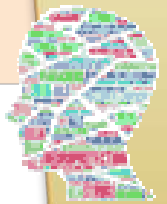


Interferon beta and c-Phycocyanin combination for MS treatment

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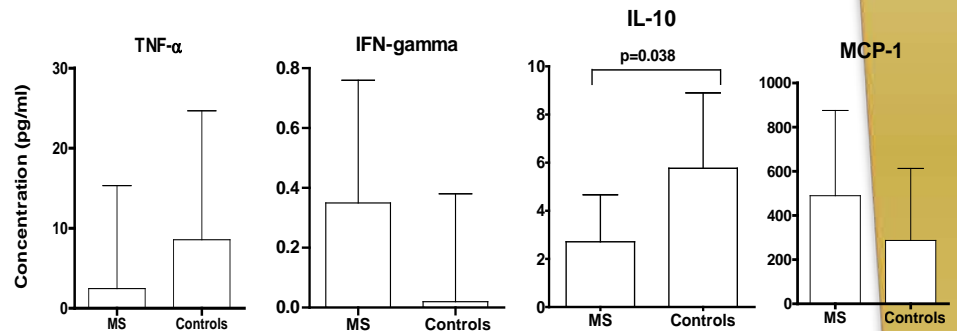
Introduction

The pathogenic process that takes place in Multiple Sclerosis (MS) is characterized either by signs of autoimmunity, inflammation and demyelination or primary oligodendrocyte loss. Interferon-beta is an approved therapy for MS with immunomodulatory, antiviral and stimulation of neurotrophic substances and endogenous opioids properties. On the other hand, c-Phycocyanin is the principal phycobiliprotein of the *Spirulina platensis*, a blue-green alga, accounting with several reports regarding its pharmacological properties as a strong antioxidant and anti-inflammatory compound.

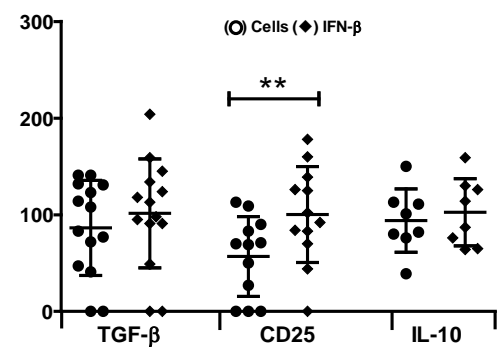
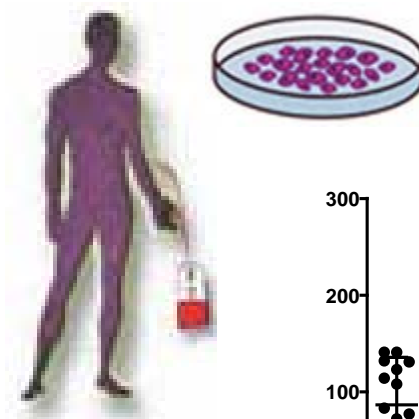
Methods

We performed the molecular characterization of cellular immune response (TNF- α , IFN- γ , IL-10, MMP-9, TIMP-1) in MS patients compared to controls. Furthermore, *in-vitro* stimulation of peripheral blood mononuclear cells from patients with clinically definite Relapsing Remitting MS with IFN- β or c-Phycocyanin was performed, then total RNA was extracted and amplified for CD86, CD28, CTLA-4, CD25, TGF- β , IL-10 Chain Reaction, also CD4+CD25^{high} subset was evaluated using flow cytometry. Finally, splenocytes from 2D2 mice were stimulated with MOG₃₅₋₅₅ and cocultured with either IFN- β , cPc or the combination. Cytokine levels in culture supernatant were measured.

Results



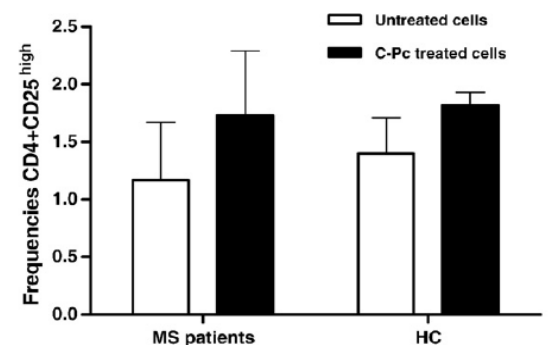
In-vitro stimulation of peripheral blood mononuclear cells



		% CD4+CD25 ^{high}
cells	Range	0.59-3.99
	Mean (SD)	1.91 (1.23)
	Median (IR)	1.47 (1.99)
IFN- β	Range	0.90-5.54
	Mean (SD)	2.58 (1.88)
	Median (IR)	1.69 (3.39)
Wilcoxon	Cells vs IFN- β treated	0.028

Conclusions

Our findings provide rationale for the combination of this natural antioxidant and immunomodulatory product supporting the therapeutic potential for MS.



Proliferation assay of 2D2 T cells

