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Immunomodulatory potential of anti-IFN-beta antibodies on monocyte-derived macrophages

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ABSTRACT

Introduction: Multiple sclerosis (MS) is a disabling neurological disease with an unknown etiology, where the recombinant interferon beta (rIFNβ) is the most established treatment. However, the development of anti-IFNβ antibodies has posed a significant therapeutic drawback. In this study, the interaction between anti-IFNβ antibodies and macrophages was investigated to assess the effects on the immune system.

Methodology: Using magnetic beads, anti-IFNβ antibodies were extracted from MS patients' sera positive for anti-IFNβ antibodies. A negative control (antibody-negative situation) and a baseline control were obtained in parallel. Bead or extracted bead-antibody complexes were then incubated *vitro* with monocyte-derived human macrophages. After incubation, macrophage cultures were tested for 91 immunologically relevant gene expressions by RT-PCR.

Results and Discussions: A Gene expression difference between antibody positive and negative situations was hypothesized to reflect the direct effects between antibodies and macrophages. Thus, 37-39 genes were either up-regulated or down-regulated due to this direct interaction. Of these, only 2-4 genes were up-regulated, and the rest were down-regulated. These observations suggest that anti-IFNβ antibodies have an overall suppressive effect on immunologically relevant gene activity when antibodies interact with macrophages.

Conclusion: The fate and effects of circulating anti-IFNβ antibodies are mainly unknown. With the observations obtained at *in vitro* level, such effects, especially from an immunological point of view, are suppressive on immunocompetent cells such as macrophages. However, *in vivo* verification is necessary.