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Down-regulation of the microbicidal profile of M1 macrophages by *Encephalitozoon cuniculi*

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INTRODUCTION

Microsporidia infect vertebrates and invertebrates and are recognized as opportunistic agents in individuals with immunological deficiencies. Although the activity of CD8+ T lymphocytes is essential to eliminate microsporidia, macrophages are attributed a fundamental role in innate immunity and in the activation of acquired immunity. For some infectious agents, the polarization of macrophages to the M1 and M2 profiles is fundamental in defining the course that the infection will take.

OBJECTIVE

This study aimed to evaluate in vitro the activity of macrophages modulated for the M1 and M2 profiles in encephalitozoonosis.

Materials and Methods

Mice bone marrow macrophages (BMD) previously differentiated were polarized in M1 with recombinant IFN-γ+LPS and in M2 with IL-4 for 24 hours and challenged with *E. cuniculi* at a 2:1 ratio for 5, 10 and 24 hours, for determination of the phagocytic index, nitric oxide and cytokine production, and cell phenotyping.

RESULTS

Macrophages polarized to M1 showed high expression of CD40+, iNOS, CD80/86 and MHC (Fig.1). However, we observed a decrease in CD40+ expression in M1 macrophages challenged with *E. cuniculi* (Fig.1). Infection by *E. cuniculi* determined a significant decrease in CD206+ expression by M2 macrophages, once again indicating the ability to modulate the phenotype of these cells induced by the presence of the pathogen. Additionally, the phagocytic index of *E. cuniculi* spores was lower in M1 compared to M2 macrophages (Fig.3).

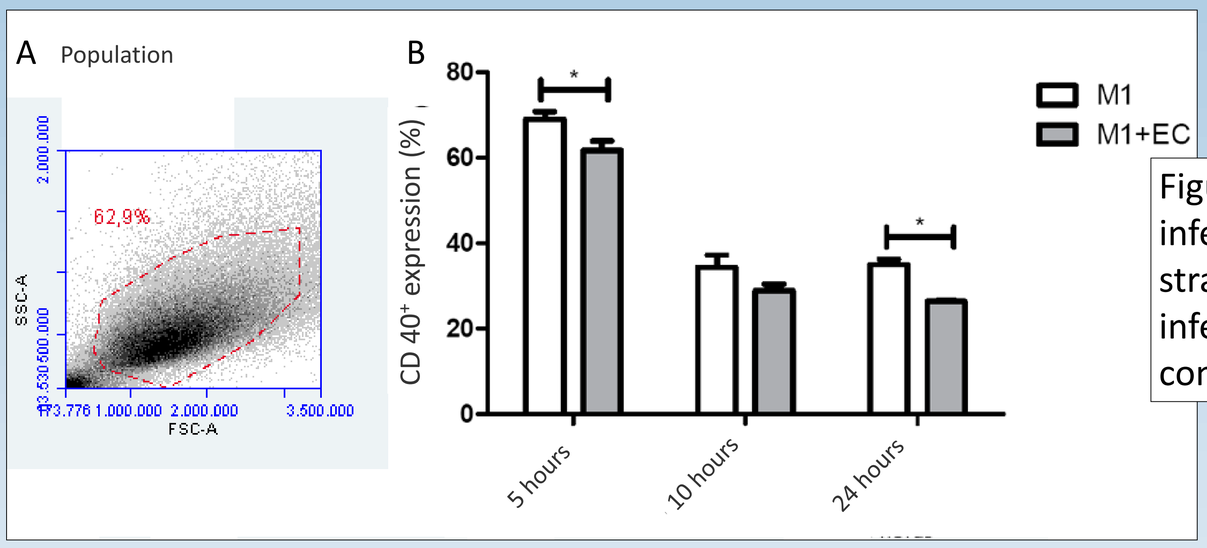

Figure 1. Phenotypic analysis of M-1 macrophages by CD40⁺ expression after infection with *E. cuniculi* (EC) or non-infected. (A) Plot showing the analysis strategy of the studied population. (B) Percentage of CD40⁺ expression in M-1 infected or not with EC after 5, 10 and 24 hours. One-way ANOVA with multiple comparisons and Bonferroni post-test with significance *p<0.05.

