

S2 Table

Groups	Number of genes	Genes			
CKOxHKO CWTxCKO CWTxHWT HWTxHKO	3	Acot11 Dhcr7 Tiam2			
CWTxCKO CWTxHWT HWTxHKO	4	LOC100862384 LOC100862317 Ndrgr2 Oxct1			
CKOxHKO CWTxCKO HWTxHKO	1	2610029I01Rik			
CKOxHKO CWTxCKO CWTxHWT	2	4732415M23Rik Aldh1l1			
CWTxCKO HWTxHKO	147	1110001J03Rik 1700028J19Rik 1700040L02Rik 1810014F10Rik 2010107E04Rik 2310061C15Rik 2410003L11Rik 4930452B06Rik 4930481A15Rik Acsl3 Adcy1 Afg3l2 Agl Agt Ak1 Ak3 Akr1b10 Apoo Arhgap6 Aspdh Aste1 Atp5e Atp5f1 Atp5g3 Atp5h Atp5sl Baiap2l2 BC090627 Bola3 C030037D09Rik Cadm4 Ccadc68 Chchd10 Ckmt1	Coq9 Cox10 Cox5a Cox7a1 Cox7a2 Cyc1 Cyca Cyp2d22 Cyp2u1 Dlat Dlst Dpp4 Enpp6 Epb4.9 Etfdh Faah Fastk Fastkd1 Fbxo18 Fbxo44 Fh1 Gfm1 Glod5 Glrx Gm10767 Gm16845 Gm19447 Gm20141 Gm2695 Gm53 Gm906 Gnb5 Got1 Gsto1	Impa2 Kcna4 Khdrbs3 Klk1b5 Klk1b7-ps Ldhd LOC100046079 LOC100862063 Luzp1 Lynx1 Lym5 Mdh2 Mir196a-1 Mrpl13 Mrps35 Msrb2 Mtfp1 Ndufa1 Ndufa12 Ndufa4 Ndufa8 Ndufa9 Ndufaf4 Ndufc1 Ndufs3 Ndufs8 Nol3 Nr0b2 Nudt7 Oplah Oxnad1 Pcolce Pfkml Pfkp	Pla2g7 Pon3 Ppif Ptges2 Ptpn18 Rtn4ip1 Sirt3 Slc12a7 Slc16a5 Slc25a12 Slc25a4 Slc2a4 Slc6a8 Srxn1 Stard8 Suv420h2 Sv2a Tarm1 Thap4 Tmem35 Tmem38a Tom1l1 Trmt2b Trp53inp2 Tspo Ubac1 Uqcr10 Uqcrb Uqcrc1 Uqcrfs1 Uqcrh Uqcrq Vmn1r157 Zdhhc23

		Clybl Cntnap5b Comtd1	Gys1 Hsd12 ldh3a	Pgam1 Pgk1 Pigy	Zfp30 Zfp691
CWTxCKO CWTxHWT	48	1110058L19Rik 1700040F15Rik 4933409K07Rik 4933413C19Rik A230107N01Rik Acot9 Al854703 Aqp3 Arhgef19 Cd93 Chka Cyp26b1	Cyp2c29 Cyp2c40 Echs1 Ehd1 Ftl1 Gbp11 Gm17361 Gm20066 Gm20251 Gm2427 Gm5039 Gm5347	Gm7429 Gpx6 Hist1h4i Hspa8 lpp Klh3 Klrd1 LOC100861804 LOC100861972 Mir140 Mir151 Mmp13	Mup-ps12 Olfr490 Olfr851 Omd Pm20d2 Prl2c5 Slc25a19 Smcr7 Spr Tbc1d24 Tgoln1 Tmem136
CKOxHKO HWTxHKO	42	1700042G15Rik 2610042L04Rik 4930412M03Rik 4931408D14Rik 5430421F17Rik Apol7c Cdh18 Crabp2 Cyp2j8 Defb35 Dnajc6	Efcab4b Fgf5 G630093K05Rik G6pc Gm13430 Gm3696 Gm428 Gm7710 Hbb-bh2 Hes2 l830127L07Rik	Igfbp1 Lin28a Mir344d-2 Myl6 Olfr1390 Olfr467 Olfr479 Olfr700 Osr2 Pax4 Sstr2	Them4 Timm9 Tmem202 Tmem86a Uhmk1 Vmn1r39 Wnk2 Zfp783 Zscan4c
