

The size of the CD4 recall response is dependent on the original precursor number of antigen-specific cells.

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There are thought to be a number of differences between naïve and memory CD4 T cells, allowing memory cells to undergo a fast and effective response upon re-exposure to antigen. To understand these differences, endogenous and T cell receptor transgenic CD4 memory cells were tracked and recall responses examined *ex vivo*. The size of the recall response was found to be more dependent on the precursor number of naïve antigen-specific cells and less dependent on the number of surviving memory cells, which was similar across a range of doses of transgenic cells. Moreover, the extent of clonal proliferation in the recall response was actually found to be less than that in the primary response, which means that, depending on the precursor number of antigen-specific cells, the size of the recall response could be less than that in the primary response. However, endogenous T cell recall responses were greater than endogenous primary responses, corresponding to the classic definition of a memory response. These results call into question the usefulness of using CD4 T cell receptor transgenic cells in memory studies, and show that the functional phenotype of the memory pool is dependent on the precursor number of transgenic cells.