

Supplementary File 1

Table S1 Targets corresponding to EACC components

No.	Gene ID	Gene Symbol	Description
1	18671	Abcb1a	ATP-dependent translocase ABCB1 (ATP-binding cassette sub-family B member 1A) (MDR1A) (Multidrug resistance protein 1A) (EC 7.6.2.2) (Multidrug resistance protein 3) (P-glycoprotein 3) (Phospholipid transporter ABCB1) (EC 7.6.2.1)
2	18669	Abcb1b	ATP-dependent translocase ABCB1 (ATP-binding cassette sub-family B member 1B) (Multidrug resistance protein 1B) (EC 7.6.2.2) (P-glycoprotein 1) (Phospholipid transporter ABCB1) (EC 7.6.2.1) (CD antigen CD243)
3	17250	Abcc1	Multidrug resistance-associated protein 1 (EC 7.6.2.2) (ATP-binding cassette sub-family C member 1) (Glutathione-S-conjugate-translocating ATPase ABCC1) (EC 7.6.2.3) (Leukotriene C(4) transporter) (LTC4 transporter)
4	26357	Abcg2	Broad substrate specificity ATP-binding cassette transporter ABCG2 (EC 7.6.2.2) (ATP-binding cassette sub-family G member 2) (Breast cancer resistance protein 1 homolog) (Urate exporter) (CD antigen CD338)
5	27405	Abcg3	ATP-binding cassette sub-family G member 3
6	66082	Abhd6	Monoacylglycerol lipase ABHD6 (EC 3.1.1.23) (2-arachidonoylglycerol hydrolase) (Abhydrolase domain-containing protein 6)
7	11350	Abl1	Tyrosine-protein kinase ABL1 (EC 2.7.10.2) (Abelson murine leukemia viral oncogene homolog 1) (Abelson tyrosine-protein kinase 1) (Proto-oncogene c-Abl) (p150)
8	107476	Acaca	Acetyl-CoA carboxylase 1 (ACC1) (EC 6.4.1.2) (ACC-alpha) (Acetyl-CoA carboxylase 265)
9	11421	Ace	Angiotensin-converting enzyme (ACE) (EC 3.2.1.-) (EC 3.4.15.1) (Dipeptidyl carboxypeptidase I) (Kininase II) (CD antigen CD143) [Cleaved into: Angiotensin-converting enzyme, soluble form]
10	66190	Acer3	Alkaline ceramidase 3 (AlkCDase 3) (Alkaline CDase 3) (EC 3.5.1.-) (EC 3.5.1.23) (Alkaline phytoceramidase) (aPHC)
11	11423	Ache	Acetylcholinesterase (AChE) (EC 3.1.1.7)
12	11477	Acvr1	Activin receptor type-1 (EC 2.7.11.30) (Activin receptor type I) (ACTR-I) (Serine/threonine-protein kinase receptor R1) (SKR1) (TGF-B superfamily receptor type I) (TSR-I) (TSK-7L)
13	11486	Ado	Adenosine deaminase (EC 3.5.4.4) (Adenosine

			aminohydrolase)
14	11491	Adam17	Disintegrin and metalloproteinase domain-containing protein 17 (ADAM 17) (EC 3.4.24.86) (TNF-alpha convertase) (TNF-alpha-converting enzyme) (CD antigen CD156b)
15	11534	Adk	Adenosine kinase (AK) (EC 2.7.1.20) (Adenosine 5'-phosphotransferase)
16	11539	Adora1	Adenosine receptor A1
17	11540	Adora2a	Adenosine receptor A2a
18	11541	Adora2b	Adenosine receptor A2b
19	11548	Adra1b	adrenergic receptor, alpha 1b
20	11554	Adrb1	Beta-1 adrenergic receptor (Beta-1 adrenoreceptor) (Beta-1 adrenoceptor)
21	11555	Adrb2	Beta-2 adrenergic receptor (Beta-2 adrenoreceptor) (Beta-2 adrenoceptor)
22	11556	Adrb3	Beta-3 adrenergic receptor (Beta-3 adrenoreceptor) (Beta-3 adrenoceptor)
23	269378	Ahcy	Adenosylhomocysteinase (AdoHcyase) (EC 3.3.1.1) (CUBP) (Liver copper-binding protein) (S-adenosyl-L-homocysteine hydrolase)
24	77337	Akr1c21	Aldo-keto reductase family 1 member C21 (EC 1.1.1.-) (17-alpha-hydroxysteroid dehydrogenase) (17-alpha-HSD) (3(or 17)-alpha-hydroxysteroid dehydrogenase) (EC 1.1.1.209) (3-alpha-hydroxysteroid dehydrogenase) (Dihydrodiol dehydrogenase type 1) (DD1) (Dihydrodiol dehydrogenase type 3) (DD3)
25	11651	Akt1	RAC-alpha serine/threonine-protein kinase (EC 2.7.11.1) (AKT1 kinase) (Protein kinase B) (PKB) (Protein kinase B alpha) (PKB alpha) (Proto-oncogene c-Akt) (RAC-PK-alpha) (Thymoma viral proto-oncogene)
26	11682	Alk	ALK tyrosine kinase receptor (EC 2.7.10.1) (Anaplastic lymphoma kinase) (CD antigen CD246)
27	11689	Alox5	Polyunsaturated fatty acid 5-lipoxygenase (EC 1.13.11.-) (Arachidonate 5-lipoxygenase) (5-LO) (5-lipoxygenase) (EC 1.13.11.34)
28	11690	Alox5ap	Arachidonate 5-lipoxygenase-activating protein (FLAP) (MK-886-binding protein)
29	11647	Alpl	Alkaline phosphatase, tissue-nonspecific isozyme (AP-TNAP) (TNSALP) (EC 3.1.3.1) (Alkaline phosphatase 2) (Alkaline phosphatase liver/bone/kidney isozyme)
30	16790	Anpep	Aminopeptidase N (AP-N) (mAPN) (EC 3.4.11.2) (Alanyl aminopeptidase) (Aminopeptidase M) (AP-M) (Membrane protein p161) (Microsomal aminopeptidase) (CD antigen CD13)

31	11754	Aoc3	Membrane primary amine oxidase (EC 1.4.3.21) (Copper amine oxidase) (Semicarbazide-sensitive amine oxidase) (SSAO) (Vascular adhesion protein 1) (VAP-1)
32	11835	Ar	Androgen receptor (Dihydrotestosterone receptor) (Nuclear receptor subfamily 3 group C member 4)
33	11886	Asah1	Acid ceramidase (AC) (ACDase) (Acid CDase) (EC 3.5.1.23) (Acylsphingosine deacylase) (N-acylethanolamine hydrolase ASAH1) (EC 3.5.1.-) (N-acylsphingosine amidohydrolase) [Cleaved into: Acid ceramidase subunit alpha; Acid ceramidase subunit beta]
34	54447	Asah2	Neutral ceramidase (N-CDase) (NCDase) (EC 3.5.1.-) (EC 3.5.1.23) (Acylsphingosine deacylase 2) (N-acylsphingosine amidohydrolase 2) [Cleaved into: Neutral ceramidase soluble form]
35	230379	Asah3l	Alkaline ceramidase 2 (AlkCDase 2) (Alkaline CDase 2) (maCER2) (EC 3.5.1.-) (EC 3.5.1.23) (Acylsphingosine deacylase 3-like) (Cancer-related gene liver 1 protein) (CRG-L1) (N-acylsphingosine amidohydrolase 3-like)
36	20878	Aurka	Aurora kinase A (EC 2.7.11.1) (Aurora 2) (Aurora family kinase 1) (Aurora/IPL1-related kinase 1) (ARK-1) (Aurora-related kinase 1) (Ipl1- and aurora-related kinase 1) (Serine/threonine-protein kinase 6) (Serine/threonine-protein kinase Ayk1) (Serine/threonine-protein kinase aurora-A)
37	20877	Aurkb	Aurora kinase B (EC 2.7.11.1) (Aurora 1) (Aurora- and IPL1-like midbody-associated protein 1) (Aurora/IPL1-related kinase 2) (ARK-2) (Aurora-related kinase 2) (STK-1) (Serine/threonine-protein kinase 12) (Serine/threonine-protein kinase 5) (Serine/threonine-protein kinase aurora-B)
38	54140	Avpr1a	Vasopressin V1a receptor (V1aR) (AVPR V1a) (Antidiuretic hormone receptor 1a) (Vascular/hepatic-type arginine vasopressin receptor)
39	23821	Bace1	Beta-secretase 1 (EC 3.4.23.46) (Aspartyl protease 2) (ASP2) (Asp 2) (Beta-site amyloid precursor protein cleaving enzyme 1) (Beta-site APP cleaving enzyme 1) (Memapsin-2) (Membrane-associated aspartic protease 2)
40	56175	Bace2	Beta-secretase 2 (EC 3.4.23.45) (Aspartyl protease 1) (ASP1) (Asp 1) (Beta-site amyloid precursor protein cleaving enzyme 2) (Beta-site APP cleaving enzyme 2) (Memapsin-1) (Membrane-associated aspartic protease 1) (Theta-secretase)
			Cholinesterase (EC 3.1.1.8) (Acylcholine acylhydrolase)

			(Butyrylcholine esterase) (Choline esterase II) (Pseudocholinesterase)
42	12044	Bcl2a1	Bcl-2-related protein A1 (A1-A) (Hemopoietic-specific early response protein) (Protein BFL-1)
43	12061	Bdkrb1	B1 bradykinin receptor (B1R) (BK-1 receptor)
44	12143	Blk	Tyrosine-protein kinase Blk (EC 2.7.10.2) (B lymphocyte kinase) (p55-Blk)
45	109880	Braf	Serine/threonine-protein kinase B-raf (EC 2.7.11.1) (Proto-oncogene B-Raf)
46	105246	Brd9	Bromodomain-containing protein 9
47	12209	Brs3	Bombesin receptor subtype-3 (BRS-3)
48	12229	Btk	Tyrosine-protein kinase BTK (EC 2.7.10.2) (Agammaglobulinemia tyrosine kinase) (ATK) (B-cell progenitor kinase) (BPK) (Bruton tyrosine kinase) (Kinase EMB)
49	71934	Ca13	Carbonic anhydrase 13 (EC 4.2.1.1) (Carbonate dehydratase XIII) (Carbonic anhydrase XIII) (CA-XIII)
50	80733	Ca15	Carbonic anhydrase 15 (EC 4.2.1.1) (Carbonate dehydratase XV) (Carbonic anhydrase XV) (CA-XV)
51	12354	Ca7	Carbonic anhydrase 7 (EC 4.2.1.1) (Carbonate dehydratase VII) (Carbonic anhydrase VII) (CA-VII)
52	12293	Cacna2d1	Voltage-dependent calcium channel subunit alpha-2/delta-1 (Voltage-gated calcium channel subunit alpha-2/delta-1) [Cleaved into: Voltage-dependent calcium channel subunit alpha-2-1; Voltage-dependent calcium channel subunit delta-1]
53	54598	Calcrl	Calcitonin gene-related peptide type 1 receptor (CGRP type 1 receptor) (Calcitonin receptor-like receptor)
54	12322	Camk2a	Calcium/calmodulin-dependent protein kinase type II subunit alpha (CaM kinase II subunit alpha) (CaMK-II subunit alpha) (EC 2.7.11.17)
55	12323	Camk2b	Calcium/calmodulin-dependent protein kinase type II subunit beta (CaM kinase II subunit beta) (CaMK-II subunit beta) (EC 2.7.11.17)
56	59035	Carm1	Histone-arginine methyltransferase CARM1 (EC 2.1.1.319) (Coactivator-associated arginine methyltransferase 1) (Protein arginine N-methyltransferase 4)
57	12362	Casp1	Caspase-1 (CASP-1) (EC 3.4.22.36) (Interleukin-1 beta convertase) (IL-1BC) (Interleukin-1 beta-converting enzyme) (ICE) (IL-1 beta-converting enzyme) (p45) [Cleaved into: Caspase-1 subunit p20; Caspase-1 subunit p10]

58	12365	Casp14	Caspase-14 (CASP-14) (EC 3.4.22.-) (Mini-ICE) (MICE) [Cleaved into: Caspase-14 subunit p17, mature form; Caspase-14 subunit p10, mature form; Caspase-14 subunit p20, intermediate form; Caspase-14 subunit p8, intermediate form]
59	12367	Casp3	Caspase-3 (CASP-3) (EC 3.4.22.56) (Apopain) (Cysteine protease CPP32) (CPP-32) (LICE) (Protein Yama) (SREBP cleavage activity 1) (SCA-1) [Cleaved into: Caspase-3 subunit p17; Caspase-3 subunit p12]
60	12370	Casp8	Caspase-8 (CASP-8) (EC 3.4.22.61) [Cleaved into: Caspase-8 subunit p18; Caspase-8 subunit p10]
61	12374	Casr	Extracellular calcium-sensing receptor (CaSR) (Parathyroid cell calcium-sensing receptor) (PCaR1)
62	12425	Cckar	Cholecystokinin receptor type A (CCK-A receptor) (CCK-AR) (Cholecystokinin-1 receptor) (CCK1-R)
63	12426	Cckbr	Gastrin/cholecystokinin type B receptor (CCK-B receptor) (CCK-BR) (Cholecystokinin-2 receptor) (CCK2-R)
64	20296	Ccl2	C-C motif chemokine 2 (Monocyte chemoattractant protein 1) (Monocyte chemotactic protein 1) (MCP-1) (Platelet-derived growth factor-inducible protein JE) (Small-inducible cytokine A2)
65	20304	Ccl5	C-C motif chemokine 5 (MuRantes) (SIS-delta) (Small-inducible cytokine A5) (T-cell-specific protein RANTES)
66	12443	Ccnd1	G1/S-specific cyclin-D1
67	12444	Ccnd2	G1/S-specific cyclin-D2
68	12445	Ccnd3	G1/S-specific cyclin-D3
69	12768	Ccr1	C-C chemokine receptor type 1 (C-C CKR-1) (CC-CKR-1) (CCR-1) (CCR1) (Macrophage inflammatory protein 1-alpha receptor) (MIP-1alpha-R) (RANTES-R) (CD antigen CD191)
70	12772	Ccr2	C-C chemokine receptor type 2 (C-C CKR-2) (CC-CKR-2) (CCR-2) (CCR2) (JE/FIC receptor) (MCP-1 receptor) (CD antigen CD192)
71	12771	Ccr3	Probable C-C chemokine receptor type 3 (C-C CKR-3) (CC-CKR-3) (CCR-3) (CCR3) (CKR3) (Macrophage inflammatory protein 1-alpha receptor-like 2) (MIP-1 alpha RL2) (CD antigen CD193)
72	12774	Ccr5	C-C chemokine receptor type 5 (C-C CKR-5) (CC-CKR-5) (CCR-5) (MIP-1 alpha receptor) (CD antigen CD195)
73	12483	Cd22	B-cell receptor CD22 (B-lymphocyte cell adhesion molecule) (BL-CAM) (Sialic acid-binding Ig-like lectin 2) (Siglec-2) (T-cell surface antigen Leu-14) (CD antigen CD22)

74	12494	Cd38	ADP-ribosyl cyclase/cyclic ADP-ribose hydrolase 1 (EC 3.2.2.6) (2'-phospho-ADP-ribosyl cyclase) (2'-phospho-ADP-ribosyl cyclase/2'-phospho-cyclic-ADP-ribose transferase) (EC 2.4.99.20) (2'-phospho-cyclic-ADP-ribose transferase) (ADP-ribosyl cyclase 1) (ADPRC 1) (Cyclic ADP-ribose hydrolase 1) (cADPr hydrolase 1) (I-19) (NIM-R5 antigen) (CD antigen CD38)
75	21947	Cd40lg	CD40 ligand (CD40-L) (T-cell antigen Gp39) (TNF-related activation protein) (TRAP) (Tumor necrosis factor ligand superfamily member 5) (CD antigen CD154) [Cleaved into: CD40 ligand, membrane form; CD40 ligand, soluble form (sCD40L)]
76	72269	Cda	Cytidine deaminase (EC 3.5.4.5) (Cytidine aminohydrolase)
77	12534	Cdk1	Cyclin-dependent kinase 1 (CDK1) (EC 2.7.11.22) (EC 2.7.11.23) (Cell division control protein 2 homolog) (Cell division protein kinase 1) (p34 protein kinase)
78	12566	Cdk2	Cyclin-dependent kinase 2 (EC 2.7.11.22) (Cell division protein kinase 2)
79	107951	Cdk9	Cyclin-dependent kinase 9 (EC 2.7.11.22) (EC 2.7.11.23) (Cell division protein kinase 9)
80	104158	Ces1d	Carboxylesterase 1D (Carboxylesterase 3) (EC 3.1.1.1) (EC 3.1.1.67) (Fatty acid ethyl ester synthase) (FAEE synthase) (Triacylglycerol hydrolase) (TGH)
81	234671	Ces2c	Acylcarnitine hydrolase (ACH M1) (EC 3.1.1.28) (Carboxylesterase 2) (CES 2) (Carboxylic ester hydrolase) (EC 3.1.1.-) (Peroxisome proliferator-inducible acylcarnitine hydrolase)
82	81600	Chia	Acidic mammalian chitinase (AMCase) (EC 3.2.1.14) (YNL)
83	12669	Chrm1	Muscarinic acetylcholine receptor M1
84	243764	Chrm2	Muscarinic acetylcholine receptor M2
85	12672	Chrm4	Muscarinic acetylcholine receptor M4 (Mm4 mAChR)
86	11438	Chrna4	Neuronal acetylcholine receptor subunit alpha-4
87	11441	Chrna7	Neuronal acetylcholine receptor subunit alpha-7
88	11444	Chrn2	Neuronal acetylcholine receptor subunit beta-2
89	108015	Chrn4	Neuronal acetylcholine receptor subunit beta-4
90	12747	Clk1	Dual specificity protein kinase CLK1 (EC 2.7.12.1) (CDC-like kinase 1) (Protein kinase STY)
91	12748	Clk2	Dual specificity protein kinase CLK2 (EC 2.7.12.1) (CDC-like kinase 2)
92	102414	Clk3	Dual specificity protein kinase CLK3 (EC 2.7.12.1) (CDC-like kinase 3)
93	12750	Clk4	Dual specificity protein kinase CLK4 (EC 2.7.12.1) (CDC-like kinase 4)

94	12801	Cnr1	Cannabinoid receptor 1 (CB-R) (CB1) (Brain-type cannabinoid receptor)
95	12802	Cnr2	Cannabinoid receptor 2 (CB-2) (CB2) (mCB2)
96	12846	Comt	Catechol O-methyltransferase (EC 2.1.1.6)
97	12912	Creb	Cyclic AMP-responsive element-binding protein (CREB) (cAMP-responsive element-binding protein 1)
98	12922	Crhr2	Corticotropin-releasing factor receptor 2 (CRF-R-2) (CRF-R2) (CRFR-2) (CRF-RB) (Corticotropin-releasing hormone receptor 2) (CRH-R-2) (CRH-R2)
99	12977	Csf1	Macrophage colony-stimulating factor 1 (CSF-1) (MCSF) [Cleaved into: Processed macrophage colony-stimulating factor 1]
100	12978	Csf1r	Macrophage colony-stimulating factor 1 receptor (CSF-1 receptor) (CSF-1-R) (CSF-1R) (M-CSF-R) (EC 2.7.10.1) (Proto-oncogene c-Fms) (CD antigen CD115)
101	12995	Csnk2a1	Casein kinase II subunit alpha (CK II alpha) (EC 2.7.11.1)
102	13000	Csnk2a2	Casein kinase II subunit alpha' (CK II alpha') (EC 2.7.11.1)
103	13030	Ctsb	Cathepsin B (EC 3.4.22.1) (Cathepsin B1) [Cleaved into: Cathepsin B light chain; Cathepsin B heavy chain]
104	13035	CtsG	Cathepsin G (EC 3.4.21.20) (Vimentin-specific protease) (VSP)
105	13038	Ctsk	Cathepsin K (EC 3.4.22.38)
106	13039	CtsL	Procathepsin L (EC 3.4.22.15) (Cathepsin L1) (Major excreted protein) (MEP) (p39 cysteine proteinase) [Cleaved into: Cathepsin L; Cathepsin L heavy chain; Cathepsin L light chain]
107	13040	Ctss	Cathepsin S (EC 3.4.22.27)
108	12766	Cxcr3	C-X-C chemokine receptor type 3 (CXC-R3) (CXCR-3) (Interferon-inducible protein 10 receptor) (IP-10 receptor) (CD antigen CD183)
109	13072	Cyp11b2	Cytochrome P450 11B2, mitochondrial (Aldosterone synthase) (ALDOS) (Aldosterone-synthesizing enzyme) (CYPXIB2) (Corticosterone 18-monooxygenase, CYP11B2) (EC 1.14.15.5) (Cytochrome P-450Aldo) (Cytochrome P-450C18) (Cytochrome P450C11) (Steroid 11-beta-hydroxylase, CYP11B2) (EC 1.14.15.4) (Steroid 18-hydroxylase)
110	13077	Cyp1a2	Cytochrome P450 1A2 (EC 1.14.14.1) (CYP1A2) (Cholesterol 25-hydroxylase) (Cytochrome P450-P2) (Cytochrome P450-P3) (Hydroperoxy icosatetraenoate dehydratase) (EC 4.2.1.152)
			25-hydroxyvitamin D-1 alpha hydroxylase, mitochondrial (EC 1.14.15.18) (25-OHD-1 alpha-hydroxylase) (25-hydroxyvitamin D(3) 1-alpha-hydroxylase) (VD3 1A

			hydroxylase) (Calcidiol 1-monooxygenase) (Cytochrome P450 subfamily XXVIIIB polypeptide 1) (Cytochrome P450C1 alpha) (Cytochrome P450VD1-alpha) (Cytochrome p450 27B1)
112	56448	Cyp2d22	Cytochrome P450 CYP2D22 (Cytochrome P450, family 2, subfamily d, polypeptide 22)
113	76279	Cyp2d26	Cytochrome P450 2D26 (EC 1.14.14.1) (CYPID26)
114	13113	Cyp3a13	Cytochrome P450 3A13 (EC 1.14.14.1) (CYP3A13)
115	53973	Cyp3a41a	Cytochrome P450 3A41 (EC 1.14.14.1)
116	622127	Cyp3a57	Unspecific monooxygenase (EC 1.14.14.1)
117	13142	Dao	D-amino-acid oxidase (DAAO) (DAMOX) (DAO) (EC 1.4.3.3)
118	13167	Dbi	Acyl-CoA-binding protein (ACBP) (Diazepam-binding inhibitor) (DBI) (Endozepine) (EP)
119	13178	Dck	Deoxycytidine kinase (dCK) (EC 2.7.1.74) (Deoxyadenosine kinase) (EC 2.7.1.76) (Deoxyguanosine kinase) (EC 2.7.1.113)
120	13350	Dgat1	Diacylglycerol O-acyltransferase 1 (EC 2.3.1.20) (Acyl-CoA retinol O-fatty-acyltransferase) (ARAT) (Retinol O-fatty-acyltransferase) (EC 2.3.1.76) (Diglyceride acyltransferase)
121	13361	Dhfr	Dihydrofolate reductase (EC 1.5.1.3)
122	56749	Dhodh	Dihydroorotate dehydrogenase (quinone), mitochondrial (DHODEHase) (EC 1.3.5.2) (Dihydroorotate oxidase)
123	13433	Dnmt1	DNA (cytosine-5)-methyltransferase 1 (Dnmt1) (Met-1) (EC 2.1.1.37) (DNA methyltransferase Mmul) (DNA MTase Mmul) (M.Mmul) (MCMT)
124	13482	Dpp4	Dipeptidyl peptidase 4 (EC 3.4.14.5) (Dipeptidyl peptidase IV) (DPP IV) (T-cell activation antigen CD26) (Thymocyte-activating molecule) (THAM) (CD antigen CD26) [Cleaved into: Dipeptidyl peptidase 4 membrane form (Dipeptidyl peptidase IV membrane form); Dipeptidyl peptidase 4 soluble form (Dipeptidyl peptidase IV soluble form)]
125	13488	Drd1	D(1A) dopamine receptor (Dopamine D1 receptor)
126	13489	Drd2	D(2) dopamine receptor (Dopamine D2 receptor)
127	19252	Dusp1	Dual specificity protein phosphatase 1 (EC 3.1.3.16) (EC 3.1.3.48) (Mitogen-activated protein kinase phosphatase 1) (MAP kinase phosphatase 1) (MKP-1) (Protein-tyrosine phosphatase 3CH134) (Protein-tyrosine phosphatase ERP)
128	13548	Dyrk1a	Dual specificity tyrosine-phosphorylation-regulated kinase 1A (EC 2.7.12.1) (Dual specificity YAK1-related kinase) (MP86) (Protein kinase minibrain homolog) (MNBH)

129	13617	Ednra	Endothelin-1 receptor (Endothelin receptor type A) (ET-A) (ET-AR)
130	13618	Ednrb	Endothelin receptor type B (ET-B) (ET-BR) (Endothelin receptor non-selective type)
131	13649	Egfr	Epidermal growth factor receptor (EC 2.7.10.1)
132	110147	Ehmt2	Histone-lysine N-methyltransferase EHMT2 (EC 2.1.1.-) (Euchromatic histone-lysine N-methyltransferase 2) (HLA-B-associated transcript 8) (Histone H3-K9 methyltransferase 3) (H3-K9-HMTase 3) (Protein G9a)
133	50701	Elane	Neutrophil elastase (EC 3.4.21.37) (Elastase-2) (Leukocyte elastase)
134	170439	Elovl6	Elongation of very long chain fatty acids protein 6 (EC 2.3.1.199) (3-keto acyl-CoA synthase Elovl6) (ELOVL fatty acid elongase 6) (ELOVL FA elongase 6) (Fatty acyl-CoA elongase) (Long chain fatty acid elongase) (Myelin-associated SUR4 protein) (Very long chain 3-ketoacyl-CoA synthase 6) (Very long chain 3-oxoacyl-CoA synthase 6)
135	18606	Enpp2	Ectonucleotide pyrophosphatase/phosphodiesterase family member 2 (E-NPP 2) (EC 3.1.4.39) (Autotaxin) (Extracellular lysophospholipase D) (LysoPLD)
136	13849	Ephx1	Epoxide hydrolase 1 (EC 3.3.2.9) (Epoxide hydratase) (Microsomal epoxide hydrolase) (mEH)
137	13850	Ephx2	Bifunctional epoxide hydrolase 2 [Includes: Cytosolic epoxide hydrolase 2 (CEH) (EC 3.3.2.10) (Epoxide hydratase) (Soluble epoxide hydrolase) (SEH); Lipid-phosphate phosphatase (EC 3.1.3.76)]
138	13866	ErbB2	Receptor tyrosine-protein kinase erbB-2 (EC 2.7.10.1) (Proto-oncogene Neu) (Proto-oncogene c-ErbB-2) (p185erbB2) (CD antigen CD340)
139	13982	Esr1	Estrogen receptor (ER) (ER-alpha) (Estradiol receptor) (Nuclear receptor subfamily 3 group A member 1)
140	13983	Esr2	Estrogen receptor beta (ER-beta) (Nuclear receptor subfamily 3 group A member 2)
141	14061	F2	Prothrombin (EC 3.4.21.5) (Coagulation factor II) [Cleaved into: Activation peptide fragment 1; Activation peptide fragment 2; Thrombin light chain; Thrombin heavy chain]
142	14089	Fap	Prolyl endopeptidase FAP (EC 3.4.21.26) (Dipeptidyl peptidase FAP) (EC 3.4.14.5) (Fibroblast activation protein alpha) (FAPalpha) (Gelatin degradation protease FAP) (EC 3.4.21.-) (Integral membrane serine protease) (Post-proline cleaving enzyme) (Serine integral membrane protease) (SIMP) (Surface-expressed protease) (Seprase) [Cleaved into: Antiplasmin-cleaving enzyme FAP, soluble form (APCE) (EC 3.4.14.5) (EC 3.4.21.-) (EC 3.4.21.26)]

