**Supplementary Table 1:  List of genotyped SNPs**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Gene [ref]a | Gene size (bp) | Number of exons | dbSNP ID | **Chr**:position | SNP position in gene | MAF  HapMapb | MAF  POLYNUCA |
| *AGRP*  [1,2] | 1,513 | 4 | rs5030980 | **16**:67,483,042 | Exon 3 | 0,03 | 0,05 |
| rs5030981 | **16**:67,483,851 | 5’near gene | 0,08 | 0,03 |
| *CARTPT* [1] | 1,886 | 3 | rs11575893 | **5**:71,719,624 | Intron 1 | 0,13 | 0,09 |
| *CCK*  [1,3] | 8,383 | 5 | rs10865918 | **3**:42,261,819 | Intron 4 | 0,47 | 0,39 |
| rs8192472 | **3**:42,258,378 | Intron 4 | 0,39 | 0,40 |
| *CNR1*  [1,4] | 26,496 | 4 | rs4707436 | **6**:88,142,032 | 3’UTR | 0,24 | 0,27 |
| rs806366 | **6**:88,137,870 | 3’ near gene | 0,48 | 0,48 |
| *CRH*  [1,5,6] | 2,235 | 2 | rs6999780 | **8**:66,179,841 | 5’ near gene | 0,09 | 0,09 |
| rs6982394 | **8**:66,176,242 | 3’ near gene | 0,03 | 0,04 |
| *DLK1*  [7] | 8,266 | 5 | rs1802710 | **14**:100,734,308 | Exon 5 | 0,50 | 0,33 |
| rs10139403 | **14**:100,728,224 | Intron 1 | 0,30 | 0,25 |
| *DRD1*  [8] | 3,489 | 2 | rs5326 | **5**:175,443,193 | 5’ UTR | 0,13 | 0,17 |
| rs686 | **5**:175,441,697 | 3’UTR | 0,41 | 0,40 |
| *DRD2*  [8,9] | 65,685 | 8 | rs17601612 | **11**:113,447,023 | Intron 1 | 0,42 | 0,38 |
| *FTO*  [10,11,12] | 410,505 | 9 | rs9939609 | **16:53,786,615** | Intron 1 | 0,44 | 0,39 |
| *GAD2*  [13] | 88,256 | 17 | rs1330581 | **10**:26,239,906 | Intron 7 | 0,32 | 0,26 |
| rs3781105 | **10**:26,302,341 | Intron 16 | 0,18 | 0,09 |
| *GAL*  [2] | 6,661 | 6 | rs1042577 | **11**:68,691,002 | 3’UTR | 0,31 | 0,36 |
| rs1893679 | **11**:68,682,862 | 5’ near gene | 0,26 | 0,30 |
| *GALP*  [2] | 9,756 | 6 | rs4801681 | **19**:56,177,300 | Intron 2 | 0,35 | 0,31 |
| rs175530 | **19**:56,174,094 | 5’ near gene | 0,24 | 0,26 |
| *GCG*  [1,3] | 9,536 | 6 | rs1990761 | **2**:162,141,193 | 3’ near gene | 0,34 | 0,38 |
| *GHSR*  [14] | 5,166 | 2 | rs509035 | **3**:172,445,659 | Intron 1 | 0,33 | 0,29 |
| rs572169 | **3**:172,447,937 | Exon 1 | 0,33 | 0,30 |
| *GNPDA2*  [15,16] | 24,839 | 7 | rs10938397 | **4:**45,180,510 | 453 kb  5’ of gene | 0,45 | 0,45 |
| *HTR2C*  [2] | 325,984 | 7 | rs6318 | **X**:114,731,326 | Exon 5 | 0,16 | 0,15 |
| rs12688102 | **X**:114,680,518 | Intron 2 | 0,40 | 0,37 |
| rs3795182 | **X**:114,582,351 | 5’near gene | 0,24 | 0,20 |
| rs7890739 | **X**:114,671,512 | Intron 2 | 0,38 | 0,36 |
| *IGF2R*  [17,18] | 142,406 | 48 | rs1003737 | **6**:160,009,624 | Intron 3 | 0,38 | 0,41 |
| rs3777421 | **6**:159,972,354 | Intron 1 | 0,32 | 0,29 |
| rs3798178 | **6**:160,086,446 | Intron 41 | 0,36 | 0,39 |
| rs998074 | **6**:160,047,351 | Intron 16 | 0,43 | 0,50 |
| rs642588 | **6**:159,990,235 | Intron 1 | 0,21 | 0,12 |
| *INSR*  [3,19,20] | 177,408 | 22 | rs11671975 | **19**:7,177,269 | Intron 3 | 0,28 | 0,26 |
| rs2059807 | **19**:7,166,098 | Intron 8 | 0,41 | 0,35 |
| rs7254921 | **19**:7,278,441 | Intron 1 | 0,40 | 0,49 |
| *LEPR*  [1,2,21] | 209,771 | 20 | rs6673591 | **1**:65,582,706 | Intron 5 | 0,39 | 0,44 |
| rs12145690 | **1**:65,421,330 | Intron 1 | 0,48 | 0,47 |
