Entity: Vall d'Hebron Institut de Recerca (VHIR)

Research group, Unit or Department: Neurovascular Research Laboratory,
Cerebral Amyloid Angiopathy Research Line
http://www.lin-bcn.com/amyloid/

Student's tutor: Mar Hernández Guillamon

Positions available: 1

Project description: Cerebral Amyloid Angiopathy (CAA) is defined by the deposition of amyloid protein in the vessel walls of the central nervous system. The most common form of CAA is associated with amyloid-β (Aβ) deposition and it is an important cause of lobar intracerebral hemorrhage (ICH) and dementia in the elderly. The mechanisms of vessel rupture triggering ICH due to Aβ deposition have not been yet elucidated. Unfortunately, definitive diagnosis of CAA can only be performed by brain necropsy, although clinical features allow the estimation of probable or possible CAA diagnosis. The impaired Aβ clearance and a deficient efflux across the blood–brain barrier (BBB) are key points involved in the accumulation of vascular Aβ and CAA. Since certain apolipoproteins (ApoE, ApoJ and ApoA-1) are capable of binding Aβ and are cleared from brain by different transport pathways, they appear to be excellent candidates to mediate the Aβ traffic across the BBB. We believe that the study of this family of proteins in CAA pathology will open new insights into the mechanisms involved in the BBB disruption caused by vascular Aβ deposition. Furthermore, we hypothesize that the modulation of the concentration of those apolipoproteins in brain and/or plasma may define the final fate of Aβ.

Our line of research is divided in three objectives: (1) Human study: To determine plasma and brain levels of determined biomarkers among CAA-related ICH patients. (2) *In vitro* experiments: To study the Aβ traffic in a co-culture model of BBB. (3) In vivo model: To test whether the modulation of the levels of apolipoproteins may prevent the aberrant accumulation of vascular Aβ in a CAA transgenic mice model (APP transgenic mice).

Period for the internship: Second semester.

Requirements:

- Graduate students in Biology, Biomedicine, Biochemistry, Biotechnology or Medicine.
- Strong interest in Neuroscience research.

Where to apply: Interested candidates please send a letter of intention, CV and academic records to Mar Hernández Guillamon (mar.hernandez.guillamon@vhir.org)