

Fellowship for a PhD in the Cell Physics Laboratory (ISIS/IGBMC) Strasbourg

Topic : Physical-chemistry of living matter

Cells are dynamic structures : they change their shapes within minutes and exhibit rich behaviors. The main actor controlling these morphogenesis is the *cytoskeleton* composed of crosslinked biopolymers under high dynamics. It can be engineered *in vivo* and *in vitro* and these manipulations have open novel and rigorous approaches at the Interface between Physics, Chemistry and Biology with new interaction rules to be unraveled.

These phenomena result from physical mechanisms which are out-of-equilibrium : the hydrolysis of ATP/GTP provides energy to the cytoskeleton which can undergo important remodeling. The system does not have time to undergo relaxation, while new energies are provided. Altogether, a new physical framework is currently emerging to explain these cellular events, while testing new models inspired from other physical systems.

The PhD proposal will consist in characterizing phenomena associated with these **active gels** behaviors experimentally. It will involve cell biology, chemistry and physics (experiments and theories), and close interactions with an international network in this interdisciplinary field.

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