Six new loci associated with body mass index highlight a neuronal influence on body weight regulation.

Common variants at only two loci, FTO and MC4R, have been reproducibly associated with body mass index (BMI) in humans. To identify additional loci, we conducted meta-analysis of 15 genome-wide association studies for BMI (n> 32,000) and followed up top signals in 14 additional cohorts (n> 59,000). We strongly confirm FTO and MC4R and identify six additional loci (P< 5 x 10(-8)): TMEM18, KCTD15, GNPDA2, SH2B1, MTCH2 and NEGR1 (where a 45-kb deletion polymorphism is a candidate causal variant). Several of the likely causal genes are highly expressed or known to act in the central nervous system (CNS), emphasizing, as in rare monogenic forms of obesity, the role of the CNS in predisposition to obesity.