Recent advances in microbial production of fuels and chemicals using tools and strategies of systems metabolic engineering

The advent of various systems metabolic engineering tools and strategies has enabled more sophisticated engineering of microorganisms for the production of industrially useful fuels and chemicals. Advances in systems metabolic engineering have been made in overproducing natural chemicals and producing novel non-natural chemicals. In this paper, we review the tools and strategies of systems metabolic engineering employed for the development of microorganisms for the production of various industrially useful chemicals belonging to fuels, building block chemicals, and specialty chemicals, in particular focusing on those reported in the last three years. It was aimed at providing the current landscape of systems metabolic engineering and suggesting directions to address future challenges towards successfully establishing processes for the bio-based production of fuels and chemicals from renewable resources.