143	14104	Fasn	Fatty acid synthase (EC 2.3.1.85) (Type I Fatty Acid Synthase) [Includes: [Acyl-carrier-protein] S-acetyltransferase (EC 2.3.1.38); [Acyl-carrier-protein] S-malonyltransferase (EC 2.3.1.39); 3-oxoacyl-[acyl-carrier-protein] synthase (EC 2.3.1.41); 3-oxoacyl-[acyl-carrier-protein] reductase (EC 1.1.1.100); 3-hydroxyacyl-[acyl-carrier-protein] dehydratase (EC 4.2.1.59); Enoyl-[acyl-carrier-protein] reductase (EC 1.3.1.39); Acyl-[acyl-carrier-protein] hydrolase (EC 3.1.2.14)]
144	14121	Fbp1	Fructose-1,6-bisphosphatase 1 (FBPase 1) (EC 3.1.3.11) (D-fructose-1,6-bisphosphate 1-phosphohydrolase 1) (Fructose-1,6-bisphosphatase isozyme 3) (FBPase 3) (Liver FBPase)
145	233081	Ffar1	Free fatty acid receptor 1 (G-protein coupled receptor 40)
146	107221	Ffar4	Free fatty acid receptor 4 (G-protein coupled receptor 120) (G-protein coupled receptor GT01) (Omega-3 fatty acid receptor 1)
147	14186	Fgfr4	Fibroblast growth factor receptor 4 (FGFR-4) (EC 2.7.10.1) (Protein-tyrosine kinase receptor MPK-11) (CD antigen CD334)
148	14191	Fgr	Tyrosine-protein kinase Fgr (EC 2.7.10.2) (Proto-oncogene c-Fgr) (p55-Fgr)
149	14254	Flt1	Vascular endothelial growth factor receptor 1 (VEGFR-1) (EC 2.7.10.1) (Embryonic receptor kinase 2) (Fms-like tyrosine kinase 1) (FLT-1) (Tyrosine-protein kinase receptor FLT)
150	14281	Fos	Proto-oncogene c-Fos (Cellular oncogene fos)
151	14294	Fpr-s1	Formyl peptide receptor-related sequence 1 (FMLP-related receptor I) (FMLP-R-I) (Formyl peptide receptor related sequence 1) (Formyl peptide receptor-like 1) (Lipoxin A4 receptor) (LXA4 receptor) (N-formyl peptide receptor 2) (N-formyl peptide receptor 3)
152	14360	Fyn	Tyrosine-protein kinase Fyn (EC 2.7.10.2) (Proto-oncogene c-Fyn) (p59-Fyn)
153	14387	Gaa	Lysosomal alpha-glucosidase (EC 3.2.1.20) (Acid maltase)
154	76051	Ganc	Neutral alpha-glucosidase C (EC 3.2.1.20)
155	14460	Gata1	Erythroid transcription factor (Eryf1) (GATA-binding factor 1) (GATA-1) (GF-1) (NF-E1 DNA-binding protein)
156	14466	Gba	Lysosomal acid glucosylceramidase (Lysosomal acid GCase) (EC 3.2.1.45) (Acid beta-glucosidase) (Beta-glucocerebrosidase) (Cholesterol glucosyltransferase) (SGTase) (EC 2.4.1.-) (Cholesteryl-beta-glucosidase) (EC 3.2.1.-) (D-glucosyl-N-acylsphingosine glucosylhydrolase)

157	230101	Gba2	Non-lysosomal glucosylceramidase (NLGase) (EC 3.2.1.45) (Beta-glucocerebrosidase 2) (Beta-glucosidase 2) (Bile acid beta-glucosidase GBA2) (Bile acid glucosyl transferase GBA2) (Cholesterol glucosyltransferase GBA2) (EC 2.4.1.-) (Cholesteryl-beta-glucosidase GBA2) (EC 3.2.1.-) (Glucosylceramidase 2)
158	14527	Gcgr	Glucagon receptor (GL-R)
159	103988	Gck	Hexokinase-4 (HK4) (EC 2.7.1.1) (Glucokinase) (Hexokinase type IV) (HK IV) (Hexokinase-D)
160	231103	Gckr	Glucokinase regulatory protein (GKRP) (Glucokinase regulator)
161	208188	Ghsr	Growth hormone secretagogue receptor type 1 (GHS-R) (GH-releasing peptide receptor) (GHRP) (Ghrelin receptor)
162	10004346 1	Gm4450	Predicted gene 4450
163	14715	Gnrhr	Gonadotropin-releasing hormone receptor (GnRH receptor) (GnRH-R)
164	227289	Gpbar1	G-protein coupled bile acid receptor 1 (Membrane-type receptor for bile acids) (M-BAR)
165	23890	Gpr34	Probable G-protein coupled receptor 34
166	64095	Gpr35	G-protein coupled receptor 35 (Kynurenic acid receptor) (KYNA receptor)
167	210198	Gprc6a	G-protein coupled receptor family C group 6 member A
168	14775	Gpx1	Glutathione peroxidase 1 (GPx-1) (GSHPx-1) (EC 1.11.1.9) (Cellular glutathione peroxidase) (Selenium-dependent glutathione peroxidase 1)
169	14776	Gpx2	Glutathione peroxidase 2 (GPx-2) (GSHPx-2) (EC 1.11.1.9) (Glutathione peroxidase-gastrointestinal) (GPx-GI) (GSHPx-GI)
170	14799	Gria1	Glutamate receptor 1 (GluR-1) (AMPA-selective glutamate receptor 1) (GluR-A) (GluR-K1) (Glutamate receptor ionotropic, AMPA 1) (GluA1)
171	14810	Grin1	Glutamate receptor ionotropic, NMDA 1 (GluN1) (Glutamate [NMDA] receptor subunit zeta-1) (N-methyl-D-aspartate receptor subunit NR1) (NMD-R1)
172	14811	Grin2a	Glutamate receptor ionotropic, NMDA 2A (GluN2A) (Glutamate [NMDA] receptor subunit epsilon-1) (N-methyl D-aspartate receptor subtype 2A) (NMDAR2A) (NR2A)
173	108071	Grm5	Metabotropic glutamate receptor 5 (mGluR5)
174	606496	Gsk3a	Glycogen synthase kinase-3 alpha (GSK-3 alpha) (EC 2.7.11.26) (Serine/threonine-protein kinase GSK3A) (EC 2.7.11.1)

175	56637	Gsk3b	Glycogen synthase kinase-3 beta (GSK-3 beta) (EC 2.7.11.26) (Serine/threonine-protein kinase GSK3B) (EC 2.7.11.1)
176	80885	Hcar2	Hydroxycarboxylic acid receptor 2 (G-protein coupled receptor 109) (G-protein coupled receptor 109A) (G-protein coupled receptor HM74) (Niacin receptor 1) (Nicotinic acid receptor) (Protein PUMA-G)
177	15165	Hcn1	Potassium/sodium hyperpolarization-activated cyclic nucleotide-gated channel 1 (Brain cyclic nucleotide-gated channel 1) (BCNG-1) (Hyperpolarization-activated cation channel 2) (HAC-2)
178	15166	Hcn2	Potassium/sodium hyperpolarization-activated cyclic nucleotide-gated channel 2 (Brain cyclic nucleotide-gated channel 2) (BCNG-2) (Hyperpolarization-activated cation channel 1) (HAC-1)
179	230777	Hcrtr1	Orexin receptor type 1 (Ox-1-R) (Ox1-R) (Ox1R) (Hypocretin receptor type 1)
180	387285	Hcrtr2	Orexin receptor type 2 (Ox-2-R) (Ox2-R) (Ox2R) (Hypocretin receptor type 2)
181	70315	Hdac8	Histone deacetylase 8 (HD8) (EC 3.5.1.98)
182	15205	Hes1	Transcription factor HES-1 (Hairy and enhancer of split 1)
183	15251	Hif1a	Hypoxia-inducible factor 1-alpha (HIF-1-alpha) (HIF1-alpha) (ARNT-interacting protein)
184	15289	Hmgb1	High mobility group protein B1 (High mobility group protein 1) (HMG-1)
185	15357	Hmgcr	3-hydroxy-3-methylglutaryl-coenzyme A reductase (HMG-CoA reductase) (EC 1.1.1.34)
186	15368	Hmox1	Heme oxygenase 1 (HO-1) (EC 1.14.14.18) (P32 protein)
187	15369	Hmox2	Heme oxygenase 2 (HO-2) (EC 1.14.14.18)
188	15461	Hras1	GTPase HRas (EC 3.6.5.2) (H-Ras-1) (Transforming protein p21) (c-H-ras) (p21ras) [Cleaved into: GTPase HRas, N-terminally processed]
189	15465	Hrh1	Histamine H1 receptor (H1R) (HH1R)
190	99296	Hrh3	Histamine H3 receptor (H3R) (HH3R)
191	225192	Hrh4	Histamine H4 receptor (H4R) (HH4R)
192	15483	Hsd11b1	Corticosteroid 11-beta-dehydrogenase isozyme 1 (EC 1.1.1.146) (11-beta-hydroxysteroid dehydrogenase 1) (11-DH) (11-beta-HSD1) (11beta-HSD1A)
193	15484	Hsd11b2	Corticosteroid 11-beta-dehydrogenase isozyme 2 (EC 1.1.1.-) (11-beta-hydroxysteroid dehydrogenase type 2) (11-DH2) (11-beta-HSD2) (NAD-dependent 11-beta-hydroxysteroid dehydrogenase)
194	15486	Hsd17b2	Estradiol 17-beta-dehydrogenase 2 (EC 1.1.1.62) (17-beta-hydroxysteroid dehydrogenase type 2) (17-beta-

			HSD 2) (Testosterone 17-beta-dehydrogenase) (EC 1.1.1.239)
195	15487	Hsd17b3	Testosterone 17-beta-dehydrogenase 3 (EC 1.1.1.64) (17-beta-hydroxysteroid dehydrogenase type 3) (17-beta-HSD 3) (Estradiol 17-beta-dehydrogenase 2) (EC 1.1.1.62) (Testicular 17-beta-hydroxysteroid dehydrogenase) 3 beta-hydroxysteroid dehydrogenase/Delta 5-->4-isomerase type 1 (3 beta-hydroxysteroid dehydrogenase/Delta 5-->4-isomerase type I) (3-beta-HSD I) (3-beta-hydroxy-5-ene steroid dehydrogenase) (3-beta-hydroxy-Delta(5)-steroid dehydrogenase) (EC 1.1.1.145) (3-beta-hydroxysteroid 3-dehydrogenase) (EC 1.1.1.270) (Delta-5-3-ketosteroid isomerase) (Dihydrotestosterone oxidoreductase) (EC 1.1.1.210) (Steroid Delta-isomerase) (EC 5.3.3.1)
196	15492	Hsd3b1	3 beta-hydroxysteroid dehydrogenase/Delta 5-->4-isomerase type 2 (3 beta-hydroxysteroid dehydrogenase/Delta 5-->4-isomerase type II) (3-beta-HSD II) [Includes: 3-beta-hydroxy-Delta(5)-steroid dehydrogenase (EC 1.1.1.145) (3-beta-hydroxy-5-ene steroid dehydrogenase) (Progesterone reductase); Steroid Delta-isomerase (EC 5.3.3.1) (Delta-5-3-ketosteroid isomerase)]
197	15493	Hsd3b2	3 beta-hydroxysteroid dehydrogenase/Delta 5-->4-isomerase type 3 (3 beta-hydroxysteroid dehydrogenase/Delta 5-->4-isomerase type III) (3-beta-HSD III) [Includes: 3-beta-hydroxy-Delta(5)-steroid dehydrogenase (EC 1.1.1.145) (3-beta-hydroxy-5-ene steroid dehydrogenase) (Progesterone reductase); Steroid Delta-isomerase (EC 5.3.3.1) (Delta-5-3-ketosteroid isomerase)]
198	15494	Hsd3b3	NADPH-dependent 3-keto-steroid reductase Hsd3b4 (3 beta-hydroxysteroid dehydrogenase type 4) (3 beta-hydroxysteroid dehydrogenase type IV) (3 beta-HSD IV) (EC 1.1.1.270) (Dihydrotestosterone 3-ketoreductase) (EC 1.1.1.210)
199	15495	Hsd3b4	Heat shock protein HSP 90-alpha (Heat shock 86 kDa) (HSP 86) (HSP86) (Tumor-specific transplantation 86 kDa antigen) (TSTA)
200	15519	Hsp90aa1	Heat shock protein HSP 90-beta (Heat shock 84 kDa) (HSP 84) (HSP84) (Tumor-specific transplantation 84 kDa antigen) (TSTA)
201	15516	Hsp90ab1	Endoplasmic reticulum resident protein 99) (ERp99)

			(Heat shock protein 90 kDa beta member 1) (Polymorphic tumor rejection antigen 1) (Tumor rejection antigen gp96)
203	15550	Htr1a	5-hydroxytryptamine receptor 1A (5-HT-1A) (5-HT1A) (Serotonin receptor 1A)
204	15560	Htr2c	5-hydroxytryptamine receptor 2C (5-HT-2C) (5-HT2C) (5-HT2C) (5-hydroxytryptamine receptor 1C) (5-HT-1C) (5-HT1C) (Serotonin receptor 2C)
205	15561	Htr3a	5-hydroxytryptamine receptor 3A (5-HT3-A) (5-HT3A) (5-hydroxytryptamine receptor 3) (5-HT-3) (5-HT3R) (Serotonin receptor 3A) (Serotonin-gated ion channel receptor)
206	57014	Htr3b	5-hydroxytryptamine receptor 3B (5-HT3-B) (5-HT3B) (Serotonin receptor 3B)
207	15562	Htr4	5-hydroxytryptamine receptor 4 (5-HT-4) (5-HT4) (Serotonin receptor 4)
208	15563	Htr5a	5-hydroxytryptamine receptor 5A (5-HT-5) (5-HT-5A) (5-HT5A) (Serotonin receptor 5A)
209	15566	Htr7	5-hydroxytryptamine receptor 7 (5-HT-7) (5-HT7) (5-HT-X) (Serotonin receptor 7)
210	11648	lap	Intestinal-type alkaline phosphatase
211	15894	Icam1	Intercellular adhesion molecule 1 (ICAM-1) (MALA-2) (MyD10) (CD antigen CD54)
212	15898	Icam5	Intercellular adhesion molecule 5 (ICAM-5) (Telencephalin)
213	16001	Igf1r	Insulin-like growth factor 1 receptor (EC 2.7.10.1) (Insulin-like growth factor I receptor) (IGF-I receptor) (CD antigen CD221) [Cleaved into: Insulin-like growth factor 1 receptor alpha chain; Insulin-like growth factor 1 receptor beta chain]
214	16150	Ikbkb	Inhibitor of nuclear factor kappa-B kinase subunit beta (I-kappa-B-kinase beta) (IKK-B) (IKK-beta) (IkbKB) (EC 2.7.11.10) (I-kappa-B kinase 2) (IKK2) (Nuclear factor NF-kappa-B inhibitor kinase beta) (NFKBIKB) (Serine/threonine protein kinase IKBKB) (EC 2.7.11.1)
215	16191	Il5	Interleukin-5 (IL-5) (B-cell growth factor II) (BCGF-II) (Cytotoxic T-lymphocyte inducer) (Eosinophil differentiation factor) (T-cell replacing factor) (TRF)
216	16193	Il6	Interleukin-6 (IL-6) (B-cell hybridoma growth factor) (Interleukin HP-1)
217	23918	Impdh2	Inosine-5'-monophosphate dehydrogenase 2 (IMP dehydrogenase 2) (IMPD 2) (IMPDH 2) (EC 1.1.1.205) (IMPDH-II)
218	16323	Inhba	Inhibin beta A chain (Activin beta-A chain)

219	16337	Insr	Insulin receptor (IR) (EC 2.7.10.1) (CD antigen CD220) [Cleaved into: Insulin receptor subunit alpha; Insulin receptor subunit beta]
220	71955	Ist1	IST1 homolog
221	16452	Jak2	Tyrosine-protein kinase JAK2 (EC 2.7.10.2) (Janus kinase 2) (JAK-2)
222	16453	Jak3	Tyrosine-protein kinase JAK3 (EC 2.7.10.2) (Janus kinase 3) (JAK-3)
223	16476	Jun	Transcription factor AP-1 (AH119) (Activator protein 1) (AP1) (Proto-oncogene c-Jun) (V-jun avian sarcoma virus 17 oncogene homolog) (Jun A)
224	16491	Kcna3	Potassium voltage-gated channel subfamily A member 3 (MK3) (Voltage-gated potassium channel subunit Kv1.3)
225	16511	Kcnh2	Potassium voltage-gated channel subfamily H member 2 (Ether-a-go-go-related gene potassium channel 1) (ERG-1) (Eag-related protein 1) (Ether-a-go-go-related protein 1) (MERG) (Voltage-gated potassium channel subunit Kv11.1)
226	192775	Kcnh6	potassium Voltage-gated channel, subfamily H (Eag-related), member 6
227	170738	Kcnh7	Potassium voltage-gated channel subfamily H member 7 (Ether-a-go-go-related gene potassium channel 3) (ERG-3) (Eag-related protein 3) (Ether-a-go-go-related protein 3) (Voltage-gated potassium channel subunit Kv11.3)
228	16518	Kcnj2	Inward rectifier potassium channel 2 (Inward rectifier K(+) channel Kir2.1) (IRK-1) (Potassium channel, inwardly rectifying subfamily J member 2)
229	72258	Kcnk10	Potassium channel, subfamily K, member 10
230	16536	Kcnq2	Potassium voltage-gated channel subfamily KQT member 2 (KQT-like 2) (Potassium channel subunit alpha KvLQT2) (Voltage-gated potassium channel subunit Kv7.2)
231	16542	Kdr	kinase insert domain protein receptor
232	16590	Kit	Mast/stem cell growth factor receptor Kit (SCFR) (EC 2.7.10.1) (Proto-oncogene c-Kit) (Tyrosine-protein kinase Kit) (CD antigen CD117)
233	98256	Kmo	Kynurenine 3-monooxygenase (EC 1.14.13.9) (Kynurenine 3-hydroxylase)
234	16653	Kras	GTPase KRas (EC 3.6.5.2) (K-Ras 2) (Ki-Ras) (c-K-ras) (c-Ki-ras) [Cleaved into: GTPase KRas, N-terminally processed]
235	76893	Lass2	Ceramide synthase 2 (CerS2) (EC 2.3.1.-) (LAG1 longevity assurance homolog 2) (Sphingosine N-acyltransferase CERS2) (EC 2.3.1.24) (Translocating chain-associating membrane protein homolog 3) (TRAM homolog 3)

236	545975	Lass3	Ceramide synthase 3 (CerS3) (mCerS3) (EC 2.3.1.-) (Dihydroceramide synthase 3) (LAG1 longevity assurance homolog 3) (Sphingosine N-acyltransferase CERS3) (EC 2.3.1.24)
237	71949	Lass5	Ceramide synthase 5 (CerS5) (EC 2.3.1.-) (LAG1 longevity assurance homolog 5) (Sphingosine N-acyltransferase CERS5) (EC 2.3.1.24) (Translocating chain-associating membrane protein homolog 4) (TRAM homolog 4)
238	241447	Lass6	Ceramide synthase 6 (CerS6) (EC 2.3.1.-) (LAG1 longevity assurance homolog 6)
239	16818	Lck	Proto-oncogene tyrosine-protein kinase LCK (EC 2.7.10.2) (Leukocyte C-terminal Src kinase) (LSK) (Lymphocyte cell-specific protein-tyrosine kinase) (p56-LCK)
240	16891	Lipg	Endothelial lipase (EC 3.1.1.3) (Endothelial cell-derived lipase) (EDL) (Phospholipase A1) (EC 3.1.1.32)
241	14745	Lpar1	Lysophosphatidic acid receptor 1 (LPA receptor 1) (LPA-1) (Lysophosphatidic acid receptor Edg-2) (Rec1.3) (VZG-1)
242	76113	Lpo	Lactoperoxidase (EC 1.11.1.7)
243	16993	Lta4h	Leukotriene A-4 hydrolase (LTA-4 hydrolase) (EC 3.3.2.6) (Leukotriene A(4) hydrolase) (Tripeptide aminopeptidase LTA4H) (EC 3.4.11.4)
244	17096	Lyn	Tyrosine-protein kinase Lyn (EC 2.7.10.2) (V-yes-1 Yamaguchi sarcoma viral related oncogene homolog) (p53Lyn) (p56Lyn)
245	17136	Mag	Myelin-associated glycoprotein (Siglec-4a)
246	17161	Maoa	Amine oxidase [flavin-containing] A (EC 1.4.3.4) (Monoamine oxidase type A) (MAO-A)
247	109731	Maob	Amine oxidase [flavin-containing] B (EC 1.4.3.4) (Monoamine oxidase type B) (MAO-B)
248	26395	Map2k1	Dual specificity mitogen-activated protein kinase kinase 1 (MAP kinase kinase 1) (MAPKK 1) (EC 2.7.12.2) (ERK activator kinase 1) (MAPK/ERK kinase 1) (MEK 1)
249	26403	Map3k11	Mitogen-activated protein kinase kinase kinase 11 (EC 2.7.11.25) (Mixed lineage kinase 3)
250	26413	Mapk1	Mitogen-activated protein kinase 1 (MAP kinase 1) (MAPK 1) (EC 2.7.11.24) (ERT1) (Extracellular signal-regulated kinase 2) (ERK-2) (MAP kinase isoform p42) (p42-MAPK) (Mitogen-activated protein kinase 2) (MAP kinase 2) (MAPK 2)
251	19094	Mapk11	Mitogen-activated protein kinase 11 (MAP kinase 11) (MAPK 11) (EC 2.7.11.24) (Mitogen-activated protein kinase p38 beta) (MAP kinase p38 beta) (p38B)
252	26416	Mapk14	Mitogen-activated protein kinase 14 (MAP kinase 14) (MAPK 14) (EC 2.7.11.24) (CRK1) (Mitogen-activated

protein kinase p38 alpha) (MAP kinase p38 alpha)

253	26417	Mapk3	Mitogen-activated protein kinase 3 (MAP kinase 3) (MAPK 3) (EC 2.7.11.24) (ERT2) (Extracellular signal-regulated kinase 1) (ERK-1) (Insulin-stimulated MAP2 kinase) (MAP kinase isoform p44) (p44-MAPK) (MNK1) (Microtubule-associated protein 2 kinase) (p44-ERK1)
254	17164	Mapkapk2	MAP kinase-activated protein kinase 2 (MAPK-activated protein kinase 2) (MAPKAP kinase 2) (MAPKAP-K2) (MAPKAPK-2) (MK-2) (MK2) (EC 2.7.11.1)
255	17199	Mc1r	Melanocyte-stimulating hormone receptor (MSH-R) (Melanocortin receptor 1) (MC1-R)
256	17201	Mc3r	Melanocortin receptor 3 (MC3-R)
257	17202	Mc4r	Melanocortin receptor 4 (MC4-R)
258	207911	Mchr1	Melanin-concentrating hormone receptor 1 (MCH receptor 1) (MCH-R1) (MCHR-1) (G-protein coupled receptor 24) (MCH-1R) (MCH1R) (MCHR) (SLC-1) (Somatostatin receptor-like protein)
259	17210	Mcl1	Induced myeloid leukemia cell differentiation protein Mcl-1 homolog (Bcl-2-related protein EAT/mcl1)
260	17242	Mdk	Midkine (MK) (Retanoic acid-responsive protein) (Retinoic acid-induced differentiation factor)
261	17246	Mdm2	E3 ubiquitin-protein ligase Mdm2 (EC 2.3.2.27) (Double minute 2 protein) (Oncoprotein Mdm2) (RING-type E3 ubiquitin transferase Mdm2) (p53-binding protein Mdm2)
262	56307	Metap2	Methionine aminopeptidase 2 (MAP 2) (MetAP 2) (EC 3.4.11.18) (Initiation factor 2-associated 67 kDa glycoprotein) (p67) (p67eIF2) (Peptidase M)
263	23945	Mgll	Monoglyceride lipase (MGL) (EC 3.1.1.23) (Monoacylglycerol lipase) (MAGL)
264	17319	Mif	Macrophage migration inhibitory factor (MIF) (EC 5.3.2.1) (Delayed early response protein 6) (DER6) (Glycosylation-inhibiting factor) (GIF) (L-dopachrome isomerase) (L-dopachrome tautomerase) (EC 5.3.3.12) (Phenylpyruvate tautomerase)
265	17380	Mme	Neprilysin (EC 3.4.24.11) (Atriopeptidase) (Enkephalinase) (Neutral endopeptidase 24.11) (NEP) (Neutral endopeptidase) (Skin fibroblast elastase) (SFE) (CD antigen CD10)
266	17386	Mmp13	Collagenase 3 (EC 3.4.24.-) (Matrix metalloproteinase-13) (MMP-13)
267	17390	Mmp2	72 kDa type IV collagenase (EC 3.4.24.24) (72 kDa gelatinase) (Gelatinase A) (Matrix metalloproteinase-2)

