

Activation of dendritic cells by nematode antigens during *colitis*

**Marta Maruszewska-Cheruiyot, Katarzyna Donskow-Łysoniewska,
Karolina Piechna**

Department of Parasitology, Zoology Institute, Faculty of Biology, University of Warsaw, ul. Miecznikowa 1, 02-096 Warsaw, Poland

Corresponding Author: Marta Maruszewska-Cheruiyot; email: mmaruszewska@biol.uw.edu.pl

The hygienic hypothesis suggests that better living conditions, especially in western countries, have resulted in a higher frequency of allergies and autoimmunological diseases, one being *ulcerative colitis* (UC) – chronic intestine inflammation. This can be attributed to minimal exposure of pathogens and parasites during childhood. One suggested treatment for *ulcerative colitis* is helminth therapy. Promising results have been obtained using this approach, but its mechanisms remain unknown. In *colitis*, antigens from pathogenic and commensal bacteria induce intestinal inflammation. The maturation of dendritic cells (DC), induced by recognized antigens, in the intestine provoke characteristically high expressions of MHC II, CD80, CD86 and CD40 molecules. Nematode antigens can induce or inhibit maturation of DC. The presentation of helminth proteins by immature DC is characterized by low expression of MHC class II, costimulatory CD80, CD86 and CD40 molecules, adhesion molecules and expression of anti-inflammatory cytokines such as IL-4, IL-5 and IL-13 which induce immune tolerance. This study tested the influence of the intestinal nematode *Heligmosomoides polygyrus*, L4 stage, from *colitis* conditions for immature DC JawsII line activity and phenotype.

Immature DC JawsII were cultured with *H. polygyrus* L4 live pre-male and pre-female stages isolated from intestine BALB/c mice with *colitis* induced by 3% Dextran Sulphate Sodium. Cells were collected, and level of expression of molecules (MHC II, CD80, CD86 and CD40) was analyzed by fluorescence activated cell sorting. Concentration of cytokines (IL-10, TGF- β , IL-12p70 and TNF- α) was measured in culture supernatants by ELISA. The activity of JawsII cells acquired *in vitro* was evaluated by cell transfer into mice with *colitis*.

After stimulation with *H. polygyrus* L4 antigens from *colitis* mice, JawsII still demonstrated an immature phenotype characterized by low expression of MHC class II, costimulatory CD80 molecules and high production of regulatory cytokines. The presentation of nematode proteins by this phenotype of immature DC can result in the development of immune tolerance.

This work was supported by Polish National Science Centre Grant No. 218668.