

## HAPTOGLOBIN SUBTYPES IN SEVERAL POPULATIONS OF SPAIN

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### INTRODUCTION

Population data on electrophoretic genetic markers are necessary for a statistical evaluation of forensic evidence. The aim of this study is to present the distribution of the haptoglobin (Hp) polymorphism in several populations of Spain. This could be of importance for forensic purposes as well as for subpopulation studies.

### MATERIALS AND METHODS

Plasma samples were obtained of unrelated donors from Madrid, Sevilla and the Basque Country, and only those individuals whose 8 surnames and birth places of their 4 grandparents were of Basque origin were considered as autochthonous.

Isoelectric focusing, under reducing conditions, of neuraminidase-treated plasma samples was carried out using dry miniaturized (interelectrode distance 55 mm) polyacrylamide gels, as previously described (Alonso et al. 1990), rehydrated in presence of 2-mercaptoethanol and a mixture (2:1) of Pharmalyte carrier ampholytes (pH 4-6.5 and pH 6-8) followed by immunoblotting. The diversity between observed and expected results has been tested using the  $\chi^2$  test for independence and genetic equilibrium according to the Hardy-Weinberg law.

## RESULTS AND DISCUSSION

Figure 1 shows the isoelectric focusing band pattern of 12 different Hp phenotypes encountered in this study. The distribution of Hp phenotypes and the corresponding allele frequencies in several populations of Spain are presented in Table 1 and Table 2. In all cases, the observed phenotypes provide a satisfactory correlation to the Hardy-Weinberg equilibrium. No significant differences were found between the populations analyzed in this study.

**Table 1.** Observed and expected Hp phenotype frequencies in several populations of Spain

Phenotype	Basque Country residents		Basque Country autochthonous		Madrid		Sevilla	
	Obs.	Exp.	Obs.	Exp.	Obs.	Exp.	Obs.	Exp.
2FS-1S	154	148.96	76	86.35	119	128.54	43	48.67
2FS	150	154.00	102	89.90	159	150.80	69	63.44
2FS-1F	105	100.19	38	44.81	76	84.03	32	36.50
1F-1S	42	48.46	23	21.52	41	35.81	11	14.00
1S	36	36.02	23	20.73	31	27.39	14	9.33
2FS-2SS	17	18.02	8	13.66	20	20.59	6	6.95
1F	16	16.30	7	5.58	14	11.70	8	5.25
2SS-1S	9	8.72	9	6.56	7	8.78	2	2.67
2SS-1F	8	5.86	6	3.41	5	5.74	4	2.00
2SS	5	5.83	3	4.37	9	7.23		0.19
2FS-2FF	4	2.82	4	2.10	2	3.08		
2FF-1S	2	1.90	1	1.09	1	2.02		
2FF-1F		0.53	1	0.52	2	0.70		
2SS-2FF		0.34		0.33	1	0.49		
2FF		0.06		0.05		0.09		
<b>Total</b>	<b>548</b>	<b>548.00</b>	<b>301</b>	<b>301.00</b>	<b>487</b>	<b>487.00</b>	<b>189</b>	<b>189.00</b>

$\chi^2 = 2.358$ ; d.f. = 6;  $0.90 > p > 0.80$  (Basque resident population)

$\chi^2 = 8.691$ ; d.f. = 4;  $0.10 > p > 0.05$  (Basque autochthonous population)

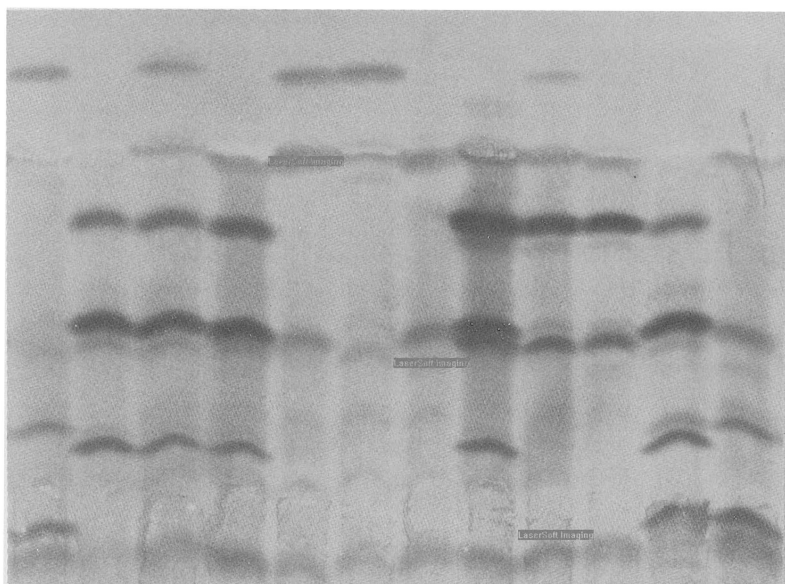
$\chi^2 = 4.522$ ; d.f. = 6;  $0.70 > p > 0.60$  (Madrid population)

$\chi^2 = 6.516$ ; d.f. = 4;  $0.20 > p > 0.10$  (Sevilla population)

The phenotypes with expected numbers below 5 were pooled for the calculation

**Table 2.** Hp allele frequencies in several populations of Spain

Population	N	Hp*2FS	Hp*1S	Hp*1F	Hp*2SS	Hp*2FF
Basque Country residents	548	0.530	0.256	0.172	0.031	0.010
Basque Country autochthonous	301	0.547	0.262	0.136	0.042	0.013
Madrid	487	0.556	0.237	0.155	0.038	0.013
Sevilla	189	0.579	0.222	0.167	0.032	0.000

**Figure 1.** IEF band pattern of Hp phenotypes. From left to right: 2FF-1S, 2FS, 2FS-1S, 2FS-1F, 1F-1S, 1S, 1F, 2FS-2SS, 2SS-1S, 2SS-1F, 2FS-2FF, 2FF-1F

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## REFERENCES

- Alonso A, Visedo G, Sancho M, Fernández-Piqueras J (1990). Haptoglobin subtyping by isoelectric focusing in miniaturized polyacrylamide gels rehydrated in presence of 2-mercaptoethanol. *Electrophoresis* 11: 321-324