

Abstract

Stem cells use different mechanisms of intercellular communication to modulate an immune response. Mitochondrial transfer is one of the mechanisms which induce metabolic changes, support cell survival, and change the phenotype of immune cells. Nevertheless, little is known about the mechanism used for transfer of mitochondria between different cell populations and the fate of mitochondria inside the acceptor cell. This thesis aims to describe the mechanism of transfer and the provided modulation. Factors that could affect mitochondrial transfer including reactive oxygen species production, apoptosis and mitochondria function were analyzed. And the impact of mitochondrial transfer on cell survival and mitophagy was described. The next aim was to compare the ability of mesenchymal stem cells (MSC) and Sertoli cells (SC) to transfer mitochondria, with MSC being more productive in the transfer of mitochondria than SC. Significant differences in the presence of mitochondria from donor MSC or SC in individual populations of immune cells were also detected. To explain these findings, the impact of reactive oxygen species on the transfer of mitochondria was analyzed in detail, although it wasn't confirmed. However, it needs to be highlighted that mitophagy plays an important role before and after mitochondrial transfer according to results obtained.

Keywords: mesenchymal stem cells, Sertoli cells, immune cells, metabolism, mitochondria, autophagy