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Sinopsis

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Research in systems biology requires the collaboration of researchers from diverse backgrounds, including biology, computer science, mathematics, statistics, physics, and biochemistry. These collaborations, necessary because of the enormous breadth of background needed for research in this field, can be hindered by differing understandings of the limitations and applicability of techniques and concerns from different disciplines. This comprehensive introduction and overview of system modeling in biology makes the relevant background material from all pertinent fields accessible to researchers with different backgrounds.

The emerging area of systems level modeling in cellular biology has lacked a critical and thorough overview. This book fills that gap. It is the first to provide the necessary critical comparison of concepts and approaches, with an emphasis on their possible applications. It presents key concepts and their theoretical background, including the concepts of robustness and modularity and their exploitation to study biological systems; the best-known modeling approaches, and their advantages and disadvantages; lessons from the application of mathematical models to the study of cellular biology; and available modeling tools and datasets, along with their computational limitations.

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