CORNET Call for Proposals: international Collective Research

--- Project Idea ---

Subject:	**Plant roots valorisation to high value-added products, PROVACID**
Coordinator: Other applicant(s):	Prof. dr. ir. Iris Cornet Prof. dr. Serge Tavernier, Prof. ir. Marc Wijnants, dr. Rashmi Katari
Sector/target group:	Root side stream providers (sugarbeet pulp, potato peels), bioethanol producers, polymer industry, food additives
Proposal summary:	In this project, the outer peel of roots will be valorized to high value-added products such as anti-oxidants for food additives and dicarboxylic acids as building block of polymers. Root side streams, such as sugar beet or potato, are mainly composed of a poly(acetylglycerol) macromolecule also known as suberin. The suberin's chemical structure is built from different monomers including bifunctional fatty acids, glycerol and phenolic acids. The root peel waste can be used to produce bioethanol (from residual saccharides on the peel) and subsequent extraction of the remaining suberin that contains diacids and phenolics (ferulic acid) which are commercially important compounds. Suberin-based products such as antioxidants and long chain dicarboxylic acids as polymer building blocks with a high value will be obtained. The research of the Biochemical Green Engineering and Materials (BioGEM) group is directed towards sustainable solutions with a strong focus on industrial application. Industrial application is a very important aspect of our identity. We want to bridge the 'valley of death' and bring innovation to industrial implementation. Therefore, our main activities are also located at somewhat higher technology readiness levels. Nonetheless, basic research supports the main research lines of the group. In the industrial biotechnology research we look for new solutions for efficient microbial production of chemicals, such as surfactants, diacids, bioethanol, lactic acid, single cell oil, enzymes, optimization of fermentation technology, biological detoxification of lignocellulose feedstock, valorisation of biomass waste streams and investigation of microbial metabolism to improve fermentation yields.
Advantages for trade and industry:	Nowadays, huge amounts of root waste streams are produced and are mainly applied as animal feed. However, it contains valuable compounds for the production of plastics. Extraction of high value-added products from these streams is an advantage for the food industry (sugar refineries, potato companies) which can get a higher price for their waste, as well as for the chemical industry, which can obtain cheaper raw materials for the production of water-repellent plastics. Additionally, the saccharides present in the waste stream can be converted to 2G

	bioethanol, .
Dissemination concepts:	Project results will be communicated via the PROVACID website (to be constructed), via seminaries and conferences. Concepts are • The process value chain • Applied technology • Economic analysis
Profile of additional partners:	SMEs and other companies interested to participate.
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