

Molecular signatures identify immature mesenchymal progenitors in early mouse limb buds that respond differentially to morphogen signaling

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SUMMARY STATEMENT

Cell sorting identifies limb bud mesenchymal progenitors (LMPs) with distinct molecular signatures and differential dependence on morphogen signaling. Specifically, two immature LMP populations with strong chondrogenic differentiation potential are identified.

ABSTRACT

The key molecular interactions governing vertebrate limb bud development are a paradigm to study the mechanisms controlling progenitor cell proliferation and specification during vertebrate organogenesis. However, little is known about the cellular heterogeneity of the mesenchymal progenitors in early limb buds that ultimately contribute to the chondrogenic condensations prefiguring the skeleton. We combined flow cytometric and transcriptome analyses to identify the molecular signatures of several distinct mesenchymal progenitor cell populations present in early mouse forelimb buds. In particular, JAGGED1 (JAG1)-positive cells located in the posterior-distal mesenchyme were identified as the most immature limb bud mesenchymal progenitors (LMPs), which critically depend on SHH and FGF signaling in culture. The analysis of *Gremlin1* (*Grem1*)-deficient forelimb buds showed that JAG1-expressing LMPs are protected from apoptosis by GREM1-mediated BMP antagonism. At the same stage, the osteo-chondrogenic progenitors (OCPs) located in the core mesenchyme are already actively responding to BMP signaling. This analysis sheds light on the cellular heterogeneity of the early mouse limb bud mesenchyme and the distinct response of LMPs and OCPs to morphogen signaling.

INTRODUCTION

The developing vertebrate limb bud is an excellent model to study the molecular mechanisms and cellular interactions that govern proliferative expansion, specification and differentiation of mesenchymal progenitors during organogenesis. The limb bud mesenchymal progenitors (LMPs) will give rise to the osteo-chondrogenic lineages of the appendicular skeleton, tendons and connective tissue. In contrast, muscles arise from myoblasts that migrate from the somites into the early limb bud (reviewed by Zuniga, 2015). There is evidence that the mesenchyme consists of molecularly distinct anterior and posterior compartments during the initiation of limb bud development (Osterwalder, et al., 2014). It has been shown that SHH morphogen signaling specifies the antero-posterior (AP) identities of the future digits during the onset of mouse limb bud outgrowth (around embryonic day E9.75-E10.5; Zhu, et al., 2008). In parallel, a feedback signaling system is established between the posterior SHH signaling centre and FGF signaling by the apical ectodermal ridge (AER), which regulates the survival and proliferative expansion of LMPs in concert with GREMLIN1 (GREM1)-mediated BMP antagonism and WNT signaling (ten Berge, et al., 2008; Zhu, et al., 2008; Benazet, et al., 2009). In contrast much less is known about the cellular heterogeneity of the mesenchyme and potential differences in the mesenchymal response to morphogen signalling.

LMPs arise by a local epithelial-to-mesenchymal transition (EMT) of the coelomic epithelium within the presumptive limb field, which is regulated by the TBX5 transcriptional regulator and FGF10 signaling (Gros and Tabin, 2014). Experimental analysis and model simulations show that distal progression of limb bud outgrowth is driven by oriented rather than random cell behaviours and division (Boehm, et al.,

2010; Gros, et al., 2010). Lineage tracing identified a dorso-ventral compartment boundary which overlaps with the dorso-ventrally restricted expression of specific genes in mouse limb buds (Arques, et al., 2007). Furthermore, genetic mapping of the descendants of *Shh*-expressing cells showed that they give rise to the two posterior-most and part of the central digit (Harfe, et al., 2004). The *Shh*-expressing mesenchymal cells were isolated from mouse limb buds by means of an EGFP marker in combination with fluorescence activated cell sorting (FACS). Their analysis identified the cisome and gene expression signature of the SHH-signaling cells in the posterior limb bud mesenchyme (Rock, et al., 2007; VanderMeer, et al., 2014). As limb bud outgrowth progresses, the distal and sub-ectodermal mesenchyme is kept in a proliferative and undifferentiated state by AER-FGF and ectodermal WNT signaling (Pearse, et al., 2007; ten Berge, et al., 2008; Karamboulas, et al., 2010). In contrast, the core mesenchyme expresses the SOX9 transcriptional regulator which marks the osteo-chondrogenic progenitors (OCPs) from early stages onward (Akiyama, et al., 2005). In particular, SOX9 controls the mesenchyme to chondrocyte transition and initiation of chondrogenic differentiation (Wright, et al., 1995; Barna and Niswander, 2007). FACS analysis of Sox9-EGFP-positive and -negative cells from mouse handplates (E11.5) showed that digit progenitors express SOX9 in a periodic pattern (Raspopovic, et al., 2014).

Here, we first investigated the cell cycle kinetics, which showed that the percentage of mesenchymal cells in S-phase decreases in parallel to the increase in cell numbers during progression of forelimb bud outgrowth. By combining flow cytometry with RNA sequencing (RNA-seq) analysis we were able to identify and analyse distinct cell mesenchymal cell populations in early mouse forelimb buds. This analysis identified distinct immature LMPs located in the posterior-distal and peripheral mesenchyme and

osteo-chondrogenic progenitors (OCPs) in the core mesenchyme. One of the three LMP populations encompasses myoblasts, while the other two represent distinct LMP populations with chondrogenic differentiation potential in culture. Comparative functional analysis showed that the transcriptional response to morphogenetic signaling differs significantly among the two chondrogenic LMP populations and OCPs. Genetic analysis of early forelimb buds revealed that the survival of the most immature LMPs located in the posterior-distal mesenchyme depends critically on GREMLIN1 (GREM1)-mediated BMP antagonism.

RESULTS

Quantitation of limb bud mesenchymal cell number and cell cycle kinetics reveals during forelimb bud outgrowth

Mouse forelimb bud mesenchymal cell numbers were determined by *Prx1*-Cre-mediated activation of an EGFP transgene in the endogenous β -actin locus. This results in EGFP expression by the vast majority of all limb bud mesenchymal cells (Fig. 1A; Logan, et al., 2002; Jagle, et al., 2007). Single cells were prepared from dissected forelimb buds (inset, Fig. 1B), which resulted in maximally 8-15% cell death at all stages (red arrowhead, Fig. 1B). Forelimb buds were accurately staged by counting somite numbers and mesenchymal cell numbers determined by counting the EGFP-positive cells in defined sub-fraction volumes using flow cytometry (for details see Materials and Methods, Fig. 1C, Table 1). Mesenchymal cell numbers increased from $\sim 1 \times 10^4$ (22 somites at E9.25) to $\sim 7.7 \times 10^5$ cells (54 somites at E12.0, Fig. 1C and Table 1). Cell numbers during the onset of forelimb bud development (18 somites at E9.0) were determined by counting DAPI-stained mesenchymal cell nuclei on serial

sections using stacks of confocal images. This analysis established that forelimb buds at E9.0 contain $\sim 4512 \pm 974$ mesenchymal cells (mean \pm SD; n=4).

The cell cycle kinetics at the three stages of forelimb bud outgrowth were analysed using flow cytometric determination of cellular DNA contents and mitotic cells by measuring propidium iodide uptake and detecting phospho-histone H3 positive cells, respectively (Fig. 1D). This analysis revealed that the fraction of mesenchymal cells in S-phase was highest at E9.5, while the fraction of mesenchymal cells in the G0/G1-phase of the cell cycle was highest at E11.75. In contrast, the fraction of mitotic cells was similar at all stages (mean at E9.5: 1.2%, E10.75: 1.22%, E11.75: 1.31%, Fig. 1D). This decrease in the fraction of cells in S-phase was independently confirmed by directly assessing DNA synthesis by BrdU incorporation, which was highest in the mesenchyme of early limb buds (Figure S1). Taken together, this analysis showed that mitotic rates are similar at all stages, but in early forelimb buds more than half of all mesenchymal cells are in S-phase (E9.75), while at late stages most are in the G0/G1-phase of the cell cycle ($\sim 68\%$, E11.75, Fig. 1D).

FACS identifies distinct mesenchymal progenitor populations in early mouse forelimb buds (E10.5-E10.75)

Previous analysis of limb bud mesenchymal cells had established that the vast majority express platelet-derived growth factor receptor- α (PDGFR α ; Takakura, et al., 1997), which in combination with SCA-1 allowed FACS isolation of mesenchymal stromal cells (MSCs) during limb long bone development (Morikawa, et al., 2009; Craft, et al., 2013; Nusspamer, et al., 2017). To gain insight into the potentially cellular heterogeneity during the early phase of forelimb bud outgrowth, we used mouse embryos at E10.5-E10.75 (35-38 somites, Figs 2-7). These are the earliest forelimb

bud stages that permitted isolation of sufficient mesenchymal cells for functional analysis. We used several cell surface markers suited for FACS analysis (Fig. 2) in combination with a *Sox9*-EGFP allele (*Sox9*^{IRE5-EGFP}; Chan, et al., 2011), as SOX9 is expressed by the OCPs located in the core limb bud mesenchyme already at early stages (Fig. 2A-C). Immunofluorescence analysis also detected high levels of PDGFR α in the core mesenchyme, while levels were lower in the peripheral mesenchyme (Fig. 2B). In contrast, the SCA-1 transcript distribution in early forelimb buds was previously shown to be rather diffuse with higher levels in the peripheral mesenchyme (Nusspaumer, et al., 2017). Our analysis of different cell surface markers suited for FACS isolation also identified the transmembrane NOTCH ligand JAG1 due to its localized expression in the posterior-distal forelimb bud mesenchyme (E10.5-E10.75, Fig. 2A,C; Fig. S2; Panman, et al., 2006). Based on these results, we decided to use these markers for FACS isolation distinct forelimb bud mesenchymal cell populations (E10.5-E10.75, Fig. 3A). Initially apoptotic, ectodermal and various non-mesenchymal cell-types were excluded from further analysis using the appropriate cell surface markers (exclusion of lineage-positive cells, for details see Materials and Methods). The vast majority of these lineage-negative (*Lin*⁻) cells were PDGFR α -positive (*P* α ⁺) mesenchymal cells, which were separated further into SOX9-positive (*S9*⁺) and negative (*S9*⁻) cells by their *Sox9*-EGFP expression (second panel in Fig. 3A). The core mesenchymal cells expressing SOX9 and high levels of PDGFR α (*S9*⁺*P* α ^{hi}, Fig. 2A-2C) corresponded to $\sim 38 \pm 8\%$ of all *Lin*⁻ mesenchymal cells (Fig. 3B). This population consisted predominantly of OCPs as it expressed only low levels of *Col2a1*, a molecular indicator of chondroblast differentiation (Fig. 3C; Akiyama, et al., 2005). The SOX9-negative *P* α ⁺ cells (*S9*⁻*P* α ⁺ cells) were sorted further with respect to

their expression of the SCA-1 and JAG1 antigens, leading to isolation of three additional populations (third panel in Fig. 3A). FACS analysis established these as distinct populations as there was no overlap between the SCA-1 (S9⁻SCA-1⁺) and JAG1 (S9⁻JAG1⁺) populations. The third population of SOX9-negative cells neither expressed SCA-1 nor JAG1, but high levels of PDGFR α (S9⁻P α ^{hi}, right panel in Fig. 3A). This S9⁻P α ^{hi} population included $\sim 25 \pm 6$ % of all Lin⁻ mesenchymal cells, while the S9⁻SCA-1⁺ ($\sim 6 \pm 2$ %) and S9⁻JAG1⁺ ($\sim 9 \pm 21$ %) populations were much less abundant.

Molecular signatures identify S9⁻P α ^{hi} and S9⁻JAG1⁺ LMPs as early progenitors with robust chondrogenic differentiation potential in culture

To gain insight into the transcriptional signatures of the three mesenchymal cell populations and OCPs isolated from mouse forelimb buds at E10.5-E10.75 (Fig. 3A), FACS was combined with RNA-seq analysis (Figs. 4, 5). Chondroblasts expressing high levels of *Col2a1* were isolated from forelimb buds at E11.5 (45-47 somites) as S9⁺P α ^{hi}*Col2a1*⁺ cells (Fig. 3B-D) and included in the analysis to discriminate OCPs from chondroblasts. Principal components analysis (PCA) of the RNA-seq data showed that the biological replicates cluster well, pointing to minimal intra-group variability. This analysis revealed that the S9⁻SCA-1⁺ mesenchymal cell population exhibit the highest variance along the y-axis, indicating that these cells might be rather different from the other populations (Fig. 4A). As expected, OCPs (S9⁺P α ^{hi} population) were rather similar to chondroblasts (S9⁺P α ^{hi}*Col2a1*⁺ population), while S9⁻JAG1⁺ and S9⁻P α ^{hi} LMPs differed from both OCPs and chondroblasts, but to a lesser extent than S9⁻SCA-1⁺ cells (Fig. 4A).

Next, the RNA-seq datasets were subjected to Gene Ontology (GO) analysis to identify the genes and pathways, whose expression differed significantly in one

population versus all others. GO analysis of the S9-SCA-1⁺ population revealed that genes and pathways functioning in cell growth/proliferation and metabolic processes were expressed at higher than average levels, while the expression of genes functioning during limb bud development and chondrogenesis were expressed at lower than average levels (Fig. S3A,B). In addition to S9-SCA-1⁺ cells being actively proliferating progenitors, the GO analysis revealed that they expressed genes functioning in migration and differentiation of myoblasts (Fig. 4B; Chal and Pourquie, 2017). These included the c-MET receptor tyrosine kinase (*Met*), myogenin (*Myog*), myogenic differentiation factor-1 (*Myod1*), myogenic factor-5 (*Myf5*) and the *Pax3* and *Pax7* transcriptional regulators (Fig. 4B). Furthermore, culturing S9-SCA-1⁺ cells under conditions that favour chondrogenesis resulted in their elimination by cell death rather than induction of chondrogenic differentiation (data not shown). Our gene expression data suggests that the S9-SCA-1⁺ cell population isolated from early forelimb buds (E10.5-E10.75) encompasses myogenic rather than chondrogenic progenitors.

S9-JAG1⁺ LMPs displayed much less variance along the y-axis and appeared more closely related to the other three populations than S9-SCA-1⁺ cells (Fig. 4A). GO analysis showed that genes functioning in pathways relevant to cell growth/proliferation, metabolism and diverse developmental processes were also expressed at higher than average levels (Fig. 4C). In addition, genes belonging to pathways functioning in limb bud, chondrogenic and skeletal development were expressed at low levels by S9-JAG1⁺ LMPs (Fig. S3C). Overall the GO analysis indicated that these cells either belong to a non-chondrogenic lineage or have not yet been determined, which would point to the immature state of S9-JAG1⁺ LMPs (see below). In contrast, S9-Pa^{hi} LMPs most prominently expressed genes with essential functions during limb bud morphogenesis and mesenchymal cell proliferation (Fig. 4D,

Fig. S2D). As expected, S9⁺Pα^{hi} OCPs and S9⁺Pα^{hi}Col2a1⁺ chondroblasts expressed high levels of genes functioning in chondrocyte and/or cartilage differentiation, extracellular matrix and collagen fibril organisation. Conversely, the expression of genes functioning in cell growth/proliferation and metabolic processes was lower than average (Fig. 4E,F, Fig. S3E,F).

The global molecular differences among two LMP populations, OCPs and chondroblasts were exemplified by the ordered comparison of all differentially expressed genes shown in Figure 5A. The most striking feature of this comparison is the large cluster of genes expressed at lower than average levels in S9⁻JAG1⁺ LMPs (indicated by the black square in Fig. 5A). While the expression a significant fraction of these genes was increased in S9⁺Pα^{hi} LMPs, this was enhanced in S9⁺Pα^{hi} OCPs and S9⁺Pα^{hi}Col2a1⁺ chondroblasts with the latter expressing the vast majority at high levels (Fig. 5A). To gain further insight into the relatedness and functional relevance of these changes in the four cell populations, we manually curated a list of the differentially expressed transcriptional regulators that are genetically required for limb bud and/or limb skeletal development (for details see legend to Fig. 5B). This analysis revealed the expression profiles of these essential transcription factors in the different cell populations. For example, *Hoxa11*, *Hoxa13* and the *Hoxd11-13* genes were expressed at higher than average levels in S9⁻JAG1⁺ LMPs as expected from their expression in the posterior-distal limb bud mesenchyme (left lane, Fig. 5B; reviewed by Zakany and Duboule, 2007). These *Hox* genes were also expressed at higher levels in S9⁺Pα^{hi}Col2a1⁺ chondroblasts in agreement with their requirement for limb skeletal bone development (right lane, Fig. 5B; Gonzalez-Martin, et al., 2014; Neufeld, et al., 2014). Other than that, the signature of S9⁻JAG1⁺ LMPs was largely complementary to one of S9⁺Pα^{hi} OCPs and S9⁺Pα^{hi}Col2a1⁺ chondroblasts (Fig. 5B).

The S9⁻Pα^{hi} LMP population expressed higher than average levels of transcription factors functioning the anterior, posterior and/or peripheral mesenchyme during early limb bud development such as *Pax1*, *Alx4*, *Irx3/5* *Tbx2/3*, and *Msx1* (second lane in Fig. 5B), which confirmed that this population is distinct from S9⁻JAG1⁺ LMPs. As expected, S9⁺Pα^{hi}Co/2a1⁺ chondroblasts expressed high levels of transcriptional regulators required for chondrogenesis and limb skeletal, digit and tendon morphogenesis such as *Hoxa* and *Hoxd*, *Sox* and *Runx* gene family members and the *Shox2*, *Osr1* and *Scx* transcription factors (right lane in Fig. 5B).

Next, we assessed the chondrogenic differentiation potential of the two LMP populations identified in high density culture (Fig. 5C; Barna and Niswander, 2007; Benazet, et al., 2012). This resulted in activation of Sox9-EGFP expression in a significant fraction of cells from both LMP populations within 24 hours as previously reported for SOX9-negative digit progenitors isolated at much later stages (E11.5; Raspopovic, et al., 2014). Moreover, the SOX9-positive cells in these cultures aggregated and formed typical chondrogenic condensations without addition of exogenous BMP4 (Fig. 5C). This analysis revealed the potent chondrogenic differentiation potential of both the S9⁻JAG1⁺ and S9⁻Pα^{hi} LMP populations, which together with the gene expression analysis (Fig. 4, Fig. 5A,B) indicated that they are likely progenitors of the chondrogenic lineage in forelimb buds.

Differential cellular responsiveness uncovers the specific requirement of SHH and FGF signaling for S9⁻JAG1⁺ and S9⁻Pα^{hi} LMPs in culture

Limb bud outgrowth and patterning are controlled by the self-regulatory SHH/GREM1/AER-FGF feedback signaling system (reviewed by Zuniga, 2015). The transcriptome datasets of the four cell populations with chondrogenic differentiation

potential (Figs. 4, 5) allowed us to analyse the differential expression of genes functioning in these pathways in an un-biased and genome-wide manner. This showed that the expression of genes functioning in SHH signal transduction by Smoothed (SMO) was very different among the four mesenchymal cell populations (Fig. 6A). In particular, the SMO gene expression signature in S9⁻JAG1⁺ LMPs in the posterior-distal and S9⁺Pα^{hi} OCPs in the core mesenchyme appeared rather complementary (Fig. 6A, compare to Fig. 2A, 2C). The genes expressed at high levels in S9⁺Pα^{hi} OCPs (and chondroblasts at E11.5) included direct transcriptional targets that are negatively regulated by SHH signaling and expressed predominantly in the core mesenchyme (e.g. *Cdon*, *Boc*, *Gli2* and *Hhip*; Tenzen, et al., 2006; Probst, et al., 2011; Lewandowski, et al., 2015). By contrast, S9⁻JAG1⁺ LMPs expressed high levels of genes like *Gli1* and *Ptch1*, which are activated in the posterior mesenchyme in response to SHH signaling (Goodrich, et al., 1996; Buscher and Ruther, 1998). As this pointed to potential differences in the SMO-mediated response to SHH signaling, we treated forelimb buds mesenchymal cells (E10.5-E10.75) in high density culture with cyclopamine, a SMO small molecule antagonist (Chen, et al., 2002). Twelve hours of cyclopamine treatment caused loss of *Gli1* expression, a direct transcriptional target of SHH-mediated signal transduction (Fig. 6B and Fig. S4A; Lee, et al., 1997). Importantly, this relatively short cyclopamine treatment did not alter cell survival but slightly decreased the fraction of mitotic cells (Fig. S4B,C). Comparative flow cytometric analysis of control and cyclopamine-treated cultures revealed a significant reduction in both the S9⁻JAG1⁺ (~3-fold) and S9⁺Pα^{hi} LMP populations (~2-fold; Fig. 6B), while the large fraction of S9⁺Pα^{hi} OCPs was not altered by inhibiting SHH signal transduction (Fig. 6B). These results showed that maintenance of the two LMP populations in culture depended critically on SHH signal transduction. As S9⁻JAG1⁺

LMPs are located in the posterior-distal mesenchyme close to the SHH source (Fig. 2C), we wondered if these LMPs include *Shh*-expressing cells and/or their descendants (Harfe, et al., 2004). The *Shh*^{GFPCre} allele, which labels *Shh*-expressing cells by EGFP (first panel in Fig. 6C) was used in combination with a CRE-inducible *ROSA26*^{LSL-tdTomato} transgene to trace the tdTOMATO-positive *Shh* descendants (second panel in Fig. 6C; Harfe, et al., 2004). This approach identified a small fraction of cells expressing both tdTOMATO and JAG1 (fourth panel in Fig. 6C). This was also confirmed by FACS as ~10% of the tdTOMATO⁺ LMPs co-expressed JAG1 (Fig. 6D). Therefore, it appears that only a small fraction of S9⁻JAG1⁺ LMPs originated from *Shh* expressing cells and/or their descendants, pointing to the cellular heterogeneity of this population.

AER-FGF signaling is required to maintain cells in the distal sub-AER mesenchyme in an undifferentiated and proliferative state (ten Berge, et al., 2008), which suggested that it might be required to maintain/expand LMPs in culture. Indeed, S9⁻JAG1⁺ LMPs express the highest levels of direct transcriptional targets of FGF signal transduction in the limb bud mesenchyme (*Spry1*, *Spry 2*, *Spry 4* and *Dusp6*, Fig. S5A; Kawakami, et al., 2003; Morgani, et al., 2018). As FGF8 is the main AER-FGF (Lewandoski, et al., 2000), we assessed the effects of treating forelimb bud mesenchymal cells in culture with FGF8b for 12 hours. As expected the FGF8b treatment did not alter cell survival, but increased the fraction of cells in S-phase and the expression of the direct targets *Spry4* and *Dusp6* (Fig. S5B-D). Flow cytometric analysis revealed that FGF8b treatment increased the fraction of S9⁻JAG1⁺ LMPs by ~2-fold, while the S9⁻Pα^{hi} LMP population remained constant and the fraction of S9⁺Pα^{hi} OCPs was slightly reduced (Fig. S5D). Together, this analysis provided experimental evidence that S9⁻JAG1⁺

LMPs isolated from early limb buds depend most critically on SHH and FGF signaling in high density cultures (Fig. 6 and Fig. S5).

GREM1-mediated BMP antagonism protects the immature S9⁻JAG1⁺ LMPs from precocious BMP-induced apoptosis

The majority of genes associated with GO term “cellular response to BMP signaling” were expressed at lower than average levels in S9⁻JAG1⁺ and S9⁻Pα^{hi} LMPs (Fig. 7A). However, genes expressed at high levels by S9⁻JAG1⁺ LMPs included the BMP antagonist *Grem1*, which is expressed by a fraction of the *Jag1*-positive limb bud mesenchyme (Panman, et al., 2006). Several other BMP pathway genes were also increased in S9⁻JAG1⁺ LMPs such as *Msx1*, *Bmp4*, *Bmp2* and *T-brachyury* which are normally expressed in the posterior and/or distal limb bud mesenchyme (Catron, et al., 1996; Liu, et al., 2003; Bandyopadhyay, et al., 2006; Benazet, et al., 2009). S9⁻Pα^{hi} LMPs also expressed higher levels of *Msx1*, *Msx2* and *Bmp4* but not *Grem1*, which showed that this population does not overlap the *Grem1*-expression domain in limb buds (Fig. 7A). This global analysis not only revealed distinct molecular differences between S9⁻JAG1⁺ and S9⁻Pα^{hi} LMPs populations, but also highlighted the expression of BMP-response genes that function in chondrogenesis in S9⁺Pα^{hi} OCPs. The higher expression of *Col2a1* transcripts in S9⁺Pα^{hi} OCPs suggested that a fraction of them already initiated chondrogenic differentiation in forelimb buds at E10.5-E10.75 (Fig. 7A, compare to Fig. 3C). However, direct comparison of BMP response genes showed that S9⁺Pα^{hi} *Col2a1*⁺ chondroblasts at E11.5 expressed higher levels of genes that function in chondroblast differentiation and maturation than S9⁺Pα^{hi} OCPs such as *Acan*, *Col2a1*, *Chordl1*, *Bmpr1*, *Nog* and *Adamts12* (Fig. 7A).

Unexpectedly, these results indicated that the SOX9-positive OCPs located in the core mesenchyme were already exposed to higher BMP activity in early forelimb buds than the SOX9-negative LMPs in the peripheral and posterior-distal mesenchyme. To assess their response to BMP signaling, LMPs and OCPs were cultured in medium containing BMP4 for 24 hours (Fig. 7B). While S9⁺P α ^{hi} OCPs activated COL2A and formed aggregates typical of chondrogenic condensations (lower panels, Fig. 7B), no COL2A and fewer to no SOX9-positive aggregates were detected in S9⁻JAG1⁺ and S9⁻P α ^{hi} LMP cultures (upper and middle panels, Fig. 7B). In fact, overall cell numbers decreased (Fig. 7B), which prompted us to assess BMP-induced apoptosis (Fig. 7C). Indeed, the apoptosis of both LMP populations increased significantly, while the survival of S9⁺P α ^{hi} OCPs was not altered. Next, the effects of inhibiting BMP signal transduction on the different cell populations were assessed. Dorsomorphin, a selective inhibitor of BMP type I receptors (Yu and Ornitz, 2008), reduced BMP signal transduction in unsorted mesenchymal cell cultures (E10.5-E10.75) by 40-50% within 12 hours (Fig. S6A) and increased overall apoptosis by ~2-fold (left panel in Fig. 7D). However, among the live Lin⁻ cells, the S9⁻JAG1⁺ and S9⁻P α ^{hi} LMPs increased by ~4 to ~7-fold, respectively, while the fraction of S9⁺P α ^{hi} OCPs was reduced (Fig. 7D). Together these results (Fig. 7B-7D) indicated that lower BMP levels favour LMPs in high density cultures.

The proposed protective role of BMP antagonism for LMPs was genetically assessed by flow cytometric analysis of forelimb buds from wild-type and *Grem1*-deficient littermate embryos (E10.5-E10.75). Due to the complexity of analysis and small numbers of cells recovered, overall cell death was ~2-fold higher than normal even in wild-type controls (Fig. S6B, see Materials and Methods). Among the live Lin⁻ mesenchymal cells, the fraction of S9⁻JAG1⁺ LMPs was reduced by ~42%, while S9⁻

P α^{hi} LMPs were not significantly affected and the fraction of the predominant S9⁺P α^{hi} OCPs increased by ~15% in *Grem1*-deficient forelimb buds (Fig. 6E). These results show that GREM1-mediated BMP antagonism (Zuniga, et al., 1999) preferentially impacts the immature S9⁺JAG1⁺ LMPs located in the distal-posterior forelimb bud mesenchyme. In particular, this analysis highlighted the importance of GREM1-mediated protection of LMPs from premature exposure to BMP signaling in early forelimb buds. At the same stage, the OPCs located in the core mesenchyme already express higher levels of BMP target genes that function in the onset of chondrogenesis. This reveals the differential exposure and response of the core and peripheral/posterior-distal mesenchyme to BMP signaling and GREM1-mediated antagonism in early forelimb buds (E10.5-E10.75).

DISCUSSION

In this study, we quantitate limb bud mesenchymal cell numbers and show that the proportion of mesenchymal cells in S-phase are highest in early forelimb buds, while the fraction of LMPs in G0/G1 increases during distal progression of outgrowth. These results corroborate one of our previous studies, which showed that GLI3 promotes the BMP-dependent cell cycle exit of digit progenitors during initiation of chondrogenic differentiation (Lopez-Rios, et al., 2012). Studies by others have shown that distal progression of limb bud outgrowth also depends on oriented divisions of the limb bud mesenchymal cell and cell shape changes (Boehm, et al., 2010; Gros, et al., 2010). To gain insight into the cellular heterogeneity of mesenchymal progenitors during outgrowth and patterning, we combined cell sorting with RNA-seq analysis of forelimb

buds at E10.5-E10.75. This analysis identified three distinct SOX9-negative mesenchymal progenitor cell populations in addition to SOX9-positive OCPs in early forelimb buds. Our transcriptome analysis reveals both the population-specific gene expression signatures and the distinct transcriptional responses of the different mesenchymal cell populations to SHH and BMP signaling in early forelimb buds. This analysis also identified S9-SCA-1⁺ mesenchymal cell population as the one encompassing the myogenic progenitors migrating into forelimb buds (reviewed by Francis-West, et al., 2003; Epting, et al., 2004). As these S9-SCA-1⁺ cells also express PDGFR α , it is important to note that this FACS signature does not appear enriched in P α ⁺SCA-1⁺ MSCs in forelimb buds (E10.5-E10.75) in contrast to developing limb long bones (Morikawa, et al., 2009; Nusspaumer, et al., 2017).

The transcriptome analysis together with their differentiation potential in culture provides evidence that S9-JAG1⁺ LMPs and S9-P α ^{hi} LMPs are early progenitors with significant chondrogenic differentiation potential. The S9-JAG1⁺ LMPs express markers of the posterior-distal mesenchyme in proximity to the source of SHH signaling, whereas S9-P α ^{hi} LMPs express a more diverse set of markers of anterior, posterior and distal mesenchyme. This contrasts with the transcriptional signature of the S9-P α ^{hi} OCPs that reside in the core mesenchyme and give rise to chondroblasts. Previous analysis of more advanced limb buds (E11.5) showed that WNT and FGF signals emanating from the ectoderm and AER keep the underlying distal mesenchyme in a proliferative and undifferentiated state (ten Berge, et al., 2008; Gros, et al., 2010). This is corroborated by our analysis, which shows that FGF8b increases the fraction of cells in S-phase. FGF8b treatment also specifically increases the fraction of S9-JAG1⁺ LMPs in high density culture. By contrast, the abundance of S9-

P α^{hi} LMPs is not altered in response to FGF signaling. In agreement, our transcriptome analysis revealed that the S9⁻JAG1⁺ LMPs located in the posterior-distal mesenchyme express highest levels of FGF target genes (Kawakami, et al., 2003; Morgani, et al., 2018). During the onset of limb bud development, SHH signaling specifies antero-posterior digit identities and subsequently promotes the proliferative expansion of mesenchymal progenitors (Towers, et al., 2008; Zhu, et al., 2008). Our analysis shows that S9⁻JAG1⁺ LMPs express the highest levels of target genes functioning in the positive response to SHH signal transduction such as *Gli1* and *Ptch1* (reviewed by Lopez-Rios, 2016). In contrast, the OCPs located in the core mesenchyme express high levels of genes (e.g. *Cdon*, *Boc* and *Hhip*) that are negatively regulated by SHH signal transduction (Tenzen, et al., 2006; Probst, et al., 2011; Lewandowski, et al., 2015). Inhibition of SHH signal transduction in culture shows that S9⁻JAG1⁺ and S9⁻P α^{hi} LMPs, but not S9⁺P α^{hi} OCPs, depend critically on SHH signaling. As no significant changes in overall mesenchymal cell cycle kinetics and apoptosis were detected after 12 hours treatment, the reduction in the two LMP populations might reflect changes in their fates and/or be the result them undergoing differentiation. Both LMP populations also express high levels of *Mycn* (also known as *N-Myc*) which regulates limb bud mesenchymal cell proliferation (ten Berge, et al., 2008; Towers, et al., 2008 and this study). It has been shown that smaller condensations and skeletal elements form in *Mycn*-deficient mouse limbs as a consequence of the premature depletion of mesenchymal progenitors (Ota, et al., 2007). Additional cell cycle regulators expressed in the distal limb bud mesenchyme include *Cdk6*, which regulates cell cycle progression and its inhibitor *Cdkn2c* (Lopez-Rios, et al., 2012; Lewandowski, et al., 2015). Interestingly, S9⁻JAG1⁺ LMPs express the highest levels of *Cdk6*, while *Cdkn2c* is expressed by the other cell populations analysed (this study).

The balance between proliferative expansion of LMPs and their exit toward chondrogenic differentiation is controlled by the GLI3 repressor, which regulates both the cell cycle and *Grem1*-mediated BMP antagonism (Lopez-Rios, et al., 2012). To transit from SOX9-negative LMPs to SOX9-positive OCPs and chondrogenic differentiation, the mesenchymal progenitors switch from responding to growth-promoting signals to increased BMP activity (Benazet, et al., 2012; Lopez-Rios, et al., 2012). We show that in early forelimb buds, the S9⁺Pα^{hi} OCPs located in the core mesenchyme are already exposed to higher BMP signal transduction. Furthermore, the proportion of S9⁺Pα^{hi} OCPs is increased in *Grem1*-deficient forelimb buds as a likely direct consequence of the increase in BMP activity. Of the two LMP populations analysed, S9⁺Pα^{hi} LMPs express the highest levels of *Tbx2*, which encodes a transcriptional regulator that participates in repressing *Grem1* in the limb bud mesenchyme (Farin, et al., 2013). This indicates that S9⁺Pα^{hi} LMPs could be in a transitory phase from immature LMPs toward OCPs. Indeed, *Grem1* is only expressed by the immature S9⁻JAG1⁺ LMPs which are drastically reduced in *Grem1*-deficient forelimb buds. In fact, previous genetic analysis has shown that *Grem1* inactivation induces limb bud mesenchymal apoptosis due to precociously increased BMP activity (Bastida, et al., 2004; Michos, et al., 2004). This together with our analysis indicates that the BMP antagonist GREM1 protects the uncommitted and proliferating S9⁻JAG1⁺ LMPs from premature exposure to high BMP activity. As *Grem1* is expressed only by dorsal and ventral mesenchymal cells within the posterior-distal JAG1 domain (Panman, et al., 2006), extra-cellular GREM1 antagonist likely protects the non-expressing S9⁻JAG1⁺ LMPs in a paracrine manner. Others have reported a similar protective effect of the BMP antagonist NOGGIN during joint development (Ray, et al., 2015; Huang, et al., 2016). Similarly, BMP activity is transiently reduced during

regeneration of the tracheal epithelium by FOLLISTATIN- and NOGGIN-mediated BMP antagonism, thereby enabling epithelial self-renewal (Chung, et al., 2018). Together, these and our study reveal a general protective function of BMP antagonists in averting premature and deleterious exposure of progenitor and stem cells to BMP signaling.

Our study establishes that the mesenchyme of early mouse forelimb buds is already composed of different types of progenitors with heterochronic cell specification and differentiation states. In particular, the immature S9-JAG1⁺ LMP population appears to critically depend on SHH, AER-FGF signaling and *Grem1*-mediated BMP antagonism as part of the self-regulatory signaling system that coordinately controls limb bud patterning and outgrowth (reviewed by Zuniga, 2015). At the same early stage, the S9⁺Pα^{hi} OCPs located in the core mesenchyme already positively respond to BMP signal transduction. Our study provides insights into how this differential responsiveness coordinately regulates both the expansion and differentiation of OCPs in the core and immature S9-JAG1⁺ LMPs in the posterior-distal mesenchyme during the early phase of mouse forelimb bud development.

MATERIALS AND METHODS

Mouse strains and ethics statement

The *Prx1-Cre* (Logan, et al., 2002), *b-ACTIN-loxP-stop-loxP-EGFP* (Jagle, et al., 2007), *Sox9*^{RES-EGFP} (Chan, et al., 2011), *Shh*^{GFP^{Cre}} (Harfe, et al., 2004), *ROSA26*^{LSL-tdTomato} (Madisen, et al., 2010) and two *Grem1* loss-of-function alleles (delta and Del C alleles; Michos, et al., 2004; Zuniga, et al., 2004) were kept in a mixed Swiss Albino genetic background. Swiss Albino mice were purchased from Janvier. All experiments were performed on embryos strictly adhering to the Swiss law, the 3R principles and the Basel Declaration. All animal studies were evaluated and approved by the Regional Commission on Animal Experimentation (license 1950 and 1951). Embryos of both genders were used at the indicated developmental stages.

Quantitation of limb bud mesenchymal cell numbers

Dissected limb buds were digested in 1ml 1xHBSS (Gibco) containing 1 mg/ml collagenase D and 50 µg/ml DNase I (Roche) at 37°C in FACS tubes. Single cells were counted by flow cytometry in defined sub-fraction volumes that were calibrated using TrueCount™ tubes with polystyrene fluorescent beads (BD Biosciences). The beads were gated in the GFP and propidium iodide (PI) channels. In order to calculate the volume acquired by the FACS in one minute, beads and/or cells from one limb bud were resuspended in 2 ml PBS and counted using a constant flow. This was repeated several times to assure that the volume calibrations and volume measurements were accurate. The volume fraction analysed per minute was calculated as follows:

$V = \text{counted beads} / \text{total beads}$ (corresponding to the volume fraction per minute)

Total cell numbers (C) were calculated as follows:

$$C = (\text{counted cells}/V) \times 2000$$

2000 (μl) = total volume used to resuspend either the cells from one limb bud or beads for calibration.

The GFP-positive LMPs correspond to the cells in which the $\beta\text{act}^{\text{GFP}}$ transgene has been activated by *Prx1*-Cre-mediated recombination. In contrast, non-limb bud mesenchymal cells and ectodermal cells do not express GFP. Gating of apoptotic cells showed maximally 8-12 % of cell death during preparation of single cells.

Cell cycle analysis by FACS

Forelimb buds were dissected, pooled (~25 at E9.75, eight at E10.75 and six at E11.75) and dissociated using collagenase D. To remove ectodermal, endothelial and hematopoietic, and apoptotic cells by FACS, the cells were stained with a mix of biotinylated antibodies (EpCAM: Biolegend, clone G88; CD31: eBioscience, clone 390; TER119: Biolegend; CD45: Biolegend clone 30F11; CD11b: Biolegend clone M1-70; Gr1: Biolegend clone RB6-8C5) as previously described by Nusspaumer, et al. (2017). Apoptotic cells were identified by double staining for Annexin V (APC-conjugated, Biolegend) and 7AAD. Following this combined staining of lineage-positive cells, all cells were fixed in 70% ethanol at -20°C for minimally 2 hours. Phospho-histone H3 antibodies (BD Biosciences, clone HTA28 Alexa Fluor 647) were used to detect mitotic cells. Cells were also incubated with 50 $\mu\text{l}/\text{ml}$ propidium iodide (Sigma) and 50 $\mu\text{l}/\text{ml}$ RNase A (Sigma) to directly measure their DNA content. For cell cycle analysis of cultured cells, mesenchymal cells were pooled from 6 forelimb buds

at E10.5. For each embryo, one forelimb bud was used as untreated control and one for the experimental treatment. FACS was used to determine the fractions of cells in the different phases of the cell cycle and the fraction of phospho-histone H3-positive mitotic cells among the lineage-negative (Lin⁻) limb bud mesenchymal cells. To study the cell cycle by BrdU incorporation, pregnant mice were injected intra-peritoneally with 1 mg of BrdU (5 mg/ml in PBS, Sigma) four and two hours before analysis. Single cells prepared from 20 forelimb buds were analysed. The BrdU-positive cells were detected using the APC BrdU Flow kit (BD Biosciences). FACS analysis was done using a BD™ FACS Aria III machine. After exclusion of apoptotic and lineage-positive cells, the numbers of cells in different phases of the cell cycle, mitotic and BrdU-positive cells were determined and fractions calculated using the FlowJo 10.5.3 software.

Immunofluorescence analysis

After fixation in 4% paraformaldehyde for 2 hours at 4°C, limb buds were dehydrated. Then they were mounted in 50:50 (v/v) OCT/30% sucrose and 10µm cryosections for immunofluorescence analyses prepared. Sections were permeabilized using PBS containing 0.2% Triton X-100 for 30 minutes at room temperature.

For immunofluorescence analysis of FACS sorted LMP populations, cells were resuspended in complete DMEM/F12 medium (supplemented with 1% penicillin/streptomycin and 10% FBS, Merck) and per well 88000 cells were seeded in one well of a 384 well plate (BD Biosciences). After culture, cells were fixed in 4% paraformaldehyde for 30 minutes at room temperature and then permeabilized as described above. The following primary antibodies were used for immunofluorescence: GFP (1:250; 4745-105, Bio-Rad), JAGGED1 (1:50; TS1.15H,

Developmental Studies Hybridoma Bank), PDGFR α (1:250; AF1062, R&D), DsRed (1:1000; 632496, Clontech), SOX9 (1:10000; AB5535, Millipore). COLII (1:250; MS-235-P1, Thermo Fischer Scientific), Signals were detected using the following fluorochrome-coupled secondary antibodies (1:250): anti-sheep Alexa Fluor 488 (713-545-147, Jackson ImmunoResearch), anti-mouse Alexa Fluor 594 (R37121, Thermo Fischer Scientific), anti-rabbit Alexa Fluor 594 (406418, Biolegend), anti-rat Alexa Fluor 647 (A-21247, Thermo Fischer Scientific) and anti-goat Alexa Fluor 647 (A-21447, Thermo Fischer Scientific). Nuclei were counterstained with Hoechst-33258. Images were taken using a Nikon Ti-E microscope equipped with Hamamatsu Flash 4.0 V2 CMOS camera, Yokogawa Spinning Disk CSU-W1-T2 and the VisiView Premier Image acquisition software. Pseudo-colours were chosen from the available lookup tables.

RNA whole mount *in situ* hybridization

Whole mount *in situ* hybridizations were done as described by (Haramis, et al., 1995).

FACS Isolation of mouse LMP populations

Single cell suspensions were prepared from 60 to 160 mouse embryonic forelimb buds at E10.5-E10.75 (35-38 somites) and E11.5 (46-48 somites; for chondroblasts only). Dissected limb buds were collected into ice-cold PBS and digested for up to 15 minutes in 1 mg/ml collagenase D in high glucose DMEM medium at 37°C. Limb buds were gently pipetted every 5 minutes until the tissue was dissociated into single cells. Ice-cold HBSS supplemented with 2% FBS and 10 mM HEPES was added to stop digestion. The cell suspensions were filtered to remove aggregates. During FACS analysis, the lineage-positive ectodermal, endothelial and hematopoietic cells (see

above) and apoptotic cells were excluded by gating. Apoptotic cells were detected using 7AAD (Biolegend) and in general amounted to ~20-30% of all mesenchymal cells at E10.5-E10.75. After the initial gating the lineage-negative (Lin⁻) cells were separated into different populations using the following antigens: anti-PDGFR α (CD140a; clone APA5: BV421-conjugated, Biolegend); anti-JAG1 (clone HMJ1-29: PE-conjugated, Biolegend) and anti-SCA-1 (clone D7: APC-conjugated, eBioscience). Streptavidin was conjugated to APC/Cy7. Cells were sorted using a FACSAria III (BD Bioscience) equipped with an 85 μ m nozzle in combination with the FACS Diva software V8.0. After sorting, the different cell populations were re-analysed to assess their viability and purity. FACS plots were generated using the FlowJo 10.5.3 and GraphPad Prism 7 software. Bar- and whiskers-plots were generated using GraphPad Prism 7.

RNA-seq analysis

Thirty to eighty forelimb buds were collected from Sox9^{RES}-EGFP embryos at E10.5-E10.75 to purify the different mesenchymal cell populations. S9⁺Pa^{hi}Col2a1⁺ chondroblasts were isolated from 12 to 30 forelimb buds at E11.5. RNA was extracted using the RNeasy Microkit (Qiagen) and the RNA quality determined using RNA 6000 Pico kit (Agilent 2100 Bioanalyzer). Only samples with an RNA integrity \geq 8.5 were used. Libraries were prepared from 15ng of total RNA after purification of poly(A)⁺ RNA using NEBNext kits according to manufacturer's instructions. Libraries were sequenced using the HiSeq 2500 Illumina sequencer with the single-read 50 cycles protocol. Single-end RNA-seq reads were mapped to the mouse genome mm10 assembly using RNA-STAR (Dobin, et al., 2013). For reporting multi-mappers, only

one hit in the final alignment files (outSAMmultNmax=1) was used and reads without evidence in splice junction tables were filtered out (outFilterType="BySJout"). Raw reads and the mapping quality were assessed using the qQCreport function of the R/Bioconductor software package QuasR (version 1.18.0; Gaidatzis, et al., 2015) The RefSeq mRNA coordinates from UCSC (genome.ucsc.edu) and the qCount function from the QuasR package were used to quantify gene expression by the number of reads starting within any of the annotated exons of the gene of interest.

Hierarchical clustering, heatmaps and statistical testing

The subsequent gene expression data analysis was done using R software (version 3.4.2, R Foundation for Statistical Computing, Vienna, Austria) and the corresponding software packages of Bioconductor (version 3.6; Huber, et al., 2015). Differentially expressed genes were identified using the edgeR package (version 3.20.1; Robinson, et al., 2010). Genes with p-values ≤ 0.1 and absolute \log_2 fold changes ≥ 1.2 were considered as differentially expressed. Principal component analysis was performed with \log_2 transformed CPM values using 25% of the most variable genes. Heatmaps are showing row-centred \log_2 transformed CPM values. The 1-Pearson correlation coefficient was used as distance measure for hierarchical clustering ("complete" method). In order to enhance the colour scale, values outside of the 0.05% - 99.5% percentile range were replaced with the corresponding percentile value. MsigDb (v6.0, Broad institute) was used in competitive gene set enrichment analysis. Human EntrezGene IDs were converted to mouse EntrezGene IDs using the HomoloGene database (NCBI, build 68). Only gene sets consisting of at least 10 genes were tested

with the “camera” function from edgeR package. A false discovery rate (FDR) of <0.05 was set as cut-off.

Limb bud mesenchymal cell cultures

Forelimb buds from two mouse embryos (E10.5-E10.75) were incubated in ice-cold 2% Trypsin (Gibco)/PBS at 4°C for 30 minutes and the digestion was stopped by an excess of DMEM medium with 10% fetal bovine serum (FBS). The limb bud ectoderm was manually removed and mesenchymal cells dissociated by gentle pipetting. Cells were plated in four wells of a 96-well plate in high glucose DMEM medium (10% FBS, 4.5 g/L glucose, 100 U penicillin, 0.1 mg/ml streptomycin and 200 mM L-glutamine, Merck). After 8-9 hours, non-adherent cells were removed by changing the medium. Two wells were treated with either 20 µM Cyclopamine KAAD (dissolved in EtOH; Calbiochem), 300 ng/µl FGF8b (dissolved in PBS, 0.1%BSA; R&D), 5µM Dorsomorphin (dissolved in DMSO; Merck) or with 20 ng/ml BMP4 (dissolved 4 mM HCl; R&D) for 24 hours, while others served as controls (normal medium with solvent). After 12 hours, cells were gently detached using trypsin and either processed for FACS analysis of specific cell populations (see before) or processed for RT-qPCR analysis (see below). The Wilcoxon test was used to statistically verify differences observed.

RT-qPCR analysis

After culture, cells were flash frozen in RLT buffer and RNA was isolated using Qiagen RNeasy Microkit. cDNA was prepared from 300 ng of total RNA that was quantified using the Qubit RNA HS assay. For each sample, the relative expression was normalized to the house-keeping gene *Rpl19* and to the target gene expression level

in the untreated condition ($\Delta\Delta C_t$ method). Transcripts detected with C_t values ≥ 32 were considered as non-expressed genes. To statistically verify significant differences in the relative gene expression, the Wilcoxon and Mann-Whitney tests were used.

The oligos used for gene expression analysis are listed:

<i>Acan fwd</i> : 5'-AGTCAACCGTTGCAGACCAG-3'
<i>Acan rev</i> : 5'-GGTCATGAAAGTGGCGGTAA-3'
<i>BMP4 fwd</i> : 5'-AGCCGAGCCAACACTGTGA-3'
<i>BMP4 rev</i> : 5'-GTTCTCCAGATGTTCTTCGTGATG-3'
<i>Col2a1 fwd</i> : 5'-AGTGGAAAGAGCGGAGACTACTG-3'
<i>Col2a1 rev</i> : 5'-TTGGGGTAGACGCCAAGTCTC-3'
<i>Id1 fwd</i> : 5'-GCGAGATCAGTGCCCTTGG-3'
<i>Id1 rev</i> : 5'-CTCCTGAAGGGCTGGAGT-3'
<i>Gli1 fwd</i> : 5'-CAAGTGCACGTTTGAAG-3'
<i>Gli1 rev</i> : 5'-CAACCTTCTTGCTCACACATGTAAG-3'
<i>Dusp6 fwd</i> : 5'-AGTTTTTCCCTGAGGCCATT-3'
<i>Dusp6 rev</i> : 5'-GCATCGTTCATGGACAGGTT-3'
<i>Grem1 fwd</i> : 5'-CCCACGGAAGTGACAGAATGA-3'
<i>Grem1 rev</i> : 5'-AAGCAACGCTCCCACAGTGTA-3'
<i>Jag1 fwd</i> : 5'-GCGGTTGCAGAAGTCAGAGT-3'
<i>Jag1 rev</i> : 5'-AGGCTGTCACCAAGCAACAG-3'
<i>Msx2 fwd</i> : 5'-ATACAGGAGCCCCGGCAGATACT-3'
<i>Msx2 rev</i> : 5'-TCCGGTTGGTCTTGTGTTTCC-3'
<i>Spry4 fwd</i> : 5'-TGTGACTCTGCA GCTCCTCAA-3'
<i>Spry4 rev</i> : 5'-ATGAGGCTGGAGGTCCTGAACT-3'
<i>Sox9 fwd</i> : 5'-CAAGTGTGTGTGCCGTGGATAG-3'
<i>Sox9 rev</i> : 5'-CCAGCCACAGCAGTGAGTAAGAA-3'
<i>Rpl19 fwd</i> : 5'-ACCCTGGCCCCGACGG-3'
<i>Rpl19 rev</i> : 5'-TACCCTTCTCCTTCCCTATGCC-3'

FACS analysis of mesenchymal cells from *Grem1*-deficient mouse limb buds

Mice heterozygous for a *Grem1* loss-of-function alleles were crossed to isolate littermate embryos of the different genotypes at E10.5-E10.75. Single cells were

prepared from pairs of forelimb buds for each embryo and divided into two samples to assess both apoptosis and the fractions of S9⁻JAG-1⁺ and S9⁻Pα^{hi} LMPs and S9⁺Pα^{hi} OCPs by FACS, which allowed analysis of ~70000 cells per sample. This analysis was done blindly as the embryos were only genotyped after the FACS analysis of the cells was already complete. The longer processing times together with the lower numbers of cells analysed explains the ~2-fold increase in overall cell death as detected by APC-conjugated Annexin-V and 7AAD (Fig. S6B). It is important to note that only the fraction of live and Lin⁻ limb bud mesenchymal cells were analysed to determine the fractions of the three cell populations, which together with sufficiently large numbers of biological replicates resulted in significant and biological meaningful results that were statistically verified using the Mann-Whitney test.

Data availability

All RNA-seq datasets have been deposited in the Gene Expression Omnibus (GEO) database under the accession number GSE116115.

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AUTHOR CONTRIBUTIONS

R.R. and F.G. performed the experiments for this study except where stated otherwise. G.N. participated in the early phase of the project and initiated the FACS isolation and transcriptome analysis of the different forelimb bud mesenchymal cell populations. E.U. performed the experimental quantitation of limb bud mesenchymal cell numbers. R.I. performed the bioinformatics analysis as head of the DBM Bioinformatics Core Facility. A.Z. and R.Z. supervised the study and wrote the manuscript together with input from all authors.

COMPETING INTERESTS

The authors have no competing interests

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Figures

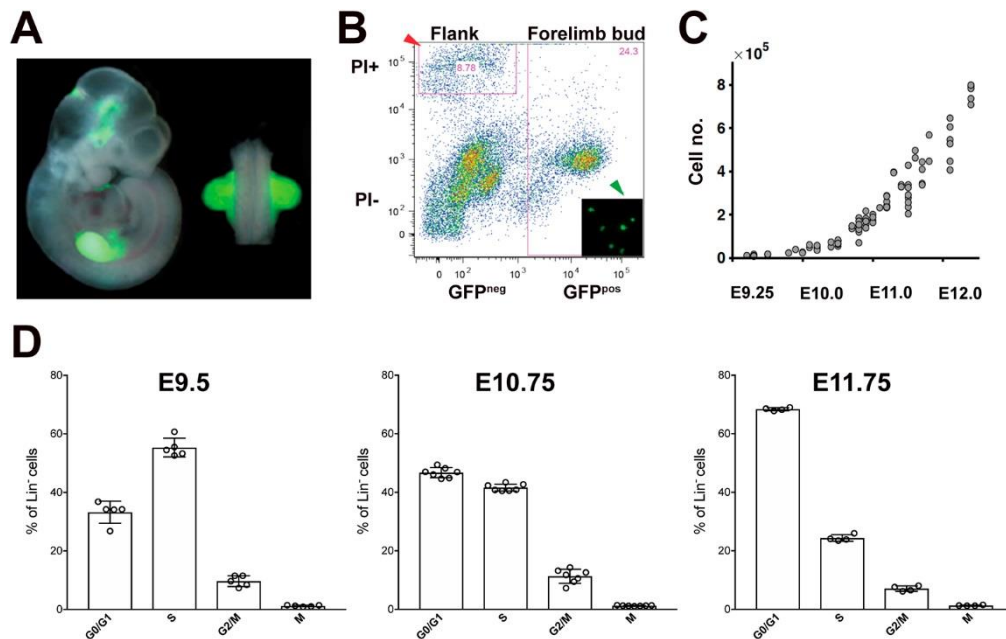


Fig. 1. Forelimb bud mesenchymal cell numbers and cell cycle analysis.

(A) *Prx1-Cre* was used to activate EGFP under control of the β -actin locus (β actGFP) in the forelimb bud mesenchyme. A representative embryo at E10.75 (37 somites) is shown. (B) Representative FACS analysis of *Prx1-Cre*/ β actGFP forelimb buds. Necrotic and apoptotic cells are electronically gated in the upper part (red arrowhead), while the EGFP-positive cells are gated in the right half. Fluorescence microscopy confirmed that single EGFP-positive cells were analysed (green arrowhead). Results shown are representative of $n \geq 3$ samples. (C) Experimentally determined forelimb bud mesenchymal cell numbers from accurately somite staged embryos between E9.5 and E12.0. Individual data points are shown. See also Table 1. (D) Analysis of the cell-cycle and mitotic cells in lineage-negative (Lin^-) mesenchymal cells from mouse forelimb buds at E9.5 (24-28 somites, $n=5$), E10.75 (35-39 somites, $n=7$) and E11.75 (49-52 somites, $n=4$).

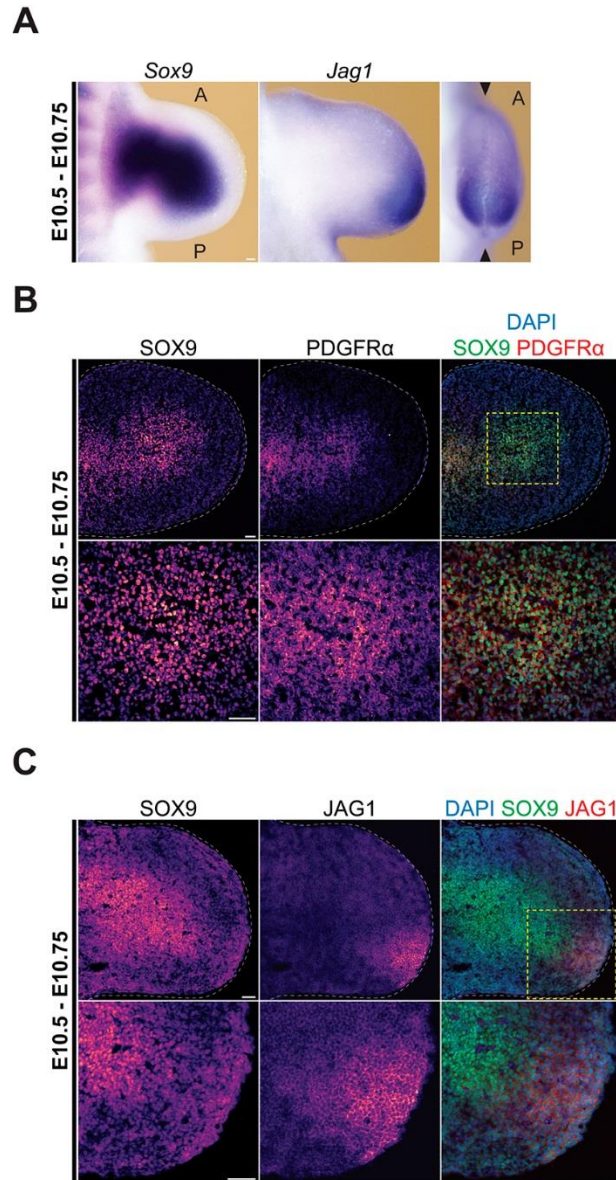


Fig. 2. Key markers used to identify mesenchymal cell populations in mouse forelimb buds.

(A) Whole mount RNA *in situ* hybridization shows the spatial distribution of the *Sox9* transcription factor and the Notch ligand *Jagged1* (*Jag1*) in forelimb buds at E10.5-E10.75 (35-38 somites). (B, C) Immunohistochemistry using forelimb buds at E10.5-10.75 detects the Platelet-derived growth factor receptor- α (PDGFR α), SOX9 and JAG1 proteins in sagittal sections through the limb bud apex (the approximate plane of section is indicated by arrowheads in the right-most panel A). The right panels show

the co-localization of PDGFR α and SOX9 in the core mesenchyme (panel B), while JAG1-positive cells are located in the posterior-distal SOX9-negative mesenchyme (panel C). Images are pseudo-coloured in accordance with fluorescence intensity (purple=low; yellow=high). White dashed lines outline limb buds. Yellow dashed lines demarcate the regions shown as close-ups. A: anterior; P: posterior. Scale bars: 50 μ m.

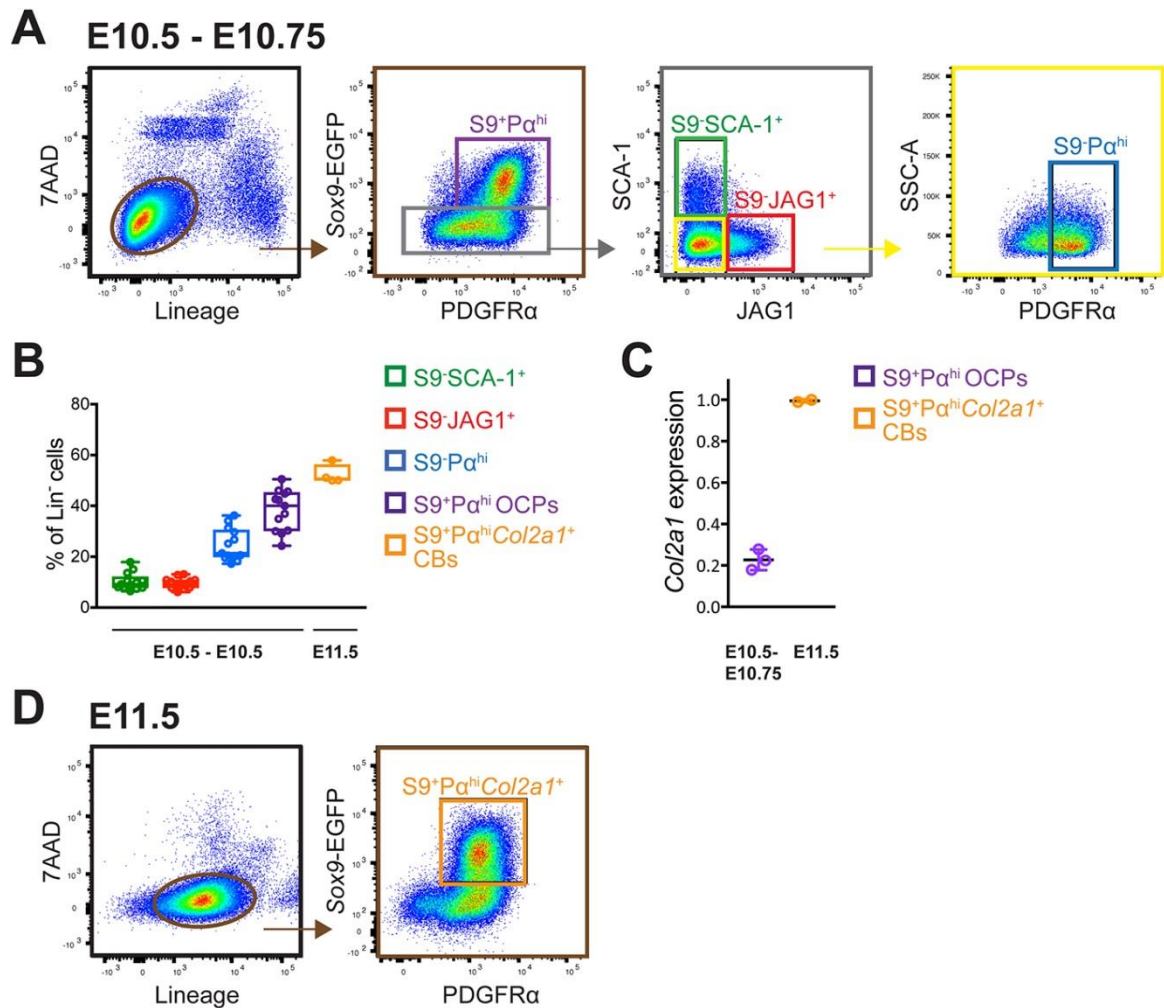


Fig. 3. Isolation of distinct mesenchymal cell populations from forelimb buds at E10.5-E10.75 and E11.5.

(A) FACS strategy to isolate the different cell populations from lineage-negative (Lin⁻) mesenchymal cells of mouse forelimb buds (35-38 somites, E10.5-E10.75, first panel). S9⁺P α ^{hi} (violet): Sox9-EGFP-positive cells correspond predominantly to osteochondrogenic progenitors (OCPs) express high levels of PDGFR α . In addition, three mesenchymal populations of Sox9-EGFP-negative cells were isolated: S9-SCA-1⁺ (green), S9-JAG1⁺ (red) and S9-P α ^{hi} (blue) cells. (B) Histogram showing the abundance (%) of the different cell populations within the Lin⁻ mesenchymal cells. (C) Relative *Col2a1* expression levels in S9⁺P α ^{hi} OCPs (E10.5-E10.75) and

S9⁺Pa^{hi}Col2a1⁺ chondroblasts (CBs, E11.5). (D) CB were isolated from Lin⁻ forelimb bud mesenchymal cells at E11.5 as S9⁺Pa^{hi} cells that express *Col2a1*: S9⁺Pa^{hi}Col2a1⁺ CBs (orange, see panel C for *Col2a1* expression). Representative FACS experiments are shown and the same gates were used for all analyses.

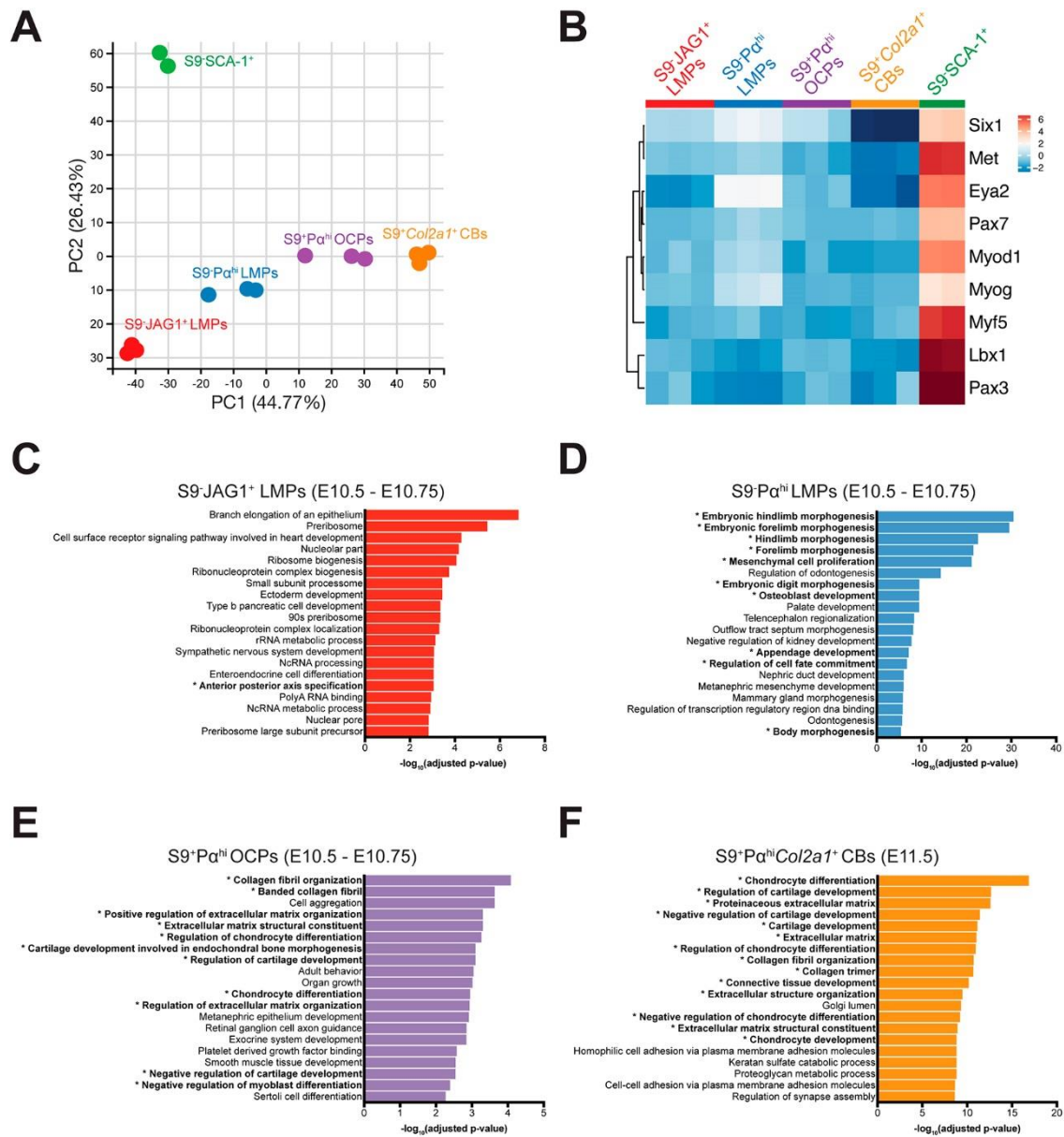


Fig. 4. Comparative transcriptome analysis identifies two early LMP populations.

(A) Principal components analysis (PCA) of RNA-seq metadata from the five different forelimb bud mesenchymal cell populations identified. Three biological replicates were sequenced for all populations with the exception of S9-SCA-1⁺ cells, which yielded only two samples of sufficient sequencing quality. (B) Heatmap showing the relative expression levels of key genes involved in myoblast migration and differentiation. Analysis shows that the S9-SCA-1⁺ progenitors express the highest levels of myoblast-

specific markers in comparison to the other populations (Table S1, S2). Higher than average expression: orange-red; lower than average: blue; average: white. (C-F) Global Gene Ontology (GO) enrichment analysis of the genes whose expression is higher in the cell population of interest than all other populations (Tables S2-S6). (C) S9⁻JAG1⁺ LMPs, (D) S9⁻Pα^{hi} LMPs, (E) S9⁺Pα^{hi} OCPs (all E10.5-E10.75) and (F) S9⁺Pα^{hi}Col2a1⁺ chondroblasts (E11.5). The X axis shows the $-\log_{10}$ of the false discovery rate (FDR). Asterisks indicate chondrogenesis- and limb-related GO terms.

