Abstract

The aim of this bachelor thesis is to study the effect of morphine withdrawal on the adenylyl cyclase signal system in the rat brain. Theoretical part of this thesis summarizes basic information known about opioids and its leading representative morphine, molecular mechanisms of its effect on the organism and yet determined knowledge about effects of morphine addiction and subsequent withdrawal on the organism and above all on the central nervous system. There is still much unknown about exact mechanism of development of morphine addiction and withdrawal. This thesis also summarizes briefly the Western blot method used in analysing the effect of morphine withdrawal on selected proteins of the adenylyl cyclase signal system in the rat brain. Experimental part of this thesis is based on the detection of expression of key components of the adenylyl cyclase pathway in selected regions of the rat brain after long-term administration and subsequent withdrawal of increasing doses of morphine. Results of this study did not reveal statistically significant differences in the expression of adenylyl cyclase signaling system components between the withdrawal and the corresponding control groups of animals, confirming high ability of the organism to withstand morphine administration and to return to physiological standard after withdrawal of the drug, which was demonstrated earlier.

Key words: Morphine, withdrawal, adenylyl cyclase signaling system, G-proteins, brain, rat