TITLE: Congenital Zika virus infection impairs corpus callosum development

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1 **Summary Statement:** Zika virus infection during development impairs the formation
2 of corpus callosum by disturbing axon guidance and growth of callosal neurons.

3

4 **Abstract**

5

6 Congenital Zika Syndrome (CZS) is a set of birth defects caused by Zika virus (ZIKV)
7 infection during pregnancy. Microcephaly is its main feature, but other brain
8 abnormalities are found in CZS patients, such as ventriculomegaly, brain
9 calcifications, and dysgenesis of the corpus callosum. Many studies have focused on
10 microcephaly, but it remains unknown how ZIKV infection leads to callosal
11 malformation. To tackle this issue, we infected mouse embryos *in utero* with a
12 Brazilian ZIKV isolate and found that they are born with a reduction in callosal area
13 and density of callosal neurons. ZIKV infection also causes a density reduction of
14 PH3+ cells, intermediate progenitor cells and SATB2+ neurons. Moreover, axonal
15 tracing revealed that callosal axons are reduced and misrouted. Also, ZIKV infected
16 cultures show a reduction of callosal axon length. GFAP labelling showed that *in*
17 *utero* infection compromises glial cells responsible for midline axon guidance. The
18 RNA-Seq data from infected brains identified downregulation of axon guidance and
19 axonogenesis related genes. In sum, we showed that ZIKV infection impairs critical
20 steps of corpus callosum formation by disrupting not only neurogenesis but also
21 axon guidance and growth across the midline.

22

23 **Keywords:** axon growth; axon guidance; brain malformation; congenital zika
24 syndrome, corticogenesis; callosal dysgenesis; microcephaly; ZIKV

25 Main text

26 Introduction

27

28 Zika virus (ZIKV) has gained worldwide attention since its devastating impact
 29 on brain development in humans was identified (Mlakar *et al.*, 2016). The virus
 30 infects neural progenitor cells *in vitro* and *in vivo*, impairing cell cycle, causing cell
 31 death, and leading to microcephaly (Cugola *et al.*, 2016; Garcez *et al.*, 2016; Tang *et al.*, 2016). Although microcephaly is the main feature of ZIKV infection, other brain
 32 abnormalities have been identified (De Oliveira Melo *et al.*, 2016; Chimelli *et al.*,
 33 2017). The set of signs present in affected newborns whose mothers were infected
 34 during pregnancy are now known as Congenital Zika Syndrome (CZS). Besides
 35 microcephaly, CZS patients also display ventriculomegaly, brain calcifications, and
 36 corpus callosum dysgenesis (De Fatima Vasco Aragao *et al.*, 2016; de Souza *et al.*,
 37 2018).

39 The corpus callosum is the main telencephalic commissure of placental
 40 mammals connecting the two cerebral hemispheres and contributing to the proper
 41 functioning of different sensorimotor and cognitive abilities (Tomasch, 1954). Corpus
 42 callosum dysgenesis is a brain malformation characterized by absence or size
 43 reduction of the commissure, with abnormal formation of ectopic bundles (Tovar-Moll
 44 *et al.*, 2007; 2014; Edwards *et al.*, 2014). In typical neurodevelopment, callosal
 45 projection neurons arise from neural progenitor cells and migrate to their final
 46 position on the cortical plate where axons are extended to a contralateral target
 47 following guidance molecules including those secreted by midline glial cells (Gobius
 48 and Richards, 2011). In mice, the midline glial populations are generated from radial
 49 glial progenitors between embryonic days E13 to E17 and express the astroglial
 50 marker GFAP. These structures are known as glial wedge, *indusium griseum* glia;
 51 and midline zipper glia, positioned close or at the boundary between hemispheres
 52 (Gobius and Richards, 2011). Defects of midline structures compromise axon
 53 guidance of callosal neurons, resulting in corpus callosum malformations (Shu *et al.*,
 54 2003).

55 During corticogenesis, ZIKV early infection disrupts radial glial progenitor cells
 56 by altering their proliferation, as shown by the reduction of proliferation markers such
 57 as Ki67 and PH3. Also, viral infection reduces intermediate progenitors that are
 58 responsible for cerebral cortex expansion (Cugola *et al.*, 2016; Garcez *et al.*, 2018).

59 This scenario leads to a reduced cortical thickness by the loss of neuronal cells of
60 different cortical layers. In later infection, ZIKV targets progenitor cells that will give
61 rise to the oligodendrocytes, causing impairment in proliferation and differentiation
62 (Li *et al.*, 2018). Primarily, ZIKV impairs proliferation, but it can also infect different
63 types of neural cells such as astrocytes, postmitotic neurons, and microglia (Lum *et al.*,
64 2017; van den Pol *et al.*, 2017; Limonta *et al.*, 2018; Ledur *et al.*, 2020). Since
65 ZIKV is capable of infecting different types of glial cells and progenitors, both at early
66 and late stages of brain development, it is conceivable that ZIKV infection indirectly
67 disturbs corpus callosum development.

68 Although many studies have shown the impact of ZIKV in neurogenesis and
69 its link to microcephaly, it is unknown how ZIKV interferes with corpus callosum
70 development. Therefore, the aim of this study was to identify the cellular
71 mechanisms that could lead to corpus callosum dysgenesis in ZIKV infection in a *in*
72 *utero* animal model. Here, we provide evidence that ZIKV infection during
73 corticogenesis causes corpus callosum developmental abnormalities by not only
74 reducing the callosal neurons production but also impairing axon guidance and
75 outgrowth.

76

77 **Results**

78

79 **Congenital ZIKV infection leads to a reduction in the corpus callosum in mice**

80

81 To investigate the cellular mechanisms underpinning corpus callosum developmental
82 abnormalities after ZIKV infection, embryonic mice were inoculated with 10^4 PFU of
83 Brazilian ZIKV (ZIKV) or culture medium (MOCK) at E15 *in utero* via an
84 intracerebroventricular approach and harvested through postnatal day 4 (P4), when
85 they were euthanized and had their brains removed (Fig. 1A-B). To characterize this
86 infection model, we measured the brain weight at P4 and found that the infected
87 brains were lighter than controls (Fig. 1C). Also, when measuring only cerebral
88 cortex weight, the effect was evident (Fig. 1D). Using ZIKV NS1 immunostaining,
89 ZIKV protein was detected in the cerebral cortex at P4 (Fig. 1E,1F). Also, plaque
90 assay confirmed the presence of infectious viral particles in cortical samples (Fig.
91 1G). To analyse the corpus callosum formation, we compared sagittal brain sections
92 of infected animals to the controls and found that the corpus callosum area is
93 severely reduced in infected animals (Fig.1H-J). Corpus callosum dysgenesis could

be caused by multiple developmental defects. To investigate whether the *in utero* infection impacted the number of callosal neurons, we used the isotropic fractionator method to estimate the total amount of cortical SATB2+ cells (Supplementary Fig. 1). At P4, we observed lower counts of both the total nuclei (DAPI+) and SATB2+ cells, when compared to controls (Supplementary Fig.1C-D). Together, these results show that 9 days after infection (dpi) animals present abnormal corpus callosum development, with a significant reduction in SATB2+ callosal cells, which is consistent with the callosal dysgenesis found in some patients with Congenital Zika Syndrome (De Fatima Vasco Aragao et al., 2016).

Congenital ZIKV infection causes cell death at the cortical plate

ZIKV infection is known to cause cell death, contributing to the microcephalic phenotype (Tang et al., 2016, Garcez et al., 2016, Cugola et., 2016). To verify if in our model cell death could account for the SATB2+ callosal cell reduction, we stained the cerebral cortex with cleaved caspase-3 (CASP3+) apoptotic marker at different time points. Interestingly, after 5dpi (50 PFU, low titre infection), there were no CASP3+ cells in the cerebral cortex (Fig. 2A-C). Cell death was only noticed after 7dpi (Fig. 2D-F), and, more pronouncedly, at 10dpi (Fig. 2G-I). In addition, animals infected with ZIKV presented an increased number of pycnotic nuclei at P4 (Supplementary Fig.1E), confirming an increased cell death after 10dpi. These results suggest that loss of cortical cells at P4 (Supplementary Fig. 1C-D) could be due to cell death induced by ZIKV infection.

ZIKV infection leads to defect in callosal neurons production

In addition to cell death, ZIKV is also known to impair neural progenitor's cell cycle (Tang et al., 2016). In the low titre ZIKV infection model, cell death was only observed after birth (Fig. 2D-F). Therefore, we investigated whether ZIKV embryonic infection would impair callosal neurons production by impacting the proliferation of neural progenitors. At E15, cortical layer V neurons migrate towards the cortical plate and callosal II/III neurons are generated. After 3dpi (E18), although infected brains show SATB2+ neurons positioned similarly to controls (Fig. 3A-C), their density is significantly reduced (Fig. 3D). The cortical plate was divided into three sectors of equal areas encompassing the whole cortical thickness, and SATB2+ neurons were quantified in relation to DAPI+ nuclei. To quantify the progenitor density, we

immunostained sections with PH3 G2/M marker. We observed that ZIKV infection reduces the density of progenitors at the ventricular zone after 3dpi (Fig 3E-G). After 5dpi, the intermediate progenitor density (TBR2+) is also reduced (Fig. 3H-J). Taken together, these results show that ZIKV infection impairs proliferation and reduces intermediate progenitor cells, responsible for generating upper granular layers, where the majority of callosal cells are found. Also, ZIKV infection reduces the callosal neurons density within the cortical plate, but not their location (Fig. 3D).

