# NSHRF PROJECT FACT SHEET

**Hope for controlling intestinal inflammation**

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Andrew Stadnyk's research is unravelling the mystery of Crohn's Disease and ulcerative colitis. These two most common forms of inflammatory bowel disease (IBD) are chronic intestinal disorders that currently have no known cause or cure. About 150,000 Canadians of all ages – roughly one percent of the population – suffer the debilitating effects of Crohn's and colitis.

Although the diseases affect the intestinal tract in different ways, both cause intestinal tissue to become inflamed, form sores and bleed easily. Both conditions cause abdominal pain, severe cramping, fatigue and diarrhea. It is particularly difficult for children and young adults to cope with IBD. Dr. Stadnyk's basic science research into the mechanisms of Crohn's and colitis is gradually bringing us closer to both a cause and a cure – an intestine-specific, anti-inflammatory medication.

Dr. Stadnyk discovered how the cells that line the intestine set off a cascade of events that lead to inflammation and tissue damage. After an initial injury to the intestinal lining, these cells produce signal proteins (or cytokines) that tell white blood cells to migrate from the bloodstream into the intestine. The white blood cells cause extensive damage to the intestinal wall as they cross over and start a self-perpetuating cycle of damage and inflammation. Dr. Stadnyk and Dr. Anthony Otley, a pediatric gastroenterologist, are examining the white blood cells of Crohn's patients to identify the helper molecule that allows the white blood cells to penetrate the intestinal lining.

One intervention is to prevent the migration of white blood cells (or polymorphonuclear leukocytes – PMN) across the intestine wall. Dr. Stadnyk compared adhesion molecules and PMN migration in adolescent IBD patients with healthy subjects. Forty-three patients, ranging in age from seven to 17, were involved in the study. The team concluded there was no difference between the responses of the white blood cells of

patients and control subjects. However, they determined that healthy PMN are less capable of crossing the intestinal wall when activated by CXCR2 compared to CXCR1. These are receptors for interleukin-8, a family of proteins that controls the recruitment of blood cells during the immune response. This difference may be due to PMN secreting adenosine.

This finding may provide a lead into understanding the activation of white blood cells in the inflamed intestine. It also shows the complexity of the events that likely occur in the inflamed intestine and how research into inflammatory bowel disease must move ahead systematically, building on proven and relevant mechanisms.

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