

Methods in Molecular Biology 985

John M. Walker, *Series Editor*

Hal S. Alper *Editor*

Systems Metabolic Engineering

Methods and Protocols

With the ultimate goal of systematically and robustly defining the specific perturbations necessary to alter a cellular phenotype, systems metabolic engineering has the potential to lead to a complete cell model capable of simulating cell and metabolic function as well as predicting phenotypic response to changes in media, gene knockouts/overexpressions, or the incorporation of heterologous pathways. In *Systems Metabolic Engineering: Methods and Protocols*, experts in the field describe the methodologies and approaches in the area of systems metabolic engineering and provide a step-by-step guide for their implementation. Four major tenants of this approach are addressed, including modeling and simulation, multiplexed genome engineering, 'omics technologies, and large data-set incorporation and synthesis, all elucidated through the use of model host organisms. Written in the highly successful *Methods in Molecular Biology*™ series format, chapters include introductions on their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls.

Comprehensive and cutting-edge, *Systems Metabolic Engineering: Methods and Protocols* serves as an ideal guide for metabolic engineers, molecular biologists, and microbiologists aiming to implement the most recent approaches available in the field.

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