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Sommario/riassunto

Currently, we are witnessing highly dynamic research efforts related to the exciting field of novel biodegradable plastic-like materials. These activities originate from a growing public awareness of prevailing ecological problems associated to, e.g., rising piles of plastic waste, increasing greenhouse gas emissions, and ongoing depletion of such fossil resources usually used for the synthesis of "full carbon backbone" plastics. Polyhydroxyalkanoate (PHA) biopolyesters, a family of versatile plastic-like materials produced by living microbes, are a future-oriented alternative to traditional plastics. If accomplished in an optimized way, production and the entire lifecycle of PHA are

embedded into nature´s closed carbon cycle, which is underlined by PHA´s main benefits of being "biobased", "biosynthesized", "biocompatible", and "biodegradable". Sustainable and economically feasible PHA synthesis, especially on an industrially relevant scale, requires all production steps to be understood and improved. Among other aspects, this calls for new powerful production strains to be screened; knowledge about the proteome and genome of PHA accumulating organisms to be consolidated; the kinetics of the bioprocesses to be thoroughly understood; abundantly available inexpensive raw materials to be tested; the monomer composition of PHA to be adapted; (bio)chemical engineering to be optimized; and novel PHA recovery strategies to be developed in order to reduce energy and chemical inventory. The present book provides a comprehensive compilation of articles addressing all these different aspects; the individual chapters were composed by globally recognized front running experts from special niches of PHA research. We are convinced that this book will be of major benefit to the growing scientific community active in biopolymer research.