

**Master 2 internship project
Year 2026-2027**

Laboratory/Institute: Institute for Advanced Biosciences.
Team: INVADE.

Director: Christophe Arnoult
Head of the team: Eva Faurobert/Olivier Destaing

Name and status of the scientist in charge of the project: Chantal Thibert

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Program of the Master's degree in Biology:

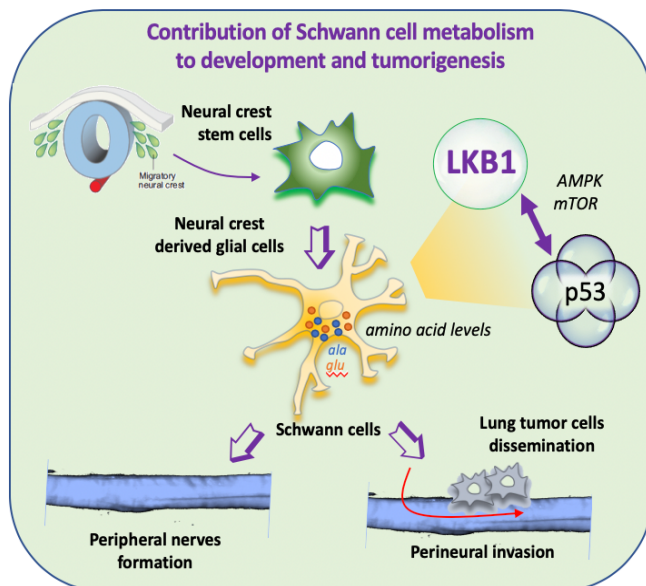
- ☐ Microbiology, Infectious Diseases and Immunology ☐ Biochemistry & Structure
☒ Physiology, Epigenetics, Differentiation, Cancer ☒ Neurosciences and Neurobiology

Title of the project: Contributions of peripheral nerves to lung cancer cell dissemination

Objectives (up to 3 lines): The M2 project will characterize nerve and cancer cells reciprocal communications within lung tumor microenvironment. Using a state-of-the-art ex vivo 3D model of peripheral nerve and tumor (spheroid) co-culture, the project will notably characterize how activities of the metabolic regulator LKB1 in Schwann cells modulate lung cancer cell migration/invasion.

Abstract (up to 10 lines): Peripheral nerves, and notably their associated glial cells such as Schwann cells, promote cancer cell dissemination through a process known as perineural invasion (PNI), whereby cancer cells could migrate along nerve fibers to invade distant tissues. Tumor innervation is therefore a bad prognostic factor as well as a cause of neuropathy pain experienced by patients. The underlying molecular mechanisms of nerve-tumor bidirectional communication are so far underexplored, especially the metabolic contributions. Our research hypothesis is that specific Schwann cell fate and metabolic status contribute to nerve-tumor crosstalk. Indeed, Schwann cells exert essential metabolic and trophic support to neurons and dedifferentiate in the vicinity of tumors. We recently uncovered the LKB1 kinase pathway as one major regulator of glial cell fate and metabolism, through the control of pyruvate-alanine cycling coupled to mTOR activity (Radu, Torch et al, 2019 Sc Adv; Lucas, Appaix, et al., 2026 G&Dev). Based on our unique genetically engineered mouse models, the M2 project will explore (in collaboration with a 2nd year PhD student) the reciprocal communications between peripheral nerves and cancer cells and their impact on cancer cell properties, especially proliferation, migration and invasion. The project also aims at identifying nerve-tumor interactions in vivo based on a 3D imaging pipeline generated in collaboration with MicroCell, the IAB microscopy facility. Lastly, the project could also involve development of optogenetics tools to track LKB1 activity over space and time within nerve cells.

Methods (up to 3 lines): Co-culture of dorsal root ganglia explants with cancer cells as spheroids; primary cultures of Schwann cells. Validations using Western blot, Immunofluorescence and FACS. Classical assays to evaluate cancer cell properties of migration and invasion using videomicroscopy, 3D imaging using light-sheet and confocal microscopy. Metabolic explorations using gain or loss of function experiments on identified candidates.



Funding: 6-months internship from the Canceropole CLARA.

Up to 3 relevant publications of the team:

* Lucas A, Appaix F, Allard J, Mével-Aliset M, Radu AG, Fauvelle F, Favier B., Grichine A, Maurer J, Hainaut P, Attardi L, Billaud M, Torch S[§], **Thibert C**[§], LKB1 functions as a checkpoint for neuronal-glial balance during enteric nervous system development. 2026 [Genes & Development](#), in press. [§]co-senior and co-corresponding authors.

* Bosc L, Pero ME, Balayssac D, Jacquemot N, Allard J, Suzanne P, Voltaire J, Cottet-Rousselle C, Michalet S, Villaret J, Torch S, Marais S, Elena-Herrmann B, Schlattner U, Mercier A, Josserand V, **Thibert C**, Dallemagne P, Bartolini F, and Lafanechère L. Preventing neuropathy and improving anticancer chemotherapy with a carbazole-based compound. 2025 [Science Advances](#), eadw6328.

* Radu AG, Torch S, Fauvelle F, Pernet-Gallay K, Blervaque R, Lucas A, Delmas V, Schlattner U, Tricaud N, Lafanechère L, Hainaut P, Tricaud N, Pingault V, Bondurand N, Bardeesy N, Larue L, **Thibert C**[§] and Billaud M.[§] LKB1 specifies neural crest cell lineages through pyruvate-alanine cycling. 2019 [Science Advances](#), eaau5106. [§]co-senior and co-corresponding authors. Work selected for numerous national communications at CNRS and UGA as well as for a Faculty of 1000 communication (F1000 PRIME).

Requested domains of expertise (up to 5 keywords): Cell signaling, Tumorigenesis, Cell biology, Biochemistry, Development, Metabolism.