

## Study of molecular genetic changes of mitochondrial D-loop region in Iraqi ageing persons- Almuthana Kh Hameed- University of Anbar, Iraq

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### Abstract

The mitochondrial DNA (mtDNA) is a small circular genome placed within the mitochondria in the cytoplasm of the cell, has a smaller 1.1 kbp fragment which is called the control region (D-loop). This paper aims at studying most of this region by using the sequencing technique and finding the degree of variation characteristics of this fragment. Geneaid extraction kit was used for extracting the whole genomic DNA, and then amplification of the the D-loop fragment was done by PCR with specific primers. The PCR products were sequenced and variations were detected by using the MEGA7 program. Different polymorphisms discovered in this region for both blood and muscle samples from Iraqi population. The accumulation of single nucleotide polymorphisms (SNPs) in the displacement loop of mtDNA may be associated with ageing. In this study, the SNPs in the mitochondrial D loop of blood and muscle samples were identified, and their association with ageing was

estimated. The majority of the polymorphism nucleotide was located in the D-loop region. The nucleotide transition, transversion, insertion and deletion were causes behind the important variations in nucleotide sequencing. The total number of mutations in blood samples of young individuals were 37 mutations (4.3%) and 48 mutations (5.6%) in muscle samples for same individuals while the total number of mutations in blood samples of older individuals was 667 mutations (78%) and 93 mutations (10.8%) in muscle samples for same individuals. There are significant differences in the number of mutations in older people, specifically for blood samples incidence and frequency of mutations were greater than those of younger age groups. The analysis of genetic polymorphisms in the mitochondrial D loop may help in identifying the most important variation in both young and adult Iraqi individuals.