

## **Abstract**

SIRT3 is a NAD<sup>+</sup>-dependent deacetylase, that is abundant in the heart and essentially regulates cellular processes in cardiomyocytes. SIRT3 positively modulates most of the enzymes and proteins in the intermediate metabolism in mitochondria, which supply the necessary ATP energy for the heart muscle and that are centers of metabolism in cardiomyocytes. In the mitochondria SIRT3 inhibits the formation of ROS by activating an antioxidant system. SIRT3 has significant anti-apoptotic, anti-hypertrophic and anti-fibrotic cardioprotective effects. Its activation is based on several drugs and natural substances that could be a promising therapeutic approach to the treatment of cardiovascular diseases, which are currently the leading cause of death of more than a half of the European population. However, more studies are required for better understanding the processes in which SIRT3 is involved. The aim of this work is to summarize the function of SIRT3 in mitochondrial metabolism and cardiac physiology.

**Key words:** sirtuin 3, cardioprotection, metabolism, heart, mitochondria