| rs6704167 | **1**:65,472,197 | Intron 2 | 0,45 | 0,37 |
| *MC3R*  [1,22] | 1,084 | 1 | rs6127698 | **20**:56,248,360 | 5’ near gene | 0,50 | 0,48 |
| rs3827103 | **20**:56,248,973 | Exon 1 | 0,11 | 0,11 |
| rs6092276 | **20**:56,247,032 | 5’ near gene | 0,23 | 0,27 |
| *MC4R*  [1,16,23] | 1,666 | 1 | rs17066829 | **18**:60,362,833 | 3’ near gene | 0,41 | 0,26 |
| rs8093815 | **18**:60,369,270 | 3’ near gene | 0,32 | 0,28 |
| rs8087522 | **18**:60,373,245 | 5’ near gene | 0,36 | 0,29 |
| *MTCH2*  [15] | 25,349 | 13 | rs10838738 | **11:**47,641,497 | Intron 1 | 0,41 | **0,37** |
| *MTOR*  [24,25] | 156,027 | 58 | rs11121704 | **1**:11,233,902 | Intron 14 | 0,27 | 0,27 |
| rs1770345 | **1:**11,154,523 | Intron 30 | 0,45 | 0,45 |
| *NEGR1*  [15,16] | 879,653 | 7 | rs2815752 | **1**:72,346,757 | 64 kb  5’ of gene | 0,35 | 0,34 |
| *NMB*  [3,26] | 3,435 | 3 | rs11637728 | **15**:84,660,161 | 5’ near gene | 0,27 | 0,28 |
| rs1107179 | **15**:84,655,131 | Exon 3 | 0,40 | 0,48 |
| *NPW*  [14] | 1,235 | 2 | rs11248906 | **16**:2,020,199 | Exon 1 | 0,15 | 0,21 |
| *NPY*  [1,2] | 7,678 | 4 | rs16145 | **7**:24,284,370 | Intron 1 | 0,48 | 0,46 |
| rs5574 | **7**:24,289,514 | Exon 3 | 0,39 | 0,43 |
| *NPY1R*  [2] | 7,623 | 4 | rs12507653 | **4**:163,333,181 | 5’ near gene | 0,28 | 0,34 |
| rs7687423 | **4**:163,329,645 | Intron 1 | 0,31 | 0,38 |
| *NPY2R*  [2] | 8,450 | 2 | rs1047214 | **4**:155,214,524 | Exon 2 | 0,43 | 0,45 |
| rs6857715 | **4**:155,208,030 | 5’ near gene | 0,40 | 0,38 |
| *PEG3*  [27] | 30,650 | 9 | rs2870477 | **19**:56,833,545 | Intron 2 | 0,26 | 0,24 |
| rs4801387 | 1**9**:56,819,401 | Intron 6 | 0,28 | 0,28 |
| *PLAGL1*  [18,28] | 124,299 | 8 | rs2281476 | **6**:144,007,831 | Intron 1 | 0,24 | 0,30 |
| rs11155338 | **6**:143,983,095 | Intron 2 | 0,34 | 0,39 |
| rs2076683 | **6**:143,947,817 | Intron 7 | 0,40 | 0,46 |
| *PMCH*  [29] | 1387 | 3 | rs11111201 | **12**:102,194,697 | 3’ near gene | 0,20 | 0,14 |
| rs11111203 | **12**:102,199,966 | 5’ near gene | 0,13 | 0,14 |
| *POMC*  [1,2] | 1295 | 4 | rs6713532 | **2**:25,161,964 | Intron 3 | 0,22 | 0,21 |
| rs934778 | **2**:25,166,355 | Intron 1 | 0,31 | 0,32 |
| *PRKAA2*  [30,31] | 70,019 | 9 | rs1124900 | **1**:56,646,549 | Intron 1 | 0,43 | 0,47 |
| rs932447 | **1**:56,704,556 | Intron 7 | 0,38 | 0,48 |
| *PYY*  [1] | 51,732 | 7 | rs1058046 | **17**:43,953,163 | Exon 6 | 0,28 | 0,35 |
| *SH2B1*  [15,32] | 27,614 | 11 | rs7498665 | **16**:28,871,920 | Exon 8 | 0,36 | 0,35 |
| *SLC6A14*  [33] | 24,880 | 14 | rs2011162 | **X:**116,459,133 | Exon 14 | 0,46 | 0,46 |
| rs4824325 | **X**:116,453,854 | Intron 9 | 0,33 | 0,30 |
| rs5905285 | **X:**116,441,262 | Intron 3 | 0,18 | 0,28 |
| *SOCS3*  [21] | 3,303 | 2 | rs4969168 | **17**:78,357,712 | Exon 2 | 0,14 | 0,18 |
| rs8069976 | **17**:78,353,769 | 3’ near gene | 0,21 | 0,20 |
| *STAT3*  [21] | 75,171 | 24 | rs7211777 | **17**:42,381,807 | Intron 1 | 0,38 | 0,35 |
| rs744166 | **17**:42,361,933 | Intron 1 | 0,44 | 0,42 |
| *TMEM18*  [15,16] | 9467 | 5 | rs6548238 | **2**:634,655 | 33 kb 3’ of gene | 0,15 | 0,16 |

