ERA CoBioTech

BioTech Research & Innovation Hack

2021

# ERA CoBioTech Funded Projects at A Glance: OLEOFERM

## Sustainable oleochemicals bioproduction from carboxylates via oleaginous fermentation

PART OF EUROPEAN BIOTECH WEEK

INNOVATION IS IN OUR GENES

# OLEOFERM

**Sustainable oleochemicals bioproduction from carboxylates via oleaginous fermentation**

***OLEOFERM implies a new oleochemicals supply chain by the interconnection of two bioprocesses including anaerobic fermentation of organic wastes for SCFAs production and oleaginous fermentation for microbial oils.***

**Project coordinator:**

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**Consortium**

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**Project duration:**

01 April 2021- 30 March 2024

**Total budget:** 629.000 €

## Contribute to the oleochemical industry by providing alternative microbial oils

Oleochemicals have traditionally been derived from vegetable oils and animal fats via chemical or enzymatic processes. However, the limited availability, sustainability and high cost of the feedstock limit the growth of the oleochemical industry from these raw materials. Microbial oils have high similarities with plant oils in terms of fatty acid composition and are found to be interesting precursors for the oleochemical industry. However, it should be emphasized that economic viability of microbial oil production strongly depends not only on the cell performance but also on the substrate costs. Indeed, most of the investigations dealing with oil accumulation are based on the use of sugars as a carbon source for microbial cultivation. This means that microbial oils effective production is also subjected to an available and low-cost sugar platform. Against this constraint, short chain fatty acids (SCFAs) produced during anaerobic fermentation (AF) of a wide range of wastes might be a suitable feedstock for microbial oil production via yeast fermentation. The ability of non-conventional oleaginous yeasts to accumulate high quantities of lipids from organic wastes offers the commercial potential for production of microbial oils. In this manner, OLEOFERM proposes to produce microbial oils by using SCFAs as carbon source via oleaginous yeast fermentation. These SCFAs can be produced from a wide range of organic substrates via anaerobic fermentation and thus, unlocking feedstock limitation. Finding alternatives to improve the process economics of microbial oil production processes holds significant potential and great promise for further societal development. With the development of OLEOFERM, Europe will increase the portfolio of potential oil sources that can give rise to a sustainable, robust and resilient industrial oleochemical industry.

## Biotechnology is a key pillar of OLEOFERM in which two bioprocesses including anaerobic fermentation of organic wastes for SCFAs production and oleaginous fermentation for microbial oils are interconnected

The implementation of OLEOFERM involves technological leaps in the individual stages of the overall process. In this way, maximizing the biomass conversion into SCFAs in the AF of wastes can only be accomplished by finding the most appropriate trade-off in terms of operational conditions, as well as paying special attention to the anaerobic microbiome conducting this bioconversion process.

This project has received funding from the European Union´s Horizon 2020 research and innovation programme under grant agreement No [722361]

Regarding oleaginous fermentation using SCFAs as carbon source, conversion efficiencies remain unknown since the metabolic pathways by which SCFAs are uptaken by oleaginous yeast remain controversial. In addition, bioprocesses linkage involves considerable improvements of the advanced separation methods of chemicals (SCFAs recovery).

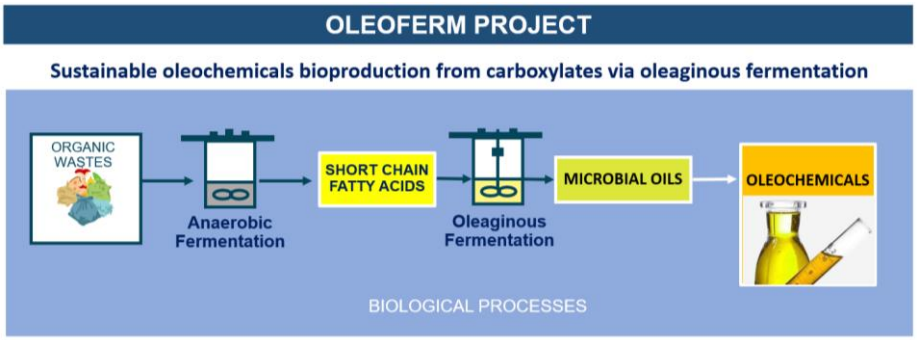


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*Figure 1: OLEOFERM Project scheme*

**Expected results**

OLEOFERM has been designed to strengthen European research and innovation, creating new market avenues, increase exchange and network, enhancing research visibility and generating a critical mass to address European (and global) challenges. With the development of OLEOFERM, Europe will increase the portfolio of potential oil sources that can give rise to a sustainable, robust and resilient industrial oleochemical industry.

**Project website:** https://oleoferm.eu/

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