



Research practical proposal*in

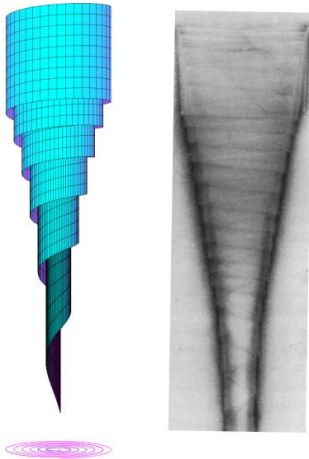
“Deciphering the R-body Extension-retrAction Mechanism”

at the Charles Sadron Institute in Strasbourg

Description:

R-bodies are unique molecular pistons produced by endosymbiotic bacteria that can switch in a fraction of second from enrolled 500nm ribbons to 20 microns membrane-perforating needles. Their extension is triggered by pH variation via a mechanism that remains unclear.

Within this internship the student will start deciphering R-bodies' extension-retraction cycle dynamics and mechanism by combining microfluidics, optical microscopy imaging, force spectroscopy methods and theoretical models.



The R-bodies will be produced in E.coli by our partner in Mulhouse. The student will immobilize them inside imaging chambers allowing rapid buffer exchange. The student will assess the influence of buffer viscosity on R-bodies dynamics and the force generated during extension using micrometric beads, optical microscopy imaging and optical tweezers. The longer-term vision is to develop the first biophysical model integrating the experimental results on the thermodynamics and kinetics of the R-body phase transition and to ultimately tame this powerful and unique, nano-machine for future applications.

Requirements & Application

The Institut Charles Sadron (ICS-Strasbourg, France) and the Institut de Sciences des Materiaux de Mulhouse (IS2M-Mulhouse France) are looking for a **motivated** master student in Experimental Physics Material Physics or Biophysics with a taste for **interdisciplinarity**.

The internship will take place at **Institut Charles Sadron in Strasbourg**.

Please address your application to:

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* *This proposal may give rise to a Master Thesis in continuation (S4 Traineeship)*