ZIKV infection impairs axonal growth of callosal neurons

Axon growth is a critical step in corpus callosum development (Gobius & Richards, 2011). To establish whether ZIKV infection directly impairs the axon extension of callosal neurons, we used E14 cortical neurons primary culture and infected with ZIKV compared to controls. After 4 days *in vitro* (div), no difference was observed in the number of SATB2+ neurons or the presence of cell death (data not shown). However, we quantified the length of callosal axons using ImageJ tracing tools and found that they were ~25% shorter compared to mock exposed axons (Fig. 4A-C). Also, Sholl analysis revealed that dendrites of these ZIKV exposed neurons are less arborized compared to controls, suggesting that ZIKV infection impairs neurite growth (Fig. 4D-F). To verify whether ZIKV affects callosal axon growth *in vivo*, a Dil crystal, a lipophilic dye that diffuses within fixated membranes, was inserted and incubated into the dorsolateral cerebral cortex surface to allow anterograde axonal tracing (Fig. 5A-F). After 20 days of Dil diffusion, the E18 brain was sectioned, and axons could be analysed. Interestingly, infected animals show not only a reduction of the callosal bundle at the midline but also signs of axonal misrouting (Fig. 5J-K). To accurately measure the width of the callosal axons, we stained axons with L1CAM and analyzed the corresponding rostrocaudal levels at 5dpi. Infected animals display a reduction of the midline bundle width compared to controls (Fig. 5G-I).

ZIKV infection impairs midline glia cells

Our *in vitro* results show that ZIKV infection generates callosal neurons with shorter axons. We also observed that *in vivo*, axons that are crossing the midline through corpus callosum are reduced and misrouted. These findings suggest that axon guidance could be altered. Midline glia consists of transient cell populations that hold the role of guiding axons across the midline during development. We measured the

signal intensity of GFAP+, a marker of glial cells (Fig. 6A-D). In ZIKV-infected mice, GFAP+ intensity is low, suggesting that this cell population is compromised, which may explain the defasciculated axons we observed.

ZIKV infection deregulates gene expression of embryonic brain

To investigate the overall unbiased effect of ZIKV infection on gene expression and cortical development, animals' brains infected at E15 (10^4 PFU) were analyzed by RNA-Seq. After 3dpi, ZIKV-infected animals already show a range of differentially expressed genes (DEGs), with 1,414 significantly up-regulated and 1,040 down-regulated [false discovery rate (FDR) < 0.05]. A list of differentially expressed genes is available in Table S1. In total, the DEGs are enriched in more than 800 terms in Gene Ontology analysis (GO). DEGs upregulated are mainly overrepresented in viral infection and immune response, while down-regulated genes are associated with neural development, metabolic processes, and synaptic formation (Supplementary Fig. 2). Circos plot analyses indicate a set of downregulated hub genes that are important for axonal formation, axonal projection, and axonal guidance (Fig. 7A). For example, genes of the β -tubulin family (e.g., *tubb3* and *tubb2b*) that are crucial for cytoskeleton assembly, therefore important for axonal growth, appear altered. In addition, *actb* is a protein-coding gene that encodes for β -actin, a key compound of the axon growth cone. In contrast, circos plot of upregulated genes reveal genes that modulate neuronal death and microglial activation (Fig 7B). In fact, microglia staining for IBA1+ presents an activated morphology at cortical region after 7 days of *in utero* infection (Fig. 6E-J)

Discussion

Congenital Zika Syndrome is a set of birth defects caused by ZIKV infection during pregnancy that has microcephaly as its hallmark. ZIKV studies focus mainly on the viral impact on neurogenesis and its relation to microcephaly. Yet, other brain abnormalities are present in CZS, such as corpus callosum dysgenesis. In this study, we identified defects in proliferation and axonal extension of callosal cells, as well as alterations in midline glial cells, which can contribute to our understanding of the

cellular mechanisms by which ZIKV infection leads to malformation of the corpus callosum.

We used *in utero* infection to assess the brain abnormalities caused by ZIKV. Like other *in vivo* studies that used this approach, ZIKV was capable of replicating in the mouse cerebral cortex and causing microcephaly (Fig. 1A-C) (Li *et al.*, 2016, 2018; Zhang *et al.*, 2019). Besides microcephaly, we found that the corpus callosum size was significantly reduced in infected animals (Fig.1H-J). This result is consistent with reported cases of CSZ in humans (De Fatima Vasco Aragao *et al.*, 2016). In addition, we found an important reduction in the total number of cells in the cerebral cortex which agrees with reduced cortical thickness found in other studies of embryonic ZIKV infection (Li *et al.*, 2016, 2018; Shao *et al.*, 2016; Wu *et al.*, 2016). Moreover, SATB2+ cells in particular, which are known to represent cortical callosal projection neurons, were severely reduced in number (Supplementary Fig.1B-C). The significant change in the number of callosal neurons explains, at least partially, the reduced size of the corpus callosum in infected animals.

ZIKV infection is associated with massive cell death ratios on the cortical plate at 10dpi (Fig 2C-F). This effect could account for the loss of callosal neurons at P4 (Supplementary Fig.1B-C). As previously shown, extensive neuronal death is detected in different mouse models of infection (Li *et al.*, 2016; Shi *et al.*, 2018; Zhang *et al.*, 2019). In these models, cell death appears to be concentrated in the cortical plate and takes place both for immature and mature neurons. In our study, we also observed the same phenomenon.

ZIKV infection impairs neurogenesis by disrupting cell cycle and reducing proliferation (Garcez *et al.*, 2016; Tang *et al.*, 2016). In this study, we observed that apoptosis typically occurred in the cortical plate only after birth, therefore we asked if ZIKV infection disrupts callosal neurons during the embryonic period by disturbing neural progenitor cell proliferation. At E15, callosal neurons that occupy cortical layers II/III are originated from progenitors located at the ventricular surface of the cerebral cortex (Shen *et al.*, 2006). We observed that infecting animals at this age reduces the number of SATB2+ neurons at E18 (Fig. 3A-B), a timepoint at which cell death was not noticed (Fig. 2A). In agreement with previous studies (Li *et al.*, 2016; Shi *et al.*, 2018; Zhang *et al.*, 2019), we also found that ZIKV infection reduces proliferation at the ventricular zone, which leads to less intermediate progenitors (TBR2+) (Fig. 3D-G). In later stages of corticogenesis, TBR2+ progenitors are

responsible for producing most glutamatergic projection neurons in all cortical layers (Hevner, 2019). Therefore, in our model of infection, ZIKV reduces the number of callosal neurons by targeting proliferation and intermediate progenitors' cells without causing cell death at the embryonic stage.

Microcephaly is mainly caused by a reduction in the number of neurons due to impaired cell proliferation (Doobin, Dantas and Vallee, 2017). Although a reduction of the callosal commissure may be directly caused by this key feature of microcephaly, in mice, we found that corpus callosum malformation is better explained by the disruption of developmental steps after neurogenesis, such as defective midline patterning, axonal misrouting and growth (Shu *et al.*, 2003). To evaluate if ZIKV directly impairs axonal extension of callosal neurons, we infected primary cell cultures of embryonic mice at E14. As observed at 3dpi, callosal neurons exhibit shorter axons compared to controls (Fig. 4A-C). Also, dendritic branching was compromised (Fig. 4D-F). Our results agree with those of Goodfellow *et al.* (2018), who infected cultured mature neurons with ZIKV and found that neurite length and branching were reduced in size. Here, we show that embryonic SATB2+ callosal neurons have a shorter axon and less arborized dendrites. In addition, using an axonal tracer to analyze callosal tracts *in vivo*, we found axonal misrouting at the midline (Fig. 5K). These results indicate that ZIKV infection compromises an important step of corpus callosum formation.

Axonal misrouting could be explained by the lack of axonal guidance signaling, which is provided by midline glial cells (Shu *et al.*, 2003). In mouse models of ZIKV infection, glial cells are also disrupted. Li and collaborators (2018) noticed that mice infected at E15 and evaluated at P5 showed a reduced number of oligodendrocytes in the corpus callosum. Here, we observed that during development infected animals showed a reduction of GFAP+ midline astrocytes (Fig. 6A-D), suggesting that these cells populations are impaired, and therefore indicating that the virus is capable of infecting different cell populations in the brain.

