

## ABSTRACT

Stem cells are unique thanks to their ability to differentiate into all cell types and self-renewal. They can be used for repairing and functional recovery of various tissues and organs. Regenerative medicine, progressive medical field, use these properties to give a chance to patients with yet incurable health complications. These include spinal cord injury, which results in huge demyelination and disorders in neurological function. Mesenchymal stem cells contribute to recovery of damaged tissue thanks to its immunomodulatory abilities and production of a number of growth factors. Embryonic stem cells can differentiate into the functional nerve cells, however its use is connected with the possibility of tumorigenesis and also ethical problems. Promising results gives a combinatorial treatment using biomaterials as scaffolds for cells or growth factors. The knowledge of genetic modification of cells will be used in the future. The aim of this thesis is to summarise current knowledge of the spinal cord treatment with emphasis on tissue specific stem cells.

Key words: stem cells – spinal cord injury – tissue recovery - biomaterials