

Level: **Master 2**

Title: **Impact of Oxysterols on blood-brain barrier integrity and properties.**

Oxysterols have recently received growing attention in the field of neurodegenerative diseases, with novel studies highlighting their roles in blood-brain barrier (BBB) physiology and immune cell migration.

We here propose to investigate more precisely oxysterol effects on BBB integrity and physiology. In particular, we will focus on 25-hydroxycholesterol (25-OHC) and 7 α -25dihydroxycholesterol (7 α -25OHC). In this project, we propose to investigate in vitro, the function of these oxysterols on BBB permeability and lipid metabolism, efflux pumps activity, and cell adhesion. We also plan to investigate their interactions with factors already known to affect BBB permeability and physiology, such as inflammatory stimuli (TNF- α , INF γ).

We will use an in vitro model of the human BBB. BBB permeability will be assessed in presence of oxysterols, and specific inhibitors/agonists. Junctional proteins expression and localization will be studied by qPCR, WB and immunofluorescence. Signaling pathways involved in these mechanisms will be identified. To provide novel insights into brain functioning, the lipid and cholesterol exchanges between brain and blood will be investigated.

Student skills: motivated master student with knowledge on culture of primary cells, RT-qPCR, immunoblot, and immunofluorescence technics. Team working. French or English speaking languages.

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