

## Polyphenols-rich extracts obtained from *Prunus avium* and *opuntia ficus indica* as Natural anti-inflammatory modulators for Inflammatory Bowel Diseases.

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### Introduction

There are evidences that the regular consumption of polyphenols in early life could reduce or delay Inflammatory Bowel Diseases (IBD) development in humans. However, IBD are usually treated with pharmacological agents, which could produce secondary effects. It is therefore, urgent to find new and safe compounds able to contribute to prevention or even to treatment of these inflammatory diseases.

In the present study we investigated the preventive effectiveness of polyphenolic-rich extracts obtained from Sweet cherries (*Prunus avium*) and cactus pear (*Opuntia ficus indica*) on inflammatory expression in intestinal epithelial human cell lines (caco-2) induced with specific stimuli (LPS and TNF- $\alpha$  combination).

### Methods and Materials

The selected fruits were processed in order to prepare the polyphenols-rich extracts (PRE) and further characterized in terms of polyphenolic compounds, namely anthocyanins and betalains using colorimetric assays and chromatographic techniques.

The inflammatory response of the PRE's were assessed using intestinal epithelial cells (seeded in transwell™ plates) after pro-inflammatory stimulus (LPS and TNF- $\alpha$  cocktail). The secretion of pro-inflammatory markers (NO excretion, IL-8 and IL-1 $\beta$  secretion) was assayed in the media from both apical and basolateral compartments for inflamed cells as compared to the control.

The monolayer integrity and permeability were assessed by the determination of transepithelial electrical resistance values.

### Results and Conclusions

When Caco-2 cells were simultaneously incubated with PREs and the inflammatory stimuli, no significant change in cytotoxicity and TEER values was observed.

In inflamed cells, the incubation with Cherry extract promotes the maintenance of epithelium barrier integrity of the inflamed cells and also reduced significantly the IL- 8 secretion and NO excretion.

Cactus pear extract provoked a slightly decrease in the IL-8 over-secretion.

In conclusion, this study provides evidence that cherry and cactus pear extracts could downregulate the inflammatory response in inflamed intestinal epithelial cells.

Further investigation on this subject are in progress.

[1] Kelley DS, Rasooly R, Jacob RA, Kader AA, Mackey BE. Consumption of Bing sweet cherries lowers circulating concentrations of inflammation markers in healthy men and women. *J Nutr.* **2006**, 136:981–6.

[2] Ferretti G, Bacchetti T, Belleggia A, Neri D, Cherry Antioxidants: From Farm to Table, *Molecules* **2010**, *15*, 6993-7005.