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Abstract

The effect of *Giardia duodenalis* on bovine monocyte-derived dendritic cells and T-cell responses *in vitro.*

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*Giardia duodenalis* is an important intestinal parasite in animals and humans. Knowledge on the immune response against *Giardia* is indispensable for the development of a vaccine. Although dendritic cells are important in the initial phase of the immune response, the role of dendritic cells in the immunity against *G. duodenalis* is poorly documented and has only been studied in the mouse, which is not a natural host for this parasite. In this study we addressed the effect of *G. duodenalis* trophozoites and excretion/secretion (ES) material on bovine monocyte-derived dendritic cells (MoDCs) and we examined the ability of stimulated DC to induce a T-cell response *in vitro.* In three experiments with 4 calves each, MoDCs were incubated with different numbers of live *Giardia* trophozoites or concentrations of ES material. None of the MoDC maturation markers (CD40, CD80 and MHC-II) were upregulated and no significant production of IL-4, IL-6, IL-10, IL-12 or TNF-α was measured in MoDC cultures after stimulation with *Giardia.* However, a dose-dependent decrease of ovalbumin uptake was observed in MoDCs incubated with trophozoites, suggesting functional maturation.

MoDCs stimulated with *Giardia* trophozoites induced a dose-dependent proliferation of allogenic peripheral blood mononuclear cells, which were depleted for antigen presenting cells. Fluorescent labeling of the proliferating cells with PKH showed that mainly CD3⁺ αβ-T-cells were expanding, including both CD4⁺ and CD8⁺ T-cells. When CD4⁺ T-cells were incubated with *Giardia*-stimulated MoDC, higher levels of IFN-γ and lower levels of IL-10 were produced, compared to T-cells that were incubated with unstimulated MoDC. Our data show that *G. duodenalis* trophozoites activate bovine MoDCs *in vitro* and cause a state of semi-maturation, capable of inducing T-cell proliferation. A broader panel of cytokines will be measured to determine the phenotype of the induced immune response.