			(MMP-2) [Cleaved into: PEX]
268	17395	Mmp9	Matrix metalloproteinase-9 (MMP-9) (EC 3.4.24.35) (92 kDa gelatinase) (92 kDa type IV collagenase) (Gelatinase B) (GELB)
269	404242	Mrgprx1	Mas-related G-protein coupled receptor member X1 (Mas-related G-protein coupled receptor member C11) (Sensory neuron-specific G-protein coupled receptor 1)
270	20288	Msr1	Macrophage scavenger receptor types I and II (Macrophage acetylated LDL receptor I and II) (Scavenger receptor type A) (SR-A) (CD antigen CD204)
271	19882	Mst1r	Macrophage-stimulating protein receptor (MSP receptor) (EC 2.7.10.1) (Stem cell-derived tyrosine kinase) (p185-Ron) (CD antigen CD136) [Cleaved into: Macrophage-stimulating protein receptor alpha chain; Macrophage-stimulating protein receptor beta chain]
272	66902	Mtap	S-methyl-5'-thioadenosine phosphorylase (EC 2.4.2.28) (5'-methylthioadenosine phosphorylase) (MTA phosphorylase) (MTAP) (MTAPase)
273	56717	Mtor	Serine/threonine-protein kinase mTOR (EC 2.7.11.1) (FK506-binding protein 12-rapamycin complex-associated protein 1) (FKBP12-rapamycin complex-associated protein) (Mammalian target of rapamycin) (mTOR) (Mechanistic target of rapamycin) (Rapamycin target protein 1) (RAPT1)
274	210009	Mtrr	Methionine synthase reductase (MSR) (EC 1.16.1.8) (Aquacobalamin reductase) (AqCbl reductase) (EC 1.16.1.-)
275	17833	Muc5ac	Mucin 5, subtypes A and C, tracheobronchial/gastric
276	59027	Nampt	Nicotinamide phosphoribosyltransferase (NAmpRTase) (Nampt) (EC 2.4.2.12) (Pre-B-cell colony-enhancing factor 1 homolog) (PBEF) (Visfatin)
277	17961	Nat2	Arylamine N-acetyltransferase 2 (EC 2.3.1.5) (Arylamide acetylase 2) (N-acetyltransferase type 2) (NAT-2)
278	54446	Nfat5	Nuclear factor of activated T-cells 5 (NF-AT5) (Rel domain-containing transcription factor NFAT5) (T-cell transcription factor NFAT5)
279	18024	Nfe2l2	Nuclear factor erythroid 2-related factor 2 (NF-E2-related factor 2) (NFE2-related factor 2) (Nuclear factor, erythroid derived 2, like 2)
280	216799	Nlrp3	NACHT, LRR and PYD domains-containing protein 3 (Cold autoinflammatory syndrome 1 protein homolog) (Cryopyrin) (Mast cell maturation-associated-inducible protein 1) (PYRIN-containing APAF1-like protein 1)

281	18125	Nos1	Nitric oxide synthase, brain (EC 1.14.13.39) (Constitutive NOS) (NC-NOS) (NOS type I) (Neuronal NOS) (N-NOS) (nNOS) (Peptidyl-cysteine S-nitrosylase NOS1) (bNOS)
282	18126	Nos2	Nitric oxide synthase, inducible (EC 1.14.13.39) (Inducible NO synthase) (Inducible NOS) (iNOS) (Macrophage NOS) (MAC-NOS) (NOS type II) (Peptidyl-cysteine S-nitrosylase NOS2)
283	18127	Nos3	Nitric oxide synthase, endothelial (EC 1.14.13.39) (Constitutive NOS) (cNOS) (EC-NOS) (Endothelial NOS) (eNOS) (NOS type III) (NOSIII)
284	77583	Notum	Palmitoleoyl-protein carboxylesterase NOTUM (EC 3.1.1.98)
285	226304	Npbwr1	Neuropeptides B/W receptor type 1 (G-protein coupled receptor 7)
286	237636	Npc1l1	NPC1 like intracellular cholesterol transporter 1
287	18168	Npy5r	Neuropeptide Y receptor type 5 (NPY5-R) (NPY-Y5 receptor) (NPYY5-R) (Y5 receptor)
288	12355	Nr1i3	Nuclear receptor subfamily 1 group I member 3 (Constitutive androstane receptor) (CAR) (Orphan nuclear receptor MB67)
289	14815	Nr3c1	nuclear receptor subfamily 3, group C, member 1
290	18216	Ntsr1	Neurotensin receptor type 1 (NT-R-1) (NTR1)
291	108078	Olr1	Oxidized low-density lipoprotein receptor 1 (Ox-LDL receptor 1) (Lectin-like oxidized LDL receptor 1) (LOX-1) (Lectin-like oxLDL receptor 1) (Lectin-type oxidized LDL receptor 1) [Cleaved into: Oxidized low-density lipoprotein receptor 1, soluble form]
292	18386	Oprd1	Delta-type opioid receptor (D-OR-1) (DOR-1) (K56) (MSL-2)
293	18387	Oprk1	Kappa-type opioid receptor (K-OR-1) (KOR-1) (MSL-1)
294	18390	Oprm1	Mu-type opioid receptor (M-OR-1) (MOR-1)
295	231602	P2rx2	P2X purinoceptor 2 (P2X2) (ATP receptor) (Purinergic receptor)
296	18439	P2rx7	P2X purinoceptor 7 (P2X7) (ATP receptor) (P2Z receptor) (Purinergic receptor)
297	212503	Paox	Peroxisomal N(1)-acetyl-spermine/spermidine oxidase (EC 1.5.3.13) (Polyamine oxidase)
298	11545	Parp1	poly (ADP-ribose) polymerase family, member 1
299	11546	Parp2	Poly [ADP-ribose] polymerase 2 (PARP-2) (mPARP-2) (EC 2.4.2.30) (ADP-ribosyltransferase diphtheria toxin-like 2) (ARTD2) (DNA ADP-ribosyltransferase PARP2) (EC 2.4.2.-) (NAD(+) ADP-ribosyltransferase 2) (ADPRT-2) (Poly[ADP-ribose] synthase 2) (pADPRT-2) (Protein poly-ADP-ribosyltransferase PARP2) (EC 2.4.2.-)

300	23984	Pde10a	cAMP and cAMP-inhibited cGMP 3',5'-cyclic phosphodiesterase 10A (EC 3.1.4.17) (EC 3.1.4.35)
301	18578	Pde4b	Phosphodiesterase (EC 3.1.4.-)
302	18583	Pde7a	High affinity cAMP-specific 3',5'-cyclic phosphodiesterase 7A (EC 3.1.4.53) (P2A)
303	18595	Pdgfra	Platelet-derived growth factor receptor alpha (PDGF-R-alpha) (PDGFR-alpha) (EC 2.7.10.1) (Alpha platelet-derived growth factor receptor) (Alpha-type platelet-derived growth factor receptor) (CD140 antigen-like family member A) (Platelet-derived growth factor alpha receptor) (CD antigen CD140a)
304	18596	Pdgfrb	Platelet-derived growth factor receptor beta (PDGF-R-beta) (PDGFR-beta) (EC 2.7.10.1) (Beta platelet-derived growth factor receptor) (Beta-type platelet-derived growth factor receptor) (CD140 antigen-like family member B) (Platelet-derived growth factor receptor 1) (PDGFR-1) (CD antigen CD140b)
305	56744	Pf4	Platelet factor 4 (PF-4) (C-X-C motif chemokine 4)
306	18706	Pik3ca	Phosphatidylinositol 4,5-bisphosphate 3-kinase catalytic subunit alpha isoform (PI3-kinase subunit alpha) (PI3K-alpha) (PI3Kalpha) (PtdIns-3-kinase subunit alpha) (EC 2.7.1.153) (Phosphatidylinositol 4,5-bisphosphate 3-kinase 110 kDa catalytic subunit alpha) (PtdIns-3-kinase subunit p110-alpha) (p110alpha) (Phosphoinositide-3-kinase catalytic alpha polypeptide) (Serine/threonine protein kinase PIK3CA) (EC 2.7.11.1)
307	30955	Pik3cg	Phosphatidylinositol 4,5-bisphosphate 3-kinase catalytic subunit gamma isoform (PI3-kinase subunit gamma) (PI3K-gamma) (PI3Kgamma) (PtdIns-3-kinase subunit gamma) (EC 2.7.1.153) (Phosphatidylinositol 4,5-bisphosphate 3-kinase 110 kDa catalytic subunit gamma) (PtdIns-3-kinase subunit p110-gamma) (p110gamma) (Phosphoinositide-3-kinase catalytic gamma polypeptide) (Serine/threonine protein kinase PIK3CG) (EC 2.7.11.1) (p120-PI3K)
308	26565	Pla2g10	Group 10 secretory phospholipase A2 (EC 3.1.1.4) (Group X secretory phospholipase A2) (GX sPLA2) (sPLA2-X) (Phosphatidylcholine 2-acylhydrolase 10)
309	18778	Pla2g1b	Phospholipase A2 (EC 3.1.1.4) (Group IB phospholipase A2) (PLA2-Ib) (Phosphatidylcholine 2-acylhydrolase 1B)
310	18780	Pla2g2a	Phospholipase A2, membrane associated (EC 3.1.1.4) (Enhancing factor) (EF) (GIIC sPLA2) (Group IIA phospholipase A2) (Phosphatidylcholine 2-acylhydrolase 2A)

311	26970	Pla2g2e	Group IIE secretory phospholipase A2 (GIIIE sPLA2) (sPLA2-IIIE) (EC 3.1.1.4) (Phosphatidylcholine 2-acylhydrolase 2E)
312	18784	Pla2g5	Phospholipase A2 group V (EC 3.1.1.4) (PLA2-10) (Phosphatidylcholine 2-acylhydrolase 5)
313	18792	Plau	Urokinase-type plasminogen activator (U-plasminogen activator) (uPA) (EC 3.4.21.73) [Cleaved into: Urokinase-type plasminogen activator long chain A; Urokinase-type plasminogen activator short chain A; Urokinase-type plasminogen activator chain B]
314	18815	Plg	Plasminogen (EC 3.4.21.7) [Cleaved into: Plasmin heavy chain A; Activation peptide; Angiostatin; Plasmin heavy chain A, short form; Plasmin light chain B]
315	18970	Polb	DNA polymerase beta (EC 2.7.7.7) (EC 4.2.99.-)
316	18984	Por	NADPH--cytochrome P450 reductase (CPR) (P450R) (EC 1.6.2.4)
317	19013	Ppara	Peroxisome proliferator-activated receptor alpha (PPAR-alpha) (Nuclear receptor subfamily 1 group C member 1)
318	19015	Ppard	Peroxisome proliferator-activated receptor delta (PPAR-delta) (Nuclear hormone receptor 1) (NUC1) (Nuclear receptor subfamily 1 group C member 2) (Peroxisome proliferator-activated receptor beta) (PPAR-beta)
319	19016	Pparg	Peroxisome proliferator-activated receptor gamma (PPAR-gamma) (Nuclear receptor subfamily 1 group C member 3)
320	72590	Ppme1	Protein phosphatase methylesterase 1 (PME-1) (EC 3.1.1.89)
321	72461	Prcp	Lysosomal Pro-X carboxypeptidase (EC 3.4.16.2) (Proline carboxypeptidase) (Prolylcarboxypeptidase) (PRCP)
322	19072	Prep	Prolyl endopeptidase (PE) (EC 3.4.21.26) (Post-proline cleaving enzyme)
323	18749	Prkacb	cAMP-dependent protein kinase catalytic subunit beta (PKA C-beta) (EC 2.7.11.11)
324	18753	Prkcd	Protein kinase C delta type (EC 2.7.11.13) (Tyrosine-protein kinase PRKCD) (EC 2.7.10.2) (nPKC-delta) [Cleaved into: Protein kinase C delta type regulatory subunit; Protein kinase C delta type catalytic subunit (Sphingosine-dependent protein kinase-1) (SDK1)]
325	18755	Prkch	Protein kinase C eta type (EC 2.7.11.13) (PKC-L) (nPKC-eta)
326	18761	Prkcq	Protein kinase C theta type (EC 2.7.11.13) (nPKC-theta)
327	19090	Prkdc	DNA-dependent protein kinase catalytic subunit (DNA-PK catalytic subunit) (DNA-PKcs) (EC 2.7.11.1) (p460)
328	19152	Prtn3	Myeloblastin (EC 3.4.21.76) (Proteinase 3) (PR-3)

329	19204	Ptafr	Platelet-activating factor receptor (PAF-R) (PAFr)
330	19211	Pten	Phosphatidylinositol 3,4,5-trisphosphate 3-phosphatase and dual-specificity protein phosphatase PTEN (EC 3.1.3.16) (EC 3.1.3.48) (EC 3.1.3.67) (Mutated in multiple advanced cancers 1) (Phosphatase and tensin homolog)
331	19214	Ptgdr	Prostaglandin D2 receptor (PGD receptor) (PGD2 receptor) (Prostanoid DP receptor)
332	14764	Ptgdr2	Prostaglandin D2 receptor 2 (Chemoattractant receptor-homologous molecule expressed on Th2 cells) (G-protein coupled receptor 44) (CD antigen CD294)
333	19215	Ptgds	Prostaglandin-H2 D-isomerase (EC 5.3.99.2) (Glutathione-independent PGD synthase) (Lipocalin-type prostaglandin-D synthase) (Prostaglandin-D2 synthase) (L-PGDS) (PGD2 synthase) (PGDS2)
334	19216	Ptger1	Prostaglandin E2 receptor EP1 subtype (PGE receptor EP1 subtype) (PGE2 receptor EP1 subtype) (Prostanoid EP1 receptor)
335	19217	Ptger2	Prostaglandin E2 receptor EP2 subtype (PGE receptor EP2 subtype) (PGE2 receptor EP2 subtype) (Prostanoid EP2 receptor)
336	19218	Ptger3	prostaglandin E receptor 3 (subtype EP3)
337	19219	Ptger4	Prostaglandin E2 receptor EP4 subtype (PGE receptor EP4 subtype) (PGE2 receptor EP4 subtype) (Prostanoid EP4 receptor)
338	19224	Ptgs1	Prostaglandin G/H synthase 1 (EC 1.14.99.1) (Cyclooxygenase-1) (COX-1) (Prostaglandin H2 synthase 1) (PGH synthase 1) (PGHS-1) (PHS 1) (Prostaglandin-endoperoxide synthase 1)
339	19225	Ptgs2	Prostaglandin G/H synthase 2 (EC 1.14.99.1) (Cyclooxygenase-2) (COX-2) (Glucocorticoid-regulated inflammatory cyclooxygenase) (Gripghs) (Macrophage activation-associated marker protein P71/73) (PES-2) (PHS II) (Prostaglandin H2 synthase 2) (PGH synthase 2) (PGHS-2) (Prostaglandin-endoperoxide synthase 2) (TIS10 protein)
340	19246	Ptpn1	Tyrosine-protein phosphatase non-receptor type 1 (EC 3.1.3.48) (Protein-tyrosine phosphatase 1B) (PTP-1B) (Protein-tyrosine phosphatase HA2) (PTP-HA2)
341	69675	Pxdn	Peroxidasin homolog (EC 1.11.1.7)
342	110095	Pygl	Glycogen phosphorylase, liver form (EC 2.4.1.1)
343	110157	Raf1	RAF proto-oncogene serine/threonine-protein kinase (EC 2.7.11.1) (Proto-oncogene c-RAF) (cRaf) (Raf-1)
344	107746	Rapgef1	Rap guanine nucleotide exchange factor (GEF) 1

345	56508	Rapgef4	Rap guanine nucleotide exchange factor 4 (Exchange factor directly activated by cAMP 2) (Exchange protein directly activated by cAMP 2) (EPAC 2) (cAMP-dependent Rap1 guanine-nucleotide exchange factor) (cAMP-regulated guanine nucleotide exchange factor II) (cAMP-GEFII)
346	19401	Rara	Retinoic acid receptor alpha (RAR-alpha) (Nuclear receptor subfamily 1 group B member 1)
347	218772	Rarb	Retinoic acid receptor beta (RAR-beta) (Nuclear receptor subfamily 1 group B member 2)
348	19411	Rarg	Retinoic acid receptor gamma (RAR-gamma) (Nuclear receptor subfamily 1 group B member 3)
349	71336	Rbks	Ribokinase (RK) (EC 2.7.1.15)
350	19701	Ren1	Renin-1 (EC 3.4.23.15) (Angiotensinogenase) (Kidney renin)
351	19713	Ret	Proto-oncogene tyrosine-protein kinase receptor Ret (EC 2.7.10.1) (Proto-oncogene c-Ret) [Cleaved into: Soluble RET kinase fragment; Extracellular cell-membrane anchored RET cadherin 120 kDa fragment]
352	19766	Ripk1	Receptor-interacting serine/threonine-protein kinase 1 (EC 2.7.11.1) (Cell death protein RIP) (Receptor-interacting protein 1) (RIP-1)
353	215615	Rnpep	Aminopeptidase B (AP-B) (EC 3.4.11.6) (Arginine aminopeptidase) (Arginyl aminopeptidase) (Cytosol aminopeptidase IV)
354	19885	Rorc	Nuclear receptor ROR-gamma (Nuclear receptor RZR-gamma) (Nuclear receptor subfamily 1 group F member 3) (RAR-related orphan receptor C) (Retinoid-related orphan receptor-gamma) (Thymus orphan receptor) (TOR)
355	19886	Ros1	Proto-oncogene tyrosine-protein kinase ROS (EC 2.7.10.1) (Proto-oncogene c-Ros) (Proto-oncogene c-Ros-1) (Receptor tyrosine kinase c-ros oncogene 1) (c-Ros receptor tyrosine kinase)
356	20112	Rps6ka2	Ribosomal protein S6 kinase alpha-2 (S6K-alpha-2) (EC 2.7.11.1) (90 kDa ribosomal protein S6 kinase 2) (p90-RSK 2) (p90RSK2) (MAP kinase-activated protein kinase 1c) (MAPK-activated protein kinase 1c) (MAPKAP kinase 1c) (MAPKAPK-1c) (Protein-tyrosine kinase Mpk-9) (Ribosomal S6 kinase 3) (RSK-3) (pp90RSK3)
357	110651	Rps6ka3	Ribosomal protein S6 kinase alpha-3 (S6K-alpha-3) (EC 2.7.11.1) (90 kDa ribosomal protein S6 kinase 3) (p90-RSK 3) (p90RSK3) (MAP kinase-activated protein kinase 1b) (MAPK-activated protein kinase 1b) (MAPKAP kinase 1b)

			(MAPKAPK-1b) (Ribosomal S6 kinase 2) (RSK-2) (pp90RSK2)
358	20181	Rxra	Retinoic acid receptor RXR-alpha (Nuclear receptor subfamily 2 group B member 1) (Retinoid X receptor alpha)
359	20182	Rxrb	Retinoic acid receptor RXR-beta (MHC class I regulatory element-binding protein H-2RIIBP) (Nuclear receptor subfamily 2 group B member 2) (Retinoid X receptor beta)
360	20183	Rxrg	Retinoic acid receptor RXR-gamma (Nuclear receptor subfamily 2 group B member 3) (Retinoid X receptor gamma)
361	20203	S100b	Protein S100-B (S-100 protein beta chain) (S-100 protein subunit beta) (S100 calcium-binding protein B)
362	13609	S1pr1	Sphingosine 1-phosphate receptor 1 (S1P receptor 1) (S1P1) (Endothelial differentiation G-protein coupled receptor 1) (Lysophospholipid receptor B1) (Sphingosine 1-phosphate receptor Edg-1) (S1P receptor Edg-1) (CD antigen CD363)
363	20778	Scarb1	Scavenger receptor class B member 1 (SRB1) (SR-BI)
364	20249	Scd1	Acyl-CoA desaturase 1 (EC 1.14.19.1) (Delta(9)-desaturase 1) (Delta-9 desaturase 1) (Fatty acid desaturase 1) (Stearoyl-CoA desaturase 1)
365	20264	Scn10a	Sodium channel protein type 10 subunit alpha (Peripheral nerve sodium channel 3) (PN3) (Sensory neuron sodium channel) (Sodium channel protein type X subunit alpha) (Voltage-gated sodium channel subunit alpha Nav1.8)
366	20266	Scn1b	Sodium channel subunit beta-1
367	72821	Scn2b	Sodium channel subunit beta-2
368	235281	Scn3b	Sodium channel subunit beta-3
369	399548	Scn4b	Sodium channel subunit beta-4
370	20271	Scn5a	Sodium channel protein type 5 subunit alpha (Sodium channel protein cardiac muscle subunit alpha) (Sodium channel protein type V subunit alpha) (Voltage-gated sodium channel subunit alpha Nav1.5) (mH1)
371	20273	Scn8a	Sodium channel protein type 8 subunit alpha (Sodium channel protein type VIII subunit alpha) (Voltage-gated sodium channel subunit alpha Nav1.6)
372	20274	Scn9a	Sodium channel protein type 9 subunit alpha (Peripheral sodium channel 1) (PN1) (Sodium channel protein type IX subunit alpha) (Voltage-gated sodium channel subunit alpha Nav1.7)
373	20276	Scn11a	Amiloride-sensitive sodium channel subunit alpha (Alpha-NaCH) (Epithelial Na(+)) channel subunit alpha) (Alpha-

			ENaC) (Nonvoltage-gated sodium channel 1 subunit alpha) (SCNEA)
374	20343	Sell	L-selectin (CD62 antigen-like family member L) (Leukocyte adhesion molecule 1) (LAM-1) (Leukocyte-endothelial cell adhesion molecule 1) (LECAM1) (Lymph node homing receptor) (Lymphocyte antigen 22) (Ly-22) (Lymphocyte surface MEL-14 antigen) (CD antigen CD62L) P-selectin (CD62 antigen-like family member P) (Granule membrane protein 140) (GMP-140) (Leukocyte-endothelial cell adhesion molecule 3) (LECAM3) (Platelet activation dependent granule-external membrane protein) (PADGEM) (CD antigen CD62P)
375	20344	Selp	Sphingosine-1-phosphate lyase 1 (S1PL) (SP-lyase 1) (SPL 1) (mSPL) (EC 4.1.2.27) (Sphingosine-1-phosphate aldolase)
376	20397	Sgpl1	Sonic hedgehog protein (SHH) (HHG-1) (Shh unprocessed N-terminal signaling and C-terminal autoprocessing domains) (ShhNC) [Cleaved into: Sonic hedgehog protein N-product (ShhN) (Shh N-terminal processed signaling domains) (ShhNp) (Sonic hedgehog protein 19 kDa product)]
377	20423	Shh	Sigma non-opioid intracellular receptor 1 (Sigma 1-type opioid receptor) (Sigma1-receptor) (Sigma1R)
378	18391	Sigmar1	NAD-dependent protein deacetylase sirtuin-1 (EC 2.3.1.286) (NAD-dependent protein deacylase sirtuin-1) (EC 2.3.1.-) (Regulatory protein SIR2 homolog 1) (SIR2-like protein 1) (SIR2alpha) (Sir2) (mSIR2a) [Cleaved into: SirtT1 75 kDa fragment (75SirT1)]
379	93759	Sirt1	sucrase isomaltase (alpha-glucosidase)
380	69983	Sis	Ileal sodium/bile acid cotransporter (Apical sodium-dependent bile acid transporter) (ASBT) (Ileal Na(+)/bile acid cotransporter) (IBAT) (ISBT) (Na(+)-dependent ileal bile acid transporter) (Sodium/taurocholate cotransporting polypeptide, ileal) (Solute carrier family 10 member 2)
381	20494	Slc10a2	Solute carrier family 13 member 5 (Na+)/citrate cotransporter) (NaCT) (Sodium-coupled citrate transporter) (Sodium-dependent citrate transporter)
382	237831	Slc13a5	Solute carrier family 22 member 20 (Organic anion transporter 6)
383	381203	Slc22a20	Long-chain fatty acid transport protein 1 (FATP-1) (Fatty acid transport protein 1) (EC 6.2.1.15) (Fatty acid transport protein) (Solute carrier family 27 member 1)
384	26457	Slc27a1	Multidrug and toxin extrusion protein 1 (MATE-1)
385	67472	Slc47a1	

			(mMATE-1) (Solute carrier family 47 member 1)
386	20537	Slc5a1	SGLT1 protein (Sodium/glucose cotransporter 1) (Solute carrier family 5 (Sodium/glucose cotransporter), member 1)
387	246787	Slc5a2	Sodium/glucose cotransporter 2 (Na(+)/glucose cotransporter 2) (Low affinity sodium-glucose cotransporter) (Solute carrier family 5 member 2)
388	63993	Slc5a7	High affinity choline transporter 1 (Hemicholinium-3-sensitive choline transporter) (CHT) (Solute carrier family 5 member 7)
389	232333	Slc6a1	Sodium- and chloride-dependent GABA transporter 1 (GAT-1) (Solute carrier family 6 member 1)
390	243616	Slc6a11	Sodium- and chloride-dependent GABA transporter 3 (GAT-3) (Sodium- and chloride-dependent GABA transporter 4) (GAT-4) (Solute carrier family 6 member 11)
391	14411	Slc6a12	solute carrier family 6 (neurotransmitter transporter, betaine/GABA), member 12
392	14412	Slc6a13	Sodium- and chloride-dependent GABA transporter 2 (GAT-2) (Sodium- and chloride-dependent GABA transporter 3) (GAT-3) (Solute carrier family 6 member 13)
393	20538	Slc6a2	Sodium-dependent noradrenaline transporter (Norepinephrine transporter) (NET) (Solute carrier family 6 member 2)
394	13162	Slc6a3	Sodium-dependent dopamine transporter (DA transporter) (DAT) (Solute carrier family 6 member 3)
395	15567	Slc6a4	Sodium-dependent serotonin transporter (SERT) (5HT transporter) (5HTT) (Solute carrier family 6 member 4)
396	14664	Slc6a9	Sodium- and chloride-dependent glycine transporter 1 (GlyT-1) (GlyT1) (Solute carrier family 6 member 9)
397	20874	Slk	STE20-like serine/threonine-protein kinase (STE20-like kinase) (mSLK) (EC 2.7.11.1) (Etk4) (STE20-related kinase) (STE20-related kinase) (Serine/threonine-protein kinase 2)
398	319757	Smo	Smoothed homolog (SMO)
399	20652	Soat1	Sterol O-acyltransferase 1 (EC 2.3.1.26) (Acyl-coenzyme A:cholesterol acyltransferase 1) (ACAT-1) (Cholesterol acyltransferase 1)
400	20698	Sphk1	Sphingosine kinase 1 (SK 1) (SPK 1) (EC 2.7.1.91) (Acetyltransferase SPHK1) (EC 2.3.1.-)
401	56632	Sphk2	Sphingosine kinase 2 (SK 2) (SPK 2) (EC 2.7.1.91)
402	20606	Sstr2	Somatostatin receptor type 2 (SS-2-R) (SS2-R) (SS2R)

