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The impact of H. diminuta antigens on human macrophages, in vitro.

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Helminths and their products can suppress the host immune response benefiting parasite survival, and are considered as masters of immunoregulation due to their ability to escape host defence mechanisms and establish chronic infections. Recently, several studies have shown that parasite proteins reduce the severity of various immune-related diseases.
Here, our aim was to study the effects of the H. diminuta worm and its excretory/secretory products on the human macrophage cell line THP-1, in vitro. Monocytes were differentiated into macrophages and cultured with whole parasite or ES products. We assessed the impact of the parasite and ES products on the profiles of cytokines and analyzed the differences in kinase phosporylation profiles.
A reduction in expression of the cytokines (i.a. IL-1α, TNFα, TGFβ, IL-10) and chemokines (i.a. IL-8, MIP-1α, Rantes, and IL-1ra) was observed with cells cultured with parasite ES products with or without LPS. Cells stimulated with whole parasite had elevated expression levels of inflammatory factors. We observed increases in s-ICAM and CxCL1 levels after culture with ES products. Regarding induced and repressed pathways, we noticed many differences pointing to contradictory effects induced by whole parasites and excretory/secretory products; especially regarding the level of phosphorylation in ERK1/2, Akt T308, p53, STAT3. Some data indicated greater immunosuppressive properties for excretory/secretory products compared to the whole parasite.
Our results show that helminth-derived molecules can be used as tools to identify the underlying mechanisms of immune regulation or to determine new anti-inflammatory therapeutics. Project funded by National Science Centre Poland grant no. 2012/05/B/NZ6/00769