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SHORT COMMUNICATION

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The STR systems FES/FPS and F13B in a Polish population

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Abstract Allele frequencies for the STR systems FES/FPS and F13B were determined from 203 unrelated individuals from north-eastern Poland. After denaturing PAGE, 7 and 6 alleles were detected for FES/FPS and F13B, respectively. No deviations from Hardy-Weinberg equilibrium were observed.

Key words Short tandem repeats · FES/FPS · F13B · Population study · Poland

Introduction

The two STR loci FES/FPS (Polymeropoulos et al. 1991) and F13B (Nishimura and Murray 1992) were investigated in a population sample from north eastern Poland.

Material and methods

DNA was extracted from the blood of 203 unrelated individuals by the Chelex-100 and proteinase K extraction method (Wiegand et al. 1993). The commercially available kits Gene Print STR System-FESFPS and Gene Print STR System-F13B (Promega, USA) were used and the amplification and separation conditions were as described by the manufacturers.

The Hardy-Weinberg equilibrium within the studied population and the heterogeneity between Polish and German populations were checked using the χ^2 and exact tests using the SPSS software, version 7.0 (SSPS Incorporated, Chicago, Illinois). The mean exclusion chance (MEC) (Krüger et al. 1968) and the discrimination index (DI) (Jones 1972) were also calculated.

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Results and discussion

For F13B, 6 alleles were observed and the most common alleles were 10 (f = 0.443), 8 (f = 0.227) and 9 (f = 0.222) (Table 1). Alleles 9C and 10C, also very rare in the German survey, were not observed.

For FES/FPS, 7 alleles were determined and the most common alleles were 10 (f = 0.303) and 11 (f = 0.441) (Table 1). Denaturing PAGE does not distinguish two suballeles of 10 and 11 repeat lengths (10A and 11A) (Klintschar 1995), therefore the MEC and DI values for our population are somewhat lower (Table 2) than those reported for Germans, based on non-denaturing PAGE (Alper et al. 1995). The mean exclusion chance for F13B

Table 1 Allele frequency distribution for FES/FPS and F13B systems in a Polish population sample compared to German data

FES/FPS Allele	Poles (Bialystok) n = 203	Poles (Gdansk) n = 106	Germans n = 414	F13B Allele	Poles n = 203	Germans n = 402
8	0.012	0.0189	0.012	6	0.101	0.103
9	0.007	0.0094	0.006	7	0.015	0.012
10A	–	0.1934	0.248	8	0.227	0.224
10	0.303	0.0708	0.056	9	0.222	0.225
11A	–	0.0142	0.030	9C	–	0.001
11	0.441	0.4057	0.413	10	0.433	0.432
12	0.187	0.2217	0.188	10C	–	0.001
13	0.047	0.0660	0.045	11	0.002	0.001
14	0.002	–	0.002			

Table 2 Comparison of heterozygosity (H), mean exclusion chance (MEC) and discrimination index (DI) for FES/FPS and F13B between Polish and German population samples

	H		MEC		DI	
	Polish	German	Polish	German	Polish	German
FES/FPS	0.71	0.69	0.42	0.50	0.82	0.88
F13B	0.71	0.69	0.45	0.46	0.86	0.87

was 0.45 and for FES/FPS 0.42 (combined 0.68). No deviations from Hardy-Weinberg equilibrium were observed.

Testing for population heterogeneity revealed no differences between the Polish and German populations for FES/FPS ($\chi^2 = 0.213$, $df = 6$, $P = 1.0$, exact $P = 1.0$) or for F13B ($\chi^2 = 1.174$, $df = 5$, $P = 0.947$, exact $P = 0.958$). However, there were statistically significant differences to the Gdansk population for FES/FPS (Pawlowski et al. 1997) ($\chi^2 = 7.503$, $df = 6$, $P = 0.315$, exact $P = 0.290$). The fact may be due to small sample sizes from both Polish populations.

References

Alper B, Meyer E, Schürenkamp M, Brinkmann B (1995) HumFES/FPS and HumF13B: Turkish and German population data. Int J Legal Med 108:93–95

Jones DA (1972) Blood samples: probabilities of discrimination. J Forensic Sci Soc 12:355–359

Klintschar M (1995) Validation of the STR system FES/FPS for forensic purposes in an Austrian population sample. Int J Legal Med 108:162–164

Krüger J, Fuhrmann W, Lichte KH, Steffens C (1968) Zur Verwendung des Polymorphismus der sauren Erythrocytenphosphatase bei der Vaterschafts-begutachtung. Dtsch Z Gerichtl Med 64:127–146

Nishimura DY, Murray JC (1992) A tetranucleotide repeat for the F13B locus. Nucleic Acids Res 20:1167

Pawlowski R, Maciejewska A, Paszkowska R, Welz A (1997) Frequencies for five short tandem repeat (STR) systems in a population from North Poland. Int J Legal Med 110:10–13

Polymeropoulos MH, Rath DS, Xiao H, Merril CR (1991) Tetranucleotide repeat polymorphism at the human c-fes/fps proto-oncogene (FES). Nucleic Acids Res 19:4018

Wiegand P, Bajanowski T, Brinkmann B (1993), PCR typing of debris from fingernails. Int J Legal Med 106:81–84