



Short population report

Killer immunoglobulin like receptor gene profiling in Western Indian population

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A B S T R A C T

One hundred and sixty one healthy unrelated hematopoietic stem cell transplant donors from Western India were enrolled in this study. The study was initiated to observe the genotypic diversity of 16 killer immunoglobulin like receptor (KIR) genes in this population. KIR genotyping was carried out using the PCR-SSP technique. 56 KIR genotypes were observed in our population, where 15 genotypes were reported for the first time in any population. The KIR genotype data for the population can be accessed from Allele Frequencies Net Database under the population name “India Western KIR” and identifier “3570”.

India is surrounded by Nepal, China and Bhutan in the north, Pakistan to the west and Burma and Bangladesh to the east. The total population is about 1.2 billion individuals belonging to 4635 anthropologically well defined population groups including 532 tribal population groups. Indian population is divided into 4 groups based on the languages spoken: Indo-European, Dravidian, Austro-Asiatic and Tibeto-Burman. Western India includes the states of Goa, Gujarat, and Maharashtra. The official languages spoken in this region are Gujarati, Konkani, Marathi, Hindi and English, which fall under the Indo-Aryan branch of the Indo-European language family. Majority of the population is Hindu (83.66%) followed by Muslims (10.12%), Buddhist (4%) and minority (2.22%) of Christians from Goa and Maharashtra [1].

Western India has had many diverse rulers from the Rashtrakuta Empire, Maurya Empire to the Kadambas in ancient times, and Vaghela dynasty, Gujarat Sultanate and Mughal rule in medieval ages. This was followed by the Maratha Empire with prominent rule in Maharashtra, until their defeat to the British which led to colonial rule in India up until India's Independence in 1947 [2]. This varied leadership has contributed to the ethnic and genetic diversity observed within this population.

A total of 161 healthy unrelated hematopoietic stem cell transplant

donors from Western India were included in the study. The study was conducted at the HLA and Immunogenetics Laboratory, Tata Memorial Hospital, Mumbai. The study was approved by the Institutional Ethics Committee (IEC-III). 10 ml blood was collected from all the donors in EDTA/Na-Citrate tubes. DNA was extracted using the salting out technique using the commercially available kits (Bag Healthcare, GmbH, Germany). KIR genotyping for the 16 genes was carried out using the PCR-SSP technique according to manufacturer's instructions (Bag Healthcare, GmbH, Germany and Innotraining, Germany). The presence or absence of KIR genes was deciphered by the visual presence or absence of amplified band on the electrophoresis gel. The code for calculating gene frequency can be found at Github repository (https://github.com/skdhanda/KIR_analysis). The KIR genotype ID was assigned based on the available information on <http://allelefrequencies.net>. KIR gene haplotypes were assigned based on the presence or absence of specific B group defining genes as published earlier [3] [Supplementary Table 1].

The frequency of the individual KIR genes is shown in Table 1. The individuals were then divided into KIR AA haplotype or KIR B/X (A/B + B/B) haplotype depending on the KIR gene content. In the Western Indian population the KIR B/X, i.e. the more activating KIR haplotype was more predominant (79.5%) as compared to the KIR A/A (more

Table 1

Distribution of the different KIR genes in the Western Indian population.

Gene	3DL1	2DL1	2DL3	2DS4	2DL2	2DL5	3DS1	2DS1	2DS2	2DS3	2DS5	2DL4	3DL2	3DL3	2DP1	3DP1
No. of Individuals gene present in (total n = 161)	141	152	128	143	97	111	73	84	106	70	77	161	161	161	150	160
Frequency in Western Indian population (%)	87.6	94.4	79.5	88.8	60.2	68.9	45.3	52.2	65.8	43.5	47.8	100	100	100	93.2	99.4

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inhibitory) haplotype, which accounts for 20.5% of the population.

The KIR genotype data for the Western Indian population can be found under the population “India Western KIR” and population number 3570 [4].

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.humimm.2019.03.010>.

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