Florence, 16/11/2023

Request of Approval**: 18/2023**

Dear colleagues,
I am asking your approval for the opening of one research scholarship:

title: **"Investigating the 3D structural features of the fibrotic area in a pig model of myocardial infarction" (**Dr Leonardo Sacconi is the Supervisor); I propose the following commission: Dr Leonardo Sacconi, Prof. Cecilia Ferrantini, Prof. Camilla Parmeggiani and Prof. Elisabetta Cerbai as substitute.
Requirements: Master degree in Medical, molecular and cellular biotechnology, PhD in Molecular Medicine and Skills in mesoscopic imaging of cardiac samples.

The research activity is: Myocardial infarction affects millions of people every year and those who survive have a higher risk of developing malignant arrhythmias and sudden cardiac death. Unfortunately, throughout the past 20 years there have been few significant improvements in pharmacological anti-arrhythmic treatments. Therapeutic approaches are therefore moving towards the possibility of employing contractile cardiac patches made with "smart polymeric materials" to surgically replace the fibrotic area in infarcted hearts. To this purpose, it is essential to tailor cardiac patches according to the morphological characteristics of the fibrotic area.
The aim of this fellowship is to develop a methodological framework to investigate at high-resolution the 3D structural features that characterize both the fibrotic area and the infarct border-zone, defined as the transition-zone between the scar and the viable myocardium. In the project, we intend to employ a pig model of myocardial infarction, widely recognized as the best preclinical animal model for studying cardiac diseases. Large-size pig heart slices will be reconstructed in 3D at high-resolution employing recently optimized optical clearing techniques, fluorescence staining and advanced optical imaging setups. The images will be analyzed with tailored software tools to extract the main structural features, such as the degree of disarray of cardiomyocytes and the amount and distribution of collagen fibers across the samples. The results of this project will improve the understanding of the morphological characteristics of the infarct area, necessary to support therapeutic development in this field.

The fellowship will last 9 months starting from 01/01/2024 to 30/09/2024. The amount of the fellowship is € 14.500,00 + IRAP charged on PERCARE project funds.

Thank you for a prompt answer.

The Director
Prof. Elisabetta Cerbai

Approved by

Alberto Bramati

Elisabetta Cerbai

Paolo De Natale

Paolo Foggi

Saida Guellati

Femius Koenderink

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