

47-2020-10854 | Expression and Secretion of Proteins in Plants

[Wolf Shmuel](#), HUJI, Faculty of Agricultural, Food and Environmental Quality Sciences, Plant Sciences and Genetics

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| Category | Agriculture, Food& Nutrition, Life Science & Biotechnology |
| Keywords | Protein expression, Plant expression, biosimilar , Food, Nutrition, Functional Additives, Peptides, Protein |
| Current development stage | General list: TRL4 Technology validated in lab |
| Collaboration Opportunity | Sponsored Research with an option to License Research Results |

Background

Plant based systems have been used in the past for producing biologics. These plant overexpression systems have been used to produce protein vaccines, monoclonal antibodies and bio-similar immunotherapeutic. However, the production capacity of these plants has been low.

These plant based expression systems usually have low yields (mg/kg of fresh weight) and purifications of the protein is generally complex and expensive due to the presence of cell walls. In these systems, 70% of production costs are related to purifications.

Our Innovation

The researchers have developed a platform system for expressing pharmaceuticals, additives, nutraceutical, and functional foods that can be expressed and secreted in high concentrations and can also be easily purified. These plants are easy to grow, and protein expression can be directed for simple extraction and purification. As such, this can reduce costs and significantly increase yields. The advantages of this platform are:

- Decreased purification costs
- Increased Yields - model Green Florescent Protein (GFP) reaches as high as 6 kg of green-fluorescent-protein (GFP) that can be purified per hectare per year.

Technology

Our aim is to develop a unique plant system for the **production of therapeutic proteins and their accumulation in plants for easy extraction and purification.**

Over the past several years, we tested the feasibility of farming recombinant proteins from plants. Transgenic plants expressing GFP served for the quantification of foreign protein. GFP was collected from several transgenic plants expressing the gene and we demonstrated production results that reached values that are over 10-fold higher than those reported for recombinant proteins expressed in other plant tissues.

Patent Status

Contact for more information:



Ilya Pittel

VP, BD AGTECH, FOODTECH, VETERINARY & ENVIRONMENT

+972-2-6586693

Yisum 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