

ABACUS

Algae for a biomass applied to the production of added value compounds



Summary

Algae production is currently limited to a few small industries, mainly for the feed, nutrition and cosmetic sectors. This is ripe for expansion. However, creating an economically viable and sustainable method of growing large quantities of algae and converting them into commercial products that the markets accept remains a challenge.

The commercialisation of high value compounds sourced from microalgae could grow the existing industry considerably, while product innovation based on new molecular targets and biorefinery schemes could open new markets. The ABACUS project has been designed to synthesise a range of new molecules, in terpenoids family, from microalgae that will help bring competitive products to the market.

<http://www.abacus-bbi.eu/>

Type of Action:

Research & Innovation Action

Value Chain: Aquatic biomass

Start date: 01 May 2017

End date: 30 April 2020

BBI JU contribution: € 4,653,658.66

Objectives

- Define market opportunities and product specifications for algae-derived products
- Select the specific algae needed to meet these product specifications.
- Optimise the production process and design tools and procedures for process management
- Demonstrate cost-in-use acceptance of algal fractions for targeted lead applications (fragrances; nutraceuticals) and side-product streams
- Fully assess the acceptability of algae-derived products and production processes using comprehensive Technical Economical and Life Cycle Analyses
- Valorise the research and disseminate the results from ABACUS

Expected impacts

- From a technical perspective, ABACUS aims to
- Determine new processes for separating, purifying and extracting the compounds of interest at a yield and cost that makes scaling up of the process cost-effective.
- Achieve improved yield per mass unit biomass-input, or improved cost effectiveness as compared to current routes towards the same or comparable products.
- Ensure that new products meet the safety, quality and purity requirements of EU legislation to ease future market access and commercialisation.
- In addition, ABACUS will enhance innovation capacity by connecting algae-producing companies with larger enterprises in the flavour and perfume sectors, which seek new natural, bio-based sources.
- Because it is a rapid- growth organism, which doubles its biomass daily, algae offer a highly effective source of protein in comparison to terrestrial plants – even more than soy. At the same time, it can absorb CO₂, offsetting its impact on climate change.

- It will also create jobs, by opening new pathways for several highly competitive but fast growing profitable sectors, namely nutraceuticals, cosmetics and specialty products for the fragrance industry.

Achievements & milestones

ABACUS publishes a paper on microalga as a source of biomass

03 April 2019

BBI JU ABACUS project published its first peer-reviewed article in the open-access *Molecules* journal. The paper focuses on *Porphyridium cruentum* microalga as a good natural source for a variety of interesting bioactive compounds. [Read the article](#)

Project coordination

- Commissariat à l'énergie atomique et aux énergies alternatives - CEA (France)
- The Scottish Association for Marine Science LBG (United Kingdom)
- A4F AlgaFuel, S.A. (Portugal)
- Karlsruher Institut für Technologie (Germany)
- Agencia Estatal Consejo Superior de Investigaciones Científicas (Spain)
- Subitec GmbH (Germany)
- Proteus (France)
- Microphyt (France)
- Sensient Cosmetic Technologies (France)

Organisation name: Commissariat à l'énergie atomique et aux énergies alternatives - CEA (France)