			(SRIF-1)
403	20607	Sstr3	Somatostatin receptor type 3 (SS-3-R) (SS3-R) (SS3R) (SSR-28)
404	19143	St14	Suppressor of tumorigenicity 14 protein homolog (EC 3.4.21.109) (Epithin) (Serine protease 14)
405	20848	Stat3	Signal transducer and activator of transcription 3 (Acute-phase response factor)
406	20852	Stat6	Signal transducer and transcription activator 6
407	111174	Taar1	Trace amine-associated receptor 1 (TaR-1) (Trace amine receptor 1)
408	21336	Tacr1	Substance-P receptor (SPR) (NK-1 receptor) (NK-1R) (Tachykinin receptor 1)
409	21337	Tacr2	Substance-K receptor (SKR) (NK-2 receptor) (NK-2R) (Neurokinin A receptor) (Tachykinin receptor 2)
410	387343	Tas2r109	Taste receptor type 2 member 109 (T2R109) (mT2R62)
411	387344	Tas2r110	Taste receptor type 2 member 110 (T2R110) (mT2r57) (STC 9-1)
412	387345	Tas2r113	Taste receptor type 2 member 113 (T2R113) (mT2R58)
413	112408	Tas2r116	Taste receptor type 2 member 116 (T2R116) (TRB1) (mT2R56) (TRB4)
414	353166	Tas2r117	Taste receptor type 2 member 117 (T2R117) (mT2R54)
415	387349	Tas2r121	Taste receptor type 2 member 13 (T2R13) (Taste receptor type 2 member 121) (T2R121) (mT2R48)
416	387352	Tas2r125	Taste receptor type 2 member 125 (T2R125) (mT2R59)
417	387355	Tas2r130	Taste receptor type 2 member 7 (T2R7) (STC7-4) (T2R30) (T2R6) (mT2R42)
418	387616	Tas2r140	Taste receptor type 2 member 140 (T2R140) (T2R13) (T2R8) (Taste receptor family B member 3) (mTRB3) (mTRB5) (Taste receptor type 2 member 40) (T2R40) (mT2r64)
419	56480	Tbk1	Serine/threonine-protein kinase TBK1 (EC 2.7.11.1) (T2K) (TANK-binding kinase 1)
420	21390	Tbxa2r	Thromboxane A2 receptor (TXA2-R) (Prostanoid TP receptor)
421	106759	Tcam1	TIR domain-containing adapter molecule 1 (TICAM-1) (Toll-interleukin-1 receptor domain-containing adapter protein inducing interferon beta) (TIR domain-containing adapter protein inducing IFN-beta)
422	56720	Tdo2	Tryptophan 2,3-dioxygenase (TDO) (EC 1.13.11.11) (Tryptamin 2,3-dioxygenase) (Tryptophan oxygenase) (TO) (TRPO) (Tryptophan pyrrolase) (Tryptophanase)
423	21812	Tgfr1	TGF-beta receptor type-1 (TGFR-1) (EC 2.7.11.30) (ESK2) (Transforming growth factor-beta receptor type I) (TGF-beta receptor type I) (TbetaR-I)

424	21817	Tgm2	Protein-glutamine gamma-glutamyltransferase 2 (EC 2.3.2.13) (Tissue transglutaminase) (Transglutaminase C) (TG(C)) (TGC) (TGase C) (Transglutaminase-2) (TGase-2)
425	21846	Tie1	Tyrosine-protein kinase receptor Tie-1 (EC 2.7.10.1)
426	21898	Tlr4	Toll-like receptor 4 (EC 3.2.2.6) (CD antigen CD284)
427	170743	Tlr7	Toll-like receptor 7
428	51789	Tnk2	Activated CDC42 kinase 1 (ACK-1) (EC 2.7.10.2) (EC 2.7.11.1) (Non-receptor protein tyrosine kinase Ack) (Tyrosine kinase non-receptor protein 2)
429	21951	Tnks	Poly [ADP-ribose] polymerase tankyrase-1 (EC 2.4.2.30) (ADP-ribosyltransferase diphtheria toxin-like 5) (ARTD5) (Protein poly-ADP-ribosyltransferase tankyrase-1) (EC 2.4.2.-) (TRF1-interacting ankyrin-related ADP-ribose polymerase 1) (Tankyrase I) (Tankyrase-1) (TANK1)
430	74493	Tnks2	Poly [ADP-ribose] polymerase tankyrase-2 (EC 2.4.2.30) (ADP-ribosyltransferase diphtheria toxin-like 6) (ARTD6) (Protein poly-ADP-ribosyltransferase tankyrase-2) (EC 2.4.2.-) (TNKS-2) (TRF1-interacting ankyrin-related ADP-ribose polymerase 2) (Tankyrase II) (Tankyrase-2) (TANK2)
431	21969	Top1	DNA topoisomerase 1 (EC 5.6.2.1) (DNA topoisomerase I)
432	21973	Top2a	DNA topoisomerase 2-alpha (EC 5.6.2.2) (DNA topoisomerase II, alpha isozyme)
433	21974	Top2b	DNA topoisomerase 2-beta (EC 5.6.2.2) (DNA topoisomerase II, beta isozyme)
434	234129	Tpte	Transmembrane phosphatase with tensin homology
435	68015	Trap1	Heat shock protein 75 kDa, mitochondrial (HSP 75) (TNFR-associated protein 1) (Tumor necrosis factor type 1 receptor-associated protein) (TRAP-1)
436	22045	Trhr	Thyrotropin-releasing hormone receptor (TRH-R) (Thyroliberin receptor)
437	170732	Trhr2	Thyroliberin receptor (Thyrotropin-releasing hormone receptor)
438	22059	Trp53	Cellular tumor antigen p53 (Tumor suppressor p53)
439	277328	Trpa1	Transient receptor potential cation channel subfamily A member 1 (Ankyrin-like with transmembrane domains protein 1) (Wasabi receptor)
440	171382	Trpm8	Transient receptor potential cation channel subfamily M member 8 (Long transient receptor potential channel 6) (LTrpC-6) (LTrpC6) (Transient receptor potential p8) (Trp-p8)
441	63872	Trpv4	Transient receptor potential cation channel subfamily V member 4 (TrpV4) (Osm-9-like TRP channel 4) (OTRPC4) (Transient receptor potential protein 12) (TRP12)

			(Vanilloid receptor-like channel 2) (Vanilloid receptor-like protein 2) (Vanilloid receptor-related osmotically-activated channel) (VR-OAC)
442	12257	Tspo	Translocator protein (Mitochondrial benzodiazepine receptor) (PKBS) (Peripheral-type benzodiazepine receptor) (PBR)
443	22114	Tssk1b	Testis-specific serine/threonine-protein kinase 1 (TSK-1) (TSK1) (TSSK-1) (Testis-specific kinase 1) (EC 2.7.11.1) (Serine/threonine-protein kinase 22A)
444	22122	Tsta3	GDP-L-fucose synthase (EC 1.1.1.271) (GDP-4-keto-6-deoxy-D-mannose-3,5-epimerase-4-reductase) (Protein FX) (Red cell NADP(H)-binding protein) (Transplantation antigen P35B) (Tum-P35B antigen)
445	22171	Tyms	Thymidylate synthase (TS) (TSase) (EC 2.1.1.45)
446	22173	Tyr	Tyrosinase (EC 1.14.18.1) (Albino locus protein) (Monophenol monooxygenase)
447	22178	Tyrp1	5,6-dihydroxyindole-2-carboxylic acid oxidase (DHICA oxidase) (EC 1.14.18.-) (Brown locus protein) (Catalase B) (Tyrosinase-related protein 1) (TRP) (TRP-1) (TRP1)
448	22234	Ugcg	Ceramide glucosyltransferase (EC 2.4.1.80) (GLCT-1) (Glucosylceramide synthase) (GCS) (UDP-glucose ceramide glucosyltransferase) (UDP-glucose:N-acylsphingosine D-glucosyltransferase)
449	71742	Ulk3	Serine/threonine-protein kinase ULK3 (EC 2.7.11.1) (Unc-51-like kinase 3)
450	22271	Upp1	Uridine phosphorylase 1 (UPase 1) (UrdPase 1) (EC 2.4.2.3)
451	217369	Uts2r	Urotensin-2 receptor (UR-2-R) (G-protein coupled receptor 14) (Urotensin II receptor) (UR-II-R)
452	67883	Uxs1	UDP-glucuronic acid decarboxylase 1 (EC 4.1.1.35) (UDP-glucuronate decarboxylase 1) (UGD) (UXS-1)
453	22329	Vcam1	vascular cell adhesion molecule 1
454	22339	Vegfa	Vascular endothelial growth factor A (VEGF-A) (Vascular permeability factor) (VPF)
455	22416	Wnt3a	Protein Wnt-3a
456	22637	Zap70	Tyrosine-protein kinase ZAP-70 (EC 2.7.10.2) (70 kDa zeta-chain associated protein) (Syk-related tyrosine kinase)
457	67235	Zfp94	Zinc finger protein 394 (Zinc finger protein 94) (Zfp-94) (Zinc finger protein with KRAB and SCAN domains 14)

Supplementary File 2

Table S2 Targets related to learning and memory

No.	Gene ID	Gene Symbol	Description
1	50518	Asip	Agouti-signaling protein (ASP) (Agouti coat color protein) (Agouti switch protein)
2	223921	Aaas	Aladin (Adracalin)
3	56321	Aatf	Protein AATF (Apoptosis-antagonizing transcription factor) (Rb-binding protein Che-1) (Traube protein)
4	27403	Abca7	ATP-binding cassette sub-family A member 7
5	329165	Abi2	Abl interactor 2 (Abelson interactor 2) (Abi-2) (Abl-

			binding protein 3) (AblBP3) (Arg-binding protein 1) (ArgBP1)
6	11352	Abl2	Tyrosine-protein kinase ABL2 (EC 2.7.10.2) (Abelson murine leukemia viral oncogene homolog 2) (Abelson tyrosine-protein kinase 2) (Abelson-related gene protein) (Tyrosine-protein kinase ARG)
7	109934	Abr	Active breakpoint cluster region-related protein
8	100705	Acacb	Acetyl-CoA carboxylase 2 (EC 6.4.1.2) (ACC-beta)
9	11363	Acadl	Long-chain specific acyl-CoA dehydrogenase, mitochondrial (LCAD) (EC 1.3.8.8)
10	11370	Acadvl	Very long-chain specific acyl-CoA dehydrogenase, mitochondrial (EC 1.3.8.9) (MVLCAD) (VLCAD)
11	60525	Acss2	Acetyl-coenzyme A synthetase, cytoplasmic (EC 6.2.1.1) (Acetate--CoA ligase) (Acetyl-CoA synthetase) (ACS) (AceCS) (Acetyl-CoA synthetase 1) (AceCS1) (Acyl-CoA synthetase short-chain family member 2) (Acyl-activating enzyme) (Propionate--CoA ligase) (EC 6.2.1.17)
12	83766	Actl6b	Actin-like protein 6B (53 kDa BRG1-associated factor B) (Actin-related protein Baf53b) (ArpN-alpha) (ArpNa) (BRG1-associated factor 53B) (BAF53B)
13	269275	Acvr1c	Activin receptor type-1C (EC 2.7.11.30) (Activin receptor type IC) (ACTR-IC) (Activin receptor-like kinase 7) (ALK-7)
14	11495	Adam2	Disintegrin and metalloproteinase domain-containing protein 2 (ADAM 2) (Fertilin subunit beta) (PH-30) (PH30) (PH30-beta)
15	94191	Adarb2	Double-stranded RNA-specific editase B2 (EC 3.5.-.-) (RNA-dependent adenosine deaminase 3) (RNA-editing deaminase 2) (RNA-editing enzyme 2) (dsRNA adenosine deaminase B2)
16	432530	Adcy1	Adenylate cyclase type 1 (EC 4.6.1.1) (ATP pyrophosphate-lyase 1) (Adenylate cyclase type I) (Adenylyl cyclase 1) (Ca(2+)/calmodulin-activated adenylyl cyclase)
17	104111	Adcy3	Adenylate cyclase type 3 (EC 4.6.1.1) (ATP pyrophosphate-lyase 3) (Adenylate cyclase type III) (AC-III) (Adenylate cyclase, olfactive type) (Adenylyl cyclase 3) (AC3)
18	11514	Adcy8	Adenylate cyclase type 8 (EC 4.6.1.1) (ATP pyrophosphate-lyase 8) (Adenylate cyclase type VIII) (Adenylyl cyclase 8) (Ca(2+)/calmodulin-activated adenylyl cyclase)
19	11519	Add2	Beta-adducin (Add97) (Erythrocyte adducin subunit beta)
20	27360	Add3	Gamma-adducin (Adducin-like protein 70)
21	210933	Adgrb3	Adhesion G protein-coupled receptor B3 (Brain-specific

			angiogenesis inhibitor 3)
22	77596	Adgrf1	Adhesion G-protein coupled receptor F1 (G protein-coupled receptor 110)
23	11538	Adnp	Activity-dependent neuroprotector homeobox protein (Activity-dependent neuroprotective protein)
24	11548	Adra1b	Alpha-1B adrenergic receptor (Alpha-1B adrenoreceptor) (Alpha-1B adrenoceptor)
25	11554	Adrb1	Beta-1 adrenergic receptor (Beta-1 adrenoreceptor) (Beta-1 adrenoceptor)
26	11555	Adrb2	Beta-2 adrenergic receptor (Beta-2 adrenoreceptor) (Beta-2 adrenoceptor)
27	14266	Aff2	AF4/FMR2 family member 2 (FMR2P) (Fragile X mental retardation protein 2 homolog) (Protein FMR-2) (Protein OX19)
28	11596	Ager	Advanced glycosylation end product-specific receptor (Receptor for advanced glycosylation end products)
29	68262	Agpat4	1-acyl-sn-glycerol-3-phosphate acyltransferase delta (EC 2.3.1.51) (1-acylglycerol-3-phosphate O-acyltransferase 4) (1-AGP acyltransferase 4) (1-AGPAT 4) (Lysophosphatidic acid acyltransferase delta) (LPAAT-delta)
30	11606	Agt	Angiotensinogen (Serpine A8) [Cleaved into: Angiotensin-1 (Angiotensin 1-10) (Angiotensin I) (Ang I); Angiotensin-2 (Angiotensin 1-8) (Angiotensin II) (Ang II); Angiotensin-3 (Angiotensin 2-8) (Angiotensin III) (Ang III) (Des-Asp[1]-angiotensin II); Angiotensin-4 (Angiotensin 3-8) (Angiotensin IV) (Ang IV); Angiotensin 1-9; Angiotensin 1-7; Angiotensin 1-5; Angiotensin 1-4]
31	238276	Akap5	A-kinase anchor protein 5 (AKAP-5) (A-kinase anchor protein 150 kDa) (AKAP 150) (P150) (cAMP-dependent protein kinase regulatory subunit II high affinity-binding protein)
32	432442	Akap7	A-kinase anchor protein 7 isoform alpha (AKAP-7 isoform alpha) (A-kinase anchor protein 18) (AKAP-18) (A-kinase anchor protein 9 kDa) (AKAP 9) (Protein kinase A-anchoring protein 7 isoform alpha) (PRKA7 isoform alpha)
33	23797	Akt3	RAC-gamma serine/threonine-protein kinase (EC 2.7.11.1) (Protein kinase Akt-3) (Protein kinase B gamma) (PKB gamma) (RAC-PK-gamma)
34	218038	Amph	Amphiphysin
35	99152	Anapc2	Anaphase-promoting complex subunit 2 (APC2) (Cyclosome subunit 2)
36	243634	Ano2	Anoctamin-2 (Transmembrane protein 16B)

37	11737	Anp32a	Acidic leucine-rich nuclear phosphoprotein 32 family member A (Acidic nuclear phosphoprotein pp32) (Leucine-rich acidic nuclear protein) (LANP) (Potent heat-stable protein phosphatase 2A inhibitor I1PP2A)
38	11769	Ap1s1	AP-1 complex subunit sigma-1A (Adaptor protein complex AP-1 subunit sigma-1A) (Adaptor-related protein complex 1 subunit sigma-1A) (Clathrin assembly protein complex 1 sigma-1A small chain) (Clathrin coat assembly protein AP19) (Golgi adaptor HA1/AP1 adaptin sigma-1A subunit) (HA1 19 kDa subunit) (Sigma 1a subunit of AP-1 clathrin) (Sigma-adaptin 1A) (Sigma1A-adaptin)
39	108012	Ap1s2	AP-1 complex subunit sigma-2 (Adaptor protein complex AP-1 subunit sigma-1B) (Adaptor-related protein complex 1 subunit sigma-1B) (Clathrin assembly protein complex 1 sigma-1B small chain) (Golgi adaptor HA1/AP1 adaptin sigma-1B subunit) (Sigma 1B subunit of AP-1 clathrin) (Sigma-adaptin 1B) (Sigma1B-adaptin)
40	11785	Apbb1	Amyloid-beta A4 precursor protein-binding family B member 1 (Protein Fe65)
41	23805	Apc2	Adenomatous polyposis coli protein 2
42	226548	Aph1a	Gamma-secretase subunit APH-1A (APH-1a) (Aph-1alpha)
43	208117	Aph1b	Gamma-secretase subunit APH-1B (APH-1b) (Aph-1beta)
44	68318	Aph1c	Putative gamma-secretase subunit APH-1C
45	11812	Apoc1	Apolipoprotein C-I (Apo-CI) (ApoC-I) (Apolipoprotein C1) [Cleaved into: Truncated apolipoprotein C-I]
46	11816	Apoe	Apolipoprotein E (Apo-E)
47	11820	App	Amyloid-beta A4 protein (ABPP) (APP) (Alzheimer disease amyloid A4 protein homolog) (Amyloid precursor protein) (Amyloid-beta precursor protein) (Amyloidogenic glycoprotein) (AG) [Cleaved into: N-APP; Soluble APP-alpha (S-APP-alpha); Soluble APP-beta (S-APP-beta); C99 (APP-C99) (Beta-secretase C-terminal fragment) (Beta-CTF); Amyloid-beta protein 42 (Abeta42) (Beta-APP42); Amyloid-beta protein 40 (Abeta40) (Beta-APP40); C83 (Alpha-secretase C-terminal fragment) (Alpha-CTF); P3(42); P3(40); C80; Gamma-secretase C-terminal fragment 59 (APP-C59) (Amyloid intracellular domain 59) (AID(59)) (Gamma-CTF(59)); Gamma-secretase C-terminal fragment 57 (APP-C57) (Amyloid intracellular domain 57) (AID(57)) (Gamma-CTF(57)); Gamma-secretase C-terminal fragment 50 (Amyloid intracellular domain 50) (AID(50)) (Gamma-CTF(50)); C31]
48	11838	Arc	Activity-regulated cytoskeleton-associated protein (mArc) (Activity-regulated gene 3.1 protein) (ARC/ARG3.1)

			(Arg3.1)
49	11843	Arf4	ADP-ribosylation factor 4
			Rho GTPase-activating protein 32 (Brain-specific Rho GTPase-activating protein) (GAB-associated Cdc42/Rac GTPase-activating protein) (GC-GAP) (Rho-type GTPase-activating protein 32) (Rho/Cdc42/Rac GTPase-activating protein RICS) (RhoGAP involved in the beta-catenin-N-cadherin and NMDA receptor signaling) (p200RhoGAP) (p250GAP)
50	330914	Arhgap32	
			Rho GTPase-activating protein 44 (Rho-type GTPase-activating protein RICH2) (RhoGAP interacting with CIP4 homologs protein 2) (RICH-2)
51	216831	Arhgap44	
			Rho guanine nucleotide exchange factor 15 (Ephexin-5) (E5)
52	442801	Arhgef15	
53	70882	Armc3	Armadillo repeat-containing protein 3
54	76709	Arpc2	Actin-related protein 2/3 complex subunit 2 (Arp2/3 complex 34 kDa subunit) (p34-ARC)
			Acid-sensing ion channel 1 (ASIC1) (Acid-sensing ion channel) (Amiloride-sensitive cation channel 2, neuronal) (Brain sodium channel 2) (BNAc2)
55	11419	Asic1	
			ATPase family AAA domain-containing protein 1 (EC 3.6.1.3) (Thorase)
56	67979	Atad1	
57	16467	Atcay	Caytaxin
			Arginyl-tRNA--protein transferase 1 (Arginyltransferase 1) (R-transferase 1) (EC 2.3.2.8) (Arginine-tRNA--protein transferase 1)
58	11907	Ate1	
			Cyclic AMP-dependent transcription factor ATF-4 (cAMP-dependent transcription factor ATF-4) (Activating transcription factor 4) (C/EBP-related ATF) (C/ATF) (Cyclic AMP-responsive element-binding protein 2) (CREB-2) (cAMP-responsive element-binding protein 2)
59	11911	Atf4	
			Cyclic AMP-dependent transcription factor ATF-7 (cAMP-dependent transcription factor ATF-7) (Activating transcription factor 7) (Transcription factor ATF-A)
60	223922	Atf7	
			Probable phospholipid-transporting ATPase VA (EC 7.6.2.1) (ATPase class V type 10A) (P-locus fat-associated ATPase) (P4-ATPase flippase complex alpha subunit ATP10A)
61	11982	Atp10a	
			Sodium/potassium-transporting ATPase subunit alpha-2 (Na(+)/K(+) ATPase alpha-2 subunit) (EC 7.2.2.13) (Na(+)/K(+) ATPase alpha(+) subunit) (Sodium pump subunit alpha-2)
62	98660	Atp1a2	
			Sodium/potassium-transporting ATPase subunit alpha-3 (Na(+)/K(+) ATPase alpha-3 subunit) (EC 7.2.2.13)
63	232975	Atp1a3	

			(Na ⁺)/K ⁺ ATPase alpha(III) subunit) (Sodium pump subunit alpha-3)
64	11980	Atp8a1	Phospholipid-transporting ATPase IA (EC 7.6.2.1) (ATPase class I type 8A member 1) (Chromaffin granule ATPase II) (P4-ATPase flippase complex alpha subunit ATP8A1)
65	20238	Atxn1	Ataxin-1 (Spinocerebellar ataxia type 1 protein homolog)
66	52335	Atxn1l	Ataxin-1-like (Brother of ataxin-1)
67	319974	Auts2	Autism susceptibility gene 2 protein homolog
68	12010	B2m	Beta-2-microglobulin
			Galactosylgalactosylxylosylprotein 3-beta-glucuronosyltransferase 1 (EC 2.4.1.135) (Beta-1,3-glucuronosyltransferase 1) (Glucuronosyltransferase P) (GlcAT-P) (UDP-GlcUA:glycoprotein beta-1,3-glucuronosyltransferase) (GlcUAT-P)
69	76898	B3gat1	Beta-1,4-galactosyltransferase 2 (Beta-1,4-GalTase 2) (Beta4Gal-T2) (b4Gal-T2) (EC 2.4.1.-) (Beta-N-acetylglucosaminyl-glycolipid beta-1,4-galactosyltransferase) (Beta-N-acetylglucosaminylglycopeptide beta-1,4-galactosyltransferase) (EC 2.4.1.38) (Lactose synthase A protein) (EC 2.4.1.22) (N-acetyllactosamine synthase) (EC 2.4.1.90) (Nal synthase) (UDP-Gal:beta-GlcNAc beta-1,4-galactosyltransferase 2) (UDP-galactose:beta-N-acetylglucosamine beta-1,4-galactosyltransferase 2)
70	53418	B4galt2	Beta-secretase 1 (EC 3.4.23.46) (Aspartyl protease 2) (ASP2) (Asp 2) (Beta-site amyloid precursor protein cleaving enzyme 1) (Beta-site APP cleaving enzyme 1) (Memapsin-2) (Membrane-associated aspartic protease 2)
71	23821	Bace1	Transcription regulator protein BACH2 (BTB and CNC homolog 2)
72	12014	Bach2	BAG family molecular chaperone regulator 1 (BAG-1) (Bcl-2-associated athanogene 1)
73	12017	Bag1	Brain-specific angiogenesis inhibitor 1-associated protein 2 (BAI-associated protein 2) (BAI1-associated protein 2)
74	108100	Baiap2	(Insulin receptor substrate protein of 53 kDa) (IRSp53) (Insulin receptor substrate p53) (Insulin receptor tyrosine kinase 53 kDa substrate)
75	12038	Bche	Cholinesterase (EC 3.1.1.8) (Acylcholine acylhydrolase) (Butyrylcholine esterase) (Choline esterase II) (Pseudocholinesterase)
76	12064	Bdnf	Brain-derived neurotrophic factor (BDNF) [Cleaved into: BDNF precursor form (ProBDNF)]
77	12096	Bglap	Osteocalcin (Bone Gla protein) (BGP) (Gamma-

			carboxyglutamic acid-containing protein)
78	70237	Bhlhb9	Protein BHLHB9 (bHLHB9)
79	12116	Bhmt	Betaine--homocysteine S-methyltransferase 1 (EC 2.1.1.5)
80	17060	Blnk	B-cell linker protein (B-cell adapter containing a SH2 domain protein) (B-cell adapter containing a Src homology 2 domain protein) (Cytoplasmic adapter protein) (Lymphocyte antigen 57) (Src homology 2 domain-containing leukocyte protein of 65 kDa) (Slp-65)
81	109880	Braf	Serine/threonine-protein kinase B-raf (EC 2.7.11.1) (Proto-oncogene B-Raf)
82	223770	Brd1	Bromodomain-containing protein 1 (Bromodomain and PHD finger-containing protein 2)
83	56710	Brinp1	BMP/retinoic acid-inducible neural-specific protein 1 (Deleted in bladder cancer protein 1 homolog)
84	381979	Brsk1	Serine/threonine-protein kinase BRSK1 (EC 2.7.11.1) (EC 2.7.11.26) (Brain-specific serine/threonine-protein kinase 1) (BR serine/threonine-protein kinase 1) (Serine/threonine-protein kinase SAD-B)
85	12217	Bsn	Protein bassoon
86	224671	Btbd9	BTB/POZ domain-containing protein 9
87	12227	Btg2	Protein BTG2 (BTG family member 2) (NGF-inducible protein TIS21)
88	23829	C1ql1	C1q-related factor (C1q and tumor necrosis factor-related protein 14) (C1q/TNF-related protein 14) (CTRP14) (Complement component 1 Q subcomponent-like 1)
89	29867	Cabp1	Calcium-binding protein 1 (CaBP1)
90	12288	Cacna1c	Voltage-dependent L-type calcium channel subunit alpha-1C (Calcium channel, L type, alpha-1 polypeptide, isoform 1, cardiac muscle) (MELC-CC) (Mouse brain class C) (MBC) (Voltage-gated calcium channel subunit alpha Cav1.2)
91	12290	Cacna1e	Voltage-dependent R-type calcium channel subunit alpha-1E (Brain calcium channel II) (BII) (Calcium channel, L type, alpha-1 polypeptide, isoform 6) (Voltage-gated calcium channel subunit alpha Cav2.3)
92	12293	Cacna2d1	Voltage-dependent calcium channel subunit alpha-2/delta-1 (Voltage-gated calcium channel subunit alpha-2/delta-1) [Cleaved into: Voltage-dependent calcium channel subunit alpha-2-1; Voltage-dependent calcium channel subunit delta-1]
93	81905	Cacng8	Voltage-dependent calcium channel gamma-8 subunit (Neuronal voltage-gated calcium channel gamma-8 subunit) (Transmembrane AMPAR regulatory protein gamma-8) (TARP gamma-8)

