

Interdisciplinary Biotechnological Advances

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Algal Photobioreactors

 Springer

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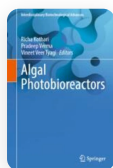
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Abstract

In the current scenario, algal biomass has been perceived as a potential candidate for carbon sequestration and better substitute for environmental quality deteriorating toxic fossil fuels. Genetic and metabolic engineering are the highly advanced emerging technologies having great potential to improve the ability of algal cells to perform with increased efficiency. Recent advancements in genetic and metabolic engineering have significantly enhanced the potential of algal biomass for carbon sequestration, wastewater phycoremediation and sustainable bioenergy production. The Cutting-edge technologies such as CRISPR/Cas genome editing, TALENs and RNA interference have accelerated the precise manipulation of algal genomes leading to improved metabolic pathways for higher yields of biofuels and value-added bioactive compounds. Integrating synthetic biology with omics techniques has facilitated the engineering of the algal strains with increased efficiency in removing pollutants from wastewater and generated industrially relevant products. This chapter focuses on the recent advancements in metabolic engineering approaches to improve algal biomass for enhancing their ability of wastewater phycoremediation, bioenergy and industrial applicability of harvested algal biomass and several value-added bioactive compounds from algal biomass.