

Supplementary information to:

Federica De Majo, Jana-Charlotte Hegenbarth, Frank Rühle, Christian Bär, Thomas Thum, Martine de Boer, Dirk J. Duncker, Blanche Schroen, Anne-Sophie Armand, Monika Stoll, Leon J. De Windt. Dichotomy between the transcriptomic landscape of naturally versus accelerated aged murine hearts.

Supplementary Table 1: *Primers Real time PCR*

Supplementary Table 2: *Differentially expressed lncRNAs and their neighbouring genes in naturally aged 104 week-old mice*

Supplementary Table 3: *Top 50 differentially expressed lncRNAs and neighbouring genes in Harlequin mice*

Supplementary Table 1. Primers Real-time PCR

Fam124b FWD	CTTGAACGGCTGCTTGAGAG
Fam124b RV	CTTTGAACCTCCGACTCCTG
Acsn5 FWD	CACACACAGCCACCACCT
Acsn5 RV	TCCACACATCCAACACATCA
Ano5 FWD	ATTCTCCCTCCTCCTCCTGT
Ano5 RV	ACCCACATCCTCCCTTTAGC
Rab6b FWD	CTGCTGGGCAAGAGAGGTT
Rab6b RV	GTCTGCTGGAAGGAGTTGAGA
Fmn1 FWD	AGCAAAGCAACCAGAAGCAG
Fmn1 RV	GTGGAGGAATGAGAGGTGGA
Gm36670 FWD	CTGGCGACTTCTGCTGCTA
Gm36670 RV	ATTCCTCCCGTGCTTATCA
Gm39465 FWD	GCCCTGAGTTTGGATTGC
Gm39465 RV	CCTGGAGTTCGCTGGTTC
Xist FWD	TCAGGATTCAAGTGGCTCTG
Xist RV	TCTTCTTTGGGTTGTCAGCA
Eprn FWD	TAGTCCAGAGGATGGGCAAC
Eprn RV	CACCAGAGGTAGTGGGAAGG
Nppa FWD	TCTTCCTCGTCTTGGCCTTT
Nppa RV	CCAGGTGGTCTAGCAGGTTC
Nppb FWD	TGGGAGGTCACCTCCTATCCT
Nppb RV	GGCCATTTCTCCGACTTT
L7 FWD	GAAGCTCATCTATGAGAAGGC
L7 RV	AAGACGAAGGAGCTGCAGAAC

Supplementary Table 2. Differentially expressed lncRNAs and their neighbouring genes in naturally aged 104 week old mice.

