

<https://doi.org/10.7124/bc.000B87>

**R.M. Naydych¹, R.R. Vasy^{1,2,3}, B.Ye. Haran^{2,3}, T.I. Lahuta³,
M.M. Kamkina³, V.Ye. Dosenko^{2,3}, D.S. Krasnienkov¹**

¹ D.F. Chebotaryov Institute of Gerontology, NAMS of Ukraine
67, Vyshhorodska Str., Kyiv, Ukraine, 04114

² Kyiv Academic University
36, Akademika Vernads'koho Blvd., Kyiv, Ukraine, 03142

³ O.O. Bogomoletz Institute of Physiology, NAS of Ukraine
4, Akademika Bohomoltsia Str., Kyiv, Ukraine, 01024
rehina.naydych@gmail.com

TELOMERASE ACTIVITY IN MICE WITH EXPERIMENTAL STRESS-ASSOCIATED PHENOTYPE

Background. Severe stress and trauma-related conditions, such as post-traumatic stress disorder (PTSD), are associated with accelerated biological aging; telomerase activity (TA) is a dynamic biomarker that responds faster than telomere length. **Methods.** Male C57BL/6J mice (9–12 weeks old, $n = 24$, 12 per group) were used, and a stress-associated phenotype was induced using the single prolonged stress (SPS) protocol, after which animals were left undisturbed for 7 days [1, 2]. Behavioral testing included OF, EZM, FC, and NOR. TA was measured by TRAP-qPCR [3] in bone marrow, testis, prefrontal cortex, hippocampus, and adrenal glands. Normality (Shapiro-Wilk) and group differences (Mann-Whitney U or Student's t -test) were tested at $p < 0.05$ for behavioral and TA data. **Results.** Behavioral tests showed a stress-associated phenotype with enhanced fear and ambiguous anxiety changes. FC and OF freezing increased ($p < 0.05$), but EZM open zone time contradicts classic anxiety. NOR discrimination index showed no difference between groups. Bone marrow TA showed no difference. Testicular TA increased ~75-fold post-stress ($p = 0.0002$). This marked increase needs confirmation due to confounding factors. TA in cortex, hippocampus, and adrenals was below detection limits. **Conclusions.** The stress-associated phenotype was accompanied a tissue-specific testicular TA increase, with no bone marrow alterations. Below-detection-limit TA in brain and adrenals likely reflects assay sensitivity and low basal activity. These findings suggest the reproductive system is an early stress-sensitive target, warranting larger multi-time-point studies.

Keywords: post-traumatic stress disorder (PTSD); telomerase activity (TA); telomere length (TL); single prolonged stress (SPS).

REFERENCES:

1. Liberzon I et al. Stress-restress: effects on ACTH and fast feedback. *Psychoneuroendocrinology*. 1997;**22**:443–53.
2. Perrine SA et al. Severe, multimodal stress exposure induces PTSD-like characteristics in a mouse model of single prolonged stress. *Behav Brain Res*. 2016;**303**:228–37.
3. Pinto TNC et al. Cost-effective TRAP qPCR approach to evaluate telomerase activity: an important tool for aging, cancer, and chronic disease research. *Clinics*. 2021;**76**:e2432.

Received: 13.05.2026; Accepted: 08.09.2026; Published: 29.09.2026

Citation: Naydych R.M., Vasy^{1,2,3}, Haran B.Ye., Lahuta T.I., Kamkina M.M., Dosenko V.Ye., Krasnienkov D.S. (2026) Telomerase activity in mice with experimental stress-associated phenotype. *Biopolymers & Cell*, Special issue(42), 76. <https://doi.org/10.7124/bc.000B87>

© Publisher PH "Akademperiodyka" of the NAS of Ukraine, 2026. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted reuse, distribution, and reproduction in any medium, provided the original work is properly cited