

Abstract

J Immunol. 2007 Jun 1;178(11):6689-94.

Telomerase in T lymphocytes: use it and lose it?

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BACKGROUND: The enzyme telomerase counteracts telomere loss in proliferating cells and extends their capacity for replication. The importance of telomerase is highlighted by the award of the 2006 Albert Lasker Prize for Basic Medical Research for its discovery.

DISCUSSION: Malignant cells subvert telomerase induction to their advantage, and up-regulation of this enzyme confers these populations with unlimited proliferative potential with obvious detrimental consequences. However this enzyme is also essential for the lifelong maintenance of normal cell populations that have a high rate of turnover. Thymic involution in early adulthood dictates that memory T cell populations have to be maintained by continuous proliferation. This highlights the inherent paradox that telomerase down-regulation in T cells may protect against malignancy yet also lead to replicative exhaustion of repeatedly activated memory T cells.

SUMMARY: In this article, we review the data on telomerase regulation in T lymphocytes and the implications this has for the maintenance of T cell memory.

PMID: 17513711

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