

## **DNA-FINGERPRINTING IN BALEARIC POPULATION**

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### **INTRODUCTION:**

The genetic structure of the Balearic Islands populations has been studied by means of the blood group polymorphism, serum proteins and erythrocyte enzymes and mtDNA polymorphisms (Picornell 1992; Massanet 1995). The global results revealed that the Balearic populations have a genetic differentiation with respect to those of the Iberian peninsula and the circummediterranean ones. In Majorca Island we find an autochthonous group, the Chuetas, which are descendents of the persecuted Sephardic Jews in the last "autos de-fe" of the Inquisition. They remained isolated from the Christian Balearic population until the middle of this century in spite of their official conversion to Christianity (15th century). Although many other schemes remain to be addressed we focus in the present work our attention on the minisatellite regions, in order to know better the genetics of the Balearic populations. We use a probe based on a tandem-repeat of the core sequence which can detect many highly variable loci simultaneously and can provide an individual specific DNA "fingerprint" of general use in human genetic analysis (Jeffreys et al., 1985)

### **MATERIALS AND METHODS:**

The sample was composed of 80 unrelated individuals, 36 of them were autochthonous of Majorca island, 21 from the Chueta population and 23 from the Iberian Peninsula resident in Majorca. The DNA was extracted, digested to

completion with Hinf I, and 10 µg samples electrophoresed in a 0.7% agarose gel, during 48 hours DNA was transferred by blotting to a Hybond-N membrane (Amersham), and southern blot hybridized with alkaline phosphatase labelled probe 33.15. The number of bands shared and unshared was estimated, and the similarity index, S (Lynch M., 1990) was employed to compare the diversity of the populations.

## RESULTS AND DISCUSION:

A multilocus probe, like 33.15, binds to alleles at a high (but unknow) number of loci. The resulting profiles consist of a series of bands, whose number and position will be different from one individual to another, according to the distint electrophoretic mobilities of the DNA fragments (Donnelly P., 1995). We have determined the number of bands (with a size >5kb) for each individual to calculate the mean number of bands and the band-sharing for each population.

POPULATION	CHUETA	MAJORCA	IBERIAN P.
Nº OF INDIVIDUALS	21	36	23
MEAN Nº OF BANDS	11.38±3.47	11.6±2.30	14.3±2.20
MEAN Nº OF SHARED BANDS	1.56±1.28	1.18±0.95	1.06±0.84
MEAN BAND-SHARING FR. (S)	0.15±0.009	0.11±0.03	0.07±0.012

Jeffreys et al. (1991b), using the multilocus probes 33.6 and 33.15, reported around 17 bands on average in the scored region (>3.5kb) for each profile and probe, with a range from 5 to 35 bands. Our scored region was lower (only bands >5kb). For this reason the number of bands we found were also lower than Jeffreys' results and different in each population: Chueta population showed 11 bands on average, with a range from 7 to 19; in Majorcan samples we scored 11.6 bands, with a range from 7 to 18 bands; and the population of

the Iberian peninsula showed 4.3 bands, with a range from 10 to 21 bands. As can be seen, the average number of bands is higher in the Peninsula than in Majorca and Chuerta population, which have similar values (slightly higher in Majorca). This indicating a major degree of heterozygosity in the sample of the Iberian Peninsula.

The average of band-sharing frequency (S) is 0.15 in Chuetas, 0.11 in Majorca population and 0.07 in Iberian peninsula. Jeffreys et al. 1991b, in a study of Caucasian population found an index of 0.14, but, as we have indicated, this study was made with a larger region. Moreover, this value depends of the different scored regions, for example values of 0.248, 0.201 and 0.068 were found for the regions 4-6 kb, 6-9kb and 9-23 kb and 0.14 was only an average. We can see that the major value of band-sharing frequency belongs to the region of 4-6 Kb that we have not scored. The band-sharing frequency estimated by Jeffreys did not show significant changes among the different ethnic groups, although a study involving a highly inbred small community from Gaza strip, where the consanguineous marriages are a cultural norm, indicated that the band-sharing coefficient among unrelated individuals significantly increased (Bellamy et al., submitted; Jeffreys et al. 1991a). Now we can say that the Chuerta population has a high value of band-sharing and showing, therefore, a higher level of consanguinity than the other populations sampled. This study would confirm the information about the existence of a high level of consanguinity detected in Chuetas by other markers.

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