CKOxHKO CWTxHWT	180	1110032F04Rik 1300002K09Rik 1700113A16Rik 1810034E14Rik 2310003L06Rik 2310030G06Rik 3110062M04Rik 8430408G22Rik 9030619P08Rik Aadat Abat Ace Acox2 Acsm1 Acsm3 Acsm5 Adh6-ps1 Agps Akr1c14 Akr1c18 Amacr Angptl7 Anks1b Anxa13 Arsb Atp11a	D630022N01Rik Defa17 Defb19 Defb29 Depdc1b Dhcr24 Dpy19l3 Em15 Erc2 Fads1 Fam55c Fasn Fbxl2 Fdft1 Fdps Fmo5 Fn1 Galns Galnt1 Ggct Glt1d1 Gm11827 Gm128 Gm17767 Gm19648 Gm19963	Igh-VJ558 Insig1 Itgb6 Itih2 Itih5 Ivd Kcng1 Kif20b Klf15 Klk1b11 Klk1b16 Ldhd Ldlr Lpl Lrrc31 Ly6f Mas1 Med14 Mep1b Mfap3l Mpv17l Mrpl54 Myo5a Naaladl2 Neurog2 Nlrc4	S100g Samd8 Sc4mol Scd1 Sec14l3 Sectm1b Sesn2 Slc22a19 Slc22a7 Slc25a48 Slc26a1 Slc35d2 Slc41a2 Slc6a15 Slc7a4 Slc8a1 Slc9a8 Slco1a1 Smcp Snx31 Sqle Srebf2 St8sia1 Sucnr1 Tbc1d10a Tc2n

		Atp8b4	Gm4285	Npas2	Tfpi2
		B4galt5	Gm6300	Nsdhl	Timd2
		Bcmo1	Gm853	Nt5e	Tm7sf2
		Bdh1	Gnmt	Odc1	Tmed6
		C1qtnf3	Gpt	Olfr153	Tmem237
		C1rl	Gstm7	Osbp2	Tmem26
		C7	Gstt2	Pacrg	Tmem45b
		Calb1	Gusb	Pde6a	Tmem97
		Car4	H2-Q10	Pelo	Tmprss9
		Casc4	Hbegf	Pion	Treh
		Cblc	Hpd	Plau	Tspan13
		Cbs	Hsd11b1	Podn	Tspan5
		Ccbl2	Hsd17b11	Proc	Tstd1
		Ccl28	Hsd17b2	Proz	Ttc39c
		Cdhr2	Hsd3b2	Ptpn22	Ttr
		Cndp2	Hsf2bp	Rab20	Ubiad1
		Coasy	Idi1	Rab27a	Veph1
		Cpe	Ido2	Rhoc	Wfdc16
		Cryaa	Igf2bp1	Rundc3a	Zbtb44
CWTxCKO	297	0610012G03Rik	Foxred1	Mir677	Sdha
		0610038B21Rik	Fpr-rs3	Mkks	Sdhc
		1520402A15Rik	Fst	Mmachc	Sdhd
		1700034P13Rik	Fv1	Mpv17l2	Serf2
		1810014B01Rik	Gadd45gip1	Mrpl34	Sfxn3
		1810021B22Rik	Gas6	Mrpl47	Shmt1
		2310003L22Rik	Gbas	Mrps23	Skil
		2310042D19Rik	Gca	Mrps25	Slc19a2
		2310061I04Rik	Gja1	Mrps27	Slc1a5
		2410015M20Rik	Glul	Mtrf1l	Slc22a4
		2610017I09Rik	Gm10589	Mtx2	Slc43a2
		2810454H06Rik	Gm13288	Mtx3	Slc45a3
		4930402H24Rik	Gm14057	Mug1	Slc4a8
		4930461G14Rik	Gm14379	Myl12a	Slit2
		4930480K23Rik	Gm19265	Myl6b	Snora2b
		4933401B06Rik	Gm20186	Myo19	Snora34
		6430590A07Rik	Gm3613	ND6	Snord11
