

# Engineered microbial production of grape flavoring

May 17 2019

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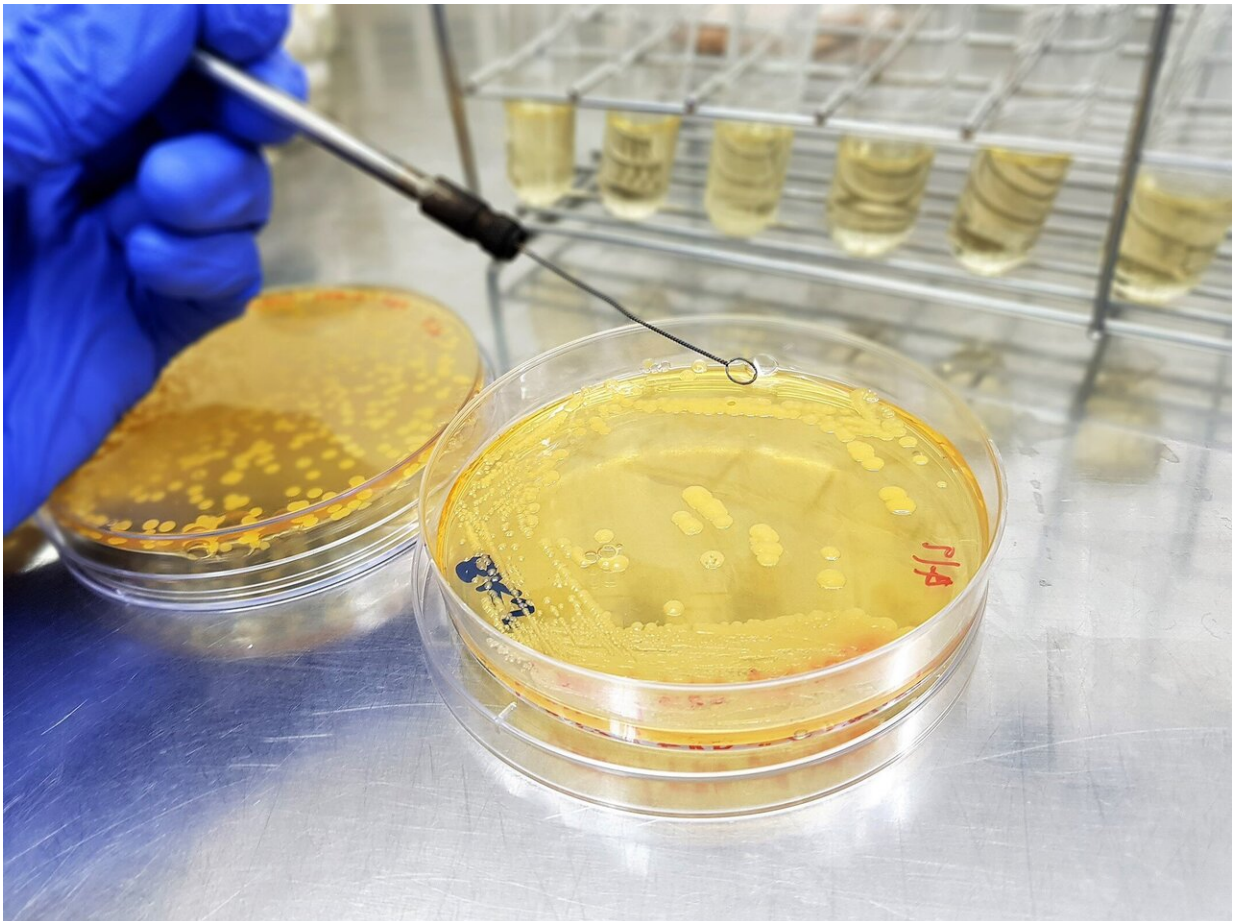


Image 1: Engineered bacteria that produce grape flavoring. Credit: The Korea Advanced Institute of Science and Technology (KAIST)

Researchers report a microbial method for producing an artificial grape flavor. Methyl anthranilate (MANT) is a common grape flavoring and odorant compound currently produced through a petroleum-based process that uses large volumes of toxic acid catalysts.

