

### **Abstract WODCA**

**Waste oil to long-chain dicarboxylic acids**, full cSBO with a proposed starting date on 1 January 2022 and a proposed duration of 48 months, with research partners UAntwerpen, UGent and VITO.

Long-chain aliphatic dicarboxylic acids (LCDAs) are versatile, biodegradable, chemical intermediates of different chain lengths ( $\geq C_{12}$ ) and saturation, usable as precursors for high-grade polymers (PE, PA, PU), lubricants, hydrophobic coatings, corrosion inhibitors, perfumes, adhesives and macrolide antibiotics. The current global LCDAs market was 201.36 M\$ in 2019 with an increase in the last three years and a broadcasted compound annual growth rate (CAGR) of 5.9% (DataHorizzon Research 2020). The EU market share is about 20%.

Traditional fossil-based LCDAs are produced via expensive, harsh chemical processes that lead to unwanted side products and only short/medium-chain saturated DA products. Also, chemical processes to convert plant oils via metathesis into bio-based LCDAs have been implemented, with similar limitations or with the disadvantage of complex product mixtures in the case of the more recent self-metathesis. Biotechnological production proved to be a good alternative technology yielding a wider range of LCDA products with varying degrees of unsaturation, obtainable from fossil-based alkanes or plant-based fatty acids using microorganisms. However, biosynthesis of longer chains ( $\geq C_{16}$ ) suffers from low performance (expensive substrates, low product concentrations, slow reaction rates, high viscosity, foaming), and costly downstream processing.

WODCA aims to tackle all limitations by applying **lipid waste streams** as a sustainable, low-cost feedstock for optimized biotransformation to **existing and new value-added LCDA building blocks, tailored to selected applications** (focus on C<sub>12</sub>, C<sub>16</sub>, C<sub>18</sub>). To this end, the project will apply robust **newly engineered non-pathogenic microbial strains, advanced conversion technologies** and **downstream processing at a competitive price**.

*For substantive questions about this project proposal, please contact MOT1 representative Isabelle Monnaie ([imonnaie@catalisti.be](mailto:imonnaie@catalisti.be); +32 471 506 833).*