Master 2 research internship in Integrated Structural & Cell Biology in Grenoble

Supervisor(s):
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Host laboratory:
BioSanté, https://biosante-lab.fr/en

Host group/team:
MAB2: Mechanisms of Angiogenesis in Biological Barriers

Title of the M2 research internship:

Characterization of the informational value of EG-VEGF as a biomarker of preterm births in an infectious context

Project summary:
Premature birth is any birth occurring before 37 weeks of amenorrhea. It affects around 10.6% of live births worldwide and costs a lot for public health. To date, sPTB is the leading cause of neonatal mortality and morbidity. Predicting sPTB in asymptomatic women remains a great challenge for clinicians. sPTB is associated with acute chorioamnionitis (CA) in 70% of cases. CA is an ascending inflammation/infection of pregnancy with germs in the vagina. Over the past decade, the role of a new family of cytokines has emerged with a specific role in the control of placental pathologies, including those related to inflammatory processes. This family is called, prokineticins (PROKs). Its canonical member is PROK1 also known as EG-VEGF. EG-VEGF is secreted by the placenta and fetal membranes (FM) and acts via two receptors, PROKR1 and PROKR2. We have recently demonstrated that EG-VEGF is increased in women with sPTB. An increase in PROKRs has also been observed in a model of pregnant rats with CA induced by group B streptococcus, thanks to a collaboration with the team of Prof. Sébire (Research Institute of McGill University, Montreal). The results strongly suggest an early role of PROKs in the inflammatory cascade and the potential use of this factor as theranostic cytokine. The objective of the proposed Master 2 project is to better understand the role of PROKs family in prematurity induced by perinatal inflammation (bacteria and LPS (lipopolysaccharide) and to validate the newly developed monoclonal antibodies for EG-VEGF and its receptors as therapy for sPTB. Until now, no study had investigated the role of the PROK family in an infectious context of pregnancy, although sPTB is known to cause significant adverse effects on the outcome of pregnancy and beyond on the fetal brain function. In vitro, preclinical and clinical studies will be conducted.

Keywords:
inflammation, vaginal bacteria, therapeutic anti-EG-VEGF antiboy

Relevant publications of the team:

Alfian I, Chakraborty A, Yong HEJ, Saini S, Lau RWK, Kalionis B, DimitriadisE, Alfaidy N, Ricardo SD, Samuel CS, Murthi P. The Placental NLRP3 Inflammasomeand Its Downstream Targets, Caspase-1 and Interleukin-6, Are Increased in HumanFetal Growth Restriction: Implications for Aberrant Inflammation-InducedTrophoblast Dysfunction. Cells. 2022 Apr 21;11(9):1413.

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Raia-Barjat T, Sarkis C, Rancon F, Thibaudin L, Gris JC, Alfaidy N, Chauleur C. Vitamin D deficiency during late pregnancy mediates placenta-associated complications. Sci Rep. 2021 Oct 20;11(1):20708.

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Alfaidy N, Brouillet S, Rajaraman G, Kalionis B, Hoffmann P, Barjat T,Benharouga M, Murthi P. The Emerging Role of the Prokineticins and HomeoboxGenes in the Vascularization of the Placenta: Physiological and PathologicalAspects. Front Physiol. 2020 Nov 12;11:591850.