



Postdoctoral position

Biophysics of type IV pili assembly

Research Project

Type IV pili machineries are bacterial molecular nanomachines found in numerous pathogenic bacteria that allow the dynamic assembly of a polymeric fiber composed of one protein, the major pilin. These fibers play essential roles in bacterial physiology and pathogenesis. Recent approaches allowing the visualization of type IV in real time revealed that these filamentous structures form by the assembly of a staggering 1000 monomers per second and can disassemble at the same speed. A physical understanding of these extremely fast processes, which combine passive diffusion of monomers and their active, motor driven assembly/dissassembly, is still missing. Fluorescence microscopy including single molecule approaches will provide the basis for a full description of the process at the biophysical level. Theoretical aspects will be explored in the context of a collaboration with Raphael Voituriez (Laboratoire Jean Perrin, CNRS - Sorbonne Université).

Host lab

This project will be funded by an ERC AdG at the Pathogenesis of Vascular Infections Unit (Head: Guillaume Duménil) at Institut Pasteur (Paris, France). The candidate will be integrated in an interdisciplinary team that combines biochemistry, microbiology, cell biology, biophysics and animal models of infection. This project will take advantage of the vivid scientific environment of the campus including in quantitative biology and the numerous available core facilities.

Activities

The successful candidate will participate in innovative and integrated approaches to understand the function of protein nanomachines. This includes sample preparation, fluorescence microscopy, image analysis and modelling. All these expertises are present in the host lab and reinforced by well-established collaborations.

Knowledge and skills

We are looking for a motivated young scientist with a PhD in biophysics or physics with interest in biological questions. Experience in fluorescence based imaging is expected. Programming skills is recommended. The candidate should feel comfortable with interdisciplinary science. Excellent communicational and presentational skills in English is expected.

Please send CV and motivation letter to Guillaume Duménil guillaume.dumenil@pasteur.fr, Institut Pasteur, Unité "Pathogénèse des infections vasculaires", 28 Rue du Dr Roux, 75015 Paris, 01 44 38 93 83.