Maslinic acid, minor compound of virgin olive oil, promotes antitumoral M1 macrophage response.

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Introduction

The inflammatory process is involved in several diseases like cancer [1]. Macrophages play a central role in the whole inflammation process.

- Macrophages can polarize into M1 or M2 state. M1 macrophages play a central role in tumorigenesis, acting against tumor appearance through Th1 cytotoxic response, while M2 promotes cancer development [2].
- Maslinic acid (MA), a triterpene presents in virgin olive oil, possesses anti-inflammatory activity and antitumor properties [3].
- For these reasons, maslinic acid could protect against tumor appearance by modulating immune system.

Materials and Methods

- THP-1 cells were maintained at 37°C in a humidified atmosphere with 5% CO2 in MEM supplemented with FBS.
- THP-1 cells were differentiated to macrophages by adding 50 nM PMA along 24h. And polarized to M1 after 24 h of LPS treatment.
- M1 macrophages were treated with MA in a range of concentrations.

Cell survival (after 24h treatment) and M1 polarization related cytokines such as macrophages recruitment-related cytokines (after treatment with 1 and 10uM of MA for 4h) were studied.

Results

- MA decreased cell survival only at the maximum concentration assayed (100 uM).
- IFN-gamma, which leads to M1 polarization, was increased respect to control at MAS 1 and 10uM. Furthermore, MA decreased IL-4 production, which leads to M2 polarization.
- IL-8, IL-1 alpha and IL-1 beta, related to macrophages recruitment increased their levels after MA treatments.

Conclusions

Maslinic acid possesses two principal actions on M1 macrophages:

- It enhanced recruitment of macrophages by production of cytokines related to macrophages recruitment.
- It promoted M1 response through the synthesis of INF-gamma.

References