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Genome instability in pulmonary tuberculosis

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Pulmonary tuberculosis (PT) is classified as a disease with a hereditary predisposition. Genetic factors contribute to the outcome of primary PT infection with an estimated heritability of more than 50%. The genotype of an organism plays an important role in the development of PT diseases. Numerous studies have been performed to identify genetic factors responsible for variation in PT susceptibility. However, none of the candidate genes was associated with susceptibility to active PT. Therefore, as with all the pathologies related to this group, particular importance is attached to finding those markers that enable early detection of high risk groups of the disease in the population. Data on the variability of such informative and important functional parameters, which are associated with the epigenetic processes in PT are practically absent. The aim of our study was to evaluate genetic and epigenetic variation of the genome in patients with sensitive pulmonary tuberculosis before and after treatment, under the effect of peptide bioregulator-Ala-Glu-Asp-Gly. In lymphocyte cultures from patients with sensitive primary PT were studied facultative heterochromatin (sister chromatid exchanges - SCE) and mutation (chromosome aberrations). We determined that there was an epigenetic alteration of functional parameters of the genome in PT before treatment. The level of heterochromatin decreased in the telomeric regions of chromosomes - A1, A2, B, C, D, F and G (in control it was high) and increased in the middle regions of chromosomes - A1, B, C, E, F and G (in control it was reduced). There was a high level of somatic recombination, revealed an increase of the frequency of cells with chromosome aberrations. The bioregulator (Ala-Glu-Asp-Gly) could be used as an aid in the prevention and treatment of tuberculosis. Redistribution of heterochromatin from the telomeric to middle chromosome arms and increasing of chromosome aberrations make it possible to define a sensitive form of PT and then monitor the results of treatment.

Biography

Tamar J Buadze is a Senior Scientist in the Department of Genetics, Ivane Javakhishvili Tbilisi State University, Georgia. Her field of interest is the human genetics, exactly, medical genetics. She is the Principal Investigator in grant projects, which concerns investigation of genetic parameters in different diseases, such as cardiomyopathy, tuberculosis and tumor namely breast cancer.

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