

GSTP1 c.313A>G polymorphism in Russian and Polish athletes

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Abstract

© 2017 the American Physiological Society. The GSTP1 gene encodes glutathione S-transferase P1, which is a member of the glutathione S-transferases (GSTs), a family of enzymes playing an important role in detoxification and in the antioxidant defense system. There is some evidence indicating that GSTP1 c.313A > G polymorphism may be beneficial for exercise performance. Therefore, we decided to verify the association between the frequency of GSTP1 c.313A > G variants, physical performance, and athletes' status in two cohorts: in a group of Russian athletes (n = 507) and in an independent population of Polish athletes (n = 510) in a replication study. The initial association study conducted with the Russian athletes revealed that the frequency of the minor G allele was significantly higher in all athletes than in controls; that was confirmed in the replication study of Polish athletes. In the combined cohort, the differences between athletes (n = 1017) and controls (n = 1246) were even more pronounced (32.7 vs 25.0%, $P < 0.0001$). Our findings emphasize that the G allele of the GSTP1 gene c.313A > G single nucleotide polymorphism is associated with improved endurance performance. These observations could support the hypothesis that the GSTP1 G allele may improve exercise performance by better elimination of exercise-induced ROS.

<http://dx.doi.org/10.1152/physiolgenomics.00014.2016>

Keywords

Athletes, Exercise performance, Gene frequency/genetics, Glutathione s-transferase, Muscle, Skeletal/metabolism

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