MGI Symbol	Ensembl ID	Locus	Genes (1,000,000bp)
Gm45159	ENSMUSG00000109125	Chr7:90,887,072-90,940,052	Dlg2, Syt12, Picalm, eed, Hikeshi, Ccdc89, Crebzf, Tmem126a, Tmem126b, Ccdc83
Gm43913	ENSMUSG00000108258	Chr6:148,915,215-148,920,535	Sinhcaf, Dennd5b, Etfbkmt, Amn1, Resf1, Bicd1, Caprin2, Ipo8, Tmtc1, ERgic2, Far2
Gm36670	ENSMUSG00000109696	Chr8: 91,974,095-91,991,869	Irx5, Irx6, , Mmp2, Lpcat2, Capms2, Slc6a2, Irx3, Fto, Rpgrip1l, Aktip, Rb12, Chc9
Gm39465	ENSMUSG00000111389	Chr9:122,029,509-122,051,508	Snrk, Ano10, Abhd5, Topazi, Tcaim, Zfp445, Zkscan7, Zfp105, Kif15, Tmem42, Tgm4, Pomgnt2, Gask1a, Ackr2, Cyp8b1, Higd1a, Ccdc13, Klh40, Hhat1, Nktr, Ss1812, Zfp651, Sec22c, Vipr1, Lyz14, Cck, Trak1, Ulk4
Gm43332	ENSMUSG00000107313	Chr5:149,183,183-149,184,226	Uspli, Alox5ap, Medag, TEx26, Wdr95, Hsph1, B3gltc, Rxfp2, Hmgb1, Katnali, Ubl3, Slc7a1, Mtus2
2900052N01Rik	ENSMUSG00000099696	Chr9:46,913,603-46,927,366	Cadm1, Apoa5, Bud13, Zpr1, Apoa4, Apoc3, Apoa1, Pafah1b2, Sidt2, Tagln, Pcsk7
Gm36161	ENSMUSG00000114608	Chr13:120,016,880-120,018,215	AF067961, BC147527, Tcstv3, Tcstv1, D13Ert608e, AF067063, Zfp131, Nim1k, Hmgcs1, Cc128, Tmem267, Paip1, Nnt
Gm16685	ENSMUSG00000097804	Chr3:7,612,705-7,690,001	Stmn2, Hey1, Il7, Zc2hc1a, Pkia
Gm26870	ENSMUSG00000097312	chr9:3,017,875-3,038,310	Alkbh8, Cwf1912, Gucy1a2
Gm15743	ENSMUSG00000086645	Chr16:31,427,876-31,429,776	Bdh1, Dlg1, Melf, Pigz, Ncbp2, Senp5, Pak2, Pigx, Cep19, Nrros, Bex6, Fbxo45, Wdr53, Smco1, Rnf168, Ubxn7, Tm4sf19, Tctex1d2, Apod, Ppp1r2, Acp2, Xxylt1, Fam43a, Lsg1, Tmem44
2310016D03Rik	ENSMUSG00000102098	Chr12:30,410,559-30,467,358	Tmem18, Alka12, Acp1 Sh3yli, Fam110c, Lamb1, Dld, Slc26a3, Sntg2, Tpo, Pxdn, Myt1l
Gm43913	ENSMUSG00000108258	Chr6:148,915,215-148,920,535	Scinhaf, Dennd5b, Etfbkmt, Amn1, Resf1, Bicd1, Caprin2, Ipo8, Tmtc1, Ergic2, Far2

