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Chromatin attenuation to release marker dots/supernumerary marker chromosomes must be an epigenetic mechanism signalling chromosomal mutagenesis

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Abstract

Studies on genotoxic assessments by lymphocyte cultures on 600 persons exposed to MIC gas and various control subjects and family members in Bhopal had also established that chromosomal damages have been installed among seriously exposed persons. This was a remarkable find to record in slides from lymphocyte cultures of exposed persons and confirm the presence of chromatin marker dots which were seen emanating from specific chromosomes (2). Obviosly this becomes imperative to reemphasize that these chromatin dots seen emanating from chromosomes are decidedly early indicators of chromosomal mutagenesis. We have confirmed by G, and C banding as well as by Feulgen's staining and fluorescence procedures that these are chromatin bodies found in patients of cancers (bone, breast, lung and colon in particular) and sometimes in a few of their family members (3). Family members prone to cancer were found to exhibit marker dots and developed clinical signs of cancer after 03 to 05 years after our report. Marker dots measuring 2-to-3 micron emanate from different chromosome in several metaphases in preparations from cancer patients obviously, it appears that the molecular attenuation of chromatin structures movable from chromosomes is related with triggering neoplastic transformations (4). These dots appear in those metaphases which exhibit translocations and acrocentric associations, which are precursors to installation of chromosomal mutagenesis as established since the time of Boveri. Lately, these expelled chromosome structures have been named as small Supernumerary Marker Chromosomes (SMCs) by various workers and with the help of most modern techniques like DNA hybridisation in situ, FISH techniques they have also reported exactly same results that chromatin structures are expelled from specific chromosomes. Since neither small marker chromosomes (SMCs) nor marker dots (MDs), though, both have been shown to be produced by any chromosome within a cell, have definite centromere, we can best designate them as marker dots. Our observations already published have exhibited marker dots to be found among some metaphases of normal persons without any phenotypic variable, sometimes in persons with malignant features or sometimes also associated with many pathological conditions as well as in recurrently aborting couples. Hence it would be logical to hypothesize that "Emanation of chromatin is an accelerated epigenetic molecular triggering within specific loci of chromosomes." Influence or impact of this expelled chromatin structure might be related with the activated DNA sequences on the chromosome loci from where and which specific chromosome, this has been "expelled. Since the mode of origin as well as functional aspects of both Marker Dots and SMCs are identical; both are present in normal persons and sometimes affiliated with some and the other disease, these should be considered as synonyms.

Biography

Hit Kishore Goswami, is a retired professor of Genetics and Plant sciences from Bhopal University, India, having published more than two hundred papers in different branches of Biology and Genetics, including human genetics and related reproductive complications. Contributions on cancer cytogenetics, Twin studies and evolutionary plant cytogenetics are keeping me busy even now.

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