

Novel Approach to Improve Production of Secondary Metabolites in Yeast (Yissum) code: 8-2012-2767 Alexander (Sasha) Vainstein, HUJI, Faculty of Agricultural, Food and Environmental Quality Sciences, Robert H. Smith Institute of Plant Sciences and Genetics in Agriculture Hagai Abeliovich, HUJI, Faculty of Agricultural, Food and Environmental Quality Sciences, Biochemistry, Food Science and Nutrition

Metabolic engineering harnesses subcellular compartments in bakers' yeast

| Categories | Food & Nutrition, Functional Foods & Ingredients, Cosmetics |
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| Development Stage | Proof of concept and prototype |
| Patent Status | Patent application filed in the United States |
| Highlights | |

- Secondary metabolites, such as terpenoids (or isoprenoids), produced by plants, are used in pharmaceuticals, perfumes, coloring agents, and food additives among others.
- The levels of these compounds in plants are low and extraction is costly, inefficient and requires large amounts of plant material, while synthesis involves multiple steps and produces low yields.
- One approach to obtain rapid and inexpensive high level production of plant terpenoids involves metabolic engineering of heterologous organisms that are easily cultivated and extracted.
- Bakers' or brewers' yeast, Saccharomyces cerevisiae, provides an attractive platform for this process.

Our Innovation

Producing high yields of valuable natural plant compounds in the common yeast, Saccharomyces cerevisiae, by using different subcellular compartments. A yeast line producing high yield of terpenoids has been already developed.

Key Features

- Up to 20-fold improvement in production of plant derived sesquiterpenoids in yeast.
- The secondary metabolites include alkaloids, terpenoids, tannins, glycosides (steroids and phenolics) and saponins. These have applications in pharmaceuticals, food flavorings, and perfumery.
- Can be used for the production of different secondary metabolites according to specific requirements.

Development Milestones

• Seeking industrial cooperation

The Opportunity

• May be used to produce natural insecticides, coloring agents, flavors and fragrances, anticancer and antimalarial drugs among others

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Link to Article

www.yissum.co.il/sites/default/files/project_images/Articles/2767_vainstein_abeliovich_2011_harnes sing_yeast_subcellular_compartments_for_the_production_of_plant_terpenoids.pdf

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