

## Defining the Location of T-bet-expressing Myeloid Cells During Acute Intestinal *Toxoplasma gondii* Infection

Melody Wickstrom<sup>1</sup>, Madison Schanz<sup>2</sup>, Kimberly Larson<sup>1,2</sup>, Américo López-Yglesias<sup>3</sup>

<sup>1</sup>Indiana University School of Medicine; <sup>2</sup>Indiana State University; <sup>3</sup>Indiana University School of Medicine, Department of Microbiology and Immunology

### Background/Objective:

The protozoan parasite *Toxoplasma gondii* is the second leading cause of foodborne pathogen-related deaths in the United States. The transcription factor T-bet is indispensable for host immunity against *T. gondii*. The absence of T-bet results in rapid susceptibility during parasite infection. T-bet has been considered essential for T-cell-derived IFN- $\gamma$  during *T. gondii* infection; yet, recent research has shown that T-bet is not required for lymphocyte-derived IFN- $\gamma$  responses. Our preliminary research shows that T-bet-deficient mice succumb to parasite infection significantly quicker than mice lacking lymphocytes. This has led to our hypothesis that T-bet-dependent myeloid cells are critical for host resistance during acute intestinal *T. gondii* infection. The objective of this project was to define the location of the T-bet-expressing myeloid cells in the medial small intestines (MSI) of naïve and infected mice during acute mucosal parasite infection.

### Methods:

We used immunofluorescence microscopy to determine the location of T-bet-expressing myeloid cells in the MSI of naïve and *T. gondii* infected mice. Mice were orally infected with 40 cysts of the ME49 strain of *T. gondii*. On days 0 and 5, one-inch MSI segments were harvested, fixed with 4% paraformaldehyde for at least one hour, and then frozen in OCT compound. Tissues were then cut into 8 $\mu$ m sections and placed onto slides for staining. Sections were stained for nuclei, CD11c, T-bet, and *T. gondii*.

### Results:

Our results revealed T-bet-expressing CD11c<sup>+</sup> cells in both the MSI and spleen on days 0 and 5 of *T. gondii* infection.

### Summary:

These data indicate that T-bet-expressing myeloid cells are present in the MSI during *T. gondii* infection. Defining the position of these cells will allow us to determine T-bet's role in mediating myeloid cell-dependent *T. gondii* clearance. Due to the limited treatment options for patients suffering from toxoplasmosis it is critical to define new mechanisms for eliminating *T. gondii*.