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

Unité INSERM ou CNRS ou Université : Institut Jacques Monod (UMR7592 CNRS/Université Paris Cité) **Intitulé Equipe :** RNA Biogenesis and Genome Homeostasis **ED d'appartenance :** BioSPC (Université Paris Cité) **Responsable de l'Equipe :** Benoit PALANCADE	**Responsable du Stage :** Benoit PALANCADE **Contacts** Adresse : Institut Jacques Monod 15, rue Helene Brion 75013 PARIS Email : benoit.palancade@ijm.fr Tel : 01 57 27 80 39

Titre du projet : Investigating mRNA localized translation at nuclear pore complexes

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

In eukaryotic cells, asymmetrical mRNA localization and site-specific translation have emerged as universal strategies regulating gene expression and defining the specific proteome of intracellular compartments. Based on RNA sequencing and imaging approaches, our team has recently reported that certain mRNAs are translated at **nuclear pore complexes (NPCs)**, at the surface of the nucleus, in budding yeast. Strikingly, most of these mRNAs encode NPC subunits (nucleoporins), suggesting that the formation of such large **multiprotein complexes** is coupled to **local translation** events. To further characterize the mechanisms and impact of **mRNA localization** at NPCs, we have initiated dedicated genetic and proteomic screens and identified new molecular players in this process, including translational regulators.
The aim of the M2 internship, which could be pursued in the frame of a PhD, will be to characterize such factors and analyze their role in regulating mRNA localization and translation at NPCs. For this purpose, the intern will combine **systematic strategies** (identification of RNA-binding proteins by mass spectrometry; genetic screens), **genomic approaches** (transcriptomics, ribosome profiling) and **microscopy** (live imaging; single molecule mRNA detection), using the budding yeast S. cerevisiae, a powerful eukaryotic model amenable to a large panel of experimental approaches.
The M2 internship can take place from January to June 2025 (earlier starting dates possible). For more information, visit our lab website (https://www.ijm.fr/research-topics/palancade-lab-va/?lang=en).

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

"A SUMO-dependent feedback loop senses and controls the biogenesis of nuclear pore subunits" (2018). Rouvière JO, Bulfoni M, Tuck A, Cosson B, Devaux F & Palancade B. *Nature Communications*.

"Co-translational assembly and localized translation of nucleoporins in nuclear pore complex biogenesis" (2021). Lautier O, Penzo A, Rouvière JO, Chevreux G, Collet L, Loïodice I, Taddei A, Devaux F, Collart MA & Palancade B. *Molecular Cell.*

"A R-loop sensing pathway mediates the relocation of transcribed genes to nuclear pore complexes" (2023). Penzo A, Dubarry M, Brocas C, Zheng M, Mangione RM, Rougemaille M, Goncalves C, Lautier O, Libri D, Simon MN, Geli V, Dubrana K & Palancade B. *Nature Communications*.

" Puzzling out nuclear pore complex assembly. " (2023)
Penzo A & Palancade B. *FEBS Letters.*

"On the edge: how nuclear pore complexes rule genome stability." (2024)
Simon MN, Dubrana K, Palancade B. *Curr Opin Genet Dev*.