Supplementary Table 3. Top 50 differentially expressed lncRNAs and neighbouring genes in Harlequin mice.

<i>MGI Symbol</i>	<i>Ensembl ID</i>	<i>Locus</i>	<i>Genes (1,000,000bp)</i>
Xist	ENSMUSG00000086503	chrX:103,460,366-103,483,254	Zcchc13, Slc6a2, Rlim, Nexmif, Abcb7, Tsx, Cdx4, Nap112, Dmrtc1a, Dmrtc1c2, Dmrtc1b, Phka1
Gm15903	ENSMUSG00000086916	chr5:129,727,046-129,728,385	Psph, Sumf2, Phkg1, Nupr1l, Chchd2, Vkorc1l1, Crpcp, Tpst1, Zbed5, Gusb, Asl, Kctd7, Rabgef1, Tmem248, Sbds, Tyw1, Caln1, Nipsnap2, Mrps17, Sept14, Zfp11, Sfswap, Adrd1, Ran, Stx2, Rimbpb2, Piwil1
Gm32171	ENSMUSG00000111645	chr9:33151292-33262516	Ets1, Fli1, Kcnj1, Kcnj5, Arhgap32
2410006H16Rik	ENSMUSG00000086841	chr11:62602877-62604807	Lrrc75a, Mmgt2, Zfp287, Trim16, Fbxw10, Tvp23b, Cdr4, Tekt3, Pmp22, Trpv2, Cenpv, Ubb, Pigl, Ncor1, Ncor1, Zswim7, Ttc19, Specc1, Akap10, Ulk2, Prpsap2, Grap, Slc5a10, Fam83g
2610035D17Rik	ENSMUSG00000087259	chr11:113043895-113201838	Slc39a11, Sstr2, Cog1, Fam104a, D11Wsu47e, Cpsf4l, Cdc42ep4, Sdk2, Sox9
Gm15564	ENSMUSG00000086324	chr16:35966753-35983230	KPn1, Wdr5b, Ccdc58, Csta1, Fam162a, Stfa2l1, Cstdc4, Csta3, Csta2, Stfa1, Cstdc6, Stfa2, Stfa3, Casr, Cd86, Ildr1, Slc15a2, Eaf2, Golgb1, Igcb1, Hlcs1, Fbxo40, Parp9, Dtx3l, Parp14, Hspbap1, Slc49a4, Sema5b, Pdia5, Sec22a, Adcy5, Hacd2, Mylk
Cep83os	ENSMUSG00000097164	chr10:94671025-94688576	Cep83, Plxnc1, Cradd, Soccs2, Mrp142, Ube2n, Nudt4, Anapc15-ps, Tmcc3, Ndufa12, Nr2c1, Fgd6, Vezt, Metap2, Usp44, Ntn4
E230013L22Rik	ENSMUSG00000096957	chr8:11477929-11480241	Naxd, Cars2, Ing1, Ankrd10, Arhgef7, Tex29, Sox1, Rab20, Col4a2, Col4a1, Irs2, Myo16
Gm34030	ENSMUSG00000109697	chr8:57331692-57334387	Scrg1, Sap30, Hmgb2, Galnt7, Galnt16, Hand2, Fbxo8, Cep44

