

Inclusion into PLGA nanoparticles greatly improves the effectiveness of α -bisabolol to inhibit human Dendritic Cell pro-inflammatory activity.

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α -bisabolol (Fig. 1) is a natural monocyclic sesquiterpene alcohol that has generated considerable interest for its biological effects, including its anti-inflammatory activity [1]. Since the mechanisms leading to this anti-inflammatory action remain poorly understood, we investigated whether α -bisabolol affects the release of pro-inflammatory cytokines by human dendritic cells (DCs).

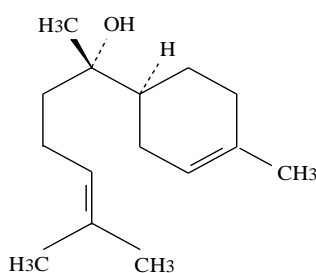


Figure 1 Structure of α -Bisabolol

RESULTS AND DISCUSSION

We found that α -bisabolol did not induce cytokine secretion and did not affect lipopolysaccharide (LPS)-induced cytokine release by DCs (Fig. 2).

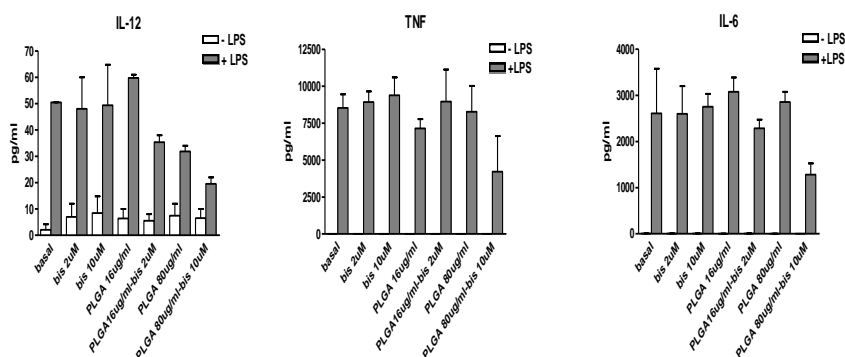


Figure 2: Cytokine secretion.

As α -bisabolol is not easily ingested by cells, this lack of effects could be ascribed to its inability to reach intracellular targets. We then prepared PLGA nanoparticles (NPs) [2, 3], that were unable to affect *per se* cytokine secretion [4] by both resting and LPS-stimulated DCs (Fig. 2), and we loaded them with α -bisabolol. The inclusion of α -bisabolol into PLGA NPs did not stimulate cytokine secretion by resting DCs, but greatly depressed LPS-induced IL-12, IL-6, and TNF α secretion (Fig. 2). A confocal microscopy analysis showed that α -bisabolol-loaded PLGA NPs are internalized by human DCs (Fig. 3). Our results indicate that α -bisabolol can inhibit inflammation by decreasing the secretion of pro-inflammatory cytokines by DCs and suggest that the insertion of this compound into PLGA NPs represents a good way to promote its ingestion by the cells that can trigger its anti-inflammatory, anti-pyretic and, possibly, immunosuppressive activity [5].

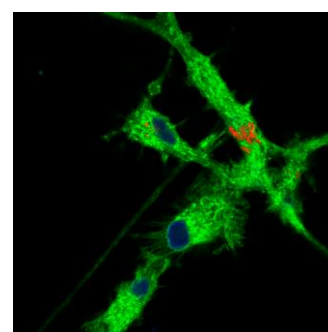


Figure 3: Cellular uptake: In green the cellular membrane, in blue the nucleus and PLGA-NPs in red

References

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