aReferences justifying the choice of the candidate genes/SNPs

bMAF HapMap: Minor Allele Frequency HapMap CEU reference population

References

1 Farooqi IS, O'Rahilly S: Monogenic obesity in humans*.* Annu Rev Med 2005; 56: 443-58.

2 Leibowitz SF, Wortley KE: Hypothalamic control of energy balance: different peptides, different functions*.* Peptides 2004; 25: 473-504.

3 Woods SC, D'Alessio DA: Central control of body weight and appetite*.* J Clin Endocrinol Metab 2008; 93: S37-50.

4 Monteleone P, Bifulco M, Di Filippo C, Gazzerro P, Canestrelli B, Monteleone F, Proto MC, Di Genio M, Grimaldi C, Maj M: Association of CNR1 and FAAH endocannabinoid gene polymorphisms with anorexia nervosa and bulimia nervosa: evidence for synergistic effects*.* Genes Brain Behav 2009; 8: 728-32.

5 Maniam J, Morris MJ: The link between stress and feeding behaviour*.* Neuropharmacology 2012; 63: 97-110.

6 Sominsky L, Spencer SJ: Eating behavior and stress: a pathway to obesity*.* Front Psychol 2014; 5: 434.

7 Meister B, Perez-Manso M, Daraio T: Delta-like 1 homologue is a hypothalamus-enriched protein that is present in orexin-containing neurones of the lateral hypothalamic area*.* J Neuroendocrinol 2013; 25: 617-25.

8 Meye FJ, Adan RA: Feelings about food: the ventral tegmental area in food reward and emotional eating*.* Trends Pharmacol Sci 2014; 35: 31-40.

9 Agurs-Collins T, Fuemmeler BF: Dopamine polymorphisms and depressive symptoms predict foods intake. Results from a nationally representative sample*.* Appetite 2011; 57: 339-48.

10 Cecil J, Dalton M, Finlayson G, Blundell J, Hetherington M, Palmer C: Obesity and eating behaviour in children and adolescents: Contribution of common gene polymorphisms*.* Int Rev Psychiatry 2012; 24: 200-10.

11 Dina C, Meyre D, Gallina S, Durand E, Korner A, Jacobson P, Carlsson LM, Kiess W, Vatin V, Lecoeur C, et al.: Variation in FTO contributes to childhood obesity and severe adult obesity*.* Nat Genet 2007; 39: 724-6.

12 Wardle J, Llewellyn C, Sanderson S, Plomin R: The FTO gene and measured food intake in children*.* Int J Obes (Lond) 2009; 33: 42-5.

13 Meyre D, Boutin P, Tounian A, Deweirder M, Aout M, Jouret B, Heude B, Weill J, Tauber M, Tounian P, et al.: Is glutamate decarboxylase 2 (GAD2) a genetic link between low birth weight and subsequent development of obesity in children? J Clin Endocrinol Metab 2005; 90: 2384-90.

14 Anderson LL, Jeftinija S, Scanes CG, Stromer MH, Lee JS, Jeftinija K, Glavaski-Joksimovic A: Physiology of ghrelin and related peptides*.* Domest Anim Endocrinol 2005; 29: 111-44.

