



Synthetic Biology - A Primer

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Synthetic Biology - A Primer From World Scientific Publishing

Synthetic Biology - A Primer gives a broad overview of the emerging field of synthetic biology and the foundational concepts on which it is built. It will be of interest to final year undergraduates, postgraduates and established researchers who are interested in learning about this exciting new field. The book introduces readers to fundamental concepts in molecular biology and engineering and then explores the two major themes for synthetic biology, namely 'bottom-up' and 'top-down' engineering approaches. 'Top-down' engineering utilises a conceptual framework of engineering and systematic design to build new biological systems by integrating robustly characterised biological parts into an existing system through the use of extensive mathematical modelling. The 'bottom-up' approach involves the design and building of synthetic protocells using basic chemical and biochemical building blocks from scratch. Exemplars of cutting-edge applications designed using synthetic biology principles are presented, including the production of novel biofuels from renewable feedstocks, microbial synthesis of pharmaceuticals and fine chemicals, and the design and implementation of biosensors to detect infections and environmental waste. The book also uses the Internationally Genetically Engineered Machine (iGEM) competition to illustrate the power of synthetic biology as an innovative research and training science. Finally, the primer includes a chapter on the ethical, legal and societal issues surrounding synthetic biology, illustrating the integration of social sciences in synthetic biology research.

Readership: Students, professionals, researchers in biotechnology and bioengineering.

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Editorial Review

From the Inside Flap

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From the Back Cover

In *Synthetic Biology*, expert researchers in the field provide the latest developments in molecular biology techniques used in Synthetic Biology. Focusing on computational tools that will aid in systematising the design and construction of parts and systems. Written in the highly successful *Methods in Molecular Biology*™ series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and key tips on troubleshooting and avoiding known pitfalls.

Authoritative and practical, *Synthetic Biology* seeks to aid scientists in the further study of developing new biological components and systems.

Users Review

From reader reviews:

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