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Population: Metalsa from Morocco

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Class I and Class II HLA polymorphism was examined in the Metalsa (ME) population, a Berber population from north Morocco. The Berber people have an ancient origin and represent the autochthonous basis of the modern Moroccan population. An oriental origin for the Berbers has been suggested (1), but Morocco has experienced so many colonization and immigration events during its history (2) that the modern Moroccan people demonstrate great heterogeneity. The people of Morocco speak either Arabic or the Berber language and are, in some places, bilingual.

Moroccan Berbers are represented by three main communities (3). The Metalsa belong to the Berber-speaking group from north Morocco (Rif mountains, Nador area), and speak the Tarifit language. Until now, few HLA studies have focused on Moroccans. HLA-DRB1 polymorphism in Metalsa Berbers and in Chaouya Arabic-speakers from Morocco was discussed by our group (3). Other studies have included a Souss Berber population from the Agadir area (4), a population sample from the El Jadida area (Arabic-speakers of Berber origins) (5), and recently class I polymorphism was examined in a mixed population of Arabic and Berber speakers from Casablanca (6).

To genetically characterize this Berber population, 100 unrelated individuals were collected in collaboration with the Immunology Laboratory of the Institut National D'Hygiene of Rabat and HLA typed. These samples were not collected in

the context of a disease study. All donors were born in and living in the same area, and both parents and grandfathers belonged to the Metalsa ethnic group. The polymorphism of the HLA-A, B, and DRB1 loci was investigated using a sequence-based typing (SBT) system. SBT of the HLA-A and B loci was performed on a 2-kb DNA fragment. This fragment was sequenced with primers specific for exons 2, 3 and 4 (7), using dye terminator chemistry (HLA-A and HLA-B Sequence-Based Typing Kits, PE, Applied Biosystems). After a preliminary SSP-PCR screening of the major DRB1 allele groups, DRB1 SBT was carried out using fluorescently labeled primers (8).

The Metalsa population was in Hardy-Weinberg equilibrium for all the studied loci. The normalized deviate of homozygosity (F_{nd}) was negative for all loci and was significantly diverged from the neutral value for the A locus ($F_{nd} = -1.1103$), suggesting that balancing selection was acting. Gene diversity was elevated, as it is in African populations (A locus, 0.92; B locus, 0.95; DRB1 locus, 0.91).

Twenty-one HLA-A alleles were present. The most frequently detected alleles were A*0201 (allele frequency (a.f.)=0.1736) and A*0101 (a.f.=0.1458), which are common in many populations, especially Caucasians. The frequencies of A*3002 (a.f.=0.0903) and A*2301 (a.f.=0.0833) were typical of north and sub-Saharan Africa. Comparison with other Moroccan populations demonstrated distinct differences in Metalsa and Chaouya A*30 alleles, with a significant difference for A*3001 allele frequency ($p = 0.028$). No differences from the El Jadida and Casablanca groups were observed.

Of the 34 HLA-B alleles observed, the high frequency of B*44 alleles is notable in comparison with other Caucasian (European and north American) populations, as well as with other Moroccan groups (El Jadida, $p = 0.0002$; Casablanca, $p = 0.0220$; Chaouya, $p = 0.0320$). An unexpectedly high