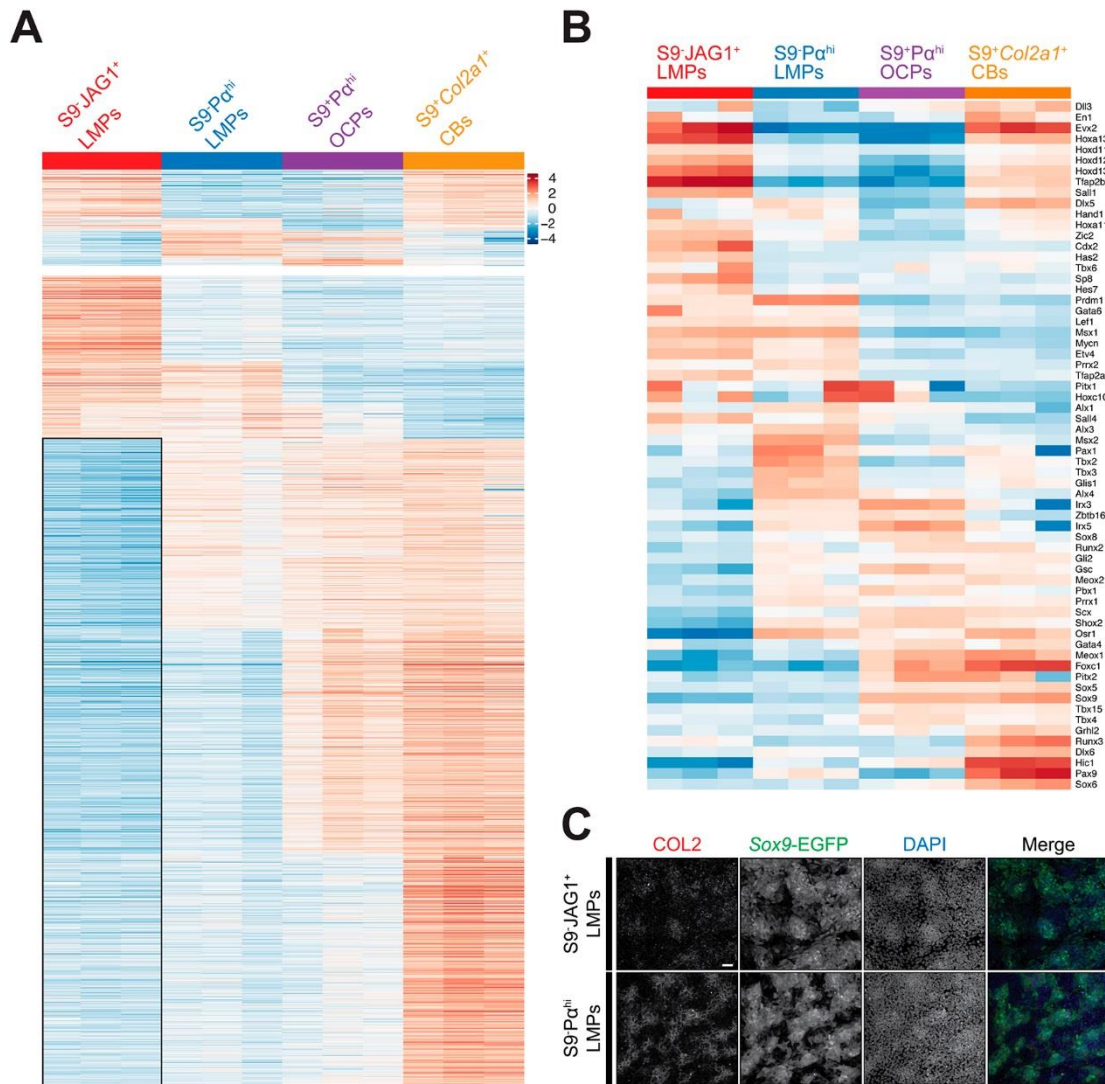


Fig. 5. S9-JAG1⁺ and S9-Pα^{hi} LMPs are early mesenchymal progenitors with distinct molecular signatures and robust chondrogenic differentiation potential.

(A) Comparative analysis of the transcriptomes based on pseudo-temporal ordering from S9-JAG1⁺ to S9-Pα^{hi} LMPs to S9⁺Pα^{hi} OCPs (E10.5-E10.75) and to S9⁺Pα^{hi}Col2a1⁺ CBs (E11.5, Table S7). (B) Manually curated list of differentially expressed transcriptional regulators required for limb bud and/or limb skeletal development (Table S10) using the “Mammalian Phenotype Ontology Annotations” related to limb development from Mouse Genome Informatics (MGI: <http://www.informatics.jax.org/>). Higher than average expression: orange-red; lower

that average: blue; average: white. (C) Culturing FACS-isolated S9-JAG1⁺ and S9-P α ^{hi} LMPs for 24 hours results in activation of Sox9-EGFP expression in cells that undergo aggregation to form the typical chondrogenic condensations. Scale bar: 50 μ m.

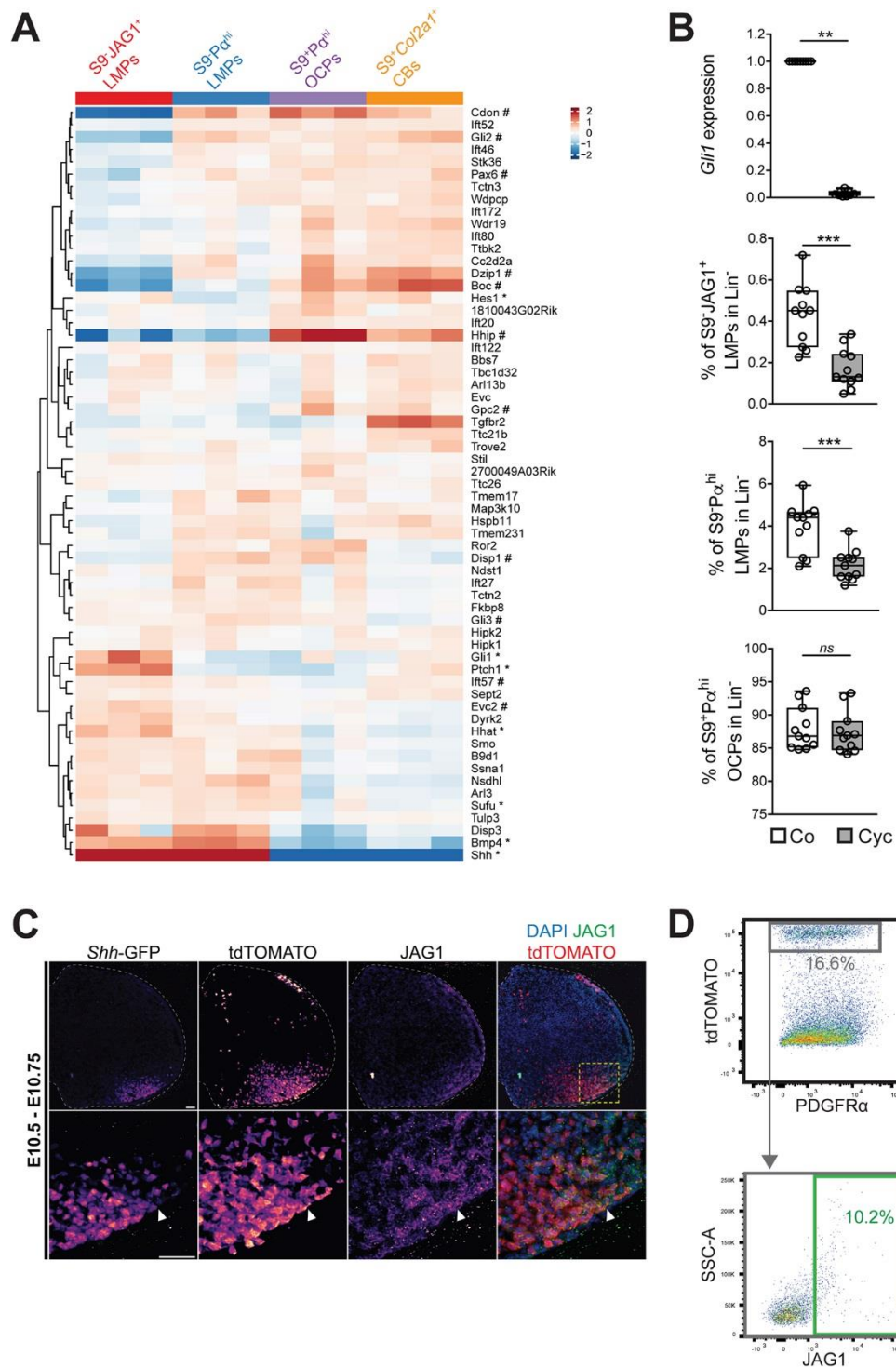


Fig. 6. S9-JAG1⁺ and S9-P α ^{hi} LMPs depend on SHH pathway activity.

(A) Heatmap showing expression level of genes associated with the term “Smoothened (SMO) signaling pathway” (GO:0007224, Table S8). Known distally (*) and centrally (#) expressed genes are highlighted. (B) Limb bud mesenchymal cells

(E10.5-E10.75) were cultured for 12 hours either in normal medium (control: co) or in medium supplemented with 20 μ M cyclopamine (Cyc, a SMO antagonist). The top panel shows the relative expression of *Gli1*, a direct transcriptional target of SHH signal transduction as determined by RT-qPCR analysis. Lower three panels: FACS analysis shows that the Fraction (%) of S9⁻JAG1⁺ and S9⁻P α ^{hi} LMPs was significantly reduced when SMO-mediated signal transduction was blocked. In contrast, the fraction of S9⁺P α ^{hi} OCPS was not altered. S9⁻JAG1⁺ LMPs: decrease from 0.43% \pm 0.14% to 0.17 \pm 0.09%, S9⁻P α ^{hi} LMPs from 3.94 \pm 1.18% to 2.14 \pm 0.73% of the lineage-negative cells in culture. The Wilcoxon test was used for statistical analysis of results: (**) p-value \leq 0.01, (***) p-value \leq 0.001. (C) Distribution of *Shh*-expressing cells (*Shh*-GFP, white arrowhead indicates distal border) and *Shh*-descendants expressing tdTOMATO in a representative forelimb bud (E10.5-E10.75). This pattern arose from permanent activation of the *Rosa26*^{tdTomato} transgene by *Shh*^{GFP^{Cre}} induced recombination. The JAG1 protein was detected using specific antibodies. The overlap (right panel) shows that only a small fraction of cells co-expressed tdTOMATO (red) and JAG1 (green; n=3 independent samples). Images were pseudo-coloured in accordance with fluorescence intensity (purple=low; yellow=high). White dashed lines outline the limb buds. Yellow dashed lines demarcate the regions shown as close-ups. Scale bars: 50 μ m. (D) FACS analysis confirmed that only a small fraction of tdTOMATO-positive cells co-expressed JAG1 (n=3).

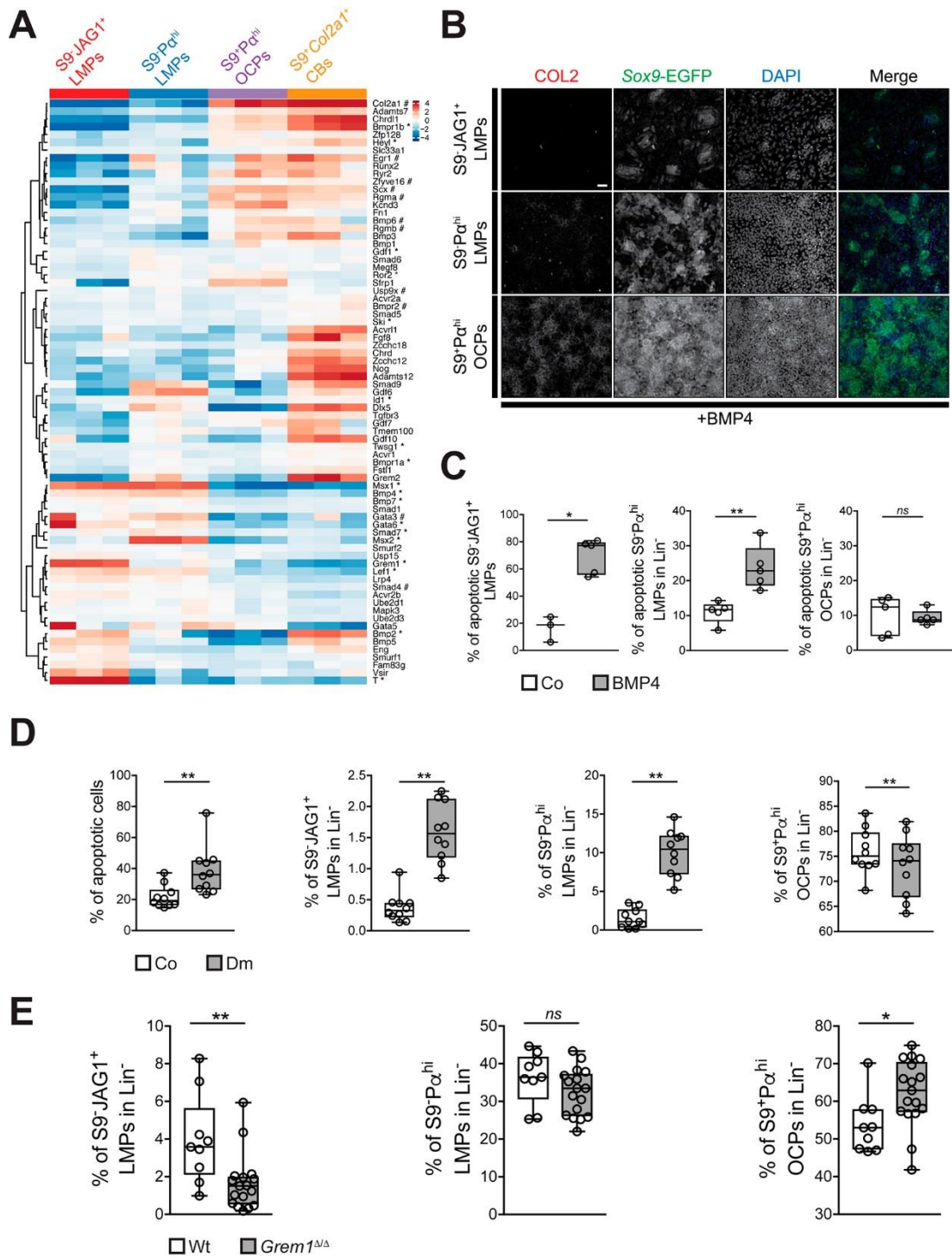


Fig. 7. Immature S9-JAG1⁺ LMPs depend critically on GREM1-mediated BMP antagonism.

(A) Heatmap showing expression level of genes associated with the GO term “Cellular response to BMP stimulus” (GO:0071773, Table S9). Known distal (*) and central (#)

expressed genes are highlighted. (B) S9⁻JAG1⁺ and S9⁻Pα^{hi} LMPs and S9⁺Pα^{hi} OCPs were cultured for 24 hours in medium supplemented with 10 ng/ml BMP4. Controls were cultured in medium with solvent. In all cases, equal numbers of alive mesenchymal cells were plated after FACS isolation. Only S9⁺Pα^{hi} OCPs underwent robust chondrogenic differentiation within 24 hours in BMP4-supplemented medium. Scale bar: 50 μm. (C) Quantitation of apoptotic cells in the three mesenchymal cell populations after culturing them for 24 hours in BMP4-supplemented medium. While apoptosis was not altered for the OCP population, cell death was significantly increased for both LMP populations. Individual data points plus mean ± SD are shown (n≥3 per condition and cell-type). (D) Forelimb bud mesenchymal cells (E10.5-E10.75) were cultured in medium supplemented with 5 μM dorsomorphin (Dm) to inhibit BMP signaling (Fig. S6A). Controls (Co) were cultured in medium supplemented with solvent only. After 12 hours, the overall cellular apoptosis and the fractions (%) of S9⁻JAG1⁺ and S9⁻Pα^{hi} LMPs and S9⁺Pα^{hi} OCPs were determined. Both LMPs populations increased significantly, while the OCP population was reduced. Individual data points plus mean ± SD are shown (n=10). (E) Comparative FACS analysis of the fraction (%) of S9⁻JAG1⁺ and S9⁻Pα^{hi} LMPs and S9⁺Pα^{hi} OCPs in pairs of forelimb buds from wild-type (Wt) and *Grem1*-deficient mouse embryos (*Grem1*^{ΔΔ}) at E10.5-E10.75. Individual data points plus mean ± SD are shown (n=9 for *Grem1*^{ΔΔ}; n=17 for Wt forelimb buds). Note that the fraction of S9⁻JAG1⁺ LMPs was reduced by ~2-fold, while S9⁻Pα^{hi} LMPs were not altered and S9⁺Pα^{hi} OCPs increased in *Grem1*-deficient forelimb buds. The Mann-Whitney test was used for statistical analysis of all results shown in panels C-E: (*) p-value ≤0.05, (**) p-value ≤0.01.

Stage	Somite no.	Average cell no. (± SD)	n
E9.25	22-24	11'395±2'641	6
E9.5	25-27	16'117±770	4
E9.75	28-30	27'059±6'541	4
E10.0	31-33	50'211±7'680	6
E10.5	34-36	68'268±11'559	8
E10.75	37-39	152'210±30'150	20
E11.0	40-42	227'945±38'934	12
E11.5	43-45	317'794±64'868	10
E11.75	46-48	438'658±70'721	8
	49-51	530'404±82'911	6
E12.0	52-54	769'171± 34'465	6

Table 1. Experimentally determined mesenchymal cell numbers in mouse forelimb buds.

The table lists the average numbers of mesenchymal cells per mouse forelimb bud at the developmental stages indicated. Somite numbers were accurately counted and

assigned to the respective days of mouse embryonic development as previously defined (Zuniga, et al., 1999). The individual data points used for generating this table are shown in Fig. 1C.

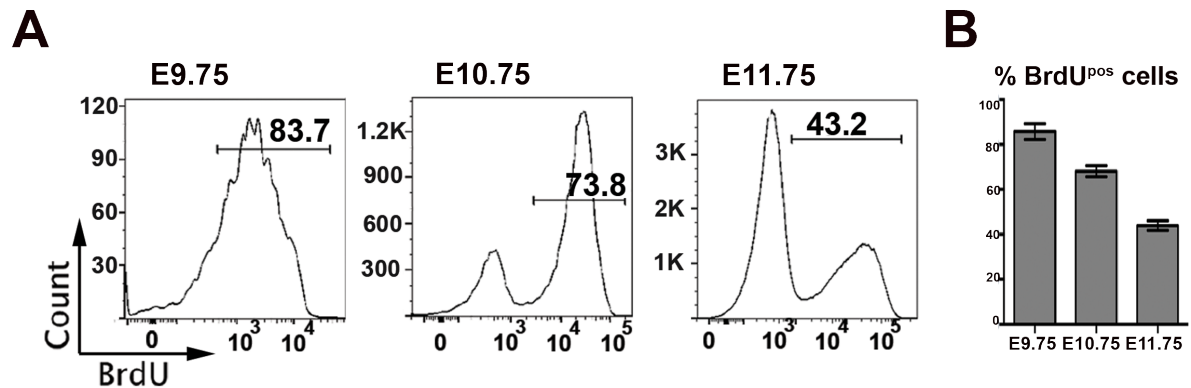


Fig. S1. Fraction of BrdU-positive mesenchymal cells at different forelimb bud stages.

(A) Representative FACS analysis shows the BrdU incorporation into wild-type forelimb buds at E9.75 (26-29 somites, n=5 independent samples), E10.75 (36-40 somites, n=4) and E11.75 (48-52 somites, n=5). Numbers indicate the percentage of BrdU-positive cells. (B) Percentage of BrdU-positive cells in wild-type forelimb buds (E9.75: n=5, E10.75: n=4 and E11.75: n=5 independent samples).

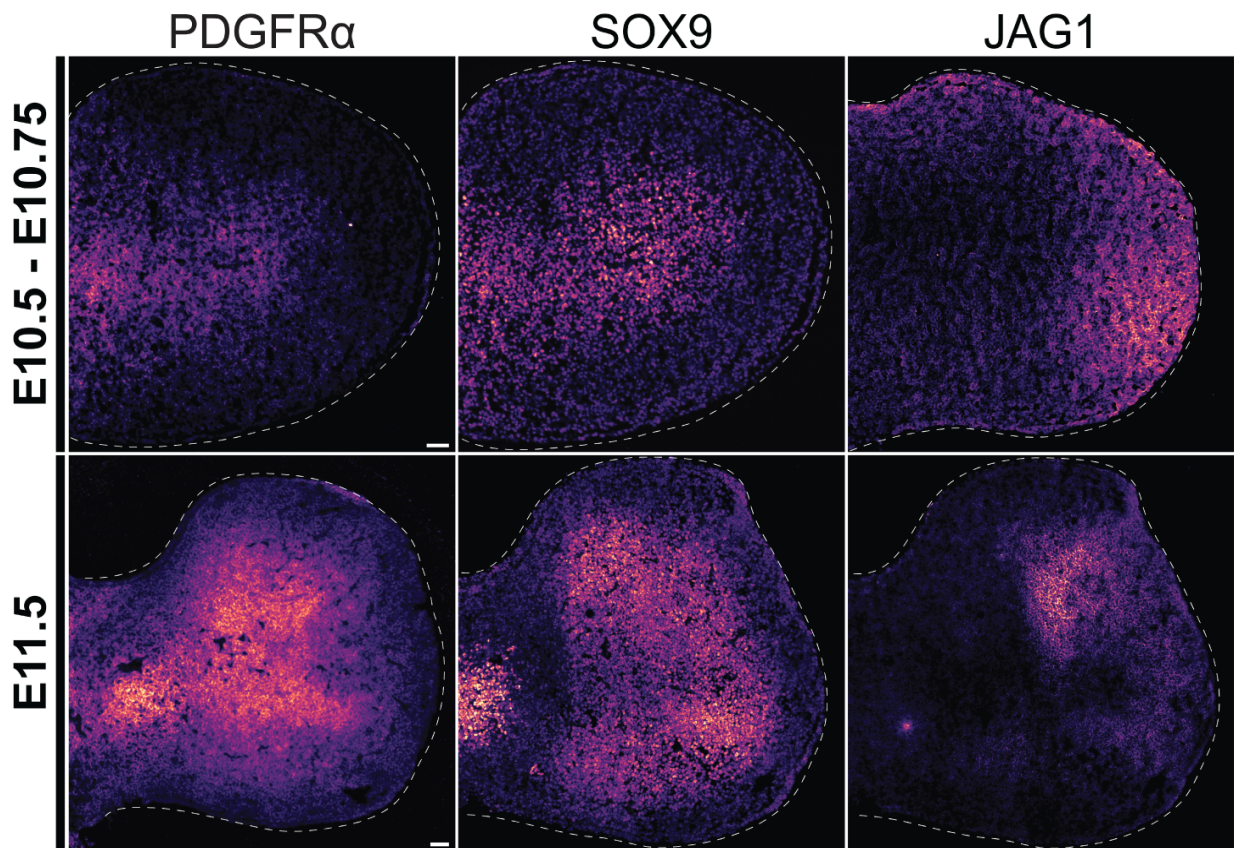


Fig. S2. Spatial distribution of markers used to identify specific mesenchymal cell populations in forelimb buds.

Immunohistochemistry shows the spatial distribution of the SOX9, PDGFR α and JAG1 proteins in mid-sagittal sections of mouse forelimb buds at E10.5 and E11.5. Note that the mesenchymal cells expressing JAG1 at E11.5 overlap with SOX9-positive cells in the anterior mesenchyme. This was confirmed by FACS analysis. Therefore, JAG1 is only marking the posterior-distal and SOX9-negative mesenchymal cells in early forelimb buds at E10.5 (see also Fig. 2). White dashed lines outline limb bud. Scale bars: 50 μ m.

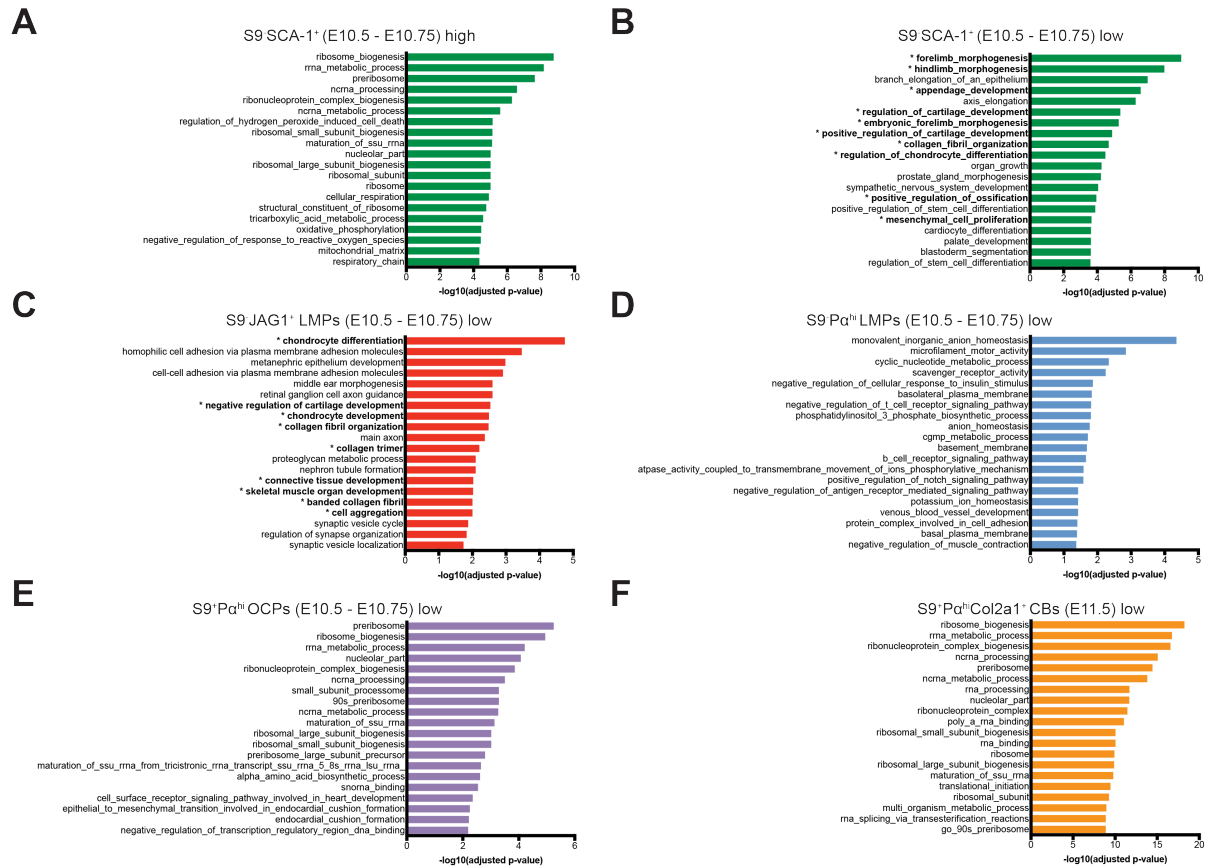


Figure S3. GO analysis of the genes expressed differentially in the forelimb bud mesenchymal cell populations at E10.5-E10.75.

(A, B) GO analysis of the genes whose expression is higher (panel A) and lower than average (panel B) in the S9-SCA-1⁺ mesenchymal cell population. (C-F) GO analysis of genes expressed at lower than average levels in S9-JAG1⁺ LMPs (panel C), S9-Pα^{hi} LMPs (panel D), S9⁺Pα^{hi} OCPs (panel E) and S9⁺Pα^{hi}Col2a1⁺ chondroblasts (panel F). Asterisks indicate chondrogenesis- and limb-related GO terms.

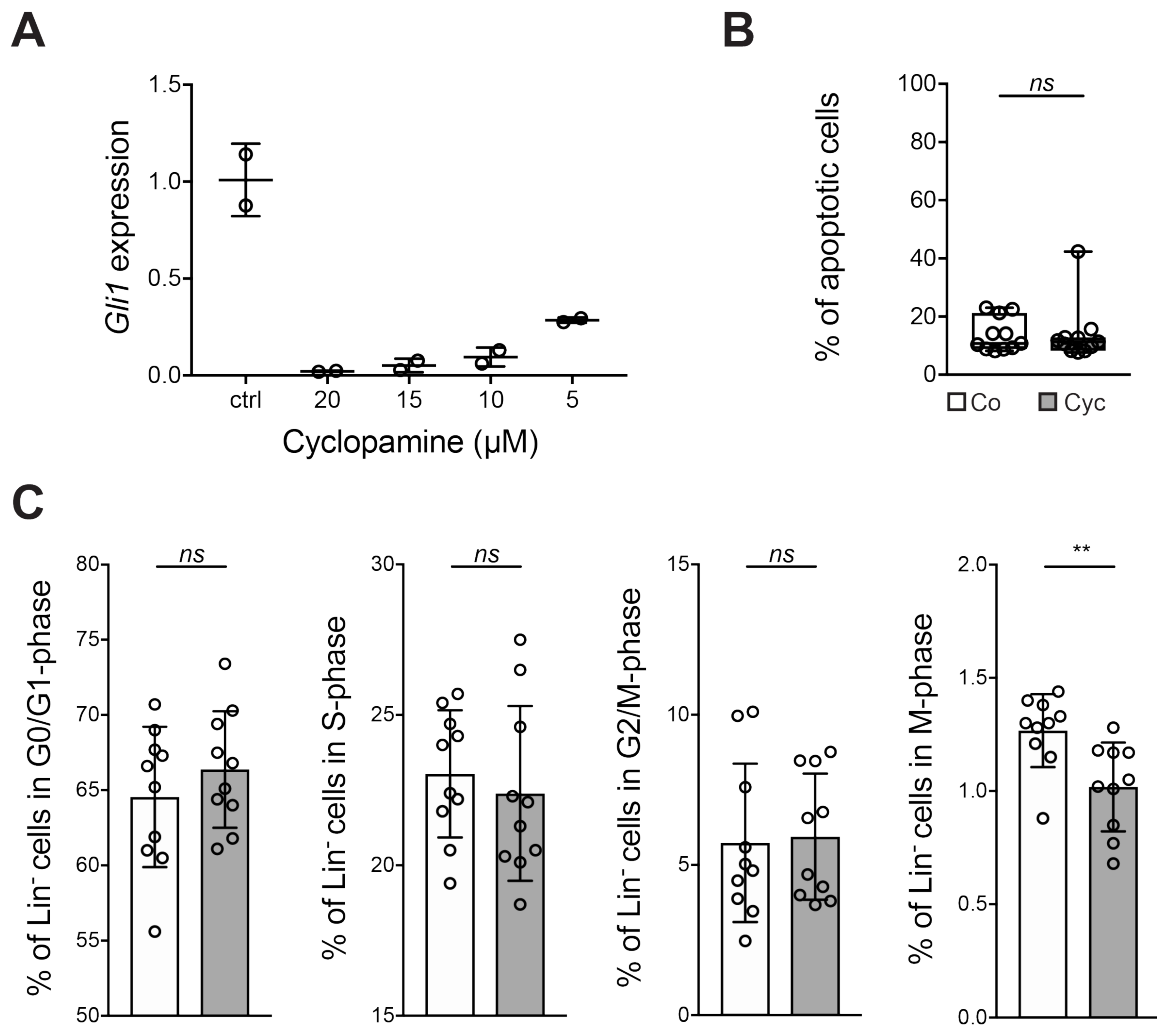
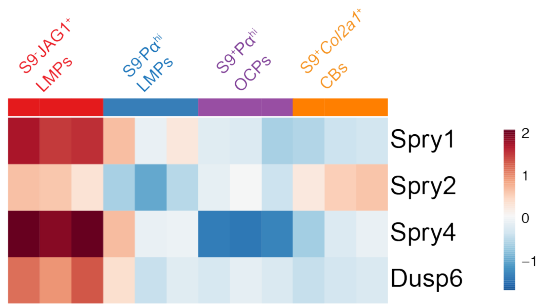


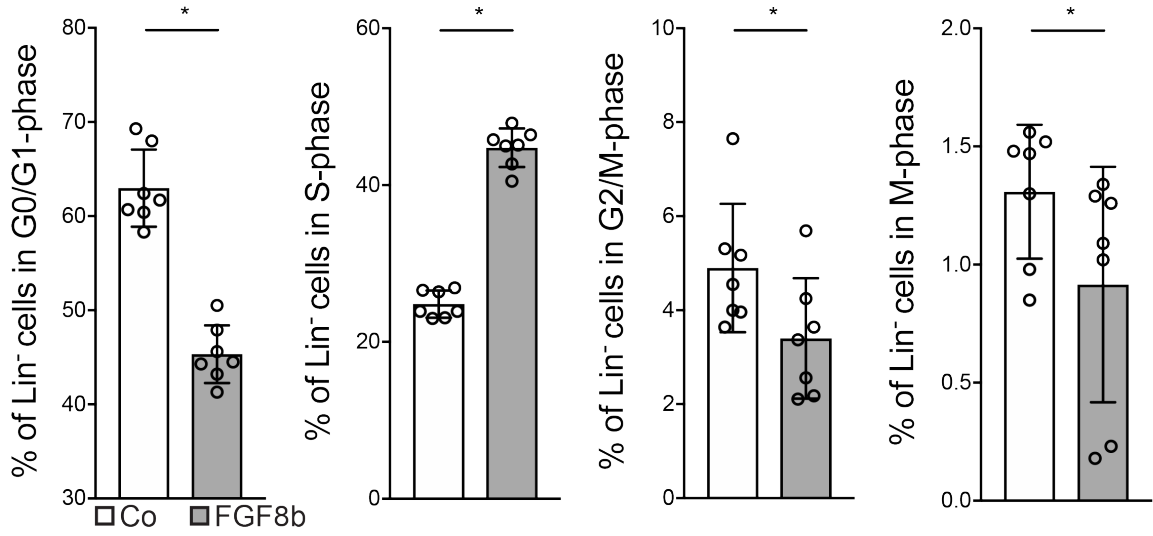
Fig. S4. SHH pathway analysis.

(A) Limb mesenchymal cells were cultured for 12 hours in presence of different concentrations of cyclopamine (0-20 μM). Graph showing relative *Gli1* expression levels as determined by RT-qPCR. Individual data points plus mean \pm SD are shown (n=2 data points per concentration). (B) Apoptosis rate assessed by Annexin-V in lineage-negative limb bud culture cells treated with 20 μM cyclopamine (Cyc) or solvent alone (Co). Individual data points plus mean \pm SD are shown (n=11). (C) Quantification of cell cycle stages occupied by limb mesenchymal cells after 12 hours of cyclopamine treatment. Individual data points plus mean \pm SD are shown (n=10). Statistical evaluation of all results was done using the Wilcoxon test: (**) p-value ≤ 0.01 .

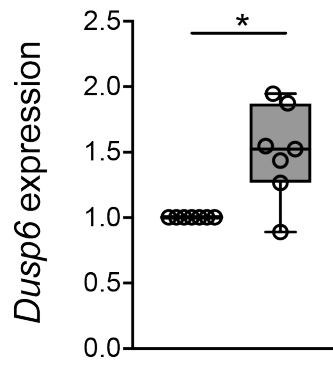
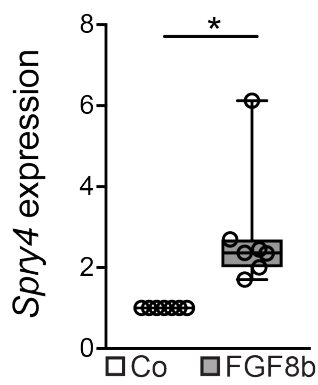
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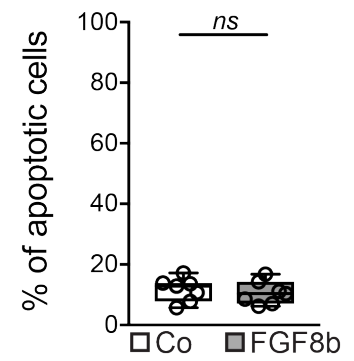
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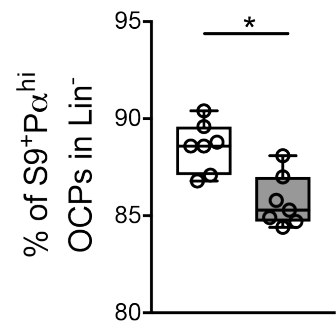
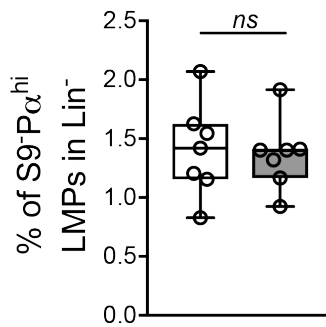
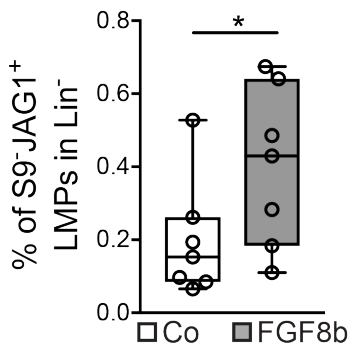


Fig. S5. FGF pathway analysis.

(A) S9-JAG1⁺LMPs express highest levels of the *Spry* and *Dusp6* transcriptional targets of FGF signaling in limb buds. (B) Forelimb bud mesenchymal cells (E10.5) were cultured for 12 hours in medium supplemented with FGF8b (300ng/mL) or solvent alone (Co). The fractions cells at the different stages of the cell cycle were quantitated by FACS. Individual data points plus mean \pm SD are shown (n=7). (C) The effects of the FGF8b treatment on *Spry4* and *Dusp6* expression levels in cultured mesenchymal cells was determined by RT-qPCR (levels in control cultures were set arbitrary to 1). (D) Lin⁻ mesenchymal cells undergoing apoptosis in control and FGF8b-treated cultures. Individual data points plus mean \pm SD are shown (n=7). (E) FACS quantitation of the different stages of the cell cycle in limb bud mesenchymal cells (controls versus FGF8b treated). Individual data points plus mean \pm SD are shown (n=7). (F) Comparative analysis of the fractions (%) of S9-JAG1⁺ and S9-P α ^{hi} LMPs and S9⁺P α ^{hi} OCPs in control and FGF8b treated cultures. Statistical evaluation of all results was done using the Wilcoxon test: (*) p-value \leq 0.05.

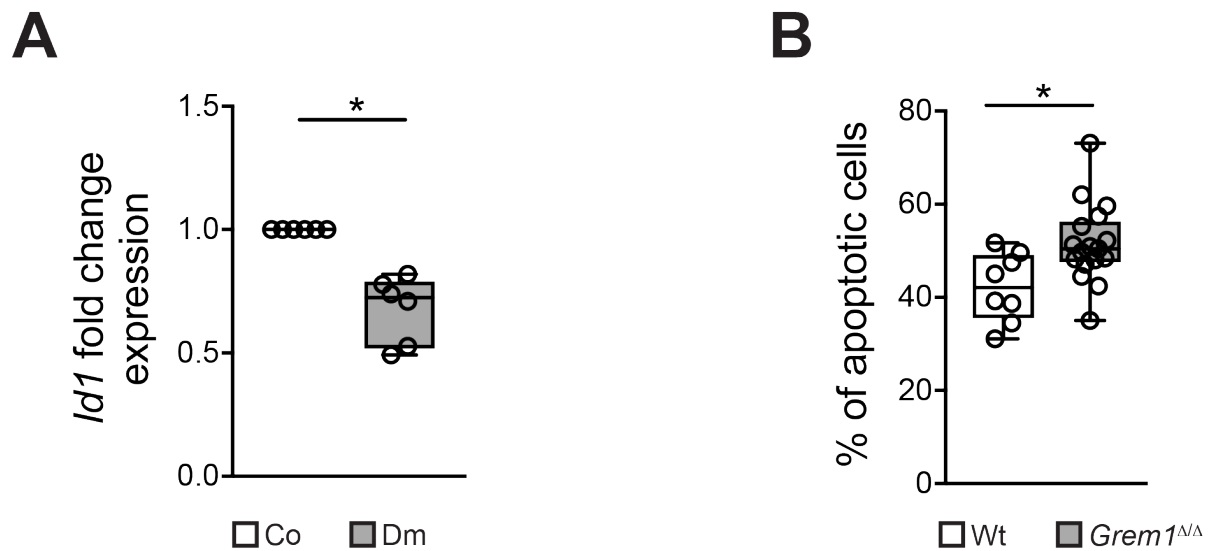


Fig. S6. BMP and *Grem1* pathway analysis.

(A) Limb mesenchymal cells (E10.5) were cultured for 12 hours in medium supplemented with solvent (Co) or 5 μ M Dorsomorphin (Dm). This reduces the expression of the direct transcriptional target *Id1* as determined by RT-qPCR analysis. Individual data points plus mean \pm SD are shown (n=6). (B) FACS was used to determine the fraction of apoptotic cells isolated from wild-type (Wt) and *Grem1*-deficient forelimb buds (*Grem1* ^{$\Delta\Delta$}) at E10.5. Individual data points plus mean \pm SD are shown (n=8 for *Grem1* ^{$\Delta\Delta$} ; n=17 for Wt). Statistical evaluation of all results was done using the Wilcoxon test: (*) p-value \leq 0.05.

Table S1

Symbol	OCP_rep1	OCP_rep2	OCP_rep3	CB_rep1	CB_rep2	CB_rep3	PDGFRa_rep1	PDGFRa_rep2	PDGFRa_rep3	Jagged_rep1	Jagged_rep2	Jagged_rep3	Sca_rep2	Sca_rep3
Eya2	-1.832764127	-1.907162408	-1.388653793	1.795475517	1.74634731	1.89571432	-0.563378195	-0.886977577	-0.488471987	-2.514229395	-2.525693122	-3.201530432	4.904714292	4.966609596
Lbx1	-0.70639119	-0.832468878	-1.212001763	-1.425405519	-1.798517434	-1.413213625	-0.689789309	-0.828707229	-0.702078045	-1.572404061	-1.57987879	-1.855401739	7.396530707	7.219726875
Met	-0.470901802	-0.585583964	-0.492018217	-0.361553264	-0.060016612	-0.125394637	-1.063538493	-0.813349738	-1.363469964	-2.42109318	-2.436388277	-2.120237219	6.220971243	6.092574123
Myf5	-1.462650965	-0.957462604	-0.876670604	-0.741537412	-0.429246268	-1.177390601	-1.029113305	-1.472915329	-1.424234859	-1.290204917	-0.784461352	-0.625420806	5.993180008	6.278129014
Myod1	-0.892901338	-0.257127882	-0.834136263	0.061487498	0.273850561	0.15288807	-1.493023282	-0.810641273	-1.493023282	-1.493023282	-1.311075773	-1.320372417	4.667840949	4.749257712
Myog	-0.582446933	-0.516492303	-0.753823449	0.390416403	0.616858698	0.947973002	-1.054293554	-0.889562049	-0.840881579	-1.054293554	-0.872346045	-0.88164269	2.554313419	2.936220636
Pax3	-0.992318017	-0.414561377	-1.557419119	-1.948160497	-2.038231371	-2.080961998	-1.231142162	-0.615597274	-0.838775258	-2.172819845	-1.613602884	-0.220817323	7.665752146	7.665752146
Pax7	-0.844870234	-0.844870234	-0.686826915	-0.328330333	0.142894331	-0.143267735	-0.50875336	-0.844870234	-0.844870234	-0.844870234	-0.662922725	-0.844870234	3.647028779	3.609399364
Six1	0.185683123	0.138332715	0.207076693	1.286250975	1.58749924	1.340385304	0.459422338	0.445465988	-0.340858115	-3.859655964	-3.981218899	-3.981218899	3.237445793	3.425980806

Table S2

DEGs S9 Sca-1 ⁺ E10.5-E10.75		
Gene Symbol	log ₂ FC	FDR
Pax3	9.091976323	2.84E-144
Lbx1	8.526176215	0
Adams16	7.739363958	0
Mybpc1	7.404872643	0
Met	7.172588356	0
Myf5	7.136355046	0
Sp5	7.038958872	2.29E-88
Eya1	6.416993071	3.83E-171
Cxcr4	6.330805778	1.10E-95
Hpgd	6.305134197	6.43E-112
Hbb-bh1	5.992714007	5.09E-14
Msc	5.957178248	2.46E-44
Itga4	5.934663939	0
Wnt16	5.750559166	1.89E-265
Sltt1	5.744092946	4.46E-216
Eya2	5.742934959	0
Gabra2	5.736595759	5.85E-209
Cr2	5.695450886	8.47E-227
Hbb-y	5.541777904	8.05E-12
Myod1	5.474993584	4.13E-262
Hba-x	5.473351137	2.48E-10
Hba-a2	5.470808744	8.71E-14
Hba-a1	5.470359756	8.73E-14
Cdkn1a	5.440119867	3.54E-158
Ppp1r16b	5.431846561	0
Tmem132d	5.350018361	1.92E-271
Foxd2	5.310501841	5.37E-284
Sim2	5.293384728	5.26E-31
Sowahb	5.123864963	6.45E-172
Slc4a1	5.086291183	1.57E-18
Cdh15	5.017842277	4.80E-181
Lurap1l	4.923562894	4.20E-159
Foxd2os	4.738087188	1.51E-198
Cpne8	4.715669508	5.03E-135
Pcdh17	4.665152085	0
Rtn4r12	4.597990081	8.53E-146
Nav3	4.588894291	6.37E-80
Cav1	4.508605802	8.49E-127
Pygm	4.382289608	1.13E-76
Tacr3	4.360853323	5.24E-94
Uncx	4.356929943	3.93E-81
Gfra1	4.352601144	7.90E-216
Camk1d	4.227256293	1.50E-278
Pax7	4.224345844	5.88E-127
Fam81a	4.216859172	1.31E-114
Pitx3	4.20413681	1.09E-90
Dlgap1	4.1742417	1.18E-80
Scn3a	4.162451949	2.31E-112
Npr1	4.158673574	9.20E-72
Plcg2	4.08292367	2.33E-218
Pitx2	3.956913067	8.14E-16
Wscd1	3.895556666	5.08E-82
Six1	3.876194418	5.29E-188
Gdnf	3.861370265	1.16E-18
Lgr5	3.860211899	1.29E-147
Crym	3.796260151	1.49E-38
Tead4	3.72500161	8.04E-144
Ppargc1b	3.722386173	4.47E-119
Tmem30b	3.717523503	6.38E-137
Npffr2	3.682263844	1.93E-90
Sim1	3.599484938	2.11E-33
Fam107a	3.587304305	6.30E-43
Lrrc3b	3.562726796	2.01E-42
Col13a1	3.543017711	3.35E-87
Pls1	3.529000209	9.25E-165
Rbm20	3.490912925	7.59E-109
3425401B19Rik	3.444172729	3.60E-66
Plch1	3.397669898	1.31E-173
Zfp536	3.389135518	4.71E-85
Dmir2	3.379739156	7.56E-23
Fgf5	3.366911266	1.64E-69
Lmcd1	3.336653149	9.54E-49
Ilgp1	3.315099856	5.83E-79
Vgll2	3.279954546	1.61E-64
Pcdh19	3.274192763	1.51E-159
Prdm8	3.264292135	3.35E-41
Ppp1r1a	3.246483047	3.45E-126
Mn1	3.239276971	1.83E-161
Myog	3.212446388	2.50E-66
Myc	3.166458561	3.43E-64
Lfng	3.140171699	1.20E-73
Lgi1	3.136535885	1.97E-43
Car2	3.131157209	1.96E-14
Tcf15	3.126883967	2.86E-111
Synpo2l	3.12330519	4.01E-46
Tubb2a-ps2	3.105939289	1.18E-70
Dclk3	3.103415253	7.75E-43
Sptb	3.095839898	2.82E-10
Tubb2b	3.08889686	7.43E-203
Lmo3	3.079613376	4.96E-45
Ripply3	3.076897069	7.80E-72
Rerg	3.059547909	1.72E-24
Lin28a	3.056346473	1.75E-09
Nav2	3.044604422	4.91E-183
Dll1	3.037949222	7.48E-06
Dgkg	3.037139975	1.73E-35
Slco5a1	3.034810582	9.62E-74
Cerkl	3.022537319	4.82E-32
Tpm2	2.99833795	2.26E-224
Alp2a1	2.989346019	2.65E-41
Pdgfra	2.989081024	8.95E-36
Fat2	2.986456927	8.73E-55
Tmem232	2.954627603	1.12E-55
Cntn3	2.933942634	1.37E-55
Tbx21	2.930822601	1.16E-51
Ephx1	2.923534761	5.14E-68
Grb14	2.921425966	6.28E-97
Fst	2.908137892	3.71E-47
Rbm24	2.900477197	2.40E-101
Vgll3	2.894270502	3.68E-38
Rab20	2.881263431	2.76E-42
Myc5b	2.87990011	2.18E-76

Six2	2.866619737	1.12E-65
Gpr12	2.810676728	1.82E-41
Tnik	2.806887683	8.45E-41
Ly6a	2.7977145	1.40E-42
Kcnk13	2.785676392	2.55E-54
Chrnd	2.783900084	1.78E-44
Il18rap	2.782194256	6.12E-53
Ube2ql1	2.779582191	2.70E-24
Kdr	2.771230761	1.22E-16
Des	2.762706441	6.31E-24
Sox3	2.758313726	8.43E-38
Rbp4	2.755612407	1.86E-40
Dach2	2.754881198	2.66E-111
Tbc1d30	2.727590399	5.65E-29
Tex16	2.724936623	6.34E-30
Islr2	2.72452005	2.25E-33
Fam195a	2.714559936	1.49E-66
Mmp9	2.713761494	6.46E-34
Fgfr4	2.712860062	1.32E-60
Smtnl2	2.711061565	2.48E-37
Brsk2	2.69670216	5.50E-39
Epha6	2.684592718	1.59E-52
Rel	2.672463709	9.84E-69
Moxd1	2.647877151	2.02E-74
Espn	2.624054749	7.71E-36
Lin7a	2.623109991	5.31E-21
Pgf	2.621103213	7.07E-80
Chst7	2.594478098	4.46E-42
Fhl1	2.557826786	1.50E-203
Wfikkn1	2.539491605	3.06E-22
Sypl2	2.536008777	5.19E-42
Ndrgr1	2.532058717	1.02E-37
Prokr2	2.511570514	1.95E-24
Hoxd1	2.481985061	3.18E-25
Adam12	2.481024745	1.72E-50
Ntn5	2.462510145	1.65E-24
Arhgdig	2.447955466	5.01E-25
Tnn1	2.428830959	2.63E-20
Tubb2a	2.417884487	1.26E-107
Meox1	2.416978578	3.84E-38
Sltsia4	2.412642835	1.98E-43
Fgf9	2.383093709	1.23E-41
Syt12	2.381481212	1.36E-30
Lingo1	2.372597872	6.55E-24
Dusp4	2.363161102	1.12E-75
Gm10007	2.351583849	5.98E-39
Ahr	2.346026216	2.49E-27
Col4a6	2.336561161	2.04E-17
Slit2	2.332131744	8.48E-43
Grik1	2.323742081	2.21E-34
Ssc5d	2.318925332	7.71E-37
Nkain3	2.315207173	1.89E-61
Hist1h2ac	2.310132207	2.95E-17
Sowaha	2.304063409	1.65E-24
Fap	2.297211806	4.51E-11
Mstn	2.28404464	2.11E-36
Lrrn1	2.282172262	1.84E-93
Alpl	2.274001098	6.70E-34
Epha5	2.273141102	1.02E-32
Cpne7	2.271425469	7.94E-27
Adams17	2.267887575	2.38E-53
Sobp	2.26696294	6.39E-87
Sec1	2.246178136	7.70E-32
Pip5k1b	2.222853274	4.59E-25
Dusp2	2.221154241	9.08E-19
Megf10	2.219671738	1.11E-24
Chchd10	2.209399908	1.69E-44
Ankrd33b	2.207500837	1.02E-23
Reps2	2.20623088	3.35E-24
Tex15	2.199891053	1.12E-36
Flk2	2.171869634	1.65E-21
Stom	2.169924835	1.04E-47
Bcar3	2.147138802	1.58E-36
Gabra3	2.141647447	6.36E-32
Hymai	2.135402937	5.70E-22
Chrbn1	2.13244789	8.71E-22
Gata3	2.129775192	1.25E-07
Plagl1	2.12309271	1.30E-29
Grem2	2.108279142	4.19E-15
Me1	2.104495493	1.20E-42
Grp	2.103049583	4.99E-17
Isl1	2.09337282	0.000492626
Cldn11	2.085765567	1.49E-19
Pde8a	2.07292838	1.15E-38
Ank1	2.067572611	2.48E-09
Palmd	2.053295054	8.73E-22
Dio3	2.051306997	1.73E-23
Ppargc1a	2.049449598	1.71E-63
Bdnf	2.04912832	4.58E-12
Cldn1	2.047885618	7.84E-47
Adora1	2.042895735	1.16E-20
Atp2b1	2.041572933	2.42E-203
Sl6galnac5	1.999192222	4.14E-18
Stk32a	1.997816565	4.79E-23
Dkk2	1.995746956	4.95E-11
Sct	1.990388356	1.23E-19
9030612E09Rik	1.989561296	7.44E-25
Ackr3	1.98942962	2.39E-18
Inpp4b	1.988728671	2.63E-30
Lox	1.986817691	7.85E-15
Sema6b	1.979905253	2.53E-36
Cobl	1.974450879	5.86E-15
Stc2	1.971798642	3.67E-10
Arhgef15	1.964954293	4.92E-20
Lama5	1.959475886	2.65E-67
Gabra4	1.95636709	2.47E-26
Lgr6	1.952576483	8.53E-07
Crip2	1.944038062	1.70E-36
Foxd1	1.92725974	6.41E-11
Epb4114a	1.920101867	3.25E-42
Rab3c	1.918468436	4.58E-28
Gria2	1.91024096	0.000232048
Calcr1	1.901436735	4.78E-92
Susd4	1.882363938	1.41E-25

Slc9a9	1.870385621	6.56E-19
Ptprj	1.866012825	1.13E-70
Pdlim1	1.847625495	1.03E-17
Fam89a	1.836668678	4.63E-25
Zcchc12	1.821449337	3.09E-30
Pdk4	1.819453126	8.43E-22
Gdap1	1.815242451	1.00E-17
Mapk12	1.814002029	1.92E-88
D930020B18Rik	1.81336253	1.24E-15
Tfpi	1.804165235	3.78E-18
Fam212b	1.799522168	1.86E-18
Cdc42ep1	1.798077594	3.26E-25
Wfdc2	1.791239176	1.49E-37
Cbs	1.790744223	1.79E-09
Sema3c	1.785628806	9.15E-19
Lrrk2	1.78489263	1.27E-36
Ezr	1.782046951	1.68E-43
Ggta1	1.780450279	3.44E-21
Glit1d1	1.771904589	1.55E-13
Scn4b	1.771857553	1.40E-06
Trim25	1.766761721	1.22E-38
Abcg1	1.766657458	1.40E-25
Sp8	1.756447825	9.85E-19
Fmp22	1.755645878	1.29E-13
Cott1	1.755146317	2.43E-24
Heyl	1.746192335	1.04E-18
Nup210	1.739302424	4.00E-28
Klk8	1.732819875	9.74E-15
Ehd4	1.720454344	1.18E-72
Notum	1.715794235	1.55E-17
P4ha3	1.705030529	1.11E-11
Pcdh11x	1.695534678	3.29E-12
Nectin1	1.690445262	7.26E-59
Grpp	1.688925775	6.66E-14
Ppfa2	1.683268248	4.51E-08
Ehbp111	1.677902033	7.01E-14
Actn3	1.67449378	1.09E-15
Anxa6	1.672512976	6.27E-94
Slc35a1	1.660324756	1.13E-26
Pdgfr	1.653712863	4.15E-73
Plk3cd	1.642161195	1.87E-30
Pknox2	1.641106183	4.63E-24
Mip	1.64009314	7.02E-17
Rimk1a	1.640010637	1.91E-20
Gpm6a	1.637924839	5.35E-15
Chst2	1.629473229	1.27E-64
Pde1b	1.62698862	8.64E-16
Elavl2	1.620661939	9.69E-37
Il13ra1	1.61720607	4.09E-23
Snhg4	1.614195567	2.24E-20
Rora	1.609922387	6.69E-10
Hspa1a	1.597035758	0.032530513
Flt4	1.589905041	2.38E-12
Vav3	1.588355523	3.70E-14
Ydjc	1.587025737	1.97E-23
Frat2	1.583942975	1.24E-24
Man1c1	1.581107306	4.23E-24
Eng	1.570683503	3.81E-28
Pltp	1.568999717	3.75E-17
Phlda1	1.567576367	1.94E-57
Stx1a	1.563119961	3.24E-21
Rpl34-ps1	1.553780013	3.77E-07
Rel1	1.549515235	2.94E-56
Rbp1	1.544755523	1.41E-23
Ttn	1.544178098	1.94E-07
Rpl21	1.543683723	9.40E-07
Srcin1	1.524518125	1.71E-12
Epha3	1.520108371	1.80E-17
Hoxc10	1.519701639	0.075708179
Bcl6	1.515395988	4.48E-08
Plk3r1	1.499806674	1.29E-63
Gamt	1.497514479	1.03E-10
Tdrd1	1.496817724	2.89E-11
Ptpn18	1.477441748	2.40E-12
Lrig1	1.465212783	1.92E-15
Fam46c	1.46485906	4.84E-13
Gucy1b3	1.462526947	2.29E-05
Ramp2	1.459112885	3.22E-10
Stc1	1.458347478	8.69E-15
Dok1	1.456284398	6.09E-30
Slk26	1.455875934	7.01E-45
Ablim1	1.445212884	3.50E-48
Hhex	1.440291898	2.15E-11
Nog	1.436849713	6.70E-10
Usp44	1.435729444	2.87E-08
Hspa1b	1.435049079	0.036283221
Hacd1	1.434251368	8.76E-28
Tbc1d4	1.428793883	1.02E-55
Pvt1	1.422612767	2.97E-10
Fam46a	1.420765938	1.03E-05
Cdx1	1.416152402	9.02E-09
Tmsb4x	1.415076764	1.79E-21
Tusc1	1.412675915	2.59E-31
Hes6	1.410623935	3.18E-61
Col18a1	1.410382039	9.28E-55
Kcng5	1.410244845	2.72E-09
Dpysl4	1.408362376	5.82E-27
Fam185a	1.401542065	7.90E-32
Gsn	1.400240106	4.91E-11
Maml1	1.398416929	2.63E-15
Pou3f4	1.39442519	1.15E-12
Acsf5	1.392885246	4.43E-31
Frmf7	1.392684114	3.90E-22
Meox2	1.39247949	4.32E-11
Id2	1.390742503	3.81E-37
Acy3	1.388470026	1.51E-09
Pde4b	1.387921303	4.99E-10
Sdc4	1.384366939	3.43E-24
Coro2b	1.379045356	1.35E-18
Rtn2	1.37891502	5.13E-12
Srxn1	1.373022849	8.78E-13
Ryr1	1.367677386	4.50E-21
Chchd4	1.365407761	3.40E-16
Kbtbd8	1.364695331	2.46E-21

Elovl2	1.364172345	5.25E-33
Zfpm1	1.34748881	7.01E-22
Acp5	1.346788701	0.000800705
Ppp1r3b	1.344322285	1.75E-11
Macrof2	1.337487308	4.79E-12
Sulf1	1.334747521	2.56E-07
Tuba4a	1.334244782	2.02E-11
Psd2	1.332513623	1.59E-08
Thsd1	1.330251702	1.53E-06
Cntnap2	1.329769279	5.56E-13
Fam169b	1.315318246	4.96E-10
Ripk3	1.312401878	3.89E-36
Rein	1.3088807	2.60E-05
Scar1f1	1.306017784	4.55E-06
Abr	1.30373839	4.62E-79
Npdc1	1.296356713	6.94E-09
Nudt19	1.295895318	4.03E-14
Egln3	1.291935631	3.70E-14
Dock5	1.287307729	2.19E-32
Ets1	1.28566331	1.04E-41
Timp1	1.279851889	3.41E-15
Atf3	1.279560897	1.27E-07
Stat5a	1.279015141	1.74E-27
Arid5a	1.27201103	1.79E-08
Shc2	1.269806196	1.91E-28
Gimap6	1.269786565	5.76E-11
Fgf8	1.265775847	0.000554937
Prss35	1.264997899	0.029710987
Klf15	1.263983642	5.04E-07
Vldlr	1.263834435	3.24E-13
Slc45a3	1.262141234	3.95E-14
Cldn9	1.258544325	1.60E-10
Tnfrsf19	1.258480433	3.04E-10
Mamstr	1.258377844	1.54E-07
Slc39a8	1.257596029	1.96E-05
Slc22a23	1.256065694	6.97E-22
Sh3kbp1	1.247798465	3.27E-28
Slc25a37	1.244471757	2.86E-10
Rps6ka4	1.244033016	3.83E-15
Eif4	1.242033443	3.61E-11
Lpl	1.241842523	9.25E-41
Cluh	1.241835401	2.42E-69
Ptpn6	1.239475704	1.17E-15
Crmp1	1.229348355	5.80E-08
Nat8l	1.227206372	1.64E-11
Ostf1	1.216199899	5.26E-30
Dgke	1.211593694	6.87E-16
Jph1	1.203380383	2.68E-17
Cdh8	1.202520624	2.58E-07
Trim16	1.201389789	3.06E-05
Hps6	1.200069475	2.05E-10
Hoxb6	-1.20028551	0.084387505
Rap1gap2	-1.202366201	5.42E-07
Cttna2	-1.203757224	0.005216178
Dkk1	-1.20657054	2.80E-06
Selenop	-1.211254585	1.49E-18
Gramd1c	-1.211455087	2.06E-06
Chrna4	-1.214723751	6.16E-08
Piprt	-1.215482853	2.01E-06
Dixdc1	-1.215720567	8.17E-36
Zadh2	-1.217619757	2.25E-21
Gm5126	-1.218336812	1.05E-06
Enox1	-1.218530817	5.26E-22
Meioc	-1.219409006	0.000715016
Igf1pl1	-1.21946859	0.000171541
Asxl3	-1.221043284	8.23E-13
Mertk	-1.221691772	3.34E-12
Fgd4	-1.222264183	1.99E-07
Fam160a1	-1.222567242	1.45E-05
Chmp4c	-1.223585946	0.000955047
Ttbk1	-1.226449367	0.001799809
Abca8b	-1.22665907	1.20E-09
Gpsm2	-1.226666381	3.23E-27
Trim9	-1.22879797	0.083537857
Rgl3	-1.229100754	9.21E-07
Rem2	-1.229831478	1.61E-10
Tns1	-1.232231185	1.96E-23
Tspan11	-1.23516263	4.08E-13
Gal3st1	-1.2351807	4.37E-05
Gck	-1.235594661	1.13E-05
Evp1	-1.238139367	7.45E-11
Dnajb4	-1.239407207	1.01E-17
Clmp	-1.240789589	1.04E-37
Epha8	-1.240859493	0.011043245
6030408B16Rik	-1.241973867	0.000800288
Smarca1	-1.242679307	5.27E-32
Spry4	-1.244051072	3.32E-09
Cacna1e	-1.245892436	0.000744773
Emp1	-1.245965311	1.72E-14
Cdh11	-1.246254786	8.95E-30
C430049B03Rik	-1.250046676	1.16E-11
Akap2	-1.251338595	7.31E-19
Dusp6	-1.252247089	5.63E-12
Stat4	-1.252361157	1.23E-05
Crocc2	-1.254135242	0.000348932
Rnf32	-1.254287017	3.81E-05
Ubl4b	-1.255420525	9.35E-07
Tceal3	-1.256551322	5.71E-09
Cdc42ep3	-1.257251365	2.53E-07
C3HC4	-1.257345237	2.57E-15
Demnd1a	-1.257448885	1.97E-28
Em1	-1.258614146	5.86E-30
Adgra2	-1.259061187	4.85E-25
Tgfb3	-1.260187208	6.14E-13
Gng2	-1.26176082	4.23E-24
Cadm2	-1.262353009	0.000369293
Fam159a	-1.262753107	7.54E-06
Dock6	-1.263229517	3.98E-14
Mapk15	-1.26361322	8.33E-05
Ankrd44	-1.265100401	1.97E-31
Fam19a1	-1.266850989	6.38E-06
Ptxnb1	-1.268254936	4.31E-19
Gpc5	-1.271458895	2.18E-09
Col6a3	-1.27213949	1.10E-07

Pakap	-1.272572055	1.34E-19
Ulk4	-1.274152345	8.83E-06
Prrt2	-1.274212879	0.000228408
Syl5	-1.274523585	3.45E-07
Dmrt1	-1.274527437	0.000644314
H2-Q5	-1.27480671	0.000127812
Hmgs2	-1.275799844	0.000114769
Vill	-1.277063419	2.09E-11
Mic4r	-1.278741876	5.83E-05
Wnt2b	-1.280056241	0.000141389
Srsf12	-1.281660601	1.06E-06
Cacna2d1	-1.284005071	2.53E-10
Tub	-1.285661739	2.75E-20
Cyp2d22	-1.28635128	4.71E-05
Efnb1	-1.286676816	1.60E-20
Dlx6	-1.286733604	2.31E-06
Ybx2	-1.287093148	0.000139226
Tnfrsf8	-1.288948906	4.64E-27
Ogn	-1.289140188	0.006082428
Atp8a2	-1.289227191	1.07E-07
Cd82	-1.289396858	7.76E-10
Prr16	-1.289568799	0.000471554
Tec	-1.289664882	0.000288497
Elf3	-1.290375904	7.47E-17
Olfml1	-1.294219515	3.85E-17
Gpc3	-1.297409611	2.21E-27
Apc2	-1.298355868	3.52E-06
Col25a1	-1.299382913	9.04E-22
Ptpr	-1.300222569	0.000252199
Flnb	-1.303107316	1.40E-12
Sgpp1	-1.303801368	2.95E-24
Hmcn1	-1.304618297	1.01E-09
Akap6	-1.304632352	1.16E-05
Creb5	-1.305070281	0.001781614
Nfib	-1.3056137	0.000129363
2610035D17Rik	-1.306257245	2.37E-07
Dsc3	-1.306608276	0.023641881
Tmem119	-1.307402751	2.99E-16
Gm9767	-1.30890619	2.56E-05
Ptges	-1.309895675	3.66E-22
Nrxn1	-1.309921007	0.000102919
Gas7	-1.309958841	3.48E-10
Dync1i1	-1.311689103	2.92E-09
Rian	-1.311697049	4.27E-05
Sorcs3	-1.314447262	1.63E-06
Panx2	-1.314779254	0.00015699
Slc5a7	-1.318539557	0.000356877
Sash1	-1.319003227	1.30E-24
Emilin3	-1.321668887	5.60E-26
Acan	-1.322531087	0.018181891
Mycbpap	-1.322709012	0.000222788
Grem1	-1.323483496	2.78E-08
Egfl6	-1.326493419	6.81E-05
Syng3	-1.329715581	5.10E-10
Wt1	-1.333717774	0.002143274
Sp7	-1.338364537	1.76E-07
Gjb2	-1.338474272	6.63E-07
Slc35f1	-1.342825919	1.63E-09
Sgk1	-1.343394075	1.47E-08
Kcnj2	-1.34449193	2.01E-07
Nell2	-1.34610682	1.85E-10
Olfml3	-1.348195814	0.000352904
Fndc3c1	-1.34844696	2.24E-31
Grid2ip	-1.349020583	5.88E-05
Dnm3	-1.350315171	8.98E-07
Nrgn	-1.352787015	1.99E-07
Thsd7a	-1.355539959	1.39E-07
Serpini1	-1.357248895	5.17E-13
Crnd	-1.358436274	0.037966055
Penk	-1.361129331	5.50E-05
Rnf128	-1.365688111	8.27E-09
Pelt3	-1.366193754	2.07E-05
Tgfb2	-1.36716756	1.23E-07
Aifm3	-1.367188465	8.70E-07
Cnih2	-1.36746632	4.48E-18
Colgalt2	-1.367669551	0.00010558
B830017H08Rik	-1.368725557	1.79E-05
Prkg1	-1.369740327	3.70E-05
Col14a1	-1.370144052	0.023786716
Nid1	-1.370212755	7.90E-26
Pdofd	-1.371942322	6.64E-09
Ptch2	-1.372549304	6.47E-21
Lpar4	-1.375332867	1.69E-16
Ctsc	-1.375925958	1.91E-17
Klh3	-1.380486536	1.88E-07
Tpd52l1	-1.38257193	1.17E-24
Rbfox3	-1.383415892	1.96E-07
St6sia6	-1.383962234	4.79E-07
Cbx8	-1.384442261	7.14E-14
Tmx4	-1.386449488	1.52E-17
Gpc4	-1.388960399	3.69E-16
Mtmr11	-1.392727205	7.24E-15
Hspb8	-1.393913805	3.81E-12
Tmcc3	-1.394147995	8.05E-13
Ccdc106	-1.398408092	2.53E-08
Rasgef1b	-1.399269022	3.52E-17
Trpm5	-1.399817242	6.42E-05
Bambi	-1.401379265	4.59E-15
Fnd3c2	-1.406958526	1.57E-21
Fgfr3	-1.407562128	2.28E-08
Gsap	-1.411737546	1.00E-05
Pdgrfb	-1.412854974	9.38E-27
Filip1l	-1.41455044	1.35E-12
Sox10	-1.416786131	0.008914753
Npas3	-1.42015342	8.90E-07
Fam227a	-1.422627825	0.000184993
Sema6d	-1.423509265	1.31E-13
Mir1906-1	-1.42394123	0.000813666
Mir1906-2	-1.42394123	0.000813666
Sox18	-1.424619799	1.23E-05
Il1m	-1.425133346	0.001233776
Rapgef5	-1.425328871	6.43E-09
Ankrd45	-1.4281201	2.13E-12
Pamr1	-1.431845259	0.094622329

