

# GELATINE TANNATE REDUCES THE PROINFLAMMATORY EFFECTS OF LIPOPOLYSACCHARIDE IN HUMAN INTESTINAL EPITHELIAL CELLS.

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## BACKGROUND & OBJECTIVES

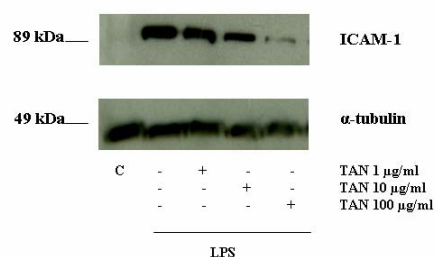
- Gelatine tannate is a mixture of tannic acid and gelatine that remains stable in the acidic environment of the stomach, giving way to tannic acid and gelatine once in the alkaline medium of the intestine.
- Tannic acid is a classic example of a water-soluble polyphenol containing sugar esters, mainly glucose and phenol carboxylic acids, known to form macromolecular complexes particularly with proteins, to which binds by means of hydrogen links (astringent properties), but also with polysaccharides, alkaloids and saponins.
- Antibacterial and antioxidant properties have also been attributed to tannic acid whilst little is known about its anti-inflammatory properties.
- The purpose of this study was to evaluate the anti-inflammatory activity of gelatine tannate by analysing the suppression of the production of key molecules released during inflammatory events in lipopolysaccharide (LPS)-stimulated human intestinal cells.
- IL-8 and TNF- $\alpha$  are important inflammatory mediators, involved in the recruitment of both neutrophils and T lymphocytes.
- ICAM-1 is induced on a wide variety of cells by inflammatory stimuli such as LPS.

## METHODS

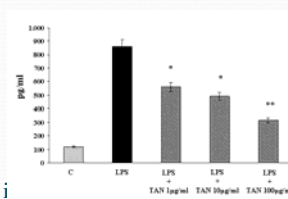
- Intercellular adhesion molecule 1 (ICAM-1) expression was determined by Western blot analysis.
- Interleukin-8 (IL-8) and tumour necrosis factor (TNF)- $\alpha$  concentrations were measured by enzyme-linked immunosorbent assays in Caco-2 cells 24 hours after treatment with LPS (1  $\mu$ g/mL) in presence of different concentrations of gelatine tannate.

## RESULTS

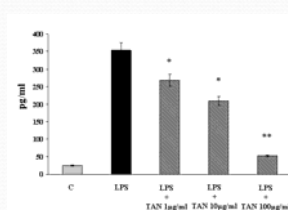
ICAM-1 is induced on a wide variety of cells by inflammatory stimuli such as LPS. Addition of gelatine tannate (TAN) at different concentrations together with LPS induced a dose-dependent inhibition of ICAM-1 expression. At the highest dose, TAN blocked ICAM-1 expression by 69%.



TAN markedly inhibited LPS-induced release of TNF- $\alpha$ : at a lower (1  $\mu$ g/mL) concentration there was a very significant inhibition (-35%), that further increased at higher (10 and 100  $\mu$ g/mL) concentrations of TAN (-43% and -63%).



LPS potently induced TNF- $\alpha$  release, which was significantly decreased by TAN in a dose-dependent manner.



## CONCLUSIONS

These results suggest that gelatine tannate exerts anti-inflammatory effects by inhibiting specific cytokines and adhesion molecules which play an important role in the pathogenesis of a variety of inflammatory disorders such as inflammatory bowel conditions.

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