B57 Population Data on the X Chromosome Short Tandem Repeat Loci AR, DXS10011, DXS101, DXS6789, DXS7132, DXS8377, DXS9895, and HPRTB in Taiwan

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After attending this presentation, attendees will understand the usage of X STR.

This presentation will demonstrate the application of X STR on special paternity cases or forensic cases.

The major applicable commercial kits for STR typing in forensic testing are only for genomic STRs and Y chromosome linked STRs, the typing for X chromosome linked STRs has not well developed yet, but the forensic DNA scientists are beginning to recognize that X STRs are powerful auxiliary systems to genomic STR, they are helpful for the identification of female such as for differentiating if two women had the same father directly, avoiding some of the ambiguity generated from sibship calculation. This report contains the results of population studies on the X chromosome STR AR, DXS10011, DXS101, DXS6789, DXS7132, DXS8377, DXS9895 and HPRTB for Chinese living in Taiwan. The numbers of unrelated individuals were 416 for AR, 273 for DXS10011, 414 for DXS7132, 413 for DXS9895, 448 for DXS101, 447 for DXS6789, 450 for DXS8377 and 428 for HPRTB. The common alleles of each locus were sequenced and used in a control ladder for typing population samples. The primer sequences and annealing temperature were modified and optimized for designing two multiplex amplification reactions to obtain typing of all the 8 loci. For each locus 6 to 28 alleles were noted.

Heterozygosity in females ranged from 0.700 to 0.953. The Chance of Exclusion(CE) for these 8 loci were 0.835, 0.905, 0.594, 0.562, 0.469, 0.761, 0.449 and 0.531 respectively. Among the 140 father-daughter or mother-child pairs examined, 1 case of mutation were found at AR locus, among the 172 father-daughter or mother-child pairs examined, 1 case of mutation were found at DX10011, among the 216 father-daughter or mother-child pairs examined, 1 case of mutation were found at DXS7132.

In a deficiency case, two women claimed that they were from the same father, the sibship index for 15 genomic STR was 1,443, and both of the two girls had the same X STR typing AR=23/25, DXS10011=24/30, DXS101=23/24, DXS7132=13/15, DXS8377=48/51 and DXS=14/15, further confirmed that they were from the same father, in another immigration case, a grand-daughter had to be confirmed was blood related to a grandmother(father side) to get the citizenship of Taiwan. Because the X chromosome linked STRs would pass from grandmother to the granddaughter, so these 8 systems were used on that, after matching the typing of X STRs and calculating the index of genomic STRs, their blood relationship was confirmed, this was the first case that X STRs were used on immigration samples. These STR polymorphisms will be useful markers for parentage testing especially when disputed child is female.

Short Tandem Repeats, X Chromosome, Population Study

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