



Research Project Proposal
Academic year 2020-2021

Máster en Investigación Biomédica

Project Nº 53	
Title: Transcriptomic analysis (RNAseq) of endothelial extracellular vesicles (EndEVs) in patients with cardiovascular diseases	
Department/ Laboratory: Laboratory of Atherothrombosis. Program of Cardiovascular Diseases. Cima Universidad de Navarra	
Director 1: Carmen Roncal Mancho Contact: croncalm@unav.es Codirector: Josune Orbe Lopategui Contact: josuneor@unav.es	
Summary <p>Extracellular vesicles (EVs) are released by all cell types after activation and have emerged as potential components of liquid biopsy regarding their cargo in nucleic acids (DNA, mRNAs, microRNAs) and proteins from the cell of origin. The endothelium has increasingly been recognized as a smart barrier and a key mediator in the development of CV diseases. The study of the endothelial monolayer is challenging due to its diffuse nature but accessible thanks to development of techniques to study EVs by their cellular origin. Transcriptomic analysis of EVs content could lead to better understand the endothelial dysfunction in CV diseases leading to vessel stenosis or occlusion (e.g.: peripheral arterial disease, PAD), and to vessel dilatation and rupture (Abdominal Aortic aneurysm, AAA). Therefore, we hypothesize that the transcriptomic study of circulating endothelial EVs (EndEVs) will be useful to find differences in the molecular responses leading to atherosclerotic occlusion or aneurysm formation. The aims of this project are to: 1) isolate circulating endEVs from platelet free plasma of PAD and AAA patients by immunocapture with magnetic beads, 2) to perform mRNA sequencing by ultra-low input RNAseq method, 3) to identify, by an adapted bioinformatics analysis, clusters of differentially expressed genes between PAD vs AAA endEVs, and 4) to determine the expression of selected differentially expressed molecules in cultured endothelial cells after stimulation with inflammatory and proatherogenic stimuli.</p>	
yes	<input type="checkbox"/>
no	<input checked="" type="checkbox"/>
Does the project include the possibility of supervised animal manipulation to complete the training for animal manipulator?	