94	94332	Cadm3	Cell adhesion molecule 3 (Immunoglobulin superfamily member 4B) (IgSF4B) (Nectin-like protein 1) (NECL-1) (Synaptic cell adhesion molecule 3) (TSLC1-like protein 1)
95	12307	Calb1	Calbindin (Calbindin D28) (D-28K) (PCD-29) (Spot 35 protein) (Vitamin D-dependent calcium-binding protein, avian-type)
96	68566	Caly	Neuron-specific vesicular protein calcyon
97	12322	Camk2a	Calcium/calmodulin-dependent protein kinase type II subunit alpha (CaM kinase II subunit alpha) (CaMK-II subunit alpha) (EC 2.7.11.17)
98	12323	Camk2b	Calcium/calmodulin-dependent protein kinase type II subunit beta (CaM kinase II subunit beta) (CaMK-II subunit beta) (EC 2.7.11.17)
99	12325	Camk2g	Calcium/calmodulin-dependent protein kinase type II subunit gamma (CaM kinase II subunit gamma) (CaMK-II subunit gamma) (EC 2.7.11.17)
100	12326	Camk4	Calcium/calmodulin-dependent protein kinase type IV (CaMK IV) (EC 2.7.11.17) (CaM kinase-GR)
101	55984	Camkk1	Calcium/calmodulin-dependent protein kinase kinase 1 (CaM-KK 1) (CaM-kinase kinase 1) (CaMKK 1) (EC 2.7.11.17) (CaM-kinase IV kinase) (Calcium/calmodulin-dependent protein kinase kinase alpha) (CaM-KK alpha) (CaM-kinase kinase alpha) (CaMKK alpha)
102	207565	Camkk2	Calcium/calmodulin-dependent protein kinase kinase 2 (CaM-KK 2) (CaM-kinase kinase 2) (CaMKK 2) (EC 2.7.11.17) (Calcium/calmodulin-dependent protein kinase kinase beta) (CaM-KK beta) (CaM-kinase kinase beta) (CaMKK beta)
103	100072	Camta1	Calmodulin-binding transcription activator 1
104	12333	Capn1	Calpain-1 catalytic subunit (EC 3.4.22.52) (Calcium-activated neutral proteinase 1) (CANP 1) (Calpain mu-type) (Calpain-1 large subunit) (Micromolar-calpain) (muCANP)
105	12334	Capn2	Calpain-2 catalytic subunit (EC 3.4.22.53) (80 kDa M-calpain subunit) (CALP80) (Calcium-activated neutral proteinase 2) (CANP 2) (Calpain M-type) (Calpain-2 large subunit) (Millimolar-calpain) (M-calpain)
106	53872	Caprin1	Caprin-1 (Cytoplasmic activation- and proliferation-associated protein 1) (GPI-anchored membrane protein 1) (GPI-anchored protein p137) (GPI-p137) (p137GPI) (Membrane component chromosome 11 surface marker 1) (RNA granule protein 105)
107	12361	Cask	Peripheral plasma membrane protein CASK (EC 2.7.11.1) (Calcium/calmodulin-dependent serine protein kinase)

108	12362	Casp1	Caspase-1 (CASP-1) (EC 3.4.22.36) (Interleukin-1 beta convertase) (IL-1BC) (Interleukin-1 beta-converting enzyme) (ICE) (IL-1 beta-converting enzyme) (p45) [Cleaved into: Caspase-1 subunit p20; Caspase-1 subunit p10]
109	12367	Casp3	Caspase-3 (CASP-3) (EC 3.4.22.56) (Apopain) (Cysteine protease CPP32) (CPP-32) (LICE) (Protein Yama) (SREBP cleavage activity 1) (SCA-1) [Cleaved into: Caspase-3 subunit p17; Caspase-3 subunit p12]
110	212139	Cc2d1a	Coiled-coil and C2 domain-containing protein 1A (Five prime repressor element under dual repression-binding protein 1) (FRE under dual repression-binding protein 1) (Freud-1)
111	319965	Cc2d1b	Coiled-coil and C2 domain-containing protein 1B (Five prime repressor element under dual repression-binding protein 2) (FRE under dual repression-binding protein 2) (Freud-2)
112	12424	Cck	Cholecystokinin (CCK) [Cleaved into: Cholecystokinin-33 (CCK33); Cholecystokinin-12 (CCK12); Cholecystokinin-8 (CCK8)]
113	12426	Cckbr	Gastrin/cholecystokinin type B receptor (CCK-B receptor) (CCK-BR) (Cholecystokinin-2 receptor) (CCK2-R)
114	20292	Ccl11	Eotaxin (C-C motif chemokine 11) (Eosinophil chemotactic protein) (Small-inducible cytokine A11)
115	24047	Ccl19	C-C motif chemokine 19 (Epstein-Barr virus-induced molecule 1 ligand chemokine) (EBI1 ligand chemokine) (ELC) (Small-inducible cytokine A19)
116	20296	Ccl2	C-C motif chemokine 2 (Monocyte chemoattractant protein 1) (Monocyte chemotactic protein 1) (MCP-1) (Platelet-derived growth factor-inducible protein JE) (Small-inducible cytokine A2)
117	12444	Ccnd2	G1/S-specific cyclin-D2
118	12777	Ccr10	C-C chemokine receptor type 10 (C-C CKR-10) (CC-CKR-10) (CCR-10) (Chemokine C-C receptor 9) (G-protein coupled receptor 2)
119	12776	Ccr8	C-C chemokine receptor type 8 (C-C CKR-8) (CC-CKR-8) (CCR-8) (CD antigen CDw198)
120	54215	Cd160	CD160 antigen (Natural killer cell receptor BY55) (CD antigen CD160) [Cleaved into: CD160 antigen, soluble form]
121	21947	Cd40lg	CD40 ligand (CD40-L) (T-cell antigen Gp39) (TNF-related activation protein) (TRAP) (Tumor necrosis factor ligand superfamily member 5) (CD antigen CD154) [Cleaved into: CD40 ligand, membrane form; CD40 ligand, soluble

			form (sCD40L)]
122	12544	Cdc45	Cell division control protein 45 homolog (PORC-PI-1)
123	12554	Cdh13	Cadherin-13 (Heart cadherin) (H-cadherin) (Truncated cadherin) (T-cad) (T-cadherin)
124	12557	Cdh17	Cadherin-17 (BILL-cadherin) (Liver-intestine cadherin) (LI-cadherin) (P130)
125	12568	Cdk5	Cyclin-dependent-like kinase 5 (EC 2.7.11.1) (CR6 protein kinase) (CRK6) (Cell division protein kinase 5) (Serine/threonine-protein kinase PSSALRE) (Tau protein kinase II catalytic subunit) (TPKII catalytic subunit)
126	53886	Cdkl2	Cyclin-dependent kinase-like 2 (EC 2.7.11.22) (Serine/threonine-protein kinase KKIAMRE)
127	76183	Celf6	CUGBP Elav-like family member 6 (CELF-6) (Bruno-like protein 6) (CUG-BP- and ETR-3-like factor 6) (RNA-binding protein BRUNOL-6)
128	12647	Chat	Choline O-acetyltransferase (CHOACTase) (ChAT) (Choline acetylase) (EC 2.3.1.6)
129	244059	Chd2	Chromodomain-helicase-DNA-binding protein 2 (CHD-2) (EC 3.6.4.12) (ATP-dependent helicase CHD2)
130	67772	Chd8	Chromodomain-helicase-DNA-binding protein 8 (CHD-8) (EC 3.6.4.12) (ATP-dependent helicase CHD8) (Axis duplication inhibitor) (Duplin)
131	108699	Chn1	N-chimaerin (A-chimaerin) (Alpha-chimerin) (N-chimerin) (NC) (Rho GTPase-activating protein 2)
132	110902	Chrna2	Neuronal acetylcholine receptor subunit alpha-2
133	11441	Chrna7	Neuronal acetylcholine receptor subunit alpha-7
134	11444	Chrn2	Neuronal acetylcholine receptor subunit beta-2
135	98388	Chst10	Carbohydrate sulfotransferase 10 (EC 2.8.2.-) (HNK-1 sulfotransferase) (HNK-1ST) (HNK1ST)
136	229599	Ciart	Circadian-associated transcriptional repressor (ChIP-derived repressor of network oscillator) (Chrono) (Computationally highlighted repressor of the network oscillator)
137	71722	Cic	Protein capicua homolog
138	224171	Cip2a	Protein CIP2A (Cancerous inhibitor of PP2A) (p90 autoantigen homolog)
139	75786	Ckap5	Cytoskeleton-associated protein 5
140	54124	Cks1b	Cyclin-dependent kinases regulatory subunit 1 (CKS-1) (Sid 1334)
141	93675	Clec2i	C-type lectin domain family 2 member I (C-type lectin-related protein DCL1) (C-type lectin-related protein G) (Clr-g) (Lymphoid-derived C-type lectin-1) (LCL-1) (Osteoclast inhibitory lectin-related protein 2) (Ocil-

			related protein 2)
142	12752	Cln3	Battenin (Protein CLN3)
143	26889	Cln8	Protein CLN8
144	12801	Cnr1	Cannabinoid receptor 1 (CB-R) (CB1) (Brain-type cannabinoid receptor)
145	21367	Cntn2	Contactin-2 (Axonal glycoprotein TAG-1) (Axonin-1) (Transient axonal glycoprotein 1) (TAX-1)
146	53870	Cntn6	Contactin-6 (Neural recognition molecule NB-3) (mNB-3)
147	66797	Cntnap2	Contactin-associated protein-like 2 (Cell recognition molecule Caspr2)
148	12846	Comt	Catechol O-methyltransferase (EC 2.1.1.6)
149	12847	Copa	Coatomer subunit alpha (Alpha-coat protein) (Alpha-COP) [Cleaved into: Xenin (Xenopsin-related peptide); Proxenin]
150	26754	Cops5	COP9 signalosome complex subunit 5 (SGN5) (Signalosome subunit 5) (EC 3.4.-.-) (Jun activation domain-binding protein 1) (Kip1 C-terminus-interacting protein 2)
151	12854	Cort	Cortistatin [Cleaved into: Cortistatin-14]
152	231207	Cpeb2	Cytoplasmic polyadenylation element-binding protein 2 (CPE-BP2) (CPE-binding protein 2) (mCPEB-2)
153	208922	Cpeb3	Cytoplasmic polyadenylation element-binding protein 3 (CPE-BP3) (CPE-binding protein 3) (mCPEB-3)
154	240058	Cpne5	Copine-5 (Copine V)
155	12891	Cpne6	Copine-6 (Copine VI) (Neuronal-copine) (N-copine)
156	58799	Crbn	Protein cereblon (Protein PiL)
157	12912	Creb	Cyclic AMP-responsive element-binding protein (CREB) (cAMP-responsive element-binding protein 1)
158	12913	Creb3	Cyclic AMP-responsive element-binding protein 3 (CREB-3) (cAMP-responsive element-binding protein 3) (Transcription factor LZIP) [Cleaved into: Processed cyclic AMP-responsive element-binding protein 3]
159	12918	Crh	Corticoliberin (Corticotropin-releasing factor) (CRF) (Corticotropin-releasing hormone)
160	12919	Crhbp	Corticotropin-releasing factor-binding protein (CRF-BP) (CRF-binding protein) (Corticotropin-releasing hormone-binding protein) (CRH-BP)
161	12921	Crhr1	Corticotropin-releasing factor receptor 1 (CRF-R-1) (CRF-R1) (CRFR-1) (Corticotropin-releasing hormone receptor 1) (CRH-R-1) (CRH-R1)
162	12933	Crmp1	Dihydropyrimidinase-related protein 1 (DRP-1) (Collapsin response mediator protein 1) (CRMP-1) (Inactive dihydropyrimidinase) (Unc-33-like phosphoprotein 3)

(ULIP-3)			
163	382056	Crtc1	CREB-regulated transcription coactivator 1 (Mucoepidermoid carcinoma translocated protein 1 homolog) (Transducer of regulated cAMP response element-binding protein 1) (TORC-1) (Transducer of CREB protein 1)
164	83410	Cstf2t	Cleavage stimulation factor subunit 2 tau variant (CF-1 64 kDa subunit tau variant) (Cleavage stimulation factor 64 kDa subunit tau variant) (CSTF 64 kDa subunit tau variant) (TauCstF-64)
165	18163	Ctnnd2	Catenin delta-2 (Neural plakophilin-related ARM-repeat protein) (NPRAP) (Neurojungin)
166	83429	Ctns	Cystinosin
167	13048	Cux2	Homeobox protein cut-like 2 (Homeobox protein Cux-2)
168	13051	Cx3cr1	CX3C chemokine receptor 1 (C-X3-C CKR-1) (CX3CR1) (Fractalkine receptor)
169	232983	Cxcl17	C-X-C motif chemokine 17 (6-Cys CXCL17) (13.6 kDa protein) (VEGF coregulated chemokine 1) [Cleaved into: 4-Cys CXCL17]
170	12766	Cxcr3	C-X-C chemokine receptor type 3 (CXC-R3) (CXCR-3) (Interferon-inducible protein 10 receptor) (IP-10 receptor) (CD antigen CD183)
171	13123	Cyp7b1	Cytochrome P450 7B1 (24-hydroxycholesterol 7-alpha-hydroxylase) (EC 1.14.14.26) (25/26-hydroxycholesterol 7-alpha-hydroxylase) (EC 1.14.14.29) (3-hydroxysteroid 7-alpha hydroxylase) (Hippocampal transcript 1 protein) (HCT-1) (Oxysterol 7-alpha-hydroxylase)
172	269060	Dagla	Sn1-specific diacylglycerol lipase alpha (DGL-alpha) (EC 3.1.1.-) (Neural stem cell-derived dendrite regulator)
173	13142	Dao	D-amino-acid oxidase (DAAO) (DAMOX) (DAO) (EC 1.4.3.3)
174	69635	Dapk1	Death-associated protein kinase 1 (DAP kinase 1) (EC 2.7.11.1)
175	13143	Dapk2	Death-associated protein kinase 2 (DAP kinase 2) (EC 2.7.11.1) (DAP-kinase-related protein 1) (DRP-1)
176	13166	Dbh	Dopamine beta-hydroxylase (EC 1.14.17.1) (Dopamine beta-monooxygenase) [Cleaved into: Soluble dopamine beta-hydroxylase]
177	13167	Dbi	Acyl-CoA-binding protein (ACBP) (Diazepam-binding inhibitor) (DBI) (Endozepine) (EP)
178	195208	Dcdc2a	Doublecortin domain-containing protein 2
179	13175	Dclk1	Serine/threonine-protein kinase DCLK1 (EC 2.7.11.1) (Doublecortin-like and CAM kinase-like 1) (Doublecortin-

			like kinase 1)
180	13194	Ddb1	DNA damage-binding protein 1 (DDB p127 subunit) (Damage-specific DNA-binding protein 1) (UV-damaged DNA-binding factor)
181	72108	Ddhd2	Phospholipase DDHD2 (EC 3.1.1.-) (DDHD domain-containing protein 2) (SAM, WWE and DDHD domain-containing protein 1)
182	54006	Deaf1	Deformed epidermal autoregulatory factor 1 homolog (Nuclear DEAF-1-related transcriptional regulator) (NUDR)
183	110052	Dek	Protein DEK
184	217480	Dgkb	Diacylglycerol kinase beta (DAG kinase beta) (EC 2.7.1.107) (Diglyceride kinase beta) (DGK-beta)
185	13380	Dkk1	Dickkopf-related protein 1 (Dickkopf-1) (Dkk-1) (mDkk-1)
186	23859	Dlg2	Disks large homolog 2 (Channel-associated protein of synapse-110) (Chapsyn-110) (Postsynaptic density protein PSD-93)
187	13385	Dlg4	Disks large homolog 4 (Postsynaptic density protein 95) (PSD-95) (Synapse-associated protein 90) (SAP-90) (SAP90)
188	242667	Dlgap3	Disks large-associated protein 3 (DAP-3) (PSD-95/SAP90-binding protein 3) (SAP90/PSD-95-associated protein 3) (SAPAP3)
189	78920	Dlst	Dihydrolipoyllysine-residue succinyltransferase component of 2-oxoglutarate dehydrogenase complex, mitochondrial (EC 2.3.1.61) (2-oxoglutarate dehydrogenase complex component E2) (OGDC-E2) (Dihydrolipoamide succinyltransferase component of 2-oxoglutarate dehydrogenase complex) (E2K)
190	67685	Dnaaf4	Dynein assembly factor 4, axonemal (Dyslexia susceptibility 1 candidate gene 1 protein homolog)
191	54427	Dnmt3l	DNA (cytosine-5)-methyltransferase 3-like
192	76088	Dock8	Dedicator of cytokinesis protein 8
193	13448	Dok1	Docking protein 1 (Downstream of tyrosine kinase 1) (p62(dok))
194	13449	Dok2	Docking protein 2 (Dok-related protein) (Dok-R) (Downstream of tyrosine kinase 2) (IL-four receptor-interacting protein) (FRIP) (p56(dok-2))
195	13483	Dpp6	Dipeptidyl aminopeptidase-like protein 6 (DPPX) (Dipeptidyl aminopeptidase-related protein) (Dipeptidyl peptidase 6) (Dipeptidyl peptidase IV-like protein) (Dipeptidyl peptidase VI) (DPP VI)
196	13488	Drd1	D(1A) dopamine receptor (Dopamine D1 receptor)
197	13489	Drd2	D(2) dopamine receptor (Dopamine D2 receptor)

198	13490	Drd3	D(3) dopamine receptor (Dopamine D3 receptor)
199	13491	Drd4	D(4) dopamine receptor (D(2C) dopamine receptor) (Dopamine D4 receptor)
200	13492	Drd5	D(1B) dopamine receptor (D(5) dopamine receptor) (Dopamine D5 receptor)
201	13494	Drg1	Developmentally-regulated GTP-binding protein 1 (DRG-1) (Neural precursor cell expressed developmentally down-regulated protein 3) (NEDD-3) (Translation factor GTPase DRG1) (TRAFAC GTPase DRG1) (EC 3.6.5.-)
202	13505	Dsc1	Desmocollin-1
203	213452	Dstk	Dual serine/threonine and tyrosine protein kinase (EC 2.7.12.1) (Dusty protein kinase) (Dusty PK) (Receptor-interacting serine/threonine-protein kinase 5)
204	94245	Dtnbp1	Dysbindin (Biogenesis of lysosome-related organelles complex 1 subunit 8) (BLOC-1 subunit 8) (Dysbindin-1) (Dystrobrein-binding protein 1) (Hermansky-Pudlak syndrome 7 protein homolog) (HPS7 protein homolog)
205	13587	Ear2	Eosinophil cationic protein 2 (ECP 2) (EC 3.1.27.-) (Eosinophil secondary granule ribonuclease 2) (EAR-2) (Ribonuclease 3-2) (RNase 3-2)
206	13864	Ear2,Nr2f6	Nuclear receptor subfamily 2 group F member 6 (COUP transcription factor 3) (COUP-TF3) (V-erbA-related protein 2) (EAR-2)
207	107522	Ece2	Endothelin-converting enzyme 2 (ECE-2) (EC 3.4.24.71)
208	13637	Efna2	Ephrin-A2 (CEK7-ligand) (CEK7-L) (ELF-1) (EPH-related receptor tyrosine kinase ligand 6) (LERK-6)
209	13649	Egfr	Epidermal growth factor receptor (EC 2.7.10.1)
210	13653	Egr1	Early growth response protein 1 (EGR-1) (Nerve growth factor-induced protein A) (NGFI-A) (Transcription factor Zif268) (Zinc finger protein Krox-24)
211	110147	Ehmt2	Histone-lysine N-methyltransferase EHMT2 (EC 2.1.1.-) (Euchromatic histone-lysine N-methyltransferase 2) (HLA-B-associated transcript 8) (Histone H3-K9 methyltransferase 3) (H3-K9-HMTase 3) (Protein G9a)
212	27103	Eif2ak4	eIF-2-alpha kinase GCN2 (Eukaryotic translation initiation factor 2-alpha kinase 4) (EC 2.7.11.1) (GCN2-like protein) (mGCN2)
213	13688	Eif4ebp2	Eukaryotic translation initiation factor 4E-binding protein 2 (4E-BP2) (eIF4E-binding protein 2) (Phosphorylated heat- and acid-stable protein regulated by insulin 2) (PHAS-II)
214	74203	Eif4enif1	Eukaryotic translation initiation factor 4E transporter (4E-T) (eIF4E transporter) (Eukaryotic translation initiation factor 4E nuclear import factor 1)

215	22384	Eif4h	Eukaryotic translation initiation factor 4H (eIF-4H) (Williams-Beuren syndrome chromosomal region 1 protein homolog)
216	16418	Eif6	Eukaryotic translation initiation factor 6 (eIF-6) (B4 integrin interactor) (CAB) (p27(BBP))
217	15572	Elavl4	ELAV-like protein 4 (Hu-antigen D) (HuD) (Paraneoplastic encephalomyelitis antigen HuD)
218	13798	En1	Homeobox protein engrailed-1 (Homeobox protein en-1) (Mo-En-1)
219	328572	Ep300	Histone acetyltransferase p300 (p300 HAT) (EC 2.3.1.48) (E1A-associated protein p300) (Histone butyryltransferase p300) (EC 2.3.1.-) (Histone crotonyltransferase p300) (EC 2.3.1.-) (Protein 2-hydroxyisobutyryltransferase p300) (EC 2.3.1.-) (Protein propionyltransferase p300) (EC 2.3.1.-)
220	13823	Epb41l3	Band 4.1-like protein 3 (4.1B) (Differentially expressed in adenocarcinoma of the lung protein 1) (DAL-1) (DAL1P) (mDAL-1) [Cleaved into: Band 4.1-like protein 3, N-terminally processed]
221	13836	Epha2	Ephrin type-A receptor 2 (EC 2.7.10.1) (Epithelial cell kinase) (Tyrosine-protein kinase receptor ECK) (Tyrosine-protein kinase receptor MPK-5) (Tyrosine-protein kinase receptor SEK-2)
222	13844	Ephb2	Ephrin type-B receptor 2 (EC 2.7.10.1) (Neural kinase) (Nuk receptor tyrosine kinase) (Tyrosine-protein kinase receptor EPH-3) (Tyrosine-protein kinase receptor SEK-3) [Cleaved into: EphB2/CTF1; EphB2/CTF2]
223	13853	Epm2a	Laforin (EC 3.1.3.-) (EC 3.1.3.16) (EC 3.1.3.48) (Glucan phosphatase) (Lafora PTPase) (LAFPTPase)
224	319955	Ercc6	DNA excision repair protein ERCC-6 (EC 3.6.4.-) (ATP-dependent helicase ERCC6) (Cockayne syndrome protein CSB)
225	13983	Esr2	Estrogen receptor beta (ER-beta) (Nuclear receptor subfamily 3 group A member 2)
226	14009	Etv1	ETS translocation variant 1 (Ets-related protein 81)
227	338521	Fa2h	Fatty acid 2-hydroxylase (EC 1.14.18.-) (Fatty acid alpha-hydroxylase)
228	330450	Far2	Fatty acyl-CoA reductase 2 (EC 1.2.1.84)
229	72194	Fbxl20	F-box/LRR-repeat protein 20 (F-box and leucine-rich repeat protein 20) (F-box/LRR-repeat protein 2-like)
230	30839	Fbxw5	F-box/WD repeat-containing protein 5 (F-box and WD-40 domain-containing protein 5)
231	435653	Fcrlb	Fc receptor-like B (Fc receptor homolog expressed in B-cells protein 2) (FREB-2) (Fc receptor-like and mucin-like

			protein 2) (Fc receptor-like protein 2) (Fc receptor-related protein Y) (FcRY)
232	14156	Fen1	Flap endonuclease 1 (FEN-1) (EC 3.1.-.-) (Flap structure-specific endonuclease 1)
233	14168	Fgf13	Fibroblast growth factor 13 (FGF-13) (Fibroblast growth factor homologous factor 2) (FHF-2)
234	14226	Fkbp1b	Peptidyl-prolyl cis-trans isomerase FKBP1B (PPIase FKBP1B) (EC 5.2.1.8) (12.6 kDa FK506-binding protein) (12.6 kDa FKBP) (FKBP-12.6) (FK506-binding protein 1B) (FKBP-1B) (Immunophilin FKBP12.6) (Rotamase)
235	14229	Fkbp5	Peptidyl-prolyl cis-trans isomerase FKBP5 (PPIase FKBP5) (EC 5.2.1.8) (51 kDa FK506-binding protein) (51 kDa FKBP) (FKBP-51) (FK506-binding protein 5) (FKBP-5) (Rotamase)
236	399558	Flrt2	Leucine-rich repeat transmembrane protein FLRT2 (Fibronectin leucine rich transmembrane protein 2)
237	54418	Fmn2	Formin-2
238	14265	Fmr1	Synaptic functional regulator FMR1 (Fragile X mental retardation protein 1 homolog) (FMRP) (Protein FMR-1) (mFmr1p)
239	14282	Fosb	Protein fosB
240	64290	Foxb1	Forkhead box protein B1 (Transcription factor FKH-5)
241	329934	Foxo6	Forkhead box protein O6
242	114142	Foxp2	Forkhead box protein P2
243	14345	Fut4	Alpha-(1,3)-fucosyltransferase 4 (EC 2.4.1.-) (Fucosyltransferase 4) (Fucosyltransferase IV) (Fuc-TIV) (FucT-IV) (Galactoside 3-L-fucosyltransferase)
244	14347	Fut7	Alpha-(1,3)-fucosyltransferase 7 (EC 2.4.1.-) (Fucosyltransferase 7) (Fucosyltransferase VII) (Fuc-TVII) (FucT-VII) (Galactoside 3-L-fucosyltransferase)
245	14360	Fyn	Tyrosine-protein kinase Fyn (EC 2.7.10.2) (Proto-oncogene c-Fyn) (p59-Fyn)
246	14371	Fzd9	Frizzled-9 (Fz-9) (mFz3) (mFz9) (CD antigen CD349)
247	14397	Gabra4	Gamma-aminobutyric acid receptor subunit alpha-4 (GABA(A) receptor subunit alpha-4)
248	110886	Gabra5	Gamma-aminobutyric acid receptor subunit alpha-5 (GABA(A) receptor subunit alpha-5)
249	14399	Gabra6	Gamma-aminobutyric acid receptor subunit alpha-6 (GABA(A) receptor subunit alpha-6)
250	13197	Gadd45a	Growth arrest and DNA damage-inducible protein GADD45 alpha (DNA damage-inducible transcript 1 protein) (DDIT-1)
251	23882	Gadd45g	Growth arrest and DNA damage-inducible protein GADD45 gamma (Cytokine-responsive protein CR6)
252	14427	Galr1	Galanin receptor type 1 (GAL1-R) (GALR-1)