Snhg8 ENSMUSG00000104960 chr3:123507552-123508404 Ndst3, Tram111, Prss12, Mettl14, Sec24d, Synpo2, Myoz2, Usp53, Fabp2, Pde5a, Fnbp1l

4933404O12Rik ENSMUSG00000097908 chr5:136919401-136937112 Fis1, Cldn15, Znhit1, Plod3, Vgf, Ap1s1, Serpine1, Trim56, Muc3, Muc3a, Ache, Ufsp1, Srrt, Trip6, Slc12a9, Ephb4, Xan, Epo, Pop7, Gigyf1, Gnb2, Actl6b, Tfr2, Mospd3, Fbxo24, Pcolce, Sap25, Lrch4, Irs3, Agfg2, Tsc22d4, Nyap1, Ppp1r35, Tsc22d4, Mepce, Zcwpw1, Pplr1, Pplr1, Pplr1, Ift22, Col26a1, Myl10, Cux1, Sh2b2, Prkrip1, Ora1, Polr2j, Rasa4, Lrdw1, Alkbh4, Upk3bl, Dtx2, Zp3, Ssc4d

Gm17017 ENSMUSG00000090246 chr1:85641222-85650585 Sp100, Cab39, Itm2c, Spata3, Gpr55, Psm1, Htr2b, Armc9, B3gnt7, Nc1, Nmur1, TEx44, Ptma, Pde6d, Cops7b, Sp140, Sp110, Slc16a14, Fbxo36, Trip12, Dner

Gm7292 ENSMUSG00000104222 chr6:117716342-117718868 Zfp637, Zfp239, Hnrnpf, Fxyd4, RAsgef1a, Csgalnact2, Ret, Bms1, Zfp248, Zfp9, Ankrd26, Cacna1c, Cxcl12

Gm20632 ENSMUSG00000093577 chr3:96239393-96241819 H3c15, H2ac19, H2ac18, H3c14, H4c14, H2bc18, Fcgr1, H3c13, BC107364, Hfv, Txnip, Polgr3gl, Ankrd34a, Rbm8a, Pex11b, Itga10, Ankrd35, Nudt17, Polr3c, Pias3, Rnf115, Cdc60, Pdck1, Gpr89, Gja5, Gja8, Acp6, Bc19, H2ac20, H2ac21, Bola1, Sv2a, Otud7b, Mtmr11, Sf3b4, Otud7b, Vps45, Plekho1, Anp32a, Mrps21, Prpf3, Ciart, Aph1a, Car14, BC028528, Rprd2, Ecm1, Tars2, Ensa, Mcl1, ADamts14, Golph3l, Hormad1, Ctss, Ctsk, Arnt, Setdb1, Cers2, Anxa9, Mindy1, Prun1

