

FOR THE RECORD

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Population Genetics of Five Y-Chromosomal Short Tandem Repeat Haplotypes in the Chinese Han Population

POPULATION: Chinese Han population living in the Shaanxi Province of China.

KEYWORDS: forensic science, DNA typing, polymorphism analysis, Y-chromosome STR haplotypes, Chinese Han population living in the Shaanxi province of China, population genetics, DYS438, DYS439, DYS392, DYS389, DYS389, Y-PLEXTM 5 kit, China

Whole-blood samples were obtained from 136 unrelated male individuals of Chinese Han population living in the Shaanxi province of China. Genomic DNA was extracted using the Chelex-100 protocol as described by Walsh et al. (1). Five Y-chromosomal short tandem repeats (STRs) loci (DYS438, DYS439, DYS392, DYS389I, and DYS389II) were performed in a fluorescence-based multiplex reaction using the Y-PLEXTM5 kit (Reliagene Technologies Inc., New Orleans, LA). The amplification reactions of 12.5 μ L in total contained 2.5 μ L of 5 \times Y-PLEXTM 5 Primer Mix, 0.25 μ L of AmpliTaq Gold DNA Polymerase (Reliagene Technologies) (5 μ L), 7.25 μ L of deionized water, and 2.5 μ L of Genomic DNA (1–5 ng). Thermal cycling was conducted using the following conditions: 95°C for 10 min; 32 cycles of 94°C for 30 sec, 56°C for 1 min, 70°C for 45 sec; and a final extension of 60°C for 60 min using the GeneAmp PCR system 9700 (Applied Biosystems, Foster City, CA) (2). Detection and genotyping of all polymerase chain reaction Products were accomplished using an ABI 3100 DNA Genetic Analyzer (Applied Biosystems). Haplotype and allele frequencies were estimated by the direct counting method. Haplotype and gene diversities were estimated according to Nei (3). The Y-STR haplotype distributions of the Chinese Han population are shown in Table 1. Allele frequencies and gene diversity values for Y-STR loci are shown in Table 2. Twenty-nine alleles of five STR loci were detected in the Chinese Han population, with the allele frequencies ranging from 0.0074 to 0.7132. The gene diversity value of five Y-STR loci ranged from a minimum of 0.4468 for DYS438 locus to a maximum of 0.7594 for

TABLE 1—Y-chromosomal short tandem repeat (STR) haplotypes in 136 unrelated male individuals of the Chinese Han population.

Haplotype	n	Frequency	DYS438	DY439	DYS392	DYS389I	DYS389II
H1	1	0.0074	10	10	11	11	27
H2	1	0.0074	10	11	11	11	27
H3	2	0.0147	10	10	10	11	28
H4	1	0.0074	10	11	11	11	28
H5	1	0.0074	10	11	13	11	28
H6	1	0.0074	10	11	14	11	28
H7	1	0.0074	11	11	11	11	29
H8	1	0.0074	10	11	11	11	30
H9	1	0.0074	10	13	12	11	30
H10	1	0.0074	10	13	11	11	31
H11	1	0.0074	10	11	11	12	29
H12	1	0.0074	10	13	13	12	26
H13	1	0.0074	10	11	14	12	27
H14	1	0.0074	11	11	13	12	27
H15	2	0.0147	10	14	13	12	27
H16	1	0.0074	10	11	11	12	28
H17	1	0.0074	10	11	13	12	28
H18	1	0.0074	10	11	14	12	28
H19	1	0.0074	11	11	14	12	28
H20	1	0.0074	9	12	13	12	28
H21	1	0.0074	10	12	14	12	28
H22	1	0.0074	10	12	15	12	28
H23	2	0.0147	11	12	14	12	28
H24	2	0.0147	11	12	15	12	28
H25	1	0.0074	11	13	13	12	28
H26	1	0.0074	11	14	14	12	28
H27	2	0.0147	10	10	10	12	29
H28	1	0.0074	10	11	10	12	29
H29	1	0.0074	10	11	11	12	29
H30	1	0.0074	10	12	10	12	29
H31	1	0.0074	12	10	13	12	30
H32	1	0.0074	10	11	11	12	30
H33	1	0.0074	10	12	14	12	30
H34	1	0.0074	10	11	11	12	31
H35	1	0.0074	11	11	10	12	32
H36	1	0.0074	10	12	14	13	27
H37	1	0.0074	11	12	15	13	27
H38	1	0.0074	11	11	15	13	28
H39	2	0.0147	10	12	12	13	28
H40	1	0.0074	10	12	13	13	28

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TABLE 1—Continued.

