

Title:

Yersinia Interactions with Innate Immune Cells in Different Organ Tissues

Authors:

Michelle Paczosa, Erin Green, Julia Murphy, Francisco Maldonado-Arocho, Hortensia Garcia-Rolan,
Joan Meccas

Presented by:

Francisco Maldonado-Arocho and Hortensia Garcia-Rolan

Department:

Department of Molecular Biology and Microbiology, School of Medicine

Abstract:

Yersinia pseudotuberculosis (Yptb) is a gram-negative enteric pathogen of humans and animals. It is an extracellular pathogen that uses a type three secretion system (T3SS) to inject effector proteins known as Yops into host cells. These Yops modify host cell responses, and allow the bacteria to inactivate the immune system and cause disease. Our lab has focused on elucidating the cellular and molecular targets of these T3SS effectors in spleens, lymph tissues and lungs, and the dynamic interplay between innate immune cells and Yptb in infected tissues. Recent work has shown that in lymph tissues, spleens and lungs, neutrophils are a key target of Yop injection by Yptb. In the lungs, Yptb uses specific bacterial adhesins to target and subvert neutrophil responses whereas in the spleen, Yptb uses both adhesins and complement to target injection of Yops into neutrophils. To inhibit neutrophils, a specific effector YopH dismantles critical signal transduction networks via dephosphorylation of the adapter proteins SLP-76, PRAM-1 and SKAP-2. Work in our lab has also focused on characterizing the behavior of Yptb in host tissues using microscopic approaches. These studies have confirmed that neutrophils are a primary responder to Yptb infection, and moreover their presence influences microcolony size and the number of Yop-injected cells. Notably we have found that other immune cell types are important for controlling Yptb infection in the absence of neutrophils. Additionally we have taken a genomics approach to discover genes critical for survival under different immune environments during animal infection. Current work involves manipulating Yptb to inject therapeutics into diseased tissues and understanding how other Yops manipulate innate immune cell behavior in infected organs.