Metabolic Control of FoxP3 Induction in Multiple Sclerosis

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Dysregulation of immune tolerance is considered a key element in self-reactive immune response in Multiple Sclerosis (MS), a chronic demyelinating disease that affects the central nervous system. Extensive experimental evidence has suggested a correlation between the occurrence of autoimmune disorders and the functional impairment in T cell subsets involved in the control of peripheral immune tolerance such as the regulatory CD4⁺CD25⁺FoxP3⁺ T cells (Tregs). In Multiple Sclerosis, an alteration of suppressive function and/or a numerical deficit in Treg cell compartment has been described. The transcription factor FoxP3 has a key role in the development and proper function of Tregs. Recent studies have shown the link between metabolic programs and lymphocyte activation. To this aim, we evaluated FoxP3 expression in inducible regulatory T cells (iTregs) generated in vitro from CD4⁺CD25⁻ in MS patients and healthy subjects, respectively. With this approach, we evaluated whether metabolic changes may influence the FoxP3 expression and the activity of regulatory T cells in MS patients. All these data should help the comprehension of mechanisms that control the immune system function and its alteration during autoimmune diseases.