

Influence of chemotherapy-induced mucositis on the gut microbiota.

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Background:

Intestinal mucositis commonly manifests in cancer patients undergoing chemotherapy. It is a serious disorder primarily affecting the small intestine and may prove fatal. Current therapies for intestinal mucositis attempt to reduce inflammation and injury to the bowel. However, these are often ineffective. An optimal gut microbiota is essential to the health and well-being of the host and can impact on the host's gut physiology and immunology. Modifying the gut microbiota by probiotic treatment has been shown to have some therapeutic treatment against chemotherapy induced mucositis in preliminary studies (1). However, a detailed knowledge of the change in the microbiota induced by mucositis remains unclear. This knowledge is important if we are to develop new agents able to treat, or prevent, this condition.

Aims and Significance:

The primary study aim is to investigate differences in the commensal gut microbiota in an animal model of chemotherapy-induced mucositis. The faecal microbial communities of healthy rats and rats with mucositis will be investigated to determine the changes in the gut microbiota resulting from chemotherapy-induced mucositis.

Techniques to be used:

Terminal restriction fragment length polymorphism (T-RFLP) (2) will be used to investigate bacterial communities in the gut tissues and faeces of healthy rats compared to rats with chemotherapy-induced mucositis. This culture independent technique enables the overall bacterial population to be investigated without prior knowledge of the bacterial species present. If overall changes in bacterial populations are detected, then *in-silico* techniques will be used to potentially identify bacterial species of interest.

1. **Tooley, K.L., G.S. Howarth, G.P. Davidson and R.N. Butler.** 2006. Oral ingestion of *Streptococcus thermophilus* diminishes severity of small intestinal mucositis in methotrexate treated rats. *Cancer Biol. Therap.* **5(6):** 593-600.
2. **Torok, V.A., K. Ophel-Keller, M. Loo, and R.J. Hughes.** 2008. Application of methods for identifying broiler chicken gut bacterial species linked with increased energy metabolism. *Appl. Environ. Microbiol.* **74:**783-791.