Mst1r	-1.431961678	4.76E-07
Cd248	-1.434391731	7.86E-11
Capn6	-1.436590302	7.34E-36
Klf3	-1.436591382	3.95E-23
Efemp1	-1.437712329	0.003634349
Sfrp2	-1.439784964	3.99E-20
Pcdh18	-1.441701079	4.13E-24
Kank1	-1.443331408	1.68E-18
Klf2	-1.447898635	0.00169775
Tox	-1.448609245	2.71E-06
Zmat4	-1.451239165	0.000680934
Col6a1	-1.452498248	1.15E-15
Pmp	-1.454923032	2.15E-16
Col5a2	-1.45521418	1.12E-17
Ltp1	-1.456089595	7.59E-14
Pcdh8	-1.45612427	0.069594703
Rnf125	-1.456478059	2.58E-07
Mob3c	-1.456645263	2.21E-10
Dmd	-1.458511985	8.09E-23
Ahnak	-1.459601469	6.15E-05
Agtr1a	-1.460093996	1.15E-08
Col15a1	-1.462605743	0.000100712
Lrrc9	-1.466396281	9.02E-08
Pag1	-1.468064012	2.98E-41
Mlap4	-1.468452423	1.01E-26
Hecw2	-1.468903731	2.17E-14
Peg3	-1.469854551	6.96E-21
Prkcb	-1.469997513	5.63E-12
Hdac9	-1.470432115	1.23E-20
Lox1	-1.470681281	6.02E-11
Postn	-1.471128454	0.019667245
Grik2	-1.471712591	1.57E-06
Spint2	-1.476043338	1.20E-19
Pax9	-1.476175288	0.000167062
Mylk	-1.476917027	1.40E-09
Wbscr17	-1.477279174	2.16E-12
Lhx1	-1.48147295	5.61E-07
Syne3	-1.483049739	1.15E-06
Ak5	-1.483136919	6.80E-07
Chst15	-1.484015009	4.66E-22
Tgm3	-1.48454328	7.39E-05
Fos	-1.489443011	0.004603184
Fam196b	-1.491269079	0.001200298
Sh3bp5	-1.49164346	7.24E-35
Ablim2	-1.491748612	5.70E-07
RspH9	-1.497440982	1.70E-09
Cd47	-1.49805504	1.24E-24
Sdc2	-1.507919156	1.89E-42
Ptgef	-1.509501106	6.92E-07
Enpp5	-1.511579907	1.12E-10
Chrna1	-1.511694095	5.26E-06
Lhx2	-1.512628554	4.27E-11
Arhgap9	-1.515348136	5.57E-12
Sema4f	-1.515887084	1.70E-14
Aatk	-1.516579681	3.66E-08
Slgla6	-1.517827094	3.38E-11
Rab37	-1.530478464	4.16E-11
Ghr	-1.531302411	2.41E-21
Thbd	-1.532608222	1.50E-05
MeF2c	-1.534012485	2.97E-10
Cyp2s1	-1.536630627	0.000114488
Mkx	-1.541142105	9.73E-16
Hoxc8	-1.541283135	0.004036188
Efnb3	-1.541883274	2.13E-23
Nrsn2	-1.544275208	1.05E-07
Adams4	-1.545588203	2.17E-14
Fam163b	-1.549770757	1.52E-09
Peg3os	-1.550442586	6.55E-25
Tril	-1.551635795	1.82E-25
Abtb2	-1.55327491	7.04E-32
H2-Ab1	-1.553656703	4.28E-07
D630003M21Rik	-1.553666142	1.45E-14
Hoxd8	-1.553788727	5.72E-23
Entpd1	-1.556587403	1.02E-08
Wipi1	-1.55964166	1.01E-31
Lrba	-1.560348127	3.03E-17
Fndc1	-1.560904482	0.010643703
Nod1	-1.561165615	0.000467646
Scube3	-1.562189426	1.78E-17
Arhgap29	-1.562830619	2.09E-19
Stard8	-1.563778105	2.53E-08
Nap1l5	-1.564722485	4.76E-14
Klhl14	-1.565130188	4.80E-08
Rgs5	-1.566205296	4.57E-06
Zcchc5	-1.569166392	0.01024678
Lrrc56	-1.571051434	1.12E-31
Clstn2	-1.573685532	1.97E-07
A330033J07Rik	-1.574004897	1.30E-05
Bgn	-1.574960102	2.85E-20
Cdh6	-1.57533136	1.98E-21
Pianp	-1.576221251	0.001930033
Pid1	-1.578158238	8.42E-06
Lgi3	-1.581912168	5.53E-07
Pear1	-1.583486427	1.91E-23
Rgs9	-1.584305342	1.57E-13
Rarres1	-1.587516673	8.90E-06
Rbms3	-1.59092745	1.77E-40
Hand1	-1.593539349	0.011270298
Frem1	-1.594378335	9.95E-20
Tox3	-1.596510879	1.42E-26
Rnf152	-1.598711749	2.37E-06
Nlmg2	-1.605314206	3.86E-06
Bmx	-1.609323812	1.86E-06
Nxnl2	-1.610721634	4.78E-06
Id1	-1.610860461	3.68E-29
Bmp4	-1.613734361	5.28E-21
Bmp3	-1.614916203	0.000638612
Wis	-1.616174688	1.87E-51
Wnt4	-1.618685671	8.78E-06
Col7a1	-1.618943366	7.22E-05
Arhgap24	-1.626962801	1.08E-29
Bnc1	-1.628910986	0.001641464
Spock3	-1.638847196	8.15E-12
Palm2	-1.64195757	3.09E-13

Slc16a7	-1.644546618	8.92E-12
Twist1	-1.64566542	2.14E-26
Spp1	-1.650031	4.21E-06
Crabp1	-1.652653425	2.90E-05
Apela	-1.654339252	4.65E-10
Tmem132c	-1.654897791	7.47E-18
Rhoj	-1.654939431	3.24E-13
Gria3	-1.654985275	6.03E-06
Kctd12b	-1.655720561	3.77E-14
Gata5	-1.65665075	0.007978687
Gdf6	-1.657033614	3.07E-06
Pappa2	-1.657806697	2.26E-05
Rarb	-1.658623122	0.000587387
Shisa6	-1.663003794	7.03E-06
Pam	-1.663296894	6.64E-26
Syne1	-1.663611073	3.64E-09
Corin	-1.664745633	0.010862573
3110039108Rik	-1.665964945	6.76E-06
Mbnl3	-1.666992279	6.02E-38
Aass	-1.667780675	2.22E-18
Krt18	-1.671669184	1.04E-08
Cbfa2l3	-1.672979263	5.15E-15
Negr1	-1.681284627	3.13E-07
Cnfr	-1.682907338	6.96E-09
Adgre5	-1.68390838	9.18E-11
Crispld2	-1.685183317	2.35E-06
Nap1l2	-1.686978211	4.26E-07
Padi3	-1.693052818	1.36E-13
Ifitm1	-1.694239246	1.89E-13
Adora2b	-1.694536914	1.09E-17
Fam84a	-1.699083038	8.08E-07
Kcp	-1.705131959	3.79E-07
Alx1	-1.711547594	5.59E-05
Itpr3	-1.713786978	1.53E-21
Bmp7	-1.715121743	8.76E-53
Zfp979	-1.718772718	0.020872902
Msx2	-1.719243901	2.31E-14
Jakmip2	-1.722477919	2.78E-14
Cpa2	-1.722495297	1.43E-35
Jag1	-1.725561005	1.20E-19
Mtus2	-1.725821067	1.10E-06
Lix1	-1.728093756	3.75E-20
Unc5b	-1.732558572	3.81E-35
Tpsg1	-1.732605024	1.60E-07
Edil3	-1.732851495	3.98E-06
Wfikkn2	-1.734040629	1.20E-12
Wisp1	-1.735489046	4.30E-06
Gata4	-1.736084932	0.000109256
Cnr1	-1.736843832	1.60E-12
Samd5	-1.73721912	3.00E-09
Pcdh1	-1.737230761	8.92E-10
Irf2bpl	-1.739474468	4.05E-18
Wnt11	-1.741968498	9.58E-21
Sdk1	-1.744004521	1.17E-27
Mirg	-1.746840131	1.20E-07
Armc2	-1.747512307	6.95E-09
D030045P18Rik	-1.748601795	8.92E-10
Ctgf	-1.749515728	4.61E-08
Gulp1	-1.755450072	6.03E-30
Maf	-1.761603259	1.61E-16
Rtn4r	-1.763205909	7.90E-10
Tns3	-1.765438966	4.53E-38
Zim3	-1.765643956	1.54E-08
Tmem252	-1.765862776	1.55E-06
Atp1a2	-1.766031042	8.60E-16
Lqals12	-1.767483453	2.55E-10
Nckap5	-1.770839261	2.41E-06
Adamsl1	-1.775140778	9.42E-07
Vasn	-1.775593342	8.40E-30
Dlg2	-1.778308673	2.52E-06
Igfbp1	-1.778708365	5.28E-09
Ctsk	-1.779193501	2.65E-09
Setbp1	-1.779481644	1.89E-17
Eln	-1.781119667	9.99E-19
Gria4	-1.783545405	2.72E-12
Wdr86	-1.787019081	5.97E-24
Spsb1	-1.791928462	3.48E-37
Arhgap18	-1.792993933	5.70E-23
Pgm5	-1.794989778	2.32E-07
Mgat4a	-1.79510001	3.34E-49
Grik4	-1.800621024	5.70E-11
Clec1f	-1.801273534	1.88E-11
Usp29	-1.803503774	9.51E-23
Meg3	-1.804756978	1.78E-05
L1td1	-1.80914672	1.41E-06
Plezo2	-1.817965264	1.50E-07
Ednra	-1.820827395	4.27E-18
Epha1	-1.821851463	7.53E-28
Xpnp2	-1.822442894	2.93E-10
Cpxm2	-1.826530643	1.06E-05
Z010300C02Rik	-1.830132803	2.00E-10
Cox4i2	-1.83078363	1.30E-11
Col6a2	-1.835200245	9.22E-33
Fam151a	-1.83594676	2.05E-15
Zic3	-1.836478582	1.50E-20
Plcb1	-1.837772786	2.02E-24
Nrtn	-1.83916502	4.02E-12
Nfatc2	-1.848788978	1.89E-10
Tfap2a	-1.851032218	6.46E-17
Col1a2	-1.855639381	7.13E-24
Sema3d	-1.862194901	7.73E-05
Tac1	-1.8643365	1.52E-07
Ldb2	-1.867436262	1.68E-37
Drp2	-1.867551107	2.06E-12
Kitl	-1.870908325	8.46E-09
Gm2694	-1.871765086	1.09E-11
Clec14a	-1.879028988	2.32E-11
Lama4	-1.879554109	2.76E-65
Vegfc	-1.887469675	5.75E-18
Dhrs3	-1.8891364	3.70E-22
Kcnq4	-1.892253828	8.56E-18
Dnm1	-1.89324407	3.24E-40
Cd38	-1.894005471	2.02E-16
Trps1	-1.89503858	3.74E-19

Col16a1	-1.895260542	4.47E-11
Elmod1	-1.895416244	4.42E-10
Snai2	-1.895425053	2.24E-39
Thbs1	-1.895576586	5.00E-09
Abca4	-1.896107761	1.87E-14
Abca9	-1.899429295	1.82E-10
Rin2	-1.904842856	2.96E-33
Fbln5	-1.904886526	4.19E-18
Daam2	-1.907932358	3.52E-47
Cyp1b1	-1.911206932	2.52E-11
Card11	-1.918767655	7.90E-06
Fbln2	-1.920774601	2.19E-34
Mgat4c	-1.923389822	0.001058763
Ptpru	-1.927121842	6.45E-32
Adgrg1	-1.937025331	6.87E-20
Pipn13	-1.937574981	1.87E-38
Mctp2	-1.937636826	1.76E-12
Cdo1	-1.942436463	2.49E-11
Prx2	-1.942714249	1.60E-31
Irx5	-1.946821285	0.006141941
Enpp3	-1.950532573	1.96E-12
Wnt2	-1.956954184	0.007265433
Kif26a	-1.960765899	2.21E-50
Alx4	-1.961911421	8.93E-12
Vax2	-1.962270127	3.76E-07
Dnajc22	-1.971776703	1.24E-12
Sema5b	-1.978166799	1.32E-08
Gdf7	-1.979589632	4.48E-07
Lvrn	-1.980848041	2.58E-11
S1pr3	-1.982566148	2.40E-24
Erg	-1.982622292	2.10E-16
Veph1	-1.989076573	2.74E-07
Gpm6b	-1.990365431	5.43E-32
Svep1	-1.995846728	3.82E-12
Fgf10	-1.997856475	2.86E-33
Slc16a2	-2.007334122	1.87E-38
Cd83	-2.007806837	2.26E-14
Slc14a1	-2.010062237	1.49E-07
Adams18	-2.011497118	3.55E-06
Kcnd3	-2.015406802	6.92E-10
Myrf	-2.015763182	7.01E-16
Stmn2	-2.016550158	3.77E-09
Cdh22	-2.017277357	3.25E-13
Hs3st1	-2.020740836	1.46E-08
Epha4	-2.021145151	1.69E-34
Hs3st6	-2.022264163	4.74E-15
Dysf	-2.024217757	2.16E-31
Aff3	-2.029541062	6.55E-32
Kank4	-2.036212797	5.75E-74
Dab1	-2.038018447	1.29E-12
Sall1	-2.041831087	2.72E-25
Nrp2	-2.044929895	6.70E-41
Arhgef19	-2.046642952	7.61E-08
Ncald	-2.047545091	9.30E-13
Zim1	-2.048130022	1.34E-05
Shank1	-2.050449484	2.67E-08
Dgkk	-2.051911456	1.98E-16
Gsg11	-2.052668386	3.49E-09
Irx3	-2.054105283	0.006379665
Foxf2	-2.057053029	2.23E-11
E330013P04Rik	-2.057972523	1.71E-08
Mir5130	-2.061872727	8.03E-10
Tshz1	-2.062229697	1.34E-42
Samd4	-2.064928334	3.83E-33
Dcn	-2.06570201	5.41E-06
Crhbp	-2.065988397	8.13E-07
Jazf1	-2.066548781	4.60E-16
Acot11	-2.068152963	5.21E-28
Gulo	-2.068280985	2.12E-17
Lrrc75b	-2.073209775	1.16E-12
Cacna1c	-2.073390882	3.19E-17
Efcab1	-2.075776222	4.04E-15
a	-2.082570841	1.66E-22
Rgcc	-2.084824183	3.46E-09
Slc6a17	-2.086524645	5.40E-21
Nrn1	-2.08823237	8.97E-12
Rti1	-2.101261089	5.51E-11
Ndnf	-2.112727564	2.53E-05
Rtn4r1	-2.113691944	3.19E-13
Wif1	-2.118702565	4.61E-15
Mdga1	-2.125955987	2.30E-24
Mmp28	-2.129754016	6.14E-11
Prx1	-2.131236298	1.13E-46
Dlk1	-2.137165548	3.46E-11
Fli1	-2.148438462	7.89E-51
Prelp	-2.14977565	0.000488903
Rgag1	-2.152034308	1.20E-14
Dil3	-2.156723032	0.002092697
Cmklr1	-2.163515902	1.05E-10
Tshz2	-2.163604846	3.50E-68
Tbx4	-2.163922793	9.32E-14
Alcam	-2.168441673	3.38E-07
Syt13	-2.183597538	1.08E-08
Rfln2	-2.186820172	6.75E-44
Egfm1	-2.188651001	8.98E-07
Barx2	-2.189678155	0.000924104
Sostdc1	-2.196267491	1.68E-11
Gja3	-2.197080007	4.03E-15
Slitrk6	-2.198000131	6.92E-07
Tmem28	-2.202440515	5.17E-18
Nfia	-2.208548107	1.94E-11
Alx3	-2.210313565	1.10E-21
Mir7025	-2.213766532	2.76E-16
Tbx2	-2.221946652	1.34E-29
Prickle2	-2.227946597	1.09E-32
Gata6	-2.229255874	9.11E-07
Kcnd2	-2.234989841	2.37E-09
Hgf	-2.236492174	4.37E-19
Lrrc4b	-2.244818234	1.73E-27
Spry1	-2.245775532	5.23E-30
Sema6a	-2.246251586	5.20E-30
Sltt3	-2.252133151	8.73E-51
A730020E08Rik	-2.256455665	1.35E-16
Emilin2	-2.263404925	7.28E-58

Thbs2	-2.264102773	1.78E-13
Cacna1h	-2.268450793	2.22E-16
Cbln1	-2.271938535	7.15E-25
Adams2	-2.281855001	5.61E-08
Zbtb16	-2.281965059	4.02E-23
Optn	-2.282028379	2.19E-20
Asb9	-2.282785369	5.38E-14
Runx3	-2.287654087	5.37E-13
Rab32	-2.29362207	4.87E-15
Vcam1	-2.296078249	1.20E-100
Rarg	-2.296371392	3.95E-58
Hoxd9	-2.299529619	2.63E-34
Lhx9	-2.307982537	8.22E-46
Nrp1	-2.308280398	2.49E-53
Mcb	-2.316084928	1.50E-20
Dlx5	-2.318849687	8.66E-11
Slc14a2	-2.324083796	6.31E-12
Kctd12	-2.326955898	1.70E-19
Itga11	-2.335154377	2.07E-17
Dcc	-2.344073058	4.40E-12
Agtr2	-2.350399384	2.75E-06
Angptl1	-2.351297008	1.19E-15
Mppcd1	-2.354970143	1.18E-25
Pfpp3	-2.366510037	1.38E-74
Fgfr2	-2.37088035	2.61E-19
Pmaip1	-2.373059679	3.23E-13
Cped1	-2.375170853	2.20E-34
Tspan18	-2.379621895	4.33E-21
Cdh10	-2.384140199	3.87E-14
Edar	-2.395304569	1.87E-10
Sfrp1	-2.395339651	8.07E-08
Tmem200b	-2.401938319	9.51E-23
En1	-2.412839009	1.10E-05
Mme	-2.413983484	6.59E-37
Astn2	-2.416754695	6.15E-20
Sdpr	-2.422491983	1.12E-09
Eva1a	-2.424851525	4.18E-22
Spata18	-2.427303808	4.68E-10
Pappa	-2.428342369	1.20E-09
Shisa7	-2.441220656	4.08E-08
Irf6	-2.449738318	1.06E-14
Tbx3	-2.459481845	4.62E-21
Rag1	-2.470343536	1.92E-11
Col1a1	-2.471070877	4.52E-24
Tmem132e	-2.473391479	8.42E-06
Kif26b	-2.492172342	1.51E-36
Gdf10	-2.493429926	9.11E-07
Rxfp2	-2.49870073	2.36E-05
Zic2	-2.498897212	1.04E-42
Sparcl1	-2.501823727	2.45E-07
Bmper	-2.516098668	6.83E-09
Fosb	-2.526464266	0.001735943
Rspo2	-2.528185686	6.30E-16
Fam181b	-2.530689351	4.58E-30
Fam69c	-2.535805874	3.11E-13
Pde3a	-2.537968448	6.27E-26
Emx2os	-2.553546719	1.05E-07
Mab21l1	-2.565876944	6.04E-44
Tmem200a	-2.567248832	2.44E-16
Enpp1	-2.572782583	3.48E-13
Wscd2	-2.573354308	1.08E-25
Ccdc85a	-2.576626629	4.81E-13
Nlgn3	-2.587022118	1.79E-21
Calb2	-2.589099296	7.06E-07
Pde7b	-2.602779783	2.46E-16
Lhfp	-2.606090934	1.10E-21
Ptprv	-2.610815523	1.58E-15
Hoxa13	-2.611191904	7.92E-29
Scube1	-2.613708186	3.28E-40
Col8a1	-2.615109121	2.28E-07
AWS49542	-2.629381397	1.00E-08
Hoxc6	-2.630172606	6.68E-09
Gpr4	-2.63543536	1.69E-67
Ets2	-2.639509265	1.03E-77
Hpse2	-2.641647262	2.93E-28
Lmx1b	-2.648722816	1.83E-45
Sema5a	-2.653779729	2.17E-65
Col8a2	-2.674511675	1.36E-13
Kbtbd11	-2.691691522	2.06E-63
Sox5	-2.693955259	1.62E-49
Z610035F20Rik	-2.715451792	1.85E-31
Id4	-2.727652295	8.58E-14
Picl1	-2.73742097	7.88E-19
Gfra3	-2.764130508	1.23E-15
Zic5	-2.770841232	1.69E-33
Sox6	-2.774832878	2.58E-26
5033428122Rik	-2.782848645	2.77E-18
Ntn1	-2.784603546	6.42E-14
Slc1a3	-2.791239821	4.29E-26
C130021120Rik	-2.793936049	1.05E-49
Arhgef3	-2.797108641	8.86E-12
Tmem178	-2.799787315	2.30E-29
Matn4	-2.823417704	0.002231557
Cbln4	-2.827264221	2.32E-14
Scn11a	-2.831416317	1.77E-13
Gdf5	-2.835063237	1.23E-25
Robo2	-2.844110285	3.00E-34
Glis3	-2.844233356	4.54E-26
Col9a1	-2.845499855	5.45E-42
Lpar1	-2.845784633	9.48E-130
Ptx3	-2.855825615	4.06E-37
Adams5	-2.862574109	3.93E-17
Cyp26b1	-2.865357307	4.98E-81
Col3a1	-2.884113483	2.76E-33
Cacna1g	-2.884959266	2.29E-36
Col23a1	-2.894375366	3.17E-48
Prickle1	-2.897070379	6.45E-47
Aldh1a2	-2.901957118	4.38E-09
Upk	-2.90640838	6.75E-49
Hoxc4	-2.919717176	2.08E-07
Adams6	-2.923309663	2.41E-13
Hottip	-2.951284065	1.34E-14
Shox2	-2.952623115	1.80E-42
Col9a3	-2.984598652	1.96E-14

Hapln1	-2.987884651	4.28E-23
Wnt5a	-3.009470475	1.67E-69
Adcy5	-3.011524278	8.13E-16
Bmp2	-3.028071097	7.46E-12
Sall3	-3.034811045	3.06E-76
Plxdc2	-3.036195974	1.43E-81
Ccser1	-3.045014	3.11E-33
Foxc1	-3.046788392	1.08E-17
Sorbs2	-3.050902448	3.36E-33
Pkdcc	-3.072084736	1.16E-07
Tnc	-3.133443155	2.66E-06
Igfb8	-3.140499521	6.10E-90
Runx2	-3.142351654	2.27E-11
Clmn	-3.171039255	4.26E-70
Fbxo41	-3.186061442	3.61E-28
Papss2	-3.221229628	9.88E-13
Hoxd10	-3.227557606	4.40E-79
Zfp503	-3.250268133	6.86E-66
Mab21l2	-3.250334486	6.79E-58
Tbx18	-3.282823762	5.20E-34
Nfix	-3.296126755	2.08E-17
Rspo1	-3.317112947	7.76E-05
Enpp2	-3.356588854	1.67E-49
Smoc2	-3.389991297	7.81E-12
Evx2	-3.432103904	2.31E-14
Sned1	-3.454367411	4.04E-14
Col12a1	-3.457996015	1.58E-15
Tfap2b	-3.471415061	3.99E-36
Synpo	-3.519354817	4.17E-65
Ddr2	-3.624776294	1.80E-87
Cttnbp2	-3.63231138	4.25E-39
Plxna4	-3.634676283	7.06E-57
Hoxc5	-3.697432602	8.79E-07
Sox9	-3.730208279	3.06E-52
Pdzd2	-3.763458256	3.99E-27
Tbx5	-3.783996801	2.23E-80
Adamtsl2	-3.79197367	2.74E-23
Hand2	-3.797945899	8.86E-102
Emx2	-3.832617248	3.59E-20
Pdgfra	-3.878509722	9.62E-59
Lum	-3.888033434	1.47E-14
Tbx15	-3.896781275	1.40E-66
Hoxd11	-3.945298591	3.62E-119
Ntrk2	-3.953379562	9.99E-28
Ebf2	-3.978859462	1.18E-30
Rspo3	-4.005824736	1.38E-84
Hic1	-4.015165797	2.00E-31
Gsc	-4.122240722	1.85E-47
Hoxd12	-4.289376518	3.36E-58
Cxcl14	-4.427304607	3.51E-42
Hoxd13	-4.431978278	1.23E-62
Pax1	-4.721613071	5.27E-06

Table S3

DEGs S9 JAG1* E10.5-E10.75		
Gene Symbol	log ₂ FC	FDR
Tfap2b	6.005444146	0
Evx1	5.227961395	1.83E-144
Shh	5.150873323	1.91E-293
Evx2	5.104798092	1.42E-116
Gja3	5.030410365	3.91E-211
Evx1os	5.007940147	1.72E-114
Hoxa13	4.671544721	1.46E-266
Lmo2	4.648730325	1.82E-283
Hottip	4.572982246	2.91E-103
T	4.545057778	2.72E-35
Hoxd13	4.476610427	9.10E-214
Tfap2c	4.310117635	3.93E-146
Edar	4.220400586	8.27E-76
Scn11a	4.070131906	1.58E-61
Epha8	3.965337174	1.79E-73
Sv2b	3.710685999	2.63E-109
Tgm3	3.698782349	4.20E-53
Mamdc2	3.692068918	1.80E-188
Rcsd1	3.590177428	1.61E-237
Jag1	3.498318179	4.42E-186
Epha2	3.461936525	4.03E-210
Naaa	3.2759461	4.00E-153
Tspan18	3.273870427	6.37E-106
Pmaip1	3.272427094	8.90E-62
Hoxd12	3.270114681	8.39E-115
Cdh22	3.267875487	1.86E-92
Cbfa2l3	3.260803431	1.83E-133
Gbx2	3.22270483	1.56E-84
Sall3	3.186563442	1.48E-242
Nptx2	3.140239735	1.14E-50
Cbin1	3.122644258	2.21E-120
Hey1	3.088146435	2.21E-157
Eogt	3.069885966	1.63E-149
Pdzd2	3.051160455	1.56E-55
Wnt2	3.043435166	2.21E-09
Rprm1	3.034780034	2.69E-38
Gucy2c	3.030642636	1.37E-44
Cpa2	2.990937241	1.53E-252
Rnf128	2.894748202	7.36E-93
Zic3	2.874608859	9.20E-121
Mnx1	2.845641748	1.02E-52
Mcub	2.794761279	1.18E-77
Gldc	2.786828444	6.59E-45
Padi3	2.776506743	1.25E-92
Sall1	2.760375559	3.10E-110
Mtus1	2.757605982	1.37E-224
Gm53	2.738416654	1.51E-37
Tmem204	2.696460248	4.80E-44
Spry4	2.659675711	5.57E-84
Chrna1	2.658265603	9.04E-45
2610035F20Rik	2.653781705	4.16E-86
Grem1	2.64943111	9.74E-67
B430010I23Rik	2.625369053	6.42E-34
Slc35f2	2.622632599	4.55E-91
Dgkk	2.622292756	1.40E-64
Zic5	2.577549297	6.84E-80
Calml4	2.562695246	1.14E-35
Cd40	2.562176222	6.31E-140
Ablim2	2.516851242	2.61E-41
Hoxb9	2.466652086	3.72E-11
Cyp26b1	2.466204205	2.11E-163
Gm2694	2.445497016	1.24E-45
Zic2	2.423153306	3.40E-103
Socs2	2.412470684	1.71E-153
Adamsl2	2.398140749	1.08E-28
Nrarp	2.367460794	1.03E-57
Soga3	2.352941989	2.37E-30
Arhgap22	2.349273502	3.92E-46
Rtn4r1	2.34562488	6.94E-41
Rgs5	2.337713613	2.05E-26
Rgs9	2.320347871	2.64E-62
Peli3	2.308118753	4.47E-29
Vax2	2.300839768	1.23E-20
Rnf125	2.288906756	2.02E-37
Vax2os	2.286540312	2.62E-34
2610528A11Rik	2.279784918	3.91E-38
Vegfd	2.259257619	1.47E-89
Slc1a3	2.256601447	2.27E-45
Gata6	2.256406757	2.54E-15
Oasl2	2.240968317	1.39E-35
Ccdc3	2.233302004	2.93E-23
Thbd	2.231825265	6.35E-27
Rbfox3	2.20997374	2.22E-41
Hoxd11	2.202584341	6.21E-117
Fam163b	2.18004796	1.56E-43
Wnt5a	2.178610912	7.92E-100
Spry1	2.176669676	9.52E-69
Rnf39	2.15526363	3.52E-29
Lama1	2.151759887	7.03E-96
Sgms2	2.148272971	3.89E-50
Greb1	2.135438937	2.73E-122
Klf9	2.122817096	9.58E-29
Gm13032	2.112139736	1.95E-28
Jazf1	2.101543657	2.40E-41
Insm1	2.087268847	2.09E-27
Mid1ip1	2.08303659	6.73E-93
Msx1	2.07845138	1.89E-64
C77370	2.072691844	1.75E-34
Epha1	2.071752012	1.57E-86
Gcnt4	2.05474304	4.78E-55
Optn	2.049451754	2.72E-40
Crmp1	2.037484994	8.21E-28
Card10	2.018962848	2.37E-30
Ajap1	2.016057628	4.90E-35
Msx1os	2.016052217	4.39E-71
Sp8	2.01558928	3.32E-27
Rapgef3	2.005639897	1.35E-24
Sernc5	2.001531472	7.62E-126
Clstn2	1.987788748	1.57E-26
Sltt3	1.986298672	4.41E-96
Epha4	1.986144727	6.05E-77
Steap3	1.981922929	6.05E-27

Mmp25	1.97409938	5.29E-26
Ptch2	1.970450168	2.61E-92
Hspb8	1.969834427	7.35E-53
Lgals12	1.967392869	6.44E-29
Hoxa11os	1.965713067	3.58E-51
Tlap2a	1.959882472	1.66E-42
Gjb2	1.948273532	1.35E-31
Ano1	1.94660732	1.70E-28
Enpp1	1.895717431	3.44E-20
Tnc	1.890015437	2.24E-06
Nid1	1.875235601	1.55E-99
Elmod1	1.869769093	8.09E-18
Lax1	1.863682586	4.95E-27
Lmo1	1.858513589	8.28E-15
Daam2	1.850974628	6.01E-101
Padi1	1.827677447	1.62E-19
Lrrc75b	1.817971169	1.57E-23
4930487H11Rik	1.81550506	1.46E-15
Nrp2	1.787951925	9.87E-72
Mdga1	1.76290626	6.83E-40
Grpp1	1.746496615	2.58E-18
Nap1l5	1.743657373	2.24E-41
Iitga8	1.725949014	2.42E-78
Vsir	1.716629338	7.43E-16
Fzd10	1.714343061	1.16E-25
Nrgn	1.713922324	1.93E-23
Dock6	1.711962483	1.24E-50
Slc27a6	1.710404646	9.73E-45
N4bp3	1.701908431	8.65E-73
Bmp2	1.701297121	2.17E-10
Tnfrsf12a	1.699507475	1.55E-26
Gata5	1.692270274	1.31E-05
Slc7a5	1.687695331	1.43E-27
H2-Q7	1.686803211	4.85E-57
H2-Q9	1.685743374	4.61E-57
Rrad	1.684415138	5.19E-32
Msi2	1.68128483	2.42E-78
Pam	1.681033136	7.34E-57
Etv4	1.668785224	5.56E-41
Slco4a1	1.667933275	5.36E-16
Mtss1	1.660866865	8.76E-49
Aifm3	1.659916967	5.75E-19
Gm26688	1.658005196	1.64E-19
Sall4	1.651411687	4.96E-19
Frem1	1.649527452	4.01E-44
Rhof	1.648081686	1.70E-16
Cyp1b1	1.643312038	4.51E-19
Tagln2	1.628779203	4.20E-28
Ppp2r2b	1.625640716	1.38E-05
Has2	1.620094166	1.30E-69
Ets2	1.619244819	2.94E-73
Hs3st6	1.609809769	1.35E-22
Unc5b	1.605904924	4.24E-65
Slc16a6	1.601759795	5.12E-35
Slc25a33	1.597420621	3.95E-67
Kih14	1.5904452	1.33E-19
Prickle1	1.581329389	9.42E-37
Slc2a3	1.581151417	1.55E-35
Mesdc1	1.579415851	1.91E-81
Dusp6	1.57826443	2.33E-36
En1	1.577915081	9.07E-06
5033428I22Rik	1.567928675	1.00E-15
C030037D09Rik	1.562637993	1.95E-13
Nxn	1.554214355	5.38E-65
Tmem173	1.552793551	6.45E-91
Ptxna4	1.548099515	7.64E-31
Sox18	1.547314189	1.19E-11
Ceacam1	1.543757836	1.44E-10
Hapln1	1.539033928	2.06E-17
Hand2	1.538520188	1.83E-49
Hlx	1.537077134	2.50E-06
Cecr2	1.527883311	1.58E-92
Col13a1	1.526948192	1.01E-18
Kitl	1.52307759	1.59E-12
Arhgap9	1.521084962	5.26E-25
Tbx6	1.504429161	7.35E-05
Sh3rf3	1.50378598	5.88E-11
Gnai1	1.503354338	3.68E-73
Gatsl3	1.500565568	2.19E-11
Ankrd6	1.500222606	4.24E-68
Kcnab3	1.488124014	6.73E-18
Aim2	1.483845116	2.18E-10
Kank4	1.481853178	9.89E-91
Gfra3	1.472653529	4.40E-12
Enpp2	1.471347515	6.42E-28
Plaur	1.471269758	5.36E-16
Svep1	1.471135001	1.18E-14
Dync111	1.469656843	2.68E-26
Hoxd10	1.460137024	3.66E-44
Fgf10	1.458057181	8.33E-40
Mapk11	1.457901539	2.45E-42
Il17rd	1.453022954	7.02E-70
Thbs4	1.439071131	2.78E-05
Slc4a4	1.437578202	3.29E-76
Mmp17	1.436827615	1.93E-32
Vwa2	1.431353129	1.43E-08
Styk1	1.427087498	9.95E-14
Maff	1.423315327	1.34E-17
H2-Q5	1.419151678	8.79E-10
Dysf	1.418375906	3.39E-35
Mycn	1.418361806	1.90E-28
Slc16a2	1.415588747	2.26E-43
Iitga1	1.411072631	3.69E-18
Pear1	1.409505782	9.78E-39
LOC100503496	1.407670828	8.25E-16
Fam169b	1.405153671	9.48E-14
Hoxc8	1.393217274	0.000178434
Fgd3	1.383727763	1.67E-11
Cited1	1.383096042	3.39E-20
Cygb	1.381779729	7.67E-15
Hey2	1.373905206	1.27E-08
Lor	1.368333405	3.96E-22
Map1b	1.360699896	3.74E-25
Dll1	1.358172524	0.022142172

Dmrt2	1.351721323	2.31E-22
Ctsc	1.3332027	7.42E-33
Tmc7	1.328128885	3.90E-39
Frdm4b	1.323670725	1.22E-34
Hes7	1.302668603	8.66E-10
Ttyh2	1.298702772	2.82E-37
Aspg	1.29596671	4.71E-08
Cdk6	1.29515417	1.93E-58
Trim71	1.286618177	1.34E-41
Lrrtm4	1.285581019	1.08E-06
B830017H08Rik	1.285302648	1.75E-09
Eps8	1.275552772	5.36E-16
Tcf7	1.263551044	3.12E-24
Ifitm1	1.262648832	8.73E-16
Eva1a	1.258798334	7.58E-15
Heg1	1.258363821	1.82E-32
Fbln7	1.255673546	1.35E-12
Nim1k	1.253392572	1.09E-20
Apba2	1.248765443	5.58E-25
Rpph1	1.248162683	6.41E-08
Bambi	1.245468165	2.12E-23
Has2os	1.245048687	6.19E-13
Shb	1.24501978	2.64E-43
Adora2b	1.244093756	7.49E-21
Saa2	1.24111737	2.46E-12
L1td1	1.240025601	8.75E-07
Lhx2	1.236759756	9.55E-15
Cgln1	1.236325092	1.13E-43
Ptch1	1.235240018	7.80E-37
Dkk1	1.232389283	4.02E-16
a	1.230043984	2.92E-19
Vcam1	1.222661657	8.98E-67
Tbrg3	1.220160712	2.38E-07
Klf6	1.218405852	9.25E-08
Kcnma1	1.2177178	3.31E-14
Gm10409	1.214836005	8.10E-10
Sema4d	1.213904855	1.19E-27
Crb2	1.212510231	6.90E-08
Kbtbd11	1.207661763	8.58E-33
Sash1	1.206531209	5.38E-40
Tfeb	1.20590446	2.23E-14
Tril	1.203503466	6.91E-31
D930048N14Rik	1.203232515	7.32E-10
Lfng	1.202191696	4.01E-13
Ubash3b	1.200715444	1.01E-31
Lhfp	-1.201511065	1.46E-08
Slc2a10	-1.204835363	4.09E-14
Tnnt1	-1.204975054	0.000219656
Trhde	-1.206961537	2.27E-05
Heyl	-1.207574519	9.41E-07
Vgll2	-1.207826074	0.000770724
Lrrtm1	-1.208721964	9.75E-05
Olfml1	-1.208798423	8.67E-21
Tex15	-1.210546009	2.03E-09
Slit2	-1.211032591	4.83E-10
septin 4	-1.211061674	4.40E-07
A730020E08Rik	-1.211241653	1.90E-06
Sesn3	-1.211887885	1.69E-23
Dpysl4	-1.213532809	2.58E-18
Xpnp2p2	-1.213920056	3.18E-06
Scamp5	-1.2139266	1.78E-11
Crnde	-1.215037143	0.024076468
Ube2l6	-1.215502603	0.000432088
Gsap	-1.218414218	2.07E-05
Cd83	-1.22052389	1.14E-07
Olfm2	-1.222284672	2.55E-05
Epha3	-1.223273994	2.16E-10
Tmem200c	-1.225003422	3.49E-08
Gpr156	-1.225234439	8.37E-07
Sobp	-1.225568839	1.02E-20
Ica1	-1.225807613	1.77E-15
9030612E09Rik	-1.226186947	2.00E-06
Dpep1	-1.227041076	9.07E-06
Mc4r	-1.227168911	7.67E-06
Pde1b	-1.228613351	5.05E-08
Map3k9	-1.229836531	2.13E-13
Prob1	-1.230214378	0.000126329
Pdpn	-1.231261154	9.06E-10
Sema3a	-1.231575509	2.00E-13
Galnt16	-1.232224606	7.53E-12
Meioc	-1.232266503	6.19E-05
Arnot	-1.232326207	9.58E-29
Dzip1	-1.233350972	9.33E-16
Plekhb1	-1.233678261	3.71E-06
Hmgcs2	-1.234204266	3.97E-05
Rin2	-1.234570642	1.95E-21
Sgcd	-1.236271009	4.27E-14
Pak3	-1.238421434	1.93E-18
Cd300a	-1.238618166	0.000759288
Mrl1	-1.238670207	1.41E-07
Hoxb6	-1.240242318	0.02836073
Fras1	-1.240947212	4.51E-10
Syt16	-1.241377217	3.06E-07
Speg	-1.242678014	1.48E-23
Fgd4	-1.243505604	2.23E-10
Robo1	-1.243778685	2.70E-24
Cadm4	-1.244561234	8.77E-18
Susd5	-1.244575605	7.51E-06
Axl	-1.247031336	1.45E-23
Cntn1	-1.248499536	4.04E-07
Gsc	-1.248701208	4.21E-09
D430041D05Rik	-1.249286278	7.57E-10
Rab40b	-1.249584484	3.10E-06
Zmat1	-1.251295107	8.62E-09
P2ry1	-1.251752309	7.34E-06
Manba	-1.252820611	8.45E-10
Rnf144b	-1.253625463	6.54E-07
Cdo1	-1.254968981	9.09E-08
Mboat1	-1.255394116	1.00E-09
Sfmbt2	-1.25626107	7.61E-07
1810011O10Rik	-1.256306926	1.20E-06
Pcdhb7	-1.25896012	1.88E-08
Tap1	-1.259245869	4.41E-08
Dusp10	-1.259266972	4.18E-10

Zpld1	-1.259478109	2.79E-06
Gpr137c	-1.261707218	1.27E-08
Gpr85	-1.262961427	4.39E-07
Mfcd6	-1.263408463	8.20E-06
Egflam	-1.263939192	1.38E-28
Abim1	-1.264807051	1.06E-31
Me1	-1.264994421	1.08E-12
Selenbp1	-1.267381581	2.18E-13
E130310I04Rik	-1.267739384	2.44E-05
Podn	-1.267913834	2.66E-07
Fam151a	-1.269352982	5.86E-11
Samd4	-1.269914971	7.92E-20
Fos	-1.271373409	0.002947846
Cd82	-1.271386638	2.25E-12
Fut4	-1.271704429	1.27E-11
Nxnl2	-1.272934499	0.000173812
Rap1gap	-1.273044346	1.87E-10
Nefl	-1.273360332	0.000247919
Unc80	-1.275928002	0.006926632
Glrb	-1.278386099	4.71E-25
Arhgef16	-1.27869444	3.45E-11
Sema3c	-1.27905713	1.91E-08
Serping1	-1.27992703	2.44E-13
Pkdcc	-1.281378391	0.003738333
Zdhhc2	-1.281598259	1.62E-12
Zfx3	-1.285342464	1.48E-08
Pcsk5	-1.286718225	8.56E-19
Nog	-1.287065536	8.47E-07
Zfp72	-1.287462096	1.43E-09
Fam181b	-1.288358531	2.07E-13
Rpm	-1.288940243	8.60E-08
Pax7	-1.289018523	0.010186916
Cdh6	-1.289040876	1.37E-20
Dusp15	-1.289977073	1.00E-07
Nol4	-1.290179315	1.04E-05
Dcaf12l1	-1.290243879	1.57E-13
Hoxc6	-1.290781738	0.000359844
Dock10	-1.290916076	3.57E-11
Lgr4	-1.290949829	1.42E-30
Nr2f2	-1.291060929	1.95E-41
Pou3f3	-1.291130976	1.53E-08
Ociad2	-1.291663988	1.02E-10
AW551984	-1.292866478	3.42E-06
Rarres1	-1.294716648	5.93E-05
Efnb2	-1.297115905	5.19E-16
Mir5130	-1.301808087	8.76E-06
Pstpip2	-1.304253732	9.80E-12
Atp9a	-1.304332273	2.14E-25
Maob	-1.305803337	7.80E-08
Map7d2	-1.310660437	2.01E-11
Wif1	-1.310961674	1.99E-09
Fil1	-1.311761052	1.61E-30
Fam219a	-1.311881127	1.50E-09
Sema3b	-1.314583765	1.52E-10
Large2	-1.314604152	3.73E-20
Mdfic	-1.316268494	1.15E-19
Msrb3	-1.319354201	2.30E-25
Efna5	-1.320439602	1.52E-18
Extl1	-1.322627324	1.30E-05
2810468N07Rik	-1.324535316	3.21E-08
Ccdc80	-1.325125799	2.39E-19
1700020L24Rik	-1.329566823	6.83E-07
Nipal2	-1.329863375	1.50E-05
Tmem63a	-1.330065151	1.75E-12
Dtx4	-1.331748156	2.24E-10
Lgi1	-1.331892231	0.000155928
Nap112	-1.332604878	7.01E-06
Id2	-1.332794844	7.12E-31
Enpp4	-1.333979911	9.02E-22
Smpd3a	-1.335316608	1.58E-13
Cdkn2c	-1.337309333	2.59E-10
Adgrb2	-1.339525599	1.79E-09
Adams7	-1.340133855	9.27E-27
Gm2a	-1.343485909	4.09E-13
Slc5a7	-1.345188188	2.02E-05
Sspn	-1.348057253	4.08E-14
Ap3m2	-1.348318893	1.79E-13
Scn3a	-1.348755017	1.54E-06
Kcnd3	-1.351512905	1.24E-05
Lgi3	-1.35217785	3.77E-06
Luzp2	-1.353116033	2.54E-05
Pik3r5	-1.354213457	1.94E-10
Col11a2	-1.356800261	0.000254555
Col4a5	-1.357216242	2.44E-19
Fndc1	-1.357381712	0.015056707
Inhba	-1.359521796	1.17E-05
Dab1	-1.36025991	1.63E-08
Tspan11	-1.360648585	5.55E-21
Eli2	-1.361518989	1.12E-06
Slc40a1	-1.363210211	4.14E-06
Cpa4	-1.363836927	8.80E-08
NA	-1.364997299	5.18E-07
Glis1	-1.365068947	3.30E-13
Kcng4	-1.368271401	2.84E-13
Abca8b	-1.369379547	1.88E-15
Adrg2	-1.370290575	3.68E-06
Sema4f	-1.37048844	1.49E-15
Arhgef28	-1.374399266	2.69E-11
Ephb1	-1.375104538	4.33E-05
Mme	-1.376219334	4.35E-20
Podhb18	-1.377020742	1.90E-09
Bmx	-1.377306613	0.00128202
Tll1	-1.378703601	6.81E-18
Rgs8	-1.378838878	3.52E-06
Rusc2	-1.379603684	7.98E-14
Pth1r	-1.37991543	9.70E-14
Sgk1	-1.381498161	4.74E-12
Gstm7	-1.382973248	7.12E-27
Erg	-1.383313279	3.02E-12
Asap3	-1.385929889	2.76E-13
Lsmp	-1.386363009	8.49E-09
Arhgap18	-1.388275089	5.13E-20
D630003M21Rik	-1.389756924	8.79E-16
Dpyd	-1.389939435	2.13E-17

Dach1	-1.390194578	4.95E-27
Ccdc149	-1.393978936	5.52E-09
Tmtc2	-1.395560475	2.44E-25
Wfikkn2	-1.395883251	6.23E-12
Tead4	-1.398656031	1.37E-09
Ppp1r36	-1.399500426	1.11E-09
Myog	-1.400356643	0.000171186
Vstm4	-1.400588165	4.64E-10
Rimkla	-1.401538034	7.02E-11
Tmcc3	-1.401797036	3.72E-17
Prkg2	-1.402355046	2.71E-07
Rps6ka4	-1.402949062	1.61E-14
Uncx	-1.407110056	6.39E-06
Actc1	-1.407114419	2.43E-06
Pitx3	-1.40736169	0.000206658
Jade2	-1.409670817	1.31E-07
Hoxb5	-1.410480366	0.021652401
Enpp5	-1.414317543	1.57E-12
Egfl6	-1.414646865	4.51E-07
Ppp1r3b	-1.415074027	3.29E-10
Tmem229b	-1.415564664	1.08E-07
Chst1	-1.41745509	1.86E-15
Cpxm2	-1.422177328	0.001301779
Scube3	-1.423974641	8.67E-21
Pde7b	-1.425539417	9.39E-07
Layn	-1.427267359	6.05E-09
Sfrp2	-1.428042462	1.11E-27
Herc6	-1.432718466	1.05E-09
Alp2a1	-1.434317292	5.42E-07
Fbn1	-1.434804991	1.40E-15
Sowahb	-1.435538304	2.61E-05
D930020B18Rik	-1.435806399	1.20E-06
Myf9	-1.436612902	4.81E-10
Igfbp5	-1.436619178	0.000991746
Kcnb1	-1.437261169	1.46E-05
Foxp1	-1.438295865	1.40E-10
Nrk2	-1.439378098	1.11E-05
Sic22a23	-1.440147609	5.86E-24
Sic14a1	-1.441174358	0.027233968
Plagl1	-1.441385551	1.61E-11
Trim12c	-1.442555624	2.35E-12
2900011O08Rik	-1.444624886	5.04E-20
3110039108Rik	-1.44495664	1.88E-06
Lrrc7	-1.445029458	0.005765106
Tmem132e	-1.448117701	0.005998165
Nedd9	-1.45116257	5.87E-16
Aass	-1.45150126	2.35E-19
Zcchc24	-1.457052204	3.46E-29
Thbs2	-1.457307905	1.49E-08
Galnt18	-1.459392597	6.20E-09
Firt2	-1.462277317	2.61E-32
Thsd7a	-1.463213811	3.45E-11
Fmod	-1.464743989	9.84E-07
Acot11	-1.465427144	1.24E-21
Glis3	-1.469634321	9.15E-12
S1pr3	-1.469654884	1.17E-20
Cdkn1c	-1.470010483	1.17E-47
Ldlrad4	-1.471236125	2.89E-09
Colgalt2	-1.471722735	9.32E-07
Plezo2	-1.472446611	2.32E-07
Sic2a12	-1.474446889	1.06E-12
Nhsf2	-1.47667058	1.32E-17
Nkain4	-1.477106908	1.33E-10
Cplx2	-1.481328192	2.85E-55
Sh2d5	-1.483912749	5.22E-21
Islr	-1.48600752	1.76E-19
Sico3a1	-1.486876079	1.07E-27
E330013P04Rik	-1.491154316	1.88E-05
Eda	-1.491881485	1.58E-18
Rnf150	-1.494008769	1.10E-19
Irx3	-1.494267911	0.013054338
Mab2111	-1.494511488	5.41E-25
Elf3	-1.495339241	1.17E-11
Kcnn3	-1.498504337	4.00E-11
Mgst1	-1.500052858	2.37E-24
Epha6	-1.503443895	6.36E-05
Sico5a1	-1.504966113	1.02E-11
Pld2	-1.505548834	7.98E-09
Scn9a	-1.506201152	8.91E-10
Gstt3	-1.507572131	2.19E-09
Rgma	-1.508167042	6.32E-36
Dsg2	-1.512790587	1.83E-07
Mmp28	-1.513404295	0.039192598
Fat3	-1.514631595	8.22E-11
Gria3	-1.52036014	8.49E-07
Dkk2	-1.520845358	1.04E-05
Arhgef26	-1.521726051	4.93E-18
Dlgap1	-1.52298798	4.51E-06
Bves	-1.523962029	1.43E-14
Hpse	-1.524815793	1.67E-14
Ryr2	-1.533571065	6.80E-06
Tmem8	-1.534978275	3.93E-12
Rasl10b	-1.535449301	2.20E-15
Trpm6	-1.53803768	4.58E-09
Myc	-1.538379963	2.01E-11
Vstm2b	-1.538419417	0.000240377
Nrxn1	-1.53961155	2.66E-08
Npr1	-1.541467845	4.79E-07
Rab27b	-1.542726078	6.17E-09
Pou2f2	-1.54474031	3.70E-20
Lgr5	-1.544860964	1.09E-13
Dgki	-1.548275085	1.18E-09
Stk32a	-1.548324023	2.17E-06
2500004C02Rik	-1.549621289	2.22E-13
Rgs16	-1.551902547	4.01E-07
Add2	-1.553390051	1.99E-12
Dner	-1.553471774	7.44E-10
Aig1	-1.556839587	2.07E-12
Robo2	-1.55875202	4.16E-18
Sult5a1	-1.558753099	1.21E-10
Zcchc12	-1.561025295	1.14E-16
Hoxc5	-1.561725412	0.008915901
Gdf5	-1.562046367	1.05E-10
Glrx	-1.564852231	1.62E-24

Kcnk6	-1.566084545	6.26E-11
Rag1	-1.566523128	7.69E-06
Slc2a13	-1.567281927	1.73E-08
Slc4a1	-1.568350121	0.045797261
Spp1	-1.572713423	1.67E-05
Kcne1l	-1.573767468	3.47E-08
Wfdc2	-1.578838374	7.98E-22
Chst11	-1.579641882	1.95E-16
Ppp1r16b	-1.580832666	1.62E-09
Fxyd1	-1.582772376	1.16E-12
Mxd4	-1.583897706	1.70E-29
Smoc2	-1.586105064	7.63E-05
Sl6galnac5	-1.590967645	5.32E-09
Tbc1d30	-1.591149345	2.01E-07
Cyr61	-1.595883795	3.24E-06
Six2	-1.596810869	8.81E-15
Nfe2	-1.597244738	1.53E-09
Wisp1	-1.602145272	2.89E-07
Rarb	-1.603411237	4.93E-05
Tnik	-1.606719591	3.23E-10
Slc25a23	-1.608284963	1.12E-49
Fgfr3	-1.612390915	2.68E-14
Cpne8	-1.613828256	5.70E-08
Ebf1	-1.616524588	9.62E-18
Nod1	-1.618944662	1.29E-05
Cntfr	-1.619877007	1.58E-11
BC064078	-1.622576677	4.37E-08
Ppp1r1a	-1.622743288	8.94E-16
Fam46c	-1.624658175	3.24E-11
Myf5	-1.627384205	0.000288775
Myo5c	-1.628344493	1.00E-07
Sor1	-1.633123672	8.98E-12
Kctd12	-1.635863919	1.93E-15
Csmp3	-1.636592453	4.48E-26
Gimap6	-1.636716233	4.60E-12
Hoxc4	-1.637096738	0.000245471
Ngf	-1.637760588	1.52E-09
Sox10	-1.642163569	8.56E-06
Pbx1	-1.642597493	6.17E-27
Cd200	-1.643426537	1.04E-08
Gprc5c	-1.64562392	1.83E-25
Lrrm1	-1.646860717	4.44E-36
Meox2	-1.64791237	2.33E-13
Ldb2	-1.64998608	3.87E-42
Mvb12b	-1.650133726	3.91E-38
Prkch	-1.650743317	1.11E-17
Apobec3	-1.651188907	2.79E-26
Adams9	-1.654047507	5.34E-07
Tubb4a	-1.656150415	9.54E-21
Foxd1	-1.659302781	2.99E-06
Boc	-1.659465089	1.28E-36
Edil3	-1.662025127	9.98E-08
Sorcs2	-1.663052512	6.05E-45
Sostdc1	-1.664702163	1.77E-09
Car11	-1.664874862	2.06E-14
Gstt1	-1.667565771	3.50E-13
Fbx16	-1.66791319	5.97E-26
Fam160a1	-1.668101974	7.65E-13
Vat1l	-1.669033217	6.63E-11
Chrb1	-1.669355911	1.07E-07
Edn3	-1.671585025	9.44E-35
Anxa2	-1.672036597	1.42E-08
Jph2	-1.673344237	3.46E-26
Stom	-1.674041142	3.43E-21
Nav3	-1.677264898	3.81E-07
Chrm4	-1.682241723	5.86E-18
Parm1	-1.683637337	5.58E-05
Ntng1	-1.68638111	2.81E-17
Spint2	-1.687287742	1.00E-33
Col6a6	-1.689628165	9.85E-08
Gas2	-1.693154416	3.73E-44
Sox9	-1.694022574	5.05E-21
Trp53inp1	-1.695028331	4.80E-46
Nbl1	-1.697814914	3.22E-13
Plekha4	-1.698533244	4.24E-07
Ntf3	-1.699139149	5.75E-17
Col8a2	-1.699237945	2.79E-07
Gpc4	-1.699783575	1.62E-30
Ssc4d	-1.70232715	3.85E-15
Wscd2	-1.702653706	6.45E-13
Loxl1	-1.705296552	3.18E-19
Al464131	-1.711132722	1.35E-14
Lrrc17	-1.713546599	5.92E-37
5930403L14Rik	-1.714040333	7.52E-42
Magel2	-1.717471798	1.96E-07
Stra6	-1.719990185	9.31E-31
Col15a1	-1.720915859	3.04E-08
Enho	-1.721416462	1.62E-18
Tmem200a	-1.721521963	6.78E-09
Vwce	-1.724405217	3.16E-21
Fez1	-1.728045773	3.22E-14
Synpo	-1.728705877	1.85E-29
Nfasc	-1.729338182	6.58E-11
Crhbp	-1.729629938	2.44E-06
Lhfp1	-1.72971352	7.53E-12
Gabra3	-1.731051696	8.18E-15
Plat	-1.731140039	1.84E-12
Pax9	-1.732946071	7.40E-08
Olfml2a	-1.733247739	4.71E-11
Alox5ap	-1.734776774	2.50E-14
Fgf5	-1.735329351	1.29E-10
Otor	-1.7372486	1.34E-10
Astn1	-1.737900413	7.50E-48
Hhip	-1.742382513	1.74E-13
Car8	-1.74305647	1.09E-11
Npdc1	-1.747176247	2.09E-11
Spock1	-1.748879005	3.67E-08
Irx5	-1.754899696	0.002250695
Pbx3	-1.757969053	1.43E-52
Myof	-1.768271762	1.46E-09
Fcgrt	-1.772618537	7.60E-23
Abca3	-1.775308718	3.99E-53
Ebf4	-1.776810025	1.56E-10
Hoxb2	-1.778824574	3.20E-11

Lrrc3b	-1.78593878	5.98E-08
Ogn	-1.785970631	3.33E-08
Fhl2	-1.787391947	1.34E-06
Mbp	-1.788345733	3.49E-14
Cyp7b1	-1.789768551	4.46E-11
Cspg4	-1.791341838	8.89E-18
Wipf3	-1.795930795	6.99E-12
Epb414a	-1.800419657	5.14E-27
Fam84a	-1.800443812	7.46E-10
Runx1	-1.800732553	2.03E-11
Itga4	-1.801215829	5.96E-23
Cellf2	-1.802621764	1.06E-47
Panx2	-1.804305903	7.20E-11
Cxcr4	-1.805082936	1.93E-05
Acss3	-1.805245698	3.88E-16
Sirpa	-1.805445161	1.48E-38
Slt1	-1.808242077	5.27E-11
Zfp663	-1.811091663	1.73E-23
Dpp6	-1.811794425	3.10E-14
Hist3h2ba	-1.813336777	4.69E-08
Map2	-1.814798185	3.86E-27
Bnc2	-1.823329262	4.08E-18
Spata18	-1.823867841	1.63E-05
Ctnnap2	-1.827362718	1.16E-17
Ephx1	-1.828413552	1.61E-15
Itgb8	-1.828549032	7.85E-12
Unc5c	-1.83043026	2.97E-12
Mylk	-1.83086328	8.95E-19
Mam1d1	-1.831104971	2.87E-13
Cdh15	-1.832584962	1.82E-12
Angptl1	-1.832658347	1.10E-13
Kcnh2	-1.837626589	1.62E-30
Kcnd2	-1.843423347	6.28E-08
Trpm5	-1.844005054	8.80E-11
Shox2	-1.844484693	3.32E-28
Nt5e	-1.844722266	6.81E-06
Mcf2l	-1.845984578	1.38E-14
Hoxb3	-1.849190533	7.53E-05
Grb14	-1.849909926	7.49E-20
Ptger4	-1.850010403	6.72E-08
Top11l2	-1.85117042	3.51E-16
Gabra2	-1.851651151	2.30E-08
Chrdl1	-1.852258472	7.59E-32
Fam189a2	-1.855829685	1.13E-17
Fam114a1	-1.855836842	5.88E-53
C330018D20Rik	-1.857025828	3.70E-22
Tmem26	-1.861590048	5.45E-28
Shisa7	-1.861919893	0.000258086
Cyp2s1	-1.866662849	2.08E-09
Adamts13	-1.868119152	0.000106881
F930015N05Rik	-1.869787551	5.09E-16
Lrrc8b	-1.870838472	1.07E-53
Mmp11	-1.879388388	9.88E-45
Scx	-1.879547991	5.99E-37
Fgfr2	-1.880442277	1.16E-18
Dnm3	-1.882788989	8.08E-16
Gm15663	-1.88605958	6.72E-12
Nfix	-1.885103561	3.57E-09
Chchd10	-1.890409407	3.04E-19
Nr4a3	-1.890569309	6.25E-09
Sema6a	-1.904356475	4.25E-32
Fzd8	-1.906698089	6.14E-20
Rassf4	-1.907689636	5.90E-19
Ank1	-1.91050709	1.38E-06
Gbp7	-1.911016682	3.61E-15
Tgfa	-1.911132554	3.77E-14
B130024G19Rik	-1.91587379	8.10E-13
Ltbp4	-1.920192054	1.06E-46
Maf	-1.927629318	8.49E-26
Reps2	-1.931348071	1.15E-12
Sned1	-1.936303729	4.25E-08
Zeb2	-1.936340747	2.50E-27
Pcdh19	-1.940033882	4.03E-37
Pdzrn4	-1.944756515	9.79E-08
Cr2	-1.946206635	9.00E-11
Prkcb	-1.949797261	1.70E-25
Sl8sia4	-1.952588071	5.80E-17
Camk2a	-1.954446129	7.45E-25
Dcdc2a	-1.956363868	2.92E-13
Rph3al	-1.959087991	4.72E-14
Slc35f1	-1.962400927	3.90E-24
Pygl	-1.970963209	1.60E-39
Tmem35a	-1.971331281	5.73E-27
A730056A06Rik	-1.984323335	2.48E-16
Rgcc	-1.984501209	3.71E-11
Hcn1	-1.985882872	1.41E-09
Sstr1	-1.986828821	1.21E-13
Aldh1a2	-1.987478294	1.21E-06
Synpo2l	-1.994387975	5.46E-12
Zmat4	-1.995625848	4.90E-10
Rec8	-1.998307815	8.21E-11
Mstn	-1.998680439	8.15E-05
Tcf15	-2.010106613	1.86E-29
Epha7	-2.011271172	3.34E-48
Rab32	-2.016464037	2.30E-16
Mpzl2	-2.016895599	8.25E-27
Ypel2	-2.017996439	4.96E-19
Egtem1	-2.023625424	5.71E-05
Ebf2	-2.023825638	1.33E-14
Pamr1	-2.025102786	3.01E-12
Cntn3	-2.029057288	1.72E-16
Megf10	-2.030205915	1.10E-13
Dtx1	-2.030736218	1.87E-18
Maml2	-2.03276493	2.41E-37
Zfr2	-2.03865872	2.77E-09
Meis2	-2.040035018	2.91E-05
Prss23	-2.042221247	7.76E-20
Hs3st1	-2.045288097	2.95E-11
Ube2ql1	-2.049085177	1.16E-09
Hs3st3a1	-2.053358018	1.39E-14
Srgap3	-2.054736892	2.80E-48
Dcc	-2.0571808	2.11E-12
Srcin1	-2.058176681	2.57E-16
Plk2	-2.059280423	1.42E-14

Foxp4	-2.059981245	3.90E-75
Dtna	-2.061872787	6.67E-16
Espn	-2.062665782	1.73E-14
Hoxb4	-2.063399355	0.000538724
Apc2	-2.067962314	4.90E-18
Tgm2	-2.076818525	1.16E-08
Rhoj	-2.083927138	1.70E-26
Palmd	-2.088075802	1.07E-13
Dab2	-2.091087209	4.13E-26
Meis1	-2.093809718	7.76E-07
Npnt	-2.093813002	8.05E-33
Hbb-y	-2.095915031	0.062563857
Negr1	-2.098706119	3.56E-14
Ppfa2	-2.098950063	5.46E-10
Pax3	-2.099590444	7.42E-05
Dact1	-2.102558651	2.36E-21
Prr16	-2.1060695	1.53E-13
Cdon	-2.124402304	1.38E-37
Myod1	-2.125403661	2.97E-11
Ddit4	-2.131119148	3.52E-27
Hba-x	-2.133918965	0.075467395
Hba-a1	-2.135520775	0.034843608
Hba-a2	-2.135633012	0.034843608
Vepf1	-2.14104114	3.51E-11
Doc2b	-2.142543076	3.64E-08
Vgll3	-2.147280841	6.23E-14
Hs3st3b1	-2.161518939	3.52E-29
Cthrc1	-2.164787071	8.39E-12
Esrg	-2.164939704	2.53E-16
Bdnf	-2.174431077	3.20E-10
Gxyl2	-2.176890376	2.87E-22
Lurap1	-2.178281233	1.84E-13
Tbx18	-2.180277307	1.93E-25
Tmem132d	-2.182960211	2.34E-17
Psd2	-2.203286887	8.15E-17
Pgf	-2.205042461	2.42E-30
Rasa4	-2.205706335	6.31E-11
Adam12	-2.209205267	3.75E-26
Adcy2	-2.212881207	1.58E-17
Mybpc1	-2.218671359	2.87E-14
Rflna	-2.220596811	6.77E-14
Wnt9a	-2.224774759	2.30E-25
Pice1	-2.228617203	8.46E-58
Ebf3	-2.234607524	4.27E-24
Kctd8	-2.236330903	1.18E-16
Fgf9	-2.237763608	1.22E-21
Fgfr4	-2.246477757	1.52E-23
Tgfb2	-2.248614125	6.32E-24
Creb5	-2.254010723	6.10E-12
Foxc1	-2.26128837	2.02E-15
Kirrel3	-2.267834534	1.14E-15
Tle2	-2.27101909	2.79E-10
Tox	-2.272872838	5.91E-18
Egr2	-2.275933475	0.000213282
Cav1	-2.281460134	5.40E-17
Z810442N19Rik	-2.285158125	2.18E-19
Calb2	-2.291848832	4.15E-06
Mgat4c	-2.295342146	5.73E-10
Ror1	-2.297879259	4.24E-11
Pls1	-2.298779127	9.48E-34
Pappa	-2.306086327	4.86E-12
Hpgd	-2.30676911	1.15E-09
Atxn1	-2.312864472	7.59E-16
Cdh8	-2.315573593	1.50E-15
Tcerg11	-2.316977816	1.02E-09
Col8a1	-2.328971302	7.54E-05
Pou6f1	-2.34044199	6.56E-30
Abcg1	-2.343644968	9.67E-27
Scm1	-2.353199802	2.20E-26
Zfx4	-2.367650495	6.62E-25
Pcdh11x	-2.37021098	4.63E-16
Dcx	-2.380482818	1.17E-61
Barx2	-2.393640708	5.56E-11
Eya1	-2.405297392	1.03E-14
Mtus2	-2.435785288	1.04E-16
Limch1	-2.439168429	4.20E-43
Matn4	-2.441559886	0.020772322
Osr2	-2.441853225	6.40E-35
Pfcl1	-2.443122267	3.33E-19
Z610316D01Rik	-2.444310584	5.96E-20
Mcam	-2.460430672	2.94E-44
Syt13	-2.46322998	1.25E-14
P4ha3	-2.464395342	6.27E-16
Sdpr	-2.485971874	4.84E-13
Fam107a	-2.489779455	3.23E-14
Col12a1	-2.496200218	2.22E-13
Pcdh8	-2.497918428	0.000120323
Egr1	-2.509388467	9.18E-06
Col9a3	-2.510461255	1.31E-14
Sulf1	-2.532619015	1.22E-18
Artn	-2.534710795	3.56E-27
Crym	-2.540584407	1.17E-11
Pde9a	-2.54084899	8.34E-34
Lmcd1	-2.542109681	1.75E-17
Fam19a2	-2.544500272	2.28E-24
Zfp804a	-2.554276832	3.87E-09
Sim1	-2.577653223	1.74E-13
Bmf	-2.581508512	7.13E-54
Pitx2	-2.586553911	9.22E-06
Fst	-2.598381119	9.93E-20
Grem2	-2.609517518	4.99E-14
Lbp	-2.618865707	3.34E-26
Nr2f1	-2.618970293	1.72E-09
Ccdc85a	-2.627952116	2.25E-17
Adams16	-2.630028507	1.91E-20
Myh14	-2.640365073	6.15E-13
Wnt16	-2.643478261	1.39E-22
Slitrk6	-2.668915823	6.71E-13
Emx2os	-2.670369191	1.65E-11
Egfr	-2.673981279	3.73E-14
Snap91	-2.675706572	1.12E-43
Lepr	-2.676385908	2.91E-16
A830082K12Rik	-2.678894734	5.88E-21
Ntm	-2.690133069	2.65E-18

Islr2	-2.692601374	4.43E-15
Lbx1	-2.695707653	9.35E-25
Lin7a	-2.701855937	1.07E-14
Hic1	-2.739515756	9.37E-23
Foxd2os	-2.743498754	3.32E-27
Myc5b	-2.745955476	9.76E-35
Pcdh9	-2.777834789	1.32E-19
Igfbp3	-2.807937495	5.65E-23
Cadm2	-2.817692304	2.32E-24
Fmp22	-2.825589972	3.07E-23
Msc	-2.845575754	1.14E-07
Bmper	-2.852723838	3.67E-16
Fam69c	-2.85474844	1.05E-23
Arsj	-2.867707849	2.09E-35
Nfatc2	-2.880526529	1.34E-30
Itim2a	-2.89074641	1.23E-24
Ppargc1a	-2.914466934	1.52E-71
Igf1	-2.917257011	6.24E-09
Erb3	-2.957316309	8.49E-20
Ntn1	-2.963261711	9.64E-22
Adams15	-2.96945359	1.24E-74
Lox	-3.016045183	3.35E-21
Nrk	-3.016798904	1.48E-38
Miat	-3.017070525	2.64E-10
Ackr3	-3.023388725	7.67E-27
Bmpr1b	-3.028611652	9.40E-82
Zochc5	-3.06252973	1.02E-19
Plekha1	-3.106993605	2.90E-28
Foxp2	-3.112758413	1.35E-31
Cldn11	-3.127916099	2.17E-25
Runx1t1	-3.169156909	2.64E-29
Eya4	-3.206325248	8.81E-29
Wnt11	-3.300659355	3.80E-81
Moxd1	-3.356903523	3.54E-47
Met	-3.419443521	2.25E-116
Cldn1	-3.456030914	8.35E-64
Meox1	-3.466146645	1.34E-42
Foxd2	-3.507485392	3.70E-49
Emx2	-3.534561703	1.56E-24
Dmrt2	-3.549443732	3.58E-14
Pcdh10	-3.570445489	1.46E-57
Mn1	-3.622377506	1.57E-103
Fap	-3.642607668	7.85E-16
Cxcl12	-3.64560031	4.66E-39
Col9a2	-3.666521025	6.87E-29
Agtr2	-3.681681294	1.36E-19
Gfra1	-3.802584007	2.05E-71
Z700069118Rik	-3.81543053	3.37E-32
Eya2	-3.828094194	3.95E-98
Tmem30b	-3.840272209	1.81E-68
Gria2	-3.859100368	2.56E-09
Col2a1	-3.881041052	5.54E-53
Pcdh17	-4.006698573	1.02E-102
Sim2	-4.107751566	1.01E-09
Osr1	-4.364145149	3.50E-95
Sema3d	-4.466481282	8.10E-39
Gdnf	-5.185900074	1.32E-15
Six1	-5.278123081	4.26E-140
Fibin	-5.406767581	3.91E-76

