

Postdoctoral position on cellular morphogenesis using high-resolution fluorescence microscopy

We are looking for a highly motivated postdoctoral candidate with a background in **biophysics, physics, engineering, or chemistry** to measure the dynamics of cell-envelope biogenesis in live bacteria at the single-protein level using high-resolution microscopy. Single-particle tracking is combined with different modes of microscopy, physical modeling, as well as methods from cell biology and genetics (e.g., CRISPRi) to build a molecular and physical understanding of the determinants of bacterial morphogenesis.

We have already constructed a custom microscope with high stability and precision that allows us to image protein dynamics in 2D at high resolution. Here, we aim to extend our capacities to follow proteins in 3D using an engineered point-spread function and improving protein labels.

The interdisciplinary lab is generally interested in how single cells control and coordinate shape, volume, cell-cycle progression, metabolism, and other aspects of physiology in view of fluctuations of both intra- and extracellular conditions. We have developed tools to control cellular physiology through precise modifications of gene expression [1], and we have established a broad repertoire of microscopy-based methods to extract single-cell and sub-cellular properties (see, e.g., [2]). The lab is composed of students and postdocs from physics, biology, and bioengineering.

The Institut Pasteur is a great environment for both bacterial cell biology as well as high-resolution light microscopy thanks to multiple labs working in this domain (using, e.g., PALM/STORM, STED, SIM, and advanced image analysis).

Funding is guaranteed through an ERC starting grant. However, candidates are also expected to apply to postdoctoral fellowship programs.

The candidate is expected to bring experience in quantitative microscopy and possibly image analysis. Experience in microfluidics, physical modeling, or bacterial genetics is beneficial.

For questions contact Sven van Teeffelen (see below) and see our website:

<https://research.pasteur.fr/en/team/microbial-morphogenesis-and-growth>

Earliest possible start date: **April 2018**

Deadline for application: **open until filled**

Contact

For applications or questions please contact Sven van Teeffelen (sven@pasteur.fr). For applications please send a motivation letter and CV, and indicate 2 references.

References:

- 1.) Vigouroux A, Oldewurtel ER, Cui L, Bikard D and van Teeffelen S, Engineered CRISPR-Cas9 system enables noiseless, fine-tuned and multiplexed repression of bacterial genes, *bioRxiv* 2017; 164384. (resubmitted to Molecular Systems Biology).
- 2.) Wong F, Renner LD, Özbaykal G, Paulose J, Weibel DB, van Teeffelen S, Amir A, Mechanical strain-sensing implicated in cell shape recovery in Escherichia coli, *Nat. Microbiology* 2017; 2:17115.

