Complex Traits Group

VERTEX
THE SCIENCE of POSSIBILITY

Crohn's and Colitis Canada
Crohn et Colite Canada

Workshop Series: **Inflammation at Barrier Surfaces: From Bench to Bedside**

Thaddeus Stappenbeck, M.D. Ph.D.

Professor, Department of Pathology and Immunology
Washington University in St-Louis
School of Medicine

"Host and microbial mechanisms of intestinal repair"

My lab studies mechanisms that trigger disease and subsequent repair in the intestine. We focus on inflammatory bowel disease (IBD) as there is a combination of host genetics and environmental factors play a role in pathogenesis. We have uncovered roles for specific susceptibility genes that play a role in autophagy. Mutations in these genes affect the primary secretory function intestinal epithelial cells (leading to altered mucus and antimicrobial protein export) that in turn alter the intestinal microbiome in both mouse models and patients with the disease. Because of these findings, we have evaluated the role of microbes in intestinal inflammation and repair. We found that specific microbes influence damage/repair phenotypes in mice (either positively or negatively) including chronic viruses and commensal bacteria that degrade IgA. We have also investigated microbial triggers of disease. For these studies, we have used genetically-susceptible mice that develop spontaneous, fulminant colitis triggered by the commensal bacteria *Bacteroides thetaiotaomicron (B. theta).*
We found that B. theta antigens triggers disease in host immune cells and gains access to these cells via outer membrane vesicles (OMVs) that engage the host through bacterial sulfatase activity.
Through the elucidation of such host-microbial interactions, we hope to develop new IBD therapies.

Paul Kubes, Ph.D.

Professor, Department of Physiology and Pharmacology
Director, Calvin, Phoebe and Joan Snyder Institute for Chronic Diseases
Cumming School of Medicine University of Calgary

"Imaging immunity in sterile injury and repair"

We have applied imaging to various organs to gain an understanding of how an injured tissue can repair. I will begin by showing how the intestine and other organs can be imaged and then I will focus on the liver to demonstrate how complex a very small regulated injury can be with respect to the immune system. Briefly, a thermal injury killing approximately 200 cells causes a very rapid response by platelets and neutrophils that help to isolate the area. The neutrophils appear to enter the injured site and begin to make small channels or sleeves for new blood vessel growth. The area is then surrounded by inflammatory monocytes that appear to change their phenotype to perhaps less inflammatory more repair like monocytes as the area begins to heal. The switch is essential for proper repair. Other cell types including iNKT cells are actually overtly restricted from the injured area for the first 4 hrs. However , with time they begin to recognize self-antigens around the outside of the injury and are induced to arrest around the injury site for at least 48 hrs. They can produce many different cytokines and they themselves are responsive to various cytokines. Ultimately, they enter the injured site and ensure proper collagen deposition. Although neutrophils, platelets, monocytes and iNKT cells have all been implicated in causing untoward inflammation, it is important to remember that normal healthy repair is very dependent upon these same cells.

Wednesday, May 13, 2015 at 4:00 PM

Martin Amphitheatre, Room 504
McIntyre Medical Sciences Bldg | 3655 Promenade Sir William Osler

Followed by a *Wine and Cheese* mixer | Bellini Atrium - 5:30 PM

Hosted by the Complex Traits Group

This seminar is mandatory for Biochemistry Graduate Students

Sponsored by:
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