking perspectives.

My deepest appreciation goes to the contributors of each chapter for their dedication, commitment, and exceptional patience! Together, we have now an introductory book for the field of chemical biology and chemical genomics.

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