Table S4

DEGs S9 P ₂ ^{hi} E10.5-E10.75		
Gene Symbol	log ₂ FC	FDR
Dkk1	3.676229481	2.27E-146
Pax1	3.292928347	8.15E-09
Sptssb	3.242660987	2.38E-58
Rspo4	3.058428618	2.91E-32
Tbx2	2.850904197	6.24E-120
Msx2	2.731477917	1.84E-80
Shh	2.70126828	1.72E-83
Prdm1	2.518664952	1.34E-74
Tbx3	2.431553818	1.18E-50
Tmem200b	2.32049133	5.03E-54
Myh15	2.301588418	5.43E-31
Aix4	2.272147058	1.32E-34
Msx1	2.249195312	4.36E-75
Msx1os	2.229659853	9.46E-87
Zfp804a	2.208729768	7.96E-11
Cyp11b1	2.182632531	3.79E-33
Slitrk6	2.167239991	1.40E-14
Lhx2	2.142026863	7.01E-45
Pkdcc	2.094133794	5.65E-09
Gdf6	2.054074105	1.55E-18
a	2.053859867	2.38E-54
Crabp1	2.047432484	4.76E-15
Col6a6	2.045468257	4.81E-12
Aix3	2.034986836	3.68E-43
Cntrf	2.014928653	8.15E-26
Cnr1	2.006771399	1.13E-35
Ermlin2	1.996633734	2.18E-110
AW549542	1.993904303	2.18E-11
Dpep1	1.958334278	1.60E-21
Pcdh10	1.898897675	3.79E-33
Kctd8	1.877539776	1.82E-20
Cdo1	1.858900153	4.30E-22
Rxfp2	1.848062635	8.93E-06
Prrt4	1.847010562	2.74E-29
Wif1	1.834953922	1.79E-25
Col14a1	1.83385186	1.19E-05
Pou4f1	1.824386399	1.24E-12
Syt13	1.800534365	1.01E-14
Cdh6	1.780184108	1.70E-58
Osr1	1.754644071	8.09E-36
Ptprt	1.722167329	2.07E-25
Hgf	1.719978052	2.30E-26
Thbs2	1.718504508	3.77E-18
Tfap2c	1.718407468	5.66E-23
Trpm1	1.709853432	3.11E-17
Notum	1.70809666	1.24E-20
Agtr2	1.686069821	2.89E-09
Lrrtm1	1.684246959	1.59E-12
Glis1	1.67528446	6.22E-30
Prrx2	1.653421842	4.62E-50
Ednra	1.650172399	1.95E-31
Htra1	1.640916618	9.41E-11
Jam1	1.625751385	8.80E-08
Hoxb5	1.623006155	0.003548974
Tmem28	1.608753883	4.59E-23
Synpo2	1.600705713	7.03E-16
Slc6a17	1.595422164	1.53E-27
Rspo1	1.592850643	0.004913445
Itim2a	1.578826522	8.07E-13
L1cam	1.572341142	4.25E-08
Aix1	1.567349339	1.28E-07
Scube1	1.554213232	2.22E-34
Hdac9	1.54973157	6.01E-47
Sostdc1	1.5371091	3.29E-13
Ubl4b	1.536700354	7.22E-20
Olfm1	1.523571705	1.26E-25
Gata2	1.502640961	4.69E-10
Zdhhc23	1.501648046	2.03E-09
Wnt11	1.495942932	1.72E-34
Col3a1	1.492020052	3.18E-22
Shox2	1.484536282	3.12E-27
Bmp4	1.477252196	8.09E-36
Zfp503	1.46719848	9.76E-36
Acc111	1.445316357	1.01E-30
Lhx9	1.431985042	2.24E-40
Sh2d5	1.431340662	3.57E-33
Ranes1	1.418764116	1.80E-10
Aicam	1.41818733	1.46E-06
Dix5	1.410304993	1.06E-09
Kctd12	1.408700168	4.11E-16
Lhfp	1.407903335	4.72E-15
Rarb	1.402053407	4.98E-05
Prdm6	1.396770262	1.25E-12
Prrx1	1.392126354	4.27E-44
Pcdh8	1.384318482	0.021095006
Sdk2	1.376405686	4.60E-15
Hoxd9	1.375188648	7.43E-28
Igdcc3	1.372935344	3.15E-14
Zic3	1.368995035	7.29E-25
Cysllr1	1.353245503	1.88E-11
Ccser1	1.352034394	6.68E-18
Dync11i	1.349900643	3.55E-21
Cygb	1.34686425	2.17E-13
Lvm	1.343201391	3.70E-11
5930412G12Rik	1.341593936	4.44E-18
Phactr3	1.337930753	1.27E-39
Hoxc5	1.328766295	0.009858298
Adgre5	1.325600181	4.09E-13
Meis2	1.322525128	0.003045046
Pth1r	1.32075341	7.01E-17
Dlk1	1.318367168	4.00E-09
Picl1	1.315465824	1.03E-13
Mab21i1	1.304519516	3.03E-27
Mir5130	1.297200917	9.75E-09
Vegfd	1.296366008	1.23E-26
Hoxc4	1.290684895	0.000888048
Fam151a	1.288847849	2.09E-16
Hoxb6	1.287677002	0.016994888
A730020E08Rik	1.286015644	1.78E-13
Pgm5	1.284844547	2.05E-07
Spata18	1.273712739	3.70E-08
Upf	1.269873687	7.76E-26
Twist1	1.256280178	6.46E-31
Dmrt1	1.255151509	2.92E-06
Snap91	1.250216988	2.00E-18

Mogat2	1.247469675	5.65E-11
Emx2	1.243576585	1.14E-07
Gsc	1.242828157	1.12E-13
Rspo2	1.241868181	3.68E-09
Postn	1.235843475	0.013317877
Nxph4	1.234027558	3.81E-08
Ptpru	1.229240893	6.84E-28
Ano1	1.22919023	9.93E-11
Thsd7a	1.228101507	1.20E-12
Zbtb16	1.224665246	5.64E-15
Hapln1	1.224115071	7.86E-11
Irx3	1.213502592	0.044714529
Angpt1	1.206368005	2.24E-12
Sloc8a1	1.202005523	4.64E-20
Lhx1	-1.205998682	0.047518491
Abcg1	-1.207775512	3.99E-07
Rbm24	-1.215817395	3.52E-11
Neb	-1.217991382	0.000648954
Rxrg	-1.234103166	2.28E-05
Eya2	-1.234218615	1.07E-09
Bmp3	-1.234351256	0.007467871
Synpo2l	-1.238052449	0.001120533
Eya1	-1.239927773	0.000197667
Rab20	-1.240518464	8.20E-05
Ndnf	-1.240917083	0.007499629
Ssc5d	-1.249374503	2.87E-08
Arhgap20	-1.250643643	8.46E-05
Nog	-1.253629112	6.36E-06
Celf2	-1.253686806	1.35E-24
Tubb4a	-1.258898705	4.52E-12
Cav1	-1.261125351	0.050352929
Lgl1	-1.261749787	0.025376899
Gcnt1	-1.26249507	4.07E-15
2610035D17Rik	-1.263063314	1.31E-08
Cacna1b	-1.26933329	0.000221482
Atf3	-1.270947369	4.65E-06
Cgln1	-1.274564451	6.78E-32
Fhdc1	-1.276044801	1.17E-08
Rbp4	-1.276527677	3.17E-06
Hhip	-1.27701415	1.95E-07
Luzp2	-1.279961404	0.00251695
Silrk2	-1.284711064	0.000111914
Cdh15	-1.285751089	1.34E-05
Tcf15	-1.290929145	4.30E-13
Hymal	-1.292843	5.43E-06
Fzd9	-1.294981975	2.37E-06
Pdgfra	-1.296745503	7.25E-05
Hoxa13	-1.304698164	1.24E-10
Cacna1e	-1.306122837	0.000151008
Col9a1	-1.311004889	1.23E-15
Fbxo44	-1.311550149	0.002264236
Fndc1	-1.312733842	0.058831774
Fgf8	-1.317192383	0.005916959
Mgll	-1.3194086	8.24E-05
Vwa2	-1.321649548	6.49E-05
Pde4b	-1.323034566	1.98E-07
Phlda1	-1.324931205	1.83E-33
Lmo3	-1.325363184	6.93E-06
Dsc3	-1.334987751	0.011634807
Gfra1	-1.337276222	1.04E-10
T	-1.339038474	0.02306784
Rgs8	-1.340792198	2.95E-05
Dab1	-1.341127172	1.08E-07
Fam107a	-1.346171792	0.017115721
Il18rap	-1.348361454	0.00636273
Stra6l	-1.353019866	3.15E-09
Sgms2	-1.356367865	2.20E-11
Fgfr4	-1.358544781	1.78E-08
2610307P16Rik	-1.361883126	0.007258398
Ldfrad4	-1.367630633	1.86E-07
Ptch1	-1.367672652	1.83E-17
Cobll1	-1.368385991	1.47E-11
Egfr	-1.373952326	0.000603304
Fzd4	-1.378019483	1.72E-12
Rcsd1	-1.380874495	3.11E-17
Lgr5	-1.382321065	1.57E-10
F930015N05Rik	-1.390559995	3.57E-09
Myog	-1.395503609	0.000704544
Mgp	-1.398376637	1.25E-07
Adora1	-1.407039156	1.05E-06
Zcchc12	-1.407599548	3.50E-13
BC064078	-1.408895558	0.023449062
Sh3rf2	-1.40941325	2.89E-09
Egln3	-1.40978026	6.57E-13
Rbfox1	-1.412167834	3.69E-06
Sdpr	-1.412619168	0.014369837
Foxd1	-1.413981012	0.000572939
Cdkn1a	-1.419228081	3.87E-06
Dll3	-1.425008225	0.052630762
Pls1	-1.425175333	2.78E-13
Fam81a	-1.43121078	4.46E-07
Wnk4	-1.43991097	4.88E-07
Thbd	-1.444909884	1.41E-05
Cobl	-1.445856024	6.37E-06
Thbs1	-1.454201296	1.36E-07
Shisa6	-1.455382331	0.001292964
Cthrc1	-1.45864704	2.44E-05
Tcp1l12	-1.460018377	1.67E-09
Sema3c	-1.466278359	5.91E-10
Ppp1r1a	-1.472308878	2.51E-12
Epha5	-1.473282148	1.69E-10
Alp2a1	-1.47459388	9.96E-07
Sema3d	-1.474970964	0.002336743
Trim16	-1.478768534	1.15E-05
Bmper	-1.491202304	0.006964768
Gsn	-1.491393063	2.22E-10
Sp8	-1.497186682	8.63E-06
Dmth	-1.499049257	1.17E-05
Plekha4	-1.499507027	5.68E-05
Fam46c	-1.504264122	5.05E-09
Adamtsl3	-1.505989768	0.00786129
Colgalt2	-1.506587311	1.78E-06
Hs3st3a1	-1.507235348	3.08E-08
Sowaha	-1.512607584	4.57E-08
Fam169b	-1.517998699	2.39E-07
Npr1	-1.532889754	2.18E-06
St8sia4	-1.536027763	5.30E-10

Lbx1	-1.540686197	5.43E-05
Pamr1	-1.541124676	0.079880241
Stk32a	-1.544452777	1.10E-05
Hcn1	-1.553047886	0.000181136
Inpp4b	-1.569274808	1.33E-14
Sox10	-1.570768229	0.004484715
Bcl6	-1.579910337	6.68E-07
Scn3a	-1.604883769	1.59E-08
Rflna	-1.613090403	9.67E-06
Lrrn3	-1.618021753	2.83E-08
Ackr3	-1.62031671	4.24E-09
Car2	-1.634926454	0.004723043
Hs3st3b1	-1.635045428	1.42E-17
Phacr1	-1.635798501	3.03E-07
Tgm2	-1.636615018	0.000154232
Tead4	-1.639256687	2.08E-12
Col2a1	-1.647870307	7.30E-13
Cdc42ep3	-1.655537121	4.87E-15
Egfm1	-1.66136607	0.036997797
Tacr3	-1.666606183	3.58E-05
Prokr2	-1.667674434	1.50E-07
Cr2	-1.672631211	3.19E-06
Ogn	-1.677436478	3.62E-06
Cpne8	-1.681508386	5.21E-08
Mamld1	-1.702318963	1.96E-10
Tpd52	-1.714160436	5.21E-39
Sardh	-1.714869521	4.97E-10
Sltt1	-1.714870433	3.39E-09
Hlx	-1.722568976	0.000797133
Pmp22	-1.727489739	9.36E-10
Arhgef3	-1.735078557	6.38E-07
Dlgap1	-1.738449723	1.89E-07
Klf9	-1.740240835	1.87E-11
Moxd1	-1.740869468	0.00017909
Cln2n2	-1.747619389	4.82E-11
Adamts16	-1.760826547	0.023916144
Dll1	-1.779247144	0.086869362
Nav3	-1.7830802	2.30E-07
Foxd2os	-1.783152053	0.004647049
Lrig1	-1.796341675	1.23E-18
Meox1	-1.822873975	1.22E-13
Sorbs2	-1.825152783	2.32E-18
Sic14a1	-1.828358573	0.000319493
Pax3	-1.831018787	0.003554626
Sorcs1	-1.831766344	1.09E-09
Pknox2	-1.837896338	1.22E-21
Met	-1.838793646	3.00E-40
Sic4a1	-1.843497045	0.039903319
Megf10	-1.847464508	7.41E-11
Tspan18	-1.849510269	4.21E-18
Sulf1	-1.852551973	1.18E-10
Sim2	-1.852685981	0.01003648
Mcam	-1.855894139	3.97E-26
Chrb1	-1.856269851	2.01E-09
Zfp536	-1.866528189	1.31E-12
Lurap1l	-1.867077681	3.13E-07
Hpgd	-1.872446126	2.50E-05
Col11a2	-1.885972958	1.29E-06
Ppp1r16b	-1.899420371	1.36E-13
Bcar3	-1.901090115	1.75E-19
Myod1	-1.917531842	0.000161247
Cldn9	-1.931077731	3.22E-14
Pygm	-1.937708751	3.33E-09
Scn1	-1.952234583	1.17E-17
Cxcr4	-1.97671295	7.40E-06
Nol4	-1.979362517	1.00E-11
Rasef	-1.985249059	3.15E-07
Mstn	-1.992832325	0.000317708
Foxd2	-1.995908656	1.17E-12
Nrarp	-2.004913995	9.59E-23
Fgf9	-2.013115715	5.73E-17
Wnt16	-2.014799662	9.01E-09
Myo5b	-2.031603807	1.23E-18
Shisa3	-2.03885047	2.40E-14
Fst	-2.043307297	1.33E-09
Afap12	-2.058855913	7.03E-16
Msc	-2.081115231	0.007258398
Col9a3	-2.086269202	7.79E-10
Foxc1	-2.091415529	7.26E-13
Six2	-2.103152973	9.59E-23
Igf1bp5	-2.114635688	7.33E-06
Tfap2b	-2.121866376	5.36E-19
Lfng	-2.145236034	6.45E-18
Myf5	-2.157283892	1.31E-10
Col8a1	-2.166020159	0.003095454
Nav2	-2.169369205	7.21E-57
Hottip	-2.169602414	2.20E-06
Enpp1	-2.171639147	1.26E-11
Parm1	-2.188445026	2.38E-07
Enpp2	-2.189036753	1.39E-33
Jag1	-2.259065474	2.89E-42
Sp5	-2.269434111	0.000236523
Erb3	-2.335370356	2.89E-10
Adamts17	-2.3641382	2.89E-38
Islr2	-2.386984221	1.07E-08
Pitx2	-2.398575626	0.000885244
Myh14	-2.413357571	1.34E-09
Atp1a2	-2.425832815	1.65E-35
Sv2b	-2.462852199	5.45E-20
Dmrt2	-2.676674	3.60E-06
Foxc2	-2.852644606	1.75E-26
Col9a2	-2.933002627	6.12E-19
Matn4	-3.191111525	1.94E-09
Evx2	-3.262321709	6.70E-13

Table S5

DEGs S9 ^{Pa} E10.5-E10.75		
Gene Symbol	log ₂ FC	FDR
Shisa7	3.976975852	1.31E-41
Emx2	3.395748345	2.08E-50
Zmat4	3.254556876	2.63E-42
Sema3d	3.080963059	7.55E-46
Ntn1	3.021469763	1.09E-42
Sned1	3.009572058	1.21E-30
Fam69c	2.997625146	2.68E-86
Calb2	2.925172521	2.69E-20
Nfatc2	2.907504828	3.72E-65
Sox9	2.846509276	2.12E-93
Foxc1	2.842524224	1.13E-42
Mgat4c	2.831052597	3.34E-24
Fibin	2.704468699	7.38E-52
Gsc	2.683259071	2.34E-66
Emx2os	2.655954908	7.18E-24
Col2a1	2.654550169	7.12E-53
Irx5	2.654125995	1.98E-09
Plekha4	2.63091133	6.83E-27
Sorbs2	2.612075944	2.26E-70
Prelp	2.611960865	2.67E-67
Irx3	2.60143342	2.75E-08
Aqp4	2.538254762	1.20E-42
Sdpr	2.536799004	7.38E-36
Bmx	2.480894114	1.51E-40
Synpo	2.475917586	6.19E-95
Hgf	2.4536347	6.68E-56
Cttnbp2	2.447972203	1.19E-53
Rag1	2.443279528	1.62E-27
Myh14	2.42491287	1.08E-22
Plcl1	2.41941084	1.39E-43
Rspo1	2.404644689	4.88E-06
Tmem132e	2.403962966	2.97E-11
Fam181b	2.39350364	3.39E-69
Nrcam	2.383683313	9.60E-48
Rspo2	2.373023799	5.66E-35
Sox10	2.365340198	6.99E-35
Barx2	2.363430769	7.33E-37
Nr2f1	2.34406756	8.19E-13
Cxcl12	2.33541113	5.54E-33
Gria2	2.333299219	6.19E-07
Myk	2.327204549	4.33E-49
Ebf2	2.32394875	4.22E-33
Col9a2	2.320151673	3.20E-26
Hoxc4	2.308610655	1.60E-11
Col9a3	2.298334164	4.55E-25
Pkdcc	2.268740878	9.28E-11
Hoxc5	2.264968195	3.55E-07
Enpp2	2.258276792	1.20E-66
Crmde	2.238955751	2.03E-07
Cnmd	2.237051647	3.41E-36
Crhbp	2.225564062	3.38E-17
Trpm6	2.219278727	4.62E-31
Pcdh1	2.216901482	1.50E-37
Gdnf	2.216163666	1.34E-07
Mmp28	2.212331913	1.56E-34
Glis3	2.186947821	1.05E-41
Col12a1	2.179506921	1.31E-17
E330013P04Rik	2.156022112	1.16E-20
Nos1	2.151820876	1.24E-30
Shox2	2.144365503	1.49E-59
Rgs8	2.137979016	5.55E-22
Veph1	2.13194439	1.78E-23
Tbx18	2.126708589	6.42E-40
Lepr	2.111328236	5.53E-18
Fap	2.098907431	1.03E-10
A830082K12Rik	2.067013287	9.19E-23
Dmrt2	2.065624152	4.04E-11
Meis1	2.050956436	8.20E-10
Rhoj	2.007662056	8.53E-44
Kcnd3	2.006757111	2.91E-22
Adamts6	1.971542843	1.20E-15
Bmper	1.950007585	9.81E-20
Rgcc	1.92175466	1.11E-18
Osr2	1.921077432	3.90E-37
Hoxc6	1.900801122	3.76E-11
Rarb	1.894133971	2.90E-09
Col23a1	1.893290798	5.42E-54
Angptl1	1.888924932	2.15E-25
Tgm2	1.874810725	9.83E-12
Pde7b	1.874801249	1.07E-22
Il1m	1.868623717	2.96E-35
Rab32	1.86369093	6.26E-25
Pde8a	1.837240277	4.37E-36
Zim1	1.837140455	2.94E-09
Cyp46a1	1.83322041	1.24E-10
Spint2	1.821004151	2.31E-63
Fbxo41	1.819971753	2.20E-25
Robo2	1.815590641	6.59E-36
Sfrp1	1.806341097	4.08E-10
Hoxb6	1.805930551	0.000124456
Prkcb	1.802864136	5.31E-42
Col9a1	1.802286989	1.90E-43
Itgb8	1.802029897	9.55E-19
Mcam	1.797402483	1.14E-48
Tbx15	1.792810027	3.15E-42
Igf1	1.773159981	6.53E-06
Spp1	1.770975497	8.23E-25
Myo5b	1.767297683	1.16E-32
Abca8b	1.75952463	2.84E-39
Mstn	1.758461891	1.46E-27
Ctgf	1.757849451	1.56E-16
Pappa	1.750199482	1.46E-12

Lhfp	1.739776512	8.39E-24
Meg3	1.726900592	8.55E-10
Meis2	1.719932675	1.79E-05
Sema6a	1.696965465	3.44E-40
Siltrk6	1.687161162	5.51E-09
Hhip	1.682929331	2.22E-19
Arsj	1.677499276	1.97E-29
Macc1	1.669182034	2.75E-29
Tcerg1l	1.657030575	5.84E-09
Tbx4	1.656452094	3.88E-18
Esrrg	1.656164557	1.79E-16
2700069118Rik	1.655466628	9.94E-14
Lbp	1.645054934	1.29E-18
Hmx1	1.621261318	2.53E-05
Kcnh2	1.620257709	3.97E-37
Nr4a3	1.619752798	4.34E-10
Hoxb7	1.61042931	0.000305378
Runx11	1.608371405	3.78E-14
Asic2	1.605408836	0.005792061
Mtus2	1.604987585	9.93E-14
Fil1	1.60155294	3.51E-65
Ypel2	1.598298747	4.93E-19
Colgal12	1.592898039	1.76E-18
Zbtb16	1.58977767	3.29E-26
Hcn1	1.583731527	7.40E-11
D030045P18Rik	1.582915114	3.13E-17
Scube3	1.582358243	1.85E-36
Ackr3	1.580980985	9.04E-14
Cldn1	1.580149552	3.93E-33
Pdgfra	1.578022223	1.04E-28
Hic1	1.567254	2.30E-16
Ntrk2	1.566707619	9.40E-15
Adgrg1	1.564154819	2.65E-29
Ptprv	1.559645494	8.86E-14
Scx	1.558268393	2.33E-39
Bmf	1.556809906	6.70E-34
Spata18	1.556655073	2.63E-11
Mir1906-1	1.554600164	1.78E-07
Mir1906-2	1.554600164	1.78E-07
Cxcl14	1.554104572	2.57E-17
Nlgn3	1.55321314	2.69E-19
2610035D17Rik	1.550161172	4.87E-20
Hoxb8	1.536756782	0.041253709
Runx2	1.518060499	4.29E-07
Foxp2	1.516701921	4.04E-14
Mctp2	1.515821204	2.34E-17
Tie2	1.511434205	2.71E-07
Smoc2	1.505537393	7.83E-07
Lrrc7	1.503720081	0.000315199
Dusp15	1.493011544	8.13E-19
Negr1	1.485431367	5.80E-12
Ror1	1.482696755	2.03E-07
Col15a1	1.479399016	5.75E-10
Dcx	1.47555106	2.33E-39
Aass	1.467763802	5.47E-31
A1854703	1.464380747	4.21E-25
Maf	1.463602819	8.02E-26
Kcnd2	1.458979822	1.85E-10
A730056A06Rik	1.45685987	1.47E-16
Duxb1	1.45521663	3.40E-10
Ildr2	1.44822888	2.23E-35
Sox5	1.447568991	1.29E-35
Duxb2	1.439639253	5.16E-10
Duxb3	1.439639253	5.16E-10
Dnm3os	1.433983551	0.000166772
Ldb2	1.432351659	2.37E-48
Gpr4	1.429701941	1.67E-52
Rgag1	1.427166184	1.34E-16
Atp1a2	1.424641835	2.52E-23
Dab1	1.422084377	2.01E-14
Thbs1	1.418443816	1.39E-10
Slc5a7	1.413850078	2.48E-09
Tmem200b	1.413372863	2.25E-19
Agr2	1.409955002	5.33E-07
Myrf	1.408617798	7.28E-17
Rian	1.398699869	5.09E-10
Fgd4	1.39364364	1.78E-17
E130310I04Rik	1.391996908	4.89E-09
Matn4	1.389607214	1.29E-08
Arhgef26	1.383311498	5.62E-22
Fgf9	1.382200021	1.56E-16
Asb9	1.378056588	4.18E-12
Ryr2	1.373862051	2.07E-06
Hs3st1	1.369032304	2.52E-11
Nrk	1.366577414	2.66E-14
Crocc2	1.365600798	1.71E-08
Egflm1	1.363380584	2.01E-12
Acot11	1.362586758	2.07E-27
Slc8a3	1.354214053	7.96E-16
Hoxb3	1.348371296	0.000968774
Psd2	1.348232499	1.85E-10
Ak1	1.343357103	1.69E-29
Dhrs3	1.342948765	1.31E-24
Zfp663	1.331772653	8.04E-24
Eda	1.329749669	1.85E-22
Rassf4	1.324820176	1.02E-15
Gata4	1.318382465	6.47E-05
Hoxb4	1.317921557	0.013601633
Ccdc85a	1.312551164	1.25E-12
Vstm2b	1.305974865	0.000393943
Mfsd6	1.299444466	2.27E-08
Aff3	1.299231026	1.77E-28
Fgfr2	1.293124773	2.66E-13
Cd83	1.283509957	6.36E-14

Fgd2	1.282064109	2.87E-05
3110039108Rik	1.280897893	9.39E-07
Igfbp3	1.275112161	1.81E-08
Cdon	1.274400518	5.50E-21
Mgll	1.272970284	9.04E-11
Srgap3	1.272719119	5.93E-30
Hoxb5	1.271429174	0.023371703
Mir214	1.267360403	2.31E-05
Cyr61	1.263852727	2.37E-05
Chma4	1.263494829	1.75E-18
Dpep1	1.263095669	2.94E-09
Tgfb2	1.262896483	4.90E-12
Irak2	1.261229154	1.96E-09
Gria3	1.258659928	3.86E-07
Ebf4	1.257458754	4.58E-08
Pbx1	1.244189248	4.25E-22
Fam151a	1.23895182	1.82E-15
Dagla	1.238054237	1.38E-25
Cadm2	1.237742674	4.13E-10
Sor1	1.236439627	1.14E-09
Dact1	1.232480808	2.42E-11
Gpc5	1.232287166	8.28E-18
Enpp5	1.227095695	9.65E-15
Fgf12	1.225767191	2.36E-12
Eya4	1.224942805	6.14E-08
1810011010Rik	1.224549566	4.27E-08
Cmklr1	1.221157637	1.23E-07
Scube1	1.218866571	7.78E-21
Col3a1	1.21721012	8.94E-15
1700020L24Rik	1.21678181	5.73E-13
Mab21l2	1.215924472	2.38E-21
Fndc1	1.215417167	0.000525079
Lix1	1.21499571	2.38E-20
Palm2	1.210864637	1.07E-14
Rec8	1.208616548	2.31E-06
Arhgap18	1.207830307	1.27E-22
Hpgd	-1.20083444	0.036319153
Col14a1	-1.201969602	0.028699788
3425401B19Rik	-1.207872053	0.000807236
Pdgfra	-1.211092365	0.000157715
Vgll2	-1.212354263	0.00135306
Steap3	-1.215644079	6.68E-07
Soga3	-1.216182918	2.17E-05
Ano1	-1.216453938	3.77E-07
Styk1	-1.223358704	1.20E-06
Ppargc1b	-1.225820635	1.10E-07
Mapk11	-1.226916828	2.53E-20
Prokr2	-1.228703362	0.000227575
Rbfox3	-1.230173097	2.23E-07
Efna1	-1.23343434	1.24E-08
Sico5a1	-1.234899042	6.93E-08
Gatsl3	-1.238458909	1.80E-05
Tcf7	-1.238566514	1.91E-16
Hoxd12	-1.247991168	7.84E-11
Cdh22	-1.251172007	4.79E-06
Slc35f2	-1.254310035	1.67E-12
Jazf1	-1.2586654	1.97E-08
Dsp	-1.260412271	0.000174246
Vldlr	-1.262320693	3.22E-11
Cbfa2l3	-1.282671391	1.46E-12
Pax7	-1.292423708	0.017185847
Islr2	-1.300381387	0.084672361
Tubb2a-ps2	-1.303792841	1.39E-08
Pdk4	-1.312175857	1.01E-07
Zic2	-1.312285333	6.65E-20
Ppp1r16b	-1.315291741	4.85E-06
Klhl14	-1.317583458	1.66E-06
Rbp4	-1.327389549	6.32E-07
Lfng	-1.341654989	4.02E-07
Slc7a5	-1.341747383	4.91E-12
Kcnj2	-1.34180558	1.33E-09
Il18rap	-1.349329671	0.003404985
Tbx2	-1.35056836	1.65E-17
Prdm8	-1.350987222	7.71E-05
Grrp1	-1.362004723	4.90E-07
Sptb	-1.3684464	0.038869108
Ccdc3	-1.373280267	1.37E-05
Jag1	-1.373460287	4.50E-18
Cbln1	-1.386374937	1.39E-14
Dlgap1	-1.393230453	0.000109732
Pitx3	-1.404997752	0.000393992
Mmp9	-1.417067799	3.62E-06
Gabra2	-1.417103596	0.041076236
Chst2	-1.417245049	5.11E-40
Slit1	-1.426419249	1.58E-06
Hspb8	-1.430005386	2.32E-16
Trpm3	-1.431685135	5.99E-06
Dkk2	-1.432316596	7.14E-05
Arhgef15	-1.432899881	2.79E-08
Tek	-1.440482057	4.78E-08
Fzd10	-1.442466556	2.80E-12
Pmaip1	-1.447035913	5.33E-08
Scn3a	-1.453456177	3.30E-07
Acan	-1.458015906	0.001626745
Rtn4rl1	-1.470308995	5.13E-08
Rassf2	-1.478786115	2.17E-16
Wnt2	-1.483367238	0.060600355
Pcsk6	-1.483437297	1.39E-07
Runx1	-1.483760462	1.20E-07
Piprt	-1.485731097	2.10E-11
C77370	-1.488827648	7.82E-11
Sall1	-1.491874152	1.51E-20
Hey1	-1.492145401	1.27E-22
Slc2a3	-1.493409902	1.03E-20

Tspan18	-1.502193095	9.05E-13
Fzd5	-1.504225249	1.19E-06
E130114P18Rik	-1.507834885	2.39E-09
Tmem30b	-1.517189609	5.24E-14
Prss35	-1.533959292	0.021651151
Irx1	-1.551687023	0.005617122
Ppp2r2b	-1.561371236	0.001059486
Spry4	-1.563509791	3.34E-18
Nrarp	-1.570261126	3.21E-15
Bmp5	-1.576493513	4.01E-22
Lrrn3	-1.583388757	3.35E-08
Car2	-1.585010341	0.004185494
Cxcr4	-1.621665328	0.000375031
Dync111	-1.624508438	7.57E-17
Epha2	-1.6248993	9.83E-26
Pknox2	-1.641841323	3.55E-18
Tnc	-1.645191491	0.003509804
Palmd	-1.649877285	1.26E-07
Rab3c	-1.656945614	8.31E-14
Hoxa11	-1.660472809	5.28E-29
Sv2b	-1.673151338	4.16E-05
Synpo2	-1.674382739	3.69E-11
Cdkn1a	-1.70044875	5.98E-09
Fam81a	-1.705793823	2.13E-10
Cpne8	-1.712719039	1.20E-08
Acta2	-1.717776796	0.00089465
Bmp2	-1.732815165	2.73E-06
Rtn4n2	-1.750544742	6.93E-10
Lbx1	-1.753272229	2.00E-07
Grem2	-1.758392354	0.000117592
Scn11a	-1.76464108	0.068076334
Etv4	-1.786774487	7.52E-30
Ramp2	-1.811980248	6.89E-12
Dlx5	-1.812237489	4.77E-09
Smad9	-1.815058321	1.21E-07
Kcnma1	-1.842285963	1.54E-17
Gcnt4	-1.850316221	3.26E-23
Tacr3	-1.864149166	7.22E-09
Edar	-1.867477868	4.26E-07
Itga4	-1.885893992	2.08E-24
Myf5	-1.885990032	2.09E-06
Rcsd1	-1.887411016	6.05E-31
Dll1	-1.894172462	0.035431916
Pax3	-1.895143899	0.001231897
Spock2	-1.91641953	1.01E-12
Adams17	-1.91965522	2.91E-27
Rprm	-1.93465791	4.29E-15
Dkk1	-1.962044808	3.09E-19
Eya1	-2.006364823	1.72E-10
Rbm20	-2.011668767	2.69E-19
Fam169b	-2.039377903	3.10E-14
Hlx	-2.066155165	5.81E-06
Epha3	-2.103664242	2.15E-25
Sp5	-2.114646123	0.000958921
Grik1	-2.120868526	7.38E-18
Hoxd13	-2.122913738	3.13E-28
Msc	-2.12322157	0.00329293
Lmo2	-2.142268167	8.71E-33
Hoxa11os	-2.154589013	1.13E-36
Mybpc1	-2.174982083	3.27E-13
Pax9	-2.24123701	4.82E-13
Gja3	-2.249250792	1.52E-20
Msx1os	-2.260611147	5.10E-51
Gata3	-2.272989968	1.63E-06
Lgr5	-2.276017272	6.80E-27
Msx1	-2.286048016	8.68E-45
Prdm1	-2.298346623	1.75E-30
Hotip	-2.334819689	5.22E-08
Camk1d	-2.368718492	2.14E-40
Eya2	-2.520013209	1.83E-40
Tlap2b	-2.659439602	1.20E-29
Zic3	-2.714573856	1.63E-53
Evx1	-2.756415463	1.65E-21
Evx1os	-2.781402836	3.13E-19
Tlap2c	-2.99642748	1.56E-33
Col13a1	-3.090877827	2.24E-33
Evx2	-3.127155062	1.74E-11
Hoxa13	-3.228910308	4.09E-55
Shh	-3.492310678	4.09E-39

Table S6

Gene Symbol	DEGs S9*Pa ^{hi}	
	log ₂ FC	FDR
Matn4	7.0664819	3.00E-59
Col8a1	6.341412334	5.44E-82
Eomes	5.733495936	5.71E-74
Kera	5.540242581	4.32482833415364e-318
Col9a2	5.431059467	9.73E-126
Ogn	5.345569605	2.15E-169
Col9a3	5.282994945	1.21E-116
Aldh1a2	5.229226442	1.93E-67
Cnmd	5.033636658	3.74E-102
Bmper	4.910017225	2.47E-95
Hic1	4.89849903	1.08E-145
Sic14a1	4.77781163	9.48E-131
Nkx3-2	4.755917276	7.09E-114
Sema3d	4.722684088	2.41E-98
Evx2	4.716782583	2.56E-103
Rflna	4.679988875	3.58E-120
Foxc1	4.556968067	1.72E-106
Egfm1	4.510261911	5.75E-69
Pax9	4.488083386	2.76E-102
Nfix	4.404586094	2.04E-85
Dcc	4.179131757	1.64E-98
Gdf5	4.167710801	2.53E-168
Tmem200a	4.183090343	6.85E-118
Acan	4.15493799	7.87E-36
Lum	4.146815147	1.17E-47
Zochc5	4.105571963	7.17E-62
Pamr1	4.023895813	1.79E-141
Smoc2	3.96771331	3.30E-44
Runx1	3.966181872	4.08E-99
Ntrk2	3.828442277	1.10E-81
Shisa6	3.814346665	1.01E-71
Sdpr	3.784284021	1.59E-73
Stmn2	3.767224812	2.30E-69
Macc1	3.706641824	2.05E-95
Inhba	3.692577397	8.61E-55
Prelp	3.680991118	3.29E-124
Arhgef3	3.676951251	1.83E-52
Miat	3.662829136	8.94E-26
Islr2	3.655446933	2.12E-62
Cbln4	3.647686608	1.70E-56
Rxfp3	3.644493472	8.82E-63
Col8a2	3.643828244	2.49E-64
Creb5	3.630373661	1.62E-53
Papss2	3.624354407	2.12E-41
Col11a2	3.565114312	1.21E-38
Sulf1	3.555835736	1.45E-65
Dcn	3.553200976	6.10E-33
Tnc	3.515882029	2.18E-20
Adamts1	3.492516551	3.19E-55
Unc80	3.486725096	1.41E-18
Ebf1	3.463160636	4.56E-129
Slitrk1	3.459409062	7.24E-80
Col2a1	3.455056531	1.95E-91
Egfr	3.439158319	1.03E-41
Fam84a	3.431547776	4.25E-66
Col12a1	3.428341589	1.12E-44
Moxd1	3.424007544	2.67E-148
Cxcl14	3.417864138	1.25E-86
Phactr1	3.412692538	6.51E-55
Sorcs1	3.402918245	3.81E-66
Cacna1e	3.373784724	5.96E-63
Irx1	3.36769267	1.91E-16
Cd200	3.363078872	3.91E-62
Runx3	3.34901602	5.53E-68
Sorbs2	3.33959166	1.50E-118
Fmod	3.322472203	6.66E-59
Dab1	3.317321152	4.17E-82
Matn1	3.285033862	4.73E-62
Piezo2	3.262016791	1.21E-52
Luzp2	3.253585885	5.32E-61
ErbB3	3.230037939	1.14E-49
Sox9	3.218893253	2.20E-121
Enam	3.19674182	4.41E-48
Rab32	3.174768267	7.46E-75
Dner	3.132489204	2.12E-76
Fam69c	3.129084761	3.35E-96
Igfbp5	3.120385752	1.22E-21
Card11	3.106649825	3.51E-24
Thbs1	3.103528917	7.15E-54
Tcp11l2	3.088401609	4.87E-97
Cntnap3	3.077636396	5.01E-59
Cpxm2	3.088960851	7.87E-29
Pdzrn4	3.065927635	7.52E-27
Lrrn3	3.035153886	5.40E-50
Dlx1	3.02524555	5.59E-78
Pcdh9	3.023727545	3.30E-44
Nfatc2	3.021163329	1.21E-71
Fndc1	3.015602869	1.94E-15
Ccdc85a	3.013947679	1.92E-55
Ntm	3.005853635	1.22E-42
Ldlrad4	2.984784719	3.20E-68
Ntn1	2.977762441	2.42E-42
Sox6	2.968289624	2.28E-81
Trpm5	2.961489338	2.63E-51
Enpp6	2.947513608	5.59E-51
Ebf3	2.944899425	6.80E-72
Rbpjl	2.936850083	4.47E-66
Agtr2	2.936055856	8.11E-27
Gsap	2.930367955	9.73E-55
Gm9767	2.930229935	3.73E-73
Sned1	2.918436902	1.52E-29
Barx2	2.895830143	1.27E-52

Hottip	2.882723923	3.15E-47
Epyc	2.865521335	6.17E-56
Extl1	2.863870189	7.41E-39
Fzd9	2.863173534	1.74E-55
Tox	2.850718555	3.40E-50
Wnt4	2.844621792	2.90E-30
Rhoj	2.832616735	7.11E-92
Tcerg1l	2.807515756	4.00E-21
Fam160a1	2.787063327	1.59E-86
Nlgn3	2.784648039	8.54E-66
Pid1	2.779489865	2.58E-35
Mmp28	2.776396901	2.15E-52
Clec14a	2.77159224	1.01E-57
Arhgef19	2.770393043	2.79E-28
Sgk1	2.769781847	3.01E-76
Tacr1	2.763651471	5.12E-67
Col9a1	2.759870992	9.40E-108
Adamsl3	2.758120001	3.63E-14
Adcy5	2.757884166	5.24E-36
Colgalt2	2.753081558	6.07E-53
Adams12	2.751283361	1.86E-50
Col6a5	2.747884544	3.64E-51
Fgfr3	2.739374802	8.54E-66
P4ha3	2.736476185	3.44E-36
Egfl6	2.732139059	8.10E-41
Susd5	2.730555749	5.24E-45
Chrd1	2.728153808	7.68E-117
Emx2	2.72785402	4.43E-34
Nod1	2.727202388	7.87E-24
Fzd5	2.72279692	2.08E-33
Sema6a	2.720272839	5.87E-110
Kcns1	2.710889875	7.28E-36
Bmp2	2.706910322	1.08E-25
Scrn1	2.698770674	5.08E-77
Enpp1	2.696118308	1.49E-39
Phex	2.695670098	1.09E-35
Mgp	2.691369294	6.71E-40
Foxp2	2.688730223	7.96E-47
Mfap3l	2.682955232	1.11E-53
Pde7b	2.681675108	4.57E-47
Dlx5	2.679252253	1.24E-35
Fibin	2.677609012	8.72E-52
Otor	2.677352749	9.16E-41
Nrxn1	2.674087714	1.26E-45
Myh14	2.67023259	1.23E-27
Ebf2	2.6669293	1.21E-44
Rasa4	2.659055604	4.22E-26
Rnf152	2.658663789	3.38E-36
Mef2c	2.655167908	8.02E-68
Slc14a2	2.645888052	9.53E-36
Arhgap20	2.640358042	5.59E-35
Wfikkn2	2.626400147	3.72E-66
Adgrg6	2.619932052	5.41E-24
Tmcc3	2.60296995	2.53E-102
DpF3	2.60109188	5.24E-36
Adgrb2	2.600082307	1.94E-52
Kcnj2	2.591791114	1.54E-55
Meioc	2.586350743	1.59E-32
Cdh12	2.582819393	1.03E-45
Car8	2.575244773	4.66E-44
Podn	2.572287948	5.99E-39
Trhde	2.570022297	9.95E-37
Rarres1	2.557124835	5.24E-33
Slitrk2	2.55671474	3.67E-29
Kcne4	2.556598704	6.22E-20
Spp1	2.550339721	8.66E-48
D630003M21Rik	2.542545142	1.05E-93
Erg	2.541039829	2.02E-64
Gdf10	2.531107633	2.87E-16
Cntn1	2.528815446	9.13E-39
Cybrd1	2.525679196	9.82E-29
Slc44a5	2.523183224	1.03E-27
Calb2	2.522858689	7.30E-17
Hmgcs2	2.516905172	5.76E-45
Efna1	2.515294512	1.67E-55
Gcgr	2.510943484	3.46E-22
Pappa	2.502566969	5.65E-26
Cadm2	2.498174378	3.18E-39
Wnt11	2.490104285	5.05E-103
Adams5	2.488630748	7.23E-35
C1qtnf3	2.48768673	1.36E-21
Wnk4	2.48310798	2.74E-33
Chrc1	2.481473013	1.01E-26
Apc2	2.479197656	1.76E-44
Hs3st1	2.47594317	9.98E-34
Hoxa13	2.473255655	3.09E-75
Tmem200c	2.469835076	8.55E-53
Ndnf	2.469647419	1.08E-15
Rin2	2.459727921	7.96E-137
Tspan18	2.457454833	4.46E-59
Islr	2.436694951	5.40E-81
Cdh8	2.41998781	1.10E-30
Rax	2.407165668	1.98E-43
Mia	2.406872528	1.88E-36
Lgi3	2.406471558	1.01E-36
Fhdc1	2.406062289	3.88E-56
Atp1a2	2.405225977	5.78E-71
Veph1	2.404037733	4.99E-30
Anxa2	2.390050962	1.77E-26
Htra3	2.386081672	1.39E-30
NA	2.385195003	8.84E-38
Tubb4a	2.383291695	1.12E-81
Pdzd2	2.378399736	8.09E-34
Pknox2	2.373336168	2.54E-65

Doc2b	2.372412952	2.10E-15
Tlr1	2.371816836	1.95E-11
Fam181b	2.370567489	3.70E-69
BC064078	2.364504925	1.40E-32
Cspg4	2.363316572	1.27E-50
Sparc	2.362156307	5.97E-15
Parm1	2.358259355	3.93E-15
Gal3st1	2.355284388	7.35E-43
Loxl1	2.35425944	1.62E-59
Adgrg2	2.349622174	1.20E-20
Rgs17	2.348924392	5.45E-25
Fbxo44	2.347478396	1.09E-14
Cdc42ep3	2.345621774	1.07E-49
Fzd8	2.340222236	2.19E-49
Chmp4c	2.329365865	4.53E-25
Sema3e	2.328308439	3.53E-26
Hoxd13	2.328104877	1.28E-58
2700069118Rik	2.32496742	3.98E-27
Cacna1h	2.320211878	2.12E-41
Robo2	2.318732935	5.66E-61
Mgll	2.311646272	2.31E-31
Maf	2.310922346	4.01E-69
Id4	2.306493204	1.89E-25
Angptl1	2.305254307	4.01E-39
Csgalnact1	2.297944882	7.49E-30
Osmr	2.291911653	3.09E-35
Hpse2	2.285357412	2.70E-57
Ptx3	2.277551937	3.85E-70
Stk32a	2.276751424	1.05E-34
Sox10	2.264377731	6.21E-34
Ptprb	2.260428587	1.44E-24
Aatk	2.259851042	7.56E-38
Rprm	2.253514104	9.44E-36
Foxc2	2.249934752	3.03E-33
Tfap2b	2.247276894	2.30E-51
Syt16	2.239218848	4.25E-40
Npas3	2.234357524	7.02E-34
Ptprc	2.22691634	3.94E-25
Cacna1d	2.216469113	5.19E-36
Scn9a	2.216254397	7.05E-38
Dlg2	2.21494049	2.52E-19
2810442N19Rik	2.211360998	1.26E-35
Atxn1	2.209382258	1.36E-25
Megf10	2.208974159	7.49E-30
Unc5c	2.208865157	9.90E-28
Nfib	2.208004561	1.19E-23
Eil2	2.199688022	2.59E-24
C1ql3	2.19859656	4.93E-45
Unc13c	2.194588309	2.35E-32
Wscd2	2.192537248	3.48E-59
Jade2	2.189081981	8.55E-28
Rab27b	2.188131199	7.01E-30
Kif1a	2.186295795	3.43E-50
Tbx18	2.181008085	6.61E-43
Grem2	2.178542861	4.22E-19
Planp	2.177562964	1.40E-11
Il1m	2.173440962	8.79E-47
En1	2.173297247	1.77E-09
Cxcl12	2.172553352	4.45E-29
Cistn2	2.168806763	4.00E-32
Ndrq2	2.168499324	4.55E-43
Rai2	2.167998494	1.15E-24
Kcnk6	2.167963911	2.68E-36
Igfbp3	2.160563987	1.99E-25
2610035D17Rik	2.160530879	4.29E-41
Corin	2.150415307	7.10E-07
Adamts15	2.146891692	5.45E-79
Adcy2	2.142609349	1.43E-28
Sstr1	2.138274323	6.83E-27
Hs3st3a1	2.136475405	6.08E-26
Arsj	2.136227106	7.83E-49
Plekhh1	2.128358679	2.07E-26
Atp9a	2.124038318	1.11E-105
Cimn	2.12149045	1.07E-89
Ltbp3	2.1131833	4.71E-55
Bmpr1b	2.112108042	6.18E-80
Syne3	2.111841253	2.80E-28
Lrrc7	2.107527151	3.31E-07
Ccdc80	2.107525396	3.85E-75
Trpc5	2.107308287	4.26E-24
Rbfox1	2.104198996	4.69E-23
AW549542	2.097086958	2.04E-13
Map2	2.095090933	9.23E-58
Dsc3	2.093623049	1.03E-08
Tekt2	2.092726289	5.15E-21
Mir6236	2.092708015	0.00025964
Emp2	2.085054003	2.04E-50
Pde8b	2.082754843	2.33E-21
Gas2	2.079346862	2.17E-107
Enpp5	2.075336125	3.32E-45
Rab40b	2.075258649	3.87E-28
2900011O08Rik	2.074655993	3.85E-75
Sfrp2	2.072368701	2.68E-87
Grin3a	2.071961354	3.04E-11
Gstt1	2.070225745	7.95E-39
Wwp2	2.069044556	1.35E-55
Alcam	2.066993375	6.55E-15
Dlx6	2.051887472	1.34E-35
Emp1	2.048869107	7.05E-80
Eln	2.048660428	1.59E-58
Tmem63a	2.044037787	9.74E-47
Gsg11	2.04332226	2.15E-16
Lhx1	2.041343723	2.91E-33
Flrt2	2.040680946	1.36E-95

AW551984	2.040165662	6.00E-21
Efcab1	2.038806499	1.76E-38
Rag1	2.037328358	1.80E-20
Zfr2	2.034821834	8.44E-15
Tgfa	2.025680004	3.58E-28
Nxn12	2.022960999	1.43E-19
Serinc2	2.014532258	1.82E-49
Iqsf11	2.011417577	4.54E-25
Mab211	2.005175976	3.32E-69
Fpp1r13b	2.001400771	2.01E-42
Srgap3	2.000276734	1.70E-79
Foxf2	1.997920244	1.15E-23
Ptfr	1.99783095	4.57E-20
Stac	1.994901837	2.87E-15
Fam196b	1.994197433	1.24E-10
Kdelr3	1.993899854	1.03E-43
Stk32b	1.99327093	6.08E-31
Crtac1	1.98570717	8.21E-34
Tmem26	1.983316977	9.98E-52
Bnc2	1.982358428	2.41E-34
B130024G19Rik	1.981253942	2.28E-23
Pla2g7	1.97374485	1.98E-27
Zfp185	1.971405331	3.41E-26
Ntng1	1.968420926	3.54E-41
Fam19a2	1.966147212	1.41E-30
3110039I08Rik	1.966029524	1.40E-16
Rgcc	1.965076747	2.27E-20
Chst11	1.963291381	6.51E-39
1700020L24Rik	1.961142614	3.41E-31
Nfia	1.959307777	4.35E-21
Cbln2	1.958230664	6.90E-15
Gpc4	1.956999569	3.98E-71
Grhl1	1.955480616	3.05E-19
Eno2	1.953216875	1.55E-11
Penk	1.952097058	1.41E-18
Dgki	1.946505569	9.25E-25
Pnck	1.944285838	8.98E-42
Smpd5	1.944054209	2.03E-28
Fgfr2	1.943183292	1.06E-31
Ltbp1	1.941911805	1.42E-50
Hs3st3b1	1.941651041	3.22E-39
Tpsg1	1.941467738	1.14E-17
B3gat1	1.941130155	2.10E-22
Wisp1	1.940968985	7.00E-16
Ccser1	1.940917872	4.14E-39
Shank1	1.938894508	1.24E-16
Negr1	1.937197211	3.80E-21
Pmp22	1.930723928	1.26E-20
Mtus2	1.930126916	2.09E-20
Fat4	1.928318547	9.11E-49
Prss35	1.926966722	4.98E-05
Dll3	1.925986981	1.21E-05
Adam22	1.921435583	1.89E-49
Ahnak	1.921179938	4.79E-16
Jdp2	1.919340822	1.30E-27
Pdgfra	1.91717915	5.14E-44
Itga11	1.916781007	5.52E-29
Nckap5	1.915262432	4.41E-15
Fam19a1	1.913793839	1.92E-29
Pard3b	1.905852203	1.10E-49
Sparcl1	1.900879219	3.54E-10
Tgfb2	1.895497838	1.27E-28
Wnt9a	1.894380644	4.77E-37
Ypel2	1.893810764	7.22E-28
Pdgfd	1.892964303	3.11E-37
Thsd7a	1.888502985	2.90E-32
Tiam2	1.888095004	7.29E-35
Aplp1	1.883143141	7.35E-55
Itgb8	1.878382936	2.82E-21
Hist3h2ba	1.873023883	3.37E-13
Hlx	1.87137045	8.03E-09
Nap1l2	1.870431885	4.15E-19
Myl9	1.870260801	7.15E-25
Emx2os	1.86960546	2.05E-14
Pde3a	1.867022971	1.09E-36
Unc5d	1.866643874	1.30E-16
Six2	1.86652752	8.69E-32
Gstt3	1.860737128	1.72E-22
Jag1	1.859768587	2.56E-50
Sostdc1	1.857591553	2.22E-20
Dtna	1.852436651	2.35E-22
Ccdc106	1.839657608	3.51E-29
Eya2	1.83939106	6.70E-70
P2ry1	1.839255953	2.97E-17
Ptprt	1.839188374	9.91E-31
Sema3b	1.837717069	8.63E-31
Gbp7	1.836689975	5.79E-26
Cd9	1.831374271	4.21E-29
Prkcb	1.830385477	3.17E-45
Rtn4r	1.829701777	6.17E-23
Tspoap1	1.825480894	6.03E-16
Vstm4	1.825148539	4.16E-29
Dab2	1.824405469	1.01E-32
Col15a1	1.824312984	1.27E-15
Enpp2	1.8160013	2.07E-43
Pou6f1	1.814925066	2.66E-32
Erc2	1.814325182	3.57E-40
Gpr156	1.811812712	8.11E-22
Prnp	1.811533246	9.06E-54
Tmem35a	1.811374663	4.33E-42
Sardh	1.81026167	5.91E-20
Atp8a2	1.805927868	8.38E-31
Runx1t1	1.802909627	1.45E-18
Gria3	1.802357284	6.78E-15

Creb3l2	1.801526827	3.92E-54
Sox5	1.798145391	2.70E-57
Kirrel3	1.79797833	1.31E-17
Gfra1	1.797450013	1.66E-39
Rnf144b	1.795050191	1.15E-20
Lbp	1.794740473	5.21E-23
Zpld1	1.794536506	1.07E-27
Ssh3	1.794389185	9.14E-10
Plxnc1	1.793081384	2.94E-20
Ddx58	1.792251387	3.54E-20
Olfml2a	1.790886742	4.32E-20
Tmem163	1.789699532	2.47E-29
Ttbk1	1.787610899	2.67E-12
Synpo	1.787096938	7.74E-49
F930015N05Rik	1.78613552	1.38E-23
Selenbp1	1.785807136	1.89E-42
Asap3	1.785060203	2.22E-34
Edil3	1.779806459	1.23E-13
Fam114a1	1.779668769	1.31E-84
Npr3	1.775449589	1.84E-05
Trim16	1.774870908	2.38E-13
Tmeff2	1.772109633	1.89E-19
Fgf8	1.770597545	5.28E-08
Myof	1.767983488	5.58E-15
Flnb	1.762103106	3.58E-45
Atp2b4	1.760690503	2.96E-54
Abi3bp	1.76055669	7.23E-11
Col6a1	1.759012323	4.13E-48
Adams9	1.758942739	1.45E-11
Prss23	1.75598651	1.57E-26
Kcnd2	1.755486641	2.90E-15
Creb3l1	1.754699205	7.91E-14
Cacng4	1.750924203	3.28E-19
Lhfp1	1.744873346	2.34E-17
Col6a2	1.743410336	1.01E-67
Nog	1.740711596	2.69E-18
Lrrc17	1.737825861	3.59E-62
Lrrc4b	1.736416123	5.89E-42
Spock1	1.736369485	2.79E-12
Tspan11	1.733071752	3.69E-52
Gpm6b	1.730443578	4.30E-60
Sl3gal6	1.728584417	1.15E-30
A330033J07Rik	1.727856449	1.97E-11
Fgf11	1.727395814	1.51E-19
Tmem30b	1.726255532	2.84E-32
Fgf18	1.725731239	1.12E-39
Palm2	1.725628746	1.54E-31
Pxdc1	1.72282982	6.35E-20
Gadd45b	1.722456787	4.15E-06
Cdh10	1.722143651	7.99E-19
Mcam	1.721253877	3.77E-46
Sfmbt2	1.720631581	8.20E-19
Hivep2	1.718512823	1.57E-16
Mturn	1.717869938	1.01E-57
Thbd	1.715590547	2.82E-17
Fgd4	1.713514896	1.19E-27
Tbx5	1.712800089	2.06E-49
Sema4f	1.711899262	4.78E-44
Dennd3	1.711872474	1.99E-19
Atp1b2	1.708465467	3.39E-25
Krt18	1.707652882	1.71E-19
Kctd12b	1.705231874	1.43E-33
Meox1	1.701965474	7.14E-23
Egr2	1.700877429	0.000433191
Slc35f1	1.699770094	1.65E-33
Zbtb4	1.697918385	9.86E-25
Frem2	1.695044301	9.04E-16
Fbxo41	1.694746282	1.16E-22
Syt13	1.693684729	3.44E-14
Ptgr	1.691504788	7.75E-18
Mr1	1.689094699	2.04E-20
Pcdhb7	1.687229617	3.02E-23
Pcsk6	1.686013279	9.49E-15
Fgf7	1.685894444	1.06E-16
Sec24d	1.684390808	3.13E-38
Catip	1.682137185	3.28E-14
Maml2	1.680480929	1.60E-43
Cadps2	1.676297399	3.16E-15
Osr1	1.676250488	9.42E-34
Adams6	1.667667102	7.76E-12
Kcnb1	1.667212893	2.65E-10
Glis3	1.665715577	1.20E-24
Hoxc5	1.665423524	0.000108127
D930020B18Rik	1.662510963	1.06E-16
Nostrin	1.662279679	2.13E-13
Frrs1l	1.661187875	3.71E-14
Kcnq4	1.660920282	1.65E-33
Maml1d1	1.658728454	3.05E-26
Scn11a	1.658468308	1.32E-15
Oplah	1.658335411	1.23E-38
Tmem51	1.658011086	7.70E-18
Bmp3	1.657102064	5.81E-08
Gpr137c	1.65314328	8.78E-23
Pcdhb3	1.652992582	3.53E-21
Strip2	1.652992037	1.97E-22
Fam65c	1.643716225	3.18E-17
Kif8	1.64155964	3.76E-22
Khdrbs2	1.64144317	7.26E-20
Sh3rf2	1.640823516	2.08E-23
Arhgap18	1.640339537	2.33E-44
Il17d	1.639932103	2.09E-22
Tmem229b	1.633141101	1.64E-15
Abcg1	1.631878822	1.81E-27
Jazf1	1.631170426	2.93E-25

Stard13	1.628554708	1.16E-16
Il1r1	1.627857707	3.85E-15
Pcdhb11	1.627733869	1.26E-17
Npr2	1.625666742	4.49E-18
Hoxd12	1.620839278	3.24E-27
Col1a1	1.619351802	2.58E-25
Abca1	1.618377357	7.46E-29
Scamp5	1.61777978	2.26E-30
Panx2	1.617720638	4.44E-16
Adgrf5	1.616711727	2.40E-08
Lsamp	1.615608469	6.41E-23
Opr1	1.614656812	4.56E-06
Nacad	1.614125368	1.84E-25
Kcnmb4os1	1.613945714	5.02E-28
Smpd3a	1.61125964	1.00E-32
Rusc2	1.610921358	1.78E-27
C1sn3	1.607909817	2.86E-58
Axl	1.607878167	2.72E-56
Trpm3	1.607355538	3.95E-11
Acvrl1	1.606067891	1.45E-16
Arhgef28	1.605074906	3.30E-22
Slc16a4	1.604352919	1.08E-08
Wbscr17	1.602558825	3.60E-32
Trp53inp1	1.601716105	1.46E-64
Spint2	1.601178159	2.06E-49
Chrd	1.59968496	1.65E-13
Pcdhb14	1.597075742	3.73E-20
Actc1	1.597006619	7.63E-13
Spock3	1.5963612	5.91E-24
F11r	1.596313423	6.60E-13
Mme	1.596290163	1.38E-39
Cldn9	1.59469811	9.24E-20
Cyp2s1	1.594441325	3.34E-13
Dnajb4	1.594111986	4.49E-59
Car5b	1.592987583	3.55E-21
Lrrc15	1.59164477	1.81E-16
Synpr	1.586563664	7.17E-13
Pcdh8	1.586393518	0.001225594
Kank1	1.585962465	1.73E-45
Pcdh10	1.584791604	1.19E-23
Dapk2	1.581959028	1.67E-13
Fxyd1	1.579967808	3.75E-23
Tgfb1	1.578599224	6.38E-58
Sspn	1.573790282	8.38E-29
Sorcs2	1.571847445	8.35E-65
Runx2	1.565252585	3.89E-08
Dsg2	1.559599936	3.38E-12
Tac1	1.55929592	2.60E-11
Fat3	1.558357127	1.23E-16
Pcdhb6	1.557777894	3.04E-12
Entpd1	1.555520796	9.95E-19
Wnt5a	1.555334073	3.71E-49
Kcnmb4	1.553703063	1.13E-44
Ngf	1.552302163	1.54E-13
C1s1	1.549464662	1.47E-14
Armc2	1.548067389	3.68E-15
Fam46a	1.547367656	2.26E-08
Serpini1	1.545627008	7.84E-36
Cd83	1.544948844	3.95E-21
Klhdc8b	1.543932542	7.13E-26
Bmx	1.542416641	6.45E-20
Astn1	1.539537328	2.19E-62
Il16	1.539194956	8.56E-15
Eli3	1.53768232	1.37E-20
Tbx15	1.534949671	3.23E-31
Selenop	1.531491776	2.10E-59
Prr16	1.525204359	1.31E-13
Myk	1.525106257	4.30E-21
A730056A06Rik	1.524109902	3.03E-19
Larp6	1.524054219	5.64E-12
Lrba	1.522895224	6.15E-34
Fst	1.522696922	8.61E-18
Fam150b	1.521723061	2.59E-19
Sytl2	1.521697922	1.29E-17
Firre	1.520661333	1.26E-06
Mfsd7c	1.518727825	2.42E-16
Scn1a	1.517468047	8.28E-17
Dsp	1.516103935	3.91E-09
Lrrc75b	1.515975485	4.04E-17
Bnc1	1.515797937	1.20E-05
Cdh4	1.514146414	3.05E-36
Egr1	1.513372522	0.000463686
Nrbp2	1.51324392	2.40E-09
Cd38	1.511421261	3.32E-24
E130114P18Rik	1.511081375	6.08E-16
Col16a1	1.510400945	1.49E-15
Samd4	1.509311958	8.34E-42
Cd82	1.508822394	8.73E-29
Rbms3	1.507865235	5.36E-78
Slain1	1.507262803	5.53E-18
Fos	1.507030789	1.09E-05
Wipf3	1.50696003	6.90E-15
Kctd12	1.506847341	1.65E-19
Drp2	1.50603921	3.99E-18
Nrxn2	1.505850896	5.12E-22
Zcchc12	1.505424965	1.02E-25
Popdc3	1.504694313	2.50E-17
L1td1	1.503583558	8.15E-10
Cttna2	1.502440391	1.84E-07
Kat2b	1.496293661	4.46E-13
Ccdc60	1.494901497	5.55E-10
Grhl2	1.493834449	3.79E-11
Prkca	1.493146279	1.01E-37
Selenbp2	1.493100271	3.43E-19

Ap3m2	1.492741339	4.24E-26
Nbl1	1.492142751	1.39E-15
Pcdhb8	1.490079557	6.58E-11
Dnm3	1.488136934	7.32E-17
Mpzl2	1.486495396	6.93E-25
Rnase1	1.486023336	3.33E-17
Rspo3	1.482973847	1.63E-37
Prkar1b	1.482424501	1.81E-20
Tll7	1.480683145	3.63E-34
Foxd1	1.48049161	9.27E-09
Brd1	1.480092077	1.74E-15
Plce1	1.4799794	1.39E-44
Tcea3	1.479804003	6.13E-13
Nt5e	1.478980047	9.75E-06
Ebf4	1.477981006	8.55E-12
Mbnl2	1.477553491	5.94E-22
Adgrf3	1.472629306	5.28E-44
Zeb2	1.471335444	2.60E-26
Six1	1.471231397	8.14E-29
Ppp1r3b	1.471072852	1.29E-17
Eps8l2	1.469788401	1.75E-13
Dhrs3	1.469781031	1.00E-30
Ghr	1.467746598	3.52E-41
Bcl2	1.467200663	1.71E-41
Grid2ip	1.466370871	9.44E-11
Tcea16	1.465764049	3.34E-17
Osr2	1.464073474	9.59E-22
2810459M11Rik	1.461905453	1.78E-12
Pcdh7	1.461420533	3.99E-29
Zfp804a	1.46040021	6.12E-06
Syt5	1.455852619	8.06E-19
Abca9	1.454752416	1.29E-13
Tshz1	1.453071952	7.69E-48
Vwa5a	1.44714812	1.58E-59
Vcan	1.446904015	3.64E-15
Plcl1	1.445666572	1.75E-17
Pcdhb18	1.445467405	1.93E-16
Rxrg	1.444910208	3.60E-12
Gsc	1.444854701	1.58E-19
Ncan	1.44214807	4.69E-31
Plekha4	1.440539562	9.31E-10
Tgfb2	1.439981558	1.45E-46
Sema5b	1.437703559	3.05E-10
Cpt1c	1.437553512	1.19E-14
Hcn1	1.436303105	3.98E-10
Pcdh1	1.435485928	6.42E-17
Brinp1	1.434951611	8.70E-09
Arhgap36	1.433835119	4.80E-09
Rab11fip5	1.433682219	1.08E-15
Timp3	1.433331202	1.58E-59
Firt1	1.432985484	9.23E-14
Sei1l3	1.429524694	1.60E-13
Als2cl	1.42931557	3.16E-14
Dennd2c	1.42884159	6.62E-15
Nol4	1.427729641	6.23E-12
Rftn2	1.427654669	5.75E-44
Rn45s	1.4269844	0.001085687
Lars2	1.425578754	0.0012666
Kifc2	1.425227496	1.68E-07
Fry	1.423521254	1.33E-13
Gria4	1.423366604	7.86E-18
Tinagl1	1.421423906	1.34E-09
Igln5	1.421394984	4.96E-43
Spata18	1.420803837	1.37E-10
Pcdha5	1.419319819	2.58E-12
Patj	1.417871948	2.36E-43
Lrrc8c	1.417772385	6.51E-39
Cicf1	1.41701669	1.08E-15
Pcdhb20	1.416033944	3.62E-19
Mctp2	1.413010353	3.96E-16
Magi2	1.411332143	1.24E-11
Pcdhac2	1.408052039	2.77E-09
Pygl	1.40720418	1.38E-38
Klhl14	1.404896114	2.09E-16
Pstpip2	1.404701313	6.48E-22
Smarca2	1.403525956	2.36E-68
Pcdhb5	1.402468664	7.30E-15
Plxna4	1.402240271	1.52E-25
St8sia4	1.402103832	2.93E-18
Arrdc1	1.398680775	1.05E-26
Rap1gap	1.397717153	2.71E-18
Fgf12	1.396052534	3.24E-17
Pcdha9	1.395142965	3.39E-12
Trps1	1.393506187	1.12E-22
Nlrp10	1.393011217	1.80E-08
Ptgs1	1.392966134	8.92E-16
Myo6	1.392390521	2.70E-24
Nlrp5-ps	1.392363642	1.93E-05
Trim46	1.392085511	3.39E-17
Pcdhb19	1.391408977	3.32E-14
Smad9	1.389736214	1.23E-07
Snai2	1.389255511	4.96E-48
Tle2	1.387435998	8.55E-07
Tec	1.386586838	3.46E-09
Pld1	1.385824047	4.93E-21
Stard8	1.385329939	1.83E-13
Rasgef1b	1.384951884	7.15E-34
Nr4a3	1.384350617	2.12E-08
Nxph3	1.382985089	2.24E-14
Cyp4v3	1.381977549	4.27E-19
Pcdha2	1.378095906	1.98E-11
2810029C07Rik	1.377503263	1.01E-09
Arhgap33os	1.376445913	9.60E-06
Eva1a	1.375455426	4.07E-18

