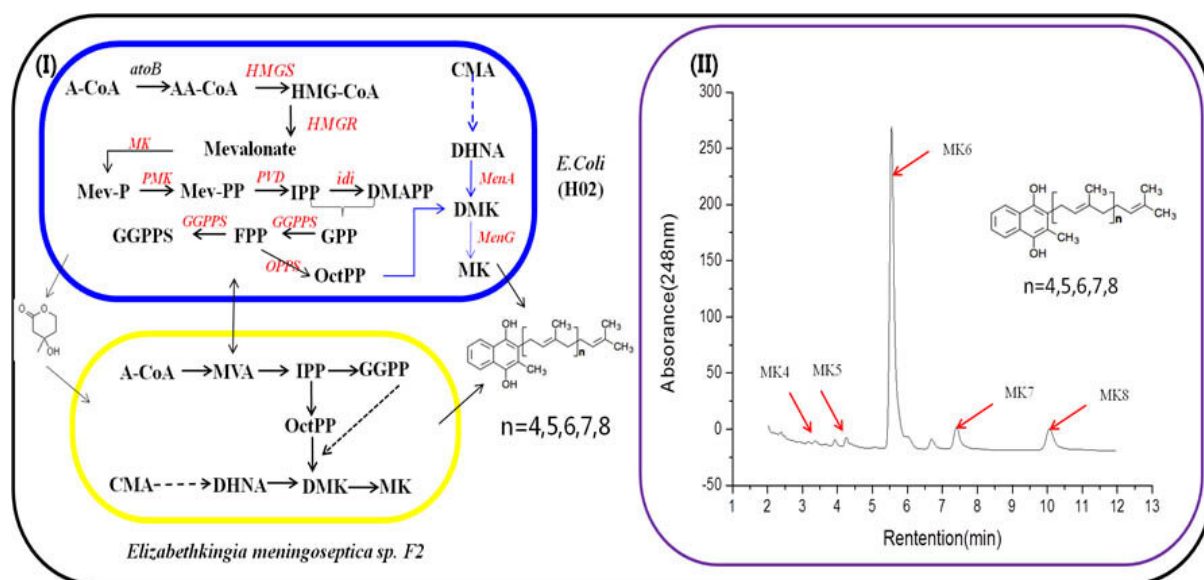


Scientists synthesize terpenoids with microbial consortium

March 30 2022, by Zhang Nannan



Design of the *Elizabethkingia meningoseptica* and *Escherichia coli* coculture system for vitamin K2 biosynthesis. Credit: Wang Peng

According to a study published in *Microbial Cell Factories*, a team led by Prof. Zheng Zhiming and associate Prof. Wang Peng from the Hefei Institutes of Physical Science (HFIPS) of the Chinese Academy of Sciences has enhanced the synthesis ability of terpenoids with newly developed microbial consortia.

The research team used *Escherichia coli* as the precursor substrate donor

to designed and optimized the consortium of Elizabethkingia meningoseptica and E. coli so as to achieve their goal.

"The E. meningoseptica and E. coli co-culture strategy can improve vitamin K2 biosynthesis," said Prof. Wang Peng.

Application of microbial consortia is a hot spot in the field of metabolic engineering and [synthetic biology](#). As a kind of terpenoid, vitamin K2 has important physiological functions such as preventing osteoporosis and promoting blood coagulation. E. meningoseptica is an important strain for synthesizing vitamin K2 with different lengths of side chains, but this strain lacks molecular manipulation and is difficult to carry out directional transformation.

By introducing the [mevalonate pathway](#) and isopentenyltransferase genes from E. meningoseptica into E. coli, the team constructed a microbial consortium of E. meningoseptica and E. coli, which was approximately threefold that of the titer achieved with E. meningoseptica sp. F2 monoculture.

Further studies showed that there was a close relationship between the cocultured strains, which improved the lipase activity and membrane permeability, and realized the material exchange between bacteria.

This study lays the foundation for the further application of E. meningoseptica and E. coli consortia for the biosynthesis of MK-n (n=4, 5, 6, 7, 8) and other terpenoids.

More information: Qiang Yang et al, Engineering microbial consortia of Elizabethkingia meningoseptica and Escherichia coli strains for the biosynthesis of vitamin K2, *Microbial Cell Factories* (2022). [DOI: 10.1186/s12934-022-01768-7](https://doi.org/10.1186/s12934-022-01768-7)

Provided by Chinese Academy of Sciences

Citation: Scientists synthesize terpenoids with microbial consortium (2022, March 30) retrieved 23 June 2024 from

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