

## Short Communication

# Low Frequency of CCR5 $\Delta$ 32 Allele among Greeks in Cyprus

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**T**HE HUMAN CHEMOKINE RECEPTOR 5 (CCR5) is the major coreceptor on CD4<sup>+</sup> cells for monocytotropic non-syncytium-inducing strains of HIV-1.<sup>1-4</sup> It has been shown<sup>5-8</sup> that individuals who are homozygous for an inherited 32-base deletion ( $\Delta$ 32) in the CCR5 gene (CCR5 $\Delta$ 32) are highly protected against HIV infection, although exceptional cases of HIV-1-infected individuals who are homozygous for CCR5 $\Delta$ 32 have been reported.<sup>9,10</sup> Population-based studies have shown that the frequency of the CCR5 $\Delta$ 32 allele in the Caucasian population is overall  $\sim$ 0.09 and is virtually zero in people with African or Asian ancestry.<sup>5-8</sup> Among the Caucasians, individuals studied thus far include Central and Northern Europeans, North Americans, or Australians with European ancestry.<sup>9</sup>

We conducted an expanded population-based study on 1002 HIV-1-seronegative Greeks from Cyprus who were unselected for a personal or family history, and who previously participated in population-based studies for genetic defects related to thalassemia, a common genetic trait in the eastern Mediterranean,<sup>10</sup> and other genetic disorders. The findings from this study (Table 1) reveal that the CCR5 $\Delta$ 32 allele is at a significantly lower frequency (0.029) ( $p < 0.0001$ ) compared with findings from previous studies on Caucasian populations. The genotype distribution (5.6% heterozygous and 0.1% homozygous) is in equilibrium as predicted by the Hardy-Weinberg equation ( $p > 0.85$ ), showing that no strong selection process is currently affecting the population.

TABLE 1. PERCENTAGES OF CCR5 GENOTYPES

CCR5 genotype	Male	Female	Overall
Homozygous wild type (wt/wt)	93.6%	95%	94.3%
Heterozygous (mut/wt)	6.4%	4.9%	5.6%
Homozygous (mut/mut)	0%	0.2%	0.1%
Total number of cases	487	515	1002

The reason for the lower frequency of CCR5 $\Delta$ 32 in the Greek population in Cyprus compared with other Caucasian populations from Central or Northern Europe is currently unknown. However, given the results from the limited population-based studies thus far, the frequencies of CCR5 $\Delta$ 32 allele among Caucasian groups tend to exhibit a gradient of values from northern regions<sup>5,7</sup> to virtually zero in sub-Saharan regions.<sup>5,7,8</sup> Additional population-based studies are needed to understand the pressure of selection on CCR5 $\Delta$ 32 among distinct Caucasian populations.

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