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Immunomodulatory and protective effects of extracts from green leaves and rhizomes of the mediterranean seagrass *P.oceanica* (L.) Delile on RAW 264.7 macrophages and a human blood-brain barrier model.

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INTRODUCTION

Bioactive compounds from marine biodiversity exert various beneficial effects on human health (*e.g.*, anti-inflammatory and antioxidant). In particular, extracts obtained from green leaves (GLE) and rhizomes (RE) of *P. oceanica* were proven to exert antitumoral activity *in vitro* against HepG2 cells.

AIM AND METHODS

The prominent polyphenolic content of GLE and RE prompted to assess their potential anti-inflammatory effect on LPS-treated mouse RAW 264.7 macrophages and TNFα-treated endothelial cells of an *in vitro* model of human blood-brain barrier (BBB)

RESULTS

Effects of GLE and RE on LPS-treated mouse RAW 264.7 macrophages

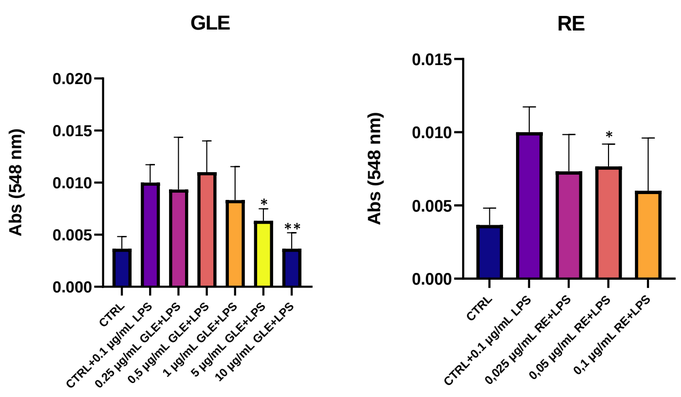


Fig.1 Effects of GLE and RE on nitrite production. Evaluation by Griess reaction

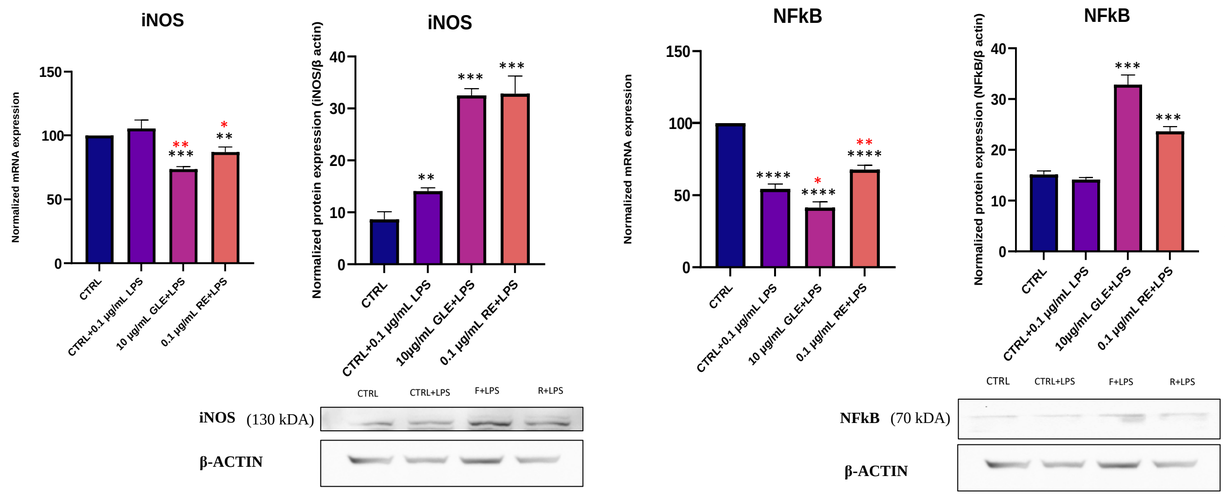


Fig.2 Western blot and qRT-PCR analysis: modulation of expression levels of factors involved in the inflammatory process

Effects of GLE and RE on TNFα-treated endothelial cells of an *in vitro* model of human blood-brain barrier (BBB)

