

## **Abstract**

Mesenchymal stem cells (MSC) display different ways of influencing not only surrounding cells but also the function of the whole organism. Besides well known immunomodulatory properties, MSC are capable of inducing and inhibiting of apoptosis in various conditions, effecting mostly cancer and immune cells. They are able to protect other cell types against apoptosis. On the contrary, anti-apoptotic and apoptotic effect of MSC is not always beneficial. Deeper and more precise understanding of influence of MSC on the apoptosis is needed to allow the usage of MSC in the biological therapy and to facilitate the treatment of many diseases. MSC are exhibited to oxidative stress, hypoxia and many pro-apoptotic factors, which cause their senescence and apoptosis. However, without this microenvironment they will not be activated and will not gain all their properties. Nowadays is an intensive research in prolongation of MSC's lifespan done, because it would improve potential biological therapy.

Key words: mesenchymal stem cells, apoptosis, biological therapy