



## TOPLIPID

### HEALTHY PRODUCTS BASED ON ACTIVE INGREDIENTS EXTRACTED FROM MARINE MICROALGAE

The TOPLIPID project aims to develop active ingredients extracted from marine microalgae that are rich in polyunsaturated fats, notable for helping combat the effects of aging. Almost 200 000 cases of AMD (Age-related Macular Degeneration), Alzheimer's, etc. are diagnosed each year. As life expectancy increases, this figure continues to rise. The French government and Ministry of Health and Sports have made tackling this social problem a priority. The scientific literature reveals that a diet rich in omega-3 and omega-6 fatty acids reduces the risk of the onset of these pathologies. These polyunsaturated fatty acids (PUFAs) may be animal or vegetable in origin. They are, for example, found in oilseed rape, grape seeds and flax. While such fatty acids extracted from plants help prevent cardiovascular diseases, they have not proven to be as effective at preventing neurodegenerative disorders. Fish oils, and particularly those from oily fish, are naturally rich in long-chain polyunsaturated fatty acids and are renowned for their protective properties. There are difficulties however in relying on this sole and increasingly rare resource. Moreover, as a result of their smell and the need to purify them of all pollutants, these fish oils require specific processing that increases production costs. Some oil-rich microalgae could provide an alternative source of omega 6. These are already being processed in specific ways designed to extract molecules with numerous useful industrial applications in agribusiness and health and nutrition, in the form of dietary supplements and cosmetics and, particularly, for preventing AMD-type illnesses. TOPLIPID will identify and characterise the most relevant microalgal strains and will create the optimum environments for cultivating the microalgae and obtaining maximum algal cell and oil fraction production yields. Environmentally friendly technologies for drying and extracting the oil fraction of the microalgae will be perfected. The resulting oils will be characterised according to lipid composition, toxicology profile and physiological effects. Depending on the results obtained, the oil fractions will be formulated to provide a lipid profile that matches desired uses. Pharmaceutical forms will be adapted to food supplement, cosmetics and health markets.

#### Spin-offs and future developments

During the project, cultivation of 7 of the 10 preselected microalgae strains was validated to the pre-industrial stage, and then on an industrial scale for 2 of these. This initial stage was crucial in enabling the project to proceed with supplying the raw material necessary for subsequent work. Lipids extracted from

#### Partners

##### Companies

Soliance, Pleumeur-Bodou [Project Developer]  
Yslab, Quimper

##### Research center

Université de Nantes, Laboratoire EA 2160, Nantes

#### Funders

- Bpifrance
- Conseil départemental du Finistère
- Quimper Communauté

#### Labelisation

28/02/2010

#### Overall budget

866 K€

the 7 preselected microalgae were successfully analysed and characterised, making it possible to produce lipid fractions and to test these on cell models. During these tests, antioxidant activity was discerned in certain lipid fractions.

Similarly, drying tests carried out at the Institut Polytechnique Lasalle Beauvais revealed the feasibility of using microwaves on the microalgae biomasses to dry them. The project has yet to complete the planned research into marketing the lipid extracts from the microalgae for cosmetics and ophthalmology.

Different research options are being explored to offset the extremely high cost of the lipid extract obtained: testing the effectiveness of new extraction technologies, improving the biological assessment of extracts to increase the concentration tested on targeted cell models and looking to the dermocosmetics market.

**The TOPLIPID project is recognised jointly by the Pôle Mer Bretagne Atlantique, Pôle IAR and Pôle Valorial.**