ABSTRACT

Trichobilharzia regenti belongs to a small group of parasitic helminthes localized in the nervous tissue of their hosts. Like in case of other bird schistosomes, repeated contacts with the infective larvae (cercariae) of *T. regenti* penetrating into the skin lead to development of skin allergic reaction in humans (cercarial dermatitis). It was assumed that the reaction is able to eliminate the majority of the parasites which penetrated into the skin. However, the studies on mice experimentally infected with bird schistosomes showed that soon after the penetration cercariae transform to schistosomula which are able to resist the host immune response. In case of successful immune evasion in the skin, schistosomula of *T. regenti* migrate further to the central nervous system (CNS). During CNS involvement, the infections of both specific avian and non-specific mammalian hosts can result in leg paralysis, balance and orientation disorders and even death of the host.

The present PhD thesis deals with *T. regenti* infections of non-specific mammalian host. The first part of the experimental work was focused on the antibody reactivity and antigen specificity of sera from mice experimentally infected with *T. regenti*. ELISA tests of the sera revealed development of antigen-specific IgM and IgG1 antibodies and elevated levels of total serum IgE, which indicated a Th2 polarized immune response. Cercarial antigens also stimulated IL-4 release from basophiles obtained from healthy human volunteers. Western blot analysis revealed that IgG and IgE antibodies in mouse sera specifically recognized an antigen of 34 kDa in both homogenate of cercariae, as well as cercarial excretory/secretory products. It seems that the molecule may represent a major immunogen responsible for development of Th2-immune response.

The second part of the experiments dealt with the pathogenesis of experimental neuroinfection of mice. Histological observation showed that schistosomula migration caused damage of neurons. Presence of the parasite in the CNS initiated an infiltration of the exposure sites by immune cells (CD3 lymphocytes, macrophages) and activation of microglial cells and astrocytes. Findings of a matter in schistosomula intestines which positively reacted with specific markers of oligodendrocytes and of neurofilaments, showed for the first time that schistosomula used the nervous tissue as a source of the nutrition during their migration.

The third part described the most antigenic structures of intravertebrate stages of *T. regenti*. Immunohistochemistry and subsequent transmission electron microscopy revealed the antibody targets in the glycocalyx and glands of cercariae, and tegument of schistosomula and adults. Spherical bodies, probably transported from subtegumental cells via cytoplasmic bridges to parasite surface, were detected as the most immunoreactive structures in the tegument of schistosomula and adults. Based on similar results for schistosomula developed in specific or non-specific hosts and *in vitro*, it seems that the ability of *T. regenti* to decrease the surface immunoreactivity during ontogenesis is independent on the host type.