

Novel Approach to Improve Production of Secondary Metabolites in Yeast (Yissum)

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[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
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

Link to Article

www.yissum.co.il/sites/default/files/project_images/Articles/2767_vainstein_abeliovich_2011_harnessing_yeast_subcellular_compartments_for_the_production_of_plant_terpenoids.pdf

Contact for more information:

Michal Levy , VP Head of Bus. Dev. Agri-Tech, Vet. & Environment, +972-2-6586635

Yissum Research Development Company of the Hebrew University of Jerusalem
Hi-Tech Park, Edmond J. Safra Campus, Givat-Ram, Jerusalem P.O. Box 39135, Jerusalem 91390
Israel Telephone: 972-2-658-6688, Fax: 972-2-658-6689