Col11a1	1.375367267	3.14E-44
Arhgef26	1.374853457	1.59E-22
Z610307P16Rik	1.374178487	0.000126541
A730020E08Rik	1.372409147	1.09E-16
Pik3ip1	1.37155301	7.44E-20
Pcdha12	1.369140034	1.80E-12
Rflnb	1.368653631	4.09E-35
Homr2	1.368372336	1.94E-51
Glrx	1.367719487	8.36E-31
Creb3l4	1.36644951	4.39E-25
Dubr	1.365043494	8.23E-08
Adgrg1	1.364767786	5.87E-23
Mst1r	1.363862734	3.91E-13
Limch1	1.363834131	4.38E-23
Pip5k1l	1.363812647	4.07E-09
Pcdha1	1.362243566	1.86E-10
Slc2a13	1.362181155	7.55E-10
Adcy9	1.36110482	1.07E-27
Mgat4c	1.360262406	2.41E-09
Kcnmb4os2	1.360024699	4.68E-37
Shroom1	1.359238639	5.02E-17
Ulp1	1.359008984	2.48E-06
Pcdhac1	1.358486762	1.57E-10
Stag3	1.358372914	3.64E-05
Ralgps1	1.356485531	2.96E-33
Pcdha7	1.356385386	1.01E-10
Pcdha6	1.35478757	3.43E-10
Chrb1	1.354703076	1.91E-12
Slc45a1	1.353613112	1.65E-11
Pcdha3	1.352587905	1.11E-10
Dst	1.351686623	1.94E-13
Ak1	1.351388601	8.68E-31
Rapgef1	1.350913726	8.77E-17
Pcdha8	1.350066968	6.95E-11
Pcdha4	1.349558824	1.56E-10
Tlr2	1.349166762	1.55E-08
Cpe	1.34866962	3.45E-43
E130310I04Rik	1.348663036	2.12E-09
Azin2	1.346478017	4.89E-29
Tub	1.346286093	2.66E-45
Rrad	1.345124619	4.16E-21
Dusp15	1.345115343	8.72E-17
Trim12c	1.344697275	4.24E-16
Z510009E07Rik	1.344135849	1.14E-52
Mirg	1.343222628	8.46E-10
Acss3	1.343028574	1.27E-15
Lgr5	1.342987401	1.19E-19
Kif5a	1.342807578	6.65E-13
Pcdha10	1.339793318	6.78E-10
Thsd4	1.339748066	5.50E-19
Gdf7	1.339542497	2.35E-07
Thbs3	1.339033292	2.62E-10
Fhl2	1.338938992	6.83E-06
Adcy4	1.336693604	3.03E-21
Nacc2	1.335219842	9.00E-42
Pnma3	1.333727178	3.14E-12
Col25a1	1.331190317	6.01E-45
Cyp2d22	1.330109733	5.09E-10
Gulo	1.329643286	2.54E-18
Lepr	1.329441415	5.25E-08
C1qtnf4	1.328298108	4.56E-16
Gmcs	1.328057624	6.63E-39
Xpnp2	1.327780837	3.24E-13
Pcdha11	1.327629265	7.57E-11
E330013P04Rik	1.326410067	1.28E-09
Mmp11	1.325928815	4.18E-35
Dleu2	1.323890751	1.24E-21
Rgag1	1.323860668	1.03E-15
Ltbp4	1.323011147	1.88E-35
Peg13	1.322915696	3.08E-20
Chadl	1.320355796	1.17E-15
Uph	1.319125098	1.04E-29
Tceal3	1.318941052	1.04E-20
Clec2l	1.318907738	1.95E-17
Ddah1	1.315607247	6.12E-27
Anxa4	1.315482876	6.76E-17
Nfic	1.314095586	1.82E-39
Dcaf12l1	1.313667525	3.85E-21
Sema3c	1.309692727	8.64E-13
Egflam	1.308397294	4.34E-44
Emilin3	1.307207122	3.18E-53
Nkain4	1.306998989	2.18E-15
Rian	1.301185827	2.60E-09
Tmem169	1.300645896	7.30E-29
Rab27a	1.299073294	7.93E-30
Fam159a	1.299057268	8.26E-12
Grina	1.298624667	1.42E-35
Lox	1.295609265	2.20E-08
Notch1	1.293735733	3.28E-14
Tap1	1.291474044	1.79E-13
Tox3	1.290808713	4.50E-37
Grik4	1.289311932	1.04E-12
Lmna	1.289192004	2.01E-23
Gpr85	1.288532513	4.66E-11
Ccdc149	1.28776818	2.94E-12
Adgrb3	1.287685477	8.39E-07
Galnt18	1.286242569	1.78E-11
Slc2a12	1.286062739	1.87E-17
Nhs12	1.28599662	2.31E-19
Nlgn2	1.284743949	1.12E-29
Gpr4	1.281999396	3.01E-43
Gm5126	1.2818499	2.12E-15
Sl8sia1	1.281715859	9.55E-15
Mir7025	1.281129621	2.00E-14

Trpm4	1.280578796	1.96E-19
Hmgcl1	1.280482439	8.69E-23
Neb	1.278530107	1.68E-06
Adgrb1	1.27836065	5.18E-12
Mtmr11	1.277752958	1.57E-25
Robo1	1.275782983	4.15E-35
Galnt3	1.274242013	2.96E-07
Scx	1.27307899	1.63E-26
Epha7	1.272750766	1.13E-30
Abca8b	1.272403221	7.66E-21
Mxd4	1.270848385	1.31E-28
Garem2	1.270741213	9.23E-09
Fam134b	1.270546972	3.86E-15
Triqk	1.270418215	4.44E-18
Hap1	1.269460978	1.84E-11
Mab21l2	1.268400225	5.41E-24
Prkg1	1.267217234	1.78E-08
Mapre3	1.266820271	2.07E-18
C3HC4	1.261939114	2.22E-31
Gcnt1	1.26129601	1.12E-24
Sall1	1.261085589	1.10E-21
Egln3	1.260799657	1.84E-17
Pnmal2	1.260189283	2.67E-27
Fndc3b	1.260047129	8.95E-29
Col6a6	1.259983956	1.05E-07
Pdzd4	1.259451357	2.05E-34
Plekhb1	1.257362264	1.62E-09
Rab33a	1.254382332	2.53E-15
Prune2	1.254165936	7.78E-11
Cox4i2	1.25378423	4.12E-13
Trpc1	1.252785537	4.98E-11
Parp9	1.252151852	2.74E-15
Olfml1	1.251291876	9.94E-32
Fkbp14	1.250401133	3.54E-25
Ccl28	1.250387846	1.36E-09
Zmat1	1.249853751	8.95E-13
Agtr1a	1.248637568	6.68E-14
Slc26a1	1.248045593	2.33E-15
Fam46c	1.247199175	2.24E-12
Pcdhb17	1.246184495	1.94E-12
Prrt2	1.245776944	1.05E-07
Olfml2b	1.244849089	2.07E-20
Kcnt2	1.244771332	3.00E-08
Mdfic	1.244402162	1.01E-25
Pcdhb4	1.244339905	3.65E-12
Dpp6	1.243943459	2.41E-12
Bicc1	1.241996834	2.43E-36
Palmd	1.241471546	2.45E-11
Myliip	1.240942325	2.45E-28
Rap1gap2	1.240775979	1.16E-14
Ep41l3	1.23999054	2.54E-36
Abcg4	1.238326267	4.94E-09
Sfxn3	1.23776656	2.21E-16
Mir5130	1.237093054	6.12E-09
Mboat1	1.236238346	2.54E-14
Tmem45a	1.236177457	8.81E-17
Apela	1.235746518	1.60E-12
Eif4	1.235119035	2.67E-14
Artn	1.234991135	1.36E-12
Wif1	1.234386235	4.14E-12
Tenm4	1.234083218	1.83E-26
Cyp7b1	1.233602524	7.20E-09
Prkcdp	1.232460567	3.75E-10
Olfml3	1.232294677	1.44E-06
Car11	1.231234436	6.13E-13
Ryr2	1.228751439	4.89E-06
Scrn1	1.228477208	1.24E-10
Chst3	1.227292331	2.64E-23
Dtx4	1.226324774	6.91E-13
Mast1	1.225087755	4.64E-13
Epcam	1.224951186	3.10E-18
Cul9	1.224355045	2.95E-14
Bmf	1.223874012	3.28E-21
Smarca1	1.22157835	1.54E-60
Dock9	1.220796805	2.31E-22
Crhbp	1.218323403	1.15E-06
Ifitm7	1.218020688	7.47E-09
4833422C13Rik	1.216701414	3.94E-31
Acss1	1.216112124	1.00E-05
Ppp1r36	1.215827566	6.88E-12
Manba	1.215583048	2.49E-14
Fli1	1.214445076	2.68E-37
Mansc4	1.214407743	8.05E-10
Chsy3	1.21339143	9.38E-14
Shisa2	1.213255616	6.96E-39
Dapp1	1.213251967	2.13E-12
Setbp1	1.212701745	2.56E-17
Col1a2	1.212500331	5.82E-22
Tcf7l2	1.212360223	6.39E-44
Srpx	1.212089637	1.62E-13
Arhgap44	1.21168875	5.37E-24
Kihl3	1.211343632	1.35E-11
Ctdspl	1.211194062	3.46E-37
Col20a1	1.208494249	8.15E-06
Rbm46	1.207579473	5.24E-06
Nrsn2	1.207131906	7.51E-10
Nedd4l	1.206533957	4.96E-31
Cpq	1.203925185	1.40E-17
Meg3	1.203887358	1.89E-05
Gm15663	1.203816539	2.22E-08
S1pr3	1.203803098	6.53E-20
Pak7	1.202081732	1.90E-15
A330074K22Rik	1.200799923	6.01E-14
Hist1h2ad	-1.201661143	0.002474328

Ak4	-1.20225799	6.46E-18
C1qbp	-1.202491394	1.60E-16
Ybx3	-1.207900103	8.63E-24
Mthfd2	-1.20863394	8.78E-19
Rps2	-1.210639469	9.42E-10
Mthfd1	-1.21157402	1.29E-40
Aen	-1.216125336	5.18E-32
Ppat	-1.216440687	1.99E-25
Dmrt1	-1.218227106	5.15E-05
Gm6644	-1.218961963	7.44E-15
Rcc1	-1.222524918	2.40E-22
Ung	-1.224304551	1.89E-15
Dach2	-1.226540075	1.14E-15
Lrrc3b	-1.228333742	0.000737819
Car14	-1.229923212	1.22E-31
Prdx6	-1.230938976	1.87E-20
Prrt4	-1.232689024	8.24E-10
Nme1	-1.233932437	2.05E-09
Hist1h2an	-1.236147754	0.001331878
Rplp1	-1.238536133	5.32E-06
Dyrk3	-1.240394315	4.77E-14
Shmt1	-1.244010647	1.36E-21
Hspa1a	-1.24449977	0.095847387
Pkm	-1.244872848	6.14E-16
Lef1	-1.245036054	3.64E-21
Etv4	-1.24824196	1.16E-16
Stc2	-1.251362012	0.000272281
Unc5a	-1.256205194	3.44E-07
Wt1	-1.259221645	0.000463056
Fabp5	-1.260299466	3.12E-13
Mrpl12	-1.2647983	3.88E-18
Eno1	-1.268754782	3.67E-19
Exosc6	-1.268779525	6.63E-28
T	-1.269913836	0.009121531
Epb41f5	-1.281848149	1.84E-13
Ninl	-1.286601408	1.34E-16
Ccne1	-1.288193266	6.56E-28
Bola2	-1.292090713	2.09E-09
Epha2	-1.296157955	2.54E-18
Gm4737	-1.303050889	2.76E-16
Rgl1	-1.305119162	2.52E-44
Hspe1	-1.309703062	1.15E-13
Ppp1r14b	-1.31078255	1.28E-26
Cth	-1.316385411	2.02E-22
Sptbn2	-1.320936149	7.08E-22
Tubb6	-1.323728503	0.00385416
Dusp2	-1.324496469	4.98E-06
Asic2	-1.330442436	0.028769575
Eno1b	-1.333559449	9.62E-17
Fgf5	-1.335381241	1.34E-05
Hprt	-1.353184348	4.55E-14
Hspd1	-1.354387253	6.08E-21
Snhg4	-1.357151141	7.95E-13
Grwd1	-1.359552392	3.73E-21
Tmem204	-1.369073245	1.40E-07
Eif5a	-1.374503404	1.87E-12
Fam89a	-1.384774235	1.27E-11
Ano1	-1.395468513	5.15E-10
Lix1	-1.397071499	6.20E-20
Sp8	-1.404601903	2.96E-05
Nhp2	-1.414061922	2.40E-11
Hist1h2ak	-1.421775775	8.43E-06
Mif	-1.430015692	1.53E-10
Greml1	-1.431014514	3.12E-13
Tmem132d	-1.431108419	7.29E-06
Scn4b	-1.435428663	0.000209301
Hist1h2ap	-1.43650071	7.14E-06
Hist1h2ab	-1.43760776	0.000265011
Bcat1	-1.43954289	1.66E-14
Ahcy	-1.446028036	1.88E-14
Slc25a5	-1.452410109	9.52E-17
Greb1	-1.460663404	6.62E-38
Myf5	-1.465696918	0.001974935
Hist1h2ao	-1.466203344	2.23E-06
Meis3	-1.46810413	0.000111521
Pou4f1	-1.475173272	1.36E-06
Cdkn1a	-1.47614056	1.21E-07
Dusp9	-1.488990165	2.64E-17
Pdlim1	-1.490063504	9.33E-10
Atg9b	-1.499721863	2.99E-09
Dctpp1	-1.504188991	1.75E-13
Oasl2	-1.513236928	2.77E-10
Arid3a	-1.529811803	1.38E-35
Gabra2	-1.531032034	0.002708001
Wfikkn1	-1.533974678	4.65E-07
Epop	-1.545099136	1.99E-34
Hoxd1	-1.547868145	9.36E-09
Plaur	-1.566268706	2.68E-12
Lama1	-1.56679796	6.36E-33
Podxl	-1.571070926	1.82E-06
Slc7a5	-1.58985465	7.44E-17
Cyp11b1	-1.616882214	4.63E-12
Nptx2	-1.618533283	5.40E-09
Crabp1	-1.635799715	2.81E-07
Mapk12	-1.647237071	1.13E-55
Lin28b	-1.649355835	2.04E-38
Trim71	-1.650723682	2.40E-46
Cpne7	-1.650958674	4.63E-11
Grpp1	-1.659181964	7.35E-11
Elovl2	-1.659293806	1.69E-41
Rpl21	-1.665482509	5.45E-07
Chchd4	-1.66753072	9.66E-21
Gata5	-1.670874177	0.000668803
Mthfd1l	-1.67271585	3.75E-29

Ripply3	-1.673027476	2.55E-13
Dusp4	-1.689147135	9.69E-30
Mycn	-1.7093288	5.79E-28
Trpm1	-1.710694208	2.83E-12
Vegfd	-1.734811435	4.42E-31
Dkk1	-1.740003416	1.13E-16
Cygb	-1.753473262	4.25E-15
Camk1d	-1.777740406	5.36E-26
a	-1.790920554	2.58E-24
Sowahb	-1.824311823	5.45E-11
Cd40	-1.834177665	2.90E-38
Mamdc2	-1.840662977	1.22E-23
Adamts16	-1.850860448	0.001876777
Gldc	-1.85328657	7.15E-13
Msx1os	-1.861692689	8.02E-38
Prdm1	-1.86810803	1.42E-22
2010204K13Rik	-1.906001485	1.26E-11
Lmo1	-1.913253556	2.00E-10
Chrna1	-1.91653262	2.18E-13
Col13a1	-1.916759553	7.63E-15
Fzd10	-1.97590168	8.90E-22
Msx1	-1.990450358	1.93E-36
Des	-2.010599989	9.54E-10
4930502E18Rik	-2.022354724	0.060960085
Mogat2	-2.048645795	7.03E-20
Mybpc1	-2.089171633	4.44E-13
Hoxc9	-2.121925015	6.67E-08
Jaml	-2.127269154	2.00E-09
Sall4	-2.159662212	2.86E-20
Plcg2	-2.1760345	2.42E-36
Cdx1	-2.202924536	6.50E-15
Figl12	-2.223638753	7.46E-38
Tcf7	-2.236647732	8.64E-47
Gbx2	-2.432072657	1.12E-25
Hoxb9	-2.45058578	1.63E-07
Epha8	-2.481642203	5.27E-17
Prtg	-2.507046524	4.60E-32
Lbx1	-2.536510135	2.44E-21
Dpep1	-2.556839576	4.10E-21
Crmp1	-2.595560889	8.35E-26
Pitx1	-2.70011597	0.025422854
Nr1h5	-2.710757751	0.027973353
Sp5	-2.783611717	1.93E-10
Rspo4	-2.812668628	1.55E-15
Tfap2c	-3.228378396	1.84E-39
Notum	-3.25871866	1.03E-37
Pax3	-3.266223193	1.95E-13
Hoxc10	-3.518061358	0.000807474
Shh	-3.547771124	1.32E-42
Igdcc3	-3.609710858	9.98E-52
Lin28a	-4.565708807	1.13E-10

Table S7

Symbol	Jagged_rep1	Jagged_rep2	Jagged_rep3	PDGFRa_rep1	PDGFRa_rep2	PDGFRa_rep3	OCF_rep1	OCF_rep2	OCF_rep3	CB_rep1	CB_rep2	CB_rep3
Gm2694	1.44678898	1.61955242	1.679168263	-0.410783987	-0.662502865	0.20201918	-1.213374854	-1.199476784	-0.695670052	-0.171551258	-0.36538002	-0.228793833
Gm3636	0.365200192	0.822906237	1.213820638	-0.228880265	-0.137722818	-0.39445946	-0.53009261	0.198407707	-0.488046966	-0.426764963	-0.31931945	-0.350984453
Gm10409	0.75281372	1.07944717	1.05749032	0.074038905	0.179712618	-0.247994616	-0.527675043	-0.227510102	-0.019874876	-0.096336451	-0.7092818	-0.101335193
Gm13032	1.732070372	1.202632125	1.497740184	-0.744353798	-0.591486444	0.173902770	-0.464111163	-0.958358526	-0.627423562	-0.495349131	-0.521061907	-0.204200926
LOC100503496	0.932439109	1.074937504	1.409365549	-0.257464924	0.309687261	-0.470359892	-0.888676373	-0.528843588	-0.639652034	-0.613466543	-0.304182778	-0.023783293
Eogt	2.001245586	2.315006729	2.323108489	-0.187122907	-0.503875287	0.11881166	-1.352366323	-0.797006322	-1.134995335	-0.917256984	-1.016433738	-0.849115858
Mtus1	2.021152356	2.013306289	1.965638705	-0.986203005	-0.804855218	-0.747644385	-0.124143058	-0.376797253	-0.541411211	-0.720246017	-0.89989110	-0.788005802
Cpne7	0.649411331	1.171533789	0.87178108	0.007935985	-0.073037329	-0.152835023	-0.28209311	0.686435302	-0.384418167	-0.845890365	-0.913785732	-0.73503776
Gm26688	0.853907408	0.90702899	1.461397561	-0.01016132	0.083743021	0.391213504	-0.636689139	-0.398656797	-0.69985194	-0.349256876	-0.439558272	-0.763115691
Crdm2	2.148249774	2.163098756	2.330952748	-0.117183085	-0.968607206	-0.910382889	-1.410800771	-1.380924781	-1.342006054	-0.306454396	0.047828361	-0.253770456
Rpnl	2.728817058	1.90125964	2.071480249	-0.101197532	-0.176341517	0.390251807	-1.030131709	-1.202081111	-0.907302789	-1.120208111	-0.680591819	-1.202081111
Slc16a6	1.162147785	1.254971506	1.558172935	-0.171065337	0.250940701	-0.258329207	-1.032854429	-0.749791161	-0.757408365	-0.632857866	-0.400096425	-0.232829751
Aspg	0.357705808	1.491628004	0.926700406	-0.447021135	-0.324317621	-0.563151908	-0.937270214	-0.020060609	-0.719578575	-0.688502626	0.178884765	0.163837305
Card10	1.359914219	1.89410857	1.878703651	-0.627840207	-1.190786367	-0.674349661	-1.229191494	-0.200580971	-0.472384719	-0.195832352	-0.274903302	-0.267006725
Trip10	0.597433022	0.96130387	0.953655289	-0.183330705	-0.093071528	0.133812821	-0.319323261	-0.160190305	-0.604593131	-0.468153265	-0.458883228	-0.588641262
Fam163b	1.336178256	1.512490817	1.424889596	-0.909781403	-1.196534188	-0.518505729	-0.446655832	-0.367809875	-0.296156837	-0.140259707	-0.464734961	0.066879864
Nop2	0.694027961	0.724626559	0.8222692	0.103750193	0.069423388	0.142752829	-0.147740519	0.055976536	-0.447694669	-0.709148694	-0.72148668	-0.734394203
Pde4c	0.637754124	1.47803624	0.653246723	-0.450338037	-0.202506915	-0.362992138	-0.909858276	0.296776861	0.110823614	0.20037304	-0.230832069	-0.174887851
H2-Q6	0.831597186	0.550649875	1.207731649	-0.488313765	0.292434356	0.112592067	-0.492988648	-0.391444505	-1.185663164	-0.379645883	0.170841626	-0.227790794
H2-Q9	1.065975033	1.217812135	1.077767916	-0.033161624	-0.383735077	-0.176282789	-0.531286887	-0.778730337	-0.56078372	-0.306776878	-0.456022112	-0.570571561
Chrna1	1.950682102	1.756731212	1.801563675	0.45952781	-0.059214413	-0.01624496	0.364293549	-0.623638017	-0.220856497	-1.914520578	-1.566286979	-1.932010013
Tlyh2	1.025118749	0.98991049	0.84013877	-0.24700703	-0.14351594	0.0543389	-0.337493856	-0.580478939	-0.445256988	-0.580478939	-0.451086735	-0.510716336
Alpa2	0.793230311	0.954170096	0.779729862	-0.091355873	0.012111554	0.18196278	-0.269246292	-0.078608732	-0.135985533	-0.75927142	-0.940481842	-0.446259405
Arp1b	0.927149147	1.125130143	1.046147245	-0.359638866	-0.470271878	-0.159532264	-0.601064015	-0.694480895	-0.606024602	-0.202574462	-0.104064322	-0.09224777
Car2	1.619796255	1.08786412	1.810418991	-0.237839985	-1.587708215	-0.453968379	-0.575685176	-0.48493748	-0.738606006	-0.332167653	0.017041085	-0.124780993
Cfba23	2.027764312	2.310943338	2.428317864	-0.32926097	-0.062928285	-0.161032873	-1.513840884	-1.3721453	-0.84495806	-0.563489678	-0.391453068	-0.391453068
Cbln1	1.988108057	2.015846258	2.135941055	-0.293510736	-0.431275383	0.336716043	-1.323263627	-1.673271119	-1.659505492	-0.534669538	-0.189510331	-0.37056426
Cdk6	0.999494238	0.90448057	1.12050805	-0.668394982	-0.120254276	-0.489557457	-0.024977078	-0.168855189	-0.157558402	-0.209511784	-0.363953308	-0.358154114
Cxd2	1.530233222	1.862410759	2.909751356	-0.778507761	-0.347780571	-0.778507761	-0.778507761	-0.778507761	-0.778507761	-0.778507761	-0.632138808	-0.629431742
Cited4	1.312657414	0.702909038	0.727516701	0.140926033	-0.352711086	0.001174282	-0.545031753	-0.107745695	-0.848946641	-0.094394368	0.094394368	0.050078752
Plk3	0.398310477	1.12225532	0.759860151	-0.135097177	-0.593500626	-0.04976934	-0.727353188	0.290059061	-0.529861705	-0.210745044	-0.172038873	-0.151988907
Dnm3b	0.857543116	0.979171875	1.061575611	0.015088525	0.015884845	-0.025561469	-0.20764347	-0.273540333	-0.315704707	-0.662197427	-0.049814639	-0.594749345
Ednr	2.187027218	3.147178496	3.253851002	-0.36859141	-0.979153806	-0.495982259	-1.442053003	-2.710550404	-1.898589586	-0.457608162	-0.042414353	-0.193142209
Epha1	1.017575762	1.344713683	1.463495111	-0.194486262	-0.202967992	-0.258100021	-0.789291179	-0.664661938	-0.693924748	-0.407733358	-0.205865163	-0.408717989
Epha2	2.460379238	2.766730357	2.759186115	0.042422517	-0.46347835	0.006711417	-1.65211996	-1.106038235	-1.438699661	-1.017310368	-0.205926065	-0.107197589
Epha4	0.967214954	1.184646184	1.37213207	-0.646103379	-0.323962278	-0.713334023	-0.986718685	-0.563745555	-0.517049474	0.12799156	0.10006015	-0.001079139
Exv1	3.175204245	3.475204245	3.475204245	-0.18502937	-0.105492572	-0.737978677	-2.811705969	-2.076010077	-2.359405704	-1.398248339	-1.104064506	-0.914106931
Ankrd10	0.971391481	1.065293228	1.209964304	0.098062909	0.161287566	0.100972619	-0.847364375	-0.734575104	-0.635327599	-0.459780731	-0.623711631	-0.306216326
Grf1	0.701084253	0.716725582	0.872904053	-0.32681801	-0.219441192	0.09282924	-0.329990671	-0.580350484	-0.476434961	-0.445618313	-0.077713277	-0.067358778
Fjx1	0.790562556	0.763525802	0.948868065	-0.049876261	-0.324678063	-0.068019562	-0.47701185	-0.329439754	-0.257450766	-0.246990835	-0.163210345	-0.586278957
Gia3	3.408369133	3.210934338	3.475204245	-0.650044924	-0.936286038	-1.824243175	-2.419070229	-2.498533156	-2.498533156	-2.498533156	-0.886558886	-0.417266558
Glycy2c	1.73617168	2.500372454	2.323549571	-1.105394557	-1.272087801	-0.881423652	-0.335243263	-0.751743983	-0.339197201	-0.11341089	-0.1091981	-0.850593268
H2-Q5	0.627404337	1.20281164	0.821652731	-0.174325218	-0.40291016	-0.514627962	-0.017722951	-0.546288115	-0.53110503	0.052889639	-0.017723852	-0.752668804
H2-Q7	1.06625627	1.220560769	1.07751804	-0.0334115	-0.383385583	-0.178532665	-0.531536746	-0.778980213	-0.561033596	-0.208226754	-0.456271988	-0.275325392
H2-Q8	0.835249767	0.589345332	1.16556444	-0.51088897	0.269859511	0.090015082	-0.515625053	-0.41401971	-1.208238369	-0.20221088	-0.215091163	-0.137878673
Has2	1.201401537	1.022327065	1.373707896	-0.888596835	-0.78731891	-0.760113074	-0.598638096	-0.575624433	-0.308373666	0.190243954	0.175740323	-0.427557611
Hey1	2.507842794	2.329035887	2.651744607	-0.895263188	-0.107366826	-0.347957578	-0.947088397	-1.218352402	-1.293385763	-0.502808464	-0.600848464	-0.666320833
Mnx1	1.660383787	2.264962346	2.276047603	-0.715629713	-0.451880664	-1.427243602	-0.64501076	-0.468380782	-0.607016819	-0.43124818	-0.772641619	-0.661971281
Lama1	1.496481748	1.79548708	2.055015015	-0.358972221	-0.304369408	-0.192430071	-0.196728718	-0.349661759	-0.496463534	-1.126521217	-1.30489028	-0.281182624
Lamb1	0.759680704	0.888586131	0.616431481	-0.462616379	-0.27973030	-0.23003501	-0.181406349	-0.213348079	-0.328474196	-0.328136928	-0.245195216	-0.021806366
Lfnlg	1.501003075	1.303896068	1.891875521	-1.47296464	-0.061921449	-0.747373929	-0.586100399	-0.124814878	-0.578986221	-0.307579778	-0.018544589	-0.201492561
Lmo2	3.19274818	3.475204245	3.475204245	-0.368739058	-0.956703154	-0.288538852	-1.771130737	-2.078962457	-1.96925108	-1.10906073	-0.896006412	-0.860702737
Lor	0.783877399	0.935823028	1.218006999	-0.174552332	0.032173203	-0.351009723	-0.93972115	-1.048446592	-0.764812176	0.199002664	0.142916402	-0.033311483
Ly75	0.73994905	0.891381266	1.000124541	-0.129585069	0.087395049	-0.065657476	-0.293502055	-0.618377173	-0.358675261	-0.46854008	-0.263263956	-0.263263956
Maff	0.913036911	1.510961579	1.283350602	0.140196617	-0.187376475	-0.071487217	-0.101229799	-0.188506064	-0.42512745	-0.422733988	-0.787196977	-0.74088035
Mman2a1	0.931446112	0.810912269	0.924915255	-0.290987107	-0.14977996	-0.562710968	-0.496425692	-0.387959601	-0.387959601	-0.387959601	-0.164196037	-0.245285538
Kitl	1.118840996	0.675466126	0.7651768	-1.174443136	-0.912235614	-0.513940302	-0.545265074	0.520410678	-0.365602747	-0.204334484	0.082380655	-0.689760465
Mpb1b	0.902851951	0.834431575	1.082923942	-0.768647467	-0.136377923	-0.396111224	-0.688279449	-0.222561358	-0.675265499	-0.218158303	0.065262641	-0.221749272
Myh9	0.742919378	0.987902134	0.980860757	-0.550776041	-0.460922318	-0.49617678	-0.336717714	-0.129255414	-0.39021668	-0.24130422	-0.107898261	0.002268942
Nid1	1.249405528	1.251920108	1.163772234	-0.24240245	-0.174378639	-0.150699891	-0.105793054	-				

Spry1	1.256628546	1.190050642	1.428834192	-0.012202851	-0.374494003	0.380815666	-0.882845206	-0.476749761	-0.471534793	-0.5940578	-0.633840834	-0.810603798
Spry4	1.939250742	1.763784822	1.948844392	-0.215628787	-0.230160398	0.538711753	-1.426290794	-1.504158295	-1.496848104	-0.215079726	-0.341264323	-0.761162181
Lax1	1.332894983	1.341403948	1.230564001	-0.64864506	-0.317236560	-0.662756329	-0.026201001	-0.122218446	-0.056227755	-0.957965954	-0.636252777	-0.55551526
Cr2	1.368002636	0.207897359	0.857032884	-0.538630643	-0.456511155	0.190639634	-0.668056389	-0.466780032	-0.602234269	-0.324503232	-0.017308218	-0.444360819
Kcnk1	1.040017287	0.173818581	1.028179946	-0.330102775	-0.111763611	-0.124363953	-0.190906498	-0.793698423	-0.288796956	-0.427358327	-0.690015436	-0.805025745
Kank4	0.68479664	0.08232652	0.812701744	-0.062019807	0.097523809	0.092196858	-0.29363531	-0.228159231	-0.237283179	-0.610984375	-0.566693576	-0.496676225
Dmrt2	0.932482277	0.508108488	1.436367288	-0.039863979	-0.065432601	0.137526619	-0.256051576	-0.256051576	-0.565372712	-0.65728952	-0.839339208	-0.386042236
Hpd1	0.6733036	0.673645692	1.112821828	0.176336642	-0.368459365	0.322056746	-0.328356734	-0.176317153	-0.490955381	-0.512725704	-0.230462871	-0.851036197
Lrrtm4	1.013398543	0.700114166	0.90038944	-0.796555975	-0.642788621	0.44899474	-0.171033854	-0.502954014	0.041081038	-0.378535322	-0.005809839	-0.94268014
Nim1k	1.040439181	0.474504747	0.806906143	0.001238877	-0.147858349	-0.10719723	-0.112482152	-0.364100357	-0.340897678	-0.444094059	-0.478667428	-0.327789202
Ceacam1	0.882965652	1.117269127	1.467756971	-1.428998821	-0.255839564	-0.230697741	0.118250156	-0.190139339	0.126262971	-0.106278078	-0.991648451	-0.508894744
Gre1	1.387326673	1.669370724	1.686985751	-0.749533327	-0.707871475	-0.52971191	0.220826158	0.494065704	0.331773876	-1.142742852	-1.424427852	-1.236043747
Elmod1	1.50180446	0.80817821	1.021867359	-1.210646498	-0.394502033	0.22013232	-0.517288488	-0.215628306	-0.752957347	-0.131676045	-0.355513158	0.026330527
Tnfrs12a	1.068033528	1.539879537	1.590450251	-1.104418157	-0.857503613	-0.708009676	-0.427937127	-0.143270475	-0.419924313	-0.298489454	-0.111623892	-0.127186609
Tnfrs19	0.816228635	1.078152955	1.11707035	0.193825831	0.015350731	-0.017078845	-0.368283834	-0.749158282	-0.371143782	-0.033794812	-0.44237144	-1.238797508
Fgd3	0.572072572	1.161304452	1.32338723	-0.153089038	-0.429040784	-0.664832784	-0.674883249	-0.179794853	-0.182545323	-0.300962065	-0.469208062	-0.361997808
Dusp4	0.756090907	0.80259421	0.996009777	0.149031421	-0.034642191	0.061111624	-0.074847349	0.036602795	-0.034449235	-0.534684435	-0.85318754	-1.264863684
Dock6	0.939176005	1.225792439	1.171877155	-0.329576644	-0.438473999	-0.649688334	-0.670395791	-0.007501153	-0.394189201	-0.394729925	-0.326249478	-0.115398199
Relt	0.777891818	0.818409208	1.044661776	-0.093557331	-0.290880751	0.091396574	-0.134282744	0.0547032	0.025665794	-0.818664122	-0.89554417	-0.885251793
Sp8	1.447746289	1.931565556	2.378853918	-0.984262797	-0.548523255	-0.984262797	-0.169115705	-0.60415585	-0.235724773	-0.583521118	-0.984262797	-0.846222903
C330024D21Rik	1.039091584	0.826671221	0.568869088	-0.40283529	-0.225732862	-0.217032372	-0.192783557	0.320180577	-0.970696784	-0.45162096	-0.396159507	-0.821452099
Hs3st6	0.845550351	0.96990145	0.981947964	-0.597685083	-0.779530352	-0.779530352	0.134688627	-0.606396145	-0.011959942	0.008726552	-0.283300514	-0.326868395
Cecr2	1.048796599	1.82896811	1.288437053	-0.128438944	-0.048867617	0.145968367	-0.431200332	-0.286791999	-0.407644152	-0.770178041	-0.864776281	-0.728262267
Dgk	1.485784616	1.680892116	1.889735436	-0.710465932	-0.667115201	-0.248374734	-0.310439096	-1.07274406	-1.48174346	-0.107941737	0.058735791	0.663861259
Aim2	0.667404545	1.126875622	1.58934794	-0.570542229	-0.549042854	-0.992558307	-0.807837727	0.374102268	-0.243239948	-0.004773346	-0.144009253	-0.442386566
Rnf39	1.2130363	1.843660316	1.865428194	-0.226643263	-0.840775452	-0.594368757	-0.680974956	-0.464707087	-0.497603619	-0.914074695	-0.737681849	-0.448564131
Timem204	2.396617083	1.602898459	2.02732968	-0.192006449	0.165725261	0.617571813	-0.988914249	-1.133829625	-0.195018565	-0.466305588	-1.474597018	-1.143645834
Dlc1	0.708807895	0.905295177	0.966693563	0.109438435	0.146172096	0.054301832	-0.727838384	-0.502699256	-0.551324697	-0.448608294	-0.287609342	-0.377863364
Nptx2	2.241035192	2.339162675	2.739395446	0.128983866	-0.025293274	-0.025293274	-0.411727168	-1.347905089	-0.101697026	-1.086575287	-1.086575287	-1.086575287
Insm1	1.214773156	2.067456803	1.975029383	-0.509010667	-1.061740666	-0.337167491	-0.343950227	-0.635422819	-0.677183534	-0.695004099	-0.550085939	-0.44775687
Pdlim1	1.366317069	1.317714872	1.241607812	-0.0969416	-0.69527571	0.419829870	-0.0565339	-0.751367358	-0.362422966	-1.092446258	-0.46275023	-0.847600427
Pic4a4	1.16758138	1.091802737	1.099115813	0.068604027	0.060796198	0.262722124	-0.59035259	-0.465448621	-0.543436692	-0.770350728	-0.689444475	-0.698048772
Mpaip1	1.415884275	2.228923965	2.194259144	-0.161702673	-0.132525615	-0.445445862	-1.988366279	-1.543836219	-1.311051827	-0.173297674	-0.644040487	-0.61779571
Hlbahd	0.758575257	0.890773002	0.896218181	-0.309503878	-0.341330616	-0.163331976	-0.656094417	-0.671092189	-0.781612144	0.040374485	0.222876216	0.114448077
Rrs1	0.812329982	0.278584293	0.842186337	0.083272556	0.031262584	0.209490019	-0.22705388	-0.18458025	-0.248458032	-0.489362784	-0.808801585	-0.749232839
Hs4os2	1.043214767	0.378646444	1.007195289	-0.822696949	-0.753116315	-0.178343911	-0.295574033	0.645426686	-0.187436469	0.185526809	-0.116497731	-0.143704876
Nrgn	1.252887377	0.955273073	0.91582814	-0.138448341	-0.628906028	0.203017827	-0.511007303	-0.76171271	-0.703066943	-0.491409151	-0.06543493	-0.304276046
Spv2b	2.676404881	3.170123892	3.287924893	-1.897130614	-1.634143142	-0.269882684	-0.972795444	-1.389219274	-1.321344608	-0.152913328	0.022924214	0.280055377
Zic5	1.219682188	1.582428614	1.695400874	0.063553763	-0.059727855	0.17356397	-1.838856926	-1.024037908	-1.518811856	-0.000147601	-0.071722287	-0.847722287
Mcuib	1.893075679	1.721699754	1.714850214	-0.050259204	-0.513739003	0.325199402	-1.149836469	-1.343130663	-1.295530465	-0.627486688	-0.618465356	-0.056752011
Rnf128	1.866584843	2.02653666	2.210617794	-0.53285842	-0.533614228	-0.283749083	-1.329337152	-1.089201441	-0.94300343	-0.772603898	-0.124636387	-0.488787509
Naaa	2.237796305	2.423994234	2.620261434	-0.839474409	-0.711446623	-1.106738028	-1.106738028	-1.239394662	-1.00640191	-0.911595287	-0.562003841	-0.377868686
Nrarp	1.982900052	2.068804655	2.331771911	-1.714982876	-1.377253997	-0.105242005	-1.318023004	-1.269845029	-0.562712999	0.289542598	0.142138992	0.479859051
Soa3	1.665738248	2.011807005	2.018643652	-0.47950658	-0.269407665	-1.198118805	-1.198118805	-0.836326743	-0.773664365	-1.413214548	-0.504483438	-0.5471119403
Dusp5	1.1784935	0.809240925	1.035746237	-0.336045332	-0.558334729	0.2399784	-0.377143043	-0.248815349	-0.412886455	-0.36767242	-0.424637996	-0.542047838
Rnf15	1.653431738	1.810500698	1.500104553	-0.529024784	-0.505335373	0.210105162	-0.940509951	-0.983496197	-0.831726301	-0.830761012	-0.171221849	-0.027771527
Mid1p1	1.289896203	1.679768596	1.549900026	-0.316493205	-0.362121156	-0.526208656	-0.205660535	-0.738530456	-0.350117463	-0.567311578	-0.460884145	-0.746279697
Steap3	1.621498304	1.656007987	1.48936468	-0.339476175	-0.252520565	0.177964452	-0.6544451	-1.263480676	-0.101202895	-0.601227889	-0.273441743	-0.547369314
B210035F20Rik	1.38713395	1.70546096	1.634866524	0.110606065	-0.13785141	-0.037648097	-1.737103743	-1.300444625	-1.238463716	-0.469566602	0.172647766	-0.089637622
Fbln7	0.958628153	1.047457764	0.740361024	-0.389519533	-0.14558367	-0.475632926	-0.304083374	-0.82433357	-0.125077899	-0.693569887	0.393043454	-0.114523134
Slc25a33	1.144755314	1.339804783	1.560673102	-0.207652479	-0.255528909	-0.171156153	-0.36562742	-0.319147702	-0.430861135	-0.666176249	-0.767671353	-0.861144894
Exv10s	2.328016209	3.475204245	3.475204245	-0.342538061	-1.389112905	-0.871629107	-2.701706618	-2.369979445	-2.170245621	-0.898601113	-0.1064593014	-0.061029397
Optn	0.977824654	1.311007578	1.258361598	-0.408866078	-0.511701948	-0.540371655	-0.866231938	-0.228404401	-0.203850191	-0.437106151	-0.308657928	0.160750085
Mamd2c	2.755808654	2.789082565	2.832240306	-1.219388212	-1.197057054	-0.742034453	-0.493264723	-0.264659689	-0.131038389	-1.723376758	-1.595704868	-1.517054078
Endod1	0.778853384	0.777553507	0.818374853	-0.374545662	-0.445034376	-0.548523058	-0.287258114	-0.689659865	-0.226371687	-0.177111043	0.216250984	0.157471077
Gats3	1.32939337	1.217338144	1.23007092	-0.202782045	-0.224332552	0.784831691	-0.60549048	-1.83190321	-1.021126132	-0.169791748	-0.196102633	-0.961372868
Slc35f2	1.964424824	1.980424858	1.875849894	-0.157051925	-0.256446867	0.438517283	-0.971857453	-1.368349656	-1.132363456	-0.901750778	-0.732027333	-0.739386865
Aimf3	1.145043946	0.985496877	1.073325697	-0.686406257	-0.620002668	-0.587741563	-0.926451986	-1.130971124	-0.172713199	0.048025373	0.337291156	-0.444876263
Timem173	1.221268606	1.286206553	1.293043836	-0.029728743	-0.052286255	-0.049277842	-0.497197764	-0.740925694	-0.559624936	-0.587303331	-0.579598488	-0.617998988
Grpp1	1.907455522	1.589280422	1.744818624	-0.106884222	-0.754897118	0.636337018	-0.549034404	-0.658117862	-0.957623898	-0.960523878	-0.816035659	-1.074182398
Ubash3b	0.804992092	0.813732669	0									

Enpp1	0.599972094	1.041181591	1.326989255	-2.34662318	-2.489517232	-1.865966447	-0.733771853	-0.462776543	0.012215763	1.209979014	1.597171129	2.111446409
Enpp2	0.646160062	0.392417944	0.472704708	-2.535737059	-2.470093718	-2.270305631	0.691293761	-1.393595062	1.287330469	0.698812915	0.642704422	1.051117067
Sardh	0.203904636	0.513550506	0.936023051	-1.326210085	-1.470830755	-1.366910081	-0.50689422	-0.220056715	-0.994014806	1.118632144	1.834396893	1.278409433
Lrrc75b	0.720532721	1.025390347	1.321034359	-0.293219061	-0.778500387	-0.549026011	-1.326587304	-1.364932064	-1.176088309	0.462160026	0.871352241	1.08792775
Slca2a3	0.902335414	1.197404778	1.568915244	-0.747043176	-0.617433601	-0.617433601	-1.183612698	-1.411513933	-1.026535006	0.462360091	0.692389154	0.72854153
Mlx	-0.122234821	0.100868431	0.034331848	-0.541458498	-0.813760053	-1.123598314	1.014237098	0.66180276	0.635263306	0.570720161	0.354048457	0.241512932
Cntn2	0.744369514	0.346783695	-0.007937143	-0.759607545	-1.500691564	-1.003962076	0.204547034	0.257546278	0.209208317	0.2594627	0.568061975	0.682218814
Megf11	-0.082255495	0.397248259	0.441274246	-0.725478603	-0.179442664	-0.501519529	-0.689007224	-0.253654504	-0.622165243	0.713438694	0.698698741	1.002892618
Tfp2b	0.247520425	0.347520425	0.475204245	-2.282769412	-2.644996842	-2.247429636	-0.303093044	-2.490387761	-2.787116908	1.090100232	1.044937461	1.267791937
Tfeb	0.612807933	1.135362246	1.17746444	-1.001842284	-0.781862602	-1.005193871	-0.663963877	-0.05169201	-0.458656013	0.255482775	0.456256459	0.325753993
Rassf2	0.653451161	0.601584905	0.545632785	-0.468607245	-0.587265501	-0.309646186	-0.852133429	-1.147284898	-1.171526757	0.503996507	1.062768893	1.168489765
Abca9	0.049425844	0.396054053	0.195913787	-0.675474556	-0.262212649	0.03979619	-0.383362088	-0.914394253	-0.779812557	0.38630191	0.697968747	1.249795959
Trib2	0.590812885	0.07604093	0.955268445	-0.543064703	-0.537081087	-0.684116613	-0.740763373	-0.923771024	-0.58899615	0.657198267	0.775934321	0.367875283
Thbd	1.683216975	0.986560214	1.710635475	-1.402634568	-1.88562226	-1.0611837	-1.062911719	-1.51104554	-0.71716317	0.883731635	0.925199441	1.451222617
Timp3	0.514448117	0.522375614	0.652821099	-0.93484772	-0.655866725	-0.994577227	-0.300986189	-0.721962325	-0.786685385	-0.514361295	0.951545542	1.079554625
Tnc	2.143845452	0.204851245	-0.775613923	-1.250935905	-0.96053098	-0.82722641	-2.652202767	-1.299641483	-1.673615314	2.50274518	2.491180893	2.044638951
Tp52	-0.008478644	0.143201412	0.307045683	-1.10436195	-1.363215952	-1.25402662	0.207328073	0.32369967	0.510733542	0.846992115	0.649489833	0.71464799
Phlda2	0.71580021	0.076375759	0.097152465	-0.878510817	-0.5962704	0.230949169	-1.053428568	-0.425589627	-0.305359253	0.335619332	0.95109617	0.8600004
Rapgef3	1.298374069	1.452027986	1.631689581	-1.00280005	-0.911253301	-1.142719076	-0.968828242	-0.450079388	-0.793630858	-0.077989933	0.864785761	0.099243431
Wnt5a	1.080855828	1.286582827	1.290209967	-0.729470707	-0.687558009	-0.273666627	-0.125878743	-1.239098057	-0.952180298	0.406376218	0.6792174	0.878126771
Adgrf5	0.166623823	0.004193273	0.653826754	-1.150624328	-0.103804477	-0.535357575	-1.627194406	-0.081251689	-1.320178506	1.143358304	1.44531414	1.314868107
Klhl14	0.849796109	1.015343001	0.878020991	-0.910784815	-0.384896093	0.011985126	-1.403089075	-1.638119553	-1.079886776	0.802072061	0.842574638	0.882230918
Abfap1	0.670615193	0.346210921	0.921004923	-1.557706015	-1.355187885	-1.312789631	-0.708772256	-0.2693963	0.021122336	1.300393308	1.245818762	0.581323644
Trp2	0.390707523	0.325030387	0.487792929	-0.867835187	-1.402881087	-0.17626093	0.280054655	-0.477262097	-0.693257634	0.535521045	1.02782118	0.70864215
Gsn	-0.349174218	0.517740766	0.694649322	-0.882146567	-0.852355322	-0.984145692	-0.530628913	-0.19817309	-0.2493346	1.000121595	1.180088425	0.654214443
Jazf1	1.095468599	1.288358716	1.407442943	-0.769445667	-1.262055871	-0.300986189	-1.371977934	-1.257720221	-1.564802469	0.897566822	1.074140312	0.735782998
Evla1	0.147435238	0.487861341	0.866605337	-0.240434957	-0.102199251	-0.761124161	-0.821543336	-0.879107618	-0.720163123	0.502003187	0.739718755	0.699948588
Adamts17	1.257553436	1.350715488	1.608854181	-1.270019932	-1.418299544	-1.616537984	-0.973688557	-0.72268946	-1.197188003	1.264314956	0.969447709	0.99647709
Ippp4b	-0.014978854	0.254233029	0.395963992	-0.859055558	-0.66652407	-1.072596449	-0.524252688	0.558976546	0.126577217	0.659788504	0.50539295	0.628198322
Adamts5	-0.293060254	0.842799774	0.412320211	-1.085280346	-1.034539777	-1.488909498	-0.541673781	-0.689627046	-0.228199126	1.082718594	1.808221952	1.556165929
Rhof	0.882377285	1.266609132	1.190287143	-0.544987539	-1.160829349	-0.532166531	-1.122711113	-0.087298847	-0.683296367	-0.027634465	0.305133902	0.468645751
Mmp25	1.143898368	1.617196646	1.410539389	-0.413566998	-1.402159546	-0.926808309	-1.06247693	-0.41587398	-1.25512365	0.324274285	1.405002474	0.446642673
Sctn11a	2.261862801	2.65483919	3.143101536	-1.171519974	-1.193070041	-2.136497678	-2.868642257	-1.195645402	-2.184824782	0.776728631	0.764775656	0.938992759
Vwn1	0.303881871	1.319512049	1.670867145	-0.656460368	-1.247770413	-1.156360165	-0.420795617	-0.452684587	-0.37513384	0.74847286	0.366979221	-0.100501856
Igfb8	0.71983478	0.818073583	0.700390736	-0.861297281	-0.795559794	-0.925924111	-0.335503443	0.014640258	-0.250780779	0.118487525	0.425097745	0.392567761
Tspan18	1.785661064	2.25997672	2.34635105	-2.226607452	-1.961366609	-1.690212317	-1.816360806	-1.447960296	-1.705534536	1.049902855	1.602904504	1.814035067
Rasaf	0.193395899	1.106035681	1.457985854	-0.866955777	-1.918006501	-1.524737131	-0.664721256	0.53388375	-0.272491927	0.920677519	0.826160475	0.408600114
Garem2	0.170460973	0.178306592	0.666311855	-0.401922715	-1.212751981	-0.628329813	-0.449382006	-0.91377407	-0.74598601	0.687401387	1.059564472	1.590599516
Sty1k	0.939822207	1.017843514	1.208953554	-0.609805811	-1.169573411	-0.348489923	-0.487683242	-0.565657093	-1.256426407	1.072727115	1.017887452	0.416726733
Nlrp10	-0.126091757	-0.143182663	0.679805583	-0.570262835	-0.791749247	-0.033586642	-0.574415781	-0.691589016	-0.593964276	0.59420793	1.161172584	1.089656011
CT7370	1.24396939	1.586066652	1.651207574	-1.03823867	-0.922499544	-0.763531363	-1.567437942	-1.288627662	-1.154870592	0.230673659	1.161713027	0.865950821
Prokr2	-0.14966562	0.609629793	1.18876628	-0.956732437	-1.013417936	-0.453225485	-0.049211402	-0.559118158	-0.801519481	0.645406749	0.901215479	0.637382871
Tspan12	0.125321322	0.303336929	0.245619859	-0.847280293	-1.081461985	-0.665627535	-0.225085778	0.503980627	0.247526398	0.305640508	0.423660978	0.487396651
Magee2	0.675449386	0.58195446	0.626839412	-0.491124147	-0.578718338	0.027424039	-0.651607959	-1.207853441	-0.548728153	0.269620416	0.688340468	0.6084147
Bcar3	0.384719564	0.471520007	0.941371298	-1.245130743	-0.990484441	-1.035927491	-0.00946400	-0.048770937	-0.033230669	0.135554804	0.946692083	0.483195106
Tor3a	0.467710593	0.086553462	0.119933992	-0.504890242	-0.820000088	-0.564577796	-0.424712512	-0.467232468	-0.342709882	0.547445304	0.894394195	0.990066234
Cxxc4	0.586365524	0.421954671	0.690110393	-0.579092985	-1.0305406181	-0.454228493	-0.544472914	-0.625352967	-0.56529309	0.3521444	0.469577635	0.583690467
Cobl1	0.025818255	-0.076901514	0.192442442	-1.047270787	-0.988924297	-0.652791611	0.109491528	0.844400251	0.07461423	0.345700733	0.523882543	0.257324828
0.524410409	0.505117595	0.401340856	-0.757311282	-0.719772607	-0.848105615	-1.350468584	-0.265745829	-0.369468818	-0.608198078	1.068032363	1.173785992	
Rasgef1b	0.153855928	0.288292301	0.408007938	-0.785215002	-1.08199406	-0.764241136	-0.238561922	-0.189295698	-0.289410594	0.581112629	0.770331733	1.147119243
Lmo7	0.823505713	1.112042344	1.054942267	-1.028702788	-1.091283576	-1.226513534	0.04577858	0.808224872	0.394144436	-0.191790849	-0.449722339	-0.250624789
Fre1	0.898513037	0.703516659	0.73429439	-0.393119037	0.748834323	-1.28650837	-1.240347356	-0.016574812	-1.146303388	0.233995957	0.826568834	1.01898775
L1td1	0.571249773	0.715628113	0.724969701	-0.524167628	-0.789052223	-0.0657744738	-0.597286111	-1.965125741	-0.859307284	0.679702518	1.352262367	0.556901209
Firt	-0.002633975	0.75665295	0.768588891	-0.123370422	-0.778019207	-0.977884958	-0.747988241	-0.932571617	-0.862266988	0.825273827	1.012794395	1.135285222
Mpal169b	0.878518689	1.619009644	1.583437301	-0.451780458	-1.454532116	-1.060836254	-1.409332149	-1.295207746	-1.293377009	1.045930883	1.070888272	0.767240943
Snhg14	0.021743747	0.957103018	0.547399356	-0.704114052	-0.701851967	-1.091836438	-0.782895454	-1.126563162	0.045901708	0.057910526	0.365919254	0.365919254
Hmcn1	0.430824319	0.447573475	0.422928544	-1.078710959	-1.001893452	-1.18509702	-0.479533139	0.223865597	-0.064754363	0.509221034	0.484599049	0.763262621
Lgals12	1.036147385	1.445925281	1.147638704	-1.029675077	-0.689131333	-0.699292651	-0.957033227	-0.510257606	-0.908908313	0.32184698	0.778555037	0.331206621
Rrad	1.058463527	1.109928589	1.191471352	-0.882537894	-0.856901134	-1.407475014	-0.970796893	-0.912979809	-0.934468695	0.647370803	0.920059723	1.037884725
Cacna2d2	0.799682003	0.599755853	0.298540187	-0.831468612	-0.739790351	-0.883989950	0.30160693	0.454575041	0.141300669	0.163255906	0.132734477	-0.417447442
Mpal196b	1.064710679	-0.034167763	-0.346973958	-0.937403401	-0.511							

Mthfd2	0.988906811	0.849309241	0.890787986	0.253176763	0.086068341	0.469916285	-0.062398127	-0.653881131	-0.353944635	-0.624337977	-0.945481292	-0.898122264
Mxcn	1.184069725	1.086031956	1.281349928	0.504866792	0.336573384	1.005881945	-0.213964866	-0.704177299	-0.595710915	-1.202825031	-1.219898991	-1.462217628
Nyn	1.079793405	0.23244522	1.18744748	0.355302815	0.119766669	0.190495082	-0.594189664	-0.85653275	-0.52454804	-0.617877203	-0.772950603	-0.98684968
Etv4	1.842930666	1.483297179	1.591784832	0.458533531	0.422488559	0.821493485	-1.070542567	-1.352855332	-1.309600273	-0.58695578	-0.630217727	-1.277386605
Pkm	0.764094578	0.727854997	0.567333099	0.476773916	0.225054165	0.593232818	0.151867267	-0.671678474	-0.208112842	-0.774244991	-0.986533342	-0.862032689
Fou4f1	0.297227861	0.752674364	0.943784405	1.201537177	1.082582907	1.779623241	-0.236234217	-0.643482725	-1.368155283	-1.156589033	-1.810285151	-0.842153565
Prox1	0.544586866	0.637887866	0.659431866	0.631634659	0.110289601	0.702677792	-0.423529344	-0.89804802	-1.008469227	-0.380783177	-0.218518648	-0.239760022
Prrx2	0.298287836	0.061578682	0.05037827	1.004227882	0.773009499	0.978992799	-0.331394189	-0.353749786	-0.579938244	-0.502463004	-0.624486418	-0.77362177
Shh	3.475204245	3.475204245	3.475204245	2.233709706	1.765509471	1.938090616	-2.975463609	-2.872582538	-2.934360776	-2.711292141	-0.303093044	-2.879593054
Slic7a5	1.665474937	1.453629269	1.521600793	0.481606657	0.157793304	0.646050754	-0.440765125	-1.494668119	-0.834546661	-0.900406851	-1.134107946	-1.117730312
Bihhe40	0.879038749	1.041143872	0.884734641	0.031954623	0.401145896	0.068956997	-0.830607174	0.035018187	-0.604847474	-0.668027348	-0.734711032	-0.506385666
Atg9b	0.73449493	0.02299005	0.94276546	0.264566	0.264566	0.731577221	-0.197304706	-0.660659537	-0.329724574	-1.58582113	-0.651004471	-0.904272543
Tcf7	1.212719937	1.231611843	1.285046431	0.957386806	0.821501985	1.382673578	-0.452971213	-1.054726835	-0.788196679	-1.612526211	-1.544134895	-1.438384747
Tfap2a	0.956327781	1.161831721	1.436792669	0.140914164	0.232262782	0.650269759	-0.927886999	-0.947872688	-0.948666701	-0.824497136	-0.581322742	-0.348212611
Tfap2c	3.467813308	3.475204245	3.475204245	1.197095798	1.070899756	1.884905042	-1.859795864	-2.599527885	-2.642783921	-2.397473278	-2.957030564	-2.216996708
Tek	0.664294317	0.510902152	0.587286007	0.308244893	1.424338374	0.827444562	-0.117629241	-0.700006879	-1.050407967	-0.247818156	-0.397532572	-0.765452387
Tnni1	1.613964083	0.051910086	0.102771038	-0.287169285	0.691987783	0.988750009	-0.779793937	-0.656005069	-0.852439834	-0.574427992	0.360345138	-0.698992577
Prdm6	0.70370622	0.497671582	0.117274887	0.940064229	0.803480679	0.936043609	-0.265184973	-0.956612388	-0.751365997	-0.657973642	-0.270221608	-1.175700965
Dyrk3	0.713888622	0.564138891	0.834286263	0.15858493	0.263880475	0.675033066	0.07212378	-0.213077237	-0.44090131	-0.897580728	-0.83503712	-0.89566849
Camk1d	0.80536921	0.68049929	0.670372359	0.958976709	0.16880485	0.812393562	-0.826398813	-1.926210758	-0.665294001	-0.498560151	-0.556162411	-0.529305011
Shb	0.630149156	0.920837277	1.090366669	0.294378226	0.160754529	0.125493589	-0.650126916	-0.483163755	-0.586813283	-0.515277347	-0.533905548	-0.452719046
Oasl2	1.525971047	1.08306985	0.985727509	0.009680115	0.507580107	0.515443029	-1.000452597	-0.771056125	-0.725917873	-0.71760753	-1.689419748	-1.030232203
Vax2	1.68099418	1.328194461	1.387308352	0.254488333	0.340441874	0.954360944	-0.130951656	-1.084821935	-0.809266019	-1.669302898	-1.454315002	-0.797135872
Asns	1.007317732	0.89719828	0.919535215	0.476326847	0.392715098	0.671431934	-0.402497393	-1.010695702	-0.734515414	-0.732536258	-0.79214881	-0.654653083
Mthfd1	1.138674832	0.95630422	1.058498946	0.215449083	0.322404836	0.558274378	-0.117635202	-0.571011505	-0.269193003	-1.090697976	-1.411778825	-1.019517291
Eif5a	0.918029557	0.62616914	0.598294353	0.445997658	0.236708131	0.677425018	-0.310476824	-0.766818503	-0.218123618	-0.760862841	-0.967589406	-0.991437176
Eno1b	0.89465131	0.577113182	0.603348065	0.436351023	0.198001254	0.640408279	-0.233269607	-0.576796192	-0.21666057	-0.858822235	-0.071958083	-0.957705374
Apcdd1	0.647196086	1.016711228	1.109879227	0.718972837	0.605905964	0.590989666	-0.875701036	-0.821925017	-0.606095368	-0.239988849	-0.507905701	-1.638038364
Bok	0.741078885	0.78808077	1.264883577	0.250442577	0.382508266	0.103234894	-0.412939074	-0.29091801	-0.66590233	-0.402375692	-0.912206267	-0.845897764
Rfbx3	1.642205999	1.352082217	1.470280327	0.49150013	0.472218011	0.547038001	-1.275287195	-0.762324081	-1.77520111	-0.748276216	-0.508283243	-0.905951964
Vax2os	1.213130441	1.76095166	1.768472671	-0.185961883	0.345639276	0.640798333	-0.533185456	-0.63824325	-0.909134699	-1.169313208	-1.164379273	-1.195196184
Nap1l5	1.168371772	1.041429222	1.009058379	0.276831047	0.497539765	0.696048736	-0.98692799	-0.936828746	-1.151958846	-0.43221729	-0.530527599	-0.64219329
Tmem41a	0.81992358	0.502978653	0.677585102	0.331824419	0.34717761	0.763906208	0.058789906	-0.744886546	-0.752048458	-0.838388818	-0.752092399	-0.619573036
Tril	0.7070548	0.552609713	0.682966564	0.413206104	0.30844765	0.387973554	-0.26044115	-0.771407741	-0.367453475	-0.439036285	-0.572135676	-0.633164058
Mgap	0.946830127	0.588896994	0.23784538	0.506221271	0.409681478	1.032078656	0.019087205	-1.20400661	-0.586155739	-0.546106391	-0.305692083	-0.718490989
Tubb6	1.51821354	0.598127813	0.20463027	0.287328093	-0.82058191	1.345960121	0.611551348	-1.406405611	-0.511687212	-0.89161714	-0.400447412	-0.98886019
Aen	0.997674608	0.79842042	0.958254178	0.168290317	0.105903075	0.409838624	-0.25013175	-0.462495117	-0.276377628	-0.714541139	-0.91633276	-0.814451122
2010204K13Rik	1.431697762	0.786809895	1.117036161	0.297048767	0.253910984	0.418907357	0.268303396	-0.86778567	-0.54029172	-1.28724432	-0.96634962	-1.493190971
Cad	0.772147783	0.825045164	1.172698745	0.252583412	0.225384477	0.415851403	0.007780753	-0.493027927	-0.339837825	-0.766090607	-0.852786938	-0.77334645
6010038B21Rik	0.614304498	0.830701639	0.565121909	0.651701473	0.388188689	0.428921404	-0.39116151	-0.737924407	-0.143054967	-0.764071389	-0.754787354	-0.682308516
4933416M07Rik	0.74391361	0.820527994	0.840564765	0.206346541	0.21893382	0.421645725	-0.064367844	-0.654615094	-0.548654374	-0.309874028	-1.151666716	-1.500248185
Chchd4	0.962045925	0.75714749	0.88807897	0.231767834	0.232075728	0.728455575	0.213814004	-0.632643016	-0.960665656	-0.898478646	-1.030144722	-0.64545794
Cdcd3	1.590753228	1.360373086	1.824407774	0.282212812	0.41574805	1.155211137	-1.239580494	-1.431135312	-1.139237903	-0.429491887	-0.719362171	-1.66925818
Dusp9	0.82591628	0.676874823	0.711414577	0.279403254	0.390235554	0.727944723	0.16806812	-0.82298147	-0.294253455	-0.102402709	-1.150592785	-0.689760332
Rab11fp1	0.924851292	0.757924665	0.976554528	0.312992378	0.281567994	0.508698135	-0.261678866	-0.79742891	-0.494130931	-0.79138247	-1.11537673	-0.396529066
Notum	1.016478229	1.578882589	0.826779675	2.174280174	1.347258558	1.490606086	-0.507543367	-0.381685562	-0.826001605	-2.091361388	-2.158045073	-2.449551961
Arhgap10	0.632865878	0.857628493	0.615797827	0.530566512	0.130783923	0.480803133	-0.241061389	-0.461336628	-0.414880067	-0.643866038	-0.762331371	-0.895915527
Slic16a3	1.049994782	0.546116988	0.732868714	0.500640008	0.517676983	0.658708164	-0.331578849	-1.231817988	-0.646122727	-0.571970688	-0.745142934	-0.571592659
Mesdc1	1.051856183	1.047559592	1.230817964	0.386654682	0.062513154	0.205252087	-0.41956413	-0.632094424	-0.441112847	-0.703235564	-0.906680828	-0.882038525
Plekha2	0.851227821	0.554863002	0.832119596	0.742996004	0.092193986	0.718494526	-0.318394526	-0.675762832	-0.992845327	-0.338998936	-0.81830805	-0.566859871
Sms1os	1.841153015	1.634526196	1.707605556	1.757187915	1.667888249	1.834035968	-1.476282171	-1.994584335	-2.046755686	-1.746159358	-1.274039602	-1.474682914
Fzd10	1.505991161	1.394714124	1.556288211	1.000577861	0.866780625	1.289114468	-0.487733227	-1.566321499	-1.309139636	-1.458156212	-1.558584741	-1.558584741
Nkd1	0.534854501	0.756550409	0.643606456	0.731745734	0.392335403	0.407365233	-0.515832064	-0.629087932	-0.444306134	-0.593452004	-0.601233488	-0.803439345
A230070E04Rik	-0.653898079	-0.346109685	-0.11736595	0.517264596	0.242335891	0.678951408	-0.817620682	-0.890319818	-0.631824739	-0.500292197	0.861025307	-0.974084622
Upn	-0.040461739	0.207270974	0.118148442	0.49015018	0.459324932	0.317260094	-0.917354178	-1.173111972	-0.927733915	0.262701589	0.534407227	0.669458363
Nxpd4	0.556435876	-0.187754745	-0.242505152	0.733217807	0.497548171	1.080525266	-0.946120483	-1.113931498	-0.493820292	-0.120220981	-0.025975095	0.275361107
Acth2	1.87582729	-0.148257128	-0.523912617	-0.919207796	0.37000852	0.57911714	-1.246807827	-1.027618768	-1.415653891	1.050919606	1.156098018	1.242924841
Bgn	0.224079179	0.141307312	0.025136372	0.331811804	0.30442221	0.28263579	-0.981982543	-1.347619197	-0.729399476	0.3202691	0.645444758	0.780240040
Bmp5	0.854419032	0.718213102	0.80878402	-0.253980224	-0.068278901	-0.199162194	-1.554192543	-1.387860731	-1.187351051	0.868934837	0.54641752	0.330466443
Col14a1	0.580328702	-1.213955078	-1.358793095	1.239129158	1.336212109	1.363090904	-1.468511919	-0.786517758	-1.091191602	1.171743667	1.009596998	-0.71723993
Dix5	-1.02564695	-0.459117903	-0.105012542	0.103266286	0.612807001	0.271889026	-0.242790306	-0.20129				