253	234366	Gatad2a	Transcriptional repressor p66 alpha (GATA zinc finger domain-containing protein 2A)
254	67092	Gatm	Glycine amidinotransferase, mitochondrial (EC 2.1.4.1) (L-arginine:glycine amidinotransferase) (Transamidinase)
255	192662	Gdi1	Rho GDP-dissociation inhibitor 1 (Rho GDI 1) (GDI-1) (Rho-GDI alpha)
256	68616	Gdpd3	Lysophospholipase D GDPD3 (EC 3.1.4.-) (Glycerophosphodiester phosphodiesterase 7) (Glycerophosphodiester phosphodiesterase domain-containing protein 3)
257	216766	Gemin5	Gem-associated protein 5 (Gemin5)
258	58991	Ghrl	Appetite-regulating hormone (Growth hormone secretagogue) (Growth hormone-releasing peptide) (Motilin-related peptide) (Protein M46) [Cleaved into: Ghrelin; Obestatin]
259	208188	Ghsr	Growth hormone secretagogue receptor type 1 (GHS-R) (GH-releasing peptide receptor) (GHRP) (Ghrelin receptor)
260	14607	Gip	Gastric inhibitory polypeptide (GIP) (Glucose-dependent insulinotropic polypeptide)
261	216963	Git1	ARF GTPase-activating protein GIT1 (ARF GAP GIT1) (G protein-coupled receptor kinase-interactor 1) (GRK-interacting protein 1)
262	14622	Gjb5	Gap junction beta-5 protein (Connexin-31.1) (Cx31.1)
263	118454	Gjc2	Gap junction gamma-2 protein (Connexin-47) (Cx47) (Gap junction alpha-12 protein)
264	14652	Glp1r	Glucagon-like peptide 1 receptor (GLP-1 receptor) (GLP-1-R) (GLP-1R)
265	237213	Gla2	Glycine receptor subunit alpha-2
266	110304	Gla3	Glycine receptor subunit alpha-3
267	216456	Gls2	Glutaminase liver isoform, mitochondrial (GLS) (EC 3.5.1.2) (L-glutaminase) (L-glutamine amidohydrolase) (LGA)
268	14667	Gm2a	Ganglioside GM2 activator (Cerebroside sulfate activator protein) (GM2-AP) (Sphingolipid activator protein 3) (SAP-3)
269	63985	Gmfb	Glia maturation factor beta (GMF-beta)
270	241263	Gpr158	Probable G-protein coupled receptor 158
271	14748	Gpr3	G-protein coupled receptor 3 (GPCR21)
272	64450	Gpr85	Probable G-protein coupled receptor 85 (Super conserved receptor expressed in brain 2)
273	64378	Gpr88	Probable G-protein coupled receptor 88 (Striatum-specific G-protein coupled receptor)
274	64297	Gprc5b	G-protein coupled receptor family C group 5 member B

			(Retinoic acid-induced gene 2 protein) (RAIG-2)
275	14775	Gpx1	Glutathione peroxidase 1 (GPx-1) (GSHPx-1) (EC 1.11.1.9) (Cellular glutathione peroxidase) (Selenium-dependent glutathione peroxidase 1)
276	56149	Grasp	General receptor for phosphoinositides 1-associated scaffold protein (GRP1-associated scaffold protein)
277	14799	Gria1	Glutamate receptor 1 (GluR-1) (AMPA-selective glutamate receptor 1) (GluR-A) (GluR-K1) (Glutamate receptor ionotropic, AMPA 1) (GluA1)
278	170935	Grid2ip	Delphilin (Glutamate receptor, ionotropic, delta 2-interacting protein 1)
279	14810	Grin1	Glutamate receptor ionotropic, NMDA 1 (GluN1) (Glutamate [NMDA] receptor subunit zeta-1) (N-methyl-D-aspartate receptor subunit NR1) (NMD-R1)
280	14811	Grin2a	Glutamate receptor ionotropic, NMDA 2A (GluN2A) (Glutamate [NMDA] receptor subunit epsilon-1) (N-methyl D-aspartate receptor subtype 2A) (NMDAR2A) (NR2A)
281	14812	Grin2b	Glutamate receptor ionotropic, NMDA 2B (GluN2B) (Glutamate [NMDA] receptor subunit epsilon-2) (N-methyl D-aspartate receptor subtype 2B) (NMDAR2B) (NR2B)
282	54645	Gripap1	GRIP1-associated protein 1 (GRASP-1) (HCMV-interacting protein) [Cleaved into: GRASP-1 C-terminal chain (30kDa C-terminus form)]
283	14816	Grm1	Metabotropic glutamate receptor 1 (mGluR1)
284	268934	Grm4	Metabotropic glutamate receptor 4 (mGluR4)
285	108071	Grm5	Metabotropic glutamate receptor 5 (mGluR5)
286	108073	Grm7	Metabotropic glutamate receptor 7 (mGluR7)
287	14823	Grm8	Metabotropic glutamate receptor 8 (mGluR8)
288	225642	Grp	Gastrin-releasing peptide (GRP) [Cleaved into: Neuromedin-C (GRP-10)]
289	14829	Grpr	Gastrin-releasing peptide receptor (GRP-R) (GRP-preferring bombesin receptor)
290	606496	Gsk3a	Glycogen synthase kinase-3 alpha (GSK-3 alpha) (EC 2.7.11.26) (Serine/threonine-protein kinase GSK3A) (EC 2.7.11.1)
291	56637	Gsk3b	Glycogen synthase kinase-3 beta (GSK-3 beta) (EC 2.7.11.26) (Serine/threonine-protein kinase GSK3B) (EC 2.7.11.1)
292	14917	Gucy2c	Heat-stable enterotoxin receptor (STA receptor) (EC 4.6.1.2) (Guanylyl cyclase C) (GC-C) (Intestinal guanylate cyclase)
293	14918	Gucy2d	Guanylate cyclase D (EC 4.6.1.2)

294	14936	Gys1	Glycogen [starch] synthase, muscle (EC 2.4.1.11)
295	15183	Hdac3	Histone deacetylase 3 (HD3) (EC 3.5.1.98)
296	56233	Hdac7	Histone deacetylase 7 (HD7) (EC 3.5.1.98) (Histone deacetylase 7A) (HD7a) Guanosine-3',5'-bis(diphosphate) 3'-pyrophosphohydrolase MESH1 (EC 3.1.7.2) (HD domain-containing protein 3) (Metazoan SpoT homolog 1) (MESH1) (Penta-phosphate guanosine-3'-pyrophosphohydrolase) ((ppGpp)ase)
297	68695	Hddc3	
298	15251	Hif1a	Hypoxia-inducible factor 1-alpha (HIF-1-alpha) (HIF1-alpha) (ARNT-interacting protein) Histidine triad nucleotide-binding protein 1 (EC 3.-.-.-) (Adenosine 5'-monophosphoramidase) (Protein kinase C inhibitor 1) (Protein kinase C-interacting protein 1) (PKCI-1)
299	15254	Hint1	
300	15260	Hira	Protein HIRA (TUP1-like enhancer of split protein 1)
301	15357	Hmgcr	3-hydroxy-3-methylglutaryl-coenzyme A reductase (HMG-CoA reductase) (EC 1.1.1.34)
302	72692	HnrnpII	Heterogeneous nuclear ribonucleoprotein L-like Homer protein homolog 2 (Homer-2) (Cupidin)
303	26557	Homer2	(VASP/Ena-related gene up-regulated during seizure and LTP 2) (Vesl-2)
304	15401	Hoxa4	Homeobox protein Hox-A4 (Homeobox protein Hox-1.4) (Homeobox protein MH-3)
305	15407	Hoxb1	Homeobox protein Hox-B1 (Homeobox protein Hox-2.9)
306	15412	Hoxb4	Homeobox protein Hox-B4 (Homeobox protein Hox-2.6)
307	15414	Hoxb6	Homeobox protein Hox-B6 (Homeobox protein Hox-2.2) (Homeobox protein MH-22A)
308	15423	Hoxc4	Homeobox protein Hox-C4 (Homeobox protein Hox-3.5)
309	15424	Hoxc5	Homeobox protein Hox-C5 (Homeobox protein Hox-3.4) (Homeobox protein Hox-6.2)
310	15425	Hoxc6	Homeobox protein Hox-C6 (Homeobox protein Hox-3.3) (Homeobox protein Hox-6.1)
311	15436	Hoxd4	Homeobox protein Hox-D4 (Homeobox protein Hox-4.2) (Homeobox protein Hox-5.1)
312	15465	Hrh1	Histamine H1 receptor (H1R) (HH1R)
313	15466	Hrh2	Histamine H2 receptor (H2R) (HH2R) (Gastric receptor I)
314	99296	Hrh3	Histamine H3 receptor (H3R) (HH3R)
315	15558	Htr2a	5-hydroxytryptamine receptor 2A (5-HT-2) (5-HT-2A) (Serotonin receptor 2A)
316	15562	Htr4	5-hydroxytryptamine receptor 4 (5-HT-4) (5-HT4) (Serotonin receptor 4)
317	15565	Htr6	5-hydroxytryptamine receptor 6 (5-HT-6) (5-HT6) (Serotonin receptor 6)

318	15566	Htr7	5-hydroxytryptamine receptor 7 (5-HT-7) (5-HT7) (5-HT-X) (Serotonin receptor 7)
319	15194	Htt	Huntingtin (Huntington disease protein homolog) (HD protein homolog) [Cleaved into: Huntingtin, myristoylated N-terminal fragment]
320	15898	Icam5	Intercellular adhesion molecule 5 (ICAM-5) (Telencephalin)
321	15925	Ide	Insulin-degrading enzyme (EC 3.4.24.56) (Insulin protease) (Insulinase) (Insulysin)
322	15932	Idua	Alpha-L-iduronidase (EC 3.2.1.76)
323	55978	Ift20	Intraflagellar transport protein 20 homolog (mIFT20)
324	16000	Igf1	Insulin-like growth factor I (IGF-I) (Somatomedin)
325	16002	Igf2	Insulin-like growth factor II (IGF-II) (Multiplication-stimulating polypeptide) [Cleaved into: Insulin-like growth factor II; Preptin]
326	22779	Ikzf2	Zinc finger protein Helios (Ikaros family zinc finger protein 2)
327	16162	Il12rb2	Interleukin-12 receptor subunit beta-2 (IL-12 receptor subunit beta-2) (IL-12R subunit beta-2) (IL-12R-beta-2) (IL-12RB2)
328	16168	Il15	Interleukin-15 (IL-15)
329	16182	Il18r1	Interleukin-18 receptor 1 (IL-18R-1) (IL-18R1) (EC 3.2.2.6) (CD218 antigen-like family member A) (IL1 receptor-related protein) (IL-1Rrp) (IL1R-rp) (Interleukin-18 receptor alpha) (IL-18R-alpha) (IL-18Ralpha) (CD antigen CD218a)
330	329244	Il19	Interleukin-19 (IL-19)
331	16176	Il1b	Interleukin-1 beta (IL-1 beta)
332	331461	Il1rapl1	Interleukin-1 receptor accessory protein-like 1 (IL-1-RAPL-1) (IL-1RAPL-1) (IL1RAPL-1) (EC 3.2.2.6) (X-linked interleukin-1 receptor accessory protein-like 1)
333	16181	Il1rn	Interleukin-1 receptor antagonist protein (IL-1RN) (IL-1ra) (IRAP) (IL1 inhibitor)
334	16183	Il2	Interleukin-2 (IL-2) (T-cell growth factor) (TCGF)
335	16185	Il2rb	Interleukin-2 receptor subunit beta (IL-2 receptor subunit beta) (IL-2R subunit beta) (IL-2RB) (High affinity IL-2 receptor subunit beta) (p70-75) (CD antigen CD122)
336	16197	Il7r	Interleukin-7 receptor subunit alpha (IL-7 receptor subunit alpha) (IL-7R subunit alpha) (IL-7R-alpha) (IL-7RA) (CD antigen CD127)
337	16199	Il9r	Interleukin-9 receptor (IL-9 receptor) (IL-9R) (CD antigen CD129)
338	271424	Ip6k3	Inositol hexakisphosphate kinase 3 (InsP6 kinase 3) (EC 2.7.4.21) (Inositol hexaphosphate kinase 3)

339	69718	lpmk	Inositol polyphosphate multikinase (EC 2.7.1.140) (EC 2.7.1.151) (EC 2.7.1.153) (Inositol 1,3,4,6-tetrakisphosphate 5-kinase)
340	16400	ltga3	Integrin alpha-3 (CD49 antigen-like family member C) (Galactoprotein B3) (GAPB3) (VLA-3 subunit alpha) (CD antigen CD49c) [Cleaved into: Integrin alpha-3 heavy chain; Integrin alpha-3 light chain]
341	16402	ltga5	Integrin alpha-5 (CD49 antigen-like family member E) (Fibronectin receptor subunit alpha) (Integrin alpha-F) (VLA-5) (CD antigen CD49e) [Cleaved into: Integrin alpha-5 heavy chain; Integrin alpha-5 light chain]
342	241226	ltga8	Integrin alpha-8 [Cleaved into: Integrin alpha-8 heavy chain; Integrin alpha-8 light chain]
343	16412	ltgb1	Integrin beta-1 (Fibronectin receptor subunit beta) (VLA-4 subunit beta) (CD antigen CD29)
344	16420	ltgb6	Integrin beta-6
345	320910	ltgb8	Integrin beta-8
346	228550	ltpka	Inositol-trisphosphate 3-kinase A (EC 2.7.1.127) (Inositol 1,4,5-trisphosphate 3-kinase A) (IP3 3-kinase A) (IP3K A) (InsP 3-kinase A)
347	16439	ltpr2	Inositol 1,4,5-trisphosphate receptor type 2 (IP3 receptor isoform 2) (IP3R 2) (InsP3R2) (Inositol 1,4,5-trisphosphate type V receptor) (Type 2 inositol 1,4,5-trisphosphate receptor) (Type 2 InsP3 receptor)
348	16440	ltpr3	Inositol 1,4,5-trisphosphate receptor type 3 (IP3 receptor isoform 3) (IP3R 3) (InsP3R3) (Type 3 inositol 1,4,5-trisphosphate receptor) (Type 3 InsP3 receptor)
349	57340	Jph3	Junctophilin-3 (JP-3) (Junctophilin type 3)
350	319984	Jph4	Junctophilin-4 (JP-4) (Junctophilin-like 1 protein)
351	16476	Jun	Transcription factor AP-1 (AH119) (Activator protein 1) (AP1) (Proto-oncogene c-Jun) (V-jun avian sarcoma virus 17 oncogene homolog) (Jun A)
352	545156	Kalrn	Kalirin (EC 2.7.11.1) (Protein Duo) (Serine/threonine-protein kinase with Dbp- and pleckstrin homology domain)
353	14534	Kat2a	Histone acetyltransferase KAT2A (EC 2.3.1.48) (General control of amino acid synthesis protein 5-like 2) (Histone acetyltransferase GCN5) (MmGCN5) (Histone glutaryltransferase KAT2A) (EC 2.3.1.-) (Histone succinyltransferase KAT2A) (EC 2.3.1.-) (Lysine acetyltransferase 2A)
354	244349	Kat6a	Histone acetyltransferase KAT6A (EC 2.3.1.48) (MOZ, YBF2/SAS3, SAS2 and TIP60 protein 3) (MYST-3) (Monocytic leukemia zinc finger homolog) (Monocytic

			leukemia zinc finger protein)
355	16490	Kcna2	Potassium voltage-gated channel subfamily A member 2 (MK2) (Voltage-gated potassium channel subunit Kv1.2)
356	16497	Kcnab1	Voltage-gated potassium channel subunit beta-1 (EC 1.1.1.-) (K(+)) channel subunit beta-1) (Kv-beta-1)
357	56461	Kcnip3	Calsenilin (A-type potassium channel modulatory protein 3) (DRE-antagonist modulator) (DREAM) (Kv channel-interacting protein 3) (KCHIP3)
358	140492	Kcnn2	Small conductance calcium-activated potassium channel protein 2 (SK2) (SKCa 2) (SKCa2) (KCa2.2)
359	233877	Kctd13	BTB/POZ domain-containing adapter for CUL3-mediated RhoA degradation protein 1 (BTB/POZ domain-containing protein KCTD13) (Polymerase delta-interacting protein 1)
360	383348	Kctd16	BTB/POZ domain-containing protein KCTD16
361	22289	Kdm6a	Lysine-specific demethylase 6A (EC 1.14.11.-) (Histone demethylase UTX) (Ubiquitously transcribed TPR protein on the X chromosome) (Ubiquitously transcribed X chromosome tetratricopeptide repeat protein)
362	216850	Kdm6b	Lysine-specific demethylase 6B (EC 1.14.11.-) (JmjC domain-containing protein 3) (Jumonji domain-containing protein 3)
363	50868	Keap1	Kelch-like ECH-associated protein 1 (Cytosolic inhibitor of Nrf2) (INrf2)
364	16559	Kif17	Kinesin-like protein KIF17 (MmKIF17)
365	16565	Kif21b	Kinesin-like protein KIF21B (Kinesin-like protein KIF6)
366	16590	Kit	Mast/stem cell growth factor receptor Kit (SCFR) (EC 2.7.10.1) (Proto-oncogene c-Kit) (Tyrosine-protein kinase Kit) (CD antigen CD117)
367	16624	Klk8	Kallikrein 1-related peptidase b8 (EC 3.4.21.35) (Glandular kallikrein K8) (mGK-8) (Tissue kallikrein-8)
368	16635	Klra4	Killer cell lectin-like receptor 4 (Lymphocyte antigen 49d) (Ly-49d) (T-cell surface glycoprotein Ly-49D)
369	16639	Klra8	Killer cell lectin-like receptor 8 (Lymphocyte antigen 49h) (Ly-49h) (T-cell surface glycoprotein Ly-49H)
370	232408	Klrb1f	Killer cell lectin-like receptor subfamily B member 1F (CD161 antigen-like family member F) (Natural killer cell surface protein NKR-P1F) (CD antigen CD161f)
371	50928	Klrg1	Killer cell lectin-like receptor subfamily G member 1 (Mast cell function-associated antigen 2F1)
372	27007	Klrk1	NKG2-D type II integral membrane protein (Killer cell lectin-like receptor subfamily K member 1) (NK cell receptor D) (NKG2-D-activating NK receptor) (CD antigen CD314)

373	214162	Kmt2a	Histone-lysine N-methyltransferase 2A (Lysine N-methyltransferase 2A) (EC 2.1.1.354) (ALL-1) (Myeloid/lymphoid or mixed-lineage leukemia) (Myeloid/lymphoid or mixed-lineage leukemia protein 1) (Zinc finger protein HRX) [Cleaved into: MLL cleavage product N320 (N-terminal cleavage product of 320 kDa) (p320); MLL cleavage product C180 (C-terminal cleavage product of 180 kDa) (p180)]
374	75410	Kmt2b	Histone-lysine N-methyltransferase 2B (Lysine N-methyltransferase 2B) (EC 2.1.1.354) (Myeloid/lymphoid or mixed-lineage leukemia protein 4 homolog) (Trithorax homolog 2) (WW domain-binding protein 7) (WBP-7)
375	16653	Kras	GTPase KRas (K-Ras 2) (Ki-Ras) (c-K-ras) (c-Ki-ras) [Cleaved into: GTPase KRas, N-terminally processed]
376	217666	L2hgdh	L-2-hydroxyglutarate dehydrogenase, mitochondrial (EC 1.1.99.2) (Duranin)
377	16768	Lag3	Lymphocyte activation gene 3 protein (LAG-3) (Activation-induced cytidine deaminase-linked autoimmunity protein) (Aida) (CD antigen CD223) [Cleaved into: Secreted lymphocyte activation gene 3 protein (sLAG-3)]
378	16777	Lamb1	Laminin subunit beta-1 (Laminin B1 chain) (Laminin-1 subunit beta) (Laminin-10 subunit beta) (Laminin-12 subunit beta) (Laminin-2 subunit beta) (Laminin-6 subunit beta) (Laminin-8 subunit beta)
379	16795	Large1	LARGE xylosyl- and glucuronyltransferase 1 (EC 2.4.-.-) (Acetylglucosaminyltransferase-like 1A) (Glycosyltransferase-like protein) [Includes: Xylosyltransferase LARGE (EC 2.4.2.-); Beta-1,3-glucuronyltransferase LARGE (EC 2.4.1.-)]
380	16835	Ldlr	Low-density lipoprotein receptor (LDL receptor)
381	19141	Lgmn	Legumain (EC 3.4.22.34) (Asparaginyl endopeptidase) (Protease, cysteine 1)
382	16875	Lhx8	LIM/homeobox protein Lhx8 (LIM homeobox protein 8) (L3) (LIM/homeobox protein Lhx7) (LIM homeobox protein 7)
383	56722	Litaf	Lipopolysaccharide-induced tumor necrosis factor-alpha factor homolog (LPS-induced TNF-alpha factor homolog) (Estrogen-enhanced transcript protein) (mEET) (LITAF-like protein) (NEDD4 WW domain-binding protein 3)
384	110648	Lmx1a	LIM homeobox transcription factor 1-alpha (LIM/homeobox protein 1.1) (LMX-1.1) (LIM/homeobox protein LMX1A)
385	16917	Lmx1b	LIM homeobox transcription factor 1-beta

			(LIM/homeobox protein 1.2) (LMX-1.2) (LIM/homeobox protein LMX1B)
386	240028	Lnpep	Leucyl-cystinyl aminopeptidase (Cystinyl aminopeptidase) (EC 3.4.11.3) (Oxytocinase) (OTase)
387	70530	Lrfn2	Leucine-rich repeat and fibronectin type-III domain-containing protein 2
388	241296	Lrrc8a	Volume-regulated anion channel subunit LRRC8A (Leucine-rich repeat-containing protein 8A)
389	320974	Lrrn4	Leucine-rich repeat neuronal protein 4 (Neuronal leucine-rich repeat protein 4) (NLRR-4)
390	17005	Ltk	Leukocyte tyrosine kinase receptor (EC 2.7.10.1)
391	17153	Mal	Myelin and lymphocyte protein (T-lymphocyte maturation-associated protein)
392	17155	Man1a	Mannosyl-oligosaccharide 1,2-alpha-mannosidase IA (EC 3.2.1.113) (Man(9)-alpha-mannosidase) (Man9-mannosidase) (Mannosidase alpha class 1A member 1) (Processing alpha-1,2-mannosidase IA) (Alpha-1,2-mannosidase IA)
393	17159	Man2b1	Lysosomal alpha-mannosidase (Laman) (EC 3.2.1.24) (Lysosomal acid alpha-mannosidase) (Mannosidase alpha class 2B member 1) (Mannosidase alpha-B)
394	17754	Map1a	Microtubule-associated protein 1A (MAP-1A) [Cleaved into: MAP1A heavy chain; MAP1 light chain LC2]
395	17756	Map2	Microtubule-associated protein 2 (MAP-2)
396	270672	Map3k15	Mitogen-activated protein kinase kinase kinase 15 (EC 2.7.11.25) (MAPK/ERK kinase kinase 15) (MEK kinase 15) (MEKK 15)
397	26413	Mapk1	Mitogen-activated protein kinase 1 (MAP kinase 1) (MAPK 1) (EC 2.7.11.24) (ERT1) (Extracellular signal-regulated kinase 2) (ERK-2) (MAP kinase isoform p42) (p42-MAPK) (Mitogen-activated protein kinase 2) (MAP kinase 2) (MAPK 2)
398	26417	Mapk3	Mitogen-activated protein kinase 3 (MAP kinase 3) (MAPK 3) (EC 2.7.11.24) (ERT2) (Extracellular signal-regulated kinase 1) (ERK-1) (Insulin-stimulated MAP2 kinase) (MAP kinase isoform p44) (p44-MAPK) (MNK1) (Microtubule-associated protein 2 kinase) (p44-ERK1)
399	19099	Mapk8ip1	C-Jun-amino-terminal kinase-interacting protein 1 (JIP-1) (JNK-interacting protein 1) (Islet-brain-1) (IB-1) (JNK MAP kinase scaffold protein 1) (Mitogen-activated protein kinase 8-interacting protein 1)
400	60597	Mapk8ip2	C-Jun-amino-terminal kinase-interacting protein 2 (JIP-2) (JNK-interacting protein 2) (Islet-brain-2) (IB-2) (JNK MAP kinase scaffold protein 2) (Mitogen-activated protein

			kinase 8-interacting protein 2)
401	17762	Mapt	Microtubule-associated protein tau (Neurofibrillary tangle protein) (Paired helical filament-tau) (PHF-tau)
402	17242	Mdk	Midkine (MK) (Retanoic acid-responsive protein) (Retinoic acid-induced differentiation factor)
403	17257	Mecp2	Methyl-CpG-binding protein 2 (MeCp-2 protein) (MeCp2)
404	17260	Mef2c	Myocyte-specific enhancer factor 2C (Myocyte enhancer factor 2C)
405	17536	Meis2	Homeobox protein Meis2 (Meis1-related protein 1)
406	210529	Mettl14	N6-adenosine-methyltransferase non-catalytic subunit (Methyltransferase-like protein 14)
407	76574	Mfsd2a	Sodium-dependent lysophosphatidylcholine symporter 1 (NLS1) (Sodium-dependent LPC symporter 1) (Major facilitator superfamily domain-containing protein 2A)
408	17380	Mme	Macrophage metalloelastase (MME) (EC 3.4.24.65) (Matrix metalloproteinase-12) (MMP-12)
409	17433	Mobp	Myelin-associated oligodendrocyte basic protein
410	404242	Mrgprx1	Mas-related G-protein coupled receptor member X1 (Mas-related G-protein coupled receptor member C11) (Sensory neuron-specific G-protein coupled receptor 1)
411	18100	Mrpl40	39S ribosomal protein L40, mitochondrial (L40mt) (MRP-L40) (Nuclear localization signal-containing protein deleted in velocardiofacial syndrome homolog)
412	17681	Msc	Musculin (Myogenic repressor)
413	56428	Mtch2	Mitochondrial carrier homolog 2
414	108156	Mthfd1	C-1-tetrahydrofolate synthase, cytoplasmic (C1-THF synthase) [Cleaved into: C-1-tetrahydrofolate synthase, cytoplasmic, N-terminally processed] [Includes: Methylenetetrahydrofolate dehydrogenase (EC 1.5.1.5); Methenyltetrahydrofolate cyclohydrolase (EC 3.5.4.9); Formyltetrahydrofolate synthetase (EC 6.3.4.3)]
415	244701	Mtnr1b	Melatonin receptor type 1B (Mel-1B-R) (Mel1b receptor)
416	56717	Mtor	Serine/threonine-protein kinase mTOR (EC 2.7.11.1) (FK506-binding protein 12-rapamycin complex-associated protein 1) (FKBP12-rapamycin complex-associated protein) (Mammalian target of rapamycin) (mTOR) (Mechanistic target of rapamycin) (Rapamycin target protein 1) (RAPT1)
417	210009	Mtrr	Methionine synthase reductase (MSR) (EC 1.16.1.8)
418	381530	Mup20	Major urinary protein 20 (Darcin) (Major urinary protein 24)
419	18198	Musk	Muscle, skeletal receptor tyrosine-protein kinase (EC 2.7.10.1) (Muscle-specific tyrosine-protein kinase

			receptor) (MuSK) (Muscle-specific kinase receptor)
420	225908	Myrf	Myelin regulatory factor (EC 3.4.-.-) (Myelin gene regulatory factor) [Cleaved into: Myelin regulatory factor, N-terminal; Myelin regulatory factor, C-terminal]
421	26422	Nbea	Neurobeachin (Lysosomal-trafficking regulator 2)
422	17967	Ncam1	Neural cell adhesion molecule 1 (N-CAM-1) (NCAM-1) (CD antigen CD56)
423	17977	Ncoa1	Nuclear receptor coactivator 1 (NCoA-1) (EC 2.3.1.48) (Nuclear receptor coactivator protein 1) (mNRC-1) (Steroid receptor coactivator 1) (SRC-1)
424	20185	Ncor1	Nuclear receptor corepressor 1 (N-CoR) (N-CoR1) (Retinoid X receptor-interacting protein 13) (RIP13)
425	20602	Ncor2	Nuclear receptor corepressor 2 (N-CoR2) (Silencing mediator of retinoic acid and thyroid hormone receptor) (SMRT) (SMRTE) (T3 receptor-associating factor) (TRAC) (Thyroid-, retinoic-acid-receptor-associated corepressor)
426	14299	Ncs1	Neuronal calcium sensor 1 (NCS-1) (Frequenin homolog)
427	59287	Ncstn	Nicastrin
428	234593	Ndr4	Protein NDRG4 (N-myc downstream-regulated gene 4 protein) (Protein Ndr4)
429	58998	Nectin3	Nectin-3 (Nectin cell adhesion molecule 3) (Poliovirus receptor-related protein 3) (CD antigen CD113)
430	54003	Nell2	Protein kinase C-binding protein NELL2 (MEL91 protein) (NEL-like protein 2)
431	18007	Neo1	Neogenin
432	246317	Neto1	Neuropilin and tolloid-like protein 1 (Brain-specific transmembrane protein containing 2 CUB and 1 LDL-receptor class A domains protein 1)
433	18011	Neurl1a	E3 ubiquitin-protein ligase NEURL1 (EC 2.3.2.27) (Neuralized-like protein 1A) (m-neu1) (m-neuralized 1) (Neuralized1) (RING-type E3 ubiquitin transferase NEURL1)
434	18013	Neurod2	Neurogenic differentiation factor 2 (NeuroD2) (NeuroD-related factor) (NDRF)
435	18014	Neurog1	Neurogenin-1 (NGN-1) (Helix-loop-helix protein mATH-4C) (mATH4C) (Neurogenic basic-helix-loop-helix protein) (Neurogenic differentiation factor 3) (NeuroD3)
436	245555	Nexmif	Neurite extension and migration factor (KIAA2022 protein associated with intellectual disability, language impairment and autistic behavior homolog) (KIDLIA)
437	18015	Nf1	Neurofibromin (Neurofibromatosis-related protein NF-1)
438	73181	Nfatc4	Nuclear factor of activated T-cells, cytoplasmic 4 (NF-ATc4) (NFATc4) (T-cell transcription factor NFAT3) (NF-

