ARE THE STRUCTURAL AND FUNCTIONAL SIMILARITIES BETWEEN THE HUMAN CHROMOSOMES AND THE ELECTRICAL TRANSFORMER COINCIDENTAL?

Kanev, I., DeHaai, K.A. Van Dyke, A. Z., Sanmann, J.N., Hess, M.M., Starr, L.J., Dave, B.J., and Sanger, W.G. University of Nebraska Medical Center, Munroe-Meyer Institute, Human Genetics Laboratory Omaha, Nebraska, USA. E-mail: ikanev@unmc.edu

Abstract-This paper presents information and raises questions about some amazing structural and functional similarities between human chromosomes and two electrical transformers, the conventional transformer and the Tesla coil. In its tightly coiled and highly repetitive segments of DNA, known as heterochromatin, chromosomes are similar to the conventional transformer. In its loosely coiled segments of DNA, known as euchromatin, chromosomes are similar to a Tesla coil transformer. Some of the defects observed in conventional transformers, including gaps, breaks, and fusions, are similar to events that occur in heterochromatin-rich regions of the chromosomes. Some of the effects that occur in a Tesla coil transformer, including wireless transportation of power and signals, are similar to events which are well expressed and clearly visible in the chromosome regions rich in heterochromatin. The questions are: Are these similarities coincidental or real? Is it possible for chromosomes to operate with energy (or power) like electrical transformers? Are the heterochromatin areas really critical and responsible for formation of gaps, breaks, fusion and other types of chromosomal abnormalities? If the answers to these questions are positive, then chromosomes should be described not only as vehicles for carrying genes and inheritance but also as transformers operating with energy. Furthermore, if true, it will change one of the oldest and main principles in cytogenetics, specifically that the heterochromatin is not important in formation of genetically based diseases and syndromes. We hypothesize that if rich in heterochromatin areas affect the transmission of energy within chromosomes causing disturbances, then these disturbances might cause gaps, breaks, fusion and other kind of damaging of the DNA molecules, and these damages could be a main mechanism in the formation of chromosome abnormalities and various cancers, infertility, pregnancy loss, and syndromes (e.g. Down and Turner syndromes) with chromosomal etiologies.