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Epigenetic regulation of function of aged chromatin

Teimuraz Lezhava
Tbilisi State University, Georgia

Abstract

Regulation of chromosome heterochromatinization (hypoacetylation and methylation causes heterochromatinization); mutation level (chromosome aberration covering telomere regions); reparation (intensity of unscheduled DNA synthesis and the frequency of sister chromatid exchanges) have been studied in lymphocyte cultures from individuals at the age of 80-114 years to reveal the chromosomes functional organization and to find explanations and therapeutic treatment of some senile pathologies.

The analysis of obtained results showed:

1. Chromosome progressive heterocromatinization (of eu- and heterochromatin regions) occurs at aging;

2. Decrease of repair processes and increase in frequency of chromosome aberration in aging are secondary to the progressive heterochromatinization. Chromosome heterochromatinization is a key factor of aging;

3. Chromosome heterochromatinization may be the reason for some senile pathologies (peptide bioregulators – Ala-Glu-Asp-Gly ; Lys-Glu-Asp-Ala and Lys-Glu induces deheterochromatinization - decondensation of total heterochromatin);

4. Chromosome heterochromatinization is an area where one should seek the ways for prolonging the lifespan.