



## Abstract

# Variant of SNP 1799930 Identifies the Protective Character of High Metabolizing of Xenobiotics in Individuals with Overweight and Obesity <sup>†</sup>

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**Abstract:** Background and Objectives: Enzymes involved with acetylation capacity affects the metabolism of several xenobiotics that can be deposited in adipose tissue and hinder weight loss, leading to obesity. Our aim was to identify single nucleotide polymorphisms (SNPs) related to the xenobiotic's metabolism and to associate such with the serum levels of heavy metals in an individual with excess body weight. Methods: The sample was selected at the Ribeirão Preto Medical School at the University of São Paulo, Brazil. Genotyping arrays were performed with 23 SNPs. Quality control and imputation steps were applied using the functions in the package 'snpReady' (CRAN) and 'imput' (Bioconductor). Results: This study selected 189 individuals of mixed ethnicity of both sexes, with a mean age of  $42.2 \pm 12.9$  years and a mean BMI of  $45.1 \pm 11.4$  kg/cm<sup>2</sup>. From the cluster of 23 evaluated SNPs, we observed a higher frequency of SNP 1799930 in the NAT2 gene (N-acetyltransferase). The genotypes were correlated to the serum levels of different metals. We observed that individuals homozygous for the mutant allele (AA), called fast metabolizers, had lower levels of aluminum (Al) ( $51.4 \pm 18.9$  µg/L) compared to those considered slow metabolizers (GG) ( $64.0 \pm 37.2$  µg/L;  $p = 0.02$ ). No difference was observed when compared with heterozygosity (AG). Furthermore, the BMI of fast metabolizers ( $48.7 \pm 12.8$  kg/cm<sup>2</sup>) was higher than the slow metabolizer individuals ( $45.9 \pm 10.4$  kg/cm<sup>2</sup>;  $p < 0.05$ ). Discussion: Fast metabolizers seem to have a greater Al metabolism only in homozygosity, that is, the dose-dependent gene, to exert its effect. Interestingly, the presence of the AA genotype is associated with a higher BMI, suggesting that larger studies should be carried out investigating the deposition of metals in adipose tissue.

**Keywords:** aluminum; mutant allele; SNP; obesity; xenobiotics



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