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Organization and evolution of a novel yeast CDEI-like repeat cervid satellite DNA

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It has been proposed that pericentromeric satellite DNA arises from the progressive proximal expansion of ancient centromeric DNA. We recently isolated a novel cervid satellite DNA element (designated as satVI) in a mini-library that was generated from the microdissected pericentromeric/centromeric DNA of the chromosome X+3 of Indian muntjac. SatVI is organized as 11 bp-monomeric (ATCACGTGGGA) tandem repeats. Its repeats have approximately 5 kb in length along with approximately 3 kb of interspersed repetitive sequences in an Indian muntjac BAC clone and stretch over approximately 850 kb in the Indian muntjac genome. FISH studies revealed that satVI is predominately located on the distal pericentromeric region of the Indian muntjac chromosome X+3 and on the pericentromeres of several old World deer species studied. SatVI is also presented in the genome of Bovidae and Suidae. Based on the chromosomal localization, genomic and sequence organization, and copy numbers of satVI in species studied, we postulate that this newly found satVI DNA could be a putative ancient cervidic centromeric DNA that may already be preserved in the ancestor of the Artiodactyla family. Interestingly, many monomers of satVI harbor the identical yeast CDEI sequences. Several zipper-like d(GGGA)2 motifs were also found in the (ATCACGTGGGA)n repeat of satVI DNA. Whether the satVI is structurally and functionally correlated with the CDEI of centromere of the budding yeast and whether a zipper-like structure in satVI has any significant role, both require further studies.

Biography

Y C Li has completed her PhD from Tsing-Hua University, Taiwan in 2002 and Postdoctoral studies from Fox Chase Cancer Center, PA in 2003-2004. She is the Professor of Chung-Shan Medical University, Taiwan since 2006. She has published more than 35 papers in reputed journals. She has endowed herself in studying the role of mammalian centromeric satellite DNAs families in karyotype evolution and centromeric function for the past several years. Currently, she is interested in comparative genomic studies.

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