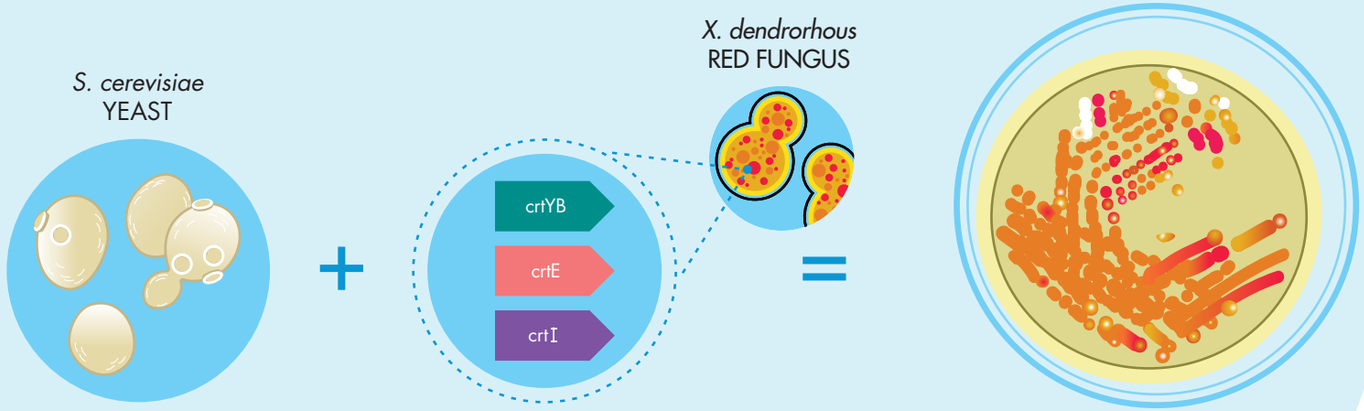
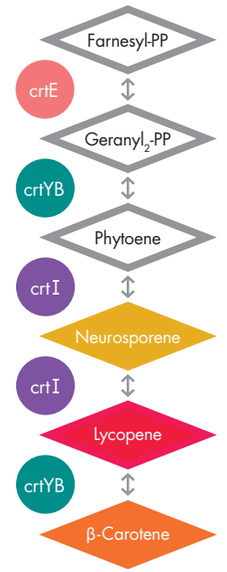
GOLDEN BREAD

THE SYSTEM

Genes from *X. dendrorhous* can be added to *S. cerevisiae*, resulting in colonies that produce beta carotene



A NEW HYPOTHESIS



WHITE colonies may have lost one or more of the crt genes

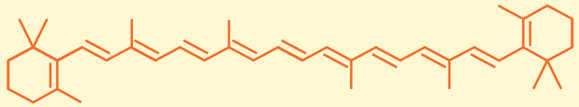
YELLOW colonies may be accumulating neurosporene.

RED colonies may be accumulating lycopene.

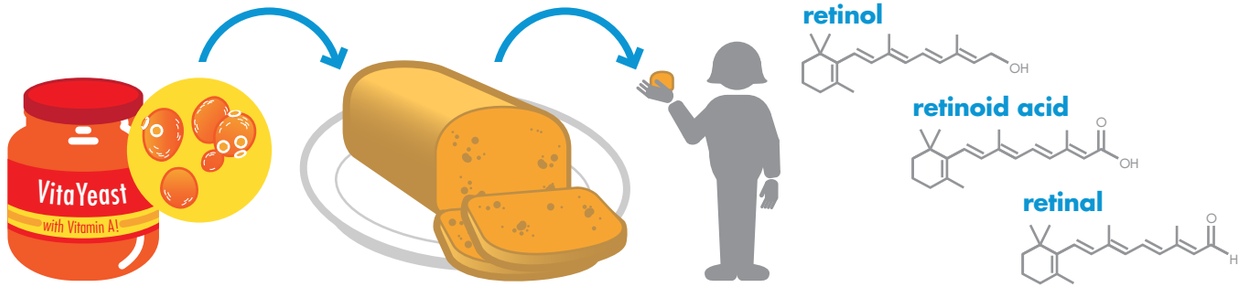
ORANGE colonies produce beta carotene, as designed.

THE BIG PICTURE

Baking with beta-carotene producing yeast creates bread "biofortified" with vitamin A

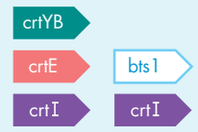


Beta-carotene (left) is converted in the body to vitamin A and its derivatives (below), which are involved in vision, development, and maintaining a healthy immune system.



ENGINEERING WITH REDUNDANCY

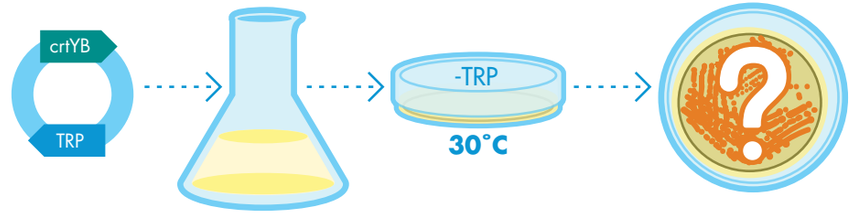
GENES in Vita YEAST



ENZYMES in Vita YEAST

- Bifunctional enzyme: Phytoene Synthase/Lycopene B-Cyclase
- Geranylgeranyl Diphosphate Synthase
- Phytoene Desaturase

The VitaYeast strain has two copies of every enzyme in the pathway except for crtYB. Will adding an "extra" copy of this gene increase the strain's robustness, i.e. eliminate non-orange colonies?



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