		9130230N09Rik	Gm4567	Ndrgr1	Snord12
		A330021E22Rik	Gm4759	Ndufa6	Snord1b
		A630020A06	Gm5113	Ndufb2	Snord42b
		Abcb9	Gm561	Ndufb5	Snord58b
		Abhd11	Gm7609	Ndufb8	Snord61
		Actg1	Gm8842	Ndufs1	Snord68
		Adssl1	Gm8995	Ndufs2	Sp100
		AK129341	Gm9833	Ndufs6	Spa17
		Akr1c20	Gm9917	Ndufv2	Spata17
		Alkbh7	Gna14	Nfyb	Srp54c
		Asap2	Gnb2l1	Nipsnap1	St6galnac5
		Aspn	Gpt2	Nkap	Stc1
		Atg4d	Hadhb	Nmnat1	Stra6
		Atp10d	Hdhd2	Olfm4	Syne1
		Atp2b4	Hist2h2ab	Olfr113	Synj2bp
		Atp4a	Hk1	Olfr1135	Syt17
		Atp5d	Idh3b	Olfr1137	Tarsl2

		Atp5l	Ii15ra	Olfr1278	Tas2r131
		B230369F24Rik	Inpp5j	Olfr1445	Tceb1
		BC002163	Irs1	Olfr1501	Tfb2m
		BC037704	Isyna1	Olfr342	Tfrc
		Bcar3	Jrkl	Olfr51	Ticam1
		Bcr	Jun	Olfr74	Tie1
		Blcap	Kansl2	Olfr866	Tmco4
		Bri3bp	Kansl3	Olfr945	Tmem143
		Cd200	Kcnj2	P2ry1	Tmem241
		Cd38	Klhdc8a	Paqr5	Tmem69
		Cdc14b	Klk1b22	Pclo	Tomm5
		Cfhr2	Ksr2	Pdgfd	Tsen54
		Chml	Lace1	Pdha1	Tspan1
		Clca1	Lad1	Pdhb	Ttc19
		Clec4b1	LOC100048410	Pdss2	Ttc30a2
		Cnih4	LOC100861803	Pdxk	Ube2a
		Cnnm4	LOC100862007	Pgam2	Vdac2
		Cntfr	LOC100862061	Pi4kb	Vdac3
		Cox4i1	Lrig1	Pnpla1	Vipar
		Cox7b	Lrp12	Polr2h	Vmn2r17
		Cpeb3	Lrrc66	Ppan	Vps13d
		Cs	Lym7	Ppm1k	Wbscr16
		Csprs	Lzic	Pptc7	Wdr72
		Cst3	MacroD1	Prdx2	Wfdc15b
		Cuedc1	Malat1	Prom2	Xirp2
		D5ErtD579e	Mapk4	Prr5	Xrcc6bp1
		D630041G03Rik	Mavs	Ptgr2	Zdhhc18
		D730048I06Rik	Mcee	Ptpru	Zdhhc8
		Dbn1	Mcpt4	Pygm	Zfp456
		Ddo	Me3	Rab6b	Zfp52
		Dennd2d	Meaf6	Rabggtb	Zfp534
		Dennd5b	Mir181a-2	Rad1	Zfp606
		Dhrs11	Mir1933	Rarb	Zfp780b
		Dhrs3	Mir1941	Ripply3	Zfp944
		Dld	Mir1949	Rmnd1	Zfp953
		Dnajc28	Mir218-1	Rnmtl1	Zfp955b
		Dnase1	Mir27b	Rny1	Zfy2
		Dusp15	Mir30b	Rtp3	Zxdb
		Etfa	Mir30c-1	Rusc1	
		Fam164c	Mir30c-2	Samm50	
		Fam73b	Mir30e	Sco1	
HWTxHKO	212	1300001I01Rik	Csrp2	Gm7367	Olfr890
		1700023F06Rik	Cux2	Gm7732	Olfr943
		1700025D23Rik	Cyp2d13	Gm8777	Oog2
		1810013D10Rik	Cyp46a1	Gm904	Pacsin1
		2300002M23Rik	DOH4S114	Gm9442	Pcdhb7
		2310046A06Rik	D630042P16Rik	Gpc1	Pgls
		2310068J16Rik	Dcaf4	Gpr162	Pla2g16
		2500002B13Rik	Defa-ps1	Gpx2	Ppcs
