
Preface

Systems biology has emerged as an exciting and rapidly growing area of research. This book presents 14 original chapters written by experts in the field covering topics ranging from the definition and scope of systems biology, to the experimental and computational techniques driving the data-rich biology revolution, to applications of the systems paradigm to clinical problems. The first two chapters discuss the systems approach and contrast it with the prevailing reductionist techniques. What emerges is a clear realization that the two paradigms complement each other. Neither can be dispensed off in favor of the other; however, what we learn from either approach must be combined into an integrated description of physiological processes.

The following seven chapters deal with experimental, statistical, kinetic, and graph theoretic techniques for organizing and interpreting systems data. A wide variety of computational strategies are covered along with a comprehensive but concise description of mass spectrometry methods that (combined with deep sequencing) are the source of many of the large data sets driving systems biology.

The last five chapters present applications of the systems approach to clinical problems and are a specially valuable feature of the book. These chapters provide interesting perspectives and literature reviews that should be very useful to anyone considering how to translate systems biology into clinical practice.

The book is written at a level accessible to a wide readership and presents much useful information in a concise and accessible format. In addition, each chapter contains references to important research in this field. The reader will find the material presented here to be an up-to-date introduction to this emerging discipline.

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