An important limitation of our work is to clearly show that the observed effects were caused directly by the viral infection and were not derived from inflammatory responses. ZIKV infection produces a strong inflammatory response and during embryonic development, inflammatory molecules are known to contribute to neurodevelopmental disorders (Jiang *et al.*, 2018) In agreement with other studies that investigate the effect of ZIKV infection on gene expression, our results

demonstrated an upregulation of genes that are involved in viral infection, immune and inflammatory response (Li *et al.*, 2016; Shao *et al.*, 2016; Chang *et al.*, 2021). Despite the strong presence of inflammatory factors, ZIKV infection also deregulates key genes important for neurodevelopment (Barbeito-Andrés *et al.*, 2020; Chang *et al.*, 2021), which was also observed in our work (Fig.7). Semaphorins and Ephrins are a family of proteins that act on axonal guidance by attracting or repelling growing axons at the midline (Hu *et al.*, 2003; Mire *et al.*, 2018). Interestingly, our transcriptome analysis showed that genes that belong to these families are downregulated (*sema3c*, *sema6b*, *epha7*). Together, the reduction of GFAP+ marker of midline glia and the lower expression levels of cue molecules may generate a poor signaling environment for crossing axons at the midline. Moreover, *tubb3* is downregulated and has been described in the literature as an important gene to the formation of commissural structures (Tischfield *et al.*, 2010). Also, our data showed that *actb*, a key protein-coding gene is deregulated. β -actin is a cytoskeleton protein that structurally composes the axon growth cone, which is responsible for identifying the molecular guidance cues. For example, Netrin1, a well-established guidance molecule, is known to modulate the levels of β -actin local expression at the growth cone (Leung *et al.*, 2006). Another gene that was downregulated in our analysis is *calb2* that encodes for a calcium-binding protein calretinin (CR). A transient population of neurons that express CR is necessary to guide axons through the midline region together with the midline glia (Niquille *et al.*, 2009). Our results demonstrated that in addition to the inflammatory response, genes important for axon guidance and outgrowth are deregulated. Our GO enrichment analysis pointed that the genes involved in synapse formation and axon terminal structure were downregulated in infected brains. Similar processes involving axon and dendrite development were found to be deregulated in previous work (Chang *et al.*, 2021).

As the formation of corpus callosum comprises complex steps of development, this is the first study to suggest a mechanism by which ZIKV infection interferes with the formation of corpus callosum during embryonic development. These findings contribute to our understanding of the pathophysiology of ZIKV infection. CSZ patients exhibit a range of brain abnormalities that are not always associated with microcephaly (Nielsen-Saines *et al.*, 2019). The ability of ZIKV to disturb critical steps of corpus callosum development reveals the importance of monitoring pregnant women who have been exposed to ZIKV and doing a follow-up of their

newborns since corpus callosum continues to develop postnatally (Moldrich *et al.*, 2010).

Further studies should address whether the changes in axonal extension and axon guidance can be explained by the lack of key players that are crucial for cortical development, either produced by the midline glia, which are altered in our work, or by other cells that also play this role.

Materials and Methods

Animals and ZIKV infection

Pregnant Swiss mice were housed in the Animal Care Facility of the Microbiology Institute of the Federal University of Rio de Janeiro and maintained in standard animal housing with food and water *ad libitum* and circadian cycles of 12 hours light/12 dark. All procedures were approved by the Committee on Ethics of Animal Use for Research of the Federal University of Rio de Janeiro, protocol 040/19.

Pregnant dams were anesthetized, and the uterus exposed to handle the embryos carefully. A volume of 1.5 µl of a Brazilian ZIKV isolate (Recife/Brazil, ZIKV PE/243, accession no: KX197192.1) or MOCK was injected into one side of the lateral ventricle of the embryonic mouse brain. On E15, mice were injected with 10⁴ PFU of ZIKV brain tissues were harvested either E18 and P4. On E13, mice were injected with 30 PFU of ZIKV and harvested either E16, E18, and P0.

Virus detection

Viral RNA was extracted from primary neuronal culture supernatant after four days *in vitro* (4DIV) with 3 days post infection (3dpi), with the RNeasy Plus Mini Kit (QIAGEN), following the recommendations of the manufacturer. To determine the viral load of these samples, reverse transcription of viral RNA followed by quantitative PCR was performed with GoTaq® Probe 1-Step RT-qPCR System (Promega) on a 7500 Real-Time PCR System (Applied Biosystems), using primers and probe described by Lanciotti *et al.* (Lanciotti *et al.*, 2008). ZIKV RNA copies were

calculated by interpolation onto a standard curve composed of eight 10-fold serial dilutions of a synthetic ZIKV RNA based on the region targeted by the set of primers and probe. The ZIKV quantification was expressed as ZIKV RNA copies per gram of tissue.

Quantification of infectious particles was performed by plaque assay. Brain tissue was mechanically homogenised with ultra turrax T10 (ika) in 1 ml of DMEM supplemented with 2% fetal bovine serum and 2x penicillin/streptomycin. Brain tissue homogenates were centrifuged at 3400 x g for 5 minutes. The clarified supernatants were serially diluted and incubated with confluent monolayers of vero cells. Virus titers were determined by plaque assay performed on Vero cells. Virus stocks or samples were serially diluted and adsorbed to confluent monolayers. After 1 h, the inoculum was removed, and cells were overlaid with semisolid medium composed of alpha-MEM (GIBCO) containing 1.25% carboxymethyl cellulose (Sigma Aldrich) and 1% FBS (GIBCO). Cells were further incubated for 5 days when cells were fixed in 4% formaldehyde. Cells were stained with 1% crystal violet in 20% ethanol for plaque visualization. Titers were expressed as plaque-forming units (PFU) per gram.

Primary neuronal culture and infection

Pregnant dams were euthanized by cervical dislocation after anesthesia. E14 brains were harvested and dissected, followed by mechanical dissociation of the cerebral cortex with a micropipette into a cell suspension. The dissociation of cortical tissue was done in Neurobasal in a final volume of 1ml. 100,000 cells were added per plate with Neurobasal culture medium supplemented with 2% B27 and antibiotics, then kept in the incubator under 5% CO₂ at 37°C. After 1DIV, cortical neurons were exposed to ZIKV (MOI 1) or MOCK. After 1 hour, the original culture medium was returned to the culture and the neurons were incubated for further 3 days (3dpi). With 4DIV, the culture was fixed with 4% paraformaldehyde for further immunohistochemical analysis.

Immunohistochemistry and imaging

Embryonic brains were fixed with 4% paraformaldehyde overnight, cut coronally at 70 µm with a vibratome (VT1000S, Leica, Germany), and stored in 0.01% PBS. After standard antigenic retrieval, coronal sections were permeabilized with 0.1% Triton X-100 (Sigma-Aldrich, USA) and incubated with 3% bovine serum albumin (Sigma-Aldrich, USA) for 2h. Next, the following primary antibodies were incubated overnight: mouse anti-SATB2:200 (GenWay 20-372-60065); rabbit anti-PH3 1:500 (Millipore 06-570); mouse anti-GFAP 1:200 (Sigma G3893); rabbit anti-TBR2 1:500 (Abcam AB23345); rabbit anti-Caspase3 1:300 (Cell signaling 9664); anti-IBA1 1:1000 (Wako 019-19741) and mouse anti-NS1 1:10. Subsequently, samples were washed with PBS and incubated with secondary antibodies: goat anti-rabbit Alexa Fluor 488 1:500 AP132JA4 (Millipore, Etobicoke, CAN) and goat anti-mouse Alexa 546 1:500 AP192SA6 (ThermoFisher Scientific, USA). Nuclei were stained with DAPI (0.5 mg/ml) for 20 min. Images were acquired with a TCS SP8 confocal microscope (Leica, Germany) with an oil immersion 20x objective of high numerical apertures (NA). Analyses of the acquired images were carried out using Fiji software.

Immunocytochemistry and quantitative analyses

Three different experiments were carried out in duplicates for further analysis. Immunocytochemistry was carried out similarly after vibratome brain sections. The following primary antibodies were used: rabbit SATB2 1:200 (Abcam AB34735);

mouse Tuj1 1:100 (Millipore MAB1637). For evaluation of the axonal length, approximately 30 cells per well were equally analyzed under the experimental conditions. To establish a comparison criterion, the largest axons of positive DAPI/SATB2/TUJ1 neurons were chosen to be analysed in the two experimental groups. Axonal length was measured on ImageJ, outlining the extension of the largest neurite from the cell body to the growth cone. To quantify the number of cells, images of five different fields were taken at random (20x magnitude) in each well. The number of DAPI+ and DAPI+/SATB2+ cells was counted in each photo and the percentage of DAPI+/SATB2+ cells in relation to DAPI+ is extracted.

Histology

Nissl staining (cresyl-violet) was used to quantify the corpus callosum area of animals. After fixation, brains were split at the midline and sectioned parasagittally in the vibratome (150 µm). The sections were then stained with cresyl-violet, (Sigma-Aldrich) for 8 minutes, then dehydrated with ethanol at different concentrations (75%, 95%, and 100%) for 5 minutes each. After dehydration, the sections were immersed in 100% Xylol (Sigma-Aldrich) for 10 minutes, and the slides were cover slipped with Entellan.