		3110047P20Rik	Dhrs2	Grin2d	Ppm1l
		4921509C19Rik	Dnahc7b	Grsf1	Prokr2
		4922502N22Rik	Dub2a	Guca1b	Psg-ps1
		4930444G20Rik	E130306D19Rik	H2-M10.3	Ptges3l

		4930478L05Rik	Efna2	Hadha	Pttg1
		4930503H13Rik	Efs	Hddc3	Rab30
		4930524N10Rik	Esrra	Hist1h3f	Retsat
		4933407G14Rik	Expi	Hlx	Rhox4f
		5730416F02Rik	Fam5b	Hsd17b14	Rnu11
		5830473C10Rik	Fchsd1	Ifitm6	Rtkn2
		9330159M07Rik	Fdx1	Il25	Sbk1
		9430037G07Rik	Fgf6	Kcna7	Sema5b
		9530046B11Rik	Fn3k	Kif15	Serpinb1a
		Abhd8	Ftcd	Klhl34	Slc22a20
		Abtb2	Fxn	Klrk1	Slc25a11
		Acaa2	G6pd2	Krtap8-1	Slc25a20
		Acacb	Gapdh	Ldlrad2	Slc25a22
		Acadl	Gbe1	LOC100862601	Slc38a1
		Acadvl	Gckr	LOC626410	Slc41a3
		Acot2	Gimap1	Lrrc61	Slc5a10
		Acot3	Gm10081	Mageb16	Slc5a11
		Aim1l	Gm10696	Mir1839	Slc6a17
		Als2cl	Gm11937	Mir210	Spata21
		Alyref2	Gm12302	Mir299	Spp1
		Ankrd34b	Gm12356	Mir466g	Ssxb1
		Apoa2	Gm12603	Mir540	Tm6sf2
		Arc	Gm12830	Mrpl10	Tmem236
		Atp2a1	Gm13369	Myod1	Tmie
		Atp5c1	Gm1679	Nefl	Tpi1
		Atp5g1	Gm19304	Nmur1	Uqcr11
		Atp5k	Gm19484	Nmur2	Vegfb
		AY358078	Gm19951	Nr1i2	Vmn1r188
		B3gnt3	Gm20187	Nrg3	Vmn1r2
		BC018473	Gm221	Olfr103	Vmn1r224
		BC048609	Gm2897	Olfr109	Vmn1r58
		C2cd4a	Gm3099	Olfr1167	Vmn2r20
		Ccnyl1	Gm3500	Olfr1347	Vmn2r51
		Chchd2	Gm3591	Olfr429	Vmn2r93
		Chrm1	Gm5114	Olfr513	Wfdc9
		Chrng	Gm5237	Olfr574	Wnt8a
		Clic6	Gm5523	Olfr622	Wnt8b
		Cnr1	Gm5567	Olfr63	Ybx2
		Cox5b	Gm5785	Olfr853	Zfp352
		Crat	Gm6086	Olfr856-ps1	Zfp629
		Creb3l3	Gm732	Olfr884	Zfp704
CWTxHWT	308	1110002B05Rik	Cyp7b1	ligp1	Pzp
		1110025L11Rik	D130020L05Rik	lpmk	Rab32
		1190003J15Rik	D630024D03Rik	Irx3	Ralgps2
		2010012O05Rik	Dcn	ltpkb	Ramp3
		2310058D17Rik	Ddit4	Izumo4	Rassf1
		2410022L05Rik	Ddt	Jdp2	Rassf4
		2610002J02Rik	Defb1	Jub	Rdh5
		2610100L16Rik	Degs1	Klf9	Retn
		2700078E11Rik	Dhrs13	Klhl21	Rhov
		2900026A02Rik	Dnaja1	Klra2	Rhox2c
		3200002M19Rik	Dnaja4	Lama3	Rlf
		4930405J17Rik	Dnajb1	Lamc3	Rnf145

	4930563M20Rik	Dpep1	Larp1b	Rnf183
	5730507C01Rik	Dpp7	Lbr	Ropn1l
	5730577I03Rik	Dqx1	Letm1	Rpp40
	A730020M07Rik	Dusp1	LOC100039753	Scd2
