



Short population report

HLA genetic study from United Arab Emirates (UAE), Abu Dhabi

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ABSTRACT

Emiratis belong to the United Arab Emirates (UAE) country. UAE is placed at the East part of the Arabian Peninsula, protruding into the Arabia Gulf and was populated since 130,000 years ago. First humans migrating out of Africa went probably across this territory. HLA-A, -B, -C, -DRB1, -DQB1, -DQA1 were typed in order to obtain HLA profile for clinical, epidemiological and population genetics studies. Twenty different HLA-A, thirty-five HLA-B and twenty-two HLA-C class I alleles were detected; twenty-seven different HLA-DRB1, fourteen HLA-DQB1 and twelve HLA-DQA1 class II alleles were found. Most frequent extended HLA haplotypes are also depicted. People are present in this area since prehistoric ages according to archaeological studies; the “Out of Africa” eastern migration may have affected the present day population composition.

United Arab Emirates (UAE) territory (see Fig. 1 from Supplementary Material) is composed of seven different Emirates (Nations) that united as a federal state to establish this country on December 2nd 1971. Present day UAE population is about 9.4 million people, in which the indigenous UAE population represents 11.4% [1]. In Mleiha Archaeological Centre (Sharjah City) ancient human remains and culture from people living there about 130,000–120,000 years ago are displayed. Ancient South Arabian Kingdom ruins (Mleiha Fort, 300 years BC) has also been found. Coins from Alexander the Great times have been unearthed in Ed-Ur at UAE's west coast city (although he never entered Arabian Peninsula) [2]. Ed-Ur exported pearls, purple dye clothing, wine and gold to eastern Mediterranean areas. Bronze and other metals were also worked [3]. In Abu Dhabi, Marawah and Baynunah Islands, a Neolithic village settlement and Late Stone Age artifacts have also been revealed [3]. People became Bedouins and moved throughout to this part of Arabian Peninsula Desert; also coast sea traditions groups existed. Bedouins and coastal groups were led by Emirs and Sheikhs. Twentieth century started disputes on Arabian Peninsula over land limits between Bedouins and Ottoman Turks and British foreigners that had arrived and claimed power and/or land. However, when richness sharply rose because of oil trade in UAE area, seven Emirates joined together and separated from other lands building up UAE on December 2nd 1971: Abu Dhabi (Federation Presidency),

Dubai (Federal National Council of all Emirates representatives), Ajman, Fujairah, Ras al-Khaima, Sharjah and Umm al-Quwain, being the most populated cities Abu Dhabi and Dubai [1,4].

UAE includes 200 islands and 83,600 Km² of land. Most area is a desert with an average summer temperature of 48 °C. Two of the main eastern Arabic Peninsula Oases belong to UAE (Al-Buraim and Al-Aim), but water is mainly used from sea water desalting factories [1,4].

Fifty-two unrelated blood donor volunteer individuals from Sheikh Khalifa Medical City, Abu Dhabi, were typed for HLA-A, -B, -C, DRB1, DQB1 and -DQA1 alleles by PCR-SSOP Luminex techniques and ambiguities were resolved by direct DNA sequencing [5]. Studied individuals spoke Arab language and both of their grandparents were living in UAE area. Arlequin program ver 3.5.2.2 was used for obtaining allele frequencies and extended HLA-A, -B, -C, -DRB1, -DQB1 and -DQA1 haplotypes [6].

For class I, 28 different HLA-A alleles, 35 different HLA-B and 22 different HLA-C alleles were detected. For class II, 27 different HLA-DRB1 alleles, 14 different HLA-DQB1 alleles and 12 different HLA-DQA1 alleles have been found (see Table 1 from Supplementary Material). Extended haplotypes are shown in Table 2 from Supplementary Material.

Our previous results [7] showed that Emiratis are related to Bahrainis and Omanis. These populations are genetically close to

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Sardinians, Famoori Iranian Arabs, some Indian Peninsula populations and Egyptians. Also, it was observed that Greeks, Macedonians and other Eastern Mediterraneans are close to Emirates, Bahrain and Oman populations according to the studied samples. Greeks went together with Subsaharans in genetic distances and NJ dendograms by using data from the 1991 International HLA Workshop large populations conjoint study and subsequent data analysis [8]. More comprehensive Mediterranean Genetic Anthropology studies may be found in [9,10]. This may be explained by admixture and/or relationship with North and South Mediterraneans. Finally, it is postulated that one of the first ways of population going out from Africa to Asia [11] went through the Arabian Peninsula and crossing present day UAE. This way out may have had a bearing on present day genetic results, together with the fact that present day UAE population is characterized by high rate of consanguinity and large families.

All genotype data included in this paper are held in www.allelefreqencies.net and identifier number is 3600 [12].

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.humimm.2019.04.013>.

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