Dye labelling

Dil (1,1'-dioctadecyl-3,3',3'-tetramethyl-indocarbocyanine perchlorate, Invitrogen) is a lipophilic dye used as an axonal tracer for fixated tissue. After tissue collection and fixation, a Dil crystal was inserted into the pial surface of the dorsolateral parietal cortex of E18 embryos and incubated for 2 weeks in PBS for diffusion from the cell body to the fibers. After incubation, the brains were serially sectioned in a vibratome (150 µm), at the coronal plane, and analyzed under a fluorescence Zeiss Axioimager Microscope.

Isotropic Fractionator for total and neuronal cell counting

To assess the total number of cells, the isotropic fractionator technique was performed as described by Valério-Gomes et al., 2018. Briefly, brains of P4 mouse pups were collected and fixed in 4% PFA by immersion for two weeks. Then, the cerebral cortex was dissected, weighed, and mechanically dissociated for 15 min

using a glass tissue homogenizer (PyrexTM) with buffer-detergent solution (40 ml sodium citrate + 1% Triton X-100). A suspension of nuclei was transferred to 15ml falcon tubes and then prepared by adding 0.1M of phosphate buffer saline (PBS) until reaching a 5ml of final volume. From this homogeneous suspension, a 1ml aliquots was taken and 2% of DAPI (20mg/L) was added for total cell quantification in the Neubauer chamber using a Axioimager fluorescence microscope (Zeiss). The total number of cells was estimated by multiplying the mean nuclear density by the total suspension volume and 15.625 (Neubauer factor number for 16 squares counted). Pyknotic nuclei were counted in parallel with total DAPI nuclei by observations of the presence of small and degenerated DAPI+ nuclei. From this same suspension, other aliquots of 1ml were taken for immunocytochemistry. To identify and count callosal neurons, immunocytochemistry was performed using the nuclear SATB2 antibody. For that, aliquots were centrifugated and washed trice in 0.1M PBS (1,500RPM, 5 min each) and then incubated with 1:200 mouse anti-SATB2:200 (GenWay 20-372-60065) in blocking solution (2µl BSA 5%, 30µl NGS and PBS to a complete volume of 200) for up to 48h in agitation at 4-8°C. After three centrifugations, aliquots were incubated with 1:500 Alexa 546 anti-mouse in the same blocking solution in agitation at room temperature for 2h. To estimate the SATB2 absolute number, the percentage obtained by counting SATB2+ positive nuclei in 500 DAPI+ nuclei was multiplied by the total number of cells.

Total RNA isolation, library construction, and sequencing

A total of 8 frozen brain samples (five controls and three infected with ZIKV) were processed in TissueLyser® (Qiagen) for 30 seconds at 30Hz for cell disruption, using Stainless Steel Grinding Balls. Total RNA isolation was performed with an in-house protocol based on TRIzol® Reagent (Thermo Fisher Scientific), Chloroform and isopropyl alcohol. Total RNA quantitation was performed with Qubit RNA HS Assay kit (Thermo Fisher Scientific, USA) and RNA quality was assayed on an Agilent 2100 Bioanalyzer using the Agilent RNA 6000 Pico Kit (Agilent Technologies, USA). Libraries were built using TruSeq Stranded Total RNA Library Prep Kits (Illumina, USA) according to the manufacturer's instructions. To analyse final libraries fragment size distribution and quantify them, we used Agilent 2100 BioAnalyzer and High Sensitivity DNA Kit (Agilent Technologies, USA), and a qPCR-based KAPA library quantification kit (KAPA Biosystems, USA). Finally, libraries

were pooled using a final concentration of 20 pM and subjected to paired-end sequencing using Illumina HiSeq 2500 (Illumina, USA) platform and HiSeq Paired-End Cluster Kits v4.

RNA-Seq analysis

The quality of the raw sequenced Illumina reads was assessed using FastQC 0.11.9 (Andrews *et al.*, 2012). Quality and adapter trimming was performed with Trim Galore! 0.6.6 (Krueger, 2015) using a default phred score of 20. After that, the trimmed reads were mapped to the GRCm39 (M27) mouse genome reference assembly (Frankish *et al.*, 2019) using STAR 2.7.9a (Dobin *et al.*, 2013) and counted with HTseq (Anders, Pyl and Huber, 2014). The edgeR (Robinson, McCarthy and Smyth, 2009) package was used to normalize the data with the TMM method and to test for differentially expressed genes using the exactTest function (p-value < 0.05). Then, the differentially expressed genes were used to perform GO over-representation analysis (Benjamini Hochberg adjusted p-value<0.05) using clusterProfiler v3.18.1 [7] in the R statistical environment [8]. The relationships between enriched GO terms and genes were visualized using circos plots generated by the R package GO plot 1.0.2 [9].

Statistical Analysis

Statistical analysis was performed using GraphPad Prism 8. *In vivo* experimental data were analysed using unpaired Student's t-test. For *in vitro* experiments statistical analysis was considered as paired. Data are expressed as mean $\pm$ S.D. For each independent experiment at least 3 animals were used per group. *p < 0.05, **p < 0.005 and *** p < 0.0005; **** p < 0.00005.

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Author contribution

R.R.C. concept/design, data acquisition, analysis and interpretation, J.H.Q, R.O.F, J.C.C.G.F., D.M.G., B.V-G, data acquisition and analysis; **L.M.H** and **A.D.R.**, provided the viral titration and viral qPCR, **J.M.V** and J.L.S.G. performed the RNA-Seq experiments and bioinformatics, **M.B.**, **A.T.**, **R.L** provided supervision and lab facility; **P.P.G** supervised, conceived and designed the experiments. All authors contributed to the manuscript writing and critical review.

Conflict of interest

The authors declare that there is no conflict of interest

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Figure 1

605 **Figure 2**

606

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

621 **Supplementary Fig.1**

622

Supplementary Fig.2

Table S1.

ENSEMBL version ID	logFC	logCPM	adj. Pval	Gene symbol
ENSMUSG00000059040.6	-6,8169	4,38846	5,67E-111	Eno1b
ENSMUSG00000058126.8	-6,13417	5,467161	1,705E-89	Tpm3-rs7
ENSMUSG00000064193.9	-5,87355	3,633593	9,343E-72	NA
ENSMUSG00000110727.2	-5,38219	-0,395689	1,242E-12	NA
ENSMUSG00000074482.6	-4,60332	0,435466	1,188E-17	NA
ENSMUSG00000042962.6	-3,952	1,715521	6,744E-18	Gm5436
ENSMUSG00000101523.3	-3,7244	2,679457	6,4E-06	Csnk2a3

ENSMUSG00000082491.2	-3,58316	0,550121	9,41E-22	NA
ENSMUSG00000045055.6	-3,45189	2,114569	0,0005057	Rpsa-ps2
ENSMUSG00000046101.17	-3,26657	0,132072	1,292E-13	Mcmcdc2
ENSMUSG00000030672.13	-3,22907	1,917039	0,0039795	Myipf
ENSMUSG00000040950.14	-3,05304	-0,844589	2,639E-07	Mgl2
ENSMUSG00000085783.4	-2,88021	1,220809	0,0034404	NA
ENSMUSG00000067189.6	-2,84387	0,977203	3,798E-08	NA
ENSMUSG00000091400.2	-2,81897	-0,856724	0,0116932	NA
ENSMUSG00000068614.8	-2,66655	1,028314	0,0352683	Actc1
ENSMUSG00000060019.7	-2,42351	1,504486	0,0017357	NA
ENSMUSG00000020660.7	-2,42043	2,024319	0,0241261	Pomc
ENSMUSG00000027014.15	-2,21965	6,330994	0,0122845	Cwc22
ENSMUSG00000061723.19	-2,19682	1,327532	0,0122325	Tnnt3
ENSMUSG00000019836.6	-2,15769	0,146431	0,0009229	NA
ENSMUSG00000031972.6	-2,00036	3,324205	0,0092405	Acta1
ENSMUSG00000037716.16	-1,95449	-0,134097	5,47E-07	Ccdc33
ENSMUSG00000060938.15	-1,92802	6,994747	8,379E-21	Rpl26
ENSMUSG00000110126.2	-1,87498	1,579536	0,0051368	Gm9347
ENSMUSG00000029306.9	-1,8713	0,361456	7,923E-05	Ibsp
ENSMUSG00000074479.4	-1,73178	1,74107	0,0403998	NA
ENSMUSG00000049353.18	-1,6703	0,699746	1,888E-05	Rd3
ENSMUSG00000032572.10	-1,63668	2,628803	0,0251524	Col6a4
ENSMUSG00000062611.5	-1,57078	3,980215	0,0238068	Rps3a2
ENSMUSG00000027861.14	-1,55143	0,095954	0,0118663	Casq2
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ENSMUSG00000027559.6	-1,51198	1,221934	0,0009285	Car3
ENSMUSG00000085882.2	-1,50478	0,922773	0,0207479	NA
ENSMUSG00000008845.10	-1,46455	2,040073	4,909E-06	Cd163
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ENSMUSG00000056071.13	-1,35556	0,164635	0,0065379	S100a9
ENSMUSG00000102600.2	-1,33196	-0,491792	0,001797	NA
ENSMUSG00000030607.8	-1,32586	0,71299	0,0030696	Acan
ENSMUSG00000102420.2	-1,26907	-0,394519	0,0040249	NA
ENSMUSG00000031461.5	-1,25299	0,177082	0,0148263	Myom2
ENSMUSG00000078684.9	-1,24831	3,784714	1,392E-10	NA
ENSMUSG00000117824.2	-1,23788	-0,366355	0,0091945	NA
ENSMUSG00000100215.2	-1,2009	1,75154	0,0016524	Gm8292
ENSMUSG00000027386.10	-1,19713	1,044026	0,0053121	Fbln7
ENSMUSG00000102504.2	-1,19145	-0,49623	0,0217701	NA
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ENSMUSG00000001865.3	-1,1837	-0,757221	0,0379129	Cpa3
ENSMUSG00000063953.4	-1,17867	1,804648	0,0321839	Amd2
ENSMUSG00000027859.11	-1,1502	-0,699549	0,0379478	Ngf
ENSMUSG00000020911.15	-1,13004	0,817851	0,0091209	Krt19