	AB099516	Eid1	LOC100861683	Senp5
	Abhd14a	Entpd2	LOC100862607	Serinc2
	Abi3bp	Entpd7	LOC100862646	Serpina1c
	Acaca	Ethe1	LOC666692	Sim2
	Acad9	Evc	Lymr2	Slc10a6
	Acat1	Exoc5	Lztr1	Slc1a4
	Acsm2	Ext1	Map2k6	Slc25a38
	Afmid	F13b	Map3k6	Slc26a4
	Ahsa2	Fa2h	Mapk13	Slitrk6
	Aldh3a2	Fam100a	Mcl1	Sly
	Alk	Fam103a1	Med18	Smoc2
	Amdhd2	Fam107a	Mettl7a3	Smpdl3a
	Anapc16	Fam176a	Mir1186	Snap29
	Ankrd44	Fam187b	Mir145	Snhg11
	Aoah	Fbxo36	Mir1907	Snord70
	Arhgef10l	Fhit	Mir1948	Snord90
	Arpc5l	Fkbp1	Mir200b	Sp9
	Asb13	Fpr-rs4	Mir24-1	Spock3
	Ass1	Frmd4b	Mir26b	Srd5a2
	Atp6v0d2	Frzb	Mir532	Srebf1
	B230216N24Rik	Fuca2	Mknk2	St3gal5
	B4galt6	Fxyd4	Mmab	Stbd1
	Bcat1	Gadd45g	Mrpl14	Stk30
	Bcat2	Gbp6	Mug2	Ston1
	Bst1	Gcat	Mvd	Stxbp5l
	C4a	Gjb2	Myh10	Synpr
	Cables1	Gm10088	Mylk	Tchhl1
	Cacybp	Gm10579	Nat8	Tesk2
	Car3	Gm10914	Nceh1	Tmco3
	Ccdc6	Gm11362	Nphp1	Tmed10
	Ccdc85c	Gm13139	Npnt	Tmem207
	Cct8l1	Gm13251	Nr1d1	Tmem28
	Cdh13	Gm15348	Nt5c3	Tnfsf15
	Cdkn2aip	Gm17771	Nudt8	Tprn
	Ces1e	Gm19325	Obfc2a	Trappc9
	Chordc1	Gm19327	Obox2	Trav12-2
	Chrdl1	Gm19958	Olfr1282	Trav9d-3
	Chrna4	Gm3579	Olfr706	Trp53inp1
	Chst11	Gm4956	Olfr724	Trpv4
	Chst7	Gm5069	Olfr733	Tsga10
	Cib1	Gm5168	Olfr825	Ttll3
	Ckb	Gm5784	Olfr849	Ttll7
	Cldn24	Gm6976	Papss1	Uap1l1
	Cldn7	Gm6996	Pcdhb11	Ubb
	Clec2h	Gm7092	Pcsk6	Vmn1r198
	Cml2	Gm9805	Pdk3	Vmn1r20
	Cmtm6	Gpr133	Penk	Vmn1r42
	Cntnap2	Gpr75	Pfn3	Vmn2r41
	Cntnap5a	Gramd1b	Pgm5	Vmn2r61

		Col6a5	Gstz1	Pgp	Vmn2r67
		Cpxm2	H47	Pi15	Wasf3
		Crot	Herc4	Pim3	Wdr55
		Csgalnact1	Hhatl	Pknox1	Wrb
		Ctla2b	Hist1h2bn	Plcxd2	Xpnpep2
		Ctxn3	Hist2h3c2	Plekha6	Zbtb16
		Cxcl14	Hmgb1-rs17	Pomp	Zfp317
		Cyb561	Hmgcr	Ppic	Zfp442
		Cyp2d12	Hmox1	Ppp1r16b	Zfp600
		Cyp2f2	Hrg	Ppp1r1b	Zfp937
		Cyp4f14	Hyi	Ptger3	Zhx3
		Cyp51	Igfbp6	Pyroxd2	Zmynd10
CKOxHKO	277	1700007J10Rik	Cphx	Gm5635	Olfr419
		2010001M06Rik	Crb1	Gm5796	Olfr427
		2010109A12Rik	Creb3l1	Gm6445	Olfr61
		2310042E22Rik	Cts3	Gm7056	Olfr705
		2610028E06Rik	Cts8-ps	Gm7358	Olfr768
		3010003L21Rik	Cyp2a22	Gm9199	Pank3
