

INNCOCELLS – INNOVATIVE HIGH-VALUE COSMETIC PRODUCTS FROM PLANTS AND PLANT CELLS FOR SCIENTIFICALLY VALIDATED SUSTAINABLE COSMETIC INGREDIENTS

FRUSCIANTE S.*, DEMURTAS O.*, FIORE A.*, SEVI F.*, MASSA S.*,
PAGLIARELLO R.*, NARDI L.*, GAREGNANI M.*, BENNICI E.*, RISCHER H.**,
GOOSSENS A.***, GUERRIERO G.****, VAN DROOGENBROECK B.*****,
BOURGAUD F.*****, TWYMAN R.*****, DIRETTO G.*, OKSMAN-CALDENTY K.**

*) ENEA Italian National Agency for New Technologies, Energy and Sustainable Economic Development

**) VTT Technical Research Centre of Finland Ltd

***) VIB Vlaams Instituut voor Biotechnologie

****) Luxemburg Institute of Science and Technology

*****) ILVO Institute for Agricultural and Fisheries Research

*****) Plant Advanced Technologies

*****) Twyman Research Management Ltd

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Higher plants are a rich source of highly diverse specialized metabolites offering enormous industrial potential particularly as cosmetic ingredients. The growing use of cosmetics has increased the demand for scientifically validated bioactive ingredients, and companies zealously seek innovations to demonstrate the evidence-based functionality of their products. Moreover, environmental concerns are also reflected in cosmetic industry and consumer preferences with higher demands for green products with natural ingredients. Cosmetic ingredients may work as fragrances, colorants, moisturisers and stabilisers, but the most valuable functions include sun protection, anti-ageing, whiteners and antimicrobials. The InnCoCells is a Horizon Europe Research and Innovation Action project, which develops innovative and sustainable plant-based production processes for the commercial exploitation of validated cosmetic ingredients based on underutilised plant resources. Raw material is obtained from cell cultures, aeroponics and greenhouse/field cultivations, but also from industrial by-

products and biowaste fractions produced by the agri-food sector. Systematic approaches regarding cultivation parameters, the extraction procedures and bioactivity assessments are being established. Genomic, transcriptomic and metabolomic data for several candidate plant species will be generated/mine in order to understand the biosynthesis, regulation and environmental/physiological roles of their bioactive molecules. This will inspire the design and development of novel engineering tools to enable further utilisation of the plants. A unique panel of innovative enzyme and cell -based assays are applied to ensure safety and validation of claimed activities based on robust scientific data and a deep and high-throughput metabolomics is used to identify the metabolites responsible of the bioactivity detected. Finally, plant extracts and natural products with the most promising activities and environmentally friendly production processes will be advanced to testing in human volunteers, this means that none of the products will be tested on animals, nor will they contain any animal ingredients.

In this contest, ENEA will deal in particular with the chemical characterization of bioactive species and molecules, through metabolomic analyzes, but also with the development of cellular and soilless cultures of plants kencur, ginger, cress, perilla, basil and tomato.

The consortium includes 17 partners with eight SMEs and one large company from the cosmetic sector. This interdisciplinary and industry-driven project directly boosts investment, employment and economic growth in Europe by developing innovative new biotechnology-based plant-derived products and processes.