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A Comparison of TSPY Gene from Y-Chromosomal DNA of the Great Apes and Humans : Sequence, Evolution, and Phylogeny

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Testis specific protein Y-encoded(TSPY) genes from the pongidae (chimpanzee, gorilla, and orangutan) and baboons as an outgroup have been sequeced by PCR amplification and DNA sequencing. The TSPY gene sequences were compared with each other and with the published human sequence(Zhang et al., 1992). Substitutions were detected at 144 of the 755 nucleotide positions compared. Deletions and/or additions were noted at twelve locations. The most divergent representative of higher primates(orangutan) differed from the other three(humans and African apes) by 7.25%(range 6.3~8.2%). The phylogenetic tree constructed by the neighbor-joining method suggests that human and chimpanzee are more closely related to each other than either of them is to gorilla and the tree also supported by the maximum likelihood and the strict consensus maximum parsimony tree. The number of nucleotide substitutions per site between human and chimpanzee, gorilla, and orangutan for TSPY intron were 0.023, 0.049, and 0.09, respectively. The rates of nucleotide substitutions per site per year were higher in TSPY intron than TSPY exon and higher in the TSPY intron than ZFY intron in hominidae.