15 Willer CJ, Speliotes EK, Loos RJ, Li S, Lindgren CM, Heid IM, Berndt SI, Elliott AL, Jackson AU, Lamina C, et al.: Six new loci associated with body mass index highlight a neuronal influence on body weight regulation*.* Nat Genet 2009; 41: 25-34.

16 den Hoed M, Ekelund U, Brage S, Grontved A, Zhao JH, Sharp SJ, Ong KK, Wareham NJ, Loos RJ: Genetic susceptibility to obesity and related traits in childhood and adolescence: influence of loci identified by genome-wide association studies*.* Diabetes 2010; 59: 2980-8.

17 Fernandez AM, Torres-Aleman I: The many faces of insulin-like peptide signalling in the brain*.* Nat Rev Neurosci 2012; 13: 225-39.

18 Smith FM, Garfield AS, Ward A: Regulation of growth and metabolism by imprinted genes*.* Cytogenet Genome Res 2006; 113: 279-91.

19 McGowan MK, Andrews KM, Fenner D, Grossman SP: Chronic intrahypothalamic insulin infusion in the rat: behavioral specificity*.* Physiol Behav 1993; 54: 1031-4.

20 Woods SC, Decke E, Vasselli JR: Metabolic hormones and regulation of body weight*.* Psychol Rev 1974; 81: 26-43.

21 Munzberg H, Myers MG, Jr.: Molecular and anatomical determinants of central leptin resistance*.* Nat Neurosci 2005; 8: 566-70.

22 Obregon AM, Amador P, Valladares M, Weisstaub G, Burrows R, Santos JL: Melanocortin-3 receptor gene variants: association with childhood obesity and eating behavior in Chilean families*.* Nutrition 2010; 26: 760-5.

23 Valladares M, Dominguez-Vasquez P, Obregon AM, Weisstaub G, Burrows R, Maiz A, Santos JL: Melanocortin-4 receptor gene variants in Chilean families: association with childhood obesity and eating behavior*.* Nutr Neurosci 2010; 13: 71-8.

24 Kahn BB, Myers MG, Jr.: mTOR tells the brain that the body is hungry*.* Nat Med 2006; 12: 615-7.

25 Stefater MA, Seeley RJ: Central Nervous System Nutrient Signaling: The Regulation of Energy Balance and the Future of Dietary Therapies*.* Annu Rev Nutr 2010.

26 Bouchard L, Drapeau V, Provencher V, Lemieux S, Chagnon Y, Rice T, Rao DC, Vohl MC, Tremblay A, Bouchard C, et al.: Neuromedin beta: a strong candidate gene linking eating behaviors and susceptibility to obesity*.* Am J Clin Nutr 2004; 80: 1478-86.

27 Curley JP, Pinnock SB, Dickson SL, Thresher R, Miyoshi N, Surani MA, Keverne EB: Increased body fat in mice with a targeted mutation of the paternally expressed imprinted gene Peg3*.* Faseb J 2005; 19: 1302-4.

28 Varrault A, Gueydan C, Delalbre A, Bellmann A, Houssami S, Aknin C, Severac D, Chotard L, Kahli M, Le Digarcher A, et al.: Zac1 regulates an imprinted gene network critically involved in the control of embryonic growth*.* Dev Cell 2006; 11: 711-22.

29 Marsh DJ, Weingarth DT, Novi DE, Chen HY, Trumbauer ME, Chen AS, Guan XM, Jiang MM, Feng Y, Camacho RE, et al.: Melanin-concentrating hormone 1 receptor-deficient mice are lean, hyperactive, and hyperphagic and have altered metabolism*.* Proc Natl Acad Sci U S A 2002; 99: 3240-5.

30 Kim MS, Lee KU: Role of hypothalamic 5'-AMP-activated protein kinase in the regulation of food intake and energy homeostasis*.* J Mol Med 2005.

31 Lee WJ, Koh EH, Won JC, Kim MS, Park JY, Lee KU: Obesity: the role of hypothalamic AMP-activated protein kinase in body weight regulation*.* Int J Biochem Cell Biol 2005; 37: 2254-9.

32 Doche ME, Bochukova EG, Su HW, Pearce LR, Keogh JM, Henning E, Cline JM, Saeed S, Dale A, Cheetham T, et al.: Human SH2B1 mutations are associated with maladaptive behaviors and obesity*.* J Clin Invest 2012; 122: 4732-6.

33 Suviolahti E, Oksanen LJ, Ohman M, Cantor RM, Ridderstrale M, Tuomi T, Kaprio J, Rissanen A, Mustajoki P, Jousilahti P, et al.: The SLC6A14 gene shows evidence of association with obesity*.* J Clin Invest 2003; 112: 1762-72.