

Investigating the potential mechanism of Grape Seed Extract: a potential new adjunctive treatment for intestinal disease

Principal Supervisor: A. Prof Gordon Howarth

Email: gordon.howarth@adelaide.edu.au

Phone: 8303 7885

Co-supervisors: Dr Susan Bastian (School of Agriculture, Food & Wine), Dr Rebecca Forder

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. On the other hand, intestinal mucositis (IM), which often manifests in cancer patients undergoing chemotherapy, 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.

Aims and Significance

Grape Seed Extract, derived from grapes utilized in the wine-making industry, is a rich source of procyanidins with anti-oxidant activity. There have been relatively few rigorously-conducted scientific studies to underpin its use health-related purposes. In a previous Honours project (Cheah et al; Cancer Biology and Therapy 2009) we have identified indications that GSE may be protecting the small intestine from injury, and we are currently investigating its potential to treat disorders of the large bowel. The current study will investigate a potential mechanism of action for GSE by determining its effects on intestinal mucins and cell kinetics of the intestinal enterocytes (cells that line the intestine).

Techniques to be used

GSE 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.

Reference

KY Cheah, GS Howarth, RN Butler, C Payne, KA Lymn, R Yazbeck, TH Wright, EJ Whitford and SEP Bastian. An extract from grape seed improves parameters of small intestinal mucositis in rats with mucositis induced by 5-Fluorouracil. *Cancer Biol Ther.*8(4):382-390 (2009).