

OLFACTORY RECEPTOR 984 A NEW TARGET FOR OBESITY IN RATS AND HUMANS?

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The genetic architecture of obesity and brain disorders are multifactorial and linked to each other. Feeding behavior and body weight are controlled through complex interactions between the central nervous system and peripheral organs. We have previously investigated the individual sensitivity to weight gain/resistance in rats developing obesity (diet-induced obesity, DIO) or not (diet resistant, DR), when fed with a high fat diet (Cifani et al., 2015). Both groups were extensively characterized and we used expression analysis in visceral adipose tissue (AT) by RNA-Chip technology to identify potential underlying target genes. One candidate gene, olfactory receptor genes OLR984, was identified in AT of rats and we investigated this gene in human paired samples of visceral and subcutaneous (SC) AT (n = 224) of individuals with a wide range of body weight and glucose homeostasis.

Gene expression analysis in AT of DR and DIO group identified OLR984 as candidate target genes in visceral AT. In humans, OLR984 genes were differentially expressed between SC and visceral AT and its mRNA was strongly correlated with parameters of obesity and glucose metabolism.

Our data provide a novel candidate gene for obesity strongly associated with body mass regulation in rats. Our human mRNA results suggest that changes in AT OLR984 expression are related to obesity parameters and glucose homeostasis.

1 Cifani et al. (2015). *Frontiers in neuroscience* 9:187.