Gm16685 ENSMUSG00000097804 chr3:7612705-7690001 Stmn2, Hey1, Il7, Zc2hc1a, Pkia

Gm38534	ENSMUSG00000108634	chr11:88253368-88256990	Ccdc182, Msi2, Akap1, Scep1, Elob1, Coil, TRim25, Dgke, Mrps23, Cuedc1, Vezf1, Srsf1, Dynll2, Olfr464, Olfr462, Olfr463, Epx, Mks1, Lpo, Mpo, Tspoap1, Supt4a, Rnf43, Hsf5, Mtmr4, Sept4, Tex14, Rad51c, Ppm1e
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2310015D24Rik	ENSMUSG00000099411	chr16:13514131-13520419	Parn, Bfar, Pla2g10, Rrn3, Ntan1, Pdxdc1, Mpv17l, Ofitm7, Bmerb1, Marf1, Nde1, Myh11, Fopnl, Abcc1, Mrtfb, ERcc4
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Eprn	ENSMUSG00000113346	chr13:73344665-73347384	Lpcat1, Slc6a3, Clptm1, Slc6a18, Tert, Slc12a7, Nkd2, Trip13, Brd9, Zdhhc11, Tppp, Cep72, Slc9a3, Exoc3, Ahrr, Pdcd6, Dsha, Mrp136, Ndufs6, Irx4, Irx2
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Gm47101	ENSMUSG00000112073	chr10:102435269-102435543	Nts, Rassf9, Alx1, Lrriq1, Slc6a15, Mgat4c
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2900097C17Rik	ENSMUSG00000102869	chr2:156388065-156392979	Epb4l1, Aar2, Dlgap4, Tgif2, Rab5if, Sla2, Ndr3, Dsn1, Soga1, Tldc2, Samhd1, Rbl1, Mroh8, Rpn2, Ghrh, Cnbd2, Scand1, Phf20, Romo1, Rbm39, Rbm12, Nsf1, Cpne1, Spag4, ERgic3, Fer1l4, Gdf5, Cep250, Uqcc1, Eif6, Mmp24, Edem2, Procr, BC029722, Gss, Acss2, Myh7b, Trpc4ap, Ggt7, Ncoa6
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Gm7125	ENSMUSG00000069996	chr11:51898966-51909624	Ube2b, Cdkn2aipnl, Cdk13m Ppp2ca, Olfr1373, Skp1a, Olfr1371, Skp1a, Tcf7, Vdac1, Jade2, Sar1b, Sec24a, N4bp3, Rmnd5b, Nhp2, Hnrnpab, Phypk1, Col23a1, Clk4, BC049762, Zfp354a, Olfr51, Olfr54, Olfr1375, Olfr1377, Olfr1378, Prop1, Zfp354b
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Gm39822	ENSMUSG00000110618	chr11:51898966-51909624	Cdkn2aipn1, Ube2b, Cdkl3, Ppp2ca, Olfr1373, Olfr1371, Skp1a, Tcf7, Vdac1, Jade2, Sar1b, Sec24a, N4bp3, Rmnd5b, Nnp2, Hnnpab, Phypk1, Col23a1, Clk4, BC049762, Zfp354a, Olfr1375, Olfr54, Olfr51, Olfr1377, Olfr1378, Prop1, Zfp354b, Zfp2
4632404M16Rik	ENSMUSG00000106296	chr3:102134615-102137496	Vangl1, Ngf, Tspan2, Tshb, Sycp1, Nr1h5, Sike1, Csde1, Nras, Ampd1, Casq2, Nhh2, Slc22a15, Mab21l3, Atp1a1, Igsf3, Cd2
Zbtb11os1	ENSMUSG00000102101	chr16:55973268-55974617	Zbtb11, Pcnp, Trmt10c, Senp7, Impg2, Ani3bp, Tfg, Adgrg7, Tmem45a, Lnp1, Rp124, Cep97, Nxe3, Nfkbiz, Zpld1
Gm35021	ENSMUSG00000109714	chr8:35724382-35734768	Cldn23, Prag1, Lonrf1, Trmt9b, Dlc1, Mfhas1, Eri1, Ppp1r3b, Tnks, Dusp4
Gm46218	ENSMUSG00000110830	chr10:29297934-29313825	Echdc1, Rnf146, Rspo3, Cenpw, Soga3, Themis, Ptprk
D830013O20Rik	ENSMUSG00000056359	chr12:73364075-73409557	Tmem30b, Prkch, Hif1a, Snapc1, Syt16, Trmt5, Slc38a6, Mnat1, Six4, Six1, Six6, Ppm1a, Dhrr7, Pcnx4, Lrrc9
Shhg1	ENSMUSG00000108414	chr19:8723475-8726443	Wdr74, Stx5a, Nxf1, Tmem223, Tmem179b, Taf6l, Polr2g, Ttc9c, Hnnpul2, Lrrn4cl, Zbtb3, Bsc12, Ubxn1, Lbhd1, Ints5, Ganab, B3gat3, Gng3, Uqcc3, Rom1, Em13, Mta2, Eef1g, Ahnak, Scgb1a1, Asrgl1, Chrm1, Slc3a2, Slc22a8, Slc22a6, Slc22a30, Slc22a29, Slc22a28, Slc22a27, Slc22a26
Dubr	ENSMUSG00000022639	chr16:50719294-50732773	Ccdc54, Bbx, Cd47, Ift57
Rmst	ENSMUSG00000112117	chr10:92075123-92075629	Nedd1, Cfp54, Tmpo, Slc25a3, Ikbip

