

LNCRNA LIPCAR PREDICTS DISEASE PROGRESSION IN HEART FAILURE AND MYOCARDIAL INFARCTION PATIENTS

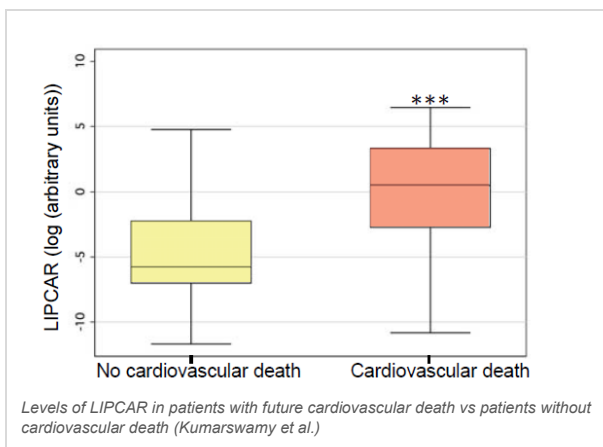
Keywords: long non-coding RNA, lncRNA, biomarker, heart failure, myocardial infarction

INVENTION NOVELTY

The invention introduces mitochondrial long non-coding RNA (lncRNA) LIPCAR as a predictive biomarker for the development of heart failure and cardiac remodeling following myocardial infarction. Furthermore, plasma levels of circulating LIPCAR predict mortality in patients with established chronic heart failure. The invention also describes precise time-dependent expression dynamics, whereby LIPCAR is underexpressed shortly after myocardial infarction in patients who later develop cardiac remodeling, and becomes overexpressed in chronic heart failure patients with increased risk of cardiovascular death. This dual-phase predictive capacity—early underexpression and late overexpression—enables both short- and long-term stratification of heart failure risks.

VALUE PROPOSITION

This technology offers a diagnostic tool that enables early and accurate risk stratification of patients suffering from or at risk of developing heart failure. The use of circulating mitochondrial lncRNA LIPCAR, allows for non-invasive, blood-based prognosis of adverse cardiac events. Compared to traditional biomarkers, this method provides superior specificity by targeting disease-driving molecular pathways rather than downstream indicators of damage. In summary, the LIPCAR-based qRT-PCR assay enhances clinical decision-making by identifying patients at increased risk of cardiac remodeling or cardiovascular death. This enables timely therapeutic intervention, optimized patient management, and reduced healthcare costs through personalized treatment plans.



TECHNOLOGY DESCRIPTION

The technology is based on the detection of specific mitochondrial lncRNA LIPCAR circulating in patient blood plasma which shows dynamic, time-dependent changes in expression levels in patients following myocardial infarction or during chronic heart failure. A greater than two-fold underexpression of LIPCAR shortly after MI is predictive of future left ventricular remodeling, while a more than two-fold overexpression at later stages or in chronic heart failure patients correlates with increased cardiovascular mortality. This biomarker is detected using a validated qRT-PCR assay, optimized for plasma samples.

COMMERCIAL OPPORTUNITY

The technology is available for licensing or co-development.

DEVELOPMENT STATUS

The assay has been clinically tested in heart failure cohorts (e.g., NCT04045405), confirming its utility for patient stratification.

PATENT SITUATION

Patents based on WO2015140224 have been granted in the USA, Canada and Europe (Germany, Spain, France, United Kingdom, Ireland, Italy, Switzerland)

FURTHER READING

Turkieh et al. LIPCAR levels in plasma-derived extracellular vesicles is associated with left ventricle remodeling post-myocardial infarction. J Transl Med. 2024 Jan 6;22(1):31. doi: 10.1186/s12967-023-04820-1.

Kumarswamy et al. Circulating long noncoding RNA, LIPCAR, predicts survival in patients with heart failure. Circ Res. 2014 May 9;114(10):1569-75. doi: 10.1161/CIRCRESAHA.114.303915.