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ENSMUSG00000048489.13	-1,09638	1,627707	3,217E-06	Depp1
ENSMUSG00000049641.16	-1,09035	-0,009134	0,0023215	Vgll2
ENSMUSG00000028648.14	-1,07631	4,562019	5,338E-12	Ndufs5
ENSMUSG00000030218.3	-1,07356	2,050472	0,0053415	Mgp
ENSMUSG00000107173.2	-1,07055	0,167299	0,0110556	NA
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ENSMUSG00000113646.2	-1,01828	1,765638	2,045E-05	NA
ENSMUSG00000034579.18	-1,01624	3,505569	0,0007482	Pla2g3
ENSMUSG00000108676.2	-1,01559	-0,366156	0,0112201	1700123J17Rik
ENSMUSG00000039021.16	-1,00984	-0,210575	0,0399674	Ttc16
ENSMUSG00000085175.8	-1,00858	0,159006	0,0059129	Gm11423
ENSMUSG00000075296.6	-0,99706	-0,440788	0,0184074	Aldh3b2
ENSMUSG00000065126.3	-0,98811	1,391605	0,0002187	Snord104
ENSMUSG00000044951.18	-0,98344	-0,072082	0,0063539	Mylk4
ENSMUSG00000025784.6	-0,981	3,150365	0,0086006	Clec3b
ENSMUSG00000089769.2	-0,97939	0,099903	0,0058291	Gm16574
ENSMUSG00000083064.2	-0,97264	0,281403	0,0109428	NA
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ENSMUSG00000105851.2	-0,88348	-0,14307	0,0249248	NA
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ENSMUSG000000083811.2	-0,8706	0,1781	0,0135915	NA
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ENSMUSG000000091971.4	-0,86121	0,637132	0,0470599	Hspa1a
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ENSMUSG000000023873.14	-0,85181	1,491826	0,0012537	1700010I14Rik
ENSMUSG000000051456.5	-0,84142	-0,211313	0,0229158	Hspb3
ENSMUSG000000093908.3	-0,83985	0,377482	0,0262911	NA
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ENSMUSG000000047686.10	-0,82543	0,850024	0,0136174	Rtl3
ENSMUSG000000095990.2	-0,82499	0,744812	0,0129759	Zfp97
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ENSMUSG000000091443.2	-0,81815	-0,490542	0,0432174	NA
ENSMUSG000000053310.12	-0,81696	5,173062	4,158E-05	Nrgn
ENSMUSG000000059213.8	-0,81317	4,177372	0,0002239	Ddn
ENSMUSG000000066652.6	-0,80336	1,295916	0,0035602	Lefty2
ENSMUSG000000041957.16	-0,80036	1,805286	0,0147414	Pkp2
ENSMUSG000000046618.8	-0,79951	3,455821	0,0136067	Olfml2a
ENSMUSG000000109372.2	-0,79843	1,801634	0,0069239	Gm19410
ENSMUSG000000042988.11	-0,79822	1,205309	0,0019228	Notum
ENSMUSG000000042064.14	-0,79519	1,372104	0,0044003	Myo3b
ENSMUSG000000052031.9	-0,79196	3,780953	4,535E-05	Tagap1
ENSMUSG000000087694.9	-0,78885	1,861841	0,0020688	A530058N18Rik
ENSMUSG000000020591.12	-0,78709	2,391761	6,581E-05	Ntsr2
ENSMUSG000000104178.2	-0,77121	1,320196	0,0057873	NA
ENSMUSG000000032269.9	-0,77004	1,719879	0,0171579	Htr3a
ENSMUSG000000019303.15	-0,76884	3,688944	0,0028742	Psmc3ip
ENSMUSG000000073063.4	-0,76782	0,248734	0,0287032	Hbq1b
ENSMUSG000000024121.14	-0,76748	6,454741	0,001422	Atp6v0c
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ENSMUSG000000108841.2	-0,75622	-0,221184	0,042212	Frmpd2
ENSMUSG000000116525.2	-0,75574	-0,084039	0,0443796	NA
ENSMUSG000000090084.8	-0,75302	1,067444	0,006319	Srpx
ENSMUSG000000042788.13	-0,74896	0,881066	0,0126311	Fam166b
ENSMUSG000000035745.10	-0,744	-0,09518	0,0353093	Grin3b
ENSMUSG000000028139.6	-0,73548	0,586545	0,0150327	Riad1

ENSMUSG000000113959.2	-0,7289	0,5048	0,0123718	NA
ENSMUSG00000022235.16	-0,72739	2,647469	4,242E-05	Cmb1
ENSMUSG00000028864.8	-0,72611	1,272132	0,0015815	Hgf
ENSMUSG00000049892.8	-0,72562	0,125477	0,0246393	Rasd1
ENSMUSG00000007655.17	-0,7208	5,134598	6,231E-10	Cav1
ENSMUSG00000030340.17	-0,71139	0,652929	0,0135634	Scnn1a
ENSMUSG00000020948.10	-0,71117	5,226972	3,966E-09	Klhl28
ENSMUSG000000113174.2	-0,70891	1,430826	0,0033079	NA
ENSMUSG00000029054.9	-0,70329	1,005708	0,0189148	Gabrd
ENSMUSG00000024039.16	-0,70044	3,968397	6,773E-06	Cbs
ENSMUSG00000063428.9	-0,70018	1,232767	0,015789	Ddo
ENSMUSG00000029602.12	-0,69917	3,750093	0,0019465	Rasal1
ENSMUSG00000071984.12	-0,69894	3,36765	0,0053669	Fndc1
ENSMUSG00000090698.3	-0,69569	3,00335	0,0103542	Apold1
ENSMUSG00000019890.5	-0,69398	4,747599	0,0020796	Nts
ENSMUSG00000034875.6	-0,69177	4,61448	5,493E-05	Nudt19
ENSMUSG00000035258.16	-0,69075	0,61509	0,0294641	Abi3bp
ENSMUSG00000036214.15	-0,6903	1,044767	0,0181	Znrd1as
ENSMUSG00000082809.4	-0,68617	3,676341	0,0349404	Gm14150
ENSMUSG00000032511.18	-0,68513	3,381102	0,0083212	Scn5a
ENSMUSG00000095677.3	-0,68246	3,552863	0,0005722	Dynlt1f
ENSMUSG00000031610.4	-0,67733	2,743043	0,0008913	Scrg1
ENSMUSG00000029061.3	-0,67645	1,112615	0,0258204	Mmp23
ENSMUSG00000021388.15	-0,67613	0,82053	0,0379226	Aspn
ENSMUSG00000007888.16	-0,67441	3,442591	0,0073832	Crlf1
ENSMUSG00000000805.19	-0,67004	1,916229	0,0011338	Car4
ENSMUSG00000058624.14	-0,6661	5,332015	0,0018959	Gda
ENSMUSG00000090066.3	-0,66561	1,365393	0,0384196	1110002E22Rik
ENSMUSG00000059456.14	-0,66417	3,965046	0,0118408	Ptk2b
ENSMUSG000000112278.2	-0,66365	0,522739	0,0367543	NA
ENSMUSG00000020061.19	-0,66215	2,355133	0,0371697	Mybpc1
ENSMUSG00000055027.18	-0,66145	0,431268	0,0269269	Smyd1
ENSMUSG00000093579.2	-0,65914	0,114234	0,0483117	NA
ENSMUSG00000007682.8	-0,65675	2,920686	0,0024563	Dio2
ENSMUSG00000046922.8	-0,65413	0,917333	0,011941	Gpr6
ENSMUSG00000033327.19	-0,64816	2,539978	0,0108453	Tnxb
ENSMUSG00000032773.10	-0,64687	3,947427	0,0004399	Chrm1
ENSMUSG00000034936.3	-0,64634	3,665122	8,021E-05	Arl4d
ENSMUSG000000110249.2	-0,64405	1,031647	0,0091863	NA
ENSMUSG00000041828.16	-0,64097	3,005896	0,0026926	Abca8a
ENSMUSG00000004473.11	-0,63763	1,334338	0,0343808	Clec11a
ENSMUSG00000092074.3	-0,63323	4,403079	0,0003289	Dynlt1a
ENSMUSG00000044916.11	-0,63133	1,532587	0,0269598	1700029I15Rik
ENSMUSG00000085603.4	-0,62786	0,798009	0,0206949	NA
ENSMUSG00000000766.19	-0,62666	1,423943	0,0164753	Oprm1

