

# DIFFERENCES IN ALLELIC FREQUENCIES OF RELEVANT PHARMACOGENETIC POLYMORPHISMS MAY LEAD TO LOCAL GENE PANEL DEVELOPMENT

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**Background and objectives:** Pharmacogenetics allows to identify and predict different responses to drugs among patients. During these last years, pharmacogenetic dosing guidelines have been developed and its use implemented in daily clinical routine around the world. Furthermore, different companies and institutions work developing gene panels including clinically relevant genes to make genetics useful in clinical practice. But, not all the single nucleotide polymorphisms (SNP) in these genes affecting drugs response are similarly relevant among populations if we look at their allelic frequencies, even in the same country. This may lead in the future to design local gene panels for pharmacogenetics implementation in clinical routine depending on the population.

The aim of this study is to find, among the SNPs studied by the pharmacogenetics unit of our hospital, those with different allelic frequencies compared with the Iberian Peninsula population.

**Materials and methods:** The patients' genotypes of all the SNP studied by the pharmacogenetics unit were recorded since the first pharmacogenetic test performed in 2012. The SNP's were genotyped using predesigned TaqMan® genotyping assays technology or KASP assay technology and analyzed on a7900HT Fast Real-Time PCR System de Applied Biosystems.

The allelic frequencies of the studied SNP were calculated and compared using chi-square test or fisher exact test with those reported in the *1000 Genomes Project* for the Iberian Peninsula population. P-values less than 0.05 were considered statistically significant.

## Results

Since the first pharmacogenetic test performed by our department, 7.678 tests in 2.287 patients, affecting 7 drugs, were performed. Altogether, 27 different SNP were genotyped. From these, we found that 3 SNP show significant differences about their allelic frequencies compared with those reported by the *1000 Genomes Project* for the Iberian Peninsula population.

These are: *ABCB1 C3435T* (c.3435T>C; rs1045642) that showed a minor allele frequency (MAF) of 53.7% in the Iberian population and 54.8% in our population (p=0.011); *CYP2D6* gene duplication (10% vs 2.6%; p= 0.049) and *CYP2D6\*5* (gene deletion) (7% vs 0%; p=0.014).



**Conclusion:** There are differences between relevant pharmacogenetic polymorphisms allelic frequencies comparing a subpopulation of the *1000 Genomes Project* and one of its sub-subpopulations.

