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SHORT COMMUNICATION

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D1S80 (pMCT118): analysis of 3 ethnic subpopulations living in Brussels

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Abstract Population genetic studies were carried out on 3 ethnic subpopulations living in Brussels (119 Belgians, 120 Turks and 137 Moroccans). DNA extraction was performed using the Chelex method. After DNA amplification the DNA fragments were separated electrophoretically in horizontal polyacrylamide gels. A total of 32 alleles (between 21 and 25 alleles in each subpopulation) including 8 "interalleles" could be differentiated. The allele frequencies were compared with population data from a German study and no significant differences could be observed.

Key words D1S80 (pMCT 188) · Population genetic study · Population comparisons

Introduction

The present investigation on D1S80 (pMCT118) is a continuation of other studies (Kasai et al. 1990; Budowle et al. 1991; Rand et al. 1992; Skowasch et al. 1992, Kloosterman et al. 1993) with the aim to examine whether significant differences could be found in the allele distribution of 3 ethnic subpopulation groups living in Brussels.

Materials and methods

Whole blood was collected in EDTA tube by venipuncture from 119 unrelated Belgians (BRU-Bel), 120 Turks (BRU-Tur) and 137 Moroccans (BRU-Mor) living in Brussels. A sample of 100 µl liquid blood was deposited on clean cotton weave (20 × 20 mm), air dried and stored at room temperature.

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Table 1 Allele designation and frequencies for 3 subpopulations living in Brussels (BRU-Bel = Belgians, BRU-Tur = Turks, BRU-Mor = Moroccans). The allele nomenclature is according to Skowasch et al. 1992

	BRU-Bel	BRU-Tur	BRU-Mor
Allele			
16			0.004
17			0.007
17m		0.004	
18	0.273	0.211	0.153
19	0.008	0.017	
20	0.042	0.033	0.029
20m	0.004		0.004
21	0.029	0.012	0.029
22	0.029	0.045	0.058
22m		0.008	0.011
23	0.013	0.017	0.018
23m	0.004		
24	0.311	0.335	0.296
24m		0.004	
25	0.034	0.062	0.051
25m			0.004
26	0.025	0.017	0.011
27	0.008	0.012	0.011
28	0.029	0.062	0.124
28m	0.004		
29	0.056	0.091	0.106
30	0.025		0.011
31	0.076	0.033	0.029
31m		0.008	
32		0.008	0.004
33	0.008	0.008	0.015
34	0.008	0.008	0.015
36		0.004	0.004
37	0.008		0.004
40	0.004		
> 40			0.025

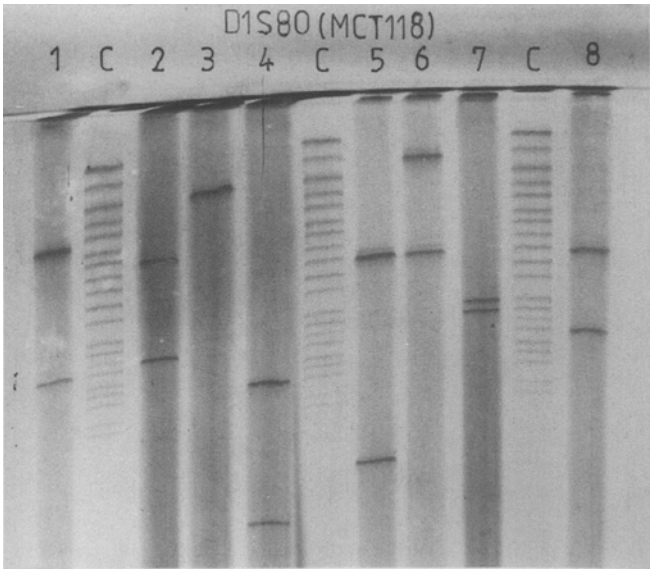

Fig. 1 Silver stained D1S80 polyacrylamide gel showing profiles from different unrelated individuals. Allelic ladder = C (according to Skowasch et al. 1992); D1S80 alleles in lane 1: 20 m–31, lane 2: 22, 30, lane 3: 18–18, lane 4: 34– > 40, lane 5: 24– > 40, lane 6: 17–24, lane 7: 28–29, lane 8: 24–31

Table 2 Mean exclusion chance (MEC – Krüger et al. 1968), discrimination index (DI – Jones 1972) and heterozygosity rates (H) for 3 subpopulations

	MEC	DI	H
BRU-Bel	0.649	0.895	0.832
BRU-TUR	0.673	0.871	0.851
BRU-Mor	0.727	0.865	0.839

DNA was extracted from bloodstains with 150 µl Chelex (5%) (Walsh et al. 1991) and 50 µl proteinase K (2 mg/ml) according to Wiegand et al. (1993).

