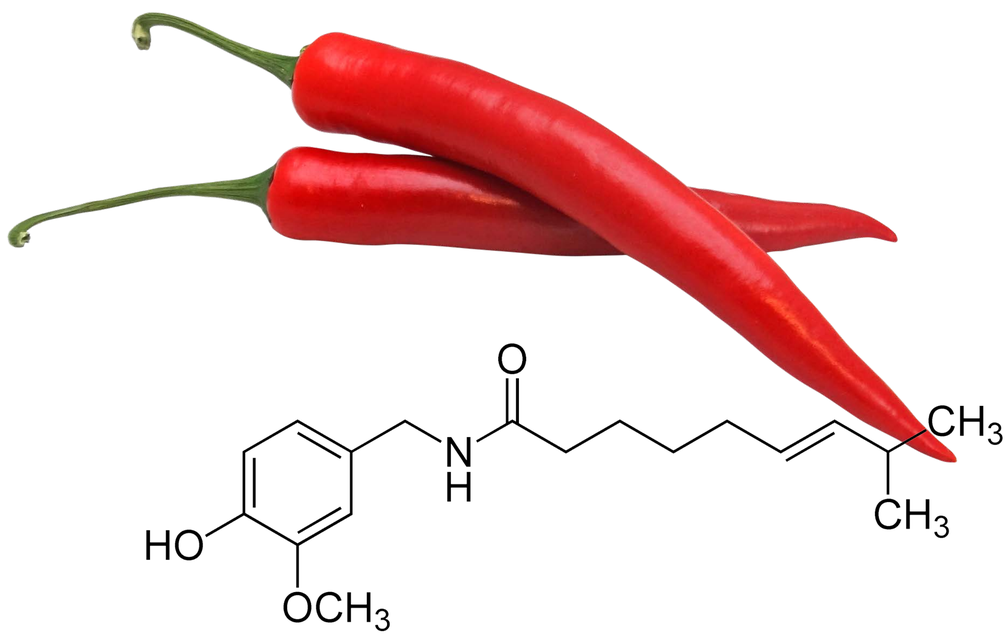
Hot Tomato! Engineering for spice

The chili pepper is the most cultivated spice crop in the world with an annual value over $20B (USD). As well as it's use in the food industry, it is used in pharmaceuticals as an analgesic in balms to treat chronic arthritis, joint and other pain.

The spicy flavour of chili peppers is due to the accumulation a compound called capsaicin. Despite chili pepper being the only organism that produces capsaicin, the genes needed for capsaicin production are also mostly present in tomatoes. Interestingly, most of these genes even behave similarly in tomato fruit to those in chili peppers - yet they don't lead to spicy tomatoes!

OpenPlant Fund Project Researchers:
Greg Reeves (University of Cambridge)
Chris Boursnell (University of Cambridge)
Jie Li (John Innes Centre, Norwich)



Capsaicin - the compound that makes chilies hot

Spicy tomatoes could be used as a source of capsaicin for medicine

Only three of the tomato genes are not active in the fruit. Researchers at the University of Cambridge and the John Innes Centre (Norwich) hypothesise that these three genes are the missing components in the 'tomato capsaicin pathway'.

Using synthetic biology approaches they are aiming to discover whether turning these three genes on in the plant will complete the capsaicin pathway. The results will teach them about the capsaicin pathway and how it evolved in chili peppers. The project may also yield spicy tomatoes which could be used for extraction of capsaicin for industry.

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