

## **Abstract**

A large number of spinal injuries that cause damage to the spinal cord occur every year. Such damage to spinal cord tissue leads to a number of dysfunctions that significantly reduce quality of life and therefore the development of effective therapies remains a very important issue. The use of animal models is considered the major tool of this research field, enabling the testing of new treatments as well as observing ongoing pathophysiological processes. Rats are the most frequently used animal model due to the many possible ways of creating a spinal cord lesion on them. The contusion model uses a computer-controlled device to simulate the spinal cord contusion and therefore is highly precise. However, a compression model seems to be the most suitable model for pathophysiological studying. Besides contusion it enables persistent compression to the spinal cord. Transection and hemisection methods are intended for axonal regeneration research, as only these models can reliably distinguish new growing fibers from the preserved ones. Less often photochemical and excitotoxic models are used. Lastly, dislocation and distraction of vertebrae or damage to the spinal cord using heat or cold can be carried out. Each of the models have their own unique features that make them optimal to use in different research fields. Consequently, they must be selected according to the specific requirements of the study.