

M & I
Microbiology
and Immunology
University of North Carolina at Chapel Hill

DISSERTATION SEMINAR

Alan Tubbs

**“Roles for Dietary Salt and Caspase-7 in Intestinal
Innate Immunity.”**

Friday, October 5, 2018

2:15 p.m.

2004 Marsico Hall

Dissertation Advisor: Dr. Ed Miao

Presented in partial fulfillment of the requirements for the degree of Doctor of
Philosophy

Abstract

Alan Tubbs: : Role of Heterodox Innate Immune Defenses in Gastrointestinal Health and Disease
(Under the direction of Dr. Ed Miao)

The intestinal epithelium constitutes the largest barrier between the host and the outside environment of any bodily surface. As a result, the intestine contains more immune cells than any other tissue in order to facilitate interactions with a wide range of resident microbes and environmental stimuli, as well as to ward off an extensive list of pathogens from every kingdom of life. The result is a series of complex, bespoke immune mechanisms that specifically help maintain homeostasis in the intestine. In this dissertation, we examine two innate immune defenses seemingly adapted to the intestinal context that help achieve this balance. In the first part, we show that the intestine is capable of sensing dietary salt during infection or inflammation, thus using this environmental factor as a signal that can presumably help achieve pathogen clearance but also drive autoimmunity. In the second part, we show that intestinal epithelial cells depend on the poorly-studied caspase-7 in order to wed aspects of pyroptosis and apoptosis into a coherent defense against intestinal pathogens. Taken together, our work adds to the burgeoning evidence that innate immunity has accrued many heterodox mechanisms adapted specifically for the tissues it has to protect.