Grenoble Alliance for Integrated Structural & Cell Biology

GRAL MSc RESEARCH SCHOLARSHIP 2020-2021

RESEARCH INTERNSHIP PROPOSAL

Institute / Group

IRIG / BCI - IMAC

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Research Project Title

In vitro and in vivo characterisations of five promising biomarkers for the diagnosis and treatment of preeclampsia

Description of the project

Preeclampsia (PE) is the most threatening pathology of human pregnancy. To date, there is no biomarker to predict its occurrence and no treatment to cure it. Recently, a gain of function mutation in the gene STOX1 has been reported to be associated with PE development. In collaboration with the Edyp laboratory, we performed a biomarker discovery study on a cohort of sera collected in pregnant women during the first trimester of their pregnancy. This cohort of 150 samples was collected in the context of a clinical trial conducted in collaboration with the University Hospital of Grenoble. This analysis identified five protein candidates (A-E). The proposed project aims at, i) confirming these preliminary data using a more distinctive cohort that was obtained in collaboration with Cochin Institute (n = 900 samples), ii) Determining the role of the identified proteins in normal pregnancy using 2D, 3D and organoid culture systems, iii) Determining whether the identified proteins are deregulated in the trophoblast cells that express the mutated form of STOX1 gene causing PE development, iv) Characterize among proteins of interest those that are deregulated *in vivo* in the mouse model of PE, the STOX-1, and test potential therapeutics, recently identified by our group.

Keywords

Angiogenesis, preeclampsia, EG-VEGF, biomarkers, therapy

Relevant publications of the team

Abi Nahed R, Reynaud D, Borg AJ, Traboulsi W, Wetzel A, Sapin V, Brouillet S, Dieudonné MN, Dakouane-Giudicelli M, Benharouga M, Murthi P, Alfaidy N. NLRP7 is increased in human idiopathic fetal growth restriction and plays a critical role in trophoblast differentiation. J Mol Med (Berl). 2019 Mar;97(3):355-367

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