AI480526	ENSMUSG00000090086	chr5:123134843-123141666	Setd1b, Hpd, Psm9, Wdr66, Bc17a, Mlixip, Ii31, Lrrc43, B3gnt4, Diablo, Vps33a, Clip1, Zcchc8, Rsrc2, Kntc1, Hcar2, Hcar1, Denr, Ccdc62, Hip1r, Vps37b, Abcb9, Ogfod2, Arl6ip4, Rhof, Tmem120b, Morn3, Orai1, Kdm2b, Rnf34, Anapc5, Camkk2, P2rx4, P2rx7, Ift81, Atp2a2, Anapc7, Arpc3, Fam216a, Vps29, Gph3, Rad9b, Pptc7, Tctn1, Hvcn1, Ppp1cc
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Gm20633	ENSMUSG00000093553	chr3:96243550-96246380	H2ac18, h3c14, H4ac14, H2bc18, H3c13, Fcgr1, BC107364, Hvj, Txnip, Polr3gl, Ankrd34a, Rbm8a, Pex11b, Itga10, Lic1l, Ankrd35, Nudt17, Polr3c, Pias3, Rnf115, Cd160, Pdzk1, Gpr89, Gja8, Gja5, Acp6, Bc19, H2ac19, H3c15, H2bc21, H2ac20, H2ac21, Bola1, Otud7b, Mtmr11, Sf3b4, Vps45, Plekho1, Anp32e, Aph1a, Car14, Prpf3, Mrps21, Rprd2, Tars2, Ecm1, Ensa, Mcl1, Adamts14, Golph3l, Hormad1, Ctss, Ctsk, Arnt, Setdb1, Anxa9, Mindy1, Prune1
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1700030C10Rik	ENSMUSG00000099759	chr12:20804381-20815779	Asap2, Utgb1bp1, Cpsf3, Iah1, Adam17, Ywhaq
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Zswim6	ENSMUSG00000032846	chr13:107724618-107890064	Smim15, Ndudaf2, ERcc8, Elovl7, Depdc1b, Pde4d, Kif2a, Dimt1, Ipo11
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E330017L17Rik	ENSMUSG00000086369	chr4:129906433-129919787	Spocd1, Adgrb2, Col16a1, Pef1, Hcrtr1, Tinagl1, Serinc2, Ldc1, Fabp3, Zcchc17, Snrnp40, Nkain1, Pum1, Sdc3, Ptp4a2, Khdrbs1, Tmem39b, Kpna6, Txlna, Iqcc, Ccdc28b, Tmem234, Dcdc2b, Eif3i, Lck, Fam167b, Hdac1, Marcksl1, Fam229a, Tssk3, Bsdc1, Zbtb8b, Zbtb8a, Zbtb8os, Rbbp4, Sync, C77080, Yars, S100ppb, Fndc5, Hpca, Rnf19b, Tmem54, Ak2, Azin2
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Gm43244	ENSMUSG00000105342	chr3:102129938-102131222	Vangl1, Ngf, Tspan2, Tshb, Sycp1, Nr1h5, Sike1, Csde1, Nras, Ampd1, Dennd2c, Casq2, Nhlh2, Slc22a15, Mab21l3, Atp1a1, Igsf3, Cd2
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Kcnq1ot1	ENSMUSG00000101609	chr7:143203458-143296549	Cdkn1c, Slc22a18, Phlda2, Nap114, Cars, Tnfrsf22, Tnfrsf23, Tnfrsf26, Osbp15, Mrgprg, Mrgpre, Nadsyn, Dhcr7, Acte1, Shank2, Kcnq1, Trpm5, Tssc4, Tspan32, Cd81, Ascl2, Th, Ins2, Igf2, Mrp123, Tnnt3, Lsp1, Prr33, Tnni2, Syt8, Ctsd, Ifitm10, Krtap5-4, Krtap5-1, Krtap5-5
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Gm13166	ENSMUSG00000085525	chr4:146251829-146253858	Zfp992, Zfp981, Zfp993, Zfp989, Rex2, Zfp991, Zfp600, Zfp987, Zfp986, Zfp980, Zfp990, Tnfrs8
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Gm28875	ENSMUSG00000100975	chr12:104925501-104926689	Syne3, Glrx5, Tcl1b2, Tcl1b1, Tcl1b5, Tcl1b4, Tcl1b3, Tcl1, Tunar, Bdkrb2, Bdkrb1, Atg2b, Gskip, Ak7, Papola, Clmn, Dicer1, Gsc, Serpina3n, Serpina3m, Serpina3j, Serpina3k, Serpina3i, Serpina3g, Serpina3f, Serpina3c, Serpina3b, Serpina3a, Serpina5, Serpina12, Serpina9, Serpina11, Serpina1e
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2410022M11Rik	ENSMUSG00000100017	chr14:56811989-56813899	Zmym2, Gja3, Gjb2, Gjb6, Cryl1, lft88, Eef1akmt1, Il17d, Xpo4, Lats2, Sap18, Zmym5, Pspc1, Mphosph8, Parp4, Cenpj, Rnf17, Atp12a, Gzmb, Gzmc, Gzmf, Gzmg, Gzmn, Gzmd, Gzme, Ctsg, Mcft8, Mcpt4, Mcpt2, Mcpt9, Mcpt1, , Cma2, Cma1, Sdr39u1, Khnyn, Cbln3, Nynrin, Nfatc4
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Gm26795	ENSMUSG00000097776	chr8:28593505-28595599	Unc5d
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A930029G22Rik	ENSMUSG00000096988	chr17:69416660-69439304	Akain1, Dlgap1, Zbtb14, Epb413, Tmem200c, L3mbtl4
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Snhg12	ENSMUSG00000086290	chr4:132308678-132311024	Trnau1ap, Phactr4, Rxr1, Med18, Sesn2, Atpif1, Ptafr, Dnajc8, Eya3, Xkr8, Smpdl3b, Rpa2, Themis2, Ppp1r8, Stx12, Fam76a, Fgr, Ahdc1, Wasf2, Gpr3, Cd164l2, Map3k6, Sytl1, Tmem222, Rab42, Taf12, Gmeb1, Ythdf2, Oprd1, Epb41, Tmem200b, Srsf4, Mecr, Ptbru
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Gm5532	ENSMUSG00000073535	chr1:155520173-155527111	Acbd6, Lhx4, Qsox1, Cep350, Tor1aip1, Tor1aip2, Fam163a, Tdrd5, Mphs2, Axdnd1, Soat1, Xpr1, BC034090, Stx9, Mr1, Oer5, Cacna1e
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Gm17251

