



Laboratoire d'accueil

Laboratoire de Biologie et de Modélisation de la Cellulaire (LBMC) – UMR 5239, ENS de Lyon 46 allée d'Italie, 69364 Lyon Cedex 07

Equipe d'accueil

Equipe Post-transcriptional Regulation in Infection and Oncogenesis (PRIO)

Dirigée par Vincent Mocquet et Pierre Jalinot

Tuteur de stage

Dr MOCQUET Vincent vincent.mocquet@ens-lyon.fr tel : 04 72 72 85 51

**REGULATION OF NONSENSE MEDIATED mRNA DECAY (NMD)
BY the NUCLEO/CYTOPLASMIC SHUTTLING**

KEYWORDS: UPF1, NMD, nucleus export, RNA decay.

Description du projet / Project description:

The Nonsense mediated mRNA Decay is a cellular pathway degrading mRNA, triggered by translation termination and stimulated by the 3'UTR environment. Our lab works on the links between NMD and viral infection. Notably, we already demonstrated that the viral protein Tax from HTLV-1 is able to inhibit NMD by interfering with the UPF1 RNA helicase (Mocquet et al 2012; Fiorini et al 2018). The viral interference with NMD makes us suspect that the nucleo/cytoplasmic shuttling is an important regulatory node of the NMD.

The project consists in characterizing how this shuttling controls NMD. Specifically we need to understand how UPF1 recruitment to its RNA target is regulated by nucleus export. Preliminary results focus on the UPF1 protein and its interaction with CRM1 but the NXF1 pathway will also be investigated. A high-throughput approach considering additional NMD factors is also planned.

Methods: cell culture, confocal microscopy, RTqPCR, cloning strategies, RNA and protein immunoprecipitation, bioinformatics analysis.



Publications du laboratoire (5 max) / Lab publications (5 max):

-PROCHASSON L, JALINOT P, MOCQUET V, **2020** The Complex Relationship between HTLV-1 and Nonsense-Mediated mRNA Decay (NMD) **Pathogens**. 9(4):287.

-FIORINI F, ROBIN JP, KANAAN J, BOROWIAK M, LE HIR H, JALINOT P, MOCQUET V **2018** HTLV-1 Tax plugs and freezes UPF1 helicase leading to nonsense-mediated mRNA decay inhibition. **Nat Commun**, 9(1):431

-PERES, E, BLIN, J, RICCI, EP, ARTESI, M, HAHAUT, V, VAN DEN BROEKE, A, CORBIN, A, GAZZOLO, L, RATNER, L, JALINOT, P, AND DUC DODON, M **2018** .PDZ domain-binding motif of Tax sustains T-cell proliferation in HTLV-1-infected humanized mice. **PLoS Pathog**, 14(3):e1006933.

-MOCQUET V, DURAND S, JALINOT P **2015** How retroviruses escape the Nonsense Mediated mRNA Decay (NMD)? **AIDS Res Hum Retroviruses**. [Epub ahead of print]

-MOCQUET V, NEUSIEDLER J, RENDE F, CLUET D, ROBIN JP, TERME JM, DUC DODON M, WITTMANN J, MORRIS C, LE HIR H, CIMINALE V, JALINOT P. **2012** The human T-lymphotropic virus type 1 tax protein inhibits nonsense-mediated mRNA decay by interacting with INT6/EIF3E and UPF1. **J Virol**. 86(14):7530-43.