		3010026O09Rik	Cyp2a5	Gm949	Pbld2
		3110045C21Rik	Cyp2c67	Gm9961	Pcsk9
		4732419C18Rik	Cyp2c69	Gpam	Piwil2
		4921515J06Rik	Cyp2d9	Gpr155	Pkd1l2
		4922505E12Rik	D14Ert449e	Grid2ip	Plac1
		4930430J02Rik	D330028D13Rik	Grm6	Plip
		4930433N12Rik	Dcpp2	Grpr	Pnck
		4930463O16Rik	Defa24	H1fx	Ppp2r5b
		4930483J18Rik	Defa-rs1	Hif3a	Pqlc2
		4930528G23Rik	Dera	Hist1h3h	Prh1
		4933408J17Rik	Dgkb	Hook2	Prkd3
		4933421A08Rik	Dlk2	Ide	Prss21
		4933430I17Rik	Doc2b	Ifna6	Ptgds
		4933433C11Rik	Dscaml1	Ifnk	Ptprq
		5730528L13Rik	Dusp14	Ifnz	Rab11b
		5930412G12Rik	Dusp23	Il22ra1	Rab33a
		6030468B19Rik	E130215H24Rik	Il5ra	Rasd1
		6330415B21Rik	Ear5	Ins2	Rasl10b
		7530416G11Rik	Ell3	Isl2	Rd3
		9130209A04Rik	Elovl2	Kif2b	Reln
		A2m	Epo	Kis2	Rps2
		A830010M20Rik	Eps8l3	Lce1h	Scand1
		Abca14	Erb3	Lefty1	Scrn1
		Abhd3	F12	Lhx2	Scrn2
		Acmsd	Fam13a	LOC100047957	Sctr
		Adam23	Fam13c	LOC100861572	Selm
		Adap1	Fbp2	LOC100861893	Sftpa1
		Adcy2	Fbxo46	LOC433461	Siglece
		Agmat	Fndc5	LOC626049	Slc16a10
		Aldh1l2	Fnip2	LOC670059	Slc17a4
		Aldh4a1	Foxq1	Lrrc50	Slc18a1
		Angptl4	G0s2	Lypd3	Slc33a1
		Apoh	Gabrb3	Masp1	Slc6a5
		Apold1	Gatsl2	Meig1	Snca
		Arsg	Gip	Mir1192	Sncb

	Arx	Gm10318	Mir124a-2	Snx20
	Azi1	Gm10509	Mir133a-2	Spats2l
	BC048602	Gm11564	Mir1945	Spink8
	BC051070	Gm12248	Mir212	Sult1b1
	BC051077	Gm14407	Mir3091	Susd4
	BC067074	Gm15070	Mir486	Syna
	Bean1	Gm15315	Mir5109	Sys1
	Bid	Gm15645	Mir598	Tbx10
	Bms1	Gm15983	Mir717	Timm8a1
	Bnpl	Gm16157	Mir9-1	Tmem169
	C130050O18Rik	Gm16677	Mir92b	Tmem25
	C330046G03Rik	Gm17416	Mpped2	Tmem64
	C530044C16Rik	Gm19277	Mtmr7	Tmigd1
	Caly	Gm19281	Myog	Tram2
	Camk1g	Gm19462	Naa11	Trh
	Car9	Gm1976	Narf	Tstd2
	Cbr2	Gm2046	Ncrna00086	Tsx
	Ccbl1	Gm22	Neurod1	Ttc39a
	Ccdc164	Gm2837	Nod2	Ttyh2
	Cckbr	Gm2921	Npm3	Ucn2
	Ccl26	Gm3086	Nt5dc2	Ugt3a1
	Ces2h	Gm3238	Ntn1	Vmn1r16
	Clip4	Gm5099	Olfm3	Vmn1r82
	Cntn5	Gm514	Olfr1061	Wnt2b
	Col6a6	Gm5329	Olfr1131	Zfp239
	Col8a1	Gm5346	Olfr1219	Zmynd12
	Colec10	Gm5475	Olfr1301	
	Comt	Gm5480	Olfr315	
	Coro1c	Gm5591	Olfr398	