ENSMUSG00000090952

chr17:33759992-33761870

Angptl4, Kank3, Rps28, Kifc1, Ndufa7, Smim40-ps, Cd320, Smim40, Daxx, Zbtb22, Tapbp, B3galt4, Rps18, Vps52, Rgl2, Pfdn6, WDr46, H2-K1, Ring1, Rxrb, H2-Ke6, Slc39a7, Col11a2, Brd2, H2-Dma, H2-DMb2, H2-DMb1, Psm9, Tap1, Psmb8, H2-Ob, Tap2, H2-Ab1, H2-Aa, H2-Ea-ps, Btnl2, H2-Eb1, H2-Eb2, Btnl1, BC051142, Btn14, Btn16, Notch4, Gpsm3, Ppt2, Pbx2, Ager, Rnf5, Agpat1, Egf18, Prt1, Fkbp1, Atf6b, Tnxb, C4b, Rab11b, March2, Rab11b, Hnrnpm, Zfp414, Pram1, Myo1f, ADamts10, Act19, Zfp101, Zfp955b, Olfr63, Zfp955a, Olfr1564, Olfr239, Olfr55, Morc2b, Zfp563, Zfp763, Zfp952, , Zfp472, Cyp4f13, Cyp4f14, Zfp870, Zfp799, Zfp811, Zfp871

Ifi30

ENSMUSG00000031838

chr8:70762774-70766663

Pik3r2, Mast3, Ili2rb1, Arrdc2, Kcnn1, Slc5a5, Rpli8a, Map1s, Rpli8a, Ccdc124, Haus8, Myo9b, Use1, Ocel1, Nr2f6, Ushbp1, Babam1, Ankle1, dda1, Ano8, Gtpbp3, Plvap, Ccdc194, Bst2, Mvb12a, Tmem221, Nxn1, Slc27a1, Fam129c, Colgalt1, Pgl3, Unc13a, Jak3, Insl3, B3gnt3, Fcho1, Mpv17l2, Rab3a, Pde4c, Lsm4, Gm3336, Pgpep1, Pde4c, Iqcn, Jund, Ssbp4, Gdf15, Lrrc25, Isyna, Fkbp8, Kxd1, uba52, REX1bd, Tmem59l, Crif1, Kihl26, Crtc1, Comp, Upf1, Gdf1, Cers1, Cope, Ddx49, Sugg2, Homer3, Armc6, Slc25a42, Tmem161a, Mef2b, Borcs8, Rfxank, Nr2c2ap, Ncan, Hapln4, Tm6sf2, Sugg1, Mau2, Gatad2a, Tssk6, Cilp2, Pbx4, Yjefn3, Ndufa13, Gatad2a, Atp13a1, Gmip, Lpar2

Gm47547

ENSMUSG00000114196

chr14:41053653-41061614

Mat1a, Mbl1, Sftpd, Sftpd1, Gm2832,
Gm5798, Gm7945, Gm6482, Gm7954,
Gm3486, Gm7970, Gm3072, Gm3676,
Gm8068, Gm7929, Gm47189, Gm7980,
Gm6401, Gm3543, Dydc1, dydc2, Prxl2a,
Tspan14, Sh2d4b

Gm20300

ENSMUSG00000111080

chr10:30603195-30606634

Hint3, Ncoa7, Hey2, Hddc2, Tpd5211,
Rnf217, Trmt11, Cenpw

Gm47469

ENSMUSG00000113047

chr13:74553910-74556948

Erap1, Cast, Pcsk1, Zfp825, Ftl1-ps1,
Zfp72, Lrrc14b, Ccdc127, Sdha, Pcd6,
Ahr, Exoc3, Slc9a3, Cep72, Tppp,
Zdhc11, Brd9, Trip13, Nkd2, Slc12a7,
Slc6a19, Slc6a18, Tert, Clptm1l