UNIVERSITÉ DE GENÈVE

Master project

Structural characterization of the Dictyostelium centrosome

Supervisors:
Virginie Hamel and Paul Guichard (Cell Biology Department)
http://guichardpaul.wixsite.com/centriolelab

Thierry Soldati (Biochemistry department)
http://cms.unige.ch/sciences/biochimie/-Thierry-Soldati-.html

The centrosome is the major microtubule-organizing center of the cell and is required for nucleating microtubules, essential for the establishment of the mitotic spindle and a correct segregation of the chromosomes. The centrosome is a conserved organelle between distant eukaryotes such as human and algae, and is composed by centrioles surrounded by an amorphous peri-centriolar matrix. Interestingly, during evolution, the amoeba Dictyostelium discoideum lost the core centrioles but instead assembles another organelle that is functionally equivalent to animal centrosomes. This organelle is called the nuclear-associated body (NAB) and its ultrastructure has been studied by conventional electron microscopy, revealing that it consists of a matchbox-shaped three-layered core also surrounded by an amorphous matrix of proteins. Despite this basic knowledge, the detailed structure of the NAB is still unknown, limiting our understanding about the mechanism of Dictyostelium centrosome assembly.

We are seeking an enthusiastic and highly motivated master student to study the native architecture of the NAB at high resolution, using the following strategy. First, NAB will be isolated from Dictyostelium cells. Second, the structure of the isolated organelles will be analyzed using cryo-electron microscopy coupled to tomography. Finally, the native 3D structure of the NAB will be solved using image processing.

For further information, please contact:
Paul Guichard (paul.guichard@unige.ch)
and/or
Thierry Soldati (Thierry.soldati@unige.ch)