ENSMUSG00000029819.7	-0,6218	4,912281	0,000927	Npy
ENSMUSG00000042567.21	-0,61965	1,376787	0,0276564	Nek10
ENSMUSG000000116953.2	-0,61721	2,229047	0,0306194	9030025P20Rik
ENSMUSG00000015568.17	-0,61506	5,051339	0,0021266	Lpl
ENSMUSG000000032298.14	-0,61103	3,924852	8,459E-07	Neil1
ENSMUSG000000105218.5	-0,61068	0,744034	0,0259101	Gm38413
ENSMUSG000000033730.5	-0,60487	2,615415	0,0061301	Egr3
ENSMUSG000000036412.6	-0,60379	2,345975	0,0238723	Arsi
ENSMUSG000000112763.2	-0,60363	0,698896	0,0310276	Gm34304
ENSMUSG000000027868.12	-0,60359	1,843948	0,0271509	Tbx15
ENSMUSG000000061878.17	-0,60276	2,19567	0,0187033	Sphk1
ENSMUSG000000052146.17	-0,59958	2,009541	0,0165455	Rps10
ENSMUSG000000028047.12	-0,59813	5,970838	5,565E-05	Thbs3
ENSMUSG000000054027.9	-0,59547	6,429816	4,655E-09	Nt5dc3
ENSMUSG000000081684.5	-0,59546	6,714575	0,0243256	Rps2-ps13
ENSMUSG000000053746.9	-0,59145	0,816738	0,025088	Pthr1
ENSMUSG000000026616.17	-0,59002	1,350798	0,0263598	Cr2
ENSMUSG000000113332.2	-0,58818	0,917261	0,0148773	NA
ENSMUSG000000040373.13	-0,58628	4,051117	0,0003991	Cacng5
ENSMUSG000000003541.7	-0,58529	1,862316	0,0223795	Ier3
ENSMUSG000000090877.4	-0,58149	2,561886	0,0189651	Hspa1b
ENSMUSG000000113294.2	-0,58106	0,988072	0,0357024	NA
ENSMUSG000000037579.8	-0,57876	4,020856	0,0020704	Kcnh3
ENSMUSG000000029032.13	-0,57865	1,342833	0,0215269	Arhgef16
ENSMUSG000000079657.11	-0,57416	2,533547	0,0018882	Rab26
ENSMUSG000000024033.11	-0,57366	2,15607	0,0309677	Rsph1
ENSMUSG000000024517.18	-0,57286	2,29847	0,0082222	Grp
ENSMUSG000000009376.16	-0,57006	4,605106	0,0039816	Met
ENSMUSG000000010362.10	-0,56723	1,993131	0,0153253	Rdm1
ENSMUSG000000048001.8	-0,56478	3,260495	0,0006023	Hes5
ENSMUSG000000034796.15	-0,56316	4,81666	0,0119345	Cpne7
ENSMUSG000000000301.17	-0,56201	1,473461	0,025054	Pemt
ENSMUSG000000015656.18	-0,5619	10,25355	5,929E-08	Hspa8
ENSMUSG000000108591.2	-0,56077	3,475196	0,000534	Particl
ENSMUSG000000097908.8	-0,56058	4,775738	1,139E-08	4933404O12Rik
ENSMUSG000000034353.15	-0,55807	3,221754	0,0272901	Ramp1
ENSMUSG000000032011.6	-0,5575	5,401326	0,0193614	Thy1
ENSMUSG000000003872.10	-0,55687	2,485723	0,0130745	Lin7b
ENSMUSG000000053553.12	-0,55594	3,195679	0,0006165	3110082I17Rik
ENSMUSG000000106905.2	-0,555	1,910703	0,0176114	NA
ENSMUSG000000097055.3	-0,552	1,410391	0,0320804	Gm4419
ENSMUSG000000059173.20	-0,54771	4,746938	0,0003431	Pde1a
ENSMUSG000000020928.15	-0,54729	2,015879	0,0129096	Higd1b
ENSMUSG000000024525.8	-0,54615	2,429901	0,0075719	Impa2
ENSMUSG000000032532.8	-0,54282	3,851822	0,002423	Cck

ENSMUSG00000027524.10	-0,54205	2,697325	0,0308552	Edn3
ENSMUSG00000079470.9	-0,54166	3,687717	0,00339	Utp14b
ENSMUSG00000061353.12	-0,54075	5,963078	0,0006802	Cxcl12
ENSMUSG00000063320.12	-0,53938	1,184196	0,034337	1190007I07Rik
ENSMUSG00000049112.10	-0,5383	2,688686	0,0023306	Oxtr
ENSMUSG00000027387.12	-0,53736	3,082646	0,011528	Zc3h8
ENSMUSG00000019761.11	-0,53603	2,953324	0,0016072	Krt10
ENSMUSG00000098912.8	-0,53601	5,429114	3,046E-07	1500004A13Rik
ENSMUSG00000050914.17	-0,53282	2,438651	0,0056817	Ankrd37
ENSMUSG000000113835.2	-0,53272	1,471618	0,0394185	NA
ENSMUSG00000044033.17	-0,5306	4,164323	4,36E-06	Ccdc141
ENSMUSG00000049721.15	-0,52908	2,397571	0,0186167	Gal3st1
ENSMUSG000000112941.2	-0,5267	0,861833	0,0443519	NA
ENSMUSG00000027133.4	-0,52335	4,967788	3,064E-07	Nop10
ENSMUSG00000038007.15	-0,52301	3,372907	0,0082322	Acer2
ENSMUSG00000030108.15	-0,51999	4,98332	0,0186607	Slc6a13
ENSMUSG00000070570.6	-0,51653	5,626264	0,0212368	Slc17a7
ENSMUSG00000059412.8	-0,5157	1,425352	0,0262082	Fxyd2
ENSMUSG00000035805.14	-0,51345	5,644655	0,0001173	Mlc1
ENSMUSG00000021508.12	-0,51316	3,520177	0,0007423	Cxcl14
ENSMUSG00000039194.17	-0,51256	5,119097	1,964E-06	Rlbp1
ENSMUSG000000105692.2	-0,51176	3,037125	0,001952	NA
ENSMUSG00000038244.15	-0,51119	5,641036	0,0071439	Mical2
ENSMUSG00000003271.18	-0,50794	3,016456	0,0033248	Sult2b1
ENSMUSG00000021534.9	-0,50769	2,923554	0,0160245	1700001L19Rik
ENSMUSG00000045031.19	-0,50567	1,599793	0,0381045	Cetn4
ENSMUSG00000037379.8	-0,50398	1,458864	0,035827	Spon2
ENSMUSG00000086213.3	-0,5017	1,934079	0,0431799	A330040F15Rik
ENSMUSG00000031070.16	-0,50126	2,22088	0,0233271	Mrgprf
ENSMUSG00000003657.10	-0,49914	6,009038	0,000501	Calb2
ENSMUSG00000028619.16	-0,49901	4,55044	1,663E-05	Tceanc2
ENSMUSG00000097683.3	-0,49877	2,212896	0,0407653	Gm26644
ENSMUSG00000037428.15	-0,49788	5,345689	0,0086108	Vgf
ENSMUSG00000020905.12	-0,49464	3,592979	0,0298878	Usp43
ENSMUSG00000023571.5	-0,49326	2,538857	0,0468283	C1qtnf12
ENSMUSG00000044534.9	-0,48822	1,651302	0,0251614	Ackr2
ENSMUSG00000029718.15	-0,48691	3,305826	0,0271607	Pcolce
ENSMUSG00000046160.7	-0,48547	5,957964	0,0029816	Olig1
ENSMUSG00000032281.12	-0,48524	5,145359	0,001411	Acsbg1
ENSMUSG00000041453.13	-0,48359	7,819089	0,0001683	Rpl21
ENSMUSG00000020766.5	-0,48039	4,339797	1,505E-05	Galk1
ENSMUSG00000017491.10	-0,47968	2,57351	0,0257705	Rarb
ENSMUSG00000032936.14	-0,47956	7,698372	0,0010334	Camkv
ENSMUSG00000032503.19	-0,47759	6,19776	0,001512	Arpp21
ENSMUSG00000026389.17	-0,47602	2,15906	0,0371633	Steap3