			AT3)
439	18032	Nfix	Nuclear factor 1 X-type (NF1-X) (Nuclear factor 1/X) (CCAAT-box-binding transcription factor) (CTF) (Nuclear factor I/X) (NF-I/X) (NFI-X) (TGGCA-binding protein)
440	18049	Ngf	Beta-nerve growth factor (Beta-NGF)
441	216856	Nlgn2	Neurologin-2
442	245537	Nlgn3	Neurologin-3 (Glotactin homolog)
443	18121	Nog	Noggin
444	18143	Npas2	Neuronal PAS domain-containing protein 2 (Neuronal PAS2)
445	225872	Npas4	Neuronal PAS domain-containing protein 4 (Neuronal PAS4) (HLH-PAS transcription factor NXF) (Limbic-enhanced PAS protein) (LE-PAS)
446	226304	Npbwr1	Neuropeptides B/W receptor type 1 (G-protein coupled receptor 7)
447	100043254	Nps	Neuropeptide S
448	319239	Npsr1	Neuropeptide S receptor (G-protein coupled receptor 154) (G-protein coupled receptor PGR14)
449	53324	Nptx2	Neuronal pentraxin-2 (NP2) (Neuronal pentraxin II) (NP-II)
450	18105	Nqo2	Ribosyldihydronicotinamide dehydrogenase [quinone] (EC 1.10.5.1) (NRH dehydrogenase [quinone] 2) (NRH:quinone oxidoreductase 2) (Quinone reductase 2) (QR2)
451	14815	Nr3c1	Glucocorticoid receptor (GR) (Nuclear receptor subfamily 3 group C member 1)
452	64011	Nrgn	Neurogranin (Ng) (RC3) [Cleaved into: NEUG(55-78)]
453	22360	Nrsn1	Neurensin-1 (Neuro-p24) (Vesicular membrane protein of 24 kDa) (Vesicular membrane protein p24)
454	18189	Nrxn1	Neurexin-1 (Neurexin I-alpha) (Neurexin-1-alpha)
455	18190	Nrxn2	Neurexin-2 (Neurexin II-alpha) (Neurexin-2-alpha)
456	18203	Ntan1	Protein N-terminal asparagine amidohydrolase (EC 3.5.1.121) (Protein NH2-terminal asparagine amidohydrolase) (PNAA) (Protein NH2-terminal asparagine deamidase) (PNAD) (Protein N-terminal Asn amidase) (Protein NTN-amidase)
457	18205	Ntf3	Neurotrophin-3 (NT-3) (HDNF) (Nerve growth factor 2) (NGF-2) (Neurotrophic factor)
458	78405	Ntf5	Neurotrophin-4 (NT-4) (Neurotrophin-5) (NT-5) (Neutrophic factor 4)
459	235106	Ntm	Neurotrimin
460	18211	Ntrk1	High affinity nerve growth factor receptor (EC 2.7.10.1) (Neurotrophic tyrosine kinase receptor type 1)
461	18212	Ntrk2	BDNF/NT-3 growth factors receptor (EC 2.7.10.1) (GP145-TrkB/GP95-TrkB) (Trk-B) (Neurotrophic tyrosine kinase

			receptor type 2) (TrkB tyrosine kinase)
462	67405	Nts	Neurotensin/neuromedin N [Cleaved into: Large neuromedin N (NmN-125); Neuromedin N (NN) (NmN); Neurotensin (NT); Tail peptide]
463	18216	Ntsr1	Neurotensin receptor type 1 (NT-R-1) (NTR1)
464	18217	Ntsr2	Neurotensin receptor type 2 (NT-R-2) (NTR2) (Low-affinity levocabastine-sensitive neurotensin receptor) (NTRL)
465	214254	Nudt15	Nucleotide triphosphate diphosphatase NUDT15 (EC 3.6.1.9) (MutT homolog 2) (mMTH2) (Nucleoside diphosphate-linked moiety X motif 15) (Nudix motif 15) (Nucleoside diphosphate-linked to another moiety X hydrolase 15) (Nudix hydrolase 15)
466	94190	Ophn1	Oligophrenin-1
467	353344	Opn5	Opsin-5 (G-protein coupled receptor 136) (G-protein coupled receptor PGR12) (Neuropsin)
468	18387	Oprk1	Kappa-type opioid receptor (K-OR-1) (KOR-1) (MSL-1)
469	18389	Oprl1	Nociceptin receptor (K3 opiate receptor) (Kappa-type 3 opioid receptor) (KOR-3) (ORGC) (Orphanin FQ receptor)
470	21906	Otop1	Proton channel OTOF1 (Otopetrin-1)
471	18430	Oxtr	Oxytocin receptor (OT-R)
472	18472	Pafah1b1	Platelet-activating factor acetylhydrolase IB subunit alpha (Lissencephaly-1 protein) (LIS-1) (PAF acetylhydrolase 45 kDa subunit) (PAF-AH 45 kDa subunit) (PAF-AH alpha) (PAFAH alpha)
473	67869	Paip2	Polyadenylate-binding protein-interacting protein 2 (PABP-interacting protein 2) (PAIP-2) (Poly(A)-binding protein-interacting protein 2)
474	232164	Paip2b	Polyadenylate-binding protein-interacting protein 2B (PABP-interacting protein 2B) (PAIP-2B) (Poly(A)-binding protein-interacting protein 2B)
475	18479	Pak1	Serine/threonine-protein kinase PAK 1 (EC 2.7.11.1) (Alpha-PAK) (CDC42/RAC effector kinase PAK-A) (p21-activated kinase 1) (PAK-1) (p65-PAK)
476	214230	Pak6	Serine/threonine-protein kinase PAK 6 (EC 2.7.11.1) (p21-activated kinase 6) (PAK-6)
477	241656	Pak7	Serine/threonine-protein kinase PAK 5 (EC 2.7.11.1) (p21-activated kinase 5) (PAK-5) (p21-activated kinase 7) (PAK-7)
478	18508	Pax6	Paired box protein Pax-6 (Oculorhombin)
479	18534	Pck1	Phosphoenolpyruvate carboxykinase, cytosolic [GTP] (PEPCK-C) (EC 4.1.1.32)
480	18545	Pcp2	Purkinje cell protein 2 (Protein PCD-5) (Purkinje cell-

			specific protein L7)
481	18546	Pcp4	Calmodulin regulator protein PCP4 (Brain-specific antigen PCP-4) (Brain-specific polypeptide PEP-19) (Purkinje cell protein 4)
482	18554	Pcsk7	Proprotein convertase subtilisin/kexin type 7 (EC 3.4.21.-) (Prohormone convertase 7) (Proprotein convertase 7) (PC7) (Subtilisin-like proprotein convertase 7) (SPC7) (Subtilisin/kexin-like protease PC7)
483	18566	Pdcd1	Programmed cell death protein 1 (Protein PD-1) (mPD-1) (CD antigen CD279)
484	18574	Pde1b	Calcium/calmodulin-dependent 3',5'-cyclic nucleotide phosphodiesterase 1B (Cam-PDE 1B) (EC 3.1.4.17) (63 kDa Cam-PDE)
485	207728	Pde2a	cGMP-dependent 3',5'-cyclic phosphodiesterase (EC 3.1.4.17) (Cyclic GMP-stimulated phosphodiesterase) (CGS-PDE) (cGSPDE)
486	18577	Pde4a	cAMP-specific 3',5'-cyclic phosphodiesterase 4A (EC 3.1.4.53)
487	110385	Pde4c	cAMP-specific 3',5'-cyclic phosphodiesterase 4C (EC 3.1.4.53)
488	238871	Pde4d	cAMP-specific 3',5'-cyclic phosphodiesterase 4D (EC 3.1.4.53) (DPDE3)
489	242202	Pde5a	cGMP-specific 3',5'-cyclic phosphodiesterase (EC 3.1.4.35) (cGMP-binding cGMP-specific phosphodiesterase) (CGB-PDE)
490	218461	Pde8b	High affinity cAMP-specific and IBMX-insensitive 3',5'-cyclic phosphodiesterase 8B (PDE8B) (EC 3.1.4.53) (Cell proliferation-inducing gene 22 protein)
491	18585	Pde9a	High affinity cGMP-specific 3',5'-cyclic phosphodiesterase 9A (EC 3.1.4.35)
492	57028	Pdpx	Pyridoxal phosphate phosphatase (PLP phosphatase) (EC 3.1.3.3) (EC 3.1.3.74) (Chronophin)
493	18610	Pdyn	Proenkephalin-B (Beta-neoendorphin-dynorphin) (Preprodynorphin) [Cleaved into: Alpha-neoendorphin; Beta-neoendorphin; Big dynorphin (Big Dyn); Dynorphin A(1-17) (Dyn-A17) (Dynorphin A); Dynorphin A(1-13); Dynorphin A(1-8); Leu-enkephalin; Rimorphin (Dynorphin B) (Dyn-B) (Dynorphin B(1-13)); Leumorphin (Dynorphin B-29)]
494	18611	Pea15a	Astrocytic phosphoprotein PEA-15 (15 kDa phosphoprotein enriched in astrocytes)
495	53328	Pgrmc1	Membrane-associated progesterone receptor component 1 (mPR)
496	74189	Phactr3	Phosphatase and actin regulator 3 (Scaffold-associated

			PP1-inhibiting protein) (Scapinin)
497	320595	Phf8	Histone lysine demethylase PHF8 (EC 1.14.11.27) (PHD finger protein 8)
498	98432	Phlpp1	PH domain leucine-rich repeat-containing protein phosphatase 1 (EC 3.1.3.16) (Pleckstrin homology domain-containing family E member 1) (PH domain-containing family E member 1) (Suprachiasmatic nucleus circadian oscillatory protein)
499	72947	Phykpl	5-phosphohydroxy-L-lysine phospho-lyase (EC 4.2.3.134) (Alanine--glyoxylate aminotransferase 2-like 2)
500	56469	Pias1	E3 SUMO-protein ligase PIAS1 (EC 2.3.2.27) (DEAD/H box-binding protein 1) (Protein inhibitor of activated STAT protein 1) (RING-type E3 ubiquitin transferase PIAS1)
501	233489	Picalm	Phosphatidylinositol-binding clathrin assembly protein (Clathrin assembly lymphoid myeloid leukemia) (CALM)
502	83490	Pik3ap1	Phosphoinositide 3-kinase adapter protein 1 (B-cell adapter for phosphoinositide 3-kinase) (B-cell phosphoinositide 3-kinase adapter protein 1)
503	68943	Pink1	Serine/threonine-protein kinase PINK1, mitochondrial (EC 2.7.11.1) (BRPK) (PTEN-induced putative kinase protein 1)
504	18733	Pirb	Leukocyte immunoglobulin-like receptor subfamily B member 3 (LIR-3) (Leukocyte immunoglobulin-like receptor 3) (Cell-surface glycoprotein p91) (Paired immunoglobulin-like receptor B) (PIR-B)
505	224938	Pja2	E3 ubiquitin-protein ligase Praja-2 (Praja2) (EC 2.3.2.27) (RING finger protein 131) (RING-type E3 ubiquitin transferase Praja-2)
506	53357	Pla2g6	85/88 kDa calcium-independent phospholipase A2 (Cal-PLA2) (EC 3.1.1.4) (Group VI phospholipase A2) (GVI PLA2) (Intracellular membrane-associated calcium-independent phospholipase A2 beta) (iPLA2-beta) (Patatin-like phospholipase domain-containing protein 9) (PNPLA9)
507	18795	Plcb1	1-phosphatidylinositol 4,5-bisphosphate phosphodiesterase beta-1 (EC 3.1.4.11) (PLC-154) (Phosphoinositide phospholipase C-beta-1) (Phospholipase C-beta-1) (PLC-beta-1)
508	20620	Plk2	Serine/threonine-protein kinase PLK2 (EC 2.7.11.21) (Polo-like kinase 2) (PLK-2) (Serine/threonine-protein kinase SNK) (Serum-inducible kinase)
509	20431	Pmel	Melanocyte protein PMEL (Melanocyte protein Pmel 17) (Premelanosome protein) (Silver locus protein) [Cleaved into: M-alpha; M-beta]
510	18155	Pnoc	Prepronociceptin (N23K/N27K) [Cleaved into: Nocistatin;

			Nociceptin (Orphanin FQ) (PPNOC); Orphanin FQ2]
511	74653	Pomk	Protein O-mannose kinase (POMK) (EC 2.7.1.183) (Protein kinase-like protein SgK196) (Sugen kinase 196)
512	18985	Pou2af1	POU domain class 2-associating factor 1 (B-cell-specific coactivator OBF-1) (BOB-1) (BOB1) (OCA-B) (OCT-binding factor 1)
513	67895	Pp	Inorganic pyrophosphatase (EC 3.6.1.1) (Pyrophosphate phospho-hydrolase) (PPase)
514	19044	Ppox	Protoporphyrinogen oxidase (PPO) (EC 1.3.3.4)
515	19051	Ppp1r17	Protein phosphatase 1 regulatory subunit 17 (G substrate)
516	19049	Ppp1r1b	Protein phosphatase 1 regulatory subunit 1B (DARPP-32) (Dopamine- and cAMP-regulated neuronal phosphoprotein)
517	66849	Ppp1r2	Protein phosphatase inhibitor 2 (IPP-2)
518	217124	Ppp1r9b	Neurabin-2 (Neurabin-II) (Protein phosphatase 1 regulatory subunit 9B) (Spinophilin)
519	19058	Ppp3r1	Calcineurin subunit B type 1 (Protein phosphatase 2B regulatory subunit 1) (Protein phosphatase 3 regulatory subunit B alpha isoform 1)
520	19063	Ppt1	Palmitoyl-protein thioesterase 1 (PPT-1) (EC 3.1.2.22) (Palmitoyl-protein hydrolase 1)
521	18646	Prf1	Perforin-1 (P1) (Cytolysin) (Lymphocyte pore-forming protein)
522	18747	Prkaca	cAMP-dependent protein kinase catalytic subunit alpha (PKA C-alpha) (EC 2.7.11.11)
523	18749	Prkacb	cAMP-dependent protein kinase catalytic subunit beta (PKA C-beta) (EC 2.7.11.11)
524	19085	Prkar1b	cAMP-dependent protein kinase type I-beta regulatory subunit
525	19088	Prkar2b	cAMP-dependent protein kinase type II-beta regulatory subunit
526	18750	Prkca	Protein kinase C alpha type (PKC-A) (PKC-alpha) (EC 2.7.11.13)
527	18755	Prkch	Protein kinase C eta type (EC 2.7.11.13) (PKC-L) (nPKC-eta)
528	18762	Prkcz	Protein kinase C zeta type (EC 2.7.11.13) (nPKC-zeta)
529	50873	Prkn	E3 ubiquitin-protein ligase parkin (EC 2.3.2.31) (Parkin RBR E3 ubiquitin-protein ligase)
530	19109	PrI	Prolactin (PRL)
531	19122	Prnp	Major prion protein (PrP) (PrP27-30) (PrP33-35C) (CD antigen CD230)
532	260297	Prrt1	Proline-rich transmembrane protein 1 (Dispanin subfamily D member 1) (DSPD1) (Synapse differentiation-

			induced protein 4)
533	69017	Prpt2	Proline-rich transmembrane protein 2 (Dispanin subfamily B member 3) (DSPB3)
534	353211	Prune2	Protein prune homolog 2 (BNIP2 motif-containing molecule at the C-terminal region 1)
535	19164	Psen1	Presenilin-1 (PS-1) (EC 3.4.23.-) (Protein S182) [Cleaved into: Presenilin-1 NTF subunit; Presenilin-1 CTF subunit; Presenilin-1 CTF12 (PS1-CTF12)]
536	19165	Psen2	Presenilin-2 (PS-2) (EC 3.4.23.-) [Cleaved into: Presenilin-2 NTF subunit; Presenilin-2 CTF subunit]
537	19186	Psme1	Proteasome activator complex subunit 1 (11S regulator complex subunit alpha) (REG-alpha) (Activator of multicatalytic protease subunit 1) (Proteasome activator 28 subunit alpha) (PA28a) (PA28alpha)
538	19188	Psme2	Proteasome activator complex subunit 2 (11S regulator complex subunit beta) (REG-beta) (Activator of multicatalytic protease subunit 2) (Proteasome activator 28 subunit beta) (PA28b) (PA28beta)
539	211612	Ptchd1	Patched domain-containing protein 1
540	19211	Pten	Phosphatidylinositol 3,4,5-trisphosphate 3-phosphatase and dual-specificity protein phosphatase PTEN (EC 3.1.3.16) (EC 3.1.3.48) (EC 3.1.3.67) (Mutated in multiple advanced cancers 1) (Phosphatase and tensin homolog)
541	19217	Ptger2	Prostaglandin E2 receptor EP2 subtype (PGE receptor EP2 subtype) (PGE2 receptor EP2 subtype) (Prostanoid EP2 receptor)
542	19219	Ptger4	Prostaglandin E2 receptor EP4 subtype (PGE receptor EP4 subtype) (PGE2 receptor EP4 subtype) (Prostanoid EP4 receptor)
543	19224	Ptgs1	Prostaglandin G/H synthase 1 (EC 1.14.99.1) (Cyclooxygenase-1) (COX-1) (Prostaglandin H2 synthase 1) (PGH synthase 1) (PGHS-1) (PHS 1) (Prostaglandin-endoperoxide synthase 1)
544	19225	Ptgs2	Prostaglandin G/H synthase 2 (EC 1.14.99.1) (Cyclooxygenase-2) (COX-2) (Glucocorticoid-regulated inflammatory cyclooxygenase) (Gripghs) (Macrophage activation-associated marker protein P71/73) (PES-2) (PHS II) (Prostaglandin H2 synthase 2) (PGH synthase 2) (PGHS-2) (Prostaglandin-endoperoxide synthase 2) (TIS10 protein)
545	19229	Ptk2b	Protein-tyrosine kinase 2-beta (EC 2.7.10.2) (Calcium-dependent tyrosine kinase) (CADTK) (Calcium-regulated non-receptor proline-rich tyrosine kinase) (Cell adhesion kinase beta) (CAK-beta) (CAKB) (Focal adhesion kinase 2)

			(FADK 2) (Proline-rich tyrosine kinase 2) (Related adhesion focal tyrosine kinase) (RAFTK)
546	19231	Ptma	Prothymosin alpha [Cleaved into: Prothymosin alpha, N-terminally processed; Thymosin alpha]
547	19242	Ptn	Pleiotrophin (PTN) (Heparin-binding brain mitogen) (HBBM) (Heparin-binding growth factor 8) (HBGF-8) (Heparin-binding growth-associated molecule) (HB-GAM) (Heparin-binding neutrophilic factor) (HBNF) (Osteoblast-specific factor 1) (OSF-1)
548	19259	Ptpn5	Tyrosine-protein phosphatase non-receptor type 5 (EC 3.1.3.48) (Neural-specific protein-tyrosine phosphatase) (Striatum-enriched protein-tyrosine phosphatase) (STEP)
549	19276	Ptpn2	Receptor-type tyrosine-protein phosphatase N2 (R-PTP-N2) (EC 3.1.3.-) (EC 3.1.3.48) (PTP IA-2beta) (Phogrin) (Protein tyrosine phosphatase-NP) (PTP-NP) [Cleaved into: IA-2beta71; IA-2beta64; IA-2beta60]
550	19279	Ptprr	Receptor-type tyrosine-protein phosphatase R (R-PTP-R) (EC 3.1.3.48) (Phosphotyrosine phosphatase 13) (Protein-tyrosine-phosphatase SL)
551	19283	Ptpnz1	Receptor-type tyrosine-protein phosphatase zeta (R-PTP-zeta) (EC 3.1.3.48)
552	30939	Pttg1	Securin (Pituitary tumor-transforming gene 1 protein)
553	19290	Pura	Transcriptional activator protein Pur-alpha (Purine-rich single-stranded DNA-binding protein alpha)
554	19293	Pvalb	Parvalbumin alpha
555	69908	Rab3b	Ras-related protein Rab-3B
556	19353	Rac1	Ras-related C3 botulinum toxin substrate 1 (EC 3.6.5.2) (p21-Rac1)
557	19366	Rad54l	DNA repair and recombination protein RAD54-like (EC 3.6.4.-) (RAD54 homolog) (mHR54) (mRAD54)
558	110157	Raf1	RAF proto-oncogene serine/threonine-protein kinase (EC 2.7.11.1) (Proto-oncogene c-RAF) (cRaf) (Raf-1)
559	19373	Rag1	V(D)J recombination-activating protein 1 (RAG-1) [Includes: Endonuclease RAG1 (EC 3.1.-.-); E3 ubiquitin-protein ligase RAG1 (EC 2.3.2.27) (RING-type E3 ubiquitin transferase RAG1)]
560	19377	Rai1	Retinoic acid-induced protein 1
561	76897	Raly1	RNA-binding Raly-like protein
562	110351	Rap1gap	Rap1 GTPase-activating protein 1 (Rap1GAP) (Rap1GAP1) (ARPP-90)
563	76089	Rapgef2	Rap guanine nucleotide exchange factor 2 (Cyclic nucleotide ras GEF) (CNrasGEF) (Neural RAP guanine nucleotide exchange protein) (nRap GEP) (PDZ domain-

			containing guanine nucleotide exchange factor 1) (PDZ-GEF1) (RA-GEF-1) (Ras/Rap1-associating GEF-1)
564	19401	Rara	Retinoic acid receptor alpha (RAR-alpha) (Nuclear receptor subfamily 1 group B member 1)
565	75141	Rasd2	GTP-binding protein Rhes (Ras homolog enriched in striatum)
566	19417	Rasgrf1	Ras-specific guanine nucleotide-releasing factor 1 (Ras-GRF1) (CDC25Mm) (Guanine nucleotide-releasing protein) (GNRP) (Ras-specific nucleotide exchange factor CDC25)
567	19646	Rbbp4	Histone-binding protein RBBP4 (Chromatin assembly factor 1 subunit C) (CAF-1 subunit C) (Chromatin assembly factor I p48 subunit) (CAF-I 48 kDa subunit) (CAF-I p48) (Nucleosome-remodeling factor subunit RBAP48) (Retinoblastoma-binding protein 4) (RBBP-4) (Retinoblastoma-binding protein p48)
568	69126	Rbis	Ribosomal biogenesis factor
569	54720	Rcan1	Calcipressin-1 (Down syndrome critical region protein 1 homolog) (Myocyte-enriched calcineurin-interacting protein 1) (MCIP1) (Regulator of calcineurin 1)
570	53901	Rcan2	Calcipressin-2 (Calcineurin inhibitory protein ZAKI-4) (Down syndrome candidate region 1-like protein 1) (Myocyte-enriched calcineurin-interacting protein 2) (MCIP2) (Regulator of calcineurin 2)
571	19699	Reln	Reelin (EC 3.4.21.-) (Reeler protein)
572	66270	Retreg1	Reticulophagy regulator 1 (Reticulophagy receptor 1)
573	19733	Rgn	Regucalcin (RC) (Gluconolactonase) (GNL) (EC 3.1.1.17) (Senescence marker protein 30) (SMP-30)
574	51791	Rgs14	Regulator of G-protein signaling 14 (RGS14) (RAP1/RAP2-interacting protein) (RPIP1)
575	56212	Rhog	Rho-related GTP-binding protein RhoG (Sid 10750)
576	101489	Ric8a	Synembryn-A (Protein Ric-8A)
577	116837	Rims1	Regulating synaptic membrane exocytosis protein 1 (Rab-3-interacting molecule 1) (RIM 1) (Rab-3-interacting protein 1)
578	225870	Rin1	Ras and Rab interactor 1 (Ras interaction/interference protein 1)
579	212108	Rln3	Relaxin-3 (Insulin-like peptide INSL7) (Insulin-like peptide 7) (Prorelaxin M3) [Cleaved into: Relaxin-3 B chain; Relaxin-3 A chain]
580	67809	Rmdn3	Regulator of microtubule dynamics protein 3 (RMD-3) (mRMD-3) (Protein FAM82A2) (Protein FAM82C)
581	24017	Rnf13	E3 ubiquitin-protein ligase RNF13 (EC 2.3.2.27) (RING finger protein 13) (RING-type E3 ubiquitin transferase

