

MICA AND MICB ALLELE AND HAPLOTYPE FREQUENCIES IN 'WELSH' BLOOD DONORS



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Introduction

As part of the validation of our MICA and MICB PCR-SSP typing system we typed 166 contiguous blood donors (essentially north western European caucasoids) from the Welsh Bone Marrow Donor Registry panel.

Methods

Our typing system uses the same PCR-SSP parameters as our HLA-A,B,C typing and detects 54 MICA and 17 MICB alleles. All allele families are differentiated with the exception of MICA*00201/020 and MICA*00701/026.

We calculated MICA and MICB carriage and gene frequencies by direct counting and HLA-B/MICA, MICA/MICB, HLA-B/MICA/MICB haplotype frequencies (HF) (by maximum likelihood) and linkage disequilibrium (Δ) parameters and their significance.

Results

HLA-B, MICA and MICB showed a good fit to Hardy-Weinberg equilibrium and the proportion of homozygotes was as expected (all p values >0.2).

Sixteen of the known 54 MICA alleles were detected with gene frequencies ranging from 0.00301-0.53012. MICA*00801/3 and MICA*00201/020 were the most common with carriage frequencies of 78.3% and 18.7%, respectively.

Seven of the 17 known MICB alleles were detected with gene frequencies ranging from 0.00301-0.35542. MICB-01021 and 0104 were the most common with carriage frequencies of 58.4% and 45.2%, respectively.

MICA and MICB alleles identified and their frequencies generally agreed with those previously found in UK subjects.

Using a haplotype frequency of $>0.05\%$ and a significantly positive Δ value ($p_{\text{corr}} < 0.05$) 14 HLA-B/MICA, 4 MICA/MICB (Table 1) and 29 HLA-B/MICA/MICB haplotypes were identified (Table 2).

Of the 29 HLA-B/MICA/MICB haplotypes identified (Table 2) 16 had previously been described in UK subjects. Haplotypes not previously identified included: HLA-B37/MICA*00801/3/MICB-0104 (haplotype frequency 0.01976) and HLA-B55/MICA*012/MICB-01021 (haplotype frequency 0.01466).

Comments

These findings support the validity of our MIC typing system and provide control data for future studies of MIC in transplantation and disease. The linkage disequilibrium data will also serve as a reference for the validation of further MIC typing assignments.

Table 1. MICA/MICB haplotypes with significant Δ values ($p_{\text{corr}} < 0.05$)

MICA*	MICB-	HF (x100)	Δ
00801	0106	14.0	0.063
00201	0103101	4.7	0.032
017	0105	4.3	0.041
010	0103101	3.2	0.026

Table 2. HLA-B/MICA/MICB haplotypes with significant Δ values ($p_{\text{corr}} < 0.05$)

HLA-B	MICA*	MICB-	HF (x100)	Δ
B8	008	0106	13.7	0.123
B7	008	0104	10.7	0.087
B44	008	01021	8.7	0.061
B57	017	0105	4.3	0.043
B35	002	0103101	3.7	0.036
B51	009	0103101	3.2	0.031
B62	010	0103101	3.1	0.03
B44	004	01021	2.8	0.025
B27	007	01021	2.4	0.024
B18	018	0103101	2.2	0.021
B37	008	0104	2	0.017
B35	002	0104	1.7	0.015
B55	012	01021	1.5	0.015
B13	008	01021	1.4	0.012
B51	009	0104	1.3	0.012
B14	019	01021	1.3	0.013
B14	011	01021	1.2	0.012
B45	009	0104	1.2	0.012
B62	010	01021	1.2	0.01
B18	001	01021	0.9	0.009
B60	008	0103101v	0.7	0.007
B27	007	0103101	0.6	0.006
B35	016	0103101	0.6	0.006
B49	004	0104	0.6	0.006
B52	009	01022	0.6	0.006
B18	007	01021	0.6	0.005
B39	002	0104	0.6	0.005
B58	002	0106	0.5	0.005
B50	009	01021	0.5	0.005

Note: MICA*002/020 MICA*00701/026 and MICB*0103101/02 were not differentiated