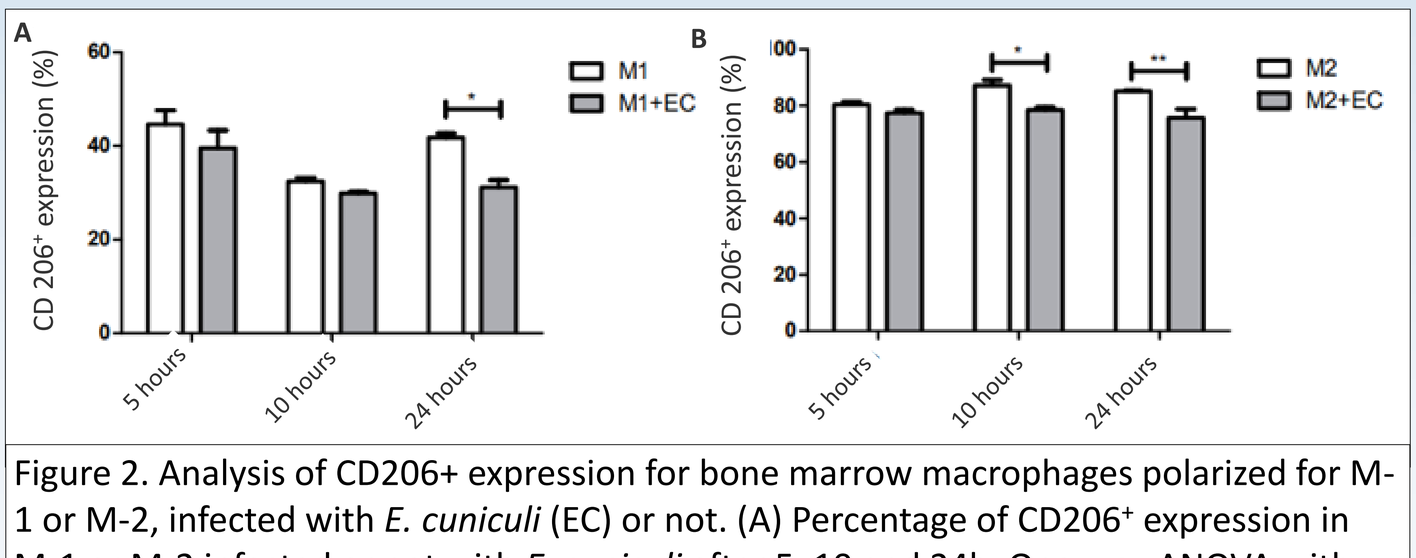

Figure 2. Analysis of CD206+ expression for bone marrow macrophages polarized for M-1 or M-2, infected with *E. cuniculi* (EC) or not. (A) Percentage of CD206⁺ expression in M-1 or M-2 infected or not with *E. cuniculi* after 5, 10 and 24h. One-way ANOVA with multiple comparisons and Bonferroni post-test with significance *p<0.05.

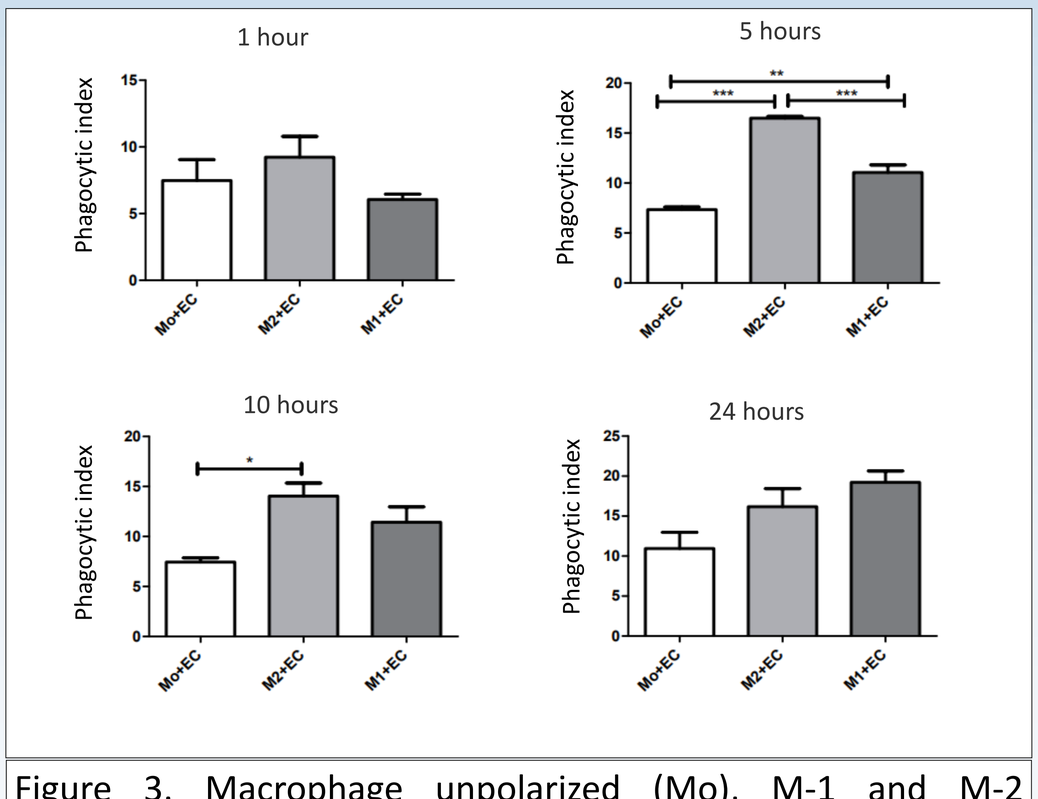

Figure 3. Macrophage unpolarized (Mo), M-1 and M-2 phagocytic activity at 1, 5, 10 and 24 hours. One-way ANOVA with multiple comparisons and Tukey's post-test with significance *p<0.05, **p<0.01, ***p<0.001

CONCLUSION

The microporidia *E. cuniculi* was able to modulate the microbicidal phenotype of M1 macrophages by decreasing CD40 and iNOS expression over time of infection.

References

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