Professor Sang-Yup Lee's team at the Department of Chemical and Biomolecular Engineering demonstrated production of MANT, a naturally occurring compound, via engineered bacteria. The authors engineered strains of *Escherichia coli* and *Corynebacterium glutamicum* to produce MANT through a plant-based engineered metabolic pathway.

The authors tuned the bacterial [metabolic pathway](#) by optimizing the levels of AAMT1, the key enzyme in the process. To maximize production of MANT, the authors tested six strategies, including increasing the supply of a precursor compound and enhancing the availability of a co-substrate. The most productive strategy proved to be a two-phase extractive culture, in which MANT was extracted into a solvent. This strategy produced MANT on the scale of 4.47 to 5.74 grams per liter, a significant amount, considering that engineered microbes produce most [natural products](#) at a scale of milligrams or micrograms per liter.

According to the authors, the results suggest that MANT and other related molecules produced through [industrial processes](#) can be produced at scale by engineered microbes in a manner that would allow them to be marketed as natural one, instead of artificial one.

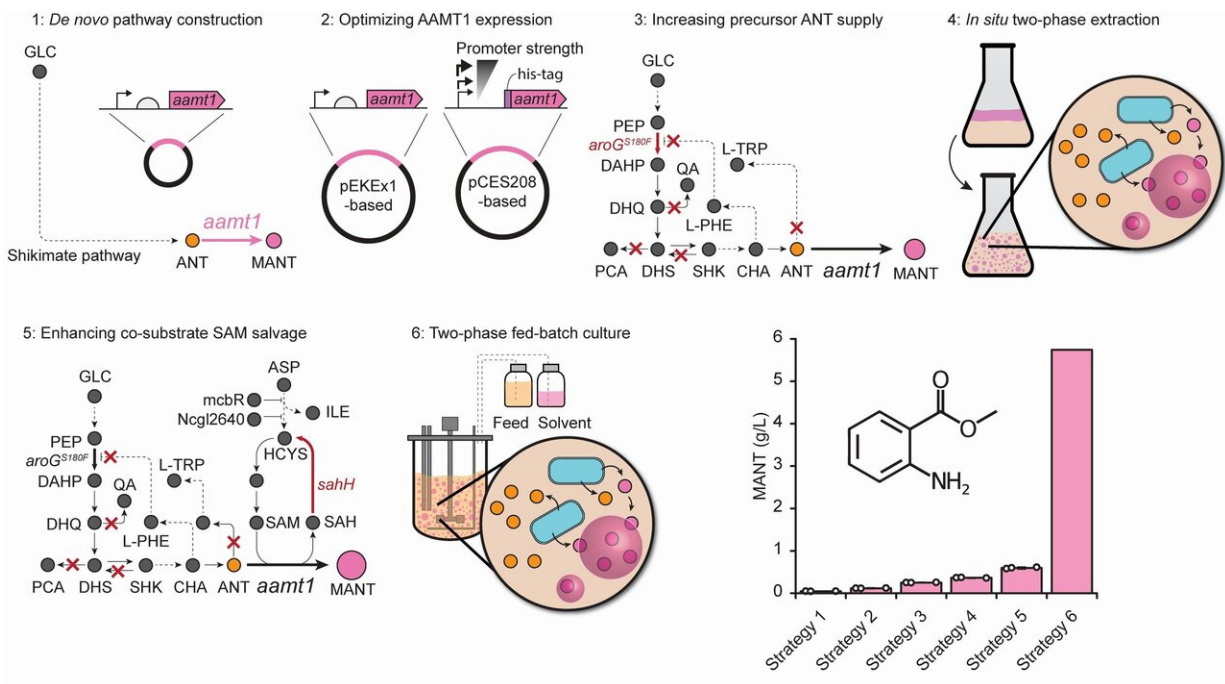


Image 2. Overview of the strategies applied for the microbial production of grape flavoring. Credit: The Korea Advanced Institute of Science and Technology (KAIST)

**More information:** Zi Wei Luo et al. Microbial production of methyl anthranilate, a grape flavor compound, *Proceedings of the National Academy of Sciences* (2019). [DOI: 10.1073/pnas.1903875116](https://doi.org/10.1073/pnas.1903875116)

Provided by The Korea Advanced Institute of Science and Technology (KAIST)

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