**Master 2 internship project**

**Year 2024-2025**

**Laboratory/Institute:** Inserm UA13, Laboratoire Biosciences et Bioingénierie pour la Santé **Director:** M.O. FAUVARQUE

**Team:** Génétique et Chemogénomique (Gen&Chem) **Head of the team:** M.O. FAUVARQUE

**Name and status of the scientist in charge of the project:** Alexandre BOURON, PhD

**HDR: yes 🗷**

**Address:** CEA, 17 rue des martyrs, 38054 Grenoble cedex 9

**Phone:** 04.38.78.66.71 **e-mail:** alexandre.bouron@cea.fr

**Program of the Master’s degree in Biology:**

**☐** Microbiology, Infectious Diseases and Immunology **☐** Structural Biology of Pathogens

**🗷** Physiology, Epigenetics, Differentiation, Cancer **☐** Neurosciences and Neurobiology

**Title of the project:**

Characterization of the spontaneous calcium oscillations of cancer cells.

**Objectives (up to 3 lines):**

*In vitro* and *in vivo* studies showed that cancer cells generate spontaneous cytosolic Ca2+ transients that play a role in tumour initiation, growth and invasion. The role of the internship is to provide a better understanding of the molecular mechanisms responsible of these oscillatory Ca2+ spikes.

**Abstract (up to 10 lines):**

Among other features, cancer cells exhibit altered expression levels of multiple proteins participating in the homeostasis of Ca2+, which leads to a remodelling of the cellular Ca2+ signalling. Of particular relevance is the occurrence of spontaneous cytosolic Ca2+ transients that can give rise to Ca2+ oscillations. Hence, weakly and non-metastatic cancer cells fail to generate such spontaneous Ca2+ activity. However, the molecular mechanisms sustaining the spontaneous Ca2+ transients of cancer cells are not yet fully characterized. So far, contrasting results have been obtained. For instance, in colorectal cancer cells, spontaneous Ca2+ transients necessitate a Ca2+ entry through Cav1.2 channels whereas some authors found no evidence for a contribution of external Ca2+ in colorectal cancer cells. We plan to characterize the spontaneous Ca2+ spikes of human prostate cancer cells and determine the impact of a putative anticancer molecule on these Ca2+ responses.

**Methods (up to 3 lines**):

Videomicroscopy, Cell culture, Western blotting, Immunofluorescence.

**Up to 3 relevant publications of the team:**

- Bouron et al (2023) *Front. Cell. Neurosci*, 17:1149954. PMID: 37032833

- Bouron A, Fauvarque MO (2022). *Molec Brain*, 15: 72. PMID: 35974412

- Bouron A (2020). *Cells*, 9:1800. PMID: 32751129

**Requested domains of expertise (up to 5 keywords):**

Cellular and molecular biology ; Cell signaling