Multiplex Fluorescent PCR Analysis in Japanese Population

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Introduction

Short tandem repeat (STR) analysis is a useful tool in forensic sciences to get information of individual identification. Recently, several STR loci can be amplified in one tube using multiplex PCR STR kit which are commercially available.

Material and Methods

We investigated 10 STR loci in Japanese population living in Sendai by two multiplex PCR kits, *GenePrint*® PowerPlex™ Fluorescent STR System (Promega, USA) and AmpF*l*STR™ Profiler™ (Perkin-Elmer, USA). Genomic DNA was extracted from EDTA whole blood and oral swab using SDS-Proteinase K or Chelex treatment followed by the phenol/chloroform extraction. PCR was performed in accordance with manufacture's protocols. Electrophoresis was carried out on an ABI 377 sequencer and the alleles were determined by GeneScan® 2.0.2 software (Perkin-Elmer, USA).

Results and Discussion

The statistical data of analyzed 10 STRs are shown in Table 1. In all loci, statistical parameters indicated relatively high rate, and no significant deviation from Hardy-Weinberg Equilibrium was detected. We apply this STR system for the paternity test and forensic casework, e. g., personal identification in rape cases. This system is very effective in the paternity test. However, in some rape cases, PCR products failed to amplify several loci in high molecular range because of DNA degradation.

Table 1. Statistical data of 10 loci in Japanese population

Locus	Number of Individuals	Alleles Observed	Het.	PD	PIC
D7S820	321	8	0.771	0.914	0.738
D13S317	322	9	0.818	0.941	0.792
D5S818	322	9	0.786	0.922	0.754
CSF1PO	246	7	0.734	0.888	0.693
TPOX	248	7	0.691	0.851	0.637
TH01	249	8	0.725	0.875	0.676
vWA	249	8	0.800	0.930	0.770
D16S539	221	7	0.777	0.916	0.742
D3S1358	107	7	0.705	0.860	0.651
FGA	107	10	0.831	0.930	0.770

Het.: heterozygosity,
PD: power of discrimination,
PIC: polymorphic information content