Determination of the Allele and Genotype Frequencies of Loci HLA-DQA1, LDLR, GYPA, HBGG, D7S8 and GC in Bogota-Colombia.

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The analysis of the allele and genotype frequencies for the reference population is necessary for studies of forensic identification. In Colombia, this work began with the determination of the allele and genotype frequencies of the loci HLA-DQA1, LDLR, GYPA, HBGG, D7S8 and GC of the whole blood samples obtained from 151 volunteer donors of blood banks, randomly selected and unrelated, who live in Bogotá.

DNA was extracted using the Chelex procedure. The Amplitype™ HLA DQA1 and Amplitype™ Polymarker PCR Amplification and Typing kits were used to detect the alleles in each system. In this sample 18 of the 21 possible HLA-DQA1 genotypes were observed. The 1.2,2, 1.3,1.3 and 1.3,2 were not represented. The allele and genotype frequencies of HLA-DQA1, HBGG, LDLR, GYPA, D7S8 and GC are shown below. (Tables 1,2,3,4,5 and 6)

Results:

Table 1. HLA-DQA1 Observed genotypes

Gen.	Obs.	Gen	Obs.	Gen.	Obs.	Gen.	Obs.
1.1, 1.1	3	1.1, 4	20	1.3, 3	3	3, 3	13
1.1, 1.2	4	1.2, 1.2	3	1.3, 4	7	3, 4	26
1.1, 1.3	3	1.2, 1.3	2	2, 2	4	4, 4	7
1.1, 2	3	1.2, 3	10	2, 3	6		
1.1, 3	14	1.2, 4	15	2, 4	8		

χ^2 , 23.2426; P, 0.0826; d.f., 15
n = 151

Table 2. HLA-DQA1 Allele frequencies

Allele	Frequency	Allele	Frequency	Allele	Frequency
1.1	0.1656	1.3	0.0497	3	0.2815
1.2	0.1225	2	0.0828	4	0.2980

Table 3. LDRL, GYPA and D7S8 Observed genotypes

System	Gen.	Obs.	System	Gen.	Obs.	System	Gen.	Obs.
LDLR	AA	58	GYPA	AA	76	D7S8	AA	59
	AB	68		AB	51		AB	70
	BB	25		BB	24		BB	22

GYPA: X^2, 8.2411; P<0.005; d.f., 1
n =151

Table 4. HBGG and GC observed genotypes

System	Gen.	Obs.	System	Gen.	Obs.
HBGG	AA	31	GC	AA	10
	AB	59		AB	15
	AC	5		AC	36
	BB	51		BB	7
	BC	5		BC	35
	CC	0		CC	48

n = 151

Table 5. LDRL, GYPA, D7S8 Allele frequencies

System	Allele	Freq.	System	Allele	Freq.	System	Allele	Freq.
LDLR	A	0.6093	GYPA	A	0.6722	D7S8	A	0.6225
	B	0.3907		B	0.3278		B	0.3775

Table 6. HBGG and GC Allele frequencies

System	Allele	Freq.	System	Allele	Freq.
HBGG	A	0.4172	GC	A	0.2351
	B	0.5497		B	0.2119
	C	0.0331		C	0.5530

The distribution of alleles in our sample is similar to those reported for US hispanic populations. (AmpliType™ User Guide; Fildes1990,).

The observed genotype frequencies for HLA-DQA1, LDLR, D7S8, HBGG and GC systems indicate that the studied population is in Hardy Weinberg equilibrium with each one of them. The only system that is not in H-W equilibrium is GYPA.

References:

Fildes N, Reynolds R. (unpublished data, Roche Molecular Systems, Inc.).

Perkin-Elmer, AmpliType User Guide, Version 2