

Nowadays, because of the growing population of patients with heart failure (HF), there is an increasing interest in the personalized and preventive approaches. Despite the growing number of available therapies, myocardial infarction is the most common cause of HF. Factors such as delayed diagnosis and ineffective prevention, including pharmacological prevention, may contribute to the high rate of mortality in this group of patients. SGLT2 inhibitors are an attractive group of drugs increasingly used among patients treated for diabetes, cardiovascular and nephrological reasons. This group of drugs is recommended for people with heart failure. The aim of our study is to understand the effect of the SGLT2 inhibitor empagliflozin on the prognosis of patients after myocardial infarction and to determine the impact of treatment on the molecular mechanisms, with particular emphasis on changes in non-coding RNAs (ncRNAs) associated with the sirtuin pathway, which has gained popularity in recent years for its protective effects on the cardiovascular system, inhibition of ageing processes and protection against harmful factors such as free radicals.

Our project aims to explore the molecular mechanisms that may explain the beneficial effects of SGLT2 inhibitors. In the future, the results of our study can be used to design new therapeutic targets. Our analysis using advanced bioinformatics tools to explore the SGLT2 interaction network, its relationship with NS, sirtuin pathways, ncRNAs, and to investigate biomarkers related to fibrosis, inflammatory processes, and oxidative stress will provide the knowledge necessary to develop predictive tools and to introduce therapies that improve clinical outcomes, with the potential to reduce the health, personal, and economic consequences for patients and the health care system.