			RNF13)
582	30945	Rnf19a	E3 ubiquitin-protein ligase RNF19A (EC 2.3.2.31) (Double ring-finger protein) (Dorfin) (Gametogenesis-expressed protein GEG-154) (RING finger protein 19A) (UBCM4-interacting protein 117) (UIP117) (XY body protein) (XYbp)
583	19934	Rpl22	60S ribosomal protein L22 (Heparin-binding protein HBp15)
584	20111	Rps6ka1	Ribosomal protein S6 kinase alpha-1 (S6K-alpha-1) (EC 2.7.11.1) (90 kDa ribosomal protein S6 kinase 1) (p90-RSK 1) (p90RSK1) (p90S6K) (MAP kinase-activated protein kinase 1a) (MAPK-activated protein kinase 1a) (MAPKAP kinase 1a) (MAPKAPK-1a) (Ribosomal S6 kinase 1) (RSK-1)
585	239336	Rxfp3	Relaxin-3 receptor 1 (RLN3 receptor 1) (G protein-coupled receptor SALPR homolog) (Relaxin family peptide receptor 3)
586	20203	S100b	Protein S100-B (S-100 protein beta chain) (S-100 protein subunit beta) (S100 calcium-binding protein B)
587	94226	S1pr5	Sphingosine 1-phosphate receptor 5 (S1P receptor 5) (S1P5) (Endothelial differentiation G-protein-coupled receptor 8) (Lysophospholipid receptor B4) (Sphingosine 1-phosphate receptor Edg-8) (S1P receptor Edg-8)
588	20234	Sbp	Prostatic spermine-binding protein (SBP) (Major prostatic secretory glycoprotein) (P25)
589	20254	Scg2	Secretogranin-2 (Chromogranin-C) (Secretogranin II) (SgII) [Cleaved into: Secretoneurin (SN); Manserin]
590	20265	Scn1a	Sodium channel protein type 1 subunit alpha (Sodium channel protein brain I subunit alpha) (Sodium channel protein type I subunit alpha) (Voltage-gated sodium channel subunit alpha Nav1.1)
591	110876	Scn2a	Sodium channel protein type 2 subunit alpha (Voltage-gated sodium channel subunit alpha Nav1.2)
592	20269	Scn3a	Sodium channel protein type 3 subunit alpha (Sodium channel protein brain III subunit alpha) (Sodium channel protein type III subunit alpha) (Voltage-gated sodium channel subtype III) (Voltage-gated sodium channel subunit alpha Nav1.3)
593	20287	Sct	Secretin
594	53378	Sdcbp	Syntenin-1 (Scaffold protein Pbp1) (Syndecan-binding protein 1)
595	257635	Sds	Serine dehydratase-like (EC 4.3.1.17) (L-serine deaminase) (L-serine dehydratase/L-threonine deaminase) (L-threonine dehydratase) (TDH) (EC 4.3.1.19) (SDH)

596	218877	Sema3g	Semaphorin-3G
597	223870	Senp1	Sentrin-specific protease 1 (EC 3.4.22.-) (SUMO-1 protease 2) (SuPr-2) (Sentrin/SUMO-specific protease SENP1)
598	53860	Septin9	Septin-9 (SL3-3 integration site 1 protein)
599	20317	Serpinf1	Pigment epithelium-derived factor (PEDF) (Caspin) (Serpin F1) (Stromal cell-derived factor 3) (SDF-3)
600	20713	Serpini1	Neuroserpin (Peptidase inhibitor 12) (PI-12) (Serine protease inhibitor 17) (Serpin I1)
601	233904	Setd1a	Histone-lysine N-methyltransferase SETD1A (EC 2.1.1.354) (SET domain-containing protein 1A)
602	78887	Sfi1	Protein SFI1 homolog
603	20393	Sgk1	Serine/threonine-protein kinase Sgk1 (EC 2.7.11.1) (Serum/glucocorticoid-regulated kinase 1)
604	52850	Sgsm1	Small G protein signaling modulator 1 (RUN and TBC1 domain-containing protein 2)
605	26904	Sh2d1b1	SH2 domain-containing protein 1B (EWS/FLI1-activated transcript 2) (EAT-2)
606	20404	Sh3gl2	Endophilin-A1 (Endophilin-1) (SH3 domain protein 2A) (SH3 domain-containing GRB2-like protein 2) (SH3p4)
607	243961	Shank1	SH3 and multiple ankyrin repeat domains protein 1 (Shank1)
608	210274	Shank2	SH3 and multiple ankyrin repeat domains protein 2 (Shank2) (Cortactin-binding protein 1) (CortBP1)
609	58234	Shank3	SH3 and multiple ankyrin repeat domains protein 3 (Shank3) (Proline-rich synapse-associated protein 2) (ProSAP2) (SPANK-2)
610	20418	Shc3	SHC-transforming protein 3 (Neuronal Shc) (N-Shc) (SHC-transforming protein C) (Src homology 2 domain-containing-transforming protein C3) (SH2 domain protein C3)
611	232813	Shisa7	Protein shisa-7 (Cystine-knot AMPAR modulating protein of 59 kDa) (CKAMP59) (GABA(A) receptor auxiliary subunit Shisa7) (Shisa family member 7)
612	20466	Sin3a	Paired amphipathic helix protein Sin3a (Histone deacetylase complex subunit Sin3a) (Transcriptional corepressor Sin3a)
613	20469	Sipa1	Signal-induced proliferation-associated protein 1 (Sipa-1) (GTPase-activating protein Spa-1)
614	217692	Sipa1l1	Signal-induced proliferation-associated 1-like protein 1 (SIPA1-like protein 1)
615	54353	Skap2	Src kinase-associated phosphoprotein 2 (Pyk2/RAFTK-associated protein) (SKAP55 homolog) (SKAP-HOM) (Src family-associated phosphoprotein 2) (Src kinase-

			associated phosphoprotein 55-related protein) (Src-associated adapter protein with PH and SH3 domains)
616	18174	Slc11a2	Natural resistance-associated macrophage protein 2 (NRAMP 2) (Divalent cation transporter 1) (Divalent metal transporter 1) (DMT-1) (Solute carrier family 11 member 2)
617	57138	Slc12a5	Solute carrier family 12 member 5 (Electroneutral potassium-chloride cotransporter 2) (K-Cl cotransporter 2) (mKCC2) (Neuronal K-Cl cotransporter)
618	72961	Slc17a7	Vesicular glutamate transporter 1 (VGluT1) (Brain-specific Na(+)-dependent inorganic phosphate cotransporter) (Solute carrier family 17 member 7)
619	76306	Slc18b1	MFS-type transporter SLC18B1 (Solute carrier family 18 member B1)
620	18399	Slc22a6	Solute carrier family 22 member 6 (Kidney-specific transport protein) (Novel kidney transcript) (mNKT) (Organic anion transporter 1) (Renal organic anion transporter 1) (mROAT1)
621	54338	Slc23a2	Solute carrier family 23 member 2 (Na+)/L-ascorbic acid transporter 2) (Sodium-dependent vitamin C transporter 2) (SVCT-2) (mSVCT2) (Yolk sac permease-like molecule 2)
622	67712	Slc25a37	Mitoferrin-1 (Mitochondrial iron transporter 1) (Mitochondrial solute carrier protein) (Solute carrier family 25 member 37)
623	20528	Slc2a4	Solute carrier family 2, facilitated glucose transporter member 4 (GT2) (Glucose transporter type 4, insulin-responsive) (GLUT-4)
624	106947	Slc39a3	Zinc transporter ZIP3 (Solute carrier family 39 member 3) (Zrt- and Irt-like protein 3) (ZIP-3)
625	232333	Slc6a1	Sodium- and chloride-dependent GABA transporter 1 (GAT-1) (Solute carrier family 6 member 1)
626	14412	Slc6a13	Sodium- and chloride-dependent GABA transporter 2 (GAT-2) (Sodium- and chloride-dependent GABA transporter 3) (GAT-3) (Solute carrier family 6 member 13)
627	103098	Slc6a15	Sodium-dependent neutral amino acid transporter B(0)AT2 (Sodium- and chloride-dependent neurotransmitter transporter NTT73) (Solute carrier family 6 member 15) (Transporter v7-3)
628	15567	Slc6a4	Sodium-dependent serotonin transporter (SERT) (5HT transporter) (5HTT) (Solute carrier family 6 member 4)
629	102857	Slc6a8	Sodium- and chloride-dependent creatine transporter 1 (CT1) (Creatine transporter 1) (Solute carrier family 6 member 8)

630	26570	Slc7a11	Cystine/glutamate transporter (Amino acid transport system xc-) (Solute carrier family 7 member 11) (xCT)
631	20541	Slc8a1	Sodium/calcium exchanger 1 (Na(+)/Ca(2+)-exchange protein 1) (Solute carrier family 8 member 1)
632	110891	Slc8a2	Sodium/calcium exchanger 2 (Na(+)/Ca(2+)-exchange protein 2) (Solute carrier family 8 member 2)
633	110893	Slc8a3	Sodium/calcium exchanger 3 (Na(+)/Ca(2+)-exchange protein 3) (Solute carrier family 8 member 3)
634	68094	Smarcc2	SWI/SNF complex subunit SMARCC2 (BRG1-associated factor 170) (BAF170) (SWI/SNF complex 170 kDa subunit) (SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily C member 2)
635	20614	Snap25	Synaptosomal-associated protein 25 (SNAP-25) (Super protein) (SUP) (Synaptosomal-associated 25 kDa protein)
636	67847	Sncaip	Synphilin-1 (Alpha-synuclein-interacting protein)
637	20618	Sncg	Gamma-synuclein (Persyn)
638	72183	Snx6	Sorting nexin-6 [Cleaved into: Sorting nexin-6, N-terminally processed]
639	12702	Socs3	Suppressor of cytokine signaling 3 (SOCS-3) (Cytokine-inducible SH2 protein 3) (CIS-3) (Protein EF-10)
640	67296	Socs4	Suppressor of cytokine signaling 4 (SOCS-4) (Suppressor of cytokine signaling 7) (SOCS-7)
641	58178	Sorcs1	VPS10 domain-containing receptor SorCS1 (mSorCS)
642	66673	Sorcs3	VPS10 domain-containing receptor SorCS3
643	20669	Sox14	Transcription factor SOX-14
644	432572	Specc1	Cytospin-B (Sperm antigen with calponin homology and coiled-coil domains 1)
645	24063	Spry1	Protein sprouty homolog 1 (Spry-1)
646	20807	Srf	Serum response factor (SRF)
647	20604	Sst	Somatostatin [Cleaved into: Antrin; Somatostatin-28; Somatostatin-14; Neuronostatin (NST)]
648	20606	Sstr2	Somatostatin receptor type 2 (SS-2-R) (SS2-R) (SS2R) (SRIF-1)
649	106766	Stap2	Signal-transducing adaptor protein 2 (STAP-2)
650	29819	Stau2	Double-stranded RNA-binding protein Staufen homolog 2
651	98267	Stk17b	Serine/threonine-protein kinase 17B (EC 2.7.11.1) (DAP kinase-related apoptosis-inducing protein kinase 2)
652	56471	Stmn4	Stathmin-4 (Stathmin-like protein B3) (RB3)
653	20897	Stra6	Receptor for retinol uptake STRA6 (Retinoic acid-responsive protein) (Retinol-binding protein receptor STRA6) (Stimulated by retinoic acid gene 6 protein)
654	20909	Stx4a	Syntaxin-4
655	20024	Sub1	Activated RNA polymerase II transcriptional coactivator p15 (Positive cofactor 4) (PC4) (SUB1 homolog) (Single-

			stranded DNA-binding protein p9) (p14)
656	240057	Syngap1	Ras/Rap GTPase-activating protein SynGAP (Neuronal RasGAP) (Synaptic Ras GTPase-activating protein 1) (Synaptic Ras-GAP 1)
657	104015	Synj1	Synaptojanin-1 (EC 3.1.3.36) (Synaptic inositol 1,4,5-trisphosphate 5-phosphatase 1)
658	104027	Synpo	Synaptopodin
659	54526	Syt10	Synaptotagmin-10 (Synaptotagmin X) (SytX)
660	229521	Syt11	Synaptotagmin-11 (Synaptotagmin XI) (SytXI)
661	80976	Syt13	Synaptotagmin-13 (Synaptotagmin XIII) (SytXIII)
662	20983	Syt4	Synaptotagmin-4 (Synaptotagmin IV) (SytIV)
663	21333	Tac1	Protachykinin-1 (PPT) [Cleaved into: Substance P; Neurokinin A (NKA) (Neuromedin L) (Substance K); Neuropeptide K (NPK); Neuropeptide gamma; C-terminal-flanking peptide] Translational activator of cytochrome c oxidase 1 (Coiled-coil domain-containing protein 44) (Translational activator of mitochondrially-encoded cytochrome c oxidase 1)
664	70207	Taco1	
665	21336	Tacr1	Substance-P receptor (SPR) (NK-1 receptor) (NK-1R) (Tachykinin receptor 1)
666	21337	Tacr2	Substance-K receptor (SKR) (NK-2 receptor) (NK-2R) (Neurokinin A receptor) (Tachykinin receptor 2)
667	407786	Taf9b	Transcription initiation factor TFIID subunit 9B (Transcription initiation factor TFIID subunit 9-like) (Transcription-associated factor TAFII31L)
668	268354	Tafa2	Chemokine-like protein TAFA-2
669	66860	Tanc1	Protein TANC1 (Tetratricopeptide repeat, ankyrin repeat and coiled-coil domain-containing protein 1)
670	77097	Tanc2	Protein TANC2 (Tetratricopeptide repeat, ankyrin repeat and coiled-coil domain-containing protein 2)
671	21354	Tap1	Antigen peptide transporter 1 (APT1) (ATP-binding cassette sub-family B member 2) (Histocompatibility antigen modifier 1) (Peptide transporter TAP1)
672	21375	Tbr1	T-box brain protein 1 (T-brain-1) (TBR-1) (TES-56)
673	57765	Tbx21	T-box transcription factor TBX21 (T-box protein 21) (T-cell-specific T-box transcription factor T-bet) (Transcription factor TBLYM)
674	21414	Tcf7	Transcription factor 7 (TCF-7) (T-cell-specific transcription factor 1) (T-cell factor 1) (TCF-1)
675	21454	Tcp1	T-complex protein 1 subunit alpha (TCP-1-alpha) (CCT-alpha) (Tailless complex polypeptide 1A) (TCP-1-A) (Tailless complex polypeptide 1B) (TCP-1-B)

676	23964	Tenm2	Teneurin-2 (Ten-2) (Protein Odd Oz/ten-m homolog 2) (Tenascin-M2) (Ten-m2) (Teneurin transmembrane protein 2) [Cleaved into: Ten-2, soluble form; Ten-2 intracellular domain (Ten-2 ICD)]
677	21814	Tgfb3	Transforming growth factor beta receptor type 3 (TGF-beta receptor type 3) (TGFR-3) (Betaglycan) (Transforming growth factor beta receptor III) (TGF-beta receptor type III)
678	21823	Th	Tyrosine 3-monooxygenase (EC 1.14.16.2) (Tyrosine 3-hydroxylase) (TH)
679	21833	Thra	Thyroid hormone receptor alpha (Nuclear receptor subfamily 1 group A member 1) (c-erbA-1) (c-erbA-alpha)
680	21841	Tia1	Nucleolysin TIA-1 (RNA-binding protein TIA-1) (T-cell-restricted intracellular antigen-1) (TIA-1)
681	212937	Tifab	TRAF-interacting protein with FHA domain-containing protein B (TIFA-like protein)
682	24088	Tlr2	Toll-like receptor 2 (EC 3.2.2.6) (CD antigen CD282)
683	216157	Tmem259	Membralin (Transmembrane protein 259)
684	67564	Tmem35a	Transmembrane protein 35A (Peroxisomal membrane protein 52) (PMP52)
685	56374	Tmem59	Transmembrane protein 59 (Thymic dendritic cell-derived factor 1)
686	50876	Tmod2	Tropomodulin-2 (Neuronal tropomodulin) (N-Tmod)
687	230979	Tnfrsf14	Tumor necrosis factor receptor superfamily member 14 (Herpes virus entry mediator A) (Herpesvirus entry mediator A) (HveA) (Tumor necrosis factor receptor-like 2) (TR2) (CD antigen CD270)
688	21936	Tnfrsf18	Tumor necrosis factor receptor superfamily member 18 (Glucocorticoid-induced TNFR-related protein) (CD antigen CD357)
689	21942	Tnfrsf9	Tumor necrosis factor receptor superfamily member 9 (4-1BB ligand receptor) (T-cell antigen 4-1BB) (CD antigen CD137)
690	50930	Tnfsf14	Tumor necrosis factor ligand superfamily member 14 (CD antigen CD258) [Cleaved into: Tumor necrosis factor ligand superfamily member 14, membrane form; Tumor necrosis factor ligand superfamily member 14, soluble form]
691	240873	Tnfsf18	Tumor necrosis factor ligand superfamily member 18 (GITR ligand) (GITRL) (Glucocorticoid-induced TNF-related ligand)
692	665113	Tnik	Traf2 and NCK-interacting protein kinase (EC 2.7.11.1)
693	320938	Tnpo3	Transportin-3
694	21960	Tnr	Tenascin-R (TN-R) (Janusin) (Neural recognition molecule

			J1-160/180) (Restrictin)
695	22029	Traf1	TNF receptor-associated factor 1
696	22036	Traip	E3 ubiquitin-protein ligase TRAIP (EC 2.3.2.27) (RING-type E3 ubiquitin transferase TRAIP) (TRAF-interacting protein) Pro-thyrotropin-releasing hormone (Pro-TRH) (Prothyroliberin) [Cleaved into: Thyrotropin-releasing hormone (TRH) (Protirelin) (TSH-releasing factor) (Thyroliberin) (Thyrotropin-releasing factor) (TRF)]
697	22044	Trh	Tripartite motif-containing protein 3 (RING finger protein 22) (RING finger protein HAC1)
698	55992	Trim3	Tripartite motif-containing protein 67
699	330863	Trim67	Short transient receptor potential channel 1 (TrpC1) (Transient receptor protein 1) (TRP-1) (mTrp1) (Trp-related protein 1)
700	22063	Trpc1	Transient receptor potential cation channel subfamily M member 2 (Long transient receptor potential channel 2) (LTrpC-2) (LTrpC2) (Transient receptor potential channel 7) (TrpC7)
701	28240	Trpm2	Transient receptor potential cation channel subfamily M member 7 (EC 2.7.11.1) (Channel-kinase 1) (Long transient receptor potential channel 7) (LTrpC-7) (LTrpC7) (Transient receptor potential-phospholipase C-interacting kinase) (TRP-PLIK)
702	58800	Trpm7	Translin (EC 3.1.-.-) (Component 3 of promoter of RISC) (C3PO) (Testis/brain RNA-binding protein) (TB-RBP)
703	22099	Tsn	Translin-associated protein X (Translin-associated factor X)
704	53424	Tsnax	Tetraspanin-6 (Tspan-6) (Transmembrane 4 superfamily member 6)
705	56496	Tspan6	Testis-specific protein TSX
706	22127	Tsx	Tau-tubulin kinase 1 (EC 2.7.11.1)
707	106763	Ttbk1	Alpha-tocopherol transfer protein (Alpha-TTP)
708	50500	Ttpa	Tubulin beta-2B chain
709	73710	Tubb2b	Thioredoxin (Trx) (ATL-derived factor) (ADF)
710	22166	Txn1	Ubiquitin-like modifier-activating enzyme 6 (Ubiquitin-activating enzyme 6) (EC 6.2.1.45) (Ubiquitin-activating enzyme E1-like protein 2) (E1-L2)
711	231380	Uba6	Ubiquitin-conjugating enzyme E2 A (EC 2.3.2.23) (E2 ubiquitin-conjugating enzyme A) (RAD6 homolog A) (HR6A) (mHR6A) (Ubiquitin carrier protein A) (Ubiquitin-protein ligase A)
712	22209	Ube2a	Ubiquilin-1 (Protein linking IAP with cytoskeleton 1) (PLIC-1)
713	56085	Ubqln1	Ubiquilin-2 (Chap1) (DSK2 homolog) (Protein linking IAP
714	54609	Ubqln2	

			with cytoskeleton 2) (PLIC-2) (Ubiquitin-like product Chap1/Dsk2)
715	22222	Ubr1	E3 ubiquitin-protein ligase UBR1 (EC 2.3.2.27) (N-recognin-1) (RING-type E3 ubiquitin transferase UBR1) (Ubiquitin-protein ligase E3-alpha-1) (Ubiquitin-protein ligase E3-alpha-I)
716	224826	Ubr2	E3 ubiquitin-protein ligase UBR2 (EC 2.3.2.27) (N-recognin-2) (RING-type E3 ubiquitin transferase UBR2) (Ubiquitin-protein ligase E3-alpha-2) (Ubiquitin-protein ligase E3-alpha-II)
717	68795	Ubr3	E3 ubiquitin-protein ligase UBR3 (EC 2.3.2.27) (N-recognin-3) (RING-type E3 ubiquitin transferase UBR3) (Ubiquitin-protein ligase E3-alpha-3) (Ubiquitin-protein ligase E3-alpha-III) (Zinc finger protein 650)
718	22226	Ucn	Urocortin
719	22230	Ufd1	Ubiquitin recognition factor in ER-associated degradation protein 1 (Ubiquitin fusion degradation protein 1 homolog) (UB fusion protein 1)
720	22239	Ugt8a	2-hydroxyacylsphingosine 1-beta-galactosyltransferase (EC 2.4.1.47) (Ceramide UDP-galactosyltransferase) (Cerebroside synthase) (UDP-galactose-ceramide galactosyltransferase)
721	109113	Uhrf2	E3 ubiquitin-protein ligase UHRF2 (EC 2.3.2.27) (NIRF) (Np95-like ring finger protein) (Nuclear protein 97) (Nuclear zinc finger protein Np97) (RING-type E3 ubiquitin transferase UHRF2) (Ubiquitin-like PHD and RING finger domain-containing protein 2) (Ubiquitin-like-containing PHD and RING finger domains protein 2)
722	208898	Unc13c	Protein unc-13 homolog C (Munc13-3)
723	22255	Uncx	Homeobox protein unc-4 homolog (Homeobox protein Uncx4.1)
724	22273	Uqcrc1	Cytochrome b-c1 complex subunit 1, mitochondrial (Complex III subunit 1) (Core protein I) (Ubiquinol-cytochrome-c reductase complex core protein 1)
725	22333	Vdac1	Voltage-dependent anion-selective channel protein 1 (VDAC-1) (mVDAC1) (Outer mitochondrial membrane protein porin 1) (Plasmalemmal porin) (Voltage-dependent anion-selective channel protein 5) (VDAC-5) (mVDAC5)
726	22335	Vdac3	Voltage-dependent anion-selective channel protein 3 (VDAC-3) (mVDAC3) (Outer mitochondrial membrane protein porin 3)
727	22353	Vip	VIP peptides [Cleaved into: Intestinal peptide PHI-42; Intestinal peptide PHI-27 (Peptide histidine

			isoleucinamide 27); Vasoactive intestinal peptide (VIP) (Vasoactive intestinal polypeptide)]
728	22355	Vipr2	Vasoactive intestinal polypeptide receptor 2 (VIP-R-2) (Pituitary adenylate cyclase-activating polypeptide type III receptor) (PACAP type III receptor) (PACAP-R-3) (PACAP-R3)
729	69922	Vrk2	Serine/threonine-protein kinase VRK2 (EC 2.7.11.1) (Vaccinia-related kinase 2)
730	26950	Vsnl1	Visinin-like protein 1 (VILIP) (Neural visinin-like protein 1) (NVL-1) (NVP-1)
731	22376	Was	Wiskott-Aldrich syndrome protein homolog (WASp)
732	83767	Wasf1	Wiskott-Aldrich syndrome protein family member 1 (WASP family protein member 1) (Protein WAVE-1)
733	73447	Wdr13	WD repeat-containing protein 13
734	54636	Wdr45	WD repeat domain phosphoinositide-interacting protein 4 (WIPI-4) (WD repeat domain X-linked 1) (WD repeat-containing protein 45)
735	20890	Wnt8a	Protein Wnt-8a (Protein Wnt-8d) (Stimulated by retinoic acid gene 11 protein)
736	211652	Wwc1	Protein KIBRA (Kidney and brain protein) (KIBRA) (WW domain-containing protein 1)
737	16963	Xcl1	Lymphotactin (C motif chemokine 1) (Cytokine SCM-1) (Lymphotaxin) (Small-inducible cytokine C1)
738	228994	Ythdf1	YTH domain-containing family protein 1 (Dermatomyositis associated with cancer putative autoantigen 1 homolog) (DACA-1 homolog)
739	22632	Yy1	Transcriptional repressor protein YY1 (Delta transcription factor) (NF-E1) (UCR-motif DNA-binding protein) (Yin and yang 1) (YY-1)
740	58206	Zbtb32	Zinc finger and BTB domain-containing protein 32 (Repressor of GATA) (Testis zinc finger protein)
741	22724	Zbtb7b	Zinc finger and BTB domain-containing protein 7B (Krueppel-related zinc finger protein cKrox) (c-Krox) (T-helper-inducing POZ/Krueppel-like factor) (Zinc finger protein 67) (Zfp-67) (Zinc finger protein Th-POK)
742	27801	Zdhhc8	Probable palmitoyltransferase ZDHHC8 (EC 2.3.1.225) (Zinc finger DHHC domain-containing protein 8) (DHHC-8)
743	29813	Zfp385a	Zinc finger protein 385A (Hematopoietic zinc finger protein)
744	22774	Zic4	Zinc finger protein ZIC 4 (Zinc finger protein of the cerebellum 4)
745	195018	Zzef1	Zinc finger ZZ-type and EF-hand domain-containing protein 1