

## **Pulmonary migration of *Trichobilharzia szidati* (Schistosomatidae) and its potential immunomodulatory effect against allergic asthma in mice**

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Schistosomula of *T. szidati* migrate through the lungs of their hosts, ducks (definitive hosts) or mice (accidental hosts). Interestingly, the migration initiates only mild pulmonary inflammation in mice, suggesting host-parasite interactions preventing inflammation and, subsequently, tissue damage. We assume that this is mediated by active immunomodulation by the parasite. Therefore, we tested the protective effect of the infection on the progression of ovalbumin (OVA) induced asthma. As was observed in flow cytometry and histology analyses, *T. szidati* infection reduced the number of eosinophils and other leukocytes in the lungs of asthmatic mice. The eosinophilia diminution was also confirmed in bronchoalveolar lavage, where it was accompanied by decreased levels of IL-4 and IL-5 cytokines. Moreover, qPCR analysis of the lungs revealed that *T. szidati* infection increased expression of regulatory cytokine *Il10* and downregulated *Chil3* and *Arg1*, markers of M2 macrophages, compared to the asthma-only group. On the other hand, splenocytes restimulated with OVA produced higher levels of cytokines (IFN $\gamma$ , IL-4, IL-5, IL-10) in the *T. szidati*-asthma group, and co-cultivation with OVA and parasite antigens even boosted the cytokine production. Seemingly, the regulatory effect induced by the infection is only local (i.e., restricted to the lungs). In summary, the invasion of the lungs by *T. szidati* alleviates the progression of asthma, probably by induction of the regulatory milieu and downregulation of the Th2/M2 pathway directly in the lungs.

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