PNRR Missione 4, Componente 2, Investimento 1.4 "Potenziamento strutture di ricerca e creazione di "campioni nazionali di R&S" su alcune Key Enabling Technologies"
Iniziativa finanziata dall'Unione europea –- NextGenerationEU.

National Center for Gene Therapy and Drugs based on RNA Technology
Sviluppo di terapia genica e farmaci con tecnologia a RNA

Codice progetto MUR: **CN00000041** – CUP UNINA: **E63C22000940007**

Doctorate of National Interest
RNA THERAPEUTICS AND GENE THERAPY

TITLE OF THE RESEARCH PROJECT
Deciphering the Role of Epicardial Adipose Tissue in Heart Failure

SELECT ONE OF THE FOLLOWING RESEARCH AREA:
☒ **Mechanisms of Diseases and Drug Target Identification**
☐ **Design and Delivery of New Gene Therapy and RNA-Based Medicines**
☐ **Validation and Safety In Preclinical and Clinical Studies**

LOCATION OF THE RESEARCH ACTIVITY (INSTITUTION/DEPARTMENT):
Centro Cardiologico Monzino, IRCCS
Unit for the Study of Aortic, Valvular, and Coronary Pathologies
20138, Milan, Italy

TUTOR:
Professor Giulio Pompilio

PROPOSED RESEARCH ACTIVITIES (max 300 words):
Chronic heart failure (HF) manifests through cardiac remodeling, leading to either impaired ventricular filling or reduced systolic function. This remodeling is influenced by various conditions, including ischemia, hypertension, and diabetes, which initiate complex molecular cascades that are not fully understood. Epicardial adipose tissue (EAT), in direct contact with the myocardium, has emerged as a significant factor in this process. It contributes to cardiac dysfunction by promoting inflammation, fibrosis, and disrupting iron metabolism.
The proposed project seeks to elucidate the impact of EAT on cardiac remodeling, particularly under the duress of type 2 diabetes (T2D), a condition that increases cardiovascular risk. The project will leverage

both clinical and pre-clinical models to explore EAT's role and pinpoint novel molecular markers for potential therapeutic applications. A key objective is to investigate the molecular alterations within EAT that participate in cardiac remodeling. By isolating and examining specific pathways in vitro, the project aims to uncover the primary mechanisms that drive the harmful effects on the heart. Additionally, the project will detail EAT's attributes using advanced imaging techniques, correlating its evolution in T2D with negative cardiac changes.

Overall, the proposed project, through a comprehensive and translational approach, aims to pose the molecular, pre-clinical, and clinical evidence to translate EAT into the clinical scenario as a modifiable risk factor to be targeted with advanced medical therapies.