



MÁSTER EN INVESTIGACIÓN BIOMÉDICA

Research Project Proposal

Academic year 2022-2023

Project Nº 24

Title: Transcriptomic analysis of thrombi extracellular vesicles for the identification of new biomarkers and therapies to improve diagnosis and prognosis in ischemic stroke patients

Department/ Laboratory: Laboratory of Atherothrombosis, Program of Cardiovascular diseases, CIMA

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Summary

Stroke is the second leading cause of death and disability in the world with huge clinical and socioeconomic burden. The etiological diagnosis of ischemic stroke (IS) remains a challenge, making it difficult to provide the most appropriate treatment to improve the prognosis and to prevent recurrent events in IS patients.

Extracellular vesicles (EV) are lipid bilayer microspheres generated from the membrane by cell activation, and are elevated in the blood of IS patients. They play an important role in intercellular communication, since their content is protected by the lipid bilayer, being the key in the search for new diagnostic and prognostic marker.

The mechanical removal of thrombi (thrombectomy) and their EVs isolation represent an opportunity to discover new biomarkers and therapeutic targets to identify the molecular signature of IS etiology and reclassify patients with undetermined stroke (25%). These results would contribute to establish safer and optimal treatment options to each type of patient and to apply personalized medicine.

The main objective of the study is to discover new therapeutic targets and circulating biomarkers for accurate diagnosis, allowing better stratification of patients and prognosis of treatment response after IS.

For this study we have thrombus and plasma samples from a cohort of 80 patients with IS undergoing thrombectomy. Isolation, quantification and characterization of thrombus EVs and transcriptomic study (RNASeq) will be done as well as validation of selected genes. Immunohistochemical analysis of thrombi, ELISAs and functional studies (cell cultures and thromboelastometry) will be performed to assess the role of selected genes in the pathogenesis of IS stroke.

yes	
no	X

Does the project include the possibility of supervised animal manipulation to complete the training for animal manipulator? No, but if students are interested in completed their training for animal manipulator we can focus on the role of selected candidates in IS models already available in the laboratory