Rpl21	0.139500112	0.766792483	-0.288412108	0.526257776	-0.56111937	0.798949972	0.714655554	0.214931362	0.586643149	-0.774832696	-0.983699802	-1.139666432
Rpm2	0.521110455	0.483447426	0.476038283	0.356239748	0.172710109	0.499101173	0.108763368	-0.140459917	-0.095128943	-0.692202925	-0.830716802	-0.858901975
Srbn2	0.03977753	0.405496657	0.546059589	0.576359873	0.568267216	0.57041875	0.173601875	0.055805149	0.01699711	-0.173038211	-1.140310762	-1.324937047
Hoxc10	1.888077125	-0.618216085	0.032385659	-1.825685195	-1.05573744	2.85511793	2.953320361	0.92434845	-1.825685195	-1.825685195	-1.676609157	-1.825685195
Ahx1	0.491699635	-0.31741999	-0.541632671	0.878699333	0.878699333	1.129263094	0.090203494	0.15526286	0.161479446	-0.354501591	-0.420786059	-2.148188108
Wp1	1.549190693	0.151060902	0.11626251	0.448318684	0.32030444	0.867275735	0.320378636	0.328675543	-0.073008799	-0.890129432	-1.055738191	-1.780959686
Eyfat415	0.767217485	0.533964507	0.613086936	-0.021580293	0.21058258	0.573464356	0.450742726	-0.343604643	-0.107018543	-0.808511034	-1.01835146	-0.850917882
Rsp04	0.367683718	-0.280956459	-0.824247542	2.140508066	2.081802014	2.557982353	1.005894798	0.01078692	0.382096625	-1.818705161	-2.533696426	-3.033030044
Fpat	0.691189262	0.526204214	0.653922531	0.224933938	0.215936222	0.419165802	1.013939799	-0.336657215	-0.178959257	-0.653927843	-0.901775572	-0.86446498
Moqat2	0.981232859	0.680654061	0.649065074	0.781810889	0.692239865	1.307923766	0.529851381	-0.554403508	-0.095156316	-1.755905273	-1.758740055	-1.458581744
Prtg	0.175952641	0.809592245	0.767051568	0.415401285	0.399919266	0.88857605	0.076089417	0.340018936	0.200110302	-1.442693121	-2.334224417	-1.879763473
Car14	0.477268648	0.478293771	0.325811181	0.223800873	0.155592328	0.454125296	0.271145084	-0.079048929	-0.029597648	-0.659981595	-0.78919431	-0.828214611
Dmrt1a	-0.223246566	0.275087522	0.202587359	0.828896995	0.218366992	1.156140534	0.810623034	0.271995627	0.250164534	-0.762393938	-1.031367962	-1.995855471
Ahcy	0.647946562	0.427225035	0.333782364	0.621746021	0.398385449	0.813329743	0.546572423	-0.470247661	-0.045784981	-0.897711624	-1.187735368	-1.187500803
Podxl	1.463982627	0.162081494	0.346980035	-0.482952754	0.495104941	0.546227887	1.040387986	0.449169921	-0.15418233	-1.005875579	-0.798450967	-1.162473262
Mpk12	0.448761208	0.625700316	0.54299112	0.048803028	0.131859386	0.137018079	0.408609817	0.285164811	0.193074814	-0.763965816	-1.097840648	-0.966484048
Hist1h2ad	1.406618927	0.445094708	0.35599749	-0.014071685	-0.179073244	0.365690874	0.83562577	-1.291054063	0.239976066	-0.388450148	-0.732752232	-1.043036991
Hist1h2ak	1.388400582	0.071953257	0.663696315	-0.099743291	0.0302791	0.595678423	0.660647292	-0.352823664	-0.1445091	-0.819409432	-0.537035161	-1.457131615
Hist1h2an	1.281409566	0.057938944	0.300302967	0.030286096	0.134156366	0.95590418	0.513798774	-1.057880373	0.203798429	-1.016920158	-0.414724828	-0.988087757
Hist1h2ap	1.094852956	-0.003004112	0.460400216	-0.211991623	-0.022559477	0.928614341	0.556427309	-0.441385282	0.398490664	-0.975718059	-0.488231423	-1.17571391
Hist1h2ab	1.575416285	0.302379089	0.650128966	0.172362106	-0.139130967	0.464890960	0.692730862	-1.170574428	0.198200768	-1.042110008	-0.452486804	-1.251874702
Fndc32	0.09294765	0.202434424	-0.220819853	0.294370526	0.581712323	0.71153707	0.452211788	0.575177479	0.503830328	-0.921773249	-0.906176038	-0.942090338
Zdhc23	-0.818453429	0.682099344	-0.173663867	1.134386996	1.185898185	0.593355784	0.236360533	0.084991886	-0.107820957	-0.893317113	-0.961266497	-0.962496847
Fndc3c1	0.090607324	-0.050196284	-0.081901096	0.341148064	0.528652913	0.638971667	0.651590353	0.594166166	0.367333744	-0.940542738	-1.131332942	-1.016957168
Linc28b	0.699391737	0.313253348	0.463447125	0.237417756	0.392777998	0.722528215	0.288021524	0.260810032	0.225881759	-0.92241782	-1.023635312	-1.143348798
Dnpi1	0.772039363	0.354848487	0.165616229	0.525608435	0.029520526	0.723073716	0.53667348	-0.826249902	-0.15567956	-0.547976645	-0.721651392	-0.856670542
Nr1h5	1.909676753	0.492359754	-0.923597754	-0.923597754	-0.923597754	3.475204245	2.861382657	-0.923597754	-0.923597754	-0.923597754	-0.923597754	-0.923597754
B330017H08Rik	0.635924079	0.032536229	0.602612861	0.688853686	0.101228341	0.461422598	-0.343698527	0.324340022	-0.734649997	-1.210396248	-1.211626597	-1.211626597
Nhp2	0.642178749	0.688571951	0.355729071	1.070004509	1.25072499	1.333267938	0.254541652	-0.322347592	0.198785833	-1.74600311	-1.84883857	-1.8476621354
Elo2	0.99304294	0.607130458	0.596910405	0.265356272	0.026285475	0.63049055	0.403371765	-0.677734956	-0.198733798	-0.781904139	-0.803187763	-1.06937562
Elo12	0.697352718	0.389157526	0.549762498	0.21678381	0.315719842	0.67282104	0.189517003	-0.03112155	-0.104289652	-0.932887635	-1.10228278	-1.01896966
Rplp1	0.775410743	-0.125736687	-0.02292735	0.305516331	0.099114316	0.862006696	0.73009537	-0.567892277	0.182157585	-0.171530518	-0.678708869	-0.787670311
Rbm38	0.459390939	0.63381807	0.293616316	0.32937244	0.09354593	0.562302869	0.026497073	0.071452759	0.017506532	-0.63595634	-0.83660756	-0.844977707
Mrip12	0.745586874	0.522187562	0.629676659	0.168992049	0.150350152	0.46673907	0.277569459	-0.485365362	-0.133595566	-0.766832953	-0.766170462	-0.819217801
Ard3b	0.83427528	0.847459467	0.917997661	0.06301832	0.092288952	0.210407285	0.133147456	-0.290238733	-0.003081985	-0.966242617	-1.074330793	-1.074330793
Trim71	1.161001835	0.988011132	1.206478145	0.174056529	0.103757163	0.313166008	0.020041898	-0.031842094	-0.318547222	-1.252353042	-1.304767723	-1.058990929
Bola2	0.802625375	0.437427839	0.482769393	0.196028277	0.040841159	0.605672761	0.574007404	-0.52830962	-0.52830962	-0.059570043	-0.81839198	-0.662524209
Dctpp1	0.898527181	0.452899229	0.53418484	0.32173863	0.189657627	0.771121049	0.473698087	-0.533581337	-0.122375304	-0.86484439	-1.041984906	-1.070003437
Hist1h2ao	1.243210265	0.028651572	0.492617135	-0.17530193	-0.067598832	0.849447564	0.531615383	-0.406146064	0.296406277	-1.020360342	-0.56265563	-1.208885397
Lix1	0.648112678	0.336198513	0.312761634	0.32549137	0.370090025	0.494337056	0.690921979	0.574148409	0.70159055	-0.102714528	-1.557704191	-1.836551745
Fignl2	0.7299922	0.374252748	0.522575927	0.635749177	0.386605453	0.937480959	0.809135502	0.171227611	0.238467248	-1.620590718	-1.722930372	-1.457448881
Murc	0.714130184	0.900358399	0.51824901	0.146881018	0.08905052	-0.584061455	-0.309261205	0.662929291	0.138753457	-0.590330158	-0.689693811	-0.971711757
Ddx39	0.755530054	0.668411491	0.721873302	0.226030124	0.081423245	0.297522917	0.151504426	-0.253935198	-0.224823666	-0.730378992	-0.923427085	-0.767035717
Mcm10	0.609885047	0.733269575	0.666120138	0.135193129	0.058331662	0.348880368	-0.060431062	-0.044298697	-0.205225955	-0.716478953	-0.783041083	-0.742155357
NA	0.411827421	0.630319289	0.687300799	0.226805773	0.402583339	0.364419509	0.480276494	-0.026526439	0.144653293	-1.095995225	-0.50987484	-0.892618736
Phacr3	0.0862804	0.234718919	0.243567688	0.728787442	-0.915751732	1.161447904	0.020910786	0.001089182	-0.225714325	-0.982875849	-1.151848557	-1.028820812
Mnd1	0.352720937	0.373566681	0.155705297	0.41999876	0.364387341	0.464617343	0.496546491	-0.271139896	0.122649703	-0.416038605	-0.905628097	-1.121474606
Ninl	0.611511922	1.009630453	0.887999505	0.198584376	0.151826514	0.15393225	-0.35687478	0.368045002	-0.300235814	-0.700724665	-0.990042917	-1.030360516
Linc28a	1.873587581	-0.59853876	0.585850929	-0.061389315	-0.408229468	0.2681129316	2.558502923	0.397178522	0.696453271	-2.466028121	-3.033093044	-2.812866444
Plvap	0.11197818	0.354070119	0.065400533	-0.019919876	0.463525455	0.366011914	0.976522926	0.858332909	-0.228742677	-1.161419804	-0.698251258	-0.358386348
Sall4	1.568270221	-0.07648258	1.599325122	-0.077175147	-0.100939646	0.813737317	0.385287629	-0.274758635	-0.301894128	-1.71889728	-1.646824287	-1.417621337
Ram174b	-0.720414044	-0.172248699	-1.188561565	-0.26688684	-0.242620877	-0.223943262	0.424266792	0.277466916	0.277466916	0.874461458	0.41765549	-0.057060388
Apela	-1.234064928	-0.896806456	-0.362900948	-0.092344984	-0.067719607	0.408106055	-0.034395156	0.351965385	-0.133755351	0.629073279	0.793223237	0.839618569
Nhs12	-1.010549151	-1.711804536	-1.565891419	0.146113271	0.478288881	-0.092746349	0.384118887	0.339388174	0.530426978	0.80049026	0.956702811	0.956702811
Gpr153	-1.031312008	-1.248300132	-1.194875856	0.0451881	-0.002002782	0.090561347	0.376792185	0.521462149	0.434115568	0.400611697	0.774081561	0.833678046
Ccdc149	-1.574283801	-0.168185065	-0.952955551	-0.214600983	0.306557713	-0.694494396	0.116445378	0.195291695	0.419663031	1.07039136	1.187997014	0.965204946
A730020E08Rik	-1.6869696342	-1.048432125	-1.579335592	0.610850833	0.612145717	0.490304160	-0.125307534	0.517109827	0.200276849	0.743956772	1.167164428	1.563440982
Gm15910	-0.725651975	-1.111865409	-0.932902922	0.14244759	0.047449399	-0.249004757	0.55701479	0.444928865	0.245942982	0.79829226	0.356997966	0.515979192
Mir301	-1.36341713	-1.170510611	-1.7917759746	0.885938423	0.822873491	0.076648236	-0.207029151	0.370765216	0.594325251	0.986552232	0.324241576	0.471372301
AWS49542	-1.098651137	-0.982446283	-1.486462991	1.596409657	1.26968414	1.153886603	-1.941337409	-0.247502608	-0.911234256	1.097328966	1.59318089	0.957199434
TA	-1.261102443	-0.745456973	-0.94934673	-0.023106367	-0.315490988	0.111297102	0.33					

Dab2	-1.490440863	-1.92514183	-2.139026408	0.054683975	0.209031622	-0.511470936	0.248396942	0.87927271	0.700588195	1.410233656	1.427844467	1.136028472
Dax1	-1.229370117	-2.918399574	-0.575652966	0.785136961	0.946617531	0.780463301	0.110062966	0.127883843	0.119645957	-0.148767589	-0.115711635	1.17199836
Dch	-1.637609999	-2.168701093	-1.57454404	0.217478671	0.612629629	0.577132065	1.256818804	1.082608375	1.239017367	0.2952618	0.079817928	0.403002579
Dlk1	-0.32772105	-0.576048777	-1.587879404	0.811456316	0.981040541	0.551991331	0.677037370	0.253774008	0.582551334	0.23303486	0.124529037	-0.324035274
Dmd	-0.564166085	-1.861120424	-1.018662093	0.191397999	0.217370422	0.589423935	0.6607130903	0.499600664	0.42111734	0.104792838	0.41118819962	0.064533953
Doc2b	-1.401610699	-2.44363386	-1.78575716	0.309153531	-0.29729905	-0.910745527	-0.372186655	1.039717888	0.646798738	0.213095819	1.996683829	1.11868711
Dpp6	-0.878614238	-1.648588195	-1.355448719	0.379670216	0.526529256	0.45743891	-0.435874564	-0.14655992	-0.01115745	1.208128279	1.465420813	0.822919682
Ebr2	-2.163874478	-2.246166808	-2.833286141	0.221611319	0.351431353	-0.675088853	0.740772394	1.423250893	1.083236489	1.521807914	1.592174227	0.983931189
Eda	-1.281885708	-1.016770495	-1.56629669	0.262905104	0.052701476	-0.26448726	0.869607737	1.0039695	1.106858622	0.378262989	0.26592038	0.183182631
Spr1r3	-1.337813292	-1.571604791	-1.873098075	0.592946525	0.682199546	0.294616711	0.614978044	0.156252834	0.644930874	0.763346879	0.63096639	0.36422441
Edi3	-0.894731166	-2.302029175	-2.11526998	0.138934069	0.621810971	-0.154004635	0.148342764	0.579887066	0.587250706	1.195920888	1.337057111	0.857171382
Edn3	-1.391315033	-1.032032697	-1.199178836	0.089801867	-0.047700981	-0.481905815	0.405321452	0.531145582	0.681969677	0.836776778	0.816257797	0.79086021
Efnas5	-0.795731542	-1.258241262	-1.169921808	-0.064835503	0.435674186	-0.07283268	0.403656464	0.264813787	0.465904666	0.728357261	0.691128753	0.372118663
Efnb2	-1.113032004	-1.011027251	-1.135359954	0.680798425	0.701299014	0.375518652	0.625184038	0.416201755	0.591309285	0.337288050	0.171264222	-0.539444197
Efnb3	-0.693643229	-0.732279735	-0.949175262	0.46012347	0.317710657	0.241964014	0.598037094	0.077737352	0.527259864	0.094170262	0.078077827	-0.020018714
Egr1	-2.07307904	-1.461418727	-1.968319618	1.044542488	-0.286191992	-1.220567243	-0.678929443	1.481853034	1.038044795	1.941341448	1.224554336	0.953988244
Egr2	-1.796505116	-1.141473018	-1.650414272	0.626707862	-0.327348954	-1.383651113	-1.385384532	1.389448819	0.884915376	2.28555374	1.298159474	1.229991735
Emp3	-0.920956166	-1.019526841	-0.410802623	-0.014586529	0.324558264	-0.19786494	1.124510698	0.093072767	0.02099076	0.832695654	0.83240517	0.427399808
Emx2	-0.303093044	-0.303093044	-0.303093044	0.558581042	0.049783054	0.124410662	1.195895775	2.045320665	2.015805952	1.880218665	1.788489399	0.314157849
Epp411	-0.834372995	-0.98267368	-1.03305974	0.067038584	-0.07222998	-0.311896151	-0.029112012	0.291027414	0.255377292	0.666562057	1.039142579	0.9519189642
Epb4103	-0.911054214	-1.108336302	-1.21293587	0.270776962	0.29282901	-0.077110246	-0.11678397	0.23253837	0.00901964	0.86925493	0.987706783	0.81924868
Stom	-0.614094218	-1.711034739	-0.960590907	0.494668985	0.761793696	0.082897948	0.090244194	-0.160445022	0.211154986	0.622817076	0.627307635	0.627307635
Epha7	-1.754009561	-1.835193588	-1.851293774	0.280819379	0.72973464	0.07144531	0.513894199	0.639111546	0.68945102	0.8411657	0.796932528	0.876474928
Nr2f1	-1.472449843	-1.922018445	-3.033093044	0.770041588	0.429886164	0.488405072	1.843603972	2.204008846	1.753629344	0.569017524	0.071895991	-1.489257738
Mp2	-1.907506073	-1.929171605	-1.430286167	0.247655041	0.625811756	0.198209794	0.379425232	0.202407832	0.41617118	1.029031336	1.411759783	0.75627459
Kcnk3	-0.924492046	-1.268238647	-1.606695047	0.72004262	0.686075004	0.852775934	-0.200733664	0.082015546	-0.363332328	0.744255733	0.944489237	0.333837078
Eya4	-2.153961507	-2.109652623	-2.934750436	0.341017503	-0.48387723	-0.17900611	0.574730156	1.660110335	1.193084076	1.32026856	1.170260573	0.620791163
Colap2	-0.233829715	-1.259483787	-1.249070684	0.253427866	0.22983925	0.27596342	1.078883438	0.297924382	0.188883812	0.439824641	0.495714016	0.365967672
Fec1	-2.22859055	-2.072977465	-2.881843051	0.44333331	0.60969052	-0.003170504	1.441610835	2.794777622	2.195031943	0.824438277	1.462454709	-1.268464278
Fbn1	-0.697893979	-1.18004372	-1.624224332	0.079464522	0.446132596	-1.10829759	0.300683905	0.385647331	0.27289577	0.804343461	0.770301282	0.554689768
Fcn1	-1.033998983	-1.401233918	-1.456979515	0.45981036	0.19761065	0.341212999	0.360584849	0.760201969	0.489505554	0.571196381	0.269670295	0.442918629
Fgfr2	-1.547664319	-1.958272704	-2.569025647	0.484256653	0.542446077	-0.06309447	0.380025254	0.7531117	0.621805517	0.90094353	1.23555999	1.20465319
Fhl2	-1.61100555	-1.455932465	-0.982753464	-0.258328209	0.647930714	-1.16831365	-0.112330995	0.801923951	0.665336348	1.298796691	1.486466554	0.687070076
Fil1	-1.408651682	-1.5180716	-1.53013314	0.115409737	0.157593619	-0.064228665	0.756839237	1.067809186	0.74436769	0.471400108	0.543166283	0.564553425
Fos	-1.443356006	-0.672076281	-1.774091956	0.699653821	-0.253111379	-0.792667855	-0.580068714	1.166266458	0.685913567	1.40927899	0.888225554	0.666026891
Put4	-0.626479861	-1.472924474	-0.825227203	0.535812032	-0.292002131	0.032023898	0.517627554	0.16201359	0.673349534	0.262693935	0.176794759	0.281309618
Gab1	-0.78130496	-1.075777653	-0.723097829	0.048664591	-0.104370711	0.11898786	0.11898786	0.096617347	0.331095815	0.527490013	0.600496368	0.78779984
Gab2	-1.090437386	-0.705926577	-0.741795988	0.225689373	0.346574037	-0.04363577	0.28853155	0.185941735	0.354863158	0.290842272	0.431825941	0.487353132
Gabra3	-0.60830993	-1.198796525	-1.075019495	-0.160301716	0.1784269	0.337395491	0.358220318	0.425678789	0.581503315	0.596824771	0.666267456	-0.101884944
Gabra3b	-1.096318727	-0.934875707	-1.248373147	0.588827053	0.702649713	0.81110782	0.502947927	0.170331897	0.431637842	0.282390303	0.1045625	-0.314890205
Gdnf	-3.033093044	-2.91819747	-3.033093044	1.167779498	0.291145084	0.581146899	2.714600478	2.714187931	2.738799528	0.104612373	0.923670063	-2.512068122
Ghr	-0.998815539	-1.06789936	-1.034914912	-0.110189099	0.208751589	-0.364519699	-0.017549917	0.44990307	0.260125394	0.828091947	0.958702112	0.889095749
Glir	-0.807681772	-0.822545773	-1.023770599	0.300305548	0.404606963	0.210959037	0.018775897	0.152542249	0.197433414	0.289703332	0.494632481	0.585047333
Glb2	-1.008392167	-1.098577533	-0.849865242	0.102281858	0.406851902	-0.150020919	0.535756236	0.765854277	0.736824983	0.189279557	0.188213551	-0.264763927
Pdpn	-0.720356279	-0.82855108	-1.461991357	0.007162033	-0.069670489	0.001676454	0.488772057	-0.07052988	0.693462308	0.906660936	0.708624014	0.442745312
Gpc4	-1.332769985	-1.888423487	-1.737579358	0.32876844	0.85650202	0.298291947	0.064564591	-0.243397805	0.409237922	1.419231471	1.419231471	1.419231471
Gria	-2.920597569	-2.366811284	-2.277464048	0.54351731	0.826302445	-0.924100001	1.121838687	3.304631999	2.206092076	1.326446979	0.533552393	-1.423014987
Gsc2	-1.439595949	-1.71730548	-2.44141948	0.439901803	0.71301934	-0.105959794	1.229225095	1.597972678	1.201954167	0.451364969	0.490668403	0.14654877
Gstm2	-0.688851289	-0.913735123	-0.903826585	0.030531774	0.11823034	-0.033045466	0.186357631	-0.159208898	0.597568667	0.425803595	0.739603515	0.50068575
H19	-0.711610108	-0.853745883	-1.009341753	0.052783816	0.051982397	0.064049969	0.381437116	-0.170290789	0.232217581	0.595035166	0.677046034	0.790081444
Hoxb3	-1.202021421	-1.151472436	-1.589152863	0.900621461	0.897955217	0.715396287	0.908086956	1.373576627	1.133250087	0.617978603	0.259914672	-2.504658581
Hoxb4	-1.107745421	-1.353817221	-2.010739636	0.709755788	0.621171272	0.294654489	1.159406354	1.410447807	1.246365915	1.41049002	0.77898993	-2.859680187
Hoxc4	-1.479416013	-1.88137308	-2.067607865	0.74738387	0.598390814	0.245800934	1.215732422	1.391866267	1.522530113	0.948764048	0.599889052	-1.835665373
Hoxc5	-1.157062523	-1.851599424	-2.895764713	0.842756894	0.20680096	0.942847727	1.276319809	1.533973362	1.466447798	1.138585038	-1.865364138	
Hoxc6	-1.37172851	-1.450876908	-1.665230596	0.452843798	0.530684984	0.271174746	0.991049728	1.042459444	1.190154307	0.865734968	0.566379037	-1.423184995
Hpse	-1.36298617	-1.306457398	-1.500248172	0.741852901	0.763188211	0.687965391	-0.081457447	0.162688349	-0.186211199	0.48115396	0.735041812	0.864570951
Hs3st1	-1.916811013	-1.82564196	-2.308291616	0.06488649	-0.252822073	-0.525141981	0.648108039	0.999452204	0.98222324	1.731182444	1.01182444	0.695719886
Id2	-0.973335052	-0.622734959	-0.7996432	0.580765504	0.676172029	0.466431836	-0.075120302	0.258603875	0.192542	0.1917898975	0.209622262	-0.111202178
Id3	-0.81190909	-1.057848796	-0.806807237	-0.160140073	-0.255214426	0.053610375	0.198067257	0.384251897	0.198067257	0.84251897	0.747253429	-0.775656326
Igf1	-1.349533118	-1.033093044	-1.033093044	0.561795173	0.87339742	-0.043770558	0.742844735	1.706297312	1.743124612	1.390938572	0.956896963	-0.154272512
Igf2	-0.695363963	-1.077328118	-1.110140994	0.236940713	0.19198942	0.240209555	0.621660923	-0.197027202	0.381469042	0.374		

Robo1	-0.7830365	-1.157480528	-1.228601144	-0.054311174	0.162713136	-0.216144261	-0.100987516	0.162900869	0.221736986	0.965055111	0.974058163	1.054096857
Mstr1	-0.625741921	-1.439141199	-0.737578351	0.312509729	0.176284705	-0.031370778	-0.389362123	0.486869609	-0.045271859	0.818247131	1.025284965	0.604566023
Sncn1a	-0.656777491	-0.717283692	-1.152828799	0.253226543	-0.166895010	-0.399373537	0.506095273	0.4932327	0.527549594	0.479610089	0.685893321	0.093261011
Sxc	-1.662811887	-1.509111475	-1.877603106	-0.0031006	-0.097734402	-0.657915416	0.908839893	1.165189358	1.164866964	0.963122923	0.794486832	0.831789116
Cxcl12	-2.565346574	-2.856141646	-3.033093044	-0.046459665	-0.140368090	-0.774488490	0.747882996	1.734855686	1.861318917	1.861259594	1.018260689	1.477331158
Sema3a	-0.748011422	-1.130226477	-1.739117836	0.173002737	0.332805905	0.194050106	0.419671380	0.698984457	0.694820401	0.465716941	0.399154776	0.239148504
Sema3f	-1.271442423	-1.618098304	-1.326360276	0.161910092	0.216803973	-0.061627028	0.233290857	0.069487083	0.340133074	1.152443579	1.142342256	0.952744818
Shox2	-1.830101433	-2.07951307	-2.332613874	0.638485446	0.754056694	0.351634766	1.014331025	1.218612632	1.187304775	0.580758631	0.379482877	0.113992867
Six1	-3.033093044	-3.033093044	-3.033093044	0.99586192	0.984818985	0.199712377	0.739502029	0.720113401	0.757274701	1.855370275	2.163062493	1.908454161
Sixb1a	-0.604660621	-0.965408424	-1.021618696	0.6690301	1.009434036	0.470713028	0.063442295	0.016669544	0.306901919	0.582901919	0.151861917	-0.184890695
Snap91	-2.078042143	-2.197216593	-2.108251357	1.095984417	1.187240236	0.645526746	0.719637181	0.963009873	0.793843799	0.59266624	0.208825087	0.176776515
Sntb1	-0.754253707	-0.878399722	-0.817811255	0.097444703	0.649898787	-0.269688651	-0.16417312	0.409932229	-0.110210954	0.714812307	0.480843506	0.532614806
Spock1	-1.160081768	-1.491678764	-2.081367097	0.5194242	0.633627903	0.174453063	0.682975469	0.731810786	0.913529198	0.626576951	0.455362725	-0.004632666
Sor1	-1.163136061	-1.749472867	-1.460328329	0.271575396	0.241118588	-0.705735969	-0.138186263	0.584544088	0.278846354	1.669108179	1.616940876	0.554272609
Str6a	-1.264511166	-1.199970051	-1.499300532	0.853306711	0.59283699	0.461316374	0.889932649	0.605763709	1.03962816	0.062167778	-0.09205916	-0.449138461
Rga1	-0.754529935	-1.399990191	-1.757907303	-0.109204737	-0.198193454	0.119850466	0.867485116	0.535370412	0.764902386	0.883218983	0.373410986	0.675582721
Igln5	-1.08329394	-1.215325701	-0.996934627	0.116637361	0.010005017	-0.09584841	0.129940463	-0.062651583	0.323686652	0.805163774	1.136841932	0.932314206
Dock10	-1.408582049	-0.711106415	-1.4741139671	0.595321897	0.703639172	0.695808302	0.588296965	0.973619997	0.332832923	0.148276759	-0.366348079	
Pcdh9	-2.123026277	-3.02262177	-2.116446182	-0.174115705	0.118023406	-0.712587587	-0.198933704	0.894843838	0.526371895	1.963384531	2.297632341	2.507661148
Sp5d4	-0.778164582	-0.85181977	-1.045945742	0.173366501	0.008247665	-0.137937777	0.800538403	0.66355886	0.952207848	-0.082647121	0.072001669	0.21259396
Klhl32	-1.041251314	-0.713014311	-0.544975434	0.609783864	0.844520101	0.155552331	0.717441435	0.161018422	-0.030484464	-0.235162008	0.217472904	-0.140874243
Pggh9	-0.692142766	-0.751195386	-0.952051321	-0.063712724	-0.179067229	-0.127519968	0.448609035	0.147629886	0.301540081	0.567624673	0.570400259	
Tap1	-0.9546849	-1.63667959	-0.89607483	0.071386055	-0.453060608	0.245226318	0.096555874	0.340188324	0.426256701	0.748618879	1.137201588	0.875922111
Fbx16	-1.39684521	-1.089015733	-1.139235716	0.089089423	-0.141024212	-0.239556526	0.322765103	0.654321436	0.672510085	0.702568981	0.953881132	0.610541236
Six35f1	-1.531366981	-1.192183611	-2.233784284	0.131318097	-0.124519892	0.139022909	0.497303134	0.402290046	0.931529562	1.086167745	1.306826422	0.941957071
Trrm2b	-0.974188816	-0.747903014	-0.722320456	-0.02050452	0.044112702	0.045030722	0.312080016	0.425567819	0.50289105	0.263078252	0.452152241	0.380002003
Ccd85a	-3.033093044	-2.183107584	-2.63636514	0.450158082	0.442519286	-0.498631410	0.354232915	0.855637571	0.472533222	0.1269196024	2.018996945	2.131376859
Rnf157	-0.939282348	-0.891723559	-0.774401537	0.304337612	0.223943937	-0.044169573	0.048079229	0.056911532	0.312063989	0.552543457	0.692164131	0.459532831
Tgfb2	-1.688098441	-2.127813692	-2.443606877	0.088185246	0.453374468	-0.339437144	0.424639899	0.863546857	0.971284754	1.424663585	0.911393868	
Mboat1	-1.35089961	-0.997917898	-0.95807547	0.173025491	0.28585528	-0.406208091	-0.06330482	0.078919953	0.471894335	0.994296333	0.975258763	0.78371477
Tgfb3	-0.742040698	-0.22155151	-1.39650525	0.06300027	0.239410477	-0.085513948	0.235058092	0.243869229	0.247083585	0.707818428	0.644801351	0.499373352
Thbs2	-1.386758303	-1.408034128	-2.087077701	0.962687274	1.25128234	0.477064121	0.12804355	0.368681198	0.611086219	0.474697074	0.652799371	-0.046245445
Lhfp12	-0.851016966	-0.970401543	-1.020679478	0.247077591	0.238857233	-0.135806183	0.173105272	0.182982395	0.54509178	0.664115959	0.444940915	0.481733064
Tle2	-2.13058875	-1.424165668	-2.083925747	0.122693646	0.051396609	-0.899610269	0.329266494	1.903097104	0.943357348	1.074365773	1.50588431	0.808789995
Pfam167a	-0.792805794	-0.739498999	-1.07410322	0.228872078	0.494495434	0.256112712	-0.091154381	0.087346013	0.243751887	0.367615879	0.190709679	0.498015113
Pcdh17	-2.090080684	-2.89628367	-2.239104591	0.272693432	0.829252376	0.375497127	-0.134482305	0.342390083	0.128445058	1.556932558	1.701941508	1.6461432
Ucp2	-0.952588681	-0.999611157	-0.740212453	0.423626496	0.298201337	0.337448533	0.144484796	-0.365845369	0.014725708	0.840730961	0.630712451	0.737274765
Utrn	-0.644611632	-0.895346719	-0.93748551	-0.066852953	0.327771115	-0.10556452	0.51932789	0.681803305	0.518063063	0.286084829	0.201374154	0.21432321
Dap	-0.860707308	-0.733088345	-1.233490145	0.050575013	-0.042375476	-0.216811952	-0.101391604	-0.033001473	0.446007385	0.812311208	0.935440267	0.976332431
Nipal2	-0.850775279	-1.289693637	-1.316723835	0.209508871	0.280949743	-0.23637638	-0.0252269	0.915971896	0.447681225	1.11241753	0.765838743	-0.443884532
Wnt1	-1.153976567	-1.88064925	-1.82628037	-0.013895931	-0.017349222	-0.364010619	0.543571806	0.620499822	0.752892323	1.901180547	1.250205546	0.187814349
Wnt11	-3.019461367	-3.033093044	-2.906243336	0.969336403	1.028899914	0.446386962	0.498286892	0.476833642	0.564350523	1.737030961	1.524016292	1.730179691
Zip3	-2.146687742	-1.677829588	-1.473116189	-0.203147886	0.066603419	-0.536460899	1.016473583	1.295046609	1.280754919	0.767536802	0.88874296	0.72208382
Gli36	-1.839695752	-0.772605928	-0.646426758	0.821439567	0.582700719	-0.48305068	0.221710738	0.811463904	0.81166523	0.595563936	0.427215414	
Pim1	-2.482346779	-2.201517907	-2.803128625	0.75484272	0.63940384	0.057121514	1.055037796	1.630182875	1.502901602	0.603069365	0.918026456	0.35331614
Zc1	-0.81931122	-1.02504598	-1.570869077	0.125238269	0.31909105	-0.299974009	0.468657056	1.590677974	1.198855752	0.806195356	0.287914885	-1.137404454
Large2	-1.175813481	-0.989691342	-1.217741774	0.07746449	-0.156208232	-0.337643739	0.670660131	0.821325117	0.635742176	0.43439866	0.754626593	0.48254391
Ebf4	-1.6628661	-1.532964392	-1.927606216	0.308132596	-0.195191985	-0.692643749	0.159294409	1.35674863	0.783505923	1.160672577	1.118905909	0.767396318
Ppp1r3	-0.584735905	-0.995793077	-1.066186262	0.295760739	0.169633613	0.14591277	0.399746181	-0.057048642	0.453017493	0.731164886	0.412970179	0.365194424
Fam151a	-1.019746856	-1.612923716	-1.558526828	0.877793987	0.762067675	0.271179607	0.658739862	0.461973645	0.789668932	0.227810295	0.105311758	0.30670705
Gimap6	-1.496196752	-0.950055425	-0.775845453	0.472206681	0.710564284	0.464390398	-0.761216876	-0.186724327	-0.437694745	0.778841582	1.050976736	1.122654247
Csers1	-1.420615947	-1.503751348	-1.623898292	0.639827981	0.616484959	0.376337925	0.016683509	0.165049733	0.181382825	0.584876384	1.117974685	1.149448037
Gxyz12	-1.273447211	-1.32015813	-2.01161258	0.256308739	0.114124998	-0.249788062	0.082582363	0.540047062	0.589929447	1.314735364	1.318337359	0.686867959
Gdpd5	-0.684372594	-0.846695263	-0.856309638	-0.14489912	-0.285925317	0.167271176	0.241452927	0.417231089	0.310271717	0.498672507	0.76909327	0.422402457
6430548M08Rik	-0.517038315	-1.103444428	-0.778295632	0.186644159	0.278528498	-0.527090372	0.543488172	0.20233124	0.45250611	0.176569864	0.810387025	0.536311796
Adamts15	-1.992203944	-2.465529244	-2.590016477	-0.210441786	-0.146412368	-0.442865004	0.912036804	0.699812084	0.901643809	1.747238532	1.964357258	1.632606226
Fez1	-1.604623373	-1.202303009	-1.480153585	0.983183577	0.338441109	0.352831597	0.278651865	0.298799973	0.689978085	0.747472993	0.253204451	
Spr3	-0.809527412	-0.755098977	-0.776480633	-3.57E-05	0.329419287	0.031874751	0.343634399	0.241443079	0.310320077	0.563729863	0.422122885	-0.004089895
Star8	-0.564878901	-1.488407029	-1.998071684	0.23670778	0.212411989	-0.154093288	-0.133543094	0.513463393	0.462229727	0.83868494	1.00695464	0.659889871
L3mbt3	-0.924129506	-0.598821929	-0.813870687	0.180847353	0.299156152	-0.124263114	-0.113322535	0.366953999	0.226806865	0.591493709	0.523750319	0.351518176
Cxcl21a	-1.532877275	-1.25986027	-1.204611529	0.360085003	0.250291391	-0.168724886	0.910493592	0.996				

A830082K12Rik	-2.41514948	-1.683694701	-2.480690756	0.50789488	0.542227484	0.152425822	1.483736821	1.907457748	1.547890179	0.61083674	0.396639746	-0.569574484
Mrb3	-0.866647194	-1.11468835	-1.272605375	0.373614535	0.375128941	0.227719594	0.28673711	0.206864234	0.390077107	0.709744198	0.455739689	0.230533521
Pik3r5	-1.097759481	-0.898761679	-1.564607906	0.39041515	0.260607582	0.041619730	0.526585569	1.060100217	0.9590281	0.434531011	0.483828274	-0.198194227
Negr1	-1.416081039	-2.287670102	-2.448786331	-0.101680404	0.196608269	-0.322306845	0.509521955	1.062146647	1.055991449	1.604470918	1.341476227	0.715314002
Cd10	-1.82377373	-1.474924338	-0.927054754	0.257199946	0.868710821	0.096476827	-0.240904968	0.137092797	0.257852442	1.121964024	0.805122357	0.886243097
Wscd2	-1.350402551	-2.296376398	-2.10651589	0.411174254	0.392484934	0.290966615	0.404548153	0.303729369	0.150998372	1.338153509	1.252407414	1.207922339
5930403L14Rik	-1.296029632	-1.281172527	-1.199486461	0.127062163	0.172838971	-0.15927512	0.569569502	0.339867629	0.854565383	0.734732026	0.952305088	0.272328797
Gm15663	-1.010081081	-1.576980635	-1.333705829	0.789677543	0.347768458	-0.111919974	0.106724391	-0.575384506	-0.115677319	1.080255645	1.592728883	0.806673423
Pmf2a	-1.2074118	-1.38780598	-1.219341729	-0.286922401	-0.049837633	0.047895783	0.209260534	1.296090278	0.74984414	1.300553124	1.032908923	-0.485325037
Emx2os	-2.60927344	-2.144435304	-2.494148607	0.44787946	0.23744400	-0.619224013	1.305576571	1.856266482	1.82067354	1.364713444	1.081254046	-0.176717493
Hecw2	-1.192068737	-0.811628477	-0.841528565	0.334820319	0.657322146	0.397768732	-0.083203765	0.198923376	0.079093356	0.471891141	0.275046513	0.31356423
Acot11	-1.299043258	-1.16704977	-1.062675053	0.974433555	0.974322148	0.43122148	0.719467964	0.480917354	0.854094918	0.115187519	0.198064152	0.267981283
Adamts3	-0.770540189	-0.840885359	-0.651974789	0.185307775	0.460671252	-0.090699304	0.040031354	0.509795232	0.42639767	0.358750667	0.184649024	0.184896668
Sdk1	-0.809232702	-0.804819064	-0.683754677	-0.127299326	-0.066247068	-0.190968993	0.255574656	0.304817475	0.489675717	0.638636034	0.59807803	0.335540817
Thsd7a	-1.169997157	-1.680768181	-1.473223886	0.843252863	0.962845362	0.196608705	-0.377336153	-0.686549824	-0.427922943	1.224779407	1.295425982	1.292885825
Wip3f	-1.182598938	-1.621686881	-2.104336302	-0.370580676	-0.20580846	0.191721008	0.409809582	0.678648806	1.090759368	0.772718708	1.34034517	1.001009515
Rnf150	-1.126098422	-1.377797402	-1.609143678	0.472273086	0.689255783	0.039231605	0.18180231	0.577490237	0.49154147	0.875190646	0.771168488	0.711536877
Rtl1	-0.812702673	-1.111350206	-0.937333817	0.518125376	0.937675571	-0.137100442	0.52344832	0.437057228	0.5842244	0.451705887	-0.039128285	-0.420621358
Rph3a1	-1.02009162	-2.00032482	-1.826114848	0.361483863	0.460573679	-0.04294287	0.828668997	0.205133394	0.82994704	0.945094228	0.584416629	0.673958346
Fam189a2	-1.392239603	-1.734993177	-1.26210969	1.055272383	0.66672838	0.978121019	0.650510749	0.750953926	0.798347678	0.425629824	1.156617041	-0.22061282
Zfp663	-1.446699333	-1.719377308	-1.577292312	-0.154123255	-0.131199953	-0.186071181	0.918498181	1.156864476	0.747817216	0.762531581	0.828825901	0.71897503
Mir124	-1.352292658	-0.926683873	-1.4112113571	0.062044431	-0.062507805	-0.334826852	0.324497811	1.524376408	0.54846843	0.367118835	0.873253378	-0.155255254
Pamx2	-1.205909499	-2.091880025	-1.84686102	0.935185648	0.867566198	-0.052881951	0.142202261	0.114329072	-0.050622814	0.794285266	1.245755446	1.148851055
Taf9b	-0.481783265	-1.05071965	-0.936892417	0.09847683	0.281890542	0.11946954	0.30194193	0.240134738	0.458598659	0.361537771	0.417876874	0.18951521
Lrrc8b	-1.288022573	-1.486699707	-1.385030375	0.213639193	0.085530457	0.121061905	0.70219239	0.946509252	0.92864634	0.337993764	0.32516783	0.48860941
Mn1	-2.126291063	-2.250180942	-2.372127838	0.103825883	0.133349181	-0.56953328	1.115467901	1.345114402	1.252434915	1.098942434	1.160470696	1.108528073
B130024G19Rik	-1.420117227	-1.558277602	-2.036262069	0.231633377	-0.102375199	-0.174116983	-0.288601077	0.895731651	0.063739624	0.063739624	0.57402273	1.259104258
A330074K22Rik	-0.76225344	-0.147198865	-1.285831358	-0.071784057	0.185695801	0.047550951	0.161444028	0.251004607	0.247574501	0.434414509	0.984738244	0.8543533
Fbx7	-0.842251309	-0.722655535	-0.858463107	0.096284445	0.068699676	-0.403730319	0.078904434	0.337152474	0.428963811	0.660021651	0.64517052	0.483752348
Cank1	-0.783125605	-0.994187187	-1.044857615	0.162976809	0.098301371	-0.05967314	0.269081556	0.218688988	0.419271391	0.521733323	0.678930626	0.51664257
Ncal	-0.46652374	-1.258273203	-1.289881255	-0.223401952	0.089684999	0.546290445	0.542129710	0.359300564	0.696456457	0.291781528	0.543872910	
Gria3	-1.167917706	-2.009532685	-1.471144435	-0.175978695	-0.02244543	-0.489415153	0.074304301	1.290746486	0.565383304	1.264600726	1.42757334	1.017018931
Slic40a1	-0.640380439	-1.39543143	-1.353734203	0.825021665	0.20737356	0.336768293	0.713119064	0.078002824	0.697949488	0.292601144	0.501842681	0.075102668
Fmn2	-0.87350581	-1.003619538	-0.777446299	0.406087329	0.418138631	-0.057859628	-0.137419722	0.508824955	0.136925287	0.506561741	0.65503112	0.219229634
Pde3a	-0.557353071	-1.470977846	-1.269947394	0.124237967	0.02733026	-0.169264207	0.203517107	0.141307246	-0.080097024	0.905400873	1.138141731	1.004002023
Zpdrn3	-0.640275672	-0.642377138	-1.013510187	0.187809693	0.089323831	-0.422763177	0.091390382	0.588445271	0.448920898	0.377163082	0.475821931	0.46042096
Kcnd3	-1.616333174	-1.123111341	-1.675251445	0.151481026	0.165614022	-0.830620421	0.771318141	1.345185454	1.505185191	0.485110779	0.510034292	0.4604745956
Mgst1	-1.022366832	-1.180279551	-1.677627523	0.38248717	0.233468479	0.58338769	0.703966215	0.314058695	0.61075014	0.39884473	0.318107111	0.379327257
Mlycd	-0.417891052	-1.090403317	-0.858088645	0.247956181	-0.048307591	0.358949952	0.514005248	0.243471931	0.18038267	0.370810039	0.7167179	0.286062794
Cicf1	-0.947276989	-0.924979288	-1.089720489	0.164542675	0.13334252	-0.744503367	0.023474817	0.716559259	0.250947163	0.628310233	0.296182416	0.99312103
Rec8	-1.894290719	-1.586817441	-1.306628388	-0.24274398	0.185523229	-0.045122662	1.149849496	1.66759384	0.805338596	0.99859499	0.767640582	0.500291357
Ube2i6	-0.937847234	-0.548688352	-0.804408737	0.178293345	-0.274817899	0.289722899	0.884943275	-0.921301666	0.923265994	0.488187422	0.732453807	0.50937146
Hact1	-1.073687902	-0.604359095	-0.744327109	-0.123178165	0.098627486	-0.249175103	0.257817477	0.258087477	0.261871998	0.428312578	0.829073868	0.66004787
Suf15a1	-1.322565378	-1.063662753	-1.747475434	-0.196919815	0.036599906	-0.080537032	0.459599595	-0.219919801	0.894930519	0.948199011	0.919485937	0.767650699
Ntn4	-0.841278391	-1.289043092	-0.81497613	0.208921223	0.027012469	0.066855009	0.108292514	0.592017595	0.292107988	0.556139996	0.474342758	0.82410806
Cdon	-1.586876553	-1.646235866	-2.20650794	0.505217208	0.75604748	0.249716063	1.043673201	0.785629365	0.997683178	0.350011666	0.444322753	0.710755298
Bcl11b	-1.064965499	-0.623085499	-0.724482609	0.553687022	0.443291018	-0.303693703	1.16825552	0.630473408	0.700743524	0.288896077	0.114466261	0.130455534
Dact1	-1.6450715	-1.085024656	-1.85822141	0.613365668	0.46200444	-0.46287588	0.637496045	1.178673995	1.113290329	0.73350201	0.537926292	0.25583004
Jph2	-1.053154488	-1.039119385	-1.360394654	0.203694661	0.067189203	-0.112447042	0.889514739	0.688096445	0.640928549	0.333662155	0.441670739	0.409573775
Timem8	-0.986614268	-1.29733477	-1.342396166	-0.356209466	-0.035485414	-0.130447346	0.700965644	0.801322465	0.303888321	0.449056413	0.459292841	
Kcnq4	-2.07199285	-1.412208116	-1.086763634	0.101835507	0.096235814	0.06935191	0.302310139	0.641518054	0.416805963	0.927780115	0.936289157	0.810771068
Kif14	-0.393489967	-1.005252684	-1.250992223	0.156514067	-0.123829348	-0.349542025	0.824252179	0.01450243	0.696532731	0.501525816	0.627862035	-0.058073638
Kctd21	-0.81674624	-1.19154532	-0.779414855	-0.017533023	0.031226728	0.295461429	0.389357487	-0.522110771	0.401236356	0.402524453	0.838766954	0.842948667
Dusp10	-0.866522869	-1.220160583	-0.888566587	-0.093243249	0.058855468	-0.173039968	0.138790913	0.33841432	0.71322308	0.473266408	1.000507613	0.820571434
Slic5a7	-1.507985168	-1.12216792	-1.268127623	0.456802311	0.252600659	-0.588525325	0.487737345	1.294917986	0.863686252	0.578364966	0.763973746	-0.211277229
Syva1	-0.972576627	-0.67641095	-1.07980755	0.058146943	0.787622803	-0.276412822	0.022296607	0.794662854	0.368937952	0.463891959	0.17530716	0.358868104
Sv2a	-0.752328958	-0.74924504	-0.849691419	0.550382037	0.69685068	0.583289542	0.293515651	0.00545621	-0.019712089	0.00545621	0.254179182	-0.361000942
Prrg2	-0.812907143	-0.791078401	-0.997618657	0.058809183	0.226974869	-0.208379127	1.126854666	0.75058771	0.66937141	0.723658843	0.53131029	0.447186516
Sostdc1	-1.893323656	-1.492259841	-1.877837583	0.982965693	1.050971456	-0.123544011	-0.03025024	-0.018547493	-0.033868408	1.241791188	1.03159873	0.993276657
Ype13	-0.647191678	-0.868977137	-0.820761986	0.090447949	-0.14979118	-0.120766959	0.21610748	0.380258743	0.425786398	0.352921654	0.560272234	0.54788143
Tmed3	-0.564148458	-0.788042459	-0.887553535	-0.09846084	-0.12699737	0.						

Atp6v0e2	-0.535461295	-0.951051505	-1.020807205	-0.009614771	-0.25402987	0.574605862	1.002255461	-0.448369894	0.854343115	0.521690579	0.193035535	0.073403988
Mfab4	-0.965029018	-0.930767915	-1.326602915	0.249709781	0.126501229	-0.01445602	0.320271074	0.595262814	0.631455322	0.392530288	0.477283732	0.445306669
Tbx18	-2.544649356	-2.351260047	-2.32490128	0.302375275	0.451173257	-0.019964267	0.891463159	1.098229369	1.170894757	1.153746735	1.153746735	1.153746735
Lmf1	-0.606817555	-0.736693872	-0.992627524	0.288280578	0.046222396	0.039655704	0.569266073	0.463998932	0.424033719	0.183782396	0.29099977	0.122344806
Prs8	-0.856754219	-0.510742851	-0.997790254	-0.059303671	0.099969639	0.062701296	0.026035875	-0.019927769	0.166757004	0.182724992	0.792346459	0.468458887
Rflnb	-0.909678516	-1.195971861	-1.3712482	0.017080529	0.013657158	-0.11564932	0.430329167	-0.010870433	0.462229628	1.026703378	0.835954383	0.817554359
Flywch2	-0.683002354	-0.988540332	-1.183641457	0.052967836	-0.07778506	0.136231747	0.529492167	0.33053353	0.441858315	0.098781603	0.632620349	0.880514754
Chest1	-0.870135829	-1.237309555	-1.23883747	0.247543125	0.165286974	0.170399467	0.031417312	0.183570216	0.211068126	0.711478632	0.676379833	0.949217771
Ube2q1f	-1.050963483	-1.020373235	-1.01549411	0.764350193	0.669149479	0.574081219	-0.85062322	-0.20414098	-0.009666176	1.433007602	1.138392939	-0.427720226
Mped2	-0.493565044	-1.394369977	-1.41773367	0.283342091	0.304339968	0.013984731	-0.067103906	0.272300694	0.376032847	0.907559186	0.783293486	0.431919593
C33001820Rik	-1.02453698	-1.500695556	-1.567912467	0.10027066	0.68060249	0.38117184	-0.025213471	0.274620812	0.351321405	0.674551567	1.036220441	0.62018932
Mtus2	-0.530335114	-2.778422934	-2.809581481	0.36405935	-0.22440854	0.27440854	0.701997363	1.376995955	0.803621406	1.28102677	1.466432476	0.977850864
Limch1	-2.133901718	-2.243881107	-1.810429974	0.37757587	0.45675182	-0.258796978	0.579214483	1.101704397	0.881263163	0.960765106	1.080494288	1.009240565
Csrp3	-1.229706237	-1.413735248	-1.49655424	0.167640373	0.443705565	-0.254131652	0.347147892	0.654034939	0.616229463	0.655145177	0.693086231	0.817137737
Lpar4	-1.230508672	-1.051545717	-1.056670618	0.135012364	0.335435988	-0.182168168	0.321528636	0.798095868	0.628921603	0.622207508	0.412266119	0.267425064
Wbscr27	-0.760998751	-0.783013637	-1.052423341	0.096424461	0.011009393	-0.114967026	0.045293952	0.248178804	0.104582988	0.503989097	0.818576909	0.883347912
Ntn1g	-1.565920156	-1.307596333	-1.8092576	-0.293644052	-0.00384168	0.00064498	0.387927333	0.273681939	0.170124667	1.580839706	1.41846209	0.41857909
Zfhx4	-2.003750039	-1.845997718	-1.970520095	0.314680022	0.906727864	0.661945767	0.443603284	0.996972774	0.881301475	1.165833989	0.769196613	0.468715731
Syt13	-2.896278981	-2.27205117	-2.056463334	1.166479856	1.07623437	0.822115656	0.651330008	0.231767465	0.667664744	1.384990137	1.163300908	0.05968189
Emc9	-0.785156292	-0.750440205	-0.86347169	-0.171996876	0.243014692	0.620625239	0.548327517	0.124132439	0.15578233	0.370944368	0.393152599	
Pe12	-1.027556616	-1.146210468	-0.84643222	0.119090858	0.172794251	-0.080279676	0.122827331	0.128666173	0.265710961	0.608147227	0.727135595	0.900357595
Abt2	-0.815291627	-0.57588256	-0.957812029	0.312372993	0.0368466	0.024038035	0.244675994	0.416935217	0.39864917	0.35180381	0.325389101	0.233614142
Olfm3	-0.520371652	-1.297682264	-2.001498047	0.242968472	-0.378435131	0.225829435	0.746261503	0.081865648	0.64281662	0.297120876	1.007369172	0.953752769
Ppyd	-0.973307896	-1.39591094	-0.902784614	0.037583296	0.359537908	-0.199868746	0.182831832	0.376690241	0.498934753	0.591789622	0.54256454	0.825620158
Drd4	-0.306100589	-0.393387421	-0.553237251	1.406012182	1.180799909	1.204134106	0.369785306	-0.072241388	0.081761648	-0.174285833	-0.98033892	-1.395102924
Hoxb2	-0.965167086	-1.475918339	-1.17407338	0.943867275	0.758604786	0.704743454	0.73368027	1.000178295	0.661832274	0.16262573	0.006660575	-1.353360778
Gpc5	-0.368726997	-0.439502514	-0.279509073	0.462526509	0.827366362	0.661945767	0.919233388	0.581855338	0.701430972	-0.899898352	-1.089273735	-1.077447688
Pkdc	-0.842142351	-1.653140453	-2.645490931	1.360343883	1.162369056	0.917323484	1.476074475	1.163379111	1.303962911	0.075867873	-0.249361871	-0.069206126
Asic2	0.182158433	-0.779414369	-2.04504085	0.690986861	0.439339351	0.695346777	1.847915545	1.316358493	0.999752167	-0.877777774	-0.213505101	
Angpt1	-0.296926894	-0.10673576	-0.292385131	0.980755425	1.076288743	0.490258807	-0.6583256	-0.264297043	-0.93361086	0.020869136	0.291501735	-0.319277781
Aix3	0.59694075	-0.149123334	-0.077141786	1.134359355	1.127364557	1.297907902	-0.29348526	-0.701742734	-0.373981699	-0.56674176	-0.912169389	-1.082186663
Aix4	-0.74297756	-1.290001906	-1.757121885	1.451553933	1.483597916	1.369091304	0.626232049	0.05981085	0.415331772	-0.186561726	-0.6543967	-0.770080547
Cnr1	-0.199491788	-0.646242064	-0.731674553	1.303369664	1.466656251	0.967025533	-0.548954049	-0.794670785	-0.40905853	-0.437057803	0.264664932	-0.234743378
Crapb2	-0.633720168	-0.840605246	-1.064025603	0.639584537	0.581757435	0.747830951	0.880423608	-0.051946271	0.490668451	-0.050055204	-0.29190908	-0.407825692
Dpep1	-0.22711356	-1.138091512	-1.10429115	1.701412416	1.820340464	1.570586654	0.820231568	0.947089216	1.103351896	-1.441099729	-2.288523556	-0.407742448
Ednra	-0.829629249	-0.95362933	-1.063728294	1.01128952	1.123212438	0.689895974	0.444445946	0.29865579	0.61294832	-0.049404047	-0.421678742	-0.875895359
Eno3	-0.501350801	-0.709812813	-0.957917339	0.429970231	0.612951336	0.286958222	1.200446538	0.803761419	0.815330461	0.607486666	-0.618190731	-0.471212128
Rfx2	-0.22783672	-0.17528608	-0.943463345	0.826916466	1.566344237	0.78312728	0.5035959	0.07089906	-0.395957371	1.06051973	-0.290146149	-1.735413462
Gata2	-0.975420095	-0.704745931	-0.751802794	1.398498829	1.294555999	0.768874209	-0.02982366	-1.075091607	-0.44622264	-0.244589947	0.19356887	-0.12541425
Hgf	-0.797261458	-1.06950145	-1.875749731	1.027479032	1.082045349	0.651182994	1.693944543	1.577323764	1.338431502	-0.960837473	-1.42475113	-1.422059941
Hoxb5	-0.687031451	-1.152303604	-1.705804302	1.35174427	1.244951571	1.2789798	0.989053312	0.943692763	1.158261076	0.274111065	-0.260287347	-0.033093044
Hoxb6	-0.697347752	-1.073701764	-1.167103785	1.107194416	0.82631928	0.84107858	1.078653222	1.775559969	1.154644646	0.196433762	-0.444261087	-0.330930044
Hoxb7	-0.174141943	-1.77882088	-1.058916662	0.190194499	0.601514069	0.486289161	1.682075958	0.999493926	1.204921235	0.341916647	-0.26569709	-2.33810594
Hoxr3	-0.705743055	-1.45808456	-2.624938836	0.897083728	0.70475274	0.670869191	1.947086051	1.979590416	1.748266691	0.422110166	-0.233291728	-0.330390344
Parvb	-0.146475483	-0.42028583	-0.390263547	0.690416646	0.642778505	0.759306313	1.812209699	-0.145024644	0.412032558	-0.65853164	-0.807762577	-0.80378475
Meis1	-1.01337925	-2.113132715	-2.555627563	0.910362128	0.996239868	0.574381058	0.728182402	1.57192181	1.450013021	-0.800101871	-0.081250791	-1.807711722
Meis2	-0.960262625	-1.048924994	-2.496530323	1.120726501	1.139420506	0.872714104	1.502631836	1.35514644	1.311227471	0.418554197	0.012373537	-2.451633499
Meis3	0.096491449	-1.048370682	-0.862299072	1.052644658	0.716729284	0.917595091	1.367906673	0.931024204	0.471091832	-0.6062205	-0.48146288	-2.282627613
Mx1	-0.451300297	-0.004451002	-0.288978499	1.916004405	1.97124258	1.621854499	-1.392645029	-1.179658662	-0.86098299	-0.18163739	-0.248640562	-0.909713558
Pax2	-1.703842773	-1.01668085	-0.983416888	2.361430942	3.062535357	0.961744797	0.206257201	-0.17863918	0.551728416	0.675694858	0.208023088	-0.303093044
Tbx	-0.500470866	-1.047198884	-1.348934219	0.586722936	0.633221904	0.46310066	0.935974811	0.523368486	0.475098514	1.161360131	-0.02893048	-0.808370114
Ptn	-0.489647507	-0.396916571	-0.675860112	2.128076356	1.866169293	1.413107771	1.763594413	-1.14607509	0.263648665	0.397281897	0.011314202	
Tbx3	-0.486159779	-1.158476703	-1.393994811	1.51572535	1.627181071	1.999288901	-0.59064147	-0.626678438	-0.517337374	0.21610839	0.399564144	-1.85307266
Rarb	-1.082098881	-1.506301274	-2.213271005	0.938013428	0.884258688	0.772823954	1.150513787	1.447568344	1.273694867	0.35454745	-0.019187294	-1.962905666
Adams20	-0.310965705	-0.471841646	-0.868540775	0.77248112	1.020551313	0.318457091	-0.003073942	0.972328344	0.438280162	0.044576861	-0.504334399	-1.407918425
Fhd3	-0.211806623	-0.518081375	-0.9646026	0.625176873	0.672792107	0.246221057	0.605618496	0.555045795	0.608437735	-0.056850524	-0.469554912	-0.99038669
Kcnj5	-0.03552686	-0.732473241	-1.004988503	0.864016984	1.060070116	0.667981557	-0.797103399	-0.520209675	-0.326852225	0.638626112	0.481345242	-1.230030034
Slic6a17	-0.070739653	-0.16200603	-0.496312143	1.0100110136	0.792106786	0.739936234	0.091824025	-0.060295766	0.071724462	-0.942062807	-0.387284236	-0.590650011
Gtse7	-1.388877459	-1.063363274	-0.925145824	1.507790242	1.153990497	1.247891632	-0.394789631	-0.470973337	-0.440958533	-0.037476589	0.603345082	0.214900615
Sh2d5	-1.184181408	-1.546642984	-1.141790877	1.120260902	1.068124915	0.923921012	0.847595848	0.740682712	0.815973318	-0.602285216	-0.614630475	-0.427127745
Zbtb16	-0.145744405	-0.482085093	-0.454277924	0.484713574	0.546280908	0.521682989	0.995297697	0.670285937	0.836682873			

Nod1	-1.868581557	-1.353471711	-1.475605698	-0.567108043	-0.921706868	-1.123572737	-0.657764817	1.235406076	0.921956335	1.814136071	1.986618152	2.009694797
Ltn7a	-1.505480571	-2.064328226	-1.248425711	-0.09304304	0.145314563	-1.545766671	0.445875787	1.08629259	0.971416615	1.600891362	1.190760221	1.016466443
Ltpb4	-1.276500201	-1.565868344	-1.35507949	-0.280415924	-0.135992057	-0.601028639	0.246875078	0.791490226	0.562360133	1.229398643	1.249963478	1.197069678
Sema3d	-3.033093044	-3.033093044	-3.033093044	-1.867644723	-1.066171942	-1.79952571	1.326781985	2.475555907	2.368316592	3.185071931	3.475204245	3.475204245
Adams7	-1.093327012	-1.049796876	-0.9027075027	-0.089420578	-0.200414174	-0.651871545	0.228181302	0.507997501	0.435110732	0.953354491	1.021500016	0.845189719
Adams6	-1.459306648	-0.988567336	-1.140640491	-0.227552373	-0.027435319	-1.134210999	0.104607068	1.600912466	1.098421497	1.9238591	0.897923401	0.633462823
Foxp1	-0.601737046	-1.422972552	-1.47711046	-0.064856157	-0.007194173	-0.795510952	0.224981006	0.573170846	0.782744771	1.013704269	0.992371919	0.826966148
Sfzd2	-0.576890138	-0.830881487	-0.603701448	-0.403505548	-0.163422238	-0.523320222	0.343385535	-0.140992347	0.391304325	0.771760835	0.815547578	0.910335336
Stor2	-0.632967747	-0.388949606	-0.100682085	-0.642177929	-0.749521064	-0.785112953	0.546945809	0.280954488	0.615025344	0.387809477	0.645105169	0.823562096
Ssc4d	-1.261079412	-1.5941065	-1.164673814	-0.195440211	0.011218621	-0.708254263	0.460894709	1.004460239	0.53878215	0.884382477	1.28479682	0.805336325
Bmp3	-0.250084845	-0.21520408	-0.31083836	-0.851318851	-1.157346417	-1.939932881	0.319958004	1.006353599	0.763470852	1.569387845	1.401713852	-0.335667991
Manba	-0.901453669	-1.160317335	-0.89665625	-0.536645736	-0.243024578	-0.231038485	0.170275001	0.6573486	0.143600858	0.772255797	1.286096496	0.929576858
Rap1gap	-1.424435161	-1.056276825	-1.06591546	-1.042667616	-1.146517339	-0.5757376	-0.021707359	0.927857748	0.541117129	0.988233955	1.034659329	0.940755445
Arhgef28	-1.506671252	-1.068989793	-0.896180979	-0.292611781	-0.186576535	-0.965057663	0.027817177	0.746062243	0.329382695	1.130615065	1.314433281	1.367785642
Adgrv1	-0.718852624	-0.78531225	-0.844335418	-0.228914225	0.181009733	-1.008020263	0.296710663	1.030371237	0.135696094	0.9060191	0.537724329	0.497903415
Sic8a2	-0.657833358	-0.897550226	-0.989722593	-0.421100326	-0.050800112	-0.142950262	0.587898919	0.12823427	0.161794972	0.684842455	1.005150375	0.576800472
Sic8a3	-0.602809044	-0.018538068	-0.080513281	-1.084703622	-0.883457137	-0.444252344	1.022660838	0.828980434	0.880700209	1.416390302	-0.145260097	0.110811811
Abca1	-0.860954965	-0.518956764	-0.855127095	-0.624416182	-0.837346617	-1.232771908	-0.02888057	0.764989974	0.369291693	1.155928105	1.334817876	1.334435764
Abcg1	-1.731598204	-1.257766367	-1.537822807	-0.400215744	-0.457297445	-1.134606513	0.367219435	0.437486766	0.663001876	1.473284593	1.830964559	1.7442037
Foxp2	-2.229235886	-2.458457716	-3.033093044	-0.368467735	-0.288356102	-0.975796568	0.600910272	1.586056327	1.088060844	2.094290208	2.293894958	1.850918652
Chrn1	-1.539591232	-1.204304433	-0.22556882	-0.721362296	-1.234998197	-1.149962463	0.173416107	0.518760744	0.739535342	1.597068663	1.309405096	1.737318888
Actb1	-1.217489327	-1.217489327	-0.415776898	-1.04737258	-0.351378402	-0.666505587	0.438711923	0.41945693	-0.374761728	1.026579589	1.798122927	1.607627159
Brd1	-1.206951823	-0.700750393	-1.328112348	-0.373240684	-0.138642329	-0.29038689	-0.057258994	0.809008219	0.16137798	0.923840861	1.124781106	1.076335194
Adam12	-0.841544595	-1.302310776	-1.756418166	-0.565450981	-0.183445732	-0.390770406	0.844140458	1.280994388	1.112076781	0.321563894	0.538611806	0.94249033
Adam22	-0.958684026	-0.99472959	-0.732951596	-0.794519679	-0.47282575	-0.87353122	0.704245406	0.443428202	0.416335712	1.486111727	1.535635759	1.02735126
Ak1	-0.870169299	-1.490778177	-1.152482436	-0.604101342	-0.586603158	-0.6837411	0.129360601	0.616999814	1.004292944	0.87583214	0.850879288	1.008733202
Prep1	-1.953395209	-2.133789209	-2.133789209	-2.133789209	-1.973469617	-2.133789209	1.555341445	1.487258936	1.883122797	2.362521878	2.739204902	2.434571526
Alox5ap	-1.045519609	-1.389266209	-1.109077157	-0.705134647	-0.174786934	-0.184106437	0.373757026	0.22655514	0.602095632	1.248854966	0.934877582	0.872176759
Boc	-1.385810029	-1.049636085	-1.252869293	-0.341567474	-0.182913736	-0.453462104	0.26551031	0.782310881	0.537890603	1.077570567	1.165549368	1.123226786
Mmp28	-1.439285393	-1.697661007	-1.719801978	-1.162967067	-1.739905933	-1.624661734	0.927815442	1.409617227	1.649921077	1.447134812	1.957472379	1.995321674
At2a1	-0.255481654	-0.612828564	-0.129502049	-0.462400535	-0.435990262	-0.829709122	-0.412704456	0.963259698	0.428602398	0.97372303	0.833246798	0.539519271
Atp8a1	-0.316539107	-0.230679698	-0.230960551	-1.188488116	-0.678942202	-0.415510761	0.38626382	0.290792517	0.201741616	0.577316325	0.658894492	0.945851103
Atp9a	-1.098635564	-1.324499898	-1.10875999	-0.445671536	-0.696271831	-1.019468101	0.201991342	0.313143932	0.399554138	1.07746664	1.606465738	1.664445105
Barx2	-2.35799016	-2.58047767	-2.35799016	-0.640025238	-0.665045808	-1.128466601	1.228466601	1.521268994	1.688911938	1.758725138	1.748023206	2.225394664
Cspg4	-1.453058081	-1.193305206	-1.787431203	-0.847083293	-0.880118454	-0.880118454	0.213618628	0.832590616	0.742352385	1.379040091	1.739020525	1.103022411
Bic1	-0.66928958	-0.82284188	-0.580714867	-0.769059708	-0.313486548	-1.103411027	0.132646672	1.017564319	0.42016039	0.922770241	0.867956492	0.897665296
Bmx	-1.244181071	-1.193618616	-1.560711165	-1.262814493	-0.72197057	-1.521247439	1.28696937	2.105059108	1.55294027	0.808149575	0.95846774	1.004799194
Klf5	-0.68708796	-0.750943428	-0.490022976	-0.024979074	-0.350881214	-1.07204116	-0.360371236	0.67085121	0.639723936	0.531498001	0.729585351	0.804618576
Blg2	-0.89813073	-0.905522657	-0.469156347	-0.220117628	-0.493726453	-0.877797023	-0.023715419	0.851958185	0.525910676	1.113703359	0.933572802	0.505703777
Ca3na1b	-0.16986097	-0.89379853	-0.293484591	-1.065291956	-1.130727859	-1.067711483	0.442446212	0.887719746	0.970939163	0.601973843	1.52994622	0.187857252
Ddr1	-0.353825512	-0.925644053	-0.743059074	-0.19383857	-0.34785158	-0.684162592	0.2156193	0.282921889	0.417910105	0.900272606	0.64250294	0.79156911
Calb2	-2.023633607	-2.20209221	-2.446069011	-0.570394567	-1.175990217	-0.960179687	0.886025409	2.179781799	2.313608213	2.174436042	1.868271165	0.13280921
Capn1	-0.72486054	-0.84442196	-0.693598066	-0.180078729	-0.441608932	-0.113036621	0.520818581	0.098451176	0.353362495	0.890387597	0.610336756	0.924276494
Carr5	-0.86380969	-1.32197145	-1.093411242	-0.587323232	-0.673599317	-0.673599317	0.177772689	0.788479242	0.017519768	1.339443246	1.345200175	0.544879617
Cd38	-0.578536526	-1.036602252	-0.560121714	-0.863263316	-0.259725121	-0.900516336	0.608387194	0.639540702	0.396959553	0.085236985	0.781443434	0.681919485
Cnk1c	-1.106139374	-1.196819585	-1.169050049	-0.12276878	-0.57151824	-0.634958096	0.1713290291	0.701190583	0.720821299	0.847532953	0.817375589	0.713029219
Ackr3	-1.329071142	-2.21919609	-2.753504125	-0.625382769	-0.996887628	-1.023678252	1.711199742	1.528511091	1.874373385	1.555466307	1.477655946	0.803253232
Clk12a1	-2.07276698	-2.913176686	-3.033093044	-0.40138697	0.127372650	-1.106877654	0.448701559	1.425753609	1.297795279	2.25415552	2.086125004	2.023268388
Clk15a1	-1.47005523	-1.93531457	-1.531417864	-0.708157219	-0.202211586	-0.234205191	0.473297221	1.613363168	0.405837235	1.127120249	1.439785862	0.877779882
Col2a1	-3.033093044	-2.945779934	-3.033093044	-1.076433316	-1.344562767	-1.984884701	1.526506121	2.370185559	2.121070575	2.425135704	2.616027251	2.985248354
Col4a5	-0.64722379	-1.055612787	-1.078786933	-0.366643084	-0.072886352	-0.669096156	0.163174969	0.569165927	0.381737657	0.875635968	0.830750353	1.06924827
Col5a1	-0.624498252	-0.77439481	-0.812124557	-0.248183493	-0.081283311	-0.577013692	0.220722927	0.163461629	0.236231299	0.754718219	0.972094076	0.761619916
Col9a1	-0.799423718	-0.704771585	-1.21061805	-1.438371052	-1.805681966	-1.837947604	0.725623441	0.925276248	1.016048089	1.294706862	1.6654705	1.963930434
Col9a2	-3.033093044	-0.873380209	-3.033093044	-2.561730126	-1.76818121	-3.03035121	0.738855207	2.039543022	1.946315331	3.475204245	3.475204245	3.475204245
Col9a3	-2.952887115	-2.564303855	-2.244126342	-1.965915228	-2.034028665	-2.860382	0.369131185	1.712808634	1.504834827	3.339694418	3.475204245	3.475204245
Vcan	-0.352232167	-0.33913067	-0.366150577	-1.37310073	-0.846186305	-1.294300443	-0.141106122	1.205354473	0.623380066	0.937921915	0.81143786	1.113010701
Dab1	-1.218939598	-1.474514539	-1.793641277	-1.733940248	-1.543734818	-1.167428797	0.121731236	0.97796277	0.898535428	1.097796259	2.364562471	1.463087305
Dapk2	-0.539983042	-1.158217126	-1.024044073	-0.413951073	-0.297840054	-1.490566204	0.41342623	0.595348566	0.395260482	1.436129801	1.1886534	0.892463394
Ddc	-0.14697997	-1.482156885	-1.23928462	-0.583782477	-0.288883702	-0.52366271	0.236500171	0.634176465	0.767586919	0.98003064	1.02167123	0.629510404
Dsc3	-0.571190388	0.12639813	-0.851707423	-1.134798849	-1.307556919	-1.096622942	-1.135601517	0.802084309	1.160753344	2.238174889	1.563075405	0.209847788
Dsg2	-0.82750244	-1.73476392	-1.656438338	-0.147354051	-0.47750276	-						

