

PRACTICAL STRATEGIES FOR OBESITY MANAGEMENT IN PRIMARY CARE

Chapter 1 Pathophysiology – Downloadable Resource

Table 1. Genetic Determinants of Obesity

Gene	Tissue expressed	Gene product	Role in energy balance
MC4R	Adipocyte, hypothalamus, liver	Melanocortin 4 receptor	Appetite stimulation; monogenic cause of obesity
ADRB3	Visceral adipose tissue	β 3-adrenergic receptor	Regulates lipolysis
PCSK1	Neuroendocrine cells (brain, pituitary, and adrenal glands)	Proprotein convertase 1	Conversion of hormones (including insulin) into metabolically active forms
BDNF	Hypothalamus	Brain-derived neurotrophic factor	Appetite stimulation; regulated by MC4R signaling and nutritional state
LCT	Intestinal epithelial cells	Lactase	Digestion of lactose
MTNR1B	Nearly ubiquitous	Melatonin receptor 1 B	Regulation of circadian rhythms
TLR4	Adipocyte, macrophage	Toll-like receptor 4	Lipolysis, inflammatory reactions
ENPP1	Nearly ubiquitous	Ecotnucleotide pyrophosphatase/phosphodiesterase 1	Inhibits tyrosine kinase activity of the insulin receptor, downregulating insulin signaling and decreasing insulin sensitivity
FGFR1	Adipose, hypothalamus	Fibroblast growth factor receptor 1	Hypothalamic regulation of food intake and physical activity
LEP, LEPR	Adipocyte	Leptin, leptin receptor	Appetite inhibition

Source: den Hoed M, Loos R. Handbook of Obesity. In: Bray G, Bouchard C, eds. Boca Raton, FL: CRC Press; 2014:105-119.