Haplotype	n	Frequency	DYS438	DY439	DYS392	DYS389I	DYS389II
H41	3	0.0221	10	12	14	13	28
H42	2	0.0147	10	12	15	13	28
H43	1	0.0074	11	12	15	13	28
H44	1	0.0074	9	13	14	13	28
H45	1	0.0074	10	13	15	13	28
H46	1	0.0074	11	13	15	13	28
H47	1	0.0074	11	14	15	13	28
H48	1	0.0074	12	14	15	13	28
H49	1	0.0074	10	10	11	13	29
H50	1	0.0074	10	10	14	13	29
H51	2	0.0147	10	11	11	13	29
H52	2	0.0147	10	11	15	13	29
H53	1	0.0074	9	12	12	13	29
H54	2	0.0147	10	12	11	13	29
H55	2	0.0147	10	12	13	13	29
H56	2	0.0147	10	12	14	13	29
H57	2	0.0147	10	12	15	13	29
H58	1	0.0074	10	13	12	13	29
H59	2	0.0147	10	13	13	13	29
H60	1	0.0074	10	13	15	13	29
H61	1	0.0074	11	13	14	13	29
H62	1	0.0074	10	14	13	13	29
H63	1	0.0074	10	14	14	13	29
H64	2	0.0147	10	10	10	13	30
H65	1	0.0074	8	11	11	13	30
H66	1	0.0074	10	11	11	13	30
H67	1	0.0074	11	10	11	13	31
H68	1	0.0074	10	11	15	13	31
H69	1	0.0074	10	11	11	14	29
H70	1	0.0074	10	10	15	14	28
H71	1	0.0074	10	12	15	14	28
H72	1	0.0074	10	13	15	14	28
H73	1	0.0074	11	13	15	14	28
H74	1	0.0074	11	13	16	14	28
H75	1	0.0074	10	11	13	14	29
H76	1	0.0074	11	11	15	14	29
H77	1	0.0074	10	12	11	14	29
H78	1	0.0074	10	12	12	14	29
H79	2	0.0147	10	12	14	14	29
H80	1	0.0074	11	12	14	14	29
H81	1	0.0074	12	12	15	14	29
H82	2	0.0147	10	13	14	14	29
H83	1	0.0074	10	13	14	14	29
H84	1	0.0074	11	13	12	14	29
H85	1	0.0074	10	14	14	14	29
H86	1	0.0074	11	14	10	14	29
H87	1	0.0074	11	14	14	14	29
H88	1	0.0074	10	10	14	14	30
H89	1	0.0074	12	10	14	14	30
H90	1	0.0074	10	11	13	14	30
H91	2	0.0147	10	11	14	14	30
H92	1	0.0074	10	11	15	14	30
H93	2	0.0147	11	11	11	14	30
H94	1	0.0074	11	11	13	14	30
H95	2	0.0147	10	12	11	14	30
H96	1	0.0074	10	13	11	14	30
H97	1	0.0074	10	13	14	14	30
H98	1	0.0074	10	13	15	14	30
H99	1	0.0074	10	12	13	14	31
H100	1	0.0074	10	12	14	14	31
H101	1	0.0074	10	12	15	15	29
H102	1	0.0074	10	11	14	15	30
H103	1	0.0074	9	12	12	15	30
H104	2	0.0147	10	12	15	15	30
H105	1	0.0074	11	12	15	15	30
H106	1	0.0074	12	12	15	15	30
H107	1	0.0074	10	13	13	15	30
H108	1	0.0074	11	13	14	15	30
H109	1	0.0074	10	12	14	15	31
H110	1	0.0074	10	12	15	15	31
H111	1	0.0074	11	13	11	15	31
H112	1	0.0074	10	12	12	15	32
H113	1	0.0074	10	13	14	15	32

n, number of individuals observed for each haplotype.

TABLE 2—Allele frequencies at fiveY-chromosomal short tandem repeats (STRs) of the Chinese Han population.

Allele	DYS438	DYS439	DYS392	DYS389I	DYS389II
8	0.0074				
9	0.0294				
10	0.7132	0.1029	0.0735		
11	0.2132	0.2721	0.1985	0.0809	
12	0.0368	0.3603	0.0662	0.2132	
13		0.1912	0.1471	0.3309	
14		0.0735	0.2721	0.2721	
15			0.2353	0.1029	
16			0.0074		
26					0.0074
27					0.0588
28					0.2794
29					0.3309
30					0.2353
31					0.0662
32					0.0221
GD	0.4468	0.7491	0.8056	0.7594	0.7542

GD, gene diversity value of each Y-STR locus.

the DYS389I loci. Out of a total of 136 male individuals 113 showed different haplotypes, 91 haplotypes of which unique, 21 haplotypes were found two times, and one was found three times. The overall haplotype diversity for five Y-STR loci was 0.9974, and the discrimination capacity was 0.9901.

The complete dataset is available via electronic mail from the corresponding author: xingjpcn@yahoo.com.cn or xingjp-mr@vip.sina.com

Acknowledgments

All the authors would like to thank Mr. Xiaosong Li for his technique assistance This research was supported by the Key Item of Science Technology Foundation of Shaanxi Province, P.R. China (2005K12-G5).

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