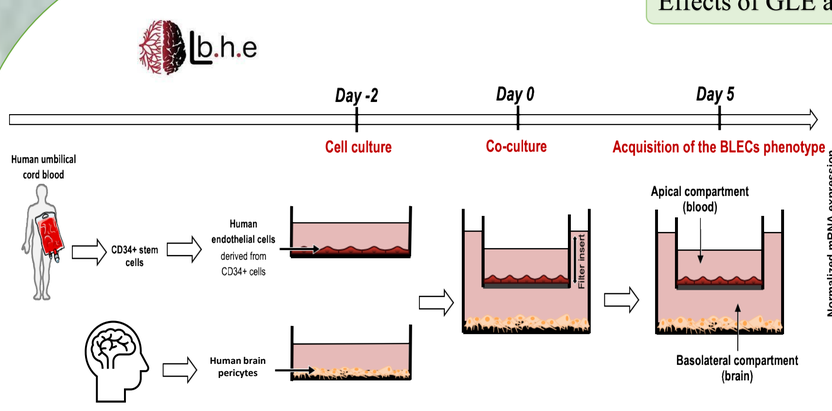


Fig.3 *In vitro* model of human blood-brain barrier. *Cecchelli et al. 2014*

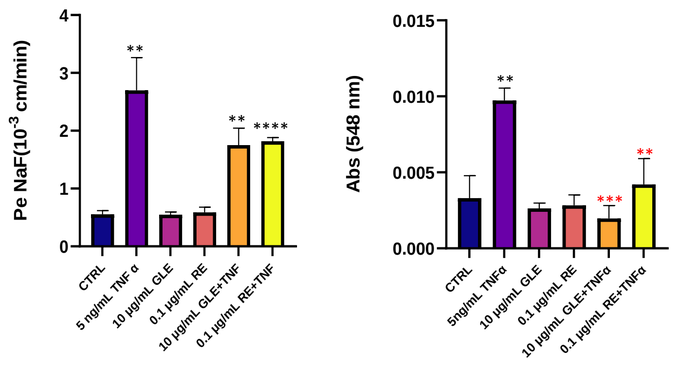
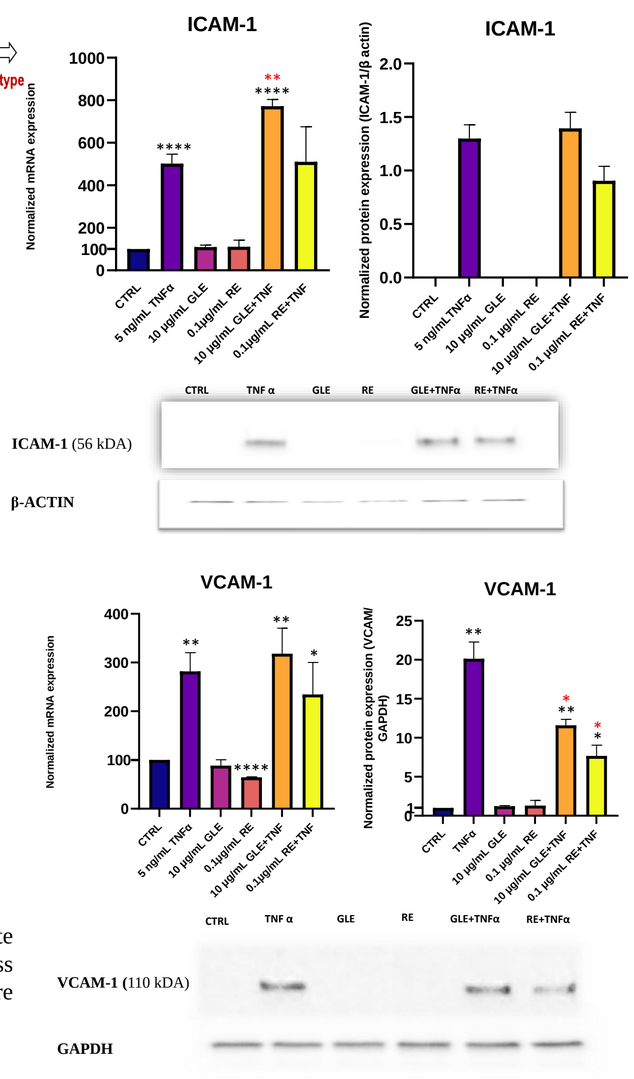
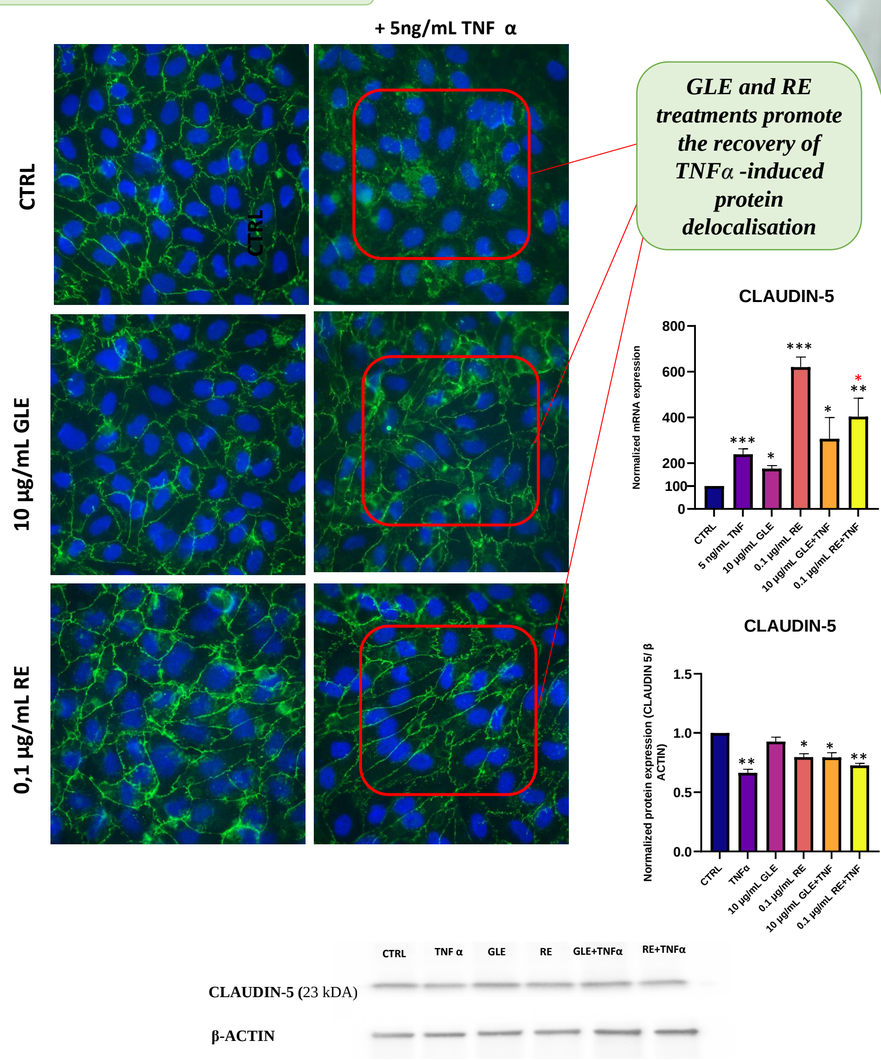


Fig.4 Effects of GLE and RE after TNF-α exposure on BBB Permeability. Pe NaF: Endothelial permeability coefficient of Fluorescein Sodium Salt

Fig.5 Effects of GLE and RE on nitrite production. Evaluation by Griess reaction on endothelial cell culture media.



Fig,6 Effects of GLE and RE after TNF-α exposure on BBB inflammatory markers ICAM-1 and VCAM-1: WB and qRT-PCR analysis



Fig,7 Effects of GLE and RE after TNF-α exposure on BBB tight junction's claudin-5: WB, qRT-PCR and immunofluorescence analysis.

CONCLUSION AND FUTURE PERSPECTIVES

These results allow us to attribute an immunomodulatory and anti-inflammatory effect to both extracts respectively on RAW cells and on the human BBB *in vitro* model and prompt further investigation to get more insight into the protective role of GLE and RE and to unveil the molecular cascade responsible for the observed beneficial effect on BBB integrity.