ENSMUSG00000032051.10	-0,47305	3,343759	0,001224	Fdx1
ENSMUSG00000033863.3	-0,47177	3,779548	0,0393188	Klf9
ENSMUSG00000027956.12	-0,47154	1,395341	0,0312062	Tmem144
ENSMUSG00000032492.15	-0,47077	3,698687	0,0041184	Pth1r
ENSMUSG00000018387.13	-0,46978	1,820257	0,0329967	Shroom1
ENSMUSG00000000876.12	-0,46917	3,052427	0,0092311	Pxmp4
ENSMUSG00000020513.16	-0,46864	2,593074	0,0156122	Tubd1
ENSMUSG00000022525.14	-0,46669	2,32419	0,0356149	Plaat1
ENSMUSG00000095105.3	-0,46413	2,519139	0,0080036	Edaradd
ENSMUSG00000027568.10	-0,46249	4,944211	0,0040479	Ntsr1
ENSMUSG00000089774.3	-0,46244	6,065676	6,249E-07	Slc5a3
ENSMUSG00000016995.18	-0,461	2,963549	0,0216928	Matn4
ENSMUSG00000040147.15	-0,46042	1,964115	0,0185484	Maob
ENSMUSG00000028004.13	-0,45931	2,301847	0,0206243	Npy2r
ENSMUSG000000101856.2	-0,45901	1,516439	0,0476065	1700096K18Rik
ENSMUSG00000041696.15	-0,45882	2,682151	0,0173167	Rasl12
ENSMUSG00000055958.4	-0,45731	1,902457	0,027404	NA
ENSMUSG00000038760.15	-0,45485	2,623822	0,0342352	Trhr
ENSMUSG00000035105.6	-0,45429	3,992846	0,0004921	Egln3
ENSMUSG00000031765.9	-0,45035	3,831855	0,0451714	Mt1
ENSMUSG00000076439.13	-0,44716	4,253195	0,0092304	Mog
ENSMUSG00000048240.15	-0,44665	6,015643	3,533E-05	Gng7
ENSMUSG00000036856.5	-0,44641	3,988329	0,0030626	Wnt4
ENSMUSG00000037010.8	-0,44631	3,288681	0,0048374	Apln
ENSMUSG00000050953.11	-0,44612	7,107052	0,0141831	Gja1
ENSMUSG00000032251.13	-0,44396	4,527745	0,004731	Irak1bp1
ENSMUSG00000060735.5	-0,44185	2,729686	0,0376641	Rxfp3
ENSMUSG00000017453.5	-0,44042	2,613395	0,0235174	Pipox
ENSMUSG000000104960.2	-0,43968	3,302763	0,0049749	Snhg8
ENSMUSG00000064080.13	-0,43647	5,154064	0,0004663	Fbln2
ENSMUSG00000031760.10	-0,43589	5,470946	0,0005608	Mt3
ENSMUSG00000026259.15	-0,43573	5,344841	0,0010923	Ngef
ENSMUSG000000118642.2	-0,43476	3,287802	0,0269659	NA
ENSMUSG00000056306.7	-0,4338	5,23992	0,0001488	Sertm1
ENSMUSG00000027848.13	-0,43328	2,790421	0,033746	Olfml3
ENSMUSG00000050505.8	-0,4331	3,991576	0,0002533	Pcdh20
ENSMUSG00000022861.18	-0,43232	3,164952	0,0212556	Dgkg
ENSMUSG00000030905.6	-0,43119	4,662152	0,021722	Crym
ENSMUSG00000059970.8	-0,43033	2,51863	0,042054	Hspa2
ENSMUSG00000066842.19	-0,42991	3,502214	0,0359456	Hmcn1
ENSMUSG00000026090.17	-0,42983	3,542887	0,0041791	Cracdl
ENSMUSG00000021125.7	-0,42951	2,483548	0,0381571	Arg2
ENSMUSG00000054855.14	-0,42859	4,529281	6,719E-05	Rnd1
ENSMUSG00000027087.12	-0,42641	4,9194	0,0001927	Itgav
ENSMUSG00000058135.13	-0,42611	5,705622	0,0158914	Gstm1

ENSMUSG00000025128.8	-0,42559	6,918946	0,0005912	Bhlhe22
ENSMUSG00000061718.13	-0,42221	3,973042	0,0067961	Ppp1r1b
ENSMUSG00000028341.10	-0,41906	5,728892	0,0362315	Nr4a3
ENSMUSG00000008435.16	-0,41903	5,704632	7,179E-06	Rdh13
ENSMUSG00000064247.15	-0,41789	2,424332	0,0435817	Plcxd1
ENSMUSG00000071073.6	-0,41584	4,820633	0,0009234	Lrrc73
ENSMUSG00000063229.16	-0,41544	8,044232	2,978E-05	Ldha
ENSMUSG00000035637.15	-0,4142	3,090709	0,0286523	Grhpr
ENSMUSG00000040938.17	-0,41378	2,647066	0,0172291	Slc16a11
ENSMUSG00000026880.12	-0,41376	3,784323	0,0267344	Stom
ENSMUSG00000044562.13	-0,41353	3,75677	0,0009213	Rasip1
ENSMUSG00000021478.7	-0,41322	3,035154	0,0179379	Drd1
ENSMUSG00000050022.17	-0,41309	3,290434	0,0296595	Amz1
ENSMUSG00000103310.2	-0,41296	3,679908	0,0102098	Pcdha12
ENSMUSG00000009216.8	-0,4127	4,489303	0,00228	Fam163b
ENSMUSG00000068617.6	-0,4074	3,511566	0,0187436	Efcab1
ENSMUSG00000019577.7	-0,40734	1,886968	0,0428222	Pdk4
ENSMUSG00000005583.17	-0,40601	8,004005	0,0298632	Mef2c
ENSMUSG00000033735.10	-0,40392	3,985983	0,0018011	Spr
ENSMUSG00000037348.16	-0,40241	4,632639	0,0039905	Paqr7
ENSMUSG00000016252.8	-0,4024	6,281169	1,133E-07	Atp5e
ENSMUSG00000024617.17	-0,40154	6,648313	7,214E-05	Camk2a
ENSMUSG00000063600.15	-0,4006	2,289308	0,0394314	Egfem1
ENSMUSG00000041468.8	-0,39874	4,265519	0,0075652	Gpr12
ENSMUSG00000025856.16	-0,39761	4,613184	0,0002318	Pdgfa
ENSMUSG00000028527.19	-0,39754	3,940631	0,0039883	Ak4
ENSMUSG00000055692.22	-0,39734	4,449746	0,0077341	Tmem191c
ENSMUSG00000001119.8	-0,3964	5,501574	0,0313522	Col6a1
ENSMUSG00000049287.6	-0,39292	3,395203	0,0033233	Iba57
ENSMUSG00000078816.11	-0,39187	4,594466	0,0172038	Prkcg
ENSMUSG00000034361.11	-0,39186	5,264764	0,0025634	Cpne2
ENSMUSG00000027978.10	-0,39074	3,70018	0,0201409	Prss12
ENSMUSG00000007097.15	-0,39067	8,393472	0,0086677	Atp1a2
ENSMUSG00000054383.3	-0,39045	2,4837	0,0396256	Pnma1
ENSMUSG00000096842.2	-0,38719	5,343775	0,0020763	NA
ENSMUSG00000021609.7	-0,38657	2,561002	0,0403959	Slc6a3
ENSMUSG00000034377.11	-0,38542	7,857803	0,0082472	Tulp4
ENSMUSG00000048562.8	-0,38537	3,702475	0,0222867	Sp8
ENSMUSG00000040181.15	-0,38494	4,888622	0,0054869	Fmo1
ENSMUSG00000015474.17	-0,38465	3,24456	0,0087316	Ppt2
ENSMUSG00000022325.15	-0,38247	3,714829	0,019878	Pop1
ENSMUSG00000046229.11	-0,38196	3,884199	0,0033334	Scand1
ENSMUSG00000035783.10	-0,38148	2,511367	0,0378864	Acta2
ENSMUSG00000058833.12	-0,38099	4,835914	2,937E-05	Rex1bd
ENSMUSG00000024654.9	-0,37958	5,801123	0,0020238	Asrgl1

