

# HLA-A, B, DR AND DQ GENE AND HAPLOTYPE FREQUENCIES IN SRI LANKAN INDIAN TAMILS



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## Introduction

As part of a study of the nature and prevalence of thyroid peroxidase and thyroglobulin antibodies in various populations in Sri Lanka we HLA-A, B, DR and DQ phenotyped 185 female Indian Tamil tea-pluckers. Indian Tamils migrated from southern India to Sri Lanka during the middle of the 19th century. They are distinct from the Sinhalese population, from Northern India, that has formed the majority of the Sri Lankan population for many centuries.

## Methods

**HLA typing.** HLA-A, B, DRB1/3/4/5 and DQB1 typing, essentially at the "split specificity" level, was performed by our standard PCR-SSP technique.

**Population genetics analysis.** This included the calculation of: phenotype frequencies; gene frequencies (derived from the haplotype counting method of maximum likelihood); the validity of Hardy-Weinberg equilibrium and homozygosity analysis; two- and three-locus haplotype frequencies (HF) by maximum likelihood and linkage disequilibrium ( $\Delta$ ) values and their significance.

## Results

**Phenotype and gene frequencies.** 12 HLA-A, 24 -B, 13 -DR and 7 -DQ specificities were identified. Hardy-Weinberg and homozygosity analysis showed a good fit for all four loci (all  $p$ -values  $> 0.1$ ). Table 1 shows the phenotype and gene frequency distribution.

**Two- and three-locus linkage disequilibrium.** The highest two-locus haplotype frequencies (HF) with significantly positive  $\Delta$  values (corrected  $p < 0.05$ ) included:

Haplotype	HF	$\Delta$ value
A11 B51	0.0474	0.02294
A2 B61	0.0429	0.02448
B7 DR15	0.0654	0.03827
B61 DR15	0.0584	0.02414
DR15 DQ6	0.2770	0.17231
DR14 DQ5	0.1211	0.09418
DR4 DQ8	0.0973	0.08411

Although, the nature of DR and DQ associations was broadly similar to our northern European Caucasoid population there was a high incidence of the DR4,DQ4 haplotype (HF-0.018).

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High frequency three-locus haplotypes, with significant  $\Delta$  values (corrected  $p < 0.05$ ), included:

Haplotype	HF	$\Delta$ value
A1 B57 DR7	0.032	0.03071
A11 B7 DR15	0.027	0.02131
A2 B61 DR14	0.026	0.02387
A2 B61 DR15	0.025	0.01918

Table 1. HLA-A, B, DR and DQ frequencies

HLA <sup>a</sup>	Phenotype freq. (%)	Gene freq.	HLA	Phenotype freq.(%)	Gene freq.
A1	23.2	0.12962	B35	22.70	0.11829
A2	29.7	0.15938	B37	4.32	0.02162
A3	16.8	0.08645	B40	0.54	0.00270
A24	36.2	0.20528	B60	4.86	0.02432
A2403	0.5	0.00270	B61	21.62	0.11524
A26	3.8	0.01892	B48	0.54	0.00270
A11	38.4	0.20802	B70	8.11	0.04054
A30	1.1	0.00541			
A31	8.1	0.04054	DR1	4.86	0.02432
A32	4.3	0.02162	DR15	51.35	0.29726
A33	14.6	0.07830	DR16	1.08	0.00541
A68	8.7	0.04324	DR17	7.57	0.03784
			DR4	23.24	0.11891
B51	21.62	0.11765	DR11	8.65	0.04324
B52	20.00	0.10000	DR12	4.32	0.02429
B7	17.30	0.09110	DR13	14.59	0.07567
B8	4.32	0.02162	DR14	24.32	0.12971
B44	7.03	0.03703	DR7	27.57	0.14323
B13	7.03	0.03514	DR8	10.27	0.05135
B62	7.57	0.03784	DR9	2.16	0.01081
B63	0.54	0.00270	DR10	7.57	0.03784
B75	4.32	0.02323			
B39	2.16	0.01081	DQ5	38.38	0.20729
B57	14.05	0.07027	DQ6	57.84	0.35208
B58	7.03	0.03514	DQ2	18.92	0.10191
B18	3.78	0.01892	DQ7	24.32	0.12162
B50	2.16	0.01081	DQ8	21.62	0.11057
B55	6.49	0.03429	DQ9	15.68	0.08315
B56	2.70	0.01483	DQ4	3.24	0.01789
B27	1.08	0.00541			

a Specificities derived from equivalent allele groups from PCR-SSP

## Comment

Several examples of infrequent alleles were identified including: A\*2417; B\*1502, B\*1505/40, B\*4023; Cw\*1507 and DRB1\*1349, \*1402, \*1406, \*1415. Interestingly, the HLA frequencies of these Indian Tamils in Sri Lanka differ from their Sinhalese (Eur J Immunogenet (2000) 27, 306) neighbours.