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Sommario/riassunto	This book reports on the ecological engineering of granular sludge processes for a high-rate removal of carbon, nitrogen, and phosphorus nutrients in compact wastewater treatment plants. It provides novel insights into microorganisms and metabolisms in wastewater microbiomes and the use of microbial ecology principles to manage wastewater treatment processes. It covers a very comprehensive and inter-disciplinary research of systems microbiology and environmental biotechnology. From the initial economic assessment of the aerobic granular sludge technology, concepts of microbiome science and engineering are developed to uncover and manage the microbial ecosystem of granular sludge. Mixed-culture biotechnological

processes, multifactorial experimental designs, laser scanning microscopy, molecular microbial ecology and bioinformatics methods, numerical ecology workflows, and mathematical modelling are engaged to disentangle granulation phenomena, microbial selection, and nutrient conversions across scales. The findings are assembled in a guideline for microbial resource management in granular sludge processes to support knowledge utilization in engineering practice. Outputs are integrated in the state of the art of biological wastewater treatment. This book addresses both scientists and engineers who are eager to get insights into and engineer microbiomes for environmental biotechnologies. It makes a valuable contribution to methods for strengthening the role of wastewater treatment plants for recovering safe water and resources, in the context of circular economy and for sustaining health and the environment in an ecologically balanced society.