Universidad de Navarra

Máster en Investigación Biomédica
Facultad de Ciencias

Research Project Proposal
Academic year 2016-2017

Project Nº 42
Title: Role of oxidative stress in myocardial fibrosis in heart failure
Department/ Laboratory :Línea de Insuficiencia cardiac, Programa de Enfermedades Cardiovasculares CIMA
Director: Dra. María de Ujué MORENO ZULATEGUI **Contact:** mumoreno@unav.es
Summary Heart failure is a complex disease of growing prevalence due to ageing of the population and the rise in related diseases such as hypertension and diabetes. Patients present very poor prognosis despite current available therapies. Their treatment is associated with high socio-sanitary cost. Therefore, an adequate knowledge of the molecular mechanisms underlying heart failure is needed, to design novel diagnostic tools and specific and effective therapies. The histological and molecular alterations that underlie heart failure are known as myocardial remodelling. Myocardial fibrosis, that is, the accumulation of extracellular matrix, is a key feature of myocardial remodelling. It affects both cardiac function and patient´s prognosis. The accumulation of reactive oxygen species, known as oxidative stress, is a key mechanism that promotes myocardial fibrosis. Our team investigates the pro-oxidant enzyme NADPH oxidase, a family of enzymes whose intrinsic role is producing reactive oxygen species. The aim of the study will be to determine the role of the NADPH oxidases in cardiac cells in conditions which promote fibrosis, in order to determine the molecular pathways that are altered and how the NADPH oxidases cause and/or mediate the accumulation of extracellular matrix. The student will learn to critically review scientific papers, to propose a hypothesis and to design experiments to validate it. The student will carry out cell culture experiments in cardiac cells (fibroblasts, endothelial cells, cardiomyocytes) and analyse expression of targets by real time PCR and western blot. The student will learn to analyse results and review them in light of the literature.

POSSIBILITY OF PhD

YES* X

* (PhD grant required)