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HETEROCHROMATIN AND NOR ALTERATIONS IN DUCTAL BREAST CANCER

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After the completion of the Human Genome Project, the strategic direction of modern genetics shifted towards functional genomics, which also includes non-coding regions of DNA. Total non-coding DNA and satellite stalk with ribosomal cystrons, comprising repetitive sequences of nucleotides localized in heterochromatin. The functions of heterochromatin remain unclear. The present study aims to investigate total heterochromatin and NOR heterochromatin in patients with Ductal Breast Cancer (DBC) with the bioregulator Livagen and a heavy metal (CoCl2) (LCo). The level of total heterochromatin by differential scanning microcalorimetry showed the melting point of heterochromatin indicating slight chromatin heterochromatinization.

Intensity of ribosomal cystrons of chromatid satellite stalks (NOR heterochromatin) in 32 lymphocyte cultures from healthy individuals and the 18 from patients with DBC, and DBC with the bioregulator and a heavy metal have been studied.

The activity of ribosomal cystrons of chromatid on the 15 chromosomes included in satellite associations in the control group was reduced compared to the activity of other chromatids (14 = 21 = 22 > 13 > 15). But, the chromatids 15 chromosome patients with DBC, compared to the control group had high activity inclusion in associations corresponded to order: (15 > 21>22= 13 = 14) ($p < 0.001$). The activity ribosomal cistrons the type of association on chromosomes 15:15 in patients with DBC also was significantly increased ($p < 0.001$). However in patients with DBC + LCo, the activity ribosomal cistrons of chromatids on chromosome 15 and the frequency of association 15:15 was reduced ($p < 0.001$), which was mainly in line with the data of middle age. Our results indicated the differential activity of ribosomal cystrons of chromatids of chromosome 15 in patients with DBC (significantly increased) and DBC with the LCo (significantly reduced) in contrast to the control group. The study of acrocentric chromatids with epigenetic variability in the activity of ribosomal genes in pathology is a new direction in medicine, indicating the diagnosis of diseases and defining a new treatment strategy in the future.

Keywords: Ductal Breast Cancer, Heterochromatin, Nucleolar Organizer Regions (NOR), Ribosomal cistrons, Epigenetic variability