PhD Position: Program INPhINIT Fundació La Caixa

"Mechanisms involving Wnt signaling and Lysyl oxidase in cardiovascular diseases: setting grounds for new therapeutic strategies"

(Dr. Cristina Rodriguez Sinovas)

CENTRE: IIB SANT PAU - Fundació Institut de Recerca de l´Hospital de la Santa Creu i Sant Pau

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CENTRE DESCRIPTION

The Research Institute of the Hospital de la Santa Creu i Sant Pau (HSCSP-IR) was created on 4 June 1992 as a private scientific foundation. Its mission is to promote basic, clinical, epidemiological and healthcare research in the health science and biomedical fields, with the ultimate aim of improving the health of the population. On 10 December 2003, the Autonomous Government of Catalonia approved affiliation of the HSCSP-IR as a University Research Institute attached to the Autonomous University of Barcelona (UAB).

The HSCSP-IR has as its mission to improve the health and quality of life of the population through the production and dissemination of scientific knowledge, the training of researchers to an international standard, innovation in health and the incorporation of medical advances in clinical practice and in healthcare policies.

The HSCSP-IR is currently one of the most active research centres in Catalonia, especially in relation to translational research and the application of new discoveries to clinical practice. Since 2011 it has been part of the Catalan System of Research Centres (CERCA).

On 17 May 2009, the HSCSP-IR and nine other organizations created the Sant Pau Biomedical Research Institute (IIB Sant Pau), with the aim of strengthening collaborative translational research and bridging the gap between basic research and clinical practice so as to ultimately improve patient care.

AREA OF KNOWLEDGE: Life Sciences Panel

GROUP LEADER: Dr. Cristina Rodriguez Sinovas / crodriguezs@santpau.cat

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RESEARCH PROJECT/RESEARCH GROUP

The Regulatory Mechanisms of Cardiovascular Remodeling in Experimental Pathology Group born from the merger of two established groups with a long collaborative trajectory

http://www.recercasantpau.cat/en/group/inflammation-and-vascular-remodelling/

POSITION DESCRIPTION

-Research Project / Research Group Description:

Cristina Rodríguez Sinovas is the Head of the Regulatory Mechanisms of Cardiovascular Remodeling in Experimental Pathology Group at Institut de Recerca del Hospital de Sant Pau and has more than 20 years of experience in the field of vascular biology and atherosclerosis. Her research aims to establish the molecular mechanisms underlying the initiation, progression and complication of vascular pathologies characterized by an important inflammatory component and an exacerbated extracellular matrix remodeling, such as ischemic heart disease, abdominal aortic aneurysm (AAA) and atherosclerosis, and thus to identify novel strategies for diagnosis and therapy. Her group develops an interdisciplinary research which combines basic and translational approaches. The main current research lines of the group are focused on (i) the contribution of elastogenic proteins such as lysyl oxidase (LOX) and Fibulin-5 (FBLN5), to cardiovascular diseases and (ii) the characterization of nuclear receptors and transcription factors involved in the onset and progression of atherothrombotic disease. The group has made notable contributions to this field, characterizing the involvement of these proteins in the control of endothelial homeostasis, neointimal thickening, adipose tissue dysfunction in obesity, vascular stiffness, oxidative stress, epigenetics, AAA development and vascular calcification. Our present project is focused in the identification of novel therapeutic targets and biomarkers for AAA, and peripheral artery disease (PAD), highly prevalent diseases with an important economic and health impact. Our hypothesis is that Wnt signaling elements and proteins involved in the control of both neovascularization and inflammation (including LOX) are critical for the pathophysiology of peripheral arteriopathies such as AAA and PAD and could provide the basis for the development of novel pharmacological strategies and the identification of disease biomarkers.

-Job position description:

The position involves working with a trans-disciplinary team of scientists, which include clinicians, pharmacists, biotechnologists and molecular biologists, studying the pathophysiological basis underlying PAD and AAA. Specifically, to approach our objectives we will analyze the levels of elements of Wnt signaling in serum/plasma and circulating cells from patients with AAA and PAD and their correlation with clinical data. Further, high throughput studies (RNAseq) will be performed to identify markers of disease progression in patients with PAD undergoing revascularization. The impact of selective pharmacological inhibitors on the development of both diseases will be evaluated in experimental models and the consequences

of the in vivo lentiviral inhibition/over-expression of those proteins of interest will be analyzed. Further, in mice over-expressing LOX (TgLOX) we will analyze the consequences of the pharmacological inhibition of signaling pathways on the enhanced neovascularization and tissue repair induced by LOX transgenesis using the femoral artery ligation model. The innovative and multidisciplinar character of the present Project, which combines both in vitro and in vivo approaches, and applies state-of-the-art technologies, will provide the doctoral fellow with a high versatility in terms of scientific and technological knowledge, acquiring a translational vision of biomedical research. Our membership to the CIBER Consortium in Cardiovascular Diseases (CIBERCV) reinforces our training capacity promoting the interaction with national leading groups and the development of short stays working in collaborative projects.

OTHER RELEVANT WEBSITES

The Regulatory Mechanisms of Cardiovascular Remodeling in Experimental Pathology Group born from the merger of two established groups with a long collaborative trajectory. http://www.recercasantpau.cat/en/group/atherosclerosis-and-vascular-biology/

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