

Abstract

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Reduced telomerase activity in human T lymphocytes exposed to cortisol.

Choi J, Fauce SR, Effros RB.

Department of Pathology and Laboratory Medicine, David Geffen School of Medicine at UCLA, 10833 Le Conte Avenue, Los Angeles, CA 90095-1732, USA.

BACKGROUND: Accelerated telomere shortening in lymphocytes has been associated with a variety of human pathologies, including HIV disease, Down syndrome, and cardiovascular disease. Recent findings indicate that reduced telomere length is also associated with chronic psychological stress and mood disorders. Telomerase, which prevents telomere shortening, can be upregulated in T lymphocytes in concert with activation, thereby retarding telomere shortening.

RESULTS: Here, we demonstrate that exposure of human T lymphocytes to cortisol is associated with a significant reduction in telomerase activity both during primary stimulation of resting cells and secondary stimulation of previously activated cells. The effect is observed in both CD4 and CD8 T lymphocytes, and is associated with reduced transcription of hTERT, the telomerase catalytic component.

CONCLUSION: These findings provide a potential mechanism for stress-associated telomere length attrition, and suggest that strategies to enhance T lymphocyte telomerase activity may provide beneficial effects on immune function in situations of chronic emotional stress.

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