Meox1	-2.010463631	-2.684589049	-2.174746571	-0.644004145	-0.992095613	-1.343086164	1.055550793	1.638522991	1.603385812	2.123040711	2.060528159	1.367956707
Foxc1	-2.820057866	-2.649096797	-1.873452372	-0.226367299	-2.663124743	-2.146312111	1.081166294	2.170819043	1.699576972	2.728815304	3.222113793	3.273190012
Foxd2	-1.633251219	-1.643075974	-1.913767804	-0.493304442	-0.483264663	-0.280251936	1.305291626	0.914563954	0.941983227	0.749443723	1.638596422	1.479558691
Mstn	-1.188497794	-1.188497794	-1.020033543	-1.188497794	-1.188497794	-0.980569818	1.554820333	2.303214663	1.643542514	0.460247056	0.527852466	0.264917314
Myo5b	-1.682153669	-1.965188078	-1.268787859	-0.796872484	-1.264159816	-1.104407171	1.597448022	2.215720529	2.144099532	0.628792575	0.693866832	0.801822102
Myom1	-1.393298933	-0.562291068	-1.038655834	-0.224831348	0.101004788	-0.703909065	0.348218133	0.953524719	0.544218588	0.675613527	0.701956882	0.687639569
Nfatc2	-2.335820329	-0.316042142	-2.70452187	-1.14205342	-1.461985264	-1.399401626	1.649896836	2.225924583	2.201202339	1.936126297	1.886038	2.360664314
Nfe2l	-1.143183568	-1.032792904	-0.957615981	-0.746650003	-0.421360064	-0.831395109	0.681700858	0.399829516	0.977798439	1.229042079	0.903809972	1.039916764
Nr4a3	-1.423863084	-1.682238698	-1.358510735	-0.752250518	-0.098987471	-1.952295189	1.084791877	1.031787072	1.730076133	1.028068186	1.10279119	1.296005737
Notch1	-0.932912952	-0.729826447	-0.311359109	-0.811535383	-0.508914641	-1.317348738	0.17819932	0.741891589	0.548019606	0.851061223	0.981976588	1.310748943
Npdc1	-1.090035689	-1.390310198	-0.912691038	-0.751164926	-0.95473126	-0.08573242	0.214315818	0.555286602	0.757737817	1.332143971	1.51851787	0.809365538
Ntn1	-2.882469574	-2.808063277	-2.972904451	-0.33825244	-0.73368	-1.244641371	1.723312579	1.796385653	2.183584914	2.352162286	2.078212435	0.845353247
Ntrk2	-1.466134566	-1.950387856	-2.468329214	-0.259720898	-0.832568234	-1.472333201	0.179560295	0.602559713	0.697567769	2.161246787	2.452043606	2.356485798
Opr1	0.560446385	-0.428425245	-1.142960927	-0.752056392	-0.605995666	-1.462258605	-0.647110883	0.696899322	0.294689228	0.71562124	1.386733223	1.28456935
Osmr	-0.906133629	-1.086527809	-1.086527809	-0.913775739	-0.926208217	-0.69689906	-0.379029618	0.478752097	0.40587497	1.450797181	1.625366284	2.03474349
Pak3	-1.176579302	-1.124748402	-0.934643934	-0.336660277	0.126055159	-0.392505905	0.382731959	0.526101316	0.466154559	0.856485711	0.690555433	0.917053685
Kat2b	-1.305847329	-0.620225514	-0.94270356	-0.176764668	-0.412084592	-0.975332989	-0.357392068	0.791716502	0.356776414	1.2634562	1.352740894	1.02566709
Pde9a	-0.786582935	-0.733848566	-0.699688168	-0.449591061	-0.44336156	-0.486343363	0.13965498	0.806079807	0.319359231	0.760694178	0.767826298	0.805801125
Pdgfra	-1.057908118	-1.052313476	-1.040525309	-0.221630073	0.055046939	-0.507713797	0.383578402	0.567846582	0.545411215	0.918517575	0.73944563	0.61626231
Pgf	-1.201147063	-1.282744037	-1.208924506	-0.14923582	-0.244348441	-0.804791955	0.296955609	0.521224841	0.337188179	1.348375111	1.274575717	1.112957536
Ptk3cd	-0.646005297	-0.386587737	-0.528746184	-0.441526682	-0.596674671	-0.367180565	0.45891746	0.442625848	0.219576442	0.378438934	0.645559083	0.83643122
Plx2	-0.399108724	-1.672686848	-1.3865261	-0.775171918	-0.789598027	-1.177032303	0.800452594	0.202575893	0.202575893	0.365206524	1.052724006	1.265726618
Prkcb	-1.671484903	-1.86781371	-2.023499596	-0.582503447	-0.309607159	-0.551213629	0.991047881	1.266112657	1.214864248	1.237804253	1.376452391	0.918940914
Pld2	-0.688750438	-1.588193524	-1.135279699	0.064966003	-0.424957166	-0.33690194	-0.023738985	0.92715789	0.447911643	0.82101813	1.0570097	0.87974639
Pmp22	-1.09515531	-2.844895369	-2.204501797	-1.013697776	-0.929937242	-1.050818293	0.951779339	1.062895312	1.26495337	1.872516421	2.151894532	1.834928593
Pou3f1	-1.268826407	-1.107881658	-0.56939764	-0.208542257	-0.337753087	-0.453206381	0.533212813	0.699682982	0.2665602	0.889742669	1.072940615	0.483994407
Pou6f3	-1.0513977421	-2.006992169	-2.029326437	-0.064991703	-0.092160257	-0.679002692	0.442262946	0.873951395	0.593547278	1.121181771	1.652164716	1.703426119
Ppargc1a	-2.310550248	-1.786178104	-1.729582282	-0.439356397	-0.159962687	-0.476528068	1.219749992	1.225014356	0.877941545	1.161809578	1.209372745	1.02282832
Prkg1	-0.555368614	-1.267916876	-0.930012192	-0.244041591	-0.06636668	-0.370292967	-0.003224815	0.767020959	0.534029342	1.015978979	1.012972852	-0.06594688
Pstpip2	-1.27775859	-1.19307469	-0.918822791	-0.445844007	-0.423333366	-0.452241303	0.175448555	0.847642986	0.350475587	0.934675316	1.130782569	1.19822633
Abcg4	-1.065653249	-0.476079249	-1.249763267	-0.099548233	-0.441103997	-0.098237961	-0.273871619	0.577734993	0.381609351	0.7964801	0.924358278	0.82501753
Ptprc	-1.409785954	-0.582346353	-0.510620243	-1.076551362	-1.124832544	-1.343796558	0.025419145	1.120253451	0.166564113	1.637693271	1.508432635	1.539570399
Rab33a	-0.792887844	-0.800155231	-0.607696041	-0.223613103	-0.225437637	-0.443315354	0.019661003	0.441307082	0.195858386	0.707349624	0.790340126	1.015717907
Rag1	-2.40715103	-1.139309094	-1.829486699	-0.801350702	-0.315787657	-1.55117182	1.373656911	1.454064824	1.691585382	1.39318313	1.101508847	1.076344178
Dcdc2a	-1.051793941	-1.593788285	-1.368324035	-0.524109878	-0.461429622	-0.373146686	0.606491605	1.655221952	1.175601394	0.57096381	1.0499980	1.211448568
Rgs16	-1.17550401	-0.80244374	-0.973000937	-0.228214763	-0.7549303	-1.326035609	0.725418038	1.182444810	1.498682713	1.211354209	0.666152784	-0.028916699
Dhr3	-0.83158831	-0.74378431	-0.79246109	-0.727738032	-0.669371942	-0.742465629	0.617621934	0.849786304	0.663605956	0.362714038	0.692892985	1.084914443
Rtkn	-0.75955185	-0.42475127	-0.68872486	-0.365729675	-0.497039287	-0.648911999	0.273309909	0.909798763	0.599433273	0.483256607	0.563034526	0.535917257
Ryr2	-0.021303069	-0.803507629	-0.639493412	-1.07760412	-1.320591065	-0.926895003	0.416228007	0.659494825	0.621850895	1.080752456	1.252039858	0.759285688
Rxr3	-1.407469872	-0.858630656	-1.273999765	-0.879785008	-0.208840071	-0.943737005	0.7076127	1.457165793	0.844662834	1.329238074	0.956527812	0.305975466
Sdrp	-1.768452284	-2.905130045	-2.905130045	-1.642532416	-1.635847885	-1.469336482	1.188736352	1.984179994	1.475872344	2.74289115	2.793811962	2.135393396
Sema3b	-1.190611892	-1.051269848	-0.911754623	-0.876789933	-0.660023955	-1.480239487	0.125718727	0.88018706	0.68889562	1.285016827	1.614235534	1.576941157
Sema6f	-2.181801372	-2.111980181	-1.670275907	-0.679729935	-0.470263161	-0.877445282	0.547945145	1.093771622	1.083002646	1.682836314	1.803418521	1.780494293
Selenop1	-0.664988416	-0.88546018	-0.820384043	-0.653364239	-0.658283522	-0.495825569	0.182261619	0.417607722	0.406894483	0.760590654	1.058095296	1.162832616
Shd	-0.687236561	-1.1365508	-0.618647767	-0.553857366	-0.629467159	-0.907157559	-0.111128051	1.007303358	0.35465235	0.564292625	0.9003898	0.795851163
Sih1	-1.26483926	-1.26483926	-1.26483926	-0.446610324	-0.829099718	-0.87520115	0.332271301	1.609014259	0.756783454	1.447237657	1.748727995	0.50116802
Sih2	-1.940992799	-1.568835614	-2.804744282	0.47709317	-0.277827475	-1.525209044	0.549349302	1.235720664	1.308236467	1.278245764	2.3196254	-0.492626103
Sih3a	-0.910998831	-0.879187977	-0.633955249	-0.244976658	-0.373737374	-0.845119197	-0.352712005	1.180356448	0.454657928	0.570005078	0.841906889	0.502541888
Sih4	-0.982561479	-1.191344857	-1.397645995	-0.10359593	-0.10359593	-0.851766616	-0.292971429	0.825401084	0.430624793	1.297066503	1.334930457	1.5714515
Pox10	-1.74740759	-1.411850971	-1.578943339	-1.74740759	-1.311668049	-1.539479614	1.022928149	2.024521026	1.663286298	1.630642301	1.341967824	1.65341083
Sox5	-2.728252451	-0.82591862	-0.641972604	-0.983955956	-0.6696707	-0.708659094	0.432408434	0.776523544	0.675198829	0.680024154	0.87372006	1.170449088
Sox9	-2.225808794	-2.022872842	-2.001016033	-1.218775434	-1.389640109	-1.201290964	1.5248581	1.543137835	1.568586545	1.473606021	1.948193233	1.020924123
Serpini1	-1.05744431	-0.889699332	-0.709369736	-0.426273988	0.150629538	-0.566540112	0.086493549	0.295933421	0.226416679	1.06784697	0.951318094	0.905285731
Spp1	-1.536449923	-1.842651681	-1.877983333	-0.363349944	-0.508439365	-0.863771475	1.284456505	0.908125883	1.294309582	1.052198302	0.940987137	1.031978691
Spp2	-1.505522002	-1.668727868	-1.526942583	-1.673488191	-0.980129336	-1.01830696	0.753836455	1.056976218	1.401856995	1.45575266	1.887230682	1.817463931
Tsroap1	-1.232915877	-1.500745109	-0.590164355	-0.658271609	-0.473347274	-0.735044647	-0.162425471	1.138536344	0.342675239	1.173081741	1.447715473	1.251058884
Crb3l2	-0.944027992	-1.00598902	-0.94690863	-0.526026027	-0.441338226	-0.861163648	0.030231147	0.2163776	0.504030053	0.70484553	1.369897246	1.534457859
Sned1	-2.188179338	-2.05849184	-2.32418777	-0.777345353	-0.88943643	-1.737631566	0.701741719	2.529252109	1.581134382	1.648913142	1.758973304	1.757153126
Timem63a	-1.001262088	-0.81262903	-1.193200833	-1.179932025	-0.945898534	-0.165932858	0.934324459	0.766343893	1.443101993	1.704506516	1.43979277	
Ctrk1	-1.066984019	-0.17352614	-0.87737796	-0.422360579	-0.40303329	-0.175800459	0.311897974	0.312613578	0.279128935	0.576841974	1.008414017	0.974282441
Cdc62	-1.123658324	0.067558865	-0.538954662	-0.344081286	-0.422605629	-0.839823005	-0.132303087	0.956503958	0.725469092	0.614981034	0.542125203	
Myo5												

Fam160a1	-1.278656697	-1.892578019	-1.599438543	-0.839112336	-1.230901832	-1.149527687	-0.492925906	0.870620278	0.622104392	1.968562978	2.029536453	2.006465107
Slc16a4	-0.985552818	-0.537105905	-0.271173339	-1.462576116	-0.231133666	-1.490314921	-0.187691294	1.191995872	0.569403751	1.270973371	0.969180838	1.137195189
Gbp7	-1.45875006	-1.64444026	-1.439977428	-0.754829707	-0.837993368	-0.757886867	0.289711205	1.184129412	0.60661781	1.130109897	1.691524818	1.229747796
Npr2	-1.482317085	-0.652551451	-0.785138564	-0.347825916	-0.260550150	-0.700943417	-0.411755747	0.692938446	0.172072997	1.096320434	1.406915949	1.274141089
Nrr1	-0.988893713	-0.878503048	-1.285740877	-0.129490031	-0.687981873	-0.777105254	-0.272212289	0.344931121	0.532611565	1.356195359	1.523610202	0.672842462
Asap3	-0.976987284	-1.89950589	-1.45060458	-0.306194247	-0.523601654	-0.487452622	0.006920343	0.732013232	0.132354144	1.187147818	1.558032339	1.319513647
Fbxo44	-1.15866742	-0.560892762	-1.182088001	-0.789183466	-1.194709363	-1.281451702	-0.791950438	0.659772248	0.813043762	1.686748635	2.111089912	1.446569707
Arhgef16	-1.107985944	-1.025108576	-0.991242831	-0.31626123	-0.383467437	0.014359481	0.63519135	0.774568795	0.82960808	0.510616483	0.281680415	0.778061424
Farm1	-0.62229665	-0.89253872	-2.372236723	-1.030462715	-1.650243185	-2.140556601	0.572611478	0.72070875	1.119427619	2.24289353	2.35780997	1.69176937
Fras1	-0.435461702	-1.279654413	-0.948631221	-0.517577442	0.032252227	-0.778695422	0.390080752	0.6250117	0.612140971	0.625107129	0.745928857	0.889267225
Slc26a1	-0.467357527	-0.987706318	-0.412683145	-0.426501914	-0.428826682	-0.756251666	-0.015790078	0.441931205	0.295301455	0.917321884	0.999577089	0.841259336
Creb5	-1.985197447	-1.924748394	-2.124575826	-1.138384726	-0.662581222	-2.027004237	-0.042167296	1.159023895	0.688847769	2.303686737	2.886621343	2.868575671
Hdac11	-0.862200363	-0.866457544	-0.953696955	-0.090620634	-0.085891655	-0.479690779	0.370137696	0.675545196	0.633135366	0.496645612	0.546651116	0.610615064
Shisa7	-2.394351032	-1.848209705	-1.581330269	-1.662066804	-0.64058342	-1.31456711	2.086508753	3.475204245	2.3165332	1.01002221	0.458184089	-0.028006581
Fbxo27	-1.275055555	-0.492439011	-0.834149402	-0.180751135	-0.261531272	-0.832626431	0.351900583	0.473688879	0.401260284	0.9607084	0.927511328	0.763807424
Glnf18	-1.025832875	-1.224017721	-1.261765158	-0.189540975	-0.82454229	-0.570177718	-0.187695619	0.905341268	0.801128877	0.883817103	1.354824373	0.806508927
Spon1	0.074959028	-0.679145356	-0.559766241	-0.858071747	-0.455049092	-0.582995607	0.592251908	0.795453518	0.386112362	0.22803224	0.877665059	0.275643298
Phka7a	-0.77970873	-0.363620487	-0.251881999	-0.753144192	-0.455457700	-0.373757714	0.318298093	1.177028125	0.015997704	0.280184769	0.059834354	0.761105952
Sorbs2	-1.59175412	-1.384180724	-1.426242816	-1.895898361	-0.234051343	-0.209341333	1.205356654	1.603890944	1.654231355	1.651391964	2.045492953	2.465285845
Gand1b	-0.972411268	-0.089158823	-0.660620487	-0.65259153	-0.430671474	-0.429737391	0.048516222	0.386749327	0.559343551	0.736292477	0.643725618	
Fam214a	-0.959376221	-0.923323042	-0.539072018	-0.153484157	-0.171580865	-0.717165873	-0.053837429	0.521199893	0.229722464	0.800595783	0.925998236	0.957220993
Aisl2c	-1.305204362	-0.284323355	-1.047891186	-0.107215277	-0.748897541	-0.702563642	0.114077224	0.645355581	0.494770735	1.253483182	1.207185801	0.784336699
Pisd-ps1	-0.642785917	-0.347767153	-0.564083555	-0.567560165	-0.268410055	-0.504621767	-0.376485491	0.909406415	-0.118826815	0.69161947	1.080437085	0.707077247
Arhgef9	-1.10290132	-0.852688213	-0.909410243	-0.097653541	0.136079556	-0.697817251	-0.036068666	0.799381294	0.588123954	0.712114007	0.897634883	0.56294374
Adam23	-0.772149284	-0.173591201	-1.158487581	-0.293396782	-0.174123287	-0.610845677	0.34754292	0.67044092	0.463873946	0.805928123	0.890274484	0.814542407
Vsp2	-2.007012619	-1.944806382	-1.77361557	-1.129596991	-0.406801082	-0.895671024	0.288773596	0.832298302	0.802337167	1.691948628	1.913477024	1.648734938
Arch	-0.740428073	-0.793382081	-0.60286447	-0.203559443	-0.413906299	-0.513702072	0.610232562	0.309137198	0.688647075	0.45881952	0.663297932	0.537706168
Mac11	-1.841471466	-1.841471466	-1.841471466	-1.668719397	-1.536879422	-1.841471466	0.324565047	1.277332983	1.142979801	2.747366591	2.589774682	2.741465581
Dlg2	-0.539236336	-0.464302586	-0.878966527	-1.105861515	-1.047613618	-0.780323212	-0.500249763	0.938665241	0.095108192	1.74613347	1.583004519	0.953261358
Mgll	-1.16693431	-1.445725353	-0.882336373	-1.610327082	-1.34733961	-0.834351286	0.18481395	1.177129003	0.954047698	1.487331602	1.692510789	1.793208728
Pdzrn4	-2.004650602	-1.45509275	-1.604468978	-1.366815846	-0.82454229	-0.570177718	-0.187695619	0.905341268	0.801128877	0.883817103	1.354824373	0.806508927
Zfp811	-0.808152056	-0.710563915	-0.729066897	-0.199198501	-0.043203895	-0.602529961	0.360685309	0.846644827	0.323485816	0.689610211	0.271843864	0.600454148
Rnasel	-0.902553977	-0.836610344	-1.1229212	-0.59038488	-0.681496347	-1.242555848	0.209453018	1.321761927	0.624117036	1.069439973	1.139269078	1.014910582
Fam9c	-2.66934663	-2.67636454	-2.985848756	-0.964749886	-1.34236404	-1.231958492	1.75971954	1.720212049	2.163188258	1.819831962	2.05211814	2.149307029
Kcnt2	-0.892991835	-1.43168542	-0.88641174	-0.862573647	-0.292974314	-0.537034444	0.236195032	1.385395044	0.693067719	0.510351376	1.056440458	1.027405433
Dusp27	-0.619824176	-0.354478026	-0.240251486	-0.976107481	-0.615074898	-0.615944960	0.960799885	0.469249141	0.669081514	0.320146931	0.131374142	0.971029259
Ralgps1	-0.886183362	-0.908949999	-0.896023468	-0.406976228	-0.291774993	-0.396171914	0.083656484	0.43858472	0.358989953	1.020515785	0.95852027	0.924215915
Zeb2	-1.137836555	-1.613792386	-1.262109828	-0.383782315	-0.740186297	-0.323372447	0.137794299	0.691424659	0.403869123	1.115384129	1.4689953	1.645794917
Gain5	-0.854573728	-1.291949292	-1.011747862	-0.55958647	-0.115057424	-0.197671156	0.613306596	0.396884473	0.815708646	0.703837747	0.488443596	1.209311105
D430041D05Rik	-0.815247394	-0.960775668	-0.66456322	-0.35869575	-0.238662813	-0.266989495	0.623437095	0.473637497	0.737708094	0.573336601	0.816384402	-0.1539608
Pak7	-0.881178287	-0.624991433	-0.704765847	-0.359434011	-0.050019813	-0.323533138	0.462088983	0.137801251	0.537241164	0.90622373	0.792043474	0.745614427
Dznk1	-0.848481846	-0.768054305	-0.860158075	-0.631525898	-0.218943373	0.068146787	0.218718572	0.466019837	0.494988368	0.325378627	0.934954749	0.878959313
Lrrc7	-0.745806958	-1.593131056	-1.593131056	-0.580452649	-0.823183002	-1.593131056	-0.189570333	1.713193988	1.192232914	2.066861712	1.839469817	0.30682402
Paln2	-1.113643888	-0.567936277	-1.597979781	-0.290134097	-0.813003427	-0.79733056	0.432164559	0.686169932	0.84380616	0.979407312	0.879447273	1.359540096
Star13	-0.917246761	-1.548881515	-0.252483795	-0.733229852	-0.455876654	-1.270151598	-0.262403508	0.789234642	0.248664296	0.98304542	1.064860593	1.355471744
AI854703	-0.912667173	-1.326656756	-0.886447121	-0.081717643	-0.451196054	-0.354432511	1.123694761	0.877452751	1.041802971	0.188446983	0.337796112	0.444388161
Shank1	-0.769984603	-0.573233338	-1.556922887	-0.04468434	0.075967117	-0.915078797	-0.322018304	0.667965629	0.27625874	1.03617024	1.413432766	1.112950695
Mctp2	-1.006649539	-0.686709076	-0.597425099	-1.052300851	-1.223500984	-0.26258099	0.96575208	0.934691495	0.621468808	0.679677078	0.867964799	0.610286876
Rgma	-1.281447158	-1.312765165	-1.179739961	-0.145569326	-0.402478954	-0.352481964	1.060195889	0.648230427	0.937901496	0.769906645	0.762076121	0.49642655
Olfr11	-1.314998442	-1.217035925	-1.118312919	-0.363405065	-1.124211141	-0.392309191	0.613986959	0.753224937	0.667212688	0.679601612	0.632982711	0.890504368
Nlgn3	-1.61264346	-0.57101285	-0.798552004	-1.380098956	-1.049375673	-1.499939544	0.270430687	0.91695791	0.983237058	1.519429682	1.830718498	1.878684987
Insc2	-0.610134277	-0.14559133	-0.678904543	-0.295471719	-0.599598128	-0.424550601	0.12535672	0.232857749	0.134267564	0.876840211	0.803512024	0.973744042
Ssh3	-0.745408928	-0.538837142	-0.890162338	-0.64697405	-0.697760258	-0.766738295	-0.921580358	1.270252802	0.175540588	0.981850209	1.650741451	1.118918837
Dusp15	-0.971361812	-1.082150404	-1.499888233	-0.556088282	-0.770754684	-0.900758261	1.151035489	0.759486899	1.165785357	0.896837193	0.986038619	0.954898899
Grih2	-1.02596614	-0.372353346	-0.777283826	-0.399813241	-0.473644194	-0.589233904	0.07371966	0.674690417	-0.231939352	0.772172587	1.387122013	1.029129325
Srgap3	-1.951672502	-1.890863475	-1.525107072	-0.726942567	-0.418053877	-0.632786036	0.657513371	0.90441399	1.10893106	1.464914928	1.603434079	1.406229655
Cadm4	-0.708323441	-0.947632914	-0.931098601	0.045431486	-0.115511149	-0.378770075	0.639301362	0.263627559	0.719278286	0.678354318	0.885871953	0.699611926
Axi	-1.021007004	-1.189148996	-1.278662134	-0.124265922	-0.056849873	-0.574193441	0.162814463	0.226274796	0.403858973	1.165685825	1.19954829	1.083944949
Fgd1	-1.494171907	-0.69213506	-0.816559839	0.127642259	-0.266221899	-1.030439266	0.078974588	1.453358361	0.941926884	0.418996165	2.020066138	1.078990641
Slc27a1	-0.875588805	-0.26124429	-0.563891248	-0.346888454	-0.40975805	-0.632571066	-0.197322328	0.791694797	0.236039319	0.691318695	0.884072762	0.682356424
Homcr2	-0.816042603	-0.988078108	-1.032701742	-0.547380061	-0.42924							

Zfp950	-0.759014069	-0.252346247	-0.578066743	-0.579598146	-0.139211332	-0.771904518	-0.381806512	1.318865496	0.200423087	0.628499626	0.625321351	0.688838007	
Picxd2	-0.845016664	-0.86592339	-0.917212322	-0.411716095	0.166442313	-0.430498264	0.357479651	0.286441156	0.584393891	0.560415724	0.721002799	0.579259994	
Oiad2	-1.03918569	-0.86517526	-0.095056466	-0.313706111	-0.301782436	-0.301878646	0.749474627	0.473060438	0.717508059	0.180340479	0.858102446	0.305291293	
Nmn3os	-1.370174299	-0.496238123	-1.435100595	-0.151322486	-0.261529574	-0.513197117	0.131213615	1.990749883	0.397577809	0.770414306	1.221518268	-0.283917089	
Rgs3	-0.817379547	-0.452103985	-0.51056044	-0.453090413	-0.483586246	-0.679878277	0.319415679	0.544671104	0.519326233	0.558031416	0.419236233	0.8079346651	
Maq2	-1.300825345	-0.761059284	-1.0379324	-0.472487446	-0.467126219	-0.591531232	0.115972547	0.932711377	0.857855311	1.319776817	1.198826334	0.418255579	
Sta3g	-1.09247639	-0.81559472	-0.387372556	-0.588946056	-0.290128368	-0.923077442	-0.962520156	1.259255666	0.245103829	0.796717355	0.56287075	0.718212479	
Srxp	-0.43982277	-0.717593594	-1.03039789	-0.241583234	-0.271144446	-0.859568624	0.402839864	0.266167662	0.133110411	1.009441487	1.069618027	0.879104982	
Gai3st1	-1.547606742	-1.129918225	-0.779591529	-0.979746316	-0.760219126	-1.358182883	0.136070745	0.824129789	0.573375265	1.555756234	1.616192152	1.827376037	
Rcan2	-0.600254905	-0.911174107	-0.734483161	-0.011834706	-0.229832785	-0.767986881	0.779674578	0.841564938	0.711397029	0.60460501	0.10158177	0.548052527	
Asah2	-0.942177806	-0.763592193	-0.63025306	-0.103366415	-0.167975071	-0.406506634	0.150425584	0.332906959	-0.010093865	0.956202033	1.012998901	0.571439577	
Fam205a2	-0.61368288	-0.885121111	-0.104599992	-0.375268473	0.104677132	-0.479551908	0.04853972	0.243812455	0.552958792	0.796717355	0.56287075	0.098724907	
Zfp108	-0.430673657	-0.829310693	-0.608573065	-0.596842689	-0.329196857	-0.511856536	0.04645737	0.929004176	0.157890022	0.569013921	0.652504794	0.993396841	
Hs3st3b1	-1.105895225	-1.653709502	-1.936911827	-0.872164395	-1.04957335	-1.476621309	0.896145616	0.666980146	1.18646792	1.716692994	1.748626352	1.879962589	
Cpxm2	-1.702479579	-1.009364478	-1.72390016	-0.63519969	-0.298738142	-1.653569009	-0.507793923	0.706835807	0.364762055	2.009038329	2.226458037	2.223950833	
Srcin1	-0.855123992	-1.395338648	-1.86662747	-0.25144274	-0.652901203	-0.638216106	0.157932279	1.037457115	0.488515995	1.412894271	1.3388635	1.223986818	
Fxyd1	-0.88704049	-1.398212465	-1.756129577	-0.411257702	-0.494245233	-0.744372462	0.766755835	0.782099068	0.472185519	1.026450507	1.221200676	1.422709983	
Txnip	-0.48029803	-1.138639453	-1.143484418	-0.585570839	-0.441186027	0.035253351	0.750915636	0.213077902	0.573518491	0.734969347	1.020262657	0.702326657	
Copz2	-0.455341168	-1.02651378	-0.932629694	-0.240848022	-0.52604958	-0.240829474	0.051925432	0.371202138	0.853490062	0.857905781	0.866631259	0.846631259	
Ikke	-0.969545418	-0.80962159	-0.438797854	-0.162753523	-0.57501004	-0.149520603	-0.046428699	1.421882266	-0.094403158	1.01451514	1.103629611	1.04158023	
Brip1	-0.431132031	-0.891823299	-1.114339723	-1.196856266	-0.488738525	-0.498989834	0.618400224	0.369002305	0.722041647	1.302432627	1.388127731	0.225374467	
Trnp5	-1.581323654	-0.881598164	-1.724586473	-0.65440813	-0.97354172	-1.457823314	0.078855179	1.21918481	0.597348996	1.202683214	1.224272088	0.28620923	
Cxcl14	-1.030528366	-0.780231743	-0.667727349	-1.069278966	-1.347298176	-1.764293178	0.032562105	1.50589113	0.848041487	2.048629369	2.071633655	1.48798205	
Vstm2b	-1.879064843	-1.401195926	-0.567366699	-0.146882927	-0.603800352	-0.88208957	0.186062258	1.572742438	1.251965225	1.523745633	1.021130436	-0.572454675	
Cacna1h	-0.869693185	-0.915376306	-1.176402993	-0.560145604	-0.68959451	-1.078945322	-0.264605237	0.725673343	0.540811389	1.119316426	1.119316426	1.582303467	
Nkain4	-0.687663468	-1.731678401	-1.328614989	-0.725185526	-0.505683362	-0.58534458	0.749899889	0.705389663	0.968062914	1.173958819	1.024580001	0.915556693	
Fam181b	-1.498401215	-1.60293634	-1.492619608	-0.907068317	-1.640105422	-1.333098362	1.521409877	1.247996053	1.502923237	1.162380548	1.304044425	1.735475213	
Chst11	-1.295961857	-1.141521911	-1.365110567	-0.259926547	-0.68126012	-0.721797567	-0.100221453	0.300220293	0.581188514	1.184373734	1.602629394	0.90738086	
Sic22a17	-1.166674271	-0.263025473	-0.802714053	-0.064592859	-0.259181638	-0.98366878	-0.382945664	1.321901852	0.398065619	0.719516902	0.853502217	1.64971615	
Zfp35np1	-1.342807588	-1.692949191	-1.423805361	-0.171200587	-0.18429019	-0.399429764	0.607114643	0.388667595	0.676315464	1.124573614	1.107175963	1.310680622	
Arhge26	-1.066369382	-1.444733969	-1.640605242	-0.519678093	-0.828720259	-0.712491472	0.5136194	1.150135905	1.142981146	1.020200891	0.89671464	1.074272196	
Rgs22	-0.987571415	-0.406818211	-1.046492328	-0.10229023	-0.231501261	-0.4756139	0.664514836	0.832585787	0.552348264	0.502964005	0.784934307	-0.087112442	
Rbm46	-1.425583393	-0.562832111	-0.187968882	-0.180514963	-0.468784717	-0.592484113	-0.43997479	0.730200459	1.062787833	1.059262699	1.059262699	-0.770977788	
Smoc2	-1.377480978	-2.709339194	-1.80990351	-0.773911466	-0.610182102	-1.98606554	-0.306959740	0.826618987	1.023510644	2.836498379	2.679153842	2.20969797	
Lpin3	-0.892062665	-0.86558113	-0.86357276	-0.167557725	-1.114120488	-0.473013859	0.433330004	0.038028654	0.038028654	0.83083722	0.442801497	0.98599798	0.679005431
Ap3m2	-1.486469105	-1.217943571	-0.842372999	-0.371564351	-0.539298446	-0.689911957	0.508466757	0.618000206	0.733900117	0.862195643	1.292519498	1.23476353	
F30015N05Rik	-0.722097663	-1.512556464	-0.915287017	-0.731395933	-0.917531212	-1.1096518	0.49722901	0.690816552	0.690816552	0.856233074	1.47312635	0.596232667	0.849180438
Fam134b	-0.979334634	-0.367490698	-0.770448035	-0.561436899	-0.403144289	-0.865449046	0.322887401	0.67030331	0.472150769	1.029181753	0.663055743	0.789760426	
1700020L24Rik	-1.319159209	-1.322040997	-1.043709893	-0.033192467	-0.729605635	-1.10992946	0.51405651	0.753824518	1.082357578	1.325515952	1.608157065	1.23732122	
Chmp4c	-0.981987573	-0.859575914	-1.147684239	-0.648752981	-0.911029658	-1.468981917	0.004005279	0.740055031	0.513794402	0.960086476	1.658833481	2.139037163	
Clec21	-0.608325185	-0.849526556	-0.885419171	-0.184182722	-0.497040522	-0.590283073	0.362079754	0.512591328	0.177860725	0.901443395	1.066576614	0.627276908	
Pgpep1	-0.486742838	-1.042960207	-0.802273015	-0.262600143	-0.172671013	-0.330037825	0.954053608	0.378327908	0.833131756	0.90434598	0.22342307	0.62738994	
Vsp13b	-0.81465023	-0.509986128	-0.510631373	-0.513886822	-0.166275705	-0.721876966	-0.021703634	0.555152063	0.426880972	0.932653531	0.631325292	1.003018981	
Trpm5	-0.982882624	-1.193003733	-0.64524693	-0.621408837	-0.687590057	-0.67875605	0.071931337	0.985626765	0.108243136	0.590456443	0.862534193	0.06672004	
Ecab1	-1.07298817	-1.40333461	-1.261278465	-0.68865568	-0.23956791	-0.261924055	0.085151905	0.49068571	0.648145407	1.157962572	1.134868508	1.41096432	
Clec14a	-0.867696814	-1.38142674	-1.498594222	-1.123514466	-1.014029457	-0.633052926	0.200741106	0.239009227	0.598296367	1.025472365	0.502475727	1.217966767	
Wwp2	-0.877475902	-0.721350086	-0.80637326	-0.862531153	-0.824130709	-0.899664704	-0.302656166	0.629229923	0.301791184	1.188772733	1.514015741	1.860368256	
Neat1	-0.736676699	-0.177102616	-0.16756649	-0.689491912	-1.317402021	-0.613170658	-0.540528194	1.194497445	-0.165403573	0.506204683	0.885701371	0.67343494	
Z900011O08Rik	-1.52212987	-1.428960461	-1.225415775	-0.22444075	-0.488828401	-0.744599244	0.358068509	0.347324126	0.574648417	1.439547035	1.512026506	1.025423233	
Cpeb4	-0.883972397	-0.596575599	-0.603307434	-0.229218482	-0.38838273	-0.844813921	-0.254276808	0.525725155	0.319714131	0.795975751	1.06276611	1.706691793	
Rgs8	-1.529667769	-0.470264635	-1.681614908	-0.901443344	-1.039023121	-1.428265002	1.59416052	1.831168181	1.649986264	0.98614602	0.819053302	1.694746763	
Rab32	-1.602536573	-2.117986209	-2.574579554	-0.81341389	-0.408018752	-1.26630402	0.770388497	0.941903447	1.404815382	1.780472088	1.710864011	2.148765083	
Ccdc80	-1.065906953	-1.3805157	-1.358734423	-0.423787372	-0.392711764	-0.93334674	0.091317601	0.442984802	0.486858138	1.416877324	1.493462357	1.81023672	
Nacc2	-1.082717624	-1.333297	-0.984282266	-0.176695908	-0.379744578	0.4150784	0.83129623	0.557390513	0.574334844	0.87323627	0.957252862	0.98399507	
Ndmf	0.611092428	-1.210351346	-1.57603677	-1.076783753	-1.659613792	-1.318438969	0.024668607	0.732558882	0.490567277	1.809331009	1.656319176	1.516687252	
Fam114a1	-1.686873176	-1.45688262	-1.79593524	-0.17032837	-0.151404962	-0.328609102	0.399734003	0.778455997	0.54005139	1.17768021	1.330333645	1.358990512	
Ankrd13d	-0.763186767	-0.30256744	-0.952498668	-0.151004692	-0.471123369	-0.57559829	-0.048762583	0.807048304	0.118752563	0.809480938	0.900311072	0.629949236	
Chtrc1	-0.953665096	-2.358924155	-2.032720994	-1.269879729	-1.044029599	-1.105968063	0.62889503	0.741888818	1.209029851	1.807962858	2.53944986	1.734030093	
Fndc1	-0.88963252	-1.457902413	-1.480043385	-1.225684668	-1.069775955	-1.38493016	0.207393009	1.182917569	0.873004019	1.872223958	1.614088325	-0.241993790	
Trpm4	-1.056943659	-0.762236068	-1.18006894	-0.264412748	-0.215365244	-0.776445676	0.2421113084	0.706829624	0.501379735	0.798559042	1.092252432	0.916772526	
PlekhA	-1.474859479	-1.31391473	-1.71967141	-1.184254971	-1.401138447	-1.461200							

Hook1	-0.970576899	-0.294232323	-0.30639714	-0.460429708	-0.247838952	-0.710271669	-0.194340825	0.58731752	0.467457905	0.881150437	0.640365205	0.607797358
B230119M05Rik	-0.808927699	-0.732190156	-1.274876256	-0.592854431	0.164570544	-0.595273958	0.967446594	0.351584889	1.043887564	0.21610844	0.731316826	0.529207355
Cp1c	-1.178031611	-0.584737657	-0.988272628	-0.040038108	-0.050361058	-0.862056563	0.259489994	0.794932173	0.403876492	0.794551285	0.122439096	0.846726408
Klhdc8b	-0.936023177	-0.864050839	-0.107222609	-0.120094529	-0.103021631	-0.869089534	0.012268594	0.521795097	0.085246578	1.046799154	1.278016994	1.022391541
Map7a2	-1.157811658	-0.911556129	-0.562212799	-0.145934924	-0.080630736	-0.510039366	0.312642278	0.98458234	0.575817902	0.54779311	0.575274257	0.49090941
Crib3l4	-1.209903229	-0.86898558	-0.962934112	-0.501463274	-0.336017919	-0.081924831	0.184711327	0.350776182	0.539719821	1.07881756	0.8313671	0.97549514
Cul9	-0.842789406	-0.996387779	-1.215965895	-0.320738102	-0.633180817	-0.650358756	-0.024043976	0.687315422	0.623355873	1.018883332	1.076482913	0.974783192
Clip4	-0.911418282	-0.353437583	-0.798200231	-0.319603782	-0.628246221	-1.219009079	0.013515871	1.414382888	0.566132576	1.057298534	1.032512512	1.144072776
Chsy3	-0.608171858	-0.572113287	-1.251973788	-0.60752249	-0.703726002	-0.305868279	0.194975918	0.02027665	0.481608861	0.946117519	1.361056567	1.045340189
Ospl5	-0.617893501	-0.679843633	-0.594703747	-0.263675429	-0.216197738	-0.736783527	0.132429272	0.456349127	0.346345241	0.762851492	0.724416678	0.686791255
Parp9	-0.924321448	-0.493383064	-0.504951788	-0.636033995	-0.003470764	-0.427396013	0.042041364	0.433152217	-0.000543962	0.790349009	1.041501806	0.764056638
Apobec3	-1.44841094	-1.113868021	-0.7017114	-0.40018511	-0.298975891	-0.424954018	0.393930945	0.693085717	0.40256753	0.863310325	1.170567813	0.933104488
Rab27b	-1.329643203	-1.07253367	-1.824169284	-0.45456977	-1.010720589	-0.2997821	0.349882647	0.334577876	0.52888812	1.265723028	1.641403004	1.870933941
Rhoj	-2.127921048	-2.203955684	-1.687634195	-1.169602266	-0.974877078	-1.553065753	0.917699706	1.332867304	1.575045011	1.810627829	1.986779752	2.098187646
Sorcs2	-1.164269999	-1.601551472	-1.641902879	-0.223087507	-0.275772991	-0.46883015	0.574593494	0.603500451	0.766676274	1.159058776	1.122875538	1.168710465
Chrd1	-1.582809613	-1.618919277	-1.797594767	-0.937878374	-1.087091025	-1.134357692	0.462989521	0.939275779	0.760022115	1.602211569	2.140130278	2.254041486
Enpp5	-1.340274456	-1.678673383	-1.294258292	-0.675127756	-0.378142707	-0.815064345	0.310636301	0.958591512	0.761875904	1.272494006	1.465736615	1.4121889
Mcam	-1.980398613	-1.59146191	-1.883984015	-1.338001893	-1.434392636	-1.219366885	1.542110151	1.831503958	1.428713673	1.692820895	1.69696422	
Glrx	-1.145890703	-1.420959744	-1.07642738	-0.233250814	-0.44111388	-0.221981108	0.467601755	0.158620566	0.412260608	0.975425776	1.177205606	1.138534417
Pcdhb7	-0.903001171	-1.327635814	-1.120691519	-0.26792947	-0.476561921	-0.265412909	0.628705383	-0.05710556	0.007881486	1.01755279	1.413932434	1.295623333
Pcdhb16	-0.767880275	-0.88070662	-0.802711032	-0.087731781	-0.482744659	-0.153199556	0.15593903	0.123092128	0.285172388	0.686842183	0.94282771	0.99568714
Pcdhb17	-1.118926137	-1.13524216	-1.251839001	-0.01895136	-0.077525152	-0.417285956	-0.133204224	0.22911442	0.595949439	0.881888113	1.249291749	1.158668812
Pcdhb19	-0.420780682	-0.984722416	-1.156507339	-0.199435271	-0.649704143	-0.327697961	0.108686746	0.021089304	0.402651615	0.851976607	1.007800468	1.347353614
Tmem62	-0.607167231	-0.554512365	-0.976379072	-0.180561704	-0.079270033	-0.796690461	0.8022272	1.111150126	0.552099292	0.398563952	0.273054751	0.257491855
Mfsd6	-0.94142832	-1.183660542	-1.228523239	-0.284321141	-0.070304533	-1.330940689	0.690926251	0.847698952	1.220216915	1.127968818	1.702297949	0.382144958
My9	-1.092676017	-1.77329397	-1.181018855	-0.181147298	-0.078203337	-1.066241319	0.106892271	0.430096145	0.785859044	1.394004083	1.342301599	1.314333384
Ildr2	-0.639665126	-0.594417394	-0.699276696	-0.097127462	-0.473271169	-0.138917095	1.07577765	1.041278464	0.67622271	-0.077867816	0.048790435	
Sloc3a1	-0.86881572	-1.180300805	-1.206990641	0.023252913	-0.06191261	-0.287706579	1.191700542	1.074195236	0.892860135	0.199471696	0.260798402	-0.036553451
Itkak2	-1.02779901	-0.367617296	-0.567447763	0.108193737	0.123282247	0.057892822	0.592420142	1.603093696	0.49099872	-0.529595504	-0.291405136	-0.191058364
Aqp4	-0.846818317	-1.056739425	-1.573844999	-0.566013808	-1.123194913	-0.632964755	1.738214783	1.92576587	1.796331489	0.50499274	-0.275692624	0.099776325
Cyp46a1	-1.041674108	-0.596259108	-0.959176644	-0.324360626	-0.549137911	-0.253973755	0.694931578	2.280934351	0.701806935	-0.067110105	0.294791691	-0.180768625
Nos1	-0.824098294	-0.728586472	-1.1573452058	0.2981546	0.273061029	-0.245267614	1.734203078	1.318532398	1.648292398	-0.655279927	-0.331634612	-0.952208139
Pde8a	-1.456428048	-1.59094477	-1.769848663	0.105596461	0.065728575	0.031056963	1.697480867	1.935559484	0.059257228	-0.068050584	-0.068078673	0.065336654
Sfrp1	0.199222755	-1.508133338	-1.8549109	0.202782319	0.133134161	0.067212067	1.02541417	0.9823428	1.138025426	0.00584765	-1.128379142	-0.315420593
Sox8	-0.776879984	-0.362144895	-0.938151567	-0.058884107	-0.090798012	-0.013540302	0.871064685	0.923064057	1.120998343	0.008713903	0.18781885	-0.501100103
Tcf15	-1.184626718	-0.997870265	-0.772536336	-0.128615018	-0.401855866	-0.770780351	1.381816709	1.604203818	1.475494381	0.262212424	-0.081971533	-0.385471247
Trpm6	-1.336507463	-1.534692309	-1.479770282	-0.547737546	-0.086030909	-0.282363575	1.143360655	1.143360652	1.826145624	1.631889196	0.21573879	-1.152859431
Dagla	-0.28358615	-0.48753294	-0.460111579	-0.153617893	-0.449282579	-0.640906194	0.868685212	0.77341225	0.780298368	-0.095716582	0.148933518	0.000651896
Nrcam	-1.214806808	-0.494594014	-0.981641416	-1.143036373	-1.105687998	-1.001947324	1.655041307	1.741287103	1.903368208	0.364937487	-0.084932378	0.322528508
Zmat4	-1.450026933	-1.924402043	-2.231922259	-0.132491063	-0.46649964	0.28353093	2.741336591	2.085176929	2.143703327	-0.22866666	0.186382376	-0.11392155
Smoc1	-0.026324964	0.004293635	-0.231297096	-0.20710581	-0.407882854	-0.165003294	1.110483446	0.666709293	0.93583846	-0.30930664	-0.816623051	-0.590769293
Aqp11	-0.684609962	-0.387258552	-0.593440199	-0.5107181	-0.204807817	-0.355856872	0.928695799	0.824230661	1.019315219	-0.04831621	-0.19214628	-0.04140609
Cmrd	-0.16544013	-1.33975234	-1.63428399	0.228086701	0.15911199	-0.326744769	1.315323931	2.244423795	1.239108138	0.563530434	0.332030549	-2.26244204
Grn9767	-0.126538902	-0.232790853	-1.191005568	-0.497624838	-0.041202564	-0.134202206	-0.369031798	0.93895386	0.068767178	2.112784405	1.915199851	
Gmr17769	-0.355109611	-0.511063977	-0.55947551	0.051949757	-0.129308237	-0.139696705	-0.160490574	-0.547425651	-0.068758204	0.766252369	0.862169747	0.790950552
Trd7	-0.159148024	-0.280597344	-0.034939388	-0.53838895	-0.323282317	-0.699892781	-0.39452681	0.214585667	0.601240442	0.548424797	0.605017557	1.034573643
Famp15b	-0.811158256	-0.501580336	-0.609391469	-0.045036803	-0.39659006	-0.422003940	-0.744818452	0.191829008	-0.0810169	1.110303722	1.21536567	1.130336313
Smp5d5	-0.285068473	-0.301484752	-0.16833349	-0.606424016	-0.1671859919	-0.920294679	-0.689022927	-0.829859281	-0.376618866	1.196854504	1.754066006	1.565329053
Kcnmb4os2	-0.706651889	-0.636645506	-0.645655791	-0.180110414	-0.214172518	-0.42961251	-0.300095342	-0.195984004	-0.093454743	0.830185979	1.29685316	1.275611421
R210029C07Rik	-0.910842731	-0.429750991	-0.493270784	-0.124755355	-0.164985865	-0.694962559	-0.85966338	0.257094317	0.124037065	0.867626391	1.02113657	0.815144003
Rn45s	-0.320945737	-1.204980578	-0.156994375	0.744512841	-0.404717844	-0.654087075	0.154612065	0.292926144	-0.722508292	0.27539739	3.00063096	0.910523115
Spre43	-0.755663174	-0.43037879	-0.359260951	-0.296886364	-0.17458056	-0.746217841	-0.328662428	0.4118596763	0.124477807	0.911129982	2.806901379	0.756534764
Cyp4v3	-0.873366696	-0.541306129	-0.945709598	-0.12885956	-0.05789887	-0.597481185	0.23313042	0.217285265	0.011204886	0.774536229	0.961222144	0.969733686
Lars2	0.013558082	-0.668856893	0.007910767	0.307191007	-0.359298183	-0.689986867	0.058108271	-0.700584457	-0.591482807	0.520288628	0.422885067	-0.691347595
Mir6236	0.085577329	-1.137048157	0.170083212	0.848866662	-0.340957325	-0.655162424	0.04474581	-0.985636977	-1.003563	1.021337678	3.194041492	-1.2422843
Pls1	-1.501162677	-1.023297599	-0.934328524	-0.573236899	-0.367429738	-0.380276371	-0.055943983	0.3132678	0.084896877	1.294735109	1.500625392	1.60246972
Gst3	-1.402797613	-1.490065	-1.054604474	-0.623220575	0.297214207	-0.566888691	0.467575523	-0.135155035	0.288447913	1.477065881	1.433330219	1.38487752
Nxp3b	-0.402108855	-0.308125216	-0.446323296	0.425922308	0.644285119	0.22520021	-0.716179021	-1.04689331	-0.745099889	0.38101658	1.006161606	1.28457394
Rab15	-0.632246681	-0.495605573	-0.34975242	0.088287542	-0.156811513	-0.087762891	-0.375204387	-0.615673438	-0.062215511	0.692858308	0.963863358	1.030203205
Ram8a4	-1.185321425	-0.84273909	-2.186898792	-0.662466006	-0.554038715	-0.970007716	0.26899368	-0.427454638	0.443982672	2.488729684	2.664930581	1.26402904
Kdelr3	-0.471261799	-0.039213543	-0.341490086	-0.960589001	-0.3905239592	-0.3922353732	-0.471899824	-0.404443178	-0.155328974	1.481711133	1.660585491	

Ncan	-0.53156161	-0.850446729	-0.543286434	-0.510216545	-0.234351904	-0.646526588	0.143533809	0.026836386	0.178008094	0.957589967	1.044404577	0.966016978
Dcn	-1.734571688	-1.924616419	-2.752803584	-0.444754137	-0.613948666	-1.363969674	0.290366844	0.396795718	-0.011671802	2.889504514	3.043980824	2.824148848
Occ	-0.236492051	-1.614483567	-1.497445513	-1.400616602	-0.559496087	-0.757524791	-0.917425694	-0.233813143	-0.240189886	2.556043249	2.659671741	2.217724286
Dlx6	-0.820141284	-0.454462848	-0.642796634	0.232780076	0.063203558	0.023401634	-0.104444998	-0.815547598	-0.171922858	1.108037131	1.475781828	1.589112014
Epxc	-0.775138798	-0.775318798	-0.775318798	-0.775318798	-0.775318798	-0.775318798	-0.775318798	-0.775318798	-0.775318798	-0.775318798	-0.775318798	-0.775318798
Ebf1	-1.363088269	-1.209646212	-1.414912122	-0.910300677	-0.634441343	-1.144374906	-0.771679174	-0.353529016	-0.348209846	2.223135924	2.812231703	3.114813931
Efn1	-0.722343212	-0.439370974	-0.040769333	-0.871264424	-0.673382512	-1.145774975	-0.877806755	-1.10858192	-0.633898636	1.865776531	2.016699586	2.499807428
Ein	-1.017508647	-1.141297241	-1.086979912	-0.158419019	0.012388579	-0.603598916	0.079853437	-0.084568033	0.105014508	1.26317902	1.539290123	1.091874101
Emp1	-0.657221744	-0.414935966	-0.222555193	-0.553157913	-0.482508119	-0.906035891	-0.490894489	-0.41023203	-0.105276093	1.379918243	1.52852576	1.33473498
Emp2	-0.303740465	-0.1923533	-0.351146949	-0.631514093	-0.163549419	-0.464814519	-0.733055768	-0.838413502	-0.768093361	1.096304502	1.589020778	1.761606399
Enam	-0.696139489	-1.036857748	-1.036857748	-0.326655635	-0.080594839	-1.036857748	-1.036857748	-0.656750802	-1.036857748	2.62295948	2.611499717	1.709972077
Eno2	-1.03589365	-0.35365219	-1.165466537	-0.287716284	-0.1068814831	-1.135697641	-0.135697641	0.784903229	-0.246022742	0.930795525	1.815148395	1.419498617
Eomes	-1.047092609	-1.35457456	-1.076243457	-1.532086953	-1.532086953	-1.424582024	-1.532086953	-1.532086953	-1.532086953	2.828333978	3.475204245	3.475204245
Erg	-1.47908074	-1.427924018	-1.576721824	-0.037325086	-0.049438128	-0.029016561	0.087974935	-0.265483585	-0.055408187	1.003575942	1.863838237	1.96520635
Eya2	-1.690936222	-1.706082237	-2.373139222	0.23963272	-0.080368572	-0.31784166	-1.010375343	-1.06333782	-0.570960598	2.627128416	2.584347687	2.726318981
Lgr5	-0.756678789	-0.261764126	-0.38225635	-0.672221846	0.125280323	-0.614829621	-0.105100401	-0.993184396	-1.014692202	1.957395758	1.979942049	1.684012203
Fgf11	-0.20682593	-0.645939636	-1.003856748	-0.571574145	-0.543321336	0.007900367	-0.049028637	-0.545270189	-0.345536365	1.218732555	1.576925049	1.108001678
Fgf18	-0.690469051	-0.412231537	-0.594182922	0.104794931	-0.034649538	-0.370746462	-0.546289922	-0.839937136	-0.272900188	1.415474027	1.047345481	1.179202037
Fgf8	-0.837296527	-0.844306403	0.574931325	-0.504061935	-0.766338611	-0.932662122	-0.712363669	-0.085662044	-0.782866058	1.566536765	2.38736997	0.955592308
Fmod	-0.622006147	-1.52160164	-1.197373678	-1.181357171	-0.415542625	-1.050891542	-1.184438386	-0.589292041	-0.507183328	2.717785726	3.006428835	2.549409997
Dtx4	-1.244102161	-1.683483818	-1.737162184	-0.648245203	-0.743735946	-1.223978568	-0.297472127	-0.245486007	0.298008655	2.286565661	2.632328365	2.654269843
Fzd4	-0.80985968	-0.63142788	0.213426575	-0.912629436	-0.885887708	-0.863900074	-0.164108377	-0.03545168	0.199572307	0.03545168	1.233243527	1.023233327
Fzd5	-0.207138511	0.028801089	-0.59645302	-0.425413788	-1.412688122	0.043906053	-1.50981993	-1.154860632	-1.124525387	1.815213899	2.234925513	2.307032835
Fzd9	-1.015851369	-0.852727022	-0.854193537	-0.881839619	-1.074578663	-1.249148205	-1.002738027	-0.021171931	0.112585139	0.202691578	2.449539831	2.368311026
Galt3	-0.203968254	-0.724317046	-1.152337765	-0.325927765	-0.695894103	-0.634430325	-0.570471993	-0.117038015	-0.375870037	0.927415244	1.003245083	1.174145429
Gcfr	-0.769403633	-0.596501306	-1.551298959	-0.901534274	0.122516838	-0.717036244	-0.804389154	-0.154483304	-0.286684352	1.381450806	2.252559491	2.07804099
Gdf10	0.518109105	-1.266188323	-1.395353194	-0.386085010	0.309687078	-0.52154518	-0.201891802	-1.120787344	-0.360714062	1.493389848	1.811465947	1.594841163
Gdf5	-0.268821084	-1.94324781	-1.48103884	-0.578526568	-0.681528033	-0.765422052	-0.16951845	-0.482790771	-0.148205602	2.414486669	3.084332476	2.820280393
Gfra1	-1.931039247	-2.226023456	-2.34095628	-0.146212192	-0.068148066	-0.427420923	-0.138750837	0.443407798	-0.10442654	2.434203308	2.559662902	1.948561109
Gm2a	-0.966173614	-0.96693526	-1.037891863	-0.168620489	0.019657001	-0.407134789	-0.051620664	-0.169452412	0.580957148	0.974985394	1.121873143	1.070356046
Gpm2b	-0.924134313	-0.824274171	-1.001670376	0.104403939	-0.272187189	-0.094027361	0.149526936	-0.105100401	-0.993184396	1.019660486	1.112398812	0.958681293
Gria4	-0.259181911	-0.212284437	-0.115399546	-0.340778544	-0.305328703	-0.476652036	-0.419627234	0.139048289	-0.350953174	0.390514309	1.093418071	0.874606018
Nrc1	-0.144648425	-0.203489695	0.009692371	0.075466717	0.171486279	-0.562359569	-0.83528292	-0.434570899	-0.455178222	0.839431417	0.922087734	0.617406615
Mrf1	-1.284650645	-0.67704822	-0.846641113	-0.492925932	-0.219258823	-0.582486203	-0.211526381	0.010000048	0.055238627	1.085277136	1.833259065	1.627490664
Has3	0.092360135	-0.209303772	0.001934611	-0.441708252	0.183746438	-0.402582851	-0.635578558	-0.315682745	-0.797992358	0.57317663	1.059722417	0.858898025
Hep1	-0.233095888	-0.188467057	-0.414442728	-0.318652034	-0.102883603	-0.412696742	0.158791099	-0.893111729	-0.19841319	0.898973002	0.79738352	0.925173402
Foxb1	-1.455013575	-1.299850956	-0.2512477	-0.372810126	-0.866860001	-0.93931373	0.184911879	0.257156166	0.072543132	1.757839347	2.00037019	1.911330876
Hic1	-2.838978533	-2.82977862	-3.03093044	-0.242467758	-0.315676684	-1.364148222	0.01290636	0.552708904	0.798665766	3.156359818	3.251217589	3.082347339
Id4	-1.158121105	-0.280965896	-0.547182126	0.005119836	-0.021179058	-1.008418665	-0.667483429	0.025371712	-0.39249582	1.197720585	1.4518638	1.396310166
Ilf1	-0.311171219	-0.20835614	-0.12156516	-0.394425728	-0.026887533	-0.288347176	-0.756357685	-0.155702426	0.050710302	0.437844926	0.547843283	1.228214556
Ilf1b	-0.862183578	-0.576192525	-1.11168283	0.372695184	0.104895191	-0.128183335	-0.129593807	-0.793870643	-0.249835591	1.69576483	1.35664434	1.222520391
Ilrh1	-1.271166093	-1.271166093	-1.271166093	-0.35243886	-0.417524981	-0.881537345	-0.680138892	-1.271166093	-0.340023232	2.808662057	3.203108913	2.042245857
Irx1	-1.137605193	-1.325291559	0.651666172	-0.210334906	-0.775808190	-0.378911839	-0.888144872	-1.678489109	-1.51640492	1.383557678	3.318489363	2.556526792
Itgb3	-0.42860349	-0.848341007	-0.823134975	-0.209924519	-0.73183974	0.322961174	0.126877981	0.162904354	0.074749673	1.166620724	1.043433452	1.042510981
Kcnab1	-1.000519647	-0.900476476	-0.221912958	0.236089933	0.478355161	-0.220694369	-0.821505673	0.033529285	-0.028928841	0.975183098	1.04519115	0.425688346
Kcnk1	-1.096539107	-1.061034555	-1.05438024	0.354053646	-0.164555791	-0.054338366	-0.475454163	0.594430684	0.4313533	0.594430684	1.393319884	0.802687779
Kcnj2	0.065821479	0.099039585	0.398605677	-0.882950918	-0.1151005243	-0.535950664	-1.528032033	-1.398677935	-1.058090651	1.183224058	1.949578692	2.121333551
Kcnk1	-0.465562002	-0.690341766	-0.55849428	-0.032261434	-0.244221348	-0.156836067	-0.179483069	-0.125491927	0.143908286	0.682048374	0.894620103	0.795642314
Kcna1	-1.058506807	-0.722949289	-0.890041837	-1.058050627	-0.753914043	-0.668877338	-0.467478886	-0.129233962	-0.215778478	1.310104212	2.512670413	1.425077005
Kers	-1.77661109	-1.77661109	-1.77661109	-1.449596254	-1.472019045	-1.568683114	-1.185583899	-0.539982363	-0.683400899	3.475204245	3.475204245	3.475204245
Kif1a	-1.332989398	-0.903487702	-0.81763878	-0.723451597	-0.280275578	-0.804727407	-0.11598368	0.352155035	0.153539214	1.243386609	1.760164299	1.880876471
Kif5a	-1.111203541	-0.579366996	-0.986620585	-0.315945106	-0.698252297	-0.225478246	-0.037598144	0.635641495	-0.320676087	0.895899343	1.103714763	0.82633813
Sspn	-1.077028403	-1.913101066	-1.06034778	-0.403322709	-0.235794962	-0.291035479	0.302206109	-0.066220853	-0.17696556	1.235926222	1.451120258	1.014118608
Lmna	-0.32612273	-0.317647066	-0.426328111	-0.025881511	-0.338986362	-0.280101265	-0.74308154	-0.037306152	-0.297117257	0.848170832	0.93098112	0.674923664
Lrrn1	-0.941600793	-0.989070555	-0.677158408	-0.063928589	-0.263347296	-0.310099621	-0.362088257	-0.131197272	0.017386952	1.009505234	1.412656337	1.300299266
Lrrn3	-1.033620627	-1.213483516	-0.121373476	-1.056755281	-1.280374908	-0.882894999	-1.377531216	-1.022571918	-0.746390406	1.96384883	3.006983685	2.863142226
Lrrn3b	-0.981430761	-0.749165373	-0.947208062	-0.469540683	-0.417524981	-0.816678997	-0.571792371	0.211706871	-0.005544975	1.346248832	1.813642732	1.587286158
Lum	-0.681188609	-1.110136401	-1.229524108	-1.979683016	-0.813324552	-1.798959379	-0.611084668	-0.029861692	0.581227572	2.928786196	2.822569011	1.919574446
Slic2a10	-0.482815379	-1.047217171	-1.117458472	-0.005366887	0.038941072	-0.188716152	-0.123165169	-0.00771831	0.267217831	0.89256529	0.90010121	0.873603134
Cyp4f13	-0.531582779	-1.313255421	0.29993529	-0.639987427	-0.422915459	-0.679472367	-0.195336507	0.388396376	-0.623133172	0.912022322	1.147478405	0.677733659
Ecam	-0.788397289	-0.291454726	-0.658589862	-0.047859625	-1.142517597	-0.631917288						

S100a11	-0.704970895	-0.514358345	-0.422202218	-0.303336169	-0.40412654	0.149309005	0.316668828	-0.311381101	-0.139652103	0.430051191	1.019272492	0.884725856
Atxn1	-1.928292063	-1.662417762	-1.16457946	-0.163350907	0.346655901	-0.855399421	-0.307348556	0.476855978	0.521541857	1.487417229	1.897844923	2.032288612
Stm2d	-1.216868739	-1.004305333	-0.84376534	-0.777324379	-1.174819396	-1.489696929	-0.725388817	-0.380044098	-0.161773351	0.291583025	0.826422584	0.727226424
Scn1a	-0.683924773	-0.325128893	-0.650452326	-0.219112426	-0.177236361	-0.526000221	-0.076238069	0.16618996	-0.274049784	1.161829495	1.33155294	0.918078977
Scn3a	-0.487135376	-0.346228757	0.089275769	-0.233141177	-0.305130244	-0.80007294	-0.305102878	-0.382590431	-0.216259922	0.955596709	1.470142948	0.641275359
Scn9a	-1.119361024	-0.924740074	-1.119361024	-0.653001002	-1.119361024	-0.291427723	-0.203985678	0.206711247	-0.471594146	1.661562147	1.97001439	1.058282587
Sfrp2	-1.189734489	-1.543740074	-1.615430417	-0.081663228	-0.204790308	-1.14783306	0.153929652	0.021878518	0.396449314	1.16530022	1.486650524	1.028781526
Selenbp1	-0.88148595	-1.305469052	-0.950017798	-0.384941178	-0.228727904	0.311468833	-0.117812528	-0.312513877	0.217523631	1.476662778	1.529280746	1.269769665
Selenbp2	-0.638267613	-0.176118077	-0.423806944	-0.228933568	-0.356907852	-0.422390141	0.114227140	-0.508242263	-0.081397928	1.006110539	1.310253189	1.403336183
Sema3c	-0.68337765	-0.706124018	-0.54460343	-0.174608838	-0.413366448	-1.504298325	-0.39305947	0.536789438	0.074819463	1.51391898	1.509211794	1.324698504
Sema3e	-0.639506915	-0.539463744	0.315446926	-0.782439856	-0.254621633	-1.167939302	-0.784839795	-0.695203586	-0.627328972	1.170282616	2.071206365	1.397407614
Sema5b	-0.394228546	-0.034657368	-0.006224175	0.177762932	-0.656621416	-0.190359365	-0.049344213	0.16834502	-0.470327904	1.003857486	0.993782376	0.336460774
Sema6b	-0.247230506	-0.357422933	-0.242324263	-0.643578129	-0.38394557	-0.030774961	0.010609677	-0.154506102	-0.339920337	0.608195635	0.981034725	0.799970965
Sgk1	-1.408508652	-1.245935803	-1.439930459	-0.126196599	-0.308912248	-0.814924501	-0.567877629	0.117025674	-0.099262787	1.970213992	2.23407408	1.690235604
St3gal1	-0.606396664	-0.592585351	-0.530405079	-0.212513177	-0.260319866	-0.489471073	-0.232895073	0.040502923	0.047147759	0.947561124	1.054490546	0.879126931
St8sia1	-0.222593451	-0.840443573	-0.575990587	0.189600847	-0.004761343	-0.556826707	-0.381521833	-0.37306805	-0.207031484	1.076844663	1.197152499	0.69863902
St8sia2	-0.534080732	-0.190462215	-0.29450648	-0.570979908	-0.427980867	-0.769808776	-0.124698646	0.032804062	0.294026312	0.763470773	1.006145303	1.018371937
St8sia4	-0.946356633	-1.385888855	-0.282035553	-0.920509041	-0.601859177	-0.731395963	-0.21201451	0.671793941	0.158278966	1.414097642	1.586235977	1.852360549
Stx2	-0.912418856	-0.485535327	-0.693552098	-0.65705679	-1.200202094	-1.610839332	-0.627507995	-0.071738329	-0.030293857	2.175760634	2.281431023	1.831953941
Sutr1	-1.19269449	-1.35906994	-1.674563793	0.150869217	0.150869217	0.614380216	-0.341737957	-0.348491523	-0.241484936	2.349542378	1.538517381	1.691924899
Sox6	-0.754832094	-1.340038333	-0.958454619	-1.089878809	-0.521168213	-1.219343177	-0.390306178	0.132044765	0.321907566	1.499324029	1.845644432	1.159246048
Sparc	0.530618842	-0.58591181	-1.421291469	-0.68375028	-0.345152625	-0.770514574	-0.719107273	-0.471828551	-0.416787984	1.923455414	2.22487365	1.94646194
Rbms2	0.10831118	-0.193382244	-0.082062228	-0.680489523	-0.507148799	-0.657320102	-0.390945961	-0.187892761	-0.131641738	0.947494131	0.913324879	0.861753157
Kctd12b	-0.012116853	-0.331357198	-0.043784688	-0.358197887	-0.124784607	-0.230535982	-0.897244008	-0.615550622	-0.501196316	0.670736705	1.230182415	1.12382954
Dtx4	-1.301031888	-1.013930196	-0.61438078	-0.140511759	-0.363102672	-0.299965808	-0.192993168	0.112083226	0.201581807	0.670750761	1.338434642	1.027423212
Thsd4	-0.372160423	0.104996141	0.370797943	-1.38600124	0.183271589	-0.276564747	-1.080045075	-0.953680108	-0.684694167	0.178169896	1.166763395	0.899835338
Igfbp1	0.042196177	-0.187213254	-0.58508879	-1.435488516	-0.926549432	-0.380506652	-0.019417068	0.097850426	0.165870187	1.404612388	1.249132127	1.204959613
Pknox2	-0.129189387	-0.117234864	-0.044205691	-1.0813981	-1.37885395	-0.980233029	-0.827382015	-1.0750331	-0.962950141	1.743821101	2.299262482	2.598313472
Stac	-0.784347343	-0.542806181	-0.275926744	-0.451112752	-0.602427559	-1.061413717	-0.454193966	-0.12807024	-0.62157481	0.831872328	2.366436197	0.723664728
Stc1	-0.487467063	-0.80488708	-0.723976727	-0.388037473	-0.050693267	-0.463930667	-0.240917908	0.024898219	-0.062484417	1.311071317	1.198909169	0.86128462
Prrg3	-0.523626679	-0.756215425	-0.620315889	-0.203947905	-0.083494066	-0.281149078	0.0215474	-0.260258386	0.145008072	0.92961531	0.872389862	0.33021544
Unic13c	-0.910366908	-1.251084357	-1.082620106	-0.423856421	0.215161868	-0.302573791	-0.543649166	-0.0144555	-0.319941495	1.204348157	1.742948691	1.694871029
Hmgcl1	-0.148952655	0.212680647	0.003969293	-0.653862214	-0.427989299	-0.858987939	-0.603002005	-0.266475475	-0.133098789	0.905489239	0.821457151	1.148789957
Sypc1	-1.169475414	0.484422086	0.193964473	-0.47046449	-0.457108032	-0.218676195	-0.645382241	-0.017525301	-0.105066247	1.009789652	1.150254772	0.254858318
Synj2	-0.422804161	-0.564944824	0.073046721	-0.731196565	-0.693413617	-0.858375209	-0.456289001	0.52912935	0.121221274	1.178440662	0.828337239	0.968830781
Unic5d	-0.106276177	-0.492192771	-0.685920545	0.180589008	-0.342177909	-0.490426939	-0.829137363	-0.515927816	-0.911769412	1.278872934	2.015768186	0.898535994
Adgrb3	-0.35892416	-0.28686931	-0.672244775	0.254616637	0.197344736	-0.607100023	-0.467088933	-0.173320507	-0.166194577	1.525022947	1.525067282	0.295274547
Gsap	-1.239835624	-1.25269384	-1.219862991	-1.052164802	-0.66598416	-1.109506164	-0.44655305	0.581521759	0.175368884	2.115814774	2.32442584	1.782555664
Fam46a	-0.083702153	-1.018577233	-0.442833378	-0.481521625	-0.373026737	-0.793426532	-1.492674608	-0.007100474	0.02370661	1.479064164	1.88481854	1.20443886
Fbx121	-0.101044809	-0.37006824	-0.424853006	-0.287046728	-0.79046395	-0.467413222	-0.083533749	-0.001394165	0.285234724	0.652316685	0.953866114	0.976332948
Tacr1	-0.691835909	-0.691835909	-0.691835909	-0.691835909	-0.691835909	-0.691835909	-0.691835909	-0.691835909	-0.691835909	-0.691835909	-0.691835909	-0.691835909
Armc2	-0.541985988	0.135184354	0.354300644	-0.558050276	-0.799358609	-1.101389399	-0.393895999	0.167189121	-0.023409078	0.792626321	0.821631156	0.840971567
Zcch5	-2.923650669	-2.58809387	-2.604352991	-0.41100728	-0.298023512	-1.487875106	0.136677543	0.42597914	0.887311351	3.149111222	3.447091865	2.268814257
Tachn	0.879744516	-0.62751462	-0.42862634	-0.783907464	-1.196431021	-0.825255555	-0.285791531	0.120046521	-0.419169655	0.836649021	0.988775479	0.718197666
Lgi3	-1.380675091	-1.289506273	-1.42628676	-0.209023116	-0.049549007	-1.167815607	-0.043962676	0.113820769	0.509127666	1.56002282	1.713989499	0.670058851
Tcea3	-1.190917998	0.035900636	-0.147676202	-0.12368109	-0.490552064	-0.471452674	-0.824201266	-0.390364809	-0.688906657	1.03994815	1.629721344	1.629877759
Tmem51	-0.263544448	0.067650809	-0.192036384	-0.237164636	-0.231862612	-0.596353164	-1.193266334	-0.806549118	-0.092492975	1.293357403	1.036641092	1.125585918
Chad1	-0.829894498	-0.486575313	-0.285148169	-0.107988436	-0.473889392	-0.612381324	-0.414437699	0.118124291	-0.052211365	0.752636767	1.178164036	1.193601103
Cdh12	-0.1071462705	-0.1071462705	-0.902998454	-0.478035565	-0.76687066	-0.071462705	-0.400435504	0.418403856	-0.228735106	1.775183269	1.214582494	1.753293782
Adgrg6	-0.124237643	-0.699364728	-0.11187822	-1.253148165	-1.12130619	-0.197966203	-0.961504654	-0.099827964	-0.886475422	1.745391041	2.661756372	1.448564145
D930020B18Rik	-0.130234998	-0.87595789	-0.453197778	-0.253059678	-0.487328332	-0.964314508	-0.889547716	0.05634943	-0.260733066	1.44922185	1.925338686	1.7669589
	-0.650775835	-0.800956218	-0.466482823	-0.017915518	0.034282352	-0.056202923	-0.895119617	-0.088371539	-0.037054738	0.72564783	0.842412327	0.764701071
Pik3ip1	-0.714939644	-0.689182883	-0.457274109	-0.846504197	-0.596389484	-0.514542259	0.010447805	0.424581026	0.059339599	0.673142238	1.288415016	1.313407851
Nlx2	-0.9484055	-0.835123657	-0.983463415	0.223051125	0.023199282	-0.298658596	-0.111245593	-0.052106186	0.132790984	0.925321286	1.153219736	0.77172844
Stxbp6	0.016837217	-0.143765863	0.17407681	-0.209836685	-0.336165913	-0.425369957	-0.334149458	-0.657267589	-0.391006707	0.599267252	0.797434014	0.909316008
Mgf8d7c	-0.758675635	-0.175300401	-0.42103994	-0.329651471	-0.764088779	-0.856473013	-1.048989745	0.14476968	-0.048043163	0.140445979	1.2467912	1.069264384
Tfhd3	-0.582323625	-0.413866672	-0.320643031	-0.429393852	-0.352525454	-0.473704119	0.072391603	0.041580677	0.043854076	0.823400484	0.879219721	0.694369834
Tgfrb2	-0.408507348	-0.450811237	-0.213388109	-0.354920053	-0.110625108	-0.432124303	-0.586755888	-0.315952843	-0.200555194	1.012063638	1.150330363	0.915454082
Gmtd	-0.387190133	-0.648099574	-0.453059772	-0.52359929	-0.732677451	-0.732984072	0.240644228	-0.047213657	0.165704691	0.89263335	1.034033553	1.064523862
Phacr1	-0.867529792	-0.958074747	-1.004050975	-1.426876996	-1.689153673	-1.184923256	-0.774118285	0.472237978	-0.306366254	2.100236922	2.78514139	1.854227956
Rnf141	-1.214311936	-1.051187689	-1.106981185									

