

## **Uncovering the Protective Effect of Intestinal Secretory Cells in Inflammatory Bowel Disease.**

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**BACKGROUND:** Inflammatory bowel disease (IBD) is a group of chronic inflammatory diseases affecting gastrointestinal tract. Literature suggests an association between IBD and depletion of secretory enterocytes.

**HYPOTHESIS:** Secretory enterocytes protect colonic epithelium against IBD.

**OBJECTIVES:** Math1 $\Delta$ intestine mice is a strain of genetically engineered mice that expresses both the secretory enterocyte-lacking and the normal intestinal epithelium in a mosaic fashion. Trinitrobenzene sulfonate (TNBS) is a chemical that can cause inflammation-driven acute colitis (with initial dose) and a hapten-induced, T-cell mediated delay-type hypersensitivity colitis (with second dose) that mimics Crohn's colitis. By measuring the susceptibility of the Math1 $\Delta$ intestine mice and the wild type mice to TNBS-induced colitis, we hope to elucidate the role of secretory enterocytes in the pathophysiology of IBD.

**METHODS:** 14 Math1 $\Delta$ intestine and 9 wild type littermate mice were treated with intra-rectal infiltration of TNBS on day 0 and day 7. The mice were assessed daily for weight loss, stool consistency and fecal occult blood; this data was analysed to produce a disease activity index (DAI). After the mice were sacrificed on day 9, their colons were harvested and tissue sections were processed via immunohistochemistry; these tissue sections were examined microscopically to obtain a histological disease score.

**RESULTS:** Math1 $\Delta$ intestine mice are more susceptible (showed higher DAI) than the wild type mice to the inflammation-driven acute phase colitis, but not to the T-cell-mediated, delay-type hypersensitivity late-phase colitis (where DAI pattern is similar). Histologic scores of the Math1 $\Delta$ intestine (3.81) and wild type (3.63) mice showed no statistically significant difference between the two groups.

**CONCLUSION:** It appears that secretory enterocytes may have played a protective role in the wild type mice against acute injury (which is believed to mimic ulcerative colitis). Such association needs to be confirmed by performing similar studies using a purely inflammation-driven mouse colitis model (i.e. dextran sulfate sodium colitis).