Universités de Paris, Master BMC

Master 1 : Biomolécules et Cellules / Biologie Cellulaire

Fiche de Projet de Stage, Année 2019-2020

Unité INSERM ou CNRS ou Université : **UM7592** Institut Jacques MONOD **Intitulé Equipe :** Team Development, Signaling and trafficking, **Responsable de l'Equipe :** Pr. A. Plessis	**Responsable du Stage :** Dr. I. Bécam **Contacts** Adresse : IJM 15 rue Hélène Brion Email :isabelle.becam@ijm.fr Tel : 01 57 27 80 16

Titre du projet :

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

During **development**, **morphogen** form gradients that pattern organs by controlling cells differentiation, migration and proliferation. In **epithelial** cells, apical and basal regions are functionally separated and in contact with extracellular environments which can differ by the nature and the doses of signaling molecules. Controlling the localization of the receptors of these signals in specific sub-domains along the **apico-basal** axis is critical for **signal transduction**.

This project aims to study the impact of apico-basal localization on signaling, using as a model the Hedgehoh (HH) morphogen in the **Drosophila** wing primordium (wing disc). In this epithelium, HH emanating from posterior cells form two gradients: an apical gradient, required for long-range responses, and a basal one, for short- distance responses. HH transduction requires the conserved G-protein coupled receptor smoothened (SMO) which is activated by its relocalization from internal vesicles to the plasma membrane which depends on the extensive phosphorylation of its intracellular C-terminal tail. However, none of these studies have addressed the impact of SMO apico-basal localization on HH transduction.

We have identified a basal sub-population of SMO that is present specifically in cells responding to high level of HH. This basal enrichment depends on SMO activation and hyperphosphorylation. Our aim is to tackle how this specific localization is regulated by HH and to understand its role in SMO ability to transduce high levels of HH signal. For that, our lab has recently developed novel approaches that allows to specifically label and follow -in the developing disc- different populations of SMO by fluorescent microscopy: intracellular SMO versus at the surface SMO and apical versus basal. By combining them with genetic approaches to modulate SMO activity and the expression of its regulators, we will address (i) how SMO phosphorylation regulates these effects and (ii) the consequences of SMO basal localization on its activity?

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Publications de l'équipe, relatives au stage proposé

1 page maximum SVP !