

The Peroxisome Proliferator-Activated Receptor Gamma2 Gene is Linked to and Associated with Fasting Blood Glucose Level in the FHS Study

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Abstract

In both developed and developing countries, there has been a marked increase in the prevalence of obesity among children and adolescents during the past two decades (Kopelman 2000). Obesity is no longer regarded as solely a cosmetic issue because it significantly increases morbidity and mortality rates. As a complex disease, the genetic background underlying obesity is still confounding. In this study, we aim to evaluate the evidence for linkage and association of several obesity candidate genes to obesity- and glucose metabolism-related traits in the National Heart, Lung, and Blood Institute Family Heart Study (FHS) (Higgins et al. 1996). We also performed preliminary exploration of the interaction of these genes. Based on already known biological functions and on previous linkage evidence, we selected three genes as our candidates. They are the leptin receptor (LEPR) gene, the peroxisome proliferator-activated receptor- γ (PPAR γ) gene, and the hormone-sensitive lipase (LIPE) gene. Due to the association between obesity and diabetes, we examined six obesity- or diabetes-related phenotypes. They are body mass index (BMI), waist to hip ratio (WHR), sum of all skinfold thickness measures, fasting blood glucose level, fasting blood insulin level, and the homeostasis model assessment (HOMA) index. Our major finding is that PPAR γ 2 is linked to and associated with fasting blood glucose level. Further studies to characterize specific variants in the gene are warranted.