

# SpiralG

Production of phycocyanin from the spirulina arthrospira sp. Revisiting the sourcing, extraction and co-valorisation of the whole algae in the frame of an industrial biorefinery concept

## Summary

The aquatic environment is underexplored and under exploited, with huge potential value. A small number of these are microalgae, with the capacity to make the best use of light, to protect against light and deploy defence systems and molecules involved in chemical communication.

Microalgae are also among the fastest-growing plants on Earth, capable of doubling or even trebling their biomass daily. The SpiralG project aims to build an algal biorefinery on a demonstration scale. This will take one of these microalgae and use it to produce several metric tonnes of phycocyanin per year. Phycocyanin is a pigment widely used in the pharmaceutical, cosmetic and food industries.



<https://www.spiralg.eu/>

### Type of Action:

Innovation Action -  
Demonstration

**Value Chain:** Aquatic  
biomass

**Start date:** 01 May 2018

**End date:** 30 April 2022

**BBI JU contribution:** €  
4,051,693

## Objectives

As individual algae can produce a number of valuable products, the overarching objective of the SpiralG project is to build an algal biorefinery capable of taking advantage of the various components and their intermediate metabolites, and hence maximising the value derived from the biomass feedstock. More specifically, SpiralG intends to build a demonstration plant with an anticipated production capacity of several MT of phycocyanin per year and tentatively a few MT of enriched amino-acid and carbohydrates co-products.

Each project partner has its own specific objective:

- Greensea wishes to acquire and deploy a new blue pigment production line that would eventually reach an output of 10 metric tonnes per year, which represents TRL 8 and the possibility of becoming a flagship project;
- Milis seeks to build a microalgae pilot plant with lower labour requirements, enhanced phycocyanin content, lower nutrient consumption and increased reliance on renewable energy;
- Algaia and Mial wish to apply novel extraction technologies at laboratory and pilot scale with a view to further industrial

## Expected impacts

The SpiralG project expects to deliver the following impacts:

- Connecting Spirulina with biorefineries by producing not only phycocyanin for the food market but also several other Spirulina fractions as raw materials;
- Establishing a new value chain that ranges from microalgae cultivation to phycocyanin co-products, by establishing an integrated co-extraction pathway between partners;
- Develop a range of bio-based extracts suitable for their use in consumer products including pet food, plant health and potentially disease prevention in humans;
- Identify ways to produce phycocyanin at a competitive price by increasing the production scale and overall quality level while reducing costs across the board;
- Highlight the potential of developing a Spirulina value chain in coastal areas willing to produce a natural product with a sustainable perspective;
- Encourage microalgae production processes using increasingly levels of renewable energy sources, such as solar, biogas heating and photovoltaic panels, able to decrease the overall carbon footprint.



## Project coordination

- Greensea SAS (France)
- Algaia (France)
- Milis Energy Società Agricola SRL (Italy)
- Mial GmbH (Germany)
- University College Dublin, National University of Ireland (Ireland)

**Organisation name:** Greensea SAS (France)