The Molecular Mechanisms of Obesity associated to Cardiac Remodeling

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This PhD Project is aimed to investigated the IL-33/ST2 effects on cardiac remodelling driven by obesity, focusing on the molecular pathway that links adipose/cardiac-derived IL-33 to development of cardiac fibrosis or hypertrophy. Both human and animal model of obesity will be use including Diet Induced Obesity (DIO) mice, to investigate the detrimental role of fribro-lipokines on left ventricle geometry and functions. Moreover, the project plans to use molecular and proteomic analysis, to assess the IL-33/ST2 signalling in both adipose and cardiac tissue, to determine the pro-fibrotic signature of obesity on heart responses. Due to the relevance of lipid mediator on heart physiology, the project will also aim to assess the potential involvement of impaired cardiac lipidome in the promotion of IL-33-induced inflammasome, to have the full overview of the obesity ways to promote heart maladaptation. To do this, co-culture experiments will be plan using cardiomyoblast cell line (H9C2) treated with conditioned medium at different time points. The project is already approved by local ethics committees for cardiovascular diseases (CVDs) patients' enrolment by ASL Milano 2 and the Italian Ministry of Health (Number 5AD83.N.G1Q) to manage experimental animal for ex vivo experiments, therefore the PhD student will be able to start right away on this project.