

Primary Research

Essential role for the histone acetyltransferase KAT7 in T cell development, fitness, and survival

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Abstract

Histone acetylation has an important role in gene regulation, DNA replication, and repair. Because these processes are central to the development of the immune system, we investigated the role of a previously unstudied histone acetyltransferase named KAT7 (also known as *Myst2* or *HBO1*) in the regulation of thymopoiesis and observed a critical role in the regulation of conventional and innate - like T cell development. We found that KAT7 - deficient thymocytes displayed normal, positive selection and development into mature single - positive $\alpha\beta$ thymocytes; however, we observed few peripheral $CD4^+$ or $CD8^+$ T cells. The observed effects did not appear to arise from alterations to DNA replication, the TCR repertoire, or a block in thymocyte maturation and, more likely, was linked to survival defects related to gene deregulation because KAT7 deficiency led to an almost complete and specific loss of global histone - H3 lysine 14 acetylation (H3K14ac). Overall, we demonstrated a nonredundant role for KAT7 in the maintenance of H3K14ac, which is intimately linked with the ability to develop a normal immune system.

Citing Literature



