
# Hla in north colombia chimila amerindians

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## ABSTRACT

HLA-A,-B,-C-DRB1 and –DQB1 alleles have been studied in Chimila Amerindians from Sabana de San Angel (North Colombian Coast) by using high resolution molecular typing.A frequent extended haplotype was found :HLA-A*24:02-B*51:10-C*15:02-BRB1*04:07-DQB1*03:02 (28.7%) which has also been described in Amerinndian Mayos Mexican population (Mexico,California Gulf,Pacific Ocean),Other haplotypae had already been found in Amerindians from Mexico (Pacific and Atlantic Coast),Peru (highlands and Amazon Basin),Bolivia and North USA. A geographic patern according to HLA allele or haplotype frequencies is lacking in Amerindians,as already known.Also,five new extended haplotypes were found in Chimila Amerindians.Their HLA-A*24:02 high frequencies characteristic is shared with aboriginal populations of Taiwan;also,HLA-C*01:02 high frequencies are found in New Zealand Maoris,New Caledonians and Kinberly Aborigines from Australia.Finally,this study may show a model of evolutionary factors acting and rising one HLA allele frequency (-A*24:02) ,but not in others that belong to the same or different HLA loci.

It is nowadays established that America peopling may be as ancient as that occurred in other continents (i.e.: Eurasia [1,2,3]) and that Pacific Islanders / Amerindian relatedness [4,5,6] makes obsolete the hypothesis that Amerindians just came from Siberia in a single wave of peopling [7].In the present study a isolated Amerindian group ,Chimila, HLA profile has been studied and also compared to thoseof other Pacific and worldwide populations.

Chimila Amerindians samples (n=47) were collected from Sabanas de San Ángel, department of Magdalena, close to North Colombia coast and 170 km far from Santa Marta city (capital). They speak a language named "ette taara" which belongs to the Chibchan linguistic family (https://en.wikipedia.org/wiki/chimila). All individuals were unrelated and signed a written consent to participate in this study; they had been born in the area and their four grandparents also been born there.

High resolution HLA class I (-A, -B and –C) and class II (-DRB1 and –DQB1) typing was performed by using PCR-SSOP Luminex technique and ambiguities were resolved by direct (not cloning) DNA sequencing ,as referenced in [8]. Statistical analysis was performed with Arlequin v3.0 [5].

Twenty one different HLA-A, twenty-nine different HLA-B, and fifteen different HLA-C alleles were found in Chimila sample (Table 1, Supplementary Material). However, only six HLA-A alleles, four HLA-B alleles, and four HLA-C alleles had frequencies higher than 4% (A*02:01, A*02:04, A*24:02, A*24:03, A*29:02, A*68:01, B*35:43, B*40:09, B*51:10, B*78:02, C*01:02, C*03:04, C*07:01, and C*15:02) . Studies in HLA class II alleles showed seventeen different HLA-DRB1 and thirteen different HLA-DQB1 alleles were found. Only five HLA-DRB1 and four HLA-DQB1 alleles had frequencies higher than 4% (DRB1*03:02, DRB1*04:04, DRB1*04:07, DRB1*04:17, DRB1*15:01,

DQB1*03:01, DQB1*03:02, DQB1*04:02, and DQB1*06:02). Most alleles had already been found in other Amerindians [4,9,10]. DQB1 allele frequencies reflect the DRB1 locus allele distribution due to the strong linkage disequilibrium between these two loci. It is remarkable the frequency of HLA-A blank alleles particularly in individuals that also bear HLA-A*24:02; thus, this is probably due to -A*24:02 homozygosis.

Of the eleven most frequent HLA-A, -B, -C, DRB1- and -DQB1 haplotypes five have been found previously in Amerindians or are new ones, except one of them also found in Asians, A*24:02-B*35:43-C*01:02-DRB1*04:07-DQB1*03:02 [5,10] (Table 2, Supplementary Material). The most frequent Chimila haplotype A*24:02-B*51:10-C*15:02-DRB1*04:07-DQB1*03:02 (28.7%) has been also found in Mayos (at Mexican Californian Gulf, Pacific Ocean). Other haplotypes have been found in other Amerindians: 1) Mayas, Nahuas (Aztecs) and Uros (Titikaka Lake, Peru Altiplano) A*68:01-B*35:43-C*01:02-DRB1*04:07-DQB1*03:02; 2) Mayas, Aymaras (Bolivian Altiplano), Quechua (Bolivian Altiplano), Teeneks (Huastecs, in North Atlantic Mexican Coast), Lakota-Sioux (North-Center USA), Jaidukama (North Colombia forest, close to Panama border) and Mayos, A*24:02-B*35:43-C*01:02-DRB1*04:07-DQB1*03:02; 3) Wayu (Colombia / Venezuela Guajira Peninsula), A*02:01-B*15:01-C*01:02-DRB1*16:02-DQB1*03:01; 4) Quechua, Jaidukama, Lamas (North Peru Amazonian Basin) and Lakota-Sioux,the latter with small differences with small differences , A*02:01-B*51:10-C*15:02-DRB1*04:07-BQB1*03:02 [5]. In addition, five new extended haplotypes were found [5] (Table 2, Supplementary Material).

Finally, it is striking HLA-A*24:02 high frequency in Chimila Amerindians, which is also found in Pacific Islanders [5, 10]. Also, HLA-C*01:02 is highly frequent in both types of populations.

***All genotype data included in this paper is held in*** www.allelefrequencies.net ***under the population name North Colombia Chimila Amerindians and identifier number*** 3426 [10]

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