

## **Effects on mucin dynamics and intestinal cell kinetics induced by probiotic treatments for intestinal mucositis and inflammatory bowel disease**

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### **Aims and Significance**

Probiotics (health-promoting bacteria) are being used widely to improve intestinal health. In previous studies, certain probiotic species have shown therapeutic benefit (Tooley et al 2006; Geier et al 2007) against small and large intestinal injury, respectively, although the mechanism underlying this effect remains undefined. The current study will seek to define a potential mechanism of action for these probiotics by determining their effects on intestinal mucins and cell kinetics of the intestinal enterocytes (cells that line the intestine).

### **Background**

Inflammatory bowel disease (IBD) is a serious idiopathic and, so-far, incurable condition affecting approximately 1 in 8000 individuals in Australia. It comprises two variants, ulcerative colitis and Crohn's disease. The histopathological features of Crohn's disease are similar to Johne's disease, a debilitating condition that affects livestock. Intestinal mucositis (IM), however, commonly manifests in cancer patients undergoing chemotherapy. It affects primarily the small intestine. Current therapies for IBD and IM attempt to reduce inflammation and injury to the bowel but these are often ineffective.

### **Techniques to be used**

Probiotic treated gastrointestinal tissues collected from rats with experimentally-induced IBD and IM will be subjected to mucin staining and subsequent localisation and quantification. Different types of mucin will be determined and correlated with histological parameters (villus height/crypt depth) and enterocyte kinetics (proliferation/apoptosis) using immunohistochemistry. Some small animal handling will be involved.

### **References**

KL Tooley, GS Howarth, GP Davidson and RN Butler. Oral ingestion of *Streptococcus thermophilus* diminishes severity of small intestinal mucositis in methotrexate treated rats. *Cancer Biol Therap.* 5(6): 593-600 (2006).

MS Geier, RN Butler, PM Giffard and GS Howarth. *Lactobacillus fermentum* BR11, a potential new probiotic, alleviates symptoms of colitis induced by dextran sulfate sodium (DSS) in rats. *Int J Food Micro* 114(3):267-274 (2007).