

15<sup>th</sup> International Conference on

# OBESITY MEDICINE

October 30-31, 2017 Bangkok, Thailand

## FTO gene affects obesity and breast cancer through similar mechanisms: A new insight into the molecular therapeutic targets

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The fat mass and obesity-related (FTO) gene is known to be associated with risk of obesity. Some recent studies have shown that the FTO polymorphisms are linked with breast cancer. This review focuses on the possible mechanisms of the effects of the FTO on obesity and breast cancer. All articles published in English from June 1990 to January 2017 were studied. The search terms used were FTO gene, FTO polymorphism, breast cancer and obesity. Inclusion criteria consisted of assessment of the relationship between FTO polymorphisms and/or FTO expression level with obesity and/or breast cancer as a primary outcome. The risk of both obesity and breast cancer is affected by the FTO genotype. Some FTO polymorphisms exert their effects through effect on IRX3 gene expression level. On the other hand, the FTO gene expression level is closely related to mTOR signaling pathway activation and its ultimate effects on obesity and breast cancer. Obesity and breast cancer might have similar genetics origins. The FTO gene is a possible mediator between obesity and breast cancer. If this result is correct then, it will be interesting to examine the FTO gene as a molecular therapeutics target.

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