



Master Biologie Moléculaire et Cellulaire 'BMC',  
Université Paris Cité - UFR Sciences du Vivant

Parcours : **Biologie et Développement Cellulaires 'BDC'**

<https://master2bdc.ijm.fr/>

Fiche de Projet de Stage de M2, 2024-2025

<b>Unité INSERM ou CNRS ou Université : Institut Pasteur (Inserm U1201)</b>	<b>Responsable du Stage : Philippe Bastin, Adeline Mallet</b>
<b>Intitulé Equipe : Trypanosome Cell Biology Unit</b>	<b>Contacts</b> Adresse :25 rue du docteur Roux
<b>ED d'appartenance : CDV (ED515)</b>	Email : <a href="mailto:pbastin@pasteur.fr">pbastin@pasteur.fr</a> <a href="mailto:adeline.mallet@pasteur.fr">adeline.mallet@pasteur.fr</a>
<b>Responsable de l'Equipe : Philippe Bastin</b>	Tel :0140613835

**Titre du projet : Protein trafficking : how do trains find the right tracks ?**

**Résumé du Projet de Stage** (en 300 mots maximum, mots clés en gras)

Protein trafficking is a hallmark of eukaryotic cells. The most spectacular one is the movement of protein complexes driven by molecular motor along microtubules. A central unanswered question is **how do motors select microtubules for initiating movement**. This can be compared to trains searching for appropriate tracks for trafficking.

Our team is investigating this process using the flagellum trypanosome as model system. We have shown that trains traffic on a defined number of microtubules (Bertiaux et al. 2018). The aim of the project will be to decipher how trains select particular microtubules for trafficking using a combination of reverse genetics (RNAi, CRISPR-Cas9, gene deletion) and imaging technologies (live imaging of protein trafficking, expansion microscopy, electron microscopy).

This multidisciplinary project is a collaboration between the Trypanosome Cell Biology Unit (P. Bastin) and the Ultrastructural Bioimaging Unit (A. Mallet) of the Institut Pasteur.

**Publications de l'équipe relatives au projet de stage (max 5)**

Bonnefoy, S., Alves, A.A., Bertiaux, E., and Bastin, P. (2023). Novel roles for the LRRC56 protein, an IFT cargo protein, in docking of dynein arms in *Trypanosoma brucei*. **Mol Biol Cell** *in press*

Mallet, A., and Bastin, P. (2022). Restriction of intraflagellar transport to some microtubule doublets: An opportunity for cilia diversification? **Bioessays** 44, e2200031. *Front cover*.

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, jcs248989.

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.

Bertiaux, E., Mallet, A., Fort, C., Blisnick, T., Bonnefoy, S., Jung, J., Lemos, M., Marco, S., Vaughan, S., Trepout, S., Tinevez, J.Y., and Bastin, P. (2018). Bidirectional intraflagellar transport is restricted to two sets of microtubule doublets in the trypanosome flagellum. **J Cell Biol** 217, 4284-4297.