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, 2025-2026

Unité INSERM ou CNRS ou Université : Institut Cochin -Inserm U1016-CNRS UMR8104-Université de Paris **Intitulé Équipe :** Interactions Hôte-virus **ED d'appartenance :** BioSPC **Responsable de l'Equipe :** Clarisse Berlioz-Torrent et Stéphane Emiliani	**Responsable du Stage :** Delphine Judith **Contacts** Adresse : Institut Cochin U1016, 27 RUE DU FG ST JACQUES, 75014 PARIS CEDEX 14, France Email : Delphine.judith@inserm.fr Tel : 01 40 51 65 74

Titre du projet: Role of Nanovesicle Vesicular Trafficking in the Formation of Immunological Synapses

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

Cells naturally communicate by exchanging information through close contacts called "synapses." Communication between immune cells occurs at contacts known as **immunological synapses (IS**). These IS are essential for T cell activation and promoting the host's response to pathogens. Pathogens can circumvent these synapses to their own advantage, attenuating the host's response to infection. **Vesicular trafficking** plays a central role in **synapse assembly and function**.

In this project, we hypothesize that **nanovesicles** – a subtype of vesicles regulating vesicular trafficking that facilitate protein delivery or lipid distribution within membranes – participate in the formation and efficacy of IS. Wecwill determine the **contribution of a specific type of nanovesicle to the communication essential for T cell activation under physiological conditions and during viral infection.**

The project will focus on the molecular analysis of the interaction between these nanovesicles and the TCR signalosome (T cell receptor), a protein complex crucial for IS formation.

The project will be conducted using a **multidisciplinary approach** employing methods from biochemistry (WB, Immunoprecipitation, **nanovesicles isolation**, **cellular fractionation**), cell biology (cell line culture, **lentiviral transduction**, **CRISPR/Cas9 technology**), and imaging (confocal microscopy, **Expansion microscopy**). Numerous tools are already available and validated in the laboratory.

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

- Judith, D., Versapuech, M., Bejjani, F., Palaric, M., Verlhac, P., Kuster, A., . . . Berlioz-Torrent, C. (2023). ATG5 selectively engages virus-tethered BST2/tetherin in an LC3C-associated pathway. Proc Natl Acad Sci U S A, 120(20), e2217451120. doi:10.1073/pnas.2217451120

- Judith, D., Jefferies, H. B. J., Boeing, S., Frith, D., Snijders, A. P., & Tooze, S. A. (2019). ATG9A shapes the forming autophagosome through Arfaptin 2 and phosphatidylinositol 4-kinase IIIbeta. J Cell Biol, 218(5), 1634-1652. doi:10.1083/jcb.201901115

- Murigneux, E., Softic, L., Aube, C., Grandi, C., Judith, D., Bruce, J., . . . Gallois-Montbrun, S. (2024). Proteomic analysis of SARS-CoV-2 particles unveils a key role of G3BP proteins in viral assembly. Nat Commun, 15(1), 640. doi:10.1038/s41467-024-44958-0