Internship proposition
One page max
M2 0HNU 2025-26

Lab: CRCI2NA

Team: “Signaling in Oncogenesis, Angiogenesis, and Permeability”

Name and position of the supervisor: BIDERE Nicolas, DR2 INSERM

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Candidate:

Title of the internship: **Deciphering novel checkpoints in the balance between inflammation and cell death**

Summary of the internship proposal:

Small-molecule inhibitors that induce mitochondrial outer membrane permeability (MOMP) and subsequent apoptosis have shown therapeutic efficacy against cancer cells. MOMP facilitates the release of apoptogenic factors that activate cysteine-aspartyl proteases (CASPs, caspases), which are responsible for executing apoptosis. Additionally, MOMP allows the release of damage-associated molecular patterns, such as mitochondrial DNA (mtDNA), which can trigger inflammation.
Recently, the paradigm regarding the role of CASPs during mitochondrial apoptosis has evolved. CASPs are no longer viewed solely as effectors of apoptosis, as cell death still occurs when CASPs are inhibited. Instead, CASP activity is now recognized as crucial for maintaining the non-inflammatory nature of mitochondrial apoptosis. Accordingly, CASP inhibition during MOMP allows the production of type I IFN and NF-kB activation. This pro-inflammatory environment enhances tumor immunogenicity and promotes the clearance of cancer cells by effector T cells. However, the precise mechanisms regulating the equipoise between apoptosis and inflammation remain elusive.
This project aims to identify factors that regulate the checkpoint between cell death and inflammation following MOMP. We will employ unbiased omic screens in conjunction with molecular biology techniques and biochemistry assays to uncover these regulatory mechanisms.

Option(s) linked to the project:

☐ Hematology
☒ Immunology-Cancerology
☐ Oncology
☐ Nuclear Medicine

Option(s) linked to the profile:

☐ Clinical Research Profile
☒ Experimental Biology Profile
☐ Data Analyst Profile