

## PhD student opportunity on “microalgae lipid droplet”

**Funding:** CEA (CEA offers a competitive stipend plus all healthy benefits included)

**Doctoral school:** Ecole doctorale 62, Aix Marseille University

**Host laboratory:**

The team of “Microalgae and Bioenergies”, CEA, CNRS, Aix-Marseille University, France

**Director of the PhD thesis:** Yonghua Li-Beisson ([yonghua.li@cea.fr](mailto:yonghua.li@cea.fr))

**Supervisors:** Marina Siponen and Yonghua Li-Beisson

### The project summary:

#### Biogenesis and degradation of lipid droplet in microalgae

Microalgae, by using solar energy and CO<sub>2</sub>, contribute significantly to the fixation of CO<sub>2</sub> on Earth. Moreover, thanks to their metabolic capacity to synthesize carbon reserves (starch and lipids), they are also promising cellular factories for the production of biofuels, raw materials for chemistry or food. For biofuel applications, the low productivity of lipids is a major problem. This is partly due to the inverse relationship between oil content and biomass production. Oils are stored in lipid droplets (LDs), a subcellular organelle present in all eukaryotic cells. LD biogenesis and turnover play a critical role not only in cell oil content, but also in algal growth and fitness, determining overall biomass quality and productivity. However, the molecular mechanisms of LD turnover remain mostly unknown. This thesis project aims to dissect the molecular mechanisms involved in LD turnover in the model microalga *Chlamydomonas reinhardtii*. We will first establish a dynamic map of the LD proteome and lipidome under contrasting environmental conditions, then study protein-protein interactions to identify key proteins and their interaction partners. Finally, we will study the function of key proteins in LD biology and function via the study of mutants. This project will provide a better understanding of LD dynamics, an essential step towards improving the oil storage capacity of microalgae.

**Requirement:** candidates with background in biochemistry, cell biology or molecular biology are all encouraged, and previous experience with microalgae is a plus but not essential.

### How to apply :

For motivated candidates, please send your CV to Yonghua Li-Beisson ([yonghua.li@cea.fr](mailto:yonghua.li@cea.fr))

### References:

For additional information related to this project or on our work, please visit:

**Team website:** <https://www.cite-des-energies.fr/biam/recherche/ebm/>