1. Record Nr. UNINA9910254154403321

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Titolo	A Network-Based Approach to Cell Metabolism : From Structure to Flux Balances / / by Oriol Güell
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2017
ISBN	3-319-64000-3
Edizione	[1st ed. 2017.]
Descrizione fisica	1 online resource (151 pages) : illustrations (some color)
Collana	Springer Theses, Recognizing Outstanding Ph.D. Research, , 2190-5053
Disciplina	574.8761
Soggetti	Biochemical engineering Systems biology Biological systems Chemistry, Physical and theoretical Biochemical Engineering Systems Biology Physical Chemistry
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"Doctoral Thesis accepted by University of Barcelona, Barcelona, Spain."
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Cellular Metabolism at the Systems Level -- Methods and Data -- Structural Knockout Cascades in Metabolic Networks -- Eects of Reaction Knockouts on Steady States of Metabolism -- Detection of Evolution and Adaptation Fingerprints in Metabolic Networks -- Assessing FBA Optimal States in the Feasible Flux Phenotypic Space -- Conclusions.
Sommario/riassunto	This thesis uses a systems-level approach to study the cellular metabolism, unveiling new mechanisms and responses that were impossible to reach with traditional reductionists procedures. The results reported here have a potential application in areas like metabolic engineering and disease treatment. They could also be used in determining the accuracy of the gene essentiality of new genome-scale reconstructions. Different methods and techniques, within the contexts of Systems Biology and the field known as Complex Networks Analysis have been applied in this work to show different features of

the robustness of metabolic networks. The specific issues addressed here range from pure topological aspec ts of the networks themselves to the balance of biochemical fluxes. .