



From DISCOvery to products:

A next generation pipeline for the sustainable generation of high-value plant products



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement No 613513.

About DISCO

Plant natural products have been utilised by human civilisation for millennia, providing vital medicines and essential dietary components. More recently bioactive compounds from plant sources have been used in cosmetics, as health supplements and are important components of feedstuffs. Despite significant investments new activities and new sustainable biosources are required to reduce or eliminate chemical refining and thus environmental impact.

Against this backdrop, DISCO aims to understand plant biosynthetic pathways involved in the formation of high-value plant products and develop new tools for metabolic engineering and molecular breeding to generate new biosources of bioactive and industrial phytochemicals.

In order to achieve this ambitious goal, DISCO brings together a multidisciplinary project consortium of leading academic experts from plant genetics, molecular biology and metabolic engineering as well as industrial partners from six European countries (UK, Belgium, Germany, Israel, Italy, Romania) and one South American country (Chile).

DISCO is a four-year collaborative project, which started on November 1, 2013. It is funded by the European Commission under the Seventh Framework Programme for Research and Innovation (FP7) with a total budget of 6.5 million euros.

Innovation

The most important innovative aspects of DISCO at a glance:

- DISCO aims at developing new sustainable biosources of plant-derived products of pharmaceutical and industrial interest.
- DISCO will fine-tune bioactive compound extraction procedures using the latest enabling technologies to achieve industrial valorisation and commercialisation.
- With the delivery of sustainable biosources, DISCO aims to eliminate future detrimental chemical refining by developing “green factories” with integrated biorefining pipelines. This will help to alleviate the reliance on chemical synthesis, thus reducing environmental impact.
- DISCO will provide new plant material to benefit human activities, improve the quality of life and health of European populations and stimulate economic development.

DISCO approach

The DISCO project is based on a proven industrial format which aims to create a framework that can act as a generic pipeline capable of taking discovery through application and validation, to translation and industrial valorisation.

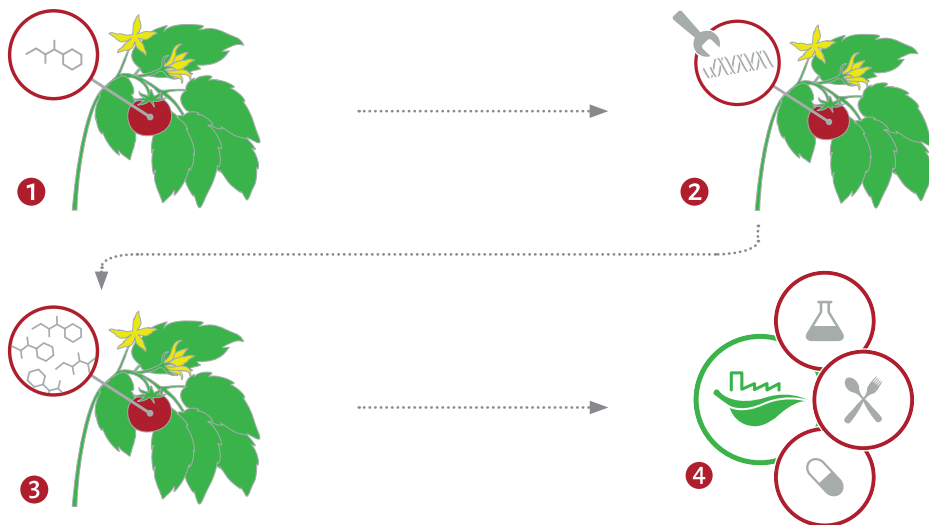
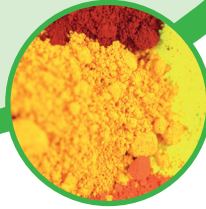
Discovery



Application



Translation



- 1 DISCO will identify new or under-utilised sustainable biosources of plant-derived compounds of pharmaceutical and industrial interest.
- 2 DISCO will develop new tools and strategies to optimise secondary metabolite production in plants.
- 3 DISCO will ensure that the very latest procedures are in place to facilitate rapid and efficient metabolic engineering and molecular breeding.
- 4 From discovery to products: DISCO will demonstrate feasibility of plant based renewable production and effectiveness of the derived products.

Solanaceae and Iridaceae as rich sources of high-value bioactive compounds

The bioactive molecules targeted in DISCO are derived from two important plant families, namely Solanaceae and Iridaceae, which have recently been identified as promising biosources and which consist of different plant species such as tomato and potato as well as saffron respectively.

What are the bioactive molecules targeted in DISCO used for?

Terpenoids

Solanesciol is used in the production of Coenzyme Q10, which is used in the treatment of cardiovascular disease, cancer and atherosclerosis. It is also used as an antiulcer agent and in the control of hypertension.



Carotenoids

Ketocarotenoids are natural pigments used as colorants in feed-stuffs especially in aquaculture (salmon and trout farming) and poultry industry.

Colourless carotenes (such as phytoene and phytofluene) are important bioactive ingredients of cosmetics conferring various beneficial health effects, such as anti-ageing.

Apo-carotenoids from saffron are used as colorants and aroma enhancers in the food industry as well as bioactive compounds in the health sector.



Tropane alkaloids

Scopolamine is mainly used by the pharmaceutical industry, as a treatment of nausea and vomiting caused by motion sickness or postoperative effects. In case of motion-sickness this could be car or sea sickness and it is even used by scuba divers and astronauts.



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For more information please visit our website

www.disco-fp7.eu



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