# Project: Study of the dynamics properties of genetically modified reaction center D1 protein in photosynthetic green algae.

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**Period of STMS**: from 2012-07-03 to 2012-07-31
**Host institution**: CNR-IOM c/o ILL 6 rue Jules Horowitz-BP 156, 38042 Grenoble Cedex 9
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## Aims & subject of work

This project aims to investigate the dynamics proprieties of wild-type or mutated algae hosting replacements in the photosynthetic D1 protein. We used neutron inelastic scattering to study the collective density fluctuations in algal systems and water molecules therein. To do this, the coherent signal needs to be analyzed. As hydrogen has a large incoherent scattering cross-section compared to the mainly coherent cross-section of deuterium, the experiments on the coherent dynamics of cellular waters have been carried out in deuterated cells. To this purpose, the conditions for algae culturing in D2O were set-up. Measurements were performed on fully deuterated and completly dried cell pellets.

## Argumentation of necessity of STSM

Unravelling how structural, dynamics and functional proprieties of natural and mutated green algae influence the sequential electron transfer reactions that lead to an efficient photochemical energy conversion will help to identify the parameters underlying an increased performance in terms of protein stability and functional reliability for biosensoristic purposes and to design molecular systems mimicking the high efficiency of solar energy conversion in natural photosynthesis.

## Workplan/timeschedule followed

1) Set-up of the conditions for culturing Chlamydomonas strains in D2O c/o ILL-EMBL deuteration Laboratory
2) Sample preparation for neutron scattering exposure c/o ILL-EMBL deuteration Laboratory
3) Sample exposure to neutron beam at the CRG Brisp Spectrometer c/o ILL
4) Data analyses c/o ILL in collaboration with the Local Contact

## Main results and outcome (conclusions):

A reliable protocol for culturing different strains of *C. reinhardtii* in D2O was successfully set-up. The measurements performed in fully deuterated and dried pellet indicate a .