

Abstract

This bachelor thesis examines the relationship between the neuroimmune system and opioid dependence. In particular, it focuses on the role of astrocytes and microglia, whose activation plays an important role in modulating the neurobiological processes associated with drug use and the development of drug dependence. Opioids can directly activate glial cells by binding to opioid receptors and/or TLR4. Glial activation leads to the production of pro-inflammatory cytokines such as $\text{TNF}\alpha$ and $\text{IL-1}\beta$. The thesis further analyses the mechanisms, through which these cells influence the effects of opioids, and the involvement of inflammatory processes in the development and maintenance of addiction. A thorough understanding of these processes may provide important information for the development of new therapeutic strategies for the treatment of drug addiction.

Key words: microglia, astrocytes, opioid receptors, TLR4, $\text{TNF}\alpha$, $\text{IL-1}\beta$, BDNF