Revista Electrónica de Biomedicina
Electronic Journal of Biomedicine

ISSN: 1697-090X

Rev Electron Biomed / Electron J Biomed 2022;1: 2-7.-

Editorial:

CARDIOVASCULAR DISEASES AND miRNA

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Cardiovascular diseases are progressive and complex diseases that include hypercholesterolemia, cardiomyopathies, aneurysms, etc. To detect these diseases in time, is essential for their prevention and adequate treatment. At present, their prognosis is still poor despite the advances in pharmacological and surgical treatments.

At present, different studies analyse the detection of cardiovascular diseases using miRNAs as biomarkers. It is known, that

changes in the miRNA expression contribute to cardiovascular diseases [1-3].. miRNAs are a family of small RNA that encode molecules of 18 to 25 nucleotides whose function is the post-transcriptional regulation of specific genes. miRNAs act as modulators of gene expression affecting mRNA stability and are involved in the modulation of numerous signaling pathways and cellular processes.

The role of different miRNAs involved in the development of cardiovascular diseases has been described [3-7]. miRNA-199, miRNA-590, miRNA-15 and miRNA-133 participate in heart muscle processing, modulating the activity of cell cycle. Adult mice with infarction, treated with miRNA-199 and miRNA-590 improve cardiac function because promotes myocardial regeneration[6]. miR-15 family of microRNAs modulates neonatal heart regeneration through inhibition of postnatal cardiomyocyte proliferation. Therefore, inhibition of the miRNA-15 family increases myocyte proliferation in the adult heart and improves left ventricular systolic function[7].

Other miRNAs are involved in the pathogenesis of cardiovascular diseases. In endothelial dysfunction (miRNA-23, miRNA-27a, miRNA-130a, miRNA-133a), cell adhesion (miRNA-27a / b, miRNA-221)

formation of atherosclerotic plaques (miRNA-130a, miRNA-21, miRNA-144), inflammation, migration and activation of monocytes in the vascular walls (miRNA-27a, miRNA-203), formation of lipoproteins (miRNA-122, miRNA-133a / b), thrombocyte activity (miRNA-27a, miRNA-633), smooth muscle cell function (miRNA-26, miRNA-195)[8-10]. Furthermore, some studies observed that miRNA quantification in serum, as miRNA-203, correlates with the expression of myocardial tissue and is correlated with the extent of atherosclerosis[10].

In addition to its role as a prognosis of cardiovascular disease, recent studies indicate its potential use in cardiovascular therapy. Whether the miRNAs are overexpressed then their expression must be inhibited or if they are inhibited then is necessary to replace them. Different strategies can be followed, such as treatment with adenovirus with miRNAs or synthetic oligonucleotides that simulate endogenous miRNAs[11]. Other strategies for endogenous miRNAs inhibition include the use of antimiRNAs, miRNA sponges, and small inhibitory molecules[12].

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