Amplification conditions, separation of the amplified DNA fragments and visualisation using silver staining was carried out according to Skowasch et al. (1992).

Results and discussion

In the 3 subpopulation groups living in Brussels (n = 376 individuals) 32 alleles could be distinguished while the number in each subgroup varied between 21 and 25 (Table 1).

A total of 8 so-called interalleles (Skowasch et al. 1992) that did not align exactly with the alleles in the ladder (multiples of 16 bp repeats) were observed (Fig. 1). Two new alleles > 40 were found in the Moroccan population.

The most common alleles were allele 18 with frequencies ranging from 0.153 in BRU-Mor to 0.273 in BRU-Bel and allele 24 with frequencies ranging from 0.296 in BRU-Mor to 0.339 in BRU-Tur.

A clear difference is the high frequency of allele 28 in the Moroccans (frequency = 0.12) in comparison to the other 2 subpopulations (frequency = 0.029 in BRU-Bel and 0.062 in BRU-Tur).

The heterozygosity rates varied in each subgroup between 0.83 and 0.85, the mean exclusion chance between 0.65 and 0.73 and the discrimination index between 0.86 and 0.90 (Table 2). Hardy-Weinberg equilibrium was tested by the formation of 4 allele groups as described in Rand et al. (1992) and Skowasch et al. (1992). No significant deviations are found in each subgroup ($P > 0.05$). Tests to examine whether the allele frequency differences between the subpopulations are significant (Carmody test for pairwise comparisons; R × C contingency table) showed that only the pairwise comparison between the Turks and the Moroccans showed no significant differences ($P > 0.05$) while all other comparisons showed significant differences.

A comparison of the D1S80 allelic data in the unrelated native Belgians living in Brussels with Caucasians from Germany (Skowasch et al. 1992) showed good agreement with only minimal differences in the range > 25 repeats (Fig. 2) but no significant deviations were found (Chi-squared = 32.5878, P = 0.205 +/– 0.0128 (S.E.); G-statistic = 37.5900, P = 0.236 +/– 0.0134 (S.E).

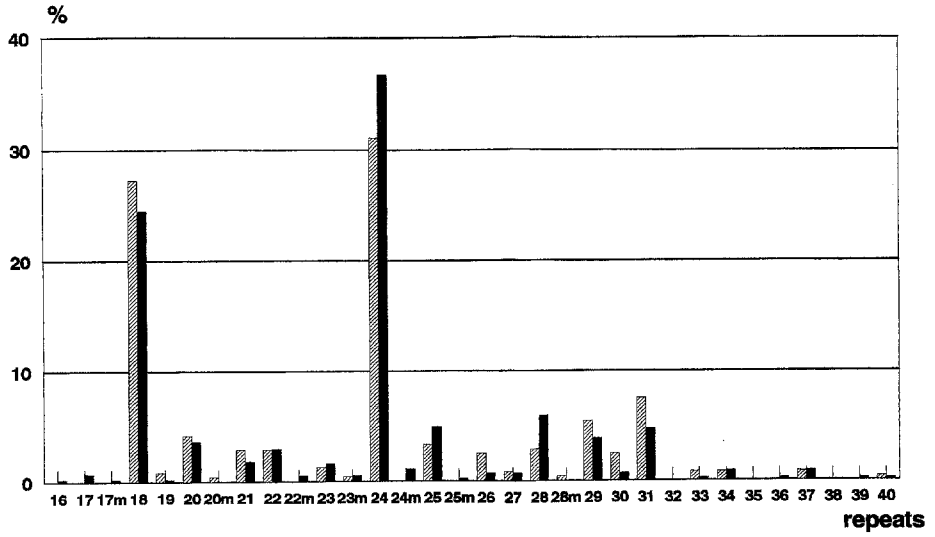

Fig. 2 Comparison of the D1S80 allele frequencies of 2 Caucasian population samples (Belgians and Germans). The additional "m" indicates the interalleles. Belgium (n = 119 ind.) = ▨; Germany (n = 218 ind.) = ■

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