FACTEUR 4

STRAIN SELECTION TO IMPROVE MICROALGAE PERFORMANCE

Obtaining original strains or populations of microalgae with significant potential for specific applications is a major challenge for the industrial exploitation of these organisms in the future.

In this context, the goal of the FACTEUR 4 project was to improve levels of lipid reserves produced in selected strains by adopting a twofold approach: firstly, combining mutagenesis and flow-cytometric selection and, secondly, using continuous selection pressure in selectiostats (instrumented photobioreactors for generating stress under controlled conditions).

The challenge was to produce improved strains with the aim of quadrupling the potential of strains harvested in the wild and those selected from algae banks.

Spin-offs and future developments

The project achieved its ambitious goal and obtained improved populations of *Phaeodactylum tricornutum* and *Tisochrysis lutea*, which exhibited greater levels of transparency, wider temperature niche and increased production of neutral lipids. Production of neutral lipids in particular was increased by a factor of 4 (hence the project name, FACTEUR 4) for several strains. Both the methodologies of mutagenesis and automated selection of cells with significant potential were greatly optimised.

Lastly, the project obtained new strains of microalgae with characteristics of interest to the aquaculture, food supplement and third-generation biofuel industries.

- **3 patents registered re selectiostat techniques and improved strains**
- **20 international publications**
- **15 presentations at symposiums**
- **New collaborative initiatives as a direct result of the project: at national level (in the context of a project funded by the Pivert Institute) and at international level (with New Zealand)**
- **Aquaculture applications under development**

The FACTEUR 4 project is also recognised by the Pôle Mer Méditerranée cluster.

Partners

Research centers

Ifremer, Centre de Nantes, laboratoire Physiologie et Biotechnologie des Algues, Nantes [Project Developer]
Institut National de Recherche en Informatique et en Automatique (INRIA), EPI BIOCORE, Sophia Antipolis
Laboratoire d'Océanographie de Villefranche, UPMC/CNRS, Villefranche-sur-mer

Funder

- Agence Nationale de la Recherche

Labelisation

31/12/2012

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2956 K€