B56 Population Data on the Short Tandem Repeat Loci Penta D and Penta E in Taiwan

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After attending this presentation, attendees will understand that it is better to add the Penta D and Penta E test to the paternity test with low CPI or add these two systems to confirm if mutations exist.

The STR loci Penta D and Penta E were observed as low-stutter and highly polymorphic pentanucleotide repeat loci, they were thought to add a lot portion of exclusion probability to the paternity disputes and also to increase the discriminating probability for forensic identification, the population data and forensic parameters of these two systems needed to be to be studied.

Whole blood was obtained in EDTA vacutainer tubes by venipuncture from 532 unrelated Chinese individuals and from routine paternity cases in Taiwan. DNA was extracted by using BioGene-Fast™ 30 Minute DNA extraction kit (Texas BioGene, Inc., TX, USA) and quantitated by a Fluorometer (DyNA Quant 200, Hoefer Pharmacia Biotech, San Francisco, CA, USA). PCR amplification was performed by using 5ng genomic DNA in a 15£gl reaction volume comprising STR buffer (Gold ST*R, Promega, Madison, WI USA) and 0.5 U Tag Gold Polymerase (Applied Biosystems, Foster City, CA, USA), 1£gM PowerPlex™ 16 primer. PCR cycling conditions followed the protocol provided by the manufacturer. Alleles of each locus were determined according to the ladder also provided by the manufacturer.

Aliquot of PCR products was processed by using ABI 310 Genetic Analyzer (PE Applied Biosystems, USA). The raw data was analyzed by the resident software (Data Collection software, version 1.0.2), Genotypes were determined by comparing the length of the unknown fragments to the allelic ladders provided by the manufacturer. A software provided by POPGENE was used to analyze the data. In this study only data for Penta D and Penta E were presented.

No significant deviation from Hardy-Weinberg equilibrium was found in these systems. The most frequent allele types for each locus were Penta D: 9(34.15%), Penta E:11(16.51%). The mean exclusion power(MEP) for Penta E(81.92%) was larger than that of Penta D(60.16%), and the DP for Penta E(98.6%) was also larger than that of Penta D(93.7%). When processing paternity test and only the alleged father were willing to be tested, the CPI was found not high enough sometimes, but if typing results of Penta D and Penta E were added, the CPI would increase accordingly, cases were presented with the increase of CPI from about 7 to 17 times. We also used these two systems without any modification on 26 Chimpanzee blood samples from Taipei Zoo(Taiwan), there were 3 families according to the first generation male in this group, the typing of these two systems was in accordance with the pedigrees established by using some other 13 STR systems, the alleles found in Penta D system were 3 and 4, the most frequently found allele for Penta D was 4(96%), alleles 5, 7, 8, 10, 11 and 13 were found in Penta E, and the most frequent one was 5(31%). The two Penta STR loci described here with high MEP and PD are highly suitable for forensic individualization and paternity tests even for the Chimpanzee.

Penta D Penta E, Population Study, Paternity

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