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**Research interests**

■ Gastrointestinal  
immunology

■ Host-bacterial  
interactions within  
the gut

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## *Modulatory impact of commensal probiotics on intestinal epithelial cell responses to pro-inflammatory stimuli*

**Background and Aims:** The human intestinal mucosa response to the presence of pathogenic bacteria is well described while the response to commensal organisms is not well understood. We investigated the epithelial cell response to individual pathogenic and commensal micro-organisms as well as the modulatory effects of probiotic commensals on intestinal epithelial cell responses to pro-inflammatory stimuli.

**Method:** HT-29 human intestinal epithelial cell gene expression following co-incubation with *Salmonella typhimurium*, *Lactobacillus salivarius* or *Bifidobacterium infantis* was examined by gene array analysis (847 genes associated with immune responses). In addition, HT-29 cells were pre-treated with or without commensal *L. salivarius* and *B. infantis* for 2 h. Subsequently, the cells were infected with *S. typhimurium*. NF- $\kappa$ B activation in epithelial nuclear extracts was determined using the TransAM assay while IL-8 protein was measured by ELISA.

**Results:** In contrast to *S. typhimurium*, which increased expression of 36 genes associated with pro-inflammatory responses (e.g. TNF- $\alpha$ , IL-8, NF- $\kappa$ B), lactobacilli and bifidobacteria did not enhance expression of these genes. However, when co-cultured with *S. typhimurium*, the lactobacilli and bifidobacteria delayed NF- $\kappa$ B activation and reduced IL-8 production. These effects could not be attributed to interference with salmonella binding to the epithelium and occurred under both atmospheric and normoxia conditions. In contrast to their impact on salmonella-induced epithelial responses, probiotics did not offset TNF- $\alpha$ -induced epithelial activation.

**Conclusion:** Commensal bacteria which are currently used as probiotics do not induce the well described epithelial cell response to pathogens. In contrast, they have the capacity to attenuate epithelial responses to *S. typhimurium*.