BioTRANSformation of by-products from fruit and vegetable processing industry into valuable BIOproducts

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The **main aim** of TRANSBIO is the implementation of an innovative **cascading concept** for the **valorisation of sub-products from the fruit and vegetable processing industry** using environmentally friendly biotechnological solutions like **fermentation** and **enzyme-conversion strategies** to obtain valuable bioproducts like plastics (**PHB**), nutraceuticals / platform chemical **succinic acid** and **enzymes** for detergent applications.
CIRCULAR ECONOMY

AGRICULTURE – Fruit & Vegetable

CO₂

end-of-Life

BIOENERGY

Food – Fruit & Vegetable Products

Fruit & vegetable transforming industry

Fruit & Vegetable waste and by-products

Waste transformation to biogas – BIOENERGY

Bio-based & Biodegradable Biomaterials

PHB

Fermentation to bio-based products

Detergents

Enzymes

Chemical Building Block

Succinic acid

By-product transformation to be used as fermentation substrate

Food Ingredient

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Fermentative Production of PHB

Cupriavidus necator

Substitution of the fossil resources for the plastic manufacture by vegetal sources

Reduction of the contamination in the polymer production process

Optimization of the PHBs production

LAB-SCALING

UP-SCALING

EXTRACTION

DOWNSTREAM and POLYMERIZATION

Research hurdle - costs of the pretreatment step!

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By-products from fruit and vegetable processing

Bio-database of ~ 1200 isolates of natural *S. cerevisiae* and “non-conventional” yeasts

Narrowed down to 2 best-preforming strains spontaneously accumulating succinic acid

Performance and scalability proven at pilot scale

Optimal chassis for building a highly performing cell factory used in the production of succinic acid and other (di)carboxylic acids

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Enzymes for detergent application

Detergent development

Stability of the ingredients respect the Supernantant of SSF

Up-scaling in 1,200 kg scale

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The cycle is closed as energy is recovered to fuel the extraction processes and an organic fertilizer with good agricultural value is produced (digestate). Nutrients are recycled back to the soil for growing new vegetables/fruit.

Biogas production potential of sweet corn (after hydrolysis)

Continuous tests on sweet corn and potato pulp (after hydrolysis)

- Combination of different biomass streams to optimize the AD-process
- Adapt in respect to availability of the biomass throughout the year

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Thank you very much for your attention!