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Tracking specialized T cell subsets Following Immunization Based on Fluorescent Reporter Protein

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ABSTRACT

The intestine relies upon T regulatory and effector cells to regulate immune response to multiple antigens. A full understanding of this phenomenon would be significant in the treatment of food intolerance and inflammatory bowel diseases (IBDs). The role of Retinoic Acid (RA) in T-cell migration to the gut is well documented. However, the distribution of tissues where this exposure to RA occurs has not been extensively mapped. In order to determine this, the cre-lox system was used to engineer a RA-responsive reporter gene that expresses the fluorescent protein tdTomato following RA exposure. The tissues were then imaged and analyzed using histo-cytometry to determine distribution of cells with RA exposure. RA exposure in various tissue microenvironments was characterized using flow cytometry, PCR, and confocal microscopy imaging to determine the changes in lymphoid expression of tdTomato during immune activation. It was found that intestinal and lymphoid tissues had greater concentrations of cells with prior RA exposure, particularly the Peyer's Patch, MLN, and Spleen. The preliminary results of these experiments indicate that immune activation leads to a higher density of tdTomato expressing cells in the intestine and lymphoid tissues, but lower in peripheral organs. These results indicate that immunization causes T-cells to be drawn out of peripheral tissues and into gut-associated lymphoid tissues. It is worth looking into the composition of these T-cells as compared to the base population.

KEYWORDS

Retinoic Acid, Homing, T cells, Microscopy