Huijuan Wang et al., J Mol Genet Med 2015, 9:3
http://dx.doi.org/10.4172/1747-0862.C1.009

OMICS International
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3rd International Conference on
Genomics & Pharmacogenomics
September 21-23, 2015 San Antonio, USA

Rapid and reliable genotyping of HLA-B*58:01 in four Chinese populations using a single-tube duplex real-time PCR assay

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Aims: HLA-B*58:01 is strongly associated with allopurinol induced Severe Cutaneous Adverse Reactions (SCARs). The aim of this study was to develop a new, convenient and economical method for HLA-B*58:01 genotyping and to investigate the distribution of HLA-B*58:01 in different Chinese populations.

Methods: Combined with ARMS (Amplification Refractory Mutation System) primers and TaqMan probe, a single-tube duplex real-time PCR assay for HLA-B*58:01 typing was established with ACTB as an internal control. Using this method, the prevalence of HLA-B*58:01 in 349 samples including 100 Northern Chinese Han, 100 Buyei, 99 Tibetan and 50 Uighur were determined. The reliability and specificity was assessed by comparison of genotyping results in 100 Buyei samples with Sequence-Based Typing (SBT). Meanwhile, the linkage status of rs9263726 in PSORS1C2 with HLA-B*58:01 in four Chinese populations was analyzed.

Results: The HLA-B*58:01 genotyping result in 100 Buyei samples by real-time PCR was in 100% concordance with SBT and the detecting limit of this assay was 50 pg. The frequency of the HLA-B*58:01 allele in Buyei minority (17%) was significantly higher than that in Han (4%), Tibetan (5.1%) and Uighur (2%) populations ($p<0.05$). The complete linkage of HLA-B*58:01 with SNP rs9263726 previously reported in a Japanese population was not observed in the Chinese populations.

Conclusion: The newly developed assay proves to be rapid, cost-effective and reliable for HLA-B*58:01 detection prior to allopurinol administration. Meanwhile, the rs9263726 could not be used as an alternative marker to HLA-B*58:01 in clinical diagnosis for allopurinol-induced SCAR especially in Chinese populations.

Biography

Huijuan Wang has graduated from Northwest University of China and received her PhD degree in Biochemistry and Molecular biology. Since 2011, she was recruited as a Teaching Staff by College of Life Science, Northwest University mainly focuses on the clinical application of pharmacogenomics findings in disease treatment especially cancers including development of genotyping methods and reagents for drug-related biomarkers and mechanic study of cancer-related biomarkers. Besides, lots of efforts are also dedicated on the study of the molecular mechanism underlying the resistance of anticancer drugs such as BRAF inhibitors and endocrine therapy.

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