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Effects of B cells as antigen presenting cells on T cell memory development

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The function of memory T cells is the primary factor in vaccine efficacy. In order to create or improve existing vaccines, an emphasis has been placed on how a T cell decides to become a memory cell. Previous discoveries in our lab suggest that the number of divisions during the initial exposure to the antigen play an important role in the decision. To further our understanding of the T cells decision, we formulated a hypothesis suggesting that the specific type of antigen presenting cell (APC) involved in the initial encounter with the antigen plays an important role in the generation of the CD4 T cell memory pool. To test this, we developed an adoptive T cell transfer model that allows us to study the different potentials of certain APCs for inducing memory. Ovalbumin (OVA) specific T cell receptor transgenic CD4+ T cells are labeled with CFSE, allowing us to visualize cell division. These are then stimulated in vitro with antigen and APCs. Afterwards, cells showing a specific division pattern are transferred into knockout mice that are lacking the ability to stimulate CD4+ T cells. The cells are left in the mice for four months. The host mice are given MHC competent APCs, immunized and memory response determined. Herein, we show the potential for B cell induced T cell memory.