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SHORT COMMUNICATION

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Frequency of D1S80 and HLA DQα alleles in a Chinese population

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Abstract Allele frequency distributions for the D1S80 (MCT118) and HLA DQα loci were determined in a Chinese population sample using the polymerase chain reaction (PCR). A total of 25 alleles and 100 phenotypes were observed for D1S80. The frequency of allele 18 was higher than allele 24 only in this Chinese population when compared to other reported populations. A total of 6 alleles and 21 possible phenotypes were observed for HLA DQα. The power of discrimination was 0.97 and 0.93 for D1S80 and HLA DQα, respectively.

Key words PCR · Population genetics · D1S80 · HLA DQα · Chinese

Introduction

The polymorphisms at the D1S80 and HLA DQα loci are considered to be useful genetic markers for forensic use [1]. However, the validation of genetic markers for use in forensic investigations requires information on allele frequency data from the local population. This paper described the genotype and allele frequencies in a Chinese population sample from Shenyang.

Materials and methods

Blood samples were obtained from unrelated Chinese living in Shenyang (north eastern China). DNA was isolated using a phenol-chloroform extraction method. The typing was carried out with AmpliFLP PCR Amplification Kit (Perkin Elmer), using the thermal cycler type 480 (Perkin Elmer). Polyacrylamide gel (T = 5%, C = 3%) electrophoresis was performed for the D1S80 locus by previously described methods [2, 3]. The HLA DQα typing was carried out according to the manufacturer's protocol.

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Results and discussion

The distribution of allele frequencies for unrelated Chinese individuals (301 for D1S80, 250 for HLA DQα) is shown in Table 1. The D1S80 alleles 18, 24, 30 and 31 were found to be the most common ones. The observed heterozygosity was 86.1%.

Alleles HLA DQα 3 and HLA DQα 4 were the most common, and the HLA DQα 1.3 was rare. The 21 possible phenotypes were all found, and the most common

Table 1 Allele Frequencies of D1S80 and HLA DQα in a Chinese population from Shenyang

Allele	D1S80	Allele	HLA DQα
14	0.0033	DQα1.1	0.112
16	0.0246	DQα1.2	0.174
17	0.0083	DQα1.3	0.092
18	0.2110	DQα2	0.128
19	0.0299	DQα3	0.258
20	0.0050	DQα4	0.236
21	0.0249		
22	0.0150		
23	0.0216		
24	0.1977		
25	0.0332		
26	0.0033		
27	0.0266		
28	0.0847		
29	0.0465		
30	0.1063		
31	0.1046		
32	0.0166		
34	0.0066		
35	0.0066		
36	0.0100		
38	0.0017		
39	0.0017		
41	0.0083		
44	0.0017		

Table 2 Check for Hardy-Weinberg equilibrium for D1S80

Groups	Alleles	Frequency
I	14–18	0.2475
II	19–23	0.0964
III	24	0.1977
IV	25–30	0.3006
V	31–44	0.1578
χ^2	15.79	
P	0.3–0.5 ($df = 14$)	

phenotypes observed were HLA DQα 3–4 (14.0%) and 1.2–3 (10.0%). The observed heterozygosity was 80.4%. The results of this analyisis showed that the allele frequencies for HLA DQα ranged from 0.09–0.26.

The expected values complied with the observed ones assuming Hardy-Weinberg equilibrium (Table 2). The power of discrimination was calculated to be 0.97 for D1S80 and 0.93 for HLA DQα. The allele frequencies found in Chinese are similar to other Asian populations originating from the Indian subcontinent [4–7], but we found that the frequency of allele 18 in D1S80 was higher than allele 24 in the Chinese population.

Our results indicated that D1S80 and HLA DQα loci are useful genetic markers for paternity testing and individual identification in the Chinese population.

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