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Haplotype data of 23 Y-chromosome markers in a Chinese Han population and its comparison with that of 12 Y-chromosome markers

Sheng-Ping Hu, Jie Shang and Sheng-Lan Chen
Shantou University Medical College, China

Aim: To genotype 23 Y-chromosomal short tandem repeat (Y-STR) loci (DYS576, DYS389I, DYS448, DYS389II, DYS19, DYS391, DYS481, DYS549, DYS533, DYS438, DYS437, DYS570, DYS635, DYS390, DYS439, DYS392, DYS643, DYS393, DYS458, DYS385ab, DYS456, and GATA-H4) included in the PowerPlex 23 kit (PPY23), as well as to assess the value of increasing number of Y-STR loci in forensic DNA analysis.

Methods: Blood samples were obtained from 109 unrelated male Chinese residing in Minnan area, Southeast China. Genomic DNA was extracted using the Chelex-100 method and typed for 23 Y-STR loci using PPY23. Locus- and haplotype-based parameters usable for forensic casework were determined. The result was compared systematically with that from our previous study on 12 Y-STR using the PowerPlex 12 kit (PPY12).

Results: A total of 106 haplotypes were identified, of which 103 (94.50%) were of uniqueness and only 3 were each found in 2 individuals (5.50%). The genetic diversity for each locus ranged from 0.321 (DYS391) to 0.955 (DYS385), the haplotype diversity was 0.9903, and the discrimination capacity 0.9725. By comparing the results from PPY23 and PPY12 genotyping, we observed a strong correlation between the number of Y-STR markers included in a marker set and the substantial improvement of forensic parameters used to discriminate between individuals.

Conclusion: The studied 23 Y-STR markers are highly polymorphic, which makes them useful in forensic DNA analysis as well as in population genetic studies. Increasing the number of Y-STR markers could enhance discrimination power of Y-STR marker set in individual identification and paternity testing.

Biography

Sheng-ping Hu earned her MD from Tongji Medical University, China and PhD from Sydney University, Australia, and completed her Postdoctoral training at Harvard and Boston University Medical Schools. She joined Shantou University Medical College of China in 1999 and is currently a Faculty member and Professor in Molecular Biology and Forensic Genetics. She is state-certified for DNA parentage testing and her laboratory also embarks on research related to the forensic molecular genetics. She has served as a grant reviewer for the National Natural Science Foundation of China (NSFC) and several other grant provider bodies, and a referee for several prestigious journals.

sphu@stu.edu.cn