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ARISA IMSUMRAN : DELETION MUTATION IN MITOCHONDRIAL GENOME FROM THAI ENCEPHALOMYOPATHIC PATIENTS. THESIS ADVISOR : PATCHAREE WICHYANUWAT, M.D., Ph.D., CHAROENSRI MUNGKORNKARN, B.Sc (in Pharm.), M.Sc., VORAPAN SENA-NARONG, M.D., STEFANO CASALOTTI, Ph.D. **120 p. ISBN 974-588-937-7**

The importance of mitochondrial DNA as an underlying lesion of human disorders has become apparent in recent years. Two major types of mtDNA mutation have been observed, large multigene deletion and single base substitution. In this thesis, we studied the molecular lesion of mtDNA in 10 Thai patients with encephalomyopathies. The DNA from skeletal muscle and blood leukocytes were extracted using appropriate methods. The Southern blot hybridization analysis was performed for determination of the size of mtDNA. The deleted region of mtDNA was mapped by amplification with 5 primer pairs covering almost the total mitochondrial genome and confirmed by PCR primer shift analysis. The exact position of the deletion was determined by restriction fragment length polymorphism (RFLP) analysis followed by DNA sequence analysis. One patient was found to have 3.6 kb deletion in mtDNA by Southern blot analysis and PCR analysis. The deleted position was localized to nt10208/13765 or nt10204/13761 spanning the coding area of subunit 3 (ND3), 4L (ND4L), 4 (ND4) and 5 (ND5) of respiratory chain enzyme complex I and also the transfer RNA genes for histidine, serine, leucine and arginine. The sequence flanking the deletion was 4 bp repeat of TCCC. This mtDNA deletion was also found by PCR analysis in 3 other patients with encephalomyopathies. All of the patients who have gene 3558 bp deletion seem to have a unique deleted position in their mtDNA which is different from those reported in the literature but the same among themselves. The mutation of these patients could only be detected in muscle but not in blood samples. This deletion in mtDNA was not found in the other 6 patients by either Southern blot analysis or PCR analysis.