The Effect of Epigenetics on CD8 T-Cell Function

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The differentiation of CD8 T-cells in response to viral infection is a hallmark trait of the acquired immune system, and many genetic factors play into its development. The epigenetic mechanisms that affect this differentiation process, however, are largely unknown. Thus, the purpose of this experiment was to map the overall epigenetic interactions of the adaptive immune system in mice to gain a better holistic understanding of the immune system of mammals in general. This study reports the specific de-methylation and therefore up-regulation of gene areas of Ag-specific naive and day-8 effector CD8 T cells following acute lymphocytic chorio-meningitis virus infection in mice. DNA de-methylation was recorded such that changes in at gene regions correlated with gene expression. Changes in the DNA methylation profile following CD8 T cell activation showed many cellular processes that were enhanced and initiated. Together, the results demonstrated that DNA de-methylation accompanies the acquisition of the CD8 T cell effector ability to combat disease. Therefore, these data show the framework for an epigenetic mechanism that is required for effector CD8 T cell differentiation and adaptive immune responses, potentially leading to future gene therapy applications.

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