Advancing metabolic engineering through systems biology of industrial microorganisms

Development of sustainable processes to produce bio-based compounds is necessary due to the severe environmental problems caused by the use of fossil resources. Metabolic engineering can facilitate the development of highly efficient cell factories to produce these compounds from renewable resources. The objective of systems biology is to gain a comprehensive and quantitative understanding of living cells and can hereby enhance our ability to characterize and predict cellular behavior. Systems biology of industrial microorganisms is therefore valuable for metabolic engineering. Here we review the application of systems biology tools for the identification of metabolic engineering targets which may lead to reduced development time for efficient cell factories. Finally, we present some perspectives of systems biology for advancing metabolic engineering further.

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