Temn4	-0.160160746	-0.291773167	-0.243000216	-0.583439845	-0.240791673	-0.863639525	-0.079124706	0.008763185	0.124204311	0.646938235	0.757086413	0.924937734
Papp25	-0.51255788	-0.44618773	0.151186037	-1.200874421	-1.701122656	-0.978020285	-1.871457448	-0.622969381	-0.471159319	1.551268681	2.483446298	2.737641633
App156	-1.488721388	-0.448106443	-1.018934791	-0.520649521	-0.458995050	-1.917921052	0.112649941	0.249959441	0.167004994	0.145924227	1.623117514	1.715327297
Tiam2	-0.92489031	-0.73137399	-0.568122064	-0.093095061	-0.083212435	-0.366449657	-1.042895032	-0.204586579	-0.285069136	1.090347271	1.441615574	1.261394889
Rai2	-0.217641151	-0.77684884	-0.98157736	-0.781249163	-0.093161164	-0.746703256	-0.462924031	-0.415803307	-0.531720094	1.080436566	1.757892861	1.805459797
Sufl1	-1.191279959	-2.226164894	-1.947987413	-0.928534248	-0.994066633	-1.779490027	-0.581334545	0.216800432	0.008162521	2.6917783	3.414205139	3.341793172
Tekt2	-0.55062004	-0.568632353	-0.906382138	-0.407916865	-0.790786336	-0.718332215	-0.181612257	0.614907707	0.185491227	1.650519267	1.464678918	1.650519267
Tlr2	-1.173108572	-1.299396049	-0.385172894	-0.141984606	0.427048241	-0.548010302	0.362243236	-0.086268414	-0.082837054	1.188662327	1.239375296	0.499454492
Catip	-0.660707817	-0.67128663	-0.194009503	-0.589304682	-0.386786553	-0.447848333	-0.917004714	0.44193776	-0.136821392	1.131718375	1.274038963	1.156416558
Frem2	-1.131512028	-0.093309656	-0.555486657	-0.224721034	-0.359176018	-0.863693287	-0.71728466	-0.145855345	-0.035258305	1.166053327	1.173908088	1.78622773
Slc44a5	0.070325224	-0.880034352	-0.711570101	-0.707282282	-0.197914761	-0.880034352	-0.880034352	-0.499272406	-0.457753214	1.297485492	2.349883974	2.018661311
Grin3a	-0.352268678	-0.738696468	-1.619552621	-0.946882917	0.08950809	-0.830493234	-0.818614257	0.532672325	-0.08781227	1.854921301	1.818414857	1.518702982
Podn	-1.08777079	-0.910258397	-1.08777079	-0.621409867	-0.131507881	-0.698142041	-1.08777079	-0.158498665	-0.24504319	2.305020913	2.09103486	1.632116637
Azin2	-0.831533589	-1.07491499	-0.76462293	-0.057375715	-0.165779392	-0.551670933	0.207794365	0.149613903	0.069657276	0.816020131	1.140269654	1.063542222
Slc45a1	-0.91676832	-0.007047316	-0.387116952	-0.302220994	-0.323771502	-0.903109098	-0.250285432	0.041885682	0.349136676	0.7720907	1.198064921	0.72914155
Ppp13b	-1.144558321	-0.60293626	-0.858257768	-0.352833608	-0.211753083	-0.480413616	-0.388040891	-0.085932597	-0.185886009	1.015617593	1.833469043	1.464882987
AW551984	-0.519207174	-0.284963082	-1.287663539	-0.522849536	-0.207417003	-0.099582558	0.307473075	-0.180943029	0.185687144	1.60288414	1.610319324	1.29637938
Arhgap20	-0.417792288	-0.661260691	-0.493221814	-1.107155017	-0.707116872	-0.94050395	-0.1700133084	-0.520755122	-0.116819272	2.335584928	1.616790705	2.167406626
Prss35	0.540143003	-0.084026895	-1.545715361	-0.297663227	0.664529339	-1.186282739	-1.739025649	-0.881180934	-0.167334266	2.198870707	2.338127589	1.159558241
Sltt2	-1.397399944	-0.54532221	-0.677048645	-1.250781288	-0.80787663	-1.026810394	-0.397755406	0.372175551	-0.409902761	1.487062024	2.394525757	2.168330688
Pnma3	-1.071090998	-0.633617214	-0.674035631	-0.259452427	-0.398168343	-0.503206957	-0.309602655	-0.62828821	0.313325745	1.046122252	0.810765647	1.25059591
Pzd4	-0.708521614	-0.271971387	-0.885566036	0.180118708	-0.004564343	-0.264232755	-0.30992284	-0.048512881	0.018636724	0.919563046	0.710590762	0.835195916
Klf8	-0.524887116	-0.490007707	-0.478870952	-0.609826025	0.071003352	-0.428684658	-0.47806214	-0.809838914	-0.026821479	1.055186791	1.281745344	1.437074687
Tox	-2.145491814	-2.381134045	-1.777925991	-0.089822703	0.105793020	-0.850884518	-0.256084811	0.601472985	0.680378013	1.934326943	2.189471238	1.99908319
Nav3	0.312972446	-0.911284132	-0.878453283	-0.346053828	-0.534709828	-0.526420322	-0.405745993	0.423012665	0.319694321	1.119388474	1.127808002	0.298911489
Cdc42ep3	0.114858194	0.436983887	0.385118886	-1.39752345	-1.896289547	-1.453369079	-0.807840653	-0.132749405	-0.132251561	1.175115337	1.749172202	1.958784388
Dad1	-0.233775912	-0.381861399	-0.623304897	-0.511085147	-0.811691137	-0.113045183	-0.049349377	0.24183887	0.201308653	1.020390743	1.221209869	
Creb3l1	-0.50787928	-1.715708232	-1.173365863	-0.205092325	-0.126355157	-0.136971071	-1.79902506	-0.170908982	0.353843902	1.517952426	1.648440087	0.616947101
Sema4g	-0.749675851	-0.427493711	-0.508438053	-0.145320681	-0.027125505	-0.610002354	-0.21029479	0.323446188	0.122799224	0.669753017	0.69790230	0.769800213
Rappg11	-0.81119978	-0.612896101	-0.582146371	0.004984911	-0.267527952	-0.835711578	0.090275782	-0.396296311	0.141323472	0.952526798	1.189536274	1.127130852
Meioc	-1.165051368	-1.375127476	-1.048960316	-1.02757046	-0.071286076	-1.151392146	-0.443913476	0.601695807	0.067550845	1.87323716	1.99142579	1.74535004
Tmem229b	-0.774929898	-1.018461391	-1.01346785	-0.675391323	-0.19797172	-0.72597047	0.14849581	-0.698391309	0.455024508	1.449572964	1.825914021	1.224559965
Rbfox1	0.244509294	-0.28048916	0.194424395	-1.593789253	-1.631264134	-0.836560058	-0.21955846	0.237935578	-0.530209159	1.090971864	1.581248734	1.73467744
Ltbp1	-0.303566705	0.071170171	0.249203281	-0.660617412	-0.699998217	-1.069402623	-0.663362043	-0.476631637	-0.313490057	1.008052224	1.34985653	1.478768328
Sh3rf2	-0.343137748	-0.2723464	-0.095655454	-0.886388369	-1.024705968	-1.217887358	-0.21387208	0.085464397	-0.108604986	1.153076005	1.533796746	1.489204055
Slk32a	-0.472874346	-1.031722035	-1.040770177	-0.615807287	-0.596462383	-1.001306451	-0.618207227	-0.528571018	-0.460696404	2.012467663	2.088132887	2.273996778
Istr	-1.131795151	-1.34159806	-1.132349672	-0.704385398	-0.95236383	-1.032562461	-0.057412307	-0.259921914	-0.361999387	1.663550291	2.06900419	2.119926043
Ssc5d	-0.259182631	-0.308071333	-0.562068317	-0.526748205	-0.364658949	-0.715521285	-0.939082628	0.359215448	-0.252471779	1.188685037	1.171872783	1.20980589
Adamt13	-2.064377424	-0.45019801	-1.468882277	-1.286774138	-0.162216551	-1.721438847	-0.893170737	0.100282941	0.349968165	2.736541207	2.447040322	2.44708256
Fat3	-0.724480885	-1.275795685	-0.951759093	-0.914411189	0.06118634	-1.0308467	-0.205440614	0.306515765	0.172184013	1.33593643	1.559210634	1.638860364
Tmem169	-0.893650501	-0.98529238	-0.854281265	-0.255095058	-0.170712588	-0.416914546	-0.1670158	-0.198332527	0.311463159	1.083329144	1.208514768	1.031689223
Pla2g7	-1.368583906	-0.767206339	-0.590518693	-0.5668608	-0.777021022	-0.624022413	-0.377612234	0.367144121	0.304447826	1.263044689	1.635606051	1.524484731
Lrrc4b	-0.120340813	-0.407643357	-0.367524143	-0.296925972	-0.518628154	-0.313062409	-0.175331956	-0.362191599	-0.282432303	1.026478855	0.661279843	1.156308545
Pdk4	-0.434727432	-0.805695404	-0.500268709	0.179131838	-0.300385351	0.614037502	-0.625984081	-0.743157316	-0.645532577	0.940640577	1.08975551	1.277085281
Npas3	-1.250725899	-0.759612148	-0.807511109	-0.708547923	-0.42320076	-0.688749974	-0.480065165	0.201626512	0.378791301	1.075242586	1.770733885	1.692067641
Slc14a2	-1.476254452	-0.672678302	-0.542456884	-0.585938965	-0.253520326	-1.261501493	-0.480075185	-0.009953912	0.572154985	1.058997679	1.56606282	1.992974756
Emlin3	-0.08185364	0.018628126	-0.13583023	-0.143025993	-0.27769862	-0.272340472	-0.640948096	-0.490696997	-0.376006188	0.783129852	0.752114063	0.86427316
Ndr2	-0.611224628	-0.60021837	-0.308732168	-0.526129967	-0.499075123	-0.410384308	-0.266811808	-0.960212263	-0.632907314	1.22487331	1.752487114	1.838138701
Hist2h2be	-0.626893556	-0.604733192	-0.858648209	0.10092464	-0.271709744	-0.144298598	-0.297363304	0.193121427	0.521519242	0.9421578	1.100181789	
Plmp	-0.375934829	-1.311244122	-1.254395776	-0.092357506	-0.486832309	-0.351330073	0.202356653	-0.46951495	-0.316154555	1.076260274	1.394469163	2.251075736
Adgrl3	-0.820761085	-0.646905242	-0.37179349	-0.136169793	-0.026567593	-1.459848621	-0.166958564	-0.233587618	-0.032641053	0.892920001	0.955991294	1.059028445
Irga11	0.038982381	0.545633506	0.068127449	-0.616425796	-0.978697928	-1.115599672	-0.835763818	0.002903926	-0.298537446	1.276216286	1.245871141	1.159989869
E130114P18Rik	-0.449530496	-0.300830326	-0.580123475	0.593085042	-0.164752916	0.419230936	-1.240295128	-0.101502775	-1.225156342	0.711605458	1.333340402	1.589825789
Olfml2b	-0.746544099	-0.606356722	-0.931522872	0.043105082	-0.167258102	-0.047201333	-0.082789157	-0.104659995	-0.039201619	1.124716729	1.07402286	0.483496782
NA	-1.06480929	-1.549803634	-1.230505957	-1.222790799	-0.08355759	-0.721870333	0.270515999	0.342760287	0.1072036	1.942166789	1.502187481	1.708503448
Rfn152	-0.468430377	-1.350197019	-1.39509716	-0.63221845	-1.031319451	-0.893004127	-0.333992417	0.610352561	0.024244639	1.531243316	1.213274397	1.028637643
Fry	-0.574824999	-1.02196405	-0.231629973	-0.802304262	-0.030932007	-0.795053244	-0.205634286	0.266410605	-0.088052981	1.28621833	1.093351987	1.84816573
Cadps2	-0.331014852	-0.38331281	-0.154920889	-0.711517509	-0.455418208	-1.367698821	-1.049313691	0.280983881	-0.066761441	1.358022116	1.282353141	1.598593536
P4ha3	-1.711233529	-1.531035267	-1.526041726	-0.162041201	-0.172872511	-0.875324602	-1.393273869	-0.173053488	-0.096114865	1.067721465	1.948361318	2.5474562
Islr2	-1.837414909	-1.87414909	-1.14203795	-1.243987769	-1.170500781	-1.629486939	-0.922040854	-0.427122223	-0.129464022	2.807916801	3.475204245	3.475204245
Strip2	-1.09599397	-0.8362321	-0.747672258	-0.167793908	-0.034387829	-0.007165305</						

Extl1	-0.56290672	-1.539253889	-1.153444949	-0.962854624	-0.680613848	-0.88668179	-0.888415209	-0.254295971	0.02748112	2.046787204	2.688121519	2.166077156
Tmem45a	0.005391469	-0.664534878	-0.711323227	-0.028210806	0.021980415	-0.072344906	-0.391682117	-0.353551479	-0.251288817	0.829430859	0.804154873	0.810097707
Tmem52	-0.416076004	-0.827414444	-0.396545695	-0.321983740	-0.321983740	-0.108047105	-0.004519036	-0.508180489	-0.279615396	0.59483132	1.549010315	0.903620244
Cyp2d22	-0.728419689	-0.264632772	-0.954753579	0.219580863	-0.263056043	-0.381450832	-0.356059532	0.460387856	-0.204477908	0.535870437	1.186940094	0.720143871
Elf4	-0.42113335	-0.402297831	-0.05896362	-0.038840286	-0.204848913	-0.913523626	-0.528371988	-0.849834512	-0.383735949	0.138272752	1.486954743	1.223131363
Mast1	-0.544366746	-0.236578632	-0.340355371	-0.541427883	-0.234858539	-0.684191932	-0.010732749	0.298690174	-0.317733049	0.803967348	0.845279613	0.966021052
Rgs17	-0.471890859	-0.484581859	-0.61766974	-0.589687985	-0.589687985	-0.684819328	-0.105401367	0.251993168	-0.350523856	1.799113251	1.854798667	1.72104581
Rps6ka4	-0.82535216	-0.761341314	-1.039114459	-0.054762505	-0.129695239	-0.231657897	-0.353673276	-0.109705184	-0.084218791	0.942610451	1.410822975	1.236300586
Scamp5	-1.104027569	-0.918305117	-0.9520628	-0.276558581	-0.213632245	-0.639971342	-0.382839639	0.288211108	0.315880698	1.374222059	1.372196278	1.136687204
Dkk2	-0.066303122	-1.10822402	-1.465881405	0.357871717	0.661719275	-0.34910737	-0.945455639	-0.632624936	-0.465461004	1.904439556	1.444547571	1.664479377
Ct28	-0.676852905	-0.89091112	-0.100441759	-0.237308544	0.455991804	-0.462586667	-0.565533964	-0.065601271	-0.348996899	0.859952725	1.153610885	0.67869841
Cidn9	-0.098645178	-0.254599544	-0.01739646	-1.617033489	-1.312444144	-0.920939507	-0.607945972	0.153375524	0.039973746	1.312829939	1.453770864	1.833795414
Smp13a	-1.338102404	-0.985120342	-0.817163443	-0.316276722	-0.289613761	-0.78277255	0.006506122	0.030665109	0.390689118	1.253412444	1.347735623	1.443845611
Otor	-1.444004339	-1.451014216	-1.473155187	-0.388921684	-0.134799895	-0.980271717	-0.458011036	-0.036434761	0.24534233	1.913733362	2.472831633	1.734705509
Kcne4	-0.843892075	-0.99329621	-1.328886419	-0.06628879	-0.77293416	-0.500953118	-0.513738698	-0.092257592	0.042324104	2.318690504	2.229019637	0.522462629
Sorcs1	-1.157702865	-0.860229587	-0.317887218	-1.300635806	-0.937800038	-1.834062946	-1.186627501	-0.188842542	-0.800852755	2.622581012	3.067280824	2.954779677
Ppp1r3	-0.997718179	-0.742161686	-0.527925282	-0.558167518	-0.376959157	-0.703053845	0.152913523	0.322526692	-0.04498192	0.934849283	1.173338571	1.147249489
Kcnmb4	-0.707995432	-0.80263788	-0.71804163	-0.327287825	-0.224900132	-0.377654949	-0.159567649	-0.398032728	-0.1358647	0.923946917	1.535940971	1.358836056
Moxd1	-2.180158852	-0.242996233	-2.192088781	-0.758710627	-0.721031854	-1.196909414	-0.098302853	-0.527774073	-0.150431161	3.092929186	3.323192532	3.434828131
Nek6	-0.450078883	-0.432431248	-0.373399905	-0.395432056	-0.576687431	-0.4271151845	-0.160728657	0.019362816	0.095509862	0.972956855	0.904789878	1.066676714
Tcea3	-0.775886263	-0.582213689	-0.52262343	-0.241983506	-0.290429948	0.155352057	0.109365145	-0.222749559	-0.091636015	0.724493277	0.924906825	0.813422104
Tmem200c	-1.239772034	-0.907184917	-0.96270918	-1.079729415	-1.022525742	-0.524280068	-0.163665786	0.061796514	-0.187196514	0.054982027	1.684645076	1.721239537
Stk32b	-0.615776366	-0.284890242	-0.688928467	-0.407272727	-0.687298037	-0.646705038	-0.559922755	-0.743296131	-0.205901376	1.254989491	1.688820874	1.896180955
Gpr85	-0.448586781	-1.420303646	-1.096575683	-0.180323191	-0.205343761	-0.305959154	0.244991777	0.443531846	-0.348904782	1.323413977	0.993653066	1.0040237
Rtnr4	-0.433126273	-0.532537908	-0.29667208	-0.393536537	0.027559692	-0.059166749	-0.41076639	-0.925285965	-0.29472965	0.827174423	0.903306956	1.591094859
Tmem176b	-0.390910932	-0.683219899	-0.586208281	-0.320057269	-0.464894586	-0.241732622	0.240384625	-0.504945898	0.093396307	0.925098839	1.019027127	0.8856665
Tcea6	-0.371978853	-0.680198273	-0.187011398	-0.352748529	0.028196922	-0.356100116	-0.130578633	-0.021025347	-0.520533478	1.29350822	1.80347803	0.720173553
Ghna	-0.641451594	-0.182966507	-0.346352427	-0.457209774	-0.473330562	-0.366405142	-0.337410092	-0.080815324	-0.02162707	0.80398104	0.955890469	1.147698983
Ahrna	-0.8357794	-1.2972142	-1.203432679	-0.333841305	0.622293703	-0.102488242	-0.232845272	0.524291252	-0.151765156	1.421191188	1.157263556	1.354514823
Cofa5	-0.850609811	-0.850609811	-0.850609811	-0.523596975	-0.294657552	-0.850609811	-0.850609811	-0.850609811	-0.202842933	1.813649599	2.362471363	1.948635363
Lrrc2	-0.624063587	-0.20691464	-0.202078371	-0.443240036	-0.2842401	-0.50854723	-0.941379511	-0.348091154	-0.367736312	1.169335474	1.389042988	1.306312072
Plezo2	-2.064858663	-1.326745729	-1.253283974	-0.300171493	-0.056293822	-0.547181919	-1.267935135	-0.1075142171	-0.125252808	2.025728156	2.598570561	2.242279913
Dleu2	-0.593223682	-0.409846577	-0.24236783	-0.444437949	-0.242039654	-0.490420949	-0.140408265	-0.085670736	-0.152059643	0.853844829	1.126217677	0.97529747
Pxd1	-0.001653685	0.182522107	-0.130284088	-0.720714431	-0.292551333	-0.385904447	-0.812510493	-0.584969183	-0.653706647	0.661651707	1.441163435	1.299304147
Analj4	-0.832448965	-0.508641592	-0.628566624	-0.496193992	-0.402039834	-0.702925274	-0.075857068	0.340731779	0.187701393	0.974262467	1.081926825	1.009110542
Tmem246	-0.415332537	-0.203831117	-0.272436048	-0.343296077	-0.296026399	-0.335893911	-0.069831078	-0.395551097	-0.386534971	0.795606709	0.951317373	0.963754516
Smarca2	-0.30502107	-0.2813243	-0.324407664	-0.471727767	-0.275000739	-0.521321628	-0.040933076	-0.197892126	-0.356576956	0.983935902	1.238172677	0.93175814
Spats2	-0.758063708	-0.358690685	-0.690425758	-0.072847831	-0.115799717	-0.68719612	-0.311229525	0.335191014	0.165738941	1.170938108	0.987189665	0.38363607
Kcnmb40s1	-0.48326713	-0.840566233	-0.931314646	-0.443677394	-0.16343571	-0.9891862	-0.184687396	-0.460628607	-0.015615647	0.981905851	1.17090826	1.30194714
3632451O6Rik	-0.647315354	-0.84767277	-0.918083398	-0.019195661	0.144844363	0.118496228	-0.196869281	-0.192835099	-0.235797914	0.639925891	0.879084063	0.867568734
C11tnf3	-0.310478365	-0.968048201	-0.66079079	0.027176467	-0.319323867	0.325991842	-0.565166325	-0.430402422	-0.235041468	0.902420793	1.0622157	1.12744605
Larq16	-0.564548679	-0.78607906	-0.57187829	0.041097271	0.293623065	-0.797845515	-0.551435397	-0.738209262	0.22831216	0.970553173	1.098059393	1.381961969
Tmem35a	-1.43507542	-1.780281877	-1.227065999	-0.432687391	-0.018615718	-0.282679657	-0.174929272	0.033667573	0.216163144	1.579926476	1.649929683	1.521969914
Vwa5a	-0.599129375	-0.836145846	-0.756270926	-0.57960451	-0.05206002	-0.605504956	0.096467399	0.219072963	0.157697369	1.085144008	1.062095418	1.2687841
Rprm	-0.908940012	-0.650325193	-0.931129849	0.352269882	0.639809810	-0.39075842	-1.176267873	-1.969616524	-1.042332492	1.901251127	2.198780907	1.977996854
Dubr	-0.292344418	-1.27577818	-0.484146554	-0.338041639	0.35958012	-0.938929743	-0.078913882	-0.228704312	0.469190938	0.871512998	0.800113149	0.800113149
Mturn	-1.049064593	-0.80302658	-0.861395514	-0.258796929	-0.37003251	-0.477663152	0.092003057	-0.168763525	0.268895538	1.048078287	1.17044944	1.046950656
Gpr155	-0.349210358	-0.29649056	-0.162471891	-0.810525818	-0.213897975	-0.711687786	-0.789542065	0.227849279	-0.133920666	1.065068056	1.105620021	1.067360478
Accs1	-0.133719742	-0.378410709	-0.108561327	-0.537067496	-0.422378715	-0.678237583	0.058462584	-0.216504546	0.111761581	1.130520799	1.19073604	0.960561215
Synp2l	-1.539824573	-0.304112321	-0.738112143	-0.527146166	-0.104303101	-0.104303101	0.173182675	0.097121684	-0.16861405	0.943425144	1.833398313	1.152066957
Gsdmd	-0.803895554	-0.158008919	-0.455422415	0.052144852	0.033193678	-0.519823535	0.333161442	0.088459073	-0.192016474	0.434982718	1.208041223	0.6045329597
Ctdsp1	-0.605426186	-0.867951907	-0.902514526	-0.10748524	-0.296695862	-0.149329066	-0.009109562	-0.003794549	0.264072426	0.711287665	0.944170247	1.003311111
Fam65c	-0.15052857	-0.501164823	-0.716706524	-0.257119016	-0.450247867	-0.730712432	-0.326208368	-0.307329545	-0.14018878	1.321859009	0.938471654	1.34415497
Sec24d	-0.775177445	-0.603142131	-0.735892631	-0.114801264	-0.275825866	-0.589068664	-0.468599314	-0.184527976	0.285110896	1.082211106	1.139011059	1.234720108
Bdn2	-0.633994591	-0.72866159	-0.830540695	-0.100861926	-0.272805853	0.021073703	0.115683878	-0.06944997	0.165858475	1.003885787	0.860311999	0.469505354
Dpf3	-0.60829168	-0.55636814	-1.477417208	-0.649994864	-0.511646334	-1.688364203	-0.587005365	-0.108023393	0.079657108	2.039940919	1.953807702	1.212974136
Mef1f0	-1.429637461	-1.318126178	-0.788357222	-1.022578093	-0.896727964	-1.431840442	-0.578873045	0.524225943	0.015613742	2.41851317	2.403970669	1.900816851
Tllf1	-0.865000298	-0.941476437	-0.913129072	-0.463062229	-0.004608027	-0.352761961	0.076794548	0.306035697	0.08466116	0.829240885	1.114087443	1.127152321
Phyhipl	-0.694330078	-0.310572201	-0.082653321	-0.120502684	0.021844621	-0.599109655	-0.604079045	0.291311831	-0.349016867	0.953176931	0.918566515	0.572270414
Arhgef3	-0.768777132	-0.68611343	-0.751862451	-0.656035552	-0.914022557	-0.961509687	-0.726230308	-0.621870209	-0.332491111	1.613135376	2.147690806	2.378943327
Mafp31	-1.537463905	-0.69798678	-0.218276227	-1.982133533								

Table S8

Symbol	Jagged_rep1	Jagged_rep2	Jagged_rep3	PDGFra_rep1	PDGFra_rep2	PDGFra_rep3	OCP_rep1	OCP_rep2	OCP_rep3	CB_rep1	CB_rep2	CB_rep3
Tctn3	-0.349381545	-0.227249598	-0.118268958	-0.095130995	-0.037732035	0.097101279	0.111853996	-0.010881357	0.100306536	0.095174597	0.15826007	0.275948011
Ifit80	-0.210970138	-0.269903651	-0.085474397	-0.19230326	-0.023320076	-0.12448113	-0.026068273	0.299717198	-0.074884785	0.161737793	0.25086524	0.295085848
Tbc1d32	-0.391634238	0.153950171	0.168584696	-0.112437107	0.088373425	-0.17457737	-0.268018003	0.169474222	-0.053862647	0.097426344	0.191350492	0.131370016
Hipk1	-0.063301457	-0.043782301	0.199832244	-0.018702326	0.165311481	-0.09775734	-0.089507748	-0.192713798	0.065416065	0.05534304	-0.050831744	0.070693885
Wtdpcp	-0.366123105	-0.469532485	-0.102548994	-0.027678365	-0.016098929	0.162016613	0.183991681	0.049564385	0.089211074	-0.036464361	0.195800994	0.337861492
Vcnr2	-0.060707604	-0.024253668	0.000121912	0.198282672	0.04332941	0.109901183	0.231757768	-0.206406474	0.131284587	-0.154091348	-0.174866022	-0.094352414
Hhip	-1.686936678	-0.653520755	-1.583172268	-0.732843811	-1.007066157	-0.860042198	1.178536612	1.464198761	1.464198761	0.509425131	0.615804838	0.95608832
Disp3	1.002259916	0.304641823	-0.580115308	0.655628846	0.727030024	0.503883725	-0.31294023	-0.949046246	-0.662716999	-0.190337565	-0.267747727	-0.230540259
Ifit122	-0.1451567	0.068632631	-0.024167643	-0.017534696	0.065137022	-0.019151461	0.046266709	0.01250304	-0.066700873	-0.042244583	0.008497723	0.113918831
Tgfb2	-0.40346501	-0.44670892	-0.202500719	-0.337396847	-0.095887644	-0.418551065	-0.586491306	-0.343347875	-0.196582411	0.997289715	1.131831957	0.901810125
Fkbp8	0.044933671	-0.031133954	-0.082140347	0.118520864	0.074642219	0.162165101	0.0831635	-0.06373993	0.06247167	-0.125455945	-0.174538394	-0.068888456
Dyrk2	0.231667394	0.316954321	0.452371257	0.077246734	0.123739598	-0.118135477	-0.136636317	-0.199763866	-0.066316754	-0.168108143	-0.277733432	-0.235285316
Ptch1	0.677531668	0.729403516	0.954337456	-0.266536851	-0.360351447	-0.505973503	-0.590851076	-0.637153801	-0.297479813	-0.087470433	0.102652646	0.281891638
Ifit20	-0.106894952	0.000497833	-0.140256851	-0.077460472	-0.190237562	-0.069213245	0.191670561	0.134511788	0.003824638	0.095002465	0.081838525	0.076717272
Arl13b	-0.175407388	0.037526681	0.045049357	-0.115652019	-0.083411225	-0.152055539	-0.344781218	0.189881032	-0.064557561	0.068768648	0.285588305	0.197980827
Gli2	-0.802569608	-0.811280475	-1.012842538	0.318115129	0.419498067	0.224786935	0.019154553	0.124817392	0.20145613	0.274664096	0.473137492	0.571062826
Smo	0.209939279	0.143531954	0.140565814	0.24126587	-0.012614121	0.068112679	0.034455605	-0.280748432	-0.005209114	-0.126769503	-0.194138269	-0.218391762
Boc	-1.380753066	-1.0383895	-1.241966692	-0.323789935	-0.168042496	-0.439658475	0.265919493	0.754612536	0.541947544	0.77676291	1.144083932	1.109273749
Stil	-0.049572068	0.084736312	0.032533438	0.005131698	0.083235917	-0.094148082	-0.126470649	0.321449717	0.151079408	-0.159027339	-0.088667062	-0.052981291
Ror2	-0.178215996	-0.190924768	-0.264510633	0.1182055	0.072263834	-0.068294892	0.299924407	0.254170582	0.494075385	-0.179268185	-0.268053284	-0.189371951
Shh	1.464198761	1.464198761	1.464198761	1.464198761	1.464198761	1.464198761	-1.686936678	-1.686936678	-1.686936678	-1.686936678	-1.686936678	-1.686936678
B9d1	0.280005559	0.134592095	0.096177743	0.17475911	-0.054002766	0.359475766	0.423007273	-0.440554968	-0.131298598	-0.246787396	-0.361469451	-0.233904368
Hhat	0.533174203	0.325692834	0.623223855	0.027265703	0.005373121	0.038296368	0.104598953	-0.557829046	-0.045921316	-0.355902679	-0.418705431	-0.279266566
Nsdhl	0.226652887	0.080494878	0.290950493	0.182010607	0.409300637	0.544916083	0.1538695	-0.551510171	-0.215913623	-0.370026809	-0.339961326	-0.410783156
Ifit52	-0.188660092	-0.2383199	-0.289883676	0.064881906	0.046516197	0.037364444	0.185480563	-0.00466716	0.123832767	0.062088662	0.104726689	0.0966342
Gpc2	-0.414670921	0.037771347	-0.184642423	-0.092850524	-0.198801926	-0.500232708	0.010618714	0.679792097	0.104717243	0.209952259	0.370931366	-0.022545523
Ifit172	-0.298948358	-0.105035573	-0.168112908	-0.105458923	-0.029514747	-0.254024036	-0.065669828	0.322434919	0.102925465	0.261037564	0.149211702	0.191154724
Hspb11	-0.346841	-0.349709632	-0.201402651	0.076038363	0.16693656	0.189385016	0.052811613	-0.4300602	0.150993134	0.191049785	0.38806564	0.112733374
Map3k10	-0.12369255	-0.121503091	-0.117786068	0.240240443	-0.032413944	0.099535665	0.076771223	-0.093957016	-0.032006645	0.104383709	0.032724459	-0.032296381
Bbs7	-0.407049084	-0.050313458	0.24125635	-0.167531964	0.225603213	-0.316581048	-0.195818737	0.200288897	-0.167688719	0.324128284	0.193175142	0.120531126
Ssna1	0.152415832	0.186803758	0.008191989	0.200500275	-0.024515091	0.196466201	0.281458584	-0.228351547	-0.151246775	-0.11291933	-0.247332288	-0.261471609
Ifit57	0.084178479	0.161519534	0.242437175	-0.030435819	0.096161731	-0.010076362	-0.158528585	-0.301194918	-0.302266111	0.094417648	0.093747314	0.030039094
Ndst1	0.049658398	-0.154509168	-0.000835707	0.256367127	0.129959237	0.128410096	0.161048825	-0.325018597	0.138713846	-0.159318269	-0.144969779	-0.07950601
2700049A03Rik	-0.050032769	-0.040152888	-0.077630893	-0.137902031	0.028902115	-0.060984558	0.015354467	0.408636772	0.012433342	-0.01892589	-0.093520429	-0.013822761
Hes1	-0.066589193	-0.097190878	0.229300097	-0.518453716	-0.541103961	-0.268182403	0.016743377	0.499724939	0.139618539	0.274195468	0.409489679	-0.07755195
1810043G02Rik	-0.284473953	0.030754228	-0.096055669	-0.038710505	-0.232685482	-0.255785401	0.213598733	0.452756176	0.232089056	-0.164338929	0.024574566	0.118277179
Trove2	-0.214174531	-0.251936118	-0.08743465	-0.174271045	0.195552021	-0.043166786	-0.108712681	-0.000185192	-0.057631306	0.201028164	0.100531984	0.440400141
Dzip1	-1.139743837	-0.976499471	-1.090027815	0.182682421	0.151264553	-0.240261301	-0.013943436	0.748369872	0.267499617	0.72428743	0.780184651	0.606187316
Wdr19	-0.486825699	-0.310503132	-0.407318946	-0.222051266	0.043108738	-0.259436189	-0.013909065	0.498861547	0.117280339	0.266175112	0.325071159	0.449547401
Cc2d2a	-0.531667221	-0.39746906	-0.57559907	0.115630885	0.340874826	-0.154277447	-0.144194693	0.669967244	0.148552682	0.135795241	0.267008243	0.12537837
Evc2	-0.156455426	0.181265842	-0.088952214	-0.007716405	-0.044189253	-0.202548589	-0.316686933	0.378003656	-0.113469022	0.133776688	0.210081479	0.026890177
Tmem17	-0.185375497	-0.47138871	-0.247253763	0.255014958	-0.024924235	0.526134675	0.23896973	-0.11328986	0.191173732	-0.12691015	-0.147737272	0.105586392
Sep.02	0.099788575	-0.015741459	0.065694013	-0.051727943	-0.053153605	-0.400335351	-0.10174373	-0.150784603	-0.067531988	0.125785812	0.049313986	0.140436292
Disp1	-0.370322305	-0.318610637	-0.350776116	0.256234586	0.310186723	0.458567563	0.211236548	0.465070867	0.281592572	-0.219173623	-0.239469074	-0.484537104
Tmem231	-0.06423026	-0.393689438	-0.194414508	0.263585114	0.170415679	0.311489427	0.136830537	-0.654853202	0.017241405	0.018778528	0.153619927	0.23522679
Cdon	-1.581799444	-1.635008204	-1.686936678	0.523059344	0.770529605	0.263572072	1.044095161	0.757910377	1.001745451	0.534986779	0.422836389	0.093776267
Ifit7	-0.102319375	-0.127591297	-0.17163743	0.398254538	0.002472943	0.356423691	0.297423987	-0.201636575	0.258401275	-0.243831643	-0.238396767	-0.182037032
Ttkb2	-0.155988301	-0.227875875	-0.049188197	-0.106623137	0.067877698	-0.37362196	-0.040210666	0.186267601	0.001103837	0.211575945	0.209704658	0.276978398
Ttc21b	-0.189335188	-0.026236083	-0.02599551	-0.062605956	-0.104180124	-0.101732164	-0.326462793	0.089649118	-0.098711425	0.257716742	0.318037507	0.329858699
Sufu	0.101172673	-0.012564583	0.038298318	0.214491847	0.103936376	0.272859204	0.213978641	-0.338616927	0.088311107	-0.261084333	-0.239811694	-0.180970629
Pax6	-0.527800514	-0.077908427	-0.034547866	-0.01520367	0.263285979	0.005319422	0.083674657	0.285674102	0.124122979	0.09524645	0.082045673	0.417267058
Gli1	0.437688022	1.085362999	0.630581062	-0.106396365	-0.529211411	-0.513936136	0.642779598	0.15165917	-0.372581613	-0.280163009	0.094435742	0.063637097
Tulp3	0.21897061	0.01529633	0.024129121	0.181731951	0.073322564	0.037958833	-0.091202781	-0.292440271	-0.048569227	-0.038364365	-0.010305871	-0.070526894
Ifit46	-0.351884906	-0.266987294	-0.186565052	0.142387666	0.01452779	-0.018406044	0.113168916	-0.025955179	0.206604586	0.07517814	0.171306626	0.12662569
Arl3	0.26383004	0.102275745	0.077971084	0.191438878	0.163612941	0.0356005762	0.256536313	-0.643160753	-0.006931313	-0.223138706	-0.230098158	-0.302942229
Hipk2	-0.107011695	-0.073418201	0.190176573	0.04087472	0.160196868	-0.048766178	-0.107587499	-0.214089014	0.150612033	-0.112759672	0.019155795	0.102616271
Bmp4	0.543839538	0.650720036	0.670346311	0.895948556	0.93477408	0.771477186	-0.743587236	-1.00846457	-0.894890616	-0.34734379	-0.423947813	-1.048871683
Ttc26	0.022486594	-0.087436925	-0.079652103	-0.094772665	0.049583601	-0.039120172	-0.022804765	0.017807544	0.104784579	-0.05780579	-0.04396365	0.13309375
Gli3	0.039479658	-0.008789405	-0.017332483	0.033644389	0.289730832	0.235543976	0.157944969	0.050541383	0.037026962	-0.371918442	-0.290861969	-0.155009872
Evc2	0.195652914	0.3955252	0.306509609	0.045214962	-0.02933581	-0.144452855	-0.097					

Table S9

Symbol	Jagged_rep1	Jagged_rep2	Jagged_rep3	PDGFRa_rep1	PDGFRa_rep2	PDGFRa_rep3	OCF_rep1	OCF_rep2	OCF_rep3	CB_rep1	CB_rep2	CB_rep3
Le1f	0.629877523	0.774675448	0.937485444	0.653041358	0.528829217	0.728341332	-0.250532398	-0.731614158	-0.571570204	-0.699515392	-0.847803539	-1.151214618
Eng	0.593810894	0.283540622	0.510316397	-0.466606037	-0.551133897	-0.587101567	-0.61880226	-0.20681806	-0.356381783	0.112091997	0.647448569	0.639887546
Sfrp1	0.2044116	-1.496961308	-1.844123958	0.220598932	0.148023752	0.081052573	1.025843961	0.954620391	1.142094579	0.043822805	-0.149858223	-0.329524839
Bmp2	0.234062692	0.930788271	1.158368175	-0.052580201	0.244505372	1.467521905	-2.069239601	-1.442269338	-2.069239601	1.6440113976	1.772073661	1.455158633
Smad4	0.152057916	0.051582507	0.1735842	0.16359913	0.057246467	0.139702414	0.027974704	-0.172784673	-0.061342856	-0.195516432	-0.2434749	-0.092628478
Bmp4	0.543839538	0.650720036	0.670346311	0.895948556	0.93477408	0.771477186	-0.743587236	-1.00846457	-0.894890616	-0.34734379	-0.423947813	-1.048871683
Bmp7	0.081774028	0.238262935	0.328507966	0.172539905	0.173266186	0.285830134	-0.342103273	-0.34666106	-0.292696194	-0.119794531	-0.124163605	-0.054762491
Smad7	-0.034447317	0.350659576	0.065541374	0.667199422	0.339728344	0.018676993	-0.4277414	-0.152555149	-0.004268669	-0.111666965	-0.210127461	-0.500998749
Rgmb	-0.380312883	-0.279470548	-0.144834089	-0.490436639	-0.769038331	-0.88608427	0.093923788	0.545783767	0.563106385	0.657376514	0.473320402	0.616665904
Acvr11	-0.480415318	-0.623402794	0.112551034	-0.551757235	-0.513885853	-0.160273638	-1.100859243	-0.507979579	-0.326695022	0.963888079	1.525822193	1.663007374
Chrd1	-1.578072384	-1.608224556	-1.787365095	-0.920379047	-1.072552991	-1.120873721	0.463696504	0.912048887	0.764408973	1.58764709	2.119124801	2.240541528
Col2a1	-2.069239601	-2.069239601	-2.069239601	-1.058585453	-1.329658608	-1.971099756	1.527012559	2.342539726	2.125224241	2.34292372	2.34292372	2.34292372
Bmp3	-0.244262079	-0.203970264	-0.300245441	-0.838056311	-1.149052195	-1.939982993	0.322979872	0.983959951	0.770580615	1.559144146	1.385246653	-0.346341954
Ryr2	-1.413218851	-0.85400189	-1.734680438	-0.87211762	0.225840377	-0.9301125	0.715235256	1.441149213	0.855791541	1.324584049	0.945938251	0.304490674
Rgma	-1.276470734	-1.301692844	-1.168940095	-0.127801583	-0.387958525	-0.3387026	1.060687099	0.620623658	0.942022142	0.974972011	0.740691252	0.482569852
Chrd	-0.67835425	-0.130236295	0.11656997	-0.29770747	-0.828201578	-1.151576912	0.838362077	0.13738332	0.203665992	1.08484254	2.800217458	0.918308223
Id1	-0.409282019	-0.031134926	-0.03131037	0.337710315	0.344188764	0.070275453	0.519947573	-0.353654785	-0.158868662	0.252941524	0.208913236	0.290169044
Acvr2b	0.337691058	0.353949661	0.456359294	0.158842392	0.153951555	0.133435531	0.168067446	-0.180114991	0.046141913	-0.551703147	-0.638152903	-0.438499064
Mapk3	0.033957233	0.061857199	0.103024367	0.164125786	0.111270411	0.398263214	0.138736135	-0.324882723	0.076057909	-0.273481694	-0.340777933	-0.130149874
Kcnd3	-1.619417364	-1.117818286	-1.673052583	0.169532648	0.18518256	-0.821240976	0.775444901	1.323539061	1.513693916	0.47489139	0.494006389	0.295292643
Sxc	-1.677983588	-1.498139651	-1.067127867	0.014725007	-0.082837149	-0.644180744	0.909392564	1.137666223	1.169068123	0.948270117	0.677165116	0.817981849
Usp9x	-0.016117672	-0.091438897	0.123103192	-0.186350548	0.211242836	-0.149154215	-0.008307757	-0.086770593	0.020626885	0.128769624	-0.076298306	0.110695651
Zfp128	-0.264811457	-0.906186024	-0.265106906	-0.271410425	-0.107889752	-0.084409761	0.350533934	0.373294036	-0.02010417	0.271097917	0.457826655	0.467165953
Tgfr3	-0.74436359	-0.711231429	-1.386425439	0.080691084	0.264281958	-0.07180547	0.23557904	0.216572859	0.251207004	0.523344062	0.623682982	0.48569363
Bmp1	-0.360034482	0.029112771	-0.157635918	-0.223088947	-0.348804284	-0.533176788	-0.251299873	0.754104502	0.116354207	0.301997581	0.402851975	0.233619255
Bmp5	0.859906257	0.729745575	0.818938086	-0.236697599	-0.53645862	-0.185697956	-1.555007909	-1.414825044	-1.184289475	0.854443062	1.04261294	0.32451837
Acvr1	-0.281639708	-0.131288595	-0.164134214	0.07273901	0.214253082	-0.266494053	-0.124325371	-0.085143938	0.1306519	0.283122235	0.171990055	0.180269147
Tmem100	-0.364730556	-0.605623913	-0.876413974	0.156989647	0.198576648	0.322947897	-0.389561556	-0.45668313	0.019160643	1.238771176	0.918962721	-0.162396187
Zcchc18	-0.52519455	-0.240723268	-0.120236945	0.027893948	-0.275599864	-0.399049102	-0.228008137	-0.090977758	-0.003297219	0.523344062	0.559649623	0.519159209
Egr1	-2.065515086	-1.450314807	-1.957727115	1.06250038	-0.271295261	-1.206916528	-0.67852335	1.454294671	1.042225313	1.926476274	1.203224347	0.941570148
Smad9	0.093347273	-1.092055452	-0.935795999	1.111039334	0.85320862	0.53502094	-1.285048152	-2.069239601	-0.855511004	0.705523213	1.423313725	1.478114901
Gdf6	-0.565122543	-1.480698142	-1.377823033	0.1017420038	1.465378743	-1.511607951	-0.330336425	-1.280725295	-0.810631657	0.394159738	0.852452	0.604318625
Twsg1	-0.061446525	-0.172647498	-0.110927028	-0.044701601	-0.038935029	-0.042139737	0.078633433	-0.242606925	0.048863486	0.216528342	0.203466694	0.323179254
Ski	-0.15754788	-0.110179104	0.042238604	0.069358457	-0.035597491	-0.240147154	-0.113243879	-0.273107876	0.021360871	0.159650702	0.282728266	0.354486484
Gdf10	0.523990471	-1.257012439	-1.386829972	0.156324617	0.264753935	-0.508529661	-1.202249472	-1.146927789	-0.356765024	1.479676015	1.791392496	1.582178823
Fn1	-0.221021949	-0.358963677	-0.270625025	-0.088500563	0.268853687	-0.277359792	0.148569674	0.459945275	0.323511248	0.169803046	-0.052166857	-0.120425068
Runx2	-1.648507729	-0.950451715	-1.037603401	0.562248671	0.324620248	-0.891946618	-0.123852499	0.903277456	0.971568512	0.990713209	0.933150512	-0.032856646
Nog	-0.690699409	-0.545125974	-1.035512425	-0.510451737	-0.52405212	-1.117167941	-0.900386664	1.121564241	0.021131174	1.350682896	1.865794166	1.869163396
Usp15	0.349680894	0.417557567	0.353333179	-0.003636003	0.120750643	0.224056111	-0.145589262	0.059362695	-0.174041565	-0.247268388	-0.408480073	-0.54572514
Megf8	-0.277400023	-0.44446555	-0.326357515	0.293870182	0.203490966	-0.023422556	0.271131879	-0.019365197	0.213028649	0.0700217	1.36021194	-0.099253729
Msx2	-0.446336148	0.015664797	-0.278183643	1.934021698	1.986348587	1.635878436	-1.392819535	-1.20707322	-0.857325457	-0.196544541	-0.269926785	-0.923701458
Zcchc12	-0.761672475	-1.228065083	-0.67852003	-0.414688604	-1.028371495	-0.867444795	-0.184793688	0.2268874	0.205498597	1.580413762	1.746458773	1.404297097
Gata6	2.323018331	0.583440529	0.663913868	0.145087962	0.487004005	0.4160985	-0.660722316	-1.032497264	-0.885238087	-0.42080129	-0.547489267	-1.071731632
Gata5	2.34292372	0.03689719	-0.635619661	0.714872678	-0.073901526	-0.935855661	0.724872367	0.260447489	0.147002867	-1.27649772	1.374696865	-1.897694192
Bmp1b	-2.069239601	-2.069239601	-2.069239601	-0.373522548	-0.092868421	-0.294986137	0.411006461	0.71278012	0.674658034	1.562270083	1.929564587	2.14332942
Smad1	0.075457933	0.051595273	0.23761357	0.028566126	0.191348584	0.075280279	-0.024251834	-0.150862945	-0.151638131	-0.067057557	-0.143876943	-0.122174356
Adamts7	-1.088364116	-1.038724221	-0.891966219	-0.071670461	-0.185323306	-0.638202335	0.224633312	0.480440231	0.439210902	0.938462027	1.000161289	0.831342917
Bmp6	-0.816147853	-0.528889864	-0.338518932	0.127399215	-0.047252176	-0.974527467	0.149192842	0.725050501	0.869959716	0.883943163	0.611461914	-0.661671058
Smad5	-0.103877088	-0.136832147	0.052950719	-0.022901121	0.06708024	-0.135147484	-0.02713326	-0.227607609	-0.006197896	0.136293565	0.090678334	0.312693748
Fstl1	-0.343712029	-0.474866125	-0.588640369	0.157620893	0.227520886	0.045033275	-0.242626758	-0.276367143	-0.128414726	0.428580645	0.631203698	0.564667953
Smurf1	0.11813464	0.369823571	0.44298266	0.03041379	-0.07493282	-0.217997038	-0.406988619	-0.175507272	-0.128481983	-0.038488075	-0.040500954	0.1215421
Vsir	1.272976868	0.879183536	1.44245285	-1.187770371	-0.372857461	-1.26723108	-0.392359902	-0.102079624	0.062691603	-0.403968056	-0.266788998	0.335750635
Ror2	-0.178215996	-0.190924768	-0.264510633	0.1182055	0.072263834	-0.068294892	0.299924407	0.354170582	0.494075385	-0.179268185	-0.268053284	-0.189371951
Gdf1	-0.045979634	-0.147408638	-0.014128234	0.334020924	-0.063548356	-0.029911845	-0.051326021	0.03756945	0.003625116	0.067486462	-0.110586999	0.020187773
Heyl	-0.563784574	-0.773557077	-0.443239455	-0.190952424	-0.333084098	-1.227457717	0.360981025	0.264890339	0.376893296	0.525168799	1.136546719	0.867595167
Dlx5	-1.022235258	-0.448728704	0.069188803	1.051856656	0.646823675	0.285967731	-2.04707468	-2.038082999	-1.617551966	1.611758785	1.884896529	1.623181428
Gdf7	-0.665972122	-0.876223567	-1.233877887	0.006704531	0.380302016	-0.267835136	0.162078125	0.1686002	0.676880731	1.168109898	1.058501278	-0.577268272
Smad6	-0.067447181	-0.268810305	-0.211739926	0.317922996	0.172894058	0.018679337	-0.153428211	0.017990296	-0.001649074	0.053296254	-0.069393812	0.191685568
Msx1	1.459977889	1.702583267	1.814096149	1.836201951	1.719113061	1.850150047	-1.431952635	-2.051325203	-2.069239601	-1.877521914	-1.399115138	-1.530162659
Zfyve16	-0.344101472	-0.37423603	-0.280633914	-0.222698856	0.055202009	-0.354535672	-0.034325391	0.35978991				

Table S10

Symbol	S9-Jag+ LMPs rep1	S9-Jag+ LMPs rep2	S9-Jag+ LMPs rep3	S9-Pahigh rep1	S9-Pahigh rep2	S9-Pahigh rep3	S9+OCs rep1	S9+OCs rep2	S9+OCs rep3	S9+Col2a1+ CBs rep1	S9+Col2a1+ CBs rep2	S9+Col2a1+ CBs rep3
Dll3	-0.830432532	-1.012257503	1.778596034	-1.325716337	-1.049845261	-1.98750573	-0.026595772	0.087679257	0.563454618	1.317597653	0.850882677	1.634142895
En1	1.954564997	-0.053541767	-0.253682032	-1.416613632	-1.016575487	-1.008285981	-1.342174217	-0.175466929	-0.500617206	2.019877218	1.401413124	0.391101913
Env2	2.57909539	3.482134306	3.895408508	-3.528143031	-3.068399547	-3.039219694	-3.144286475	-3.19711575	-3.087546798	2.750559128	3.45451367	3.110170936
Hoxa13	2.980948901	3.145501877	3.488500083	-1.312920008	-1.821536861	-1.597655815	-3.22393539	-3.215638484	-2.856969449	1.143307951	1.627780681	1.642615766
Hoxd11	0.922463471	0.966529351	1.01890724	-0.295746965	-0.565560377	-0.315827154	-0.847718912	-0.796499511	-0.557099493	-0.007563677	0.063368809	0.414747217
Hoxd12	1.551677133	1.737226444	1.973699322	-0.168451897	-0.478914176	-0.391944359	-1.911077358	-2.15757661	-1.513924733	0.133947845	0.533033408	0.692304964
Hoxd13	2.389301944	2.666994698	2.995375964	-0.926081189	-1.277768314	-1.062824821	-2.457890249	-2.939892209	-2.350022609	0.595073483	1.163312266	1.204421035
Tfap2b	3.628588805	3.914654713	3.914654713	-2.282769412	-2.64499844	-2.247425939	-3.161029938	-2.490387761	-2.787116908	1.090100232	1.044937461	1.257709137
Sall1	1.758647016	1.741203615	1.907654888	-0.858464447	-0.994594302	-0.577588565	-1.742653131	-1.635278424	-1.388805869	0.250222375	0.531614842	1.008042003
Dlx5	-1.02564695	-0.459117903	0.058102542	1.033062286	0.631280201	0.271896026	-2.042730306	-2.012960073	-1.617948884	1.624739488	1.904194029	1.635129545
Hand1	1.718652005	-0.589583095	-0.17902442	0.360370328	0.874251964	-0.027072766	-1.631781766	-0.753448508	-0.916359147	-0.19698289	0.576490899	0.764487396
Hoxa11	0.932949408	1.138088109	0.966904221	-0.202146832	-0.219021883	0.234303284	-1.025397001	-1.330771461	-1.14485237	-0.095751231	0.251711391	0.493984367
Zic2	1.381679967	1.42289911	1.509055215	0.027278919	-0.050969015	0.402319644	-1.610956435	-1.434109586	-1.554866796	-0.392740652	0.087812919	0.212596708
Cdx2	1.503223222	1.862410759	2.097513566	-0.778507761	-0.34276822	-0.778507761	-0.778507761	-0.778507761	-0.778507761	-0.632138808	-0.629431742	-0.778507761
Has2	1.201401537	1.022327065	1.373707896	-0.888596835	-0.78731891	-0.760113074	-0.599638096	-0.575624433	-0.309373666	0.190243954	0.175740323	-0.042755761
Tbx6	0.334292491	-0.190705963	2.109246835	-0.760304327	-0.404488843	-0.505100276	-0.626445549	0.71583834	-0.201991858	-0.353630446	0.232489939	-0.349200342
Sp8	1.44746289	1.931565556	2.378853918	-0.984262797	-0.548523255	-0.984262797	-0.169115075	-0.60415585	-0.235724773	-0.583352118	-0.984262797	-0.664222903
Hes7	0.432747055	0.0861480117	1.443100609	-0.501793216	0.221444527	0.221444527	-0.459580347	-0.422062532	-0.488501216	-0.551625389	-0.371728323	-0.186781225
Prdm1	0.78037338	0.589559123	0.621059987	2.319182134	2.159692552	2.234539964	-1.782418562	-1.857515188	-1.252523525	-0.882174449	-1.420155975	-1.50961944
Gata6	2.317008055	0.572109756	0.65282842	0.127956295	0.472321447	0.402494485	-0.660304949	-1.00594787	-0.8878361	-0.406236607	-0.526738831	-1.057654101
Lef1	0.624700966	0.763328328	0.926443398	0.635246177	0.513965004	0.714504577	-0.25085985	-0.703903061	-0.575481238	-0.684447923	-0.823610619	-1.13715846
Msx1	1.454741224	1.691168891	1.802994591	1.818314931	1.704155422	1.836234203	-1.432156812	-2.023664242	-2.095670498	-1.86238877	-1.377624229	-1.516104711
Mycn	1.184069725	1.086031956	1.281349928	0.504866792	0.336573384	1.005881945	-0.213961866	-0.704177299	-0.595710915	-1.202825031	-1.219880991	-1.462217628
Etv4	1.449320666	1.483297179	1.591784832	0.45835351	0.422868589	0.821493485	-1.070542567	-1.352855332	-1.2309600273	-0.630217727	-1.277386605	-1.422217628
Prrx2	0.298287836	0.061575862	0.05037627	1.004227682	0.773009499	0.979897299	-0.331394819	-0.353749786	-0.579938244	-0.502463004	-0.624466418	-0.775362177
Tfap2a	0.956327781	1.161831721	1.436792669	0.140914164	0.232262782	0.650269759	-0.927886999	-0.947872688	-0.948606701	-0.824497136	-0.581322742	-0.348212611
Pitx1	2.548136675	-0.419357366	0.005437536	-0.740096088	-0.444703536	3.235008119	2.868665865	0.150016261	-3.374113964	-1.054074692	-1.308066004	-1.466852804
Hoxc10	1.888077125	-0.618216085	2.032385659	-1.825685195	-1.05573744	2.855171983	2.953320261	0.924348445	-1.825685195	-1.825685195	-1.676609175	-1.825685195
Alx1	0.491699635	-0.31741999	-0.541632671	0.878699333	0.878889347	1.126294305	0.090203494	0.15526286	0.161479446	-0.354501591	-0.420786059	-2.148188108
Sall4	1.568270221	1.07648258	1.599392512	-0.077175147	-0.006036646	0.813775317	0.385287629	-0.274758635	-0.301894128	-1.71889728	-1.646824787	-1.417621637
Alx3	0.59694075	-0.149123334	-0.077141786	1.134359355	1.127364557	1.297907982	-0.293485286	-0.701742734	-0.373981691	-0.56674176	-0.912169389	-1.082186663
Msx2	-0.451300297	0.004451002	-0.288978499	1.916004405	1.971242558	1.621854499	-1.392640529	-1.179658662	-0.86098299	-0.18163739	-0.248640562	-0.909713558
Pax1	-1.703842773	-0.161668085	-0.983416888	2.361430942	2.306543057	0.961474797	0.206257201	-0.17863918	0.551728416	0.675694858	0.208023088	-3.528143031
Tbx2	-0.489647507	-0.396916571	-0.675860112	2.128076356	1.866169293	1.418137771	-1.763594413	-1.317658971	-1.4607509	0.263648865	0.397281987	0.031114202
Tbx3	-0.486159779	-1.158476703	-1.393994811	1.51572535	1.627181071	1.199928891	-0.590461474	-0.626678438	-0.517337374	0.21601639	0.399564144	-0.185307266
Glis1	-1.388877459	-1.063363274	-0.925145824	1.507790242	1.153994077	1.247891632	-0.394789631	-0.470973337	-0.440995533	-0.043776589	0.603345982	0.219400615
Alx4	-0.742997756	-1.290001906	-1.757121885	1.451555393	1.483597916	1.369091304	0.626323049	0.055981085	0.415331772	-0.186561726	-0.6543967	-0.770800547
Irx3	-0.705743055	-1.45880456	-2.624938836	0.897083728	0.704275274	0.670869191	1.947086051	1.979590416	1.74826661	0.422110166	-0.233291728	-3.346503255
Zbtb16	-0.145744405	-0.428805293	-0.454277924	0.484713574	0.549625098	0.521682989	0.975297697	0.670285937	0.836682873	-0.598500132	-1.192561855	-1.218398558
Irx5	-1.075857397	-1.702722187	-2.305583788	0.847715779	0.554626784	0.527960684	1.723230443	1.219239488	1.863950457	0.580306831	-0.008662615	-3.184204479
Sox8	-0.776879984	-0.362144895	-0.938151567	0.058884107	-0.198079466	-0.013540302	0.871064685	0.923064057	1.120998343	0.008713903	-0.18381885	-0.51011003
Runx2	-1.652964028	-0.961386107	-1.048176235	0.544340726	0.309316011	-0.905360073	-0.124319532	0.930630136	0.967299446	1.005430552	0.954300386	-0.01911128
Gli2	-0.807681772	-0.822545773	-1.023770599	0.300305548	0.404606963	0.210950937	0.018775897	0.152542249	0.197433414	0.289703332	0.494623481	0.585047323
Gsc	-1.439559494	-1.71370854	-2.44141948	0.439901803	0.143012324	-0.105959794	1.229225095	1.597972678	1.201954167	0.451364969	0.490668403	0.14654787
Meox2	-1.365348044	-0.798798116	-0.951806775	0.253675348	0.401655177	-0.681219636	-0.083458165	0.358598589	0.435953413	1.028651396	0.747294967	0.654801845
Pbx1	-0.933872668	-1.414014071	-1.59694092	0.389272138	0.567237794	0.287572668	1.213840554	0.87854633	0.999875352	0.077962081	-0.091069966	-0.378409262
Prrx1	-0.866500572	-1.012155757	-1.082478611	0.606183872	0.803942535	0.608610824	0.088639625	-0.168087953	0.082638769	0.266525539	0.21165246	0.461029269
Scx	-1.682811887	-1.509111475	-1.877603106	-0.0031006	-0.097734402	-0.657915416	0.908839893	1.165189358	1.164866964	0.963122923	0.794468632	0.831789116
Shox2	-1.830101433	-2.075951307	-2.332613674	0.638485446	0.754056994	0.351634766	1.014331025	1.218612632	1.187304775	0.580758631	0.379482877	0.113999267
Osr1	-3.170376007	-3.509514608	-3.367313637	1.735068596	1.598145594	1.241914213	0.568672045	0.122140494	0.323493855	1.615003752	1.731338116	1.111427588
Gata4	0.165975581	-1.508149399	-1.420378443	-0.343055989	-0.918593677	-0.193364888	0.422790021	0.925929126	0.968476203	-0.008003506	1.010059996	0.898314975
Meox1	-2.010463631	-2.684589049	-2.174746571	-0.644004145	-0.992095613	-1.343086164	1.055550793	1.638522991	1.603385812	2.123040711	2.060528159	1.367956707
Foxc1	-2.820057866	-2.649096797	-1.873452372	-2.023637299	-2.663124743	-1.218775434	1.081166264	2.170819043	1.699576972	2.728815304	3.222113793	3.273190012
Pitx2	-0.399108724	-1.672668484	-1.3865261	-0.775171918	-0.789598027	-1.177032303	0.800452594	2.022578913	2.032665166	2.005206524	1.365724006	-2.026521648
Sox5	-0.782852541	-0.82591862	-0.641972604	-0.983955596	-0.6696707	-0.708605994	0.432408434	0.767523544	0.675198829	0.680024154	0.878372006	1.170449088
Sox9	-2.225808794	-2.022872842	-2.070016033	-1.218775434	-1.389640109	-1.201290646	1.5245861	1.543137835	1.568586545	1.473606021	1.948193233	2.072094123
Tbx15	-0.723196818	-0.332808824	-0.256247988	-0.688248067	-0.579615307	-0.807701384	0.41290335	0.862401387	0.705636798	0.445737136	0.342628001	0.618511717
Tbx4	-0.171458981	-0.555562987	-0.512387572	-1.022155333	-1.283914835	-0.041939942	1.022320339	0.811132747	0.946552598	0.146469882	0.167948795	0.492995289
Grhl2	-1.09256614	-0.372353346	-0.777283826	-0.399813241	-0.473644194	-0.589233904	0.07371966	0.674690417	-0.231939352	0.772172587	1.387122013	1.029129325

Runx3	0.197277659	0.356260913	0.023996639	-1.507895845	-1.14253338	-1.172985861	-1.205219201	-0.776000466	-1.369883237	1.658714594	2.332257675	2.60601051
Dlx6	-0.820141284	-0.454462848	-0.642796634	0.232780076	0.063203558	0.023401634	-1.04144499	-0.815547598	-0.717922858	1.108037103	1.475781828	1.589112014
Hic1	-2.838978533	-2.82977862	-3.263152214	-0.242467758	-0.315676694	-1.364148222	0.012905636	0.552706094	0.798665766	3.156359618	3.251217589	3.082347339
Pax9	-1.639617311	-1.983363911	-1.382304135	0.27223311	0.842423211	0.28096289	-2.101823215	-2.336533861	-1.778301083	2.636221889	3.470162737	3.719939679
Sox6	-0.754832094	-1.034003833	-0.958454619	-1.089878809	-0.521168123	-1.219343187	-0.38030618	0.132044765	0.321907569	1.499324029	1.845464432	2.159246048