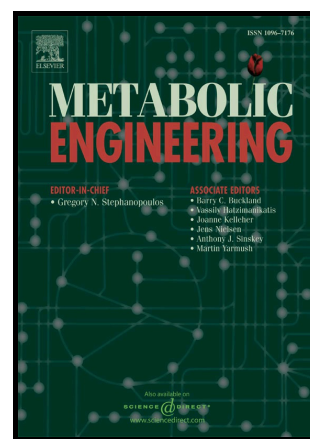


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Characterization and engineering of a carotenoid biosynthesis operon from *Bacillus megaterium*

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Abstract:

Bacillus megaterium belongs to the group of pigmented bacilli producing carotenoids that ensure self-protection from UV radiation-induced and collateral oxidative damage. Metabolite profiling of strain MS941 revealed the presence of the C30 carotenoids 4,4'-diapophytofluene and 4,4'-diaponeurosporenic acid. A gene function analysis demonstrated the presence of a corresponding C30 carotenoid biosynthetic pathway with pharmaceutical importance. We identified a gene cluster comprising putative genes for a farnesyl diphosphate synthase (IspA), a diapophytoene synthase (CrtM) and three distinct diapophytoene desaturases (CrtN1-3). Intriguingly, *crtM* was organized in an operon together with two of the identified *crtN* genes. The individual activities of the encoded enzymes were determined by

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