ABSTRACT

A central nervous system (CNS) can be invaded by plenty of parasites, including parasitic helminths. Host's immune response during such infections includes not only participation of peripheral lymphocytes, but also astrocytes and microglia, resident glial cells present in the CNS. Activation of astrocytes and microglia has been recently demonstrated also in mice infected by neurotropic avian trematode *Trichobilharzia regenti* (Digenea: Schistosomatidae) for which mammals represent accidental hosts. The parasite does not mature in them and elicits development of inflammatory reaction in the CNS which may take part in parasite's destruction.

Employing *in vitro* experiments, this thesis aimed at evaluation of the possible role of astrocytes and microglia in murine immune response to *T. regenti*. For this purpose, primary astrocyte and microglia culture preparations were established and the cells were then stimulated by antigens of *T. regenti* (homogenate of transformed cercariae, recombinant cathepsins B1.1 and B2). After that, production of nitric oxide and proinflammatory cytokines (IL-1 beta, IL-6, TNF-alpha) was measured. The results revealed that *in vitro* stimulated astrocytes and microglia increase production of nitric oxide, IL-6 and TNF-alpha. Such response to parasite's antigens could influence the course of the infection *in vivo*. Apart from *in vitro* stimulation experiments, those *in vivo* were performed using MHC II-EGFP knock-in mice. In these experiments, MHC II+ cells were observed in the spinal cords of infected mice in proximity of the migrating parasites. It suggests the possible role of these cells in mediating T-lymphocytes based immune response.

To conclude, the data presented in this thesis represent the first report of *in vitro* response of murine glial cells to antigens of *T. regenti*; MHC II+ cells in the CNS of infected mice were noticed for the first time as well. Collectively, these data contribute to understanding of immune processes occurring during the infection of mice by neurotropic trematode *T. regenti*.

Keywords: central nervous system, astrocytes, microglia, *Trichobilharzia regenti*, schistosomulum, cathepsin B, cytokines, nitric oxide.