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# PRODUCING CHOLESTEROL-LOWERING MICROALGAE AT INDUSTRIAL SCALE

#energy transition #clean technologies #microalgae  
 #bioprocess engineering #bioproduction #photobioreactors  
 #biomolecules #scale up

Incubated by the European Space Agency (ESA), ezCOL BV is developing brand-new medical technology for LDL cholesterol reduction. The program of this "MedTech" company aims to make medical use of a very specific strain of microalgae that has been identified as having remarkable cholesterol-lowering properties. The company called upon experts in bioprocess engineering from Capacités to scale up the microalgal biomass production and provide the volume necessary for a clinical trial.

## DESIGNING AND SCALING UP MICROALGAL CULTURE PROCESSES

In order to launch a clinical study on microalgae with cholesterol-lowering properties, the MedTech company ezCOL needed a volume of biomass exceeding one kilogram dry wet. The strain had not yet been cultivated at this scale; the company put Capacités experts in charge of defining and implementing the scale-up conditions and then supplying the dried biomass necessary for the clinical trial.

As an extension to the specifications provided by ezCOL, engineers from both companies first established a technology transfer protocol. The scale-up parameters could then begin to be defined on a highly controlled photobioreactor from the AlgoSolis technology platform, operated by Capacités engineers. This strain of microalgae grows naturally in extreme conditions, so the parameters of temperature, pH,

light and oxygen level had to be accurately adjusted. At the end of this first phase of study, all parameters for scaling up had been defined.

The strain could then be inoculated into a 150-liter controlled photobioreactor (HECTOR). After several weeks in a fed-batch culture, the biomass volume produced reached 1.5 kg. After undergoing a microbial analysis, the biomass produced was conditioned in capsules before being delivered to ezCOL for the clinical study.

To successfully complete this project, the Capacités' experts benefited from support and technical equipment from the GEPEA, joint research unit Université de Nantes, Oniris, IMT Atlantique and CNRS (The French National Centre for Scientific Research). ■

### Expertises:

- Bioprocess engineering
- Microalgae

### CAPACITÉS

Created in 2005, Capacités is the private engineering and research valorisation subsidiary of the University of Nantes. It employs 90 employees, mainly engineers and PhDs, who work directly with scientists in the research laboratories.



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