

Abstract

The circadian system affects almost all cells in the mammalian body. These cells include astrocytes, which together with microglia and oligodendrocytes represent the main types of glial cells found in the brain. The first chapter of this thesis presents a summary of circadian system characteristics and focuses mainly on the molecular mechanism underlying its functioning. The second chapter is devoted to astrocytes, astrocyte calcium signaling, and the process of gliotransmission. The third and last chapter connects both topics and discusses the circadian system in astrocytes. It presents evidence of astrocytic circadian oscillations existence and physiological consequences of its action. Great attention is paid to circadian rhythms in gliotransmission, with a focus on gliotransmitters ATP and glutamate. As the most impressive output of the circadian system of astrocytes is presented the participation in maintaining the rhythmic activity of the main circadian oscillator located in the suprachiasmatic nucleus of the hypothalamus.

Key words:

circadian system, clock genes, astrocytes, gliotransmission, calcium signaling, glutamate, ATP