

PLANT TERPENE BIOSYNTHESIS GENES FOR HUMAN HEALTH. APPLICATION VIA GENOME EDITING IN CHICORY; THE EU-CHIC PROJECT

CANKAR K.*, VAN DER MEER I.*, HENDRIKS T.**, TISSIER A.***, ALLAN A.****, VAN DER OOST J.*****, MALNOY M.*****, HÄKKINEN S. T.*****, SOKOVIC M.*****, SPRINK T.*****, SPÖK A.*****, HOFFMANN J.*****, METZLAFF K.*****, DE ROODE M.*****, SANTOS C.*****, HINGSAMER M.*****, BUNDOCK P.*****, SANZ M.*****, BOSCH D.*

*) Wageningen Research, NL

**) University of Lille, FR

***) Leibniz-Institut für Pflanzenbiochemie, DE

****) Plant and Food Research Limited. NZ

*****) Wageningen University

*****) Fondazione Edmund Mach, IT

*****) Teknologian tutkimuskeskus VTT Oy, FI

*****) Institut za Biološka istraživanja Siniša Stanković, RS

*****) Julius Kuhn-Institut Bundesforschungsinstitut für

Kulturpflanzen, DE

*****) Graz University of Technology, AT

*****) Art & Science Synergy Foundation , PL

*****) European Plant Science Organization, BE

*****) Sensus, NL

*****) Instituto de Biologia Experimental e Tecnológica, PT

*****) Joanneum research, AT

*****) KeyGene, NL

*****) IDConsortium, ES

The CHIC project (Chicory Innovation Consortium), which is funded by the EU Horizon 2020 programme, consists of 17 partners from 12 different countries (<http://chicproject.eu/>). The overall objective is to implement New Plant Breeding Techniques (NPBTs) in root chicory in order to establish it as a multipurpose crop and as a sustainable approach to molecular farming, i.e.

the production of health-related products with clear benefits for consumers. CHIC develops root chicory varieties that on the one hand produce more and healthier inulin food fiber, a product which is already extracted from chicory on an industrial scale, and on the other hand produce sufficient amounts of medicinal terpenes. To this end, it has investigated the bioactivity of the endogenous chicory terpenes and has intervened in the biosynthetic pathways to optimize terpene formation using genome editing.

CHIC is highly interdisciplinary and focussed on interaction with stakeholders. The Consortium evaluates the technical performance of different NPBTs, as well as the safety, environmental, regulatory, socio-economic and broader societal issues associated with them. CHIC gives great emphasis to communication about the project and about genome editing in general, also implementing innovative communication methods such as by involving artists that aim to inspire a broader public debate using CHIC inspired art works.