# CARBOSURF

*New processes for the fermentative production of glycolipid biosurfactants and sialylated carbohydrates*

CONSORTIUM: 11 partners

BBI JU: €2,7M

GA N°: 669003

COORDINATOR: BBEPP

CARBOSURF

## CONCEPT

This project aims to develop new processes and solve bottlenecks in the fermentative production of biosurfactants and specialty carbohydrates. Specifically, the project targets the development of innovative fermentation processes to produce the following compounds:

1. Glycolipid biosurfactants. The project targets four distinct classes of biosurfactants, specifically rhamnolipids, sophorolipids, xylolipids and mannosylerythritol-lipids with a wide range of application fields.

2. Specialty carbohydrates. Specifically, the project targets sialylated oligosaccharides, a class of very complex Human Milk Oligosaccharides that find application as a neutraceutical, pharmaceutical and cosmetic ingredient.

For both product lines, microbial producer strains will be developed through metabolic engineering.
The fermentation process and down-stream processing will be developed and optimized in order to obtain an industrial process.
Second generation technology based on lignocellulosic substrates will also be developed.
Sufficient amounts of the new products will be produced for application testing, in order to evaluate their market potential in a wide range of application fields.
The technical, economic, environmental and social sustainability of the process over the whole value chain from biomass to product application will also be assessed, with an emphasis on identifying and addressing the bottlenecks in the innovation chain. A valorisation plan will be drafted to complete the innovation process.
The project consortium has all the required players to obtain the expected impact: RTO's to address the research challenges in this project, an open innovation pilot plant to optimize and scale up the new processes, three biotech SMEs and three large industries to ensure the exploitation of the project results. In addition, two user groups (one for each product line) consisting of end-user companies are involved in the project.

## OBJECTIVES

The hurdles to be tackled for the glycolipid biosurfactants are

- Widening the biosurfactant range to broaden the application field and improve efficacy
- Developing cost-efficient and sustainable fermentation processes
- Developing cost-efficient downstream processing to meet product specifications
- Prove of effectiveness in product applications
- Standardisation related activities to facilitate market uptake

## CIMV CONTRIBUTION

CIMV developed a technology platform for the production of second generation sugars and lignin (Biolignin™) from lignocellulose biomass as substrate for e.g. fermentation based processes.

The role of CIMV in CARBOSURF will be the implementation of its biorefining technology to produce fermentable second generation sugars for fermentative biosurfactant production.

Contribution to the Bioeconomy

www.carbosurf.eu

cimv
THE BIOREFINERY CONCEPT

# BIO-BASED INDUSTRIES

The Joint Undertaking on Bio-Based Industries (BBI) is a public-private partnership aiming at increasing investment in the development of a sustainable bio-based industry sector in Europe. It aims at providing environmental and socio-economic benefits for European citizens, increasing the competitiveness of Europe and contributing to establishing Europe as a key player in research, demonstration and deployment of advanced bio-based products and biofuels. The BBI Joint Undertaking will also play an important role in achieving a bioeconomy in Europe. Bio-based industries and their value chains are facing complex and substantial technology and innovation challenges. As a nascent sector, bio-based industries have to overcome the dispersion of technical competences and the limited publicly available data on real resource availability in order to build sustainable and competitive value chains. In order to tackle these challenges, critical mass has to be achieved in a focused and coherent way at European level in terms of scale of activity, excellence, and potential for innovation. The BBI Joint Undertaking will mitigate the different types of market failures that discourage private investment into pre-competitive research, demonstration and deployment activities for bio-based industries in Europe. In particular, it will ascertain the availability of reliable biomass supply taking into account other competing social and environmental demands, and support the development of advanced processing technologies, large scale demonstration activities and policy instruments, thus reducing the risk for private research and innovation investment in the development of sustainable and competitive bio-based products and biofuels.

The objectives of the Bio-Based Industries (BBI) Joint Undertaking are to contribute to a more resource efficient and sustainable low-carbon economy and to increase economic growth and employment, in particular in rural areas, by developing sustainable and competitive bio-based industries in Europe, based on advanced biorefineries that source their biomass sustainably and in particular to:

- Demonstrate technologies that enable new chemical building blocks, new materials, and new consumer products from European biomass, which replace the need for fossil-based inputs;
- Develop business models that integrate economic actors along the value chain from supply of biomass to biorefinery plants to consumers of bio-based materials, chemicals and fuels, including through creating new cross-sector interconnections and supporting cross-industry clusters;
- Set-up flagship biorefinery plants that deploy the technologies and business models for bio-based materials, chemicals and fuels and demonstrate cost and performance improvements to levels that are competitive with fossil-based alternatives.



BIO-BASED INDUSTRIES Public-Private Partnership