

A 3-year PhD position is now available in the Trypanosome Cell Biology unit at the Institut Pasteur (INSERM U1201) in Paris, funded by an “Équipe FRM” grant (starting date 1st October 2022)

Context. Microtubules are cytoskeletal elements that are central to cell life. Their primary components are tubulins that undergo various post-translational modifications acting as a tubulin code. We wish to investigate a main modification called glutamylation that is over-represented in cilia and flagella. These organelles are composed of 9 doublet microtubules, whose construction takes place at the distal end. New tubulin subunits are delivered to the tip by intraflagellar transport, the movement of protein complexes driven by kinesin and dynein motors ^{1,2}. This project aims to investigate the significance of tubulin poly-glutamylation in cilia in relationship with kinesin motors. The work will be performed in *Trypanosoma brucei*, a model organism perfectly suited for the project.

Project. The successful candidate will determine how the code is written by exploiting existing mutant cell lines and developing novel ones. The project relies on our recent breakthrough that allows us to visualise tubulin incorporation in microtubules and to monitor how, where and when tubulin is glutamylated, opening the door to both dynamic and functional studies. The contribution of glutamylation to the control of flagellum assembly and function ^{3,4} will be scrutinised. The project relies on a combination of imaging (light & electron microscopy, super-resolution, expansion microscopy), reverse genetics (gene replacement/tagging, RNAi), in addition to classic molecular and cellular biology. It will benefit from access to state-of-the-art imaging facilities at the Institut Pasteur, including cryo-electron microscopy.

Host laboratory. The Trypanosome Cell Biology-INSERM U1201 is located at the Institut Pasteur in Paris town centre and is affiliated to the doctoral school “Complexité du Vivant” (CDV, ED515) at Sorbonne Université. The lab investigates trypanosomes both as parasites and as models. More information and a list of recent publications can be found on the [lab website](#) and on [Twitter](#).

Candidate profile. The candidates need to have Master degree with some expertise in cell biology. Having worked with trypanosomes and/or cilia is not necessary but will be a bonus.

To apply: Applicants should send their CV, a motivation letter and 3 references in a single pdf file to Philippe Bastin (pbastin@pasteur.fr) Trypanosome Cell Biology Unit, Institut Pasteur, 25 rue du Dr Roux, 75015 Paris. The application deadline is 30th June 2022.

References:

1. Bertiaux, E., Mallet, A., Fort, C., Blisnick, T., Bonnefoy, S., Jung, J., Lemos, M., Marco, S., Vaughan, S., Trepout, S., et al. (2018). Bidirectional intraflagellar transport is restricted to two sets of microtubule doublets in the trypanosome flagellum. *J Cell Biol* 217, 4284-4297. 10.1083/jcb.201805030.
2. Bertiaux, E., Mallet, A., Rotureau, B., and Bastin, P. (2020). Intraflagellar transport during assembly of flagella of different length in *Trypanosoma brucei* isolated from tsetse flies. *J Cell Sci* 133. 10.1242/jcs.248989.
3. Atkins, M., Tyc, J., Shafiq, S., Ahmed, M., Bertiaux, E., De Castro Neto, A.L., Sunter, J., Bastin, P., Dean, S.D., and Vaughan, S. (2021). CEP164C regulates flagellum length in stable flagella. *J Cell Biol* 220. 10.1083/jcb.202001160.
4. Bertiaux, E., Morga, B., Blisnick, T., Rotureau, B., and Bastin, P. (2018). A Grow-and-Lock Model for the Control of Flagellum Length in Trypanosomes. *Curr Biol* 28, 3802-3814 e3803. 10.1016/j.cub.2018.10.031.

