

CO-ORGANIZED EVENT

International Conference on **Chronic Diseases**

&
6th International Conference on **Microbial Physiology and Genomics**

August 31-September 01, 2017 Brussels, Belgium

Association of FTO and IRX3 genetic variants to obesity risk in north India

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Obesity is an increasingly important health problem worldwide as well as in developing countries like India. Recent genetic studies suggest that obesity associated FTO and IRX3 are functionally linked and many effects due to genetic variants in FTO gene act through IRX3. The aim of the present study was to evaluate the association of FTO and IRX3 genetic variants with obesity risk in North Indian Population. North Indian individuals categorized as non-obese (BMI<30 kg/m²) and obese (BMI≥30 kg/m²) were selected. FTO rs8050136, rs1421085, rs9939609, rs17817449 and IRX3 rs3751723 were genotyped by validated TaqMan allelic discrimination to evaluate their association with obesity by means of single locus logistic regression by SPSS version 19 and multi-locus linkage and haplotype analysis by SNP Stats and gene-gene interaction with Generalized Multifactor Dimensionality Reduction (GMDR) version 6. In single locus analysis, FTO rs8050136 CA [p=0.0001; OR (95% CI)=2.4 (1.7–3.4)] and AA [p=0.0001; OR (95% CI)=3.1 (1.9–5.2)]; FTO rs1421085 TA [p=0.0001; OR (95% CI)=2.1 (1.4–3.0)] and AA [p=0.0001; OR (95% CI)=3.0 (1.8–5.0)]; FTO rs9939609 TC [p=0.0001; OR (95% CI)=2.1 (1.5–3.1)] and CC [p=0.0001; OR (95% CI)=4.2 (2.5–7.3)] along with TG [p=0.001; OR (95% CI)=2.1 (1.3–3.2)] and GG (p=0.021; OR (95% CI)=3.8 (1.2–11.8)] genotypes of FTO rs17817449 with GT (p=0.0001; OR (95% CI)=2.1 (1.5–3.1)] and TT (p=0.012; OR (95% CI)=3.3 (1.8–3.6)] genotypes of IRX3 rs3751723 were significantly associated with obesity. In multi-locus analysis, SNPs of FTO and IRX3 were in strong linkage disequilibrium and in haplotype and GMDR analysis the SNPs were significantly associated with obesity risk (p<0.05). To conclude, this is the first study to reveal that genetic variants of both FTO and IRX3 genes are in high linkage disequilibrium (LD) and are associated with obesity risk in North Indians.

Biography

Neena Srivastava is Professor in Department of Physiology at King George's Medical University, Lucknow, UP, India. She is an active Researcher in the field of Medical Genetics and Genetic Epidemiology since last 27 years. She has published 74 publications in national and international peer-reviewed journals and has authored three chapters in the book *Sports Medicine* by Paras Medical Publisher, New Delhi. She has also received awards like Bharat Ratna Dr. A.P.J. Abdul Kalam Excellence Award, Prof K.P. Puthuraya Best Medical Teacher, PEARL Foundation Educational Excellence Award for Best Women Physician in the field of Physiology, Glory of India Award for Meritorious achievements and individual excellence and outstanding contribution for the progress of the nation and worldwide-IIFS, etc. She is also member of various international and national scientific bodies and is part of editorial/review board of various international and national journals.

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