Requirements for Memory CD8 T Cell Function and Survival in Non-lymphoid Tissues

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The generation of immunological memory is crucial for the establishment of protection against secondary microbial infections. Many of the rules governing the generation, migration, and maintenance of memory T cells remain to be elucidated. Analysis of primary and memory responses induced by infection with vesicular stomatitis virus or with Listeria monocytogenes revealed that antigen-specific CD8 and CD4 T cells were present in many non-lymphoid tissues. Moreover, CD8 memory T cells in non-lymphoid tissues retained effector levels of lytic activity, as opposed to their splenic counterparts with low lytic ability. The requirement for cytokines in controlling lymphoid and non-lymphoid CD8 T cell responses was also examined. IL-7 was essential for survival of naïve CD8 T cells and was important for generation of a normal memory population. Autocrine IL-2 preferentially controlled the magnitude of the primary response in non-lymphoid tissues but had little effect on memory cells. IL-15 was utilized for optimal expansion of primary CD8 T cells and had a further role in maintenance of antigen-specific memory cells. In contrast, IL-15Ra played no role in primary expansion and was only partially responsible for CD8 memory T cell proliferation/survival. Overall, our findings revealed the existence of distinct CD8 memory T cell pools based on function and location and further demonstrated that gC cytokines controlled distinct stages of the CD8 T cell immune response.

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