ENSMUSG00000051373.6	-0,37925	3,454604	0,0075743	Plpp7
ENSMUSG00000041889.8	-0,37907	5,25307	0,0008665	Shisa4
ENSMUSG00000052301.15	-0,37868	3,497955	0,0083677	Doc2a
ENSMUSG00000050896.13	-0,37759	4,042922	0,0203702	Rtn4rl2
ENSMUSG00000042737.10	-0,37654	3,047471	0,0133829	Dpm3
ENSMUSG00000034681.18	-0,37486	6,533129	0,0102189	Rnps1
ENSMUSG00000022096.15	-0,37347	3,574805	0,0074401	Hr
ENSMUSG00000039830.10	-0,37193	4,888131	0,0028402	Olig2
ENSMUSG00000060548.14	-0,37156	6,128527	3,418E-05	Tnfrsf19
ENSMUSG00000037946.12	-0,37085	4,994652	0,0017032	Fgd3
ENSMUSG00000026632.18	-0,37082	3,627327	0,0164441	Tatdn3
ENSMUSG00000032482.10	-0,36906	8,051333	0,0019439	Cspg5
ENSMUSG00000053963.8	-0,3688	6,55703	0,0119606	Stum
ENSMUSG00000030406.8	-0,3666	5,022985	0,0357539	Gipr
ENSMUSG00000051726.7	-0,36522	4,383636	0,0041481	Kcnf1
ENSMUSG00000075334.3	-0,36471	6,682184	7,511E-05	Rprm
ENSMUSG00000035431.5	-0,36372	4,219334	0,0046897	Sstr1
ENSMUSG00000040536.16	-0,36346	5,494093	0,0204414	Necab1
ENSMUSG00000030605.16	-0,36203	6,98463	0,003084	Mfge8
ENSMUSG00000038301.16	-0,36191	5,953012	0,0031704	Snx10
ENSMUSG00000074575.5	-0,3605	4,070282	0,008771	Kcng1
ENSMUSG00000034472.14	-0,35932	3,239612	0,0424902	Rasd2
ENSMUSG00000023832.15	-0,35827	7,028299	1,291E-05	Acat2
ENSMUSG00000044730.18	-0,35746	4,401026	0,0005446	9930104L06Rik
ENSMUSG00000020629.13	-0,35702	4,068602	0,0241463	Adi1
ENSMUSG00000030532.7	-0,35521	3,779774	0,0049536	Hddc3
ENSMUSG00000036437.7	-0,35514	4,154398	0,0348784	Npy1r
ENSMUSG00000044317.8	-0,35442	2,498249	0,0472861	Gpr4
ENSMUSG00000042215.9	-0,35353	3,293884	0,0081658	Bag2
ENSMUSG00000006205.14	-0,35308	4,095706	0,027128	Htra1
ENSMUSG00000040569.14	-0,35266	3,298791	0,0348454	Slc26a7
ENSMUSG00000105867.3	-0,35259	4,146585	0,019908	Gm42517
ENSMUSG00000028601.19	-0,35194	3,157741	0,0149064	Echdc2
ENSMUSG00000022505.10	-0,35184	4,680785	0,0415187	Emp2
ENSMUSG00000027347.19	-0,35115	4,212361	0,0347958	Rasgrp1
ENSMUSG00000006717.8	-0,35017	3,581749	0,0345858	Acot13
ENSMUSG00000024026.14	-0,35003	6,771483	0,0335483	Glo1
ENSMUSG00000073433.12	-0,34999	5,252032	0,0452083	Arhgdig
ENSMUSG00000034686.9	-0,3483	4,919923	0,0020515	Prr7
ENSMUSG00000067279.4	-0,3481	4,335727	0,0485917	Ppp1r3c
ENSMUSG00000027637.4	-0,3475	4,035189	0,0046301	Rab5if
ENSMUSG00000095597.3	-0,34563	5,16498	0,0012069	Rps7-ps3
ENSMUSG00000046093.10	-0,3454	6,25766	0,0006654	Hpcal4
ENSMUSG00000030934.10	-0,34494	6,198839	0,000158	Oat
ENSMUSG00000070858.13	-0,34475	5,45484	0,0002297	Gm1673

ENSMUSG00000020937.15	-0,34442	3,023199	0,019451	Plcd3
ENSMUSG00000051557.16	-0,34361	4,12733	0,0262773	Pusl1
ENSMUSG00000024570.8	-0,34316	2,937806	0,0355799	Rbfa
ENSMUSG00000028957.13	-0,34215	3,429571	0,0378848	Per3
ENSMUSG00000036398.14	-0,34041	5,13794	0,0235529	Ppp1r11
ENSMUSG00000022665.16	-0,34018	4,348628	0,0112331	Ccdc80
ENSMUSG00000039904.10	-0,33933	3,279619	0,0132041	Gpr37
ENSMUSG00000054312.7	-0,33755	4,282974	0,0016098	Mrps21
ENSMUSG00000040690.16	-0,33733	4,675283	0,0484452	Col16a1
ENSMUSG00000055078.8	-0,33679	5,812265	0,0055103	Gabra5
ENSMUSG00000006818.6	-0,33677	6,446469	0,0004407	Sod2
ENSMUSG00000019874.12	-0,33651	9,158512	0,0008138	Fabp7
ENSMUSG00000003526.13	-0,33538	3,260036	0,0397586	Prodh
ENSMUSG00000044006.9	-0,33485	3,203216	0,0260703	Cilp2
ENSMUSG00000074825.5	-0,33253	3,444228	0,0397415	Itprl1
ENSMUSG00000054013.7	-0,332	5,968159	8,291E-05	Tmem179
ENSMUSG00000000202.10	-0,33188	3,886409	0,0077585	Btbd17
ENSMUSG00000002908.18	-0,33142	4,700957	0,0486351	Kcnn1
ENSMUSG00000082286.12	-0,33073	5,079827	0,0109608	NA
ENSMUSG00000093910.3	-0,33006	3,224799	0,029138	Zfp853
ENSMUSG00000036775.14	-0,32879	4,416013	0,0160669	Decr2
ENSMUSG00000038296.15	-0,32848	3,838157	0,0043108	Galnt18
ENSMUSG00000047428.15	-0,32839	5,396053	0,0307438	Dlk2
ENSMUSG00000051319.7	-0,32822	3,142601	0,0206966	Mtln
ENSMUSG00000033720.13	-0,32737	5,690239	0,0212449	Sfxn5
ENSMUSG00000023942.16	-0,32716	4,965242	0,0084909	Slc29a1
ENSMUSG00000036304.15	-0,32636	4,860702	0,0222305	Zdhhc23
ENSMUSG00000033342.16	-0,32623	5,35805	0,0259492	Plppr5
ENSMUSG00000003469.10	-0,32609	4,233363	0,0332929	Phyhip
ENSMUSG00000078789.10	-0,32502	3,104782	0,0343392	Dph1
ENSMUSG00000026939.13	-0,32482	3,965719	0,0092224	Tmem141
ENSMUSG00000054871.6	-0,32465	5,420115	0,0050931	Tmem158
ENSMUSG00000023809.11	-0,32399	5,794483	0,0031756	Rps6ka2
ENSMUSG00000030772.7	-0,32388	5,432977	0,0062999	Dkk3
ENSMUSG00000051062.7	-0,32369	4,914083	0,0087549	Fbl1
ENSMUSG000000109274.2	-0,3236	3,582343	0,0108733	NA
ENSMUSG00000029455.15	-0,32349	6,210948	0,0080638	Aldh2
ENSMUSG00000047959.5	-0,3225	3,505652	0,0141492	Kcna3
ENSMUSG00000039474.14	-0,32235	4,473705	0,0152805	Wfs1
ENSMUSG00000006218.5	-0,32175	5,147102	0,0093308	Fam131c
ENSMUSG00000022037.16	-0,32111	6,428499	0,0161178	Clu
ENSMUSG00000022372.15	-0,32032	6,131553	0,0121959	Sla
ENSMUSG00000005125.14	-0,3189	5,83928	0,0089839	Ndr1
ENSMUSG00000040490.5	-0,31877	4,495239	0,0031684	Lrnf2
ENSMUSG00000029675.13	-0,31858	5,793714	0,013179	Eln

ENSMUSG00000087006.4	-0,31836	3,978887	0,0101361	Gm13889
ENSMUSG00000028005.14	-0,31821	6,720314	0,0034952	Gucy1b1
ENSMUSG00000056367.15	-0,31815	5,134374	0,0045021	Actr3b
ENSMUSG00000048550.18	-0,31771	4,33424	0,0189751	Thns1
ENSMUSG00000003380.12	-0,31721	5,846122	0,0037421	Rabac1
ENSMUSG00000045733.8	-0,31717	5,641533	0,0044025	Sprn
ENSMUSG00000046719.8	-0,317	4,618264	0,0023425	Nxph3
ENSMUSG00000023456.17	-0,31683	7,638651	0,0011599	Tpi1
ENSMUSG00000007777.10	-0,31608	3,620241	0,0259998	0610009B22Rik
ENSMUSG00000010609.16	-0,31603	3,824012	0,0347572	Psen2
ENSMUSG00000026617.17	-0,31596	5,102193	0,0022376	Bpnt1
ENSMUSG00000059278.10	-0,31483	3,019367	0,0352888	Naa38
ENSMUSG00000033063.9	-0,31443	3,665411	0,0455307	Cntnap3
ENSMUSG00000027076.11	-0,3143	4,09944	0,0051843	Timm10
ENSMUSG00000029648.14	-0,31388	5,216099	0,0203825	Flt1
ENSMUSG00000042116.4	-0,31358	4,724906	0,0051393	Vwa1
ENSMUSG00000032224.16	-0,3132	4,41447	0,0085953	Fam81a
ENSMUSG00000078317.7	-0,31209	3,951518	0,0222636	F8a
ENSMUSG00000004558.16	-0,31184	7,55677	0,0275021	Ndr2
ENSMUSG00000032564.17	-0,31154	5,292996	0,0206161	Cpne4
ENSMUSG00000018599.6	-0,31111	4,251703	0,0044742	Mief2
ENSMUSG00000021236.17	-0,31084	4,354303	0,0045035	Entpd5
ENSMUSG00000078348.5	-0,31076	4,667951	0,0168174	Sf3b5
ENSMUSG00000041774.17	-0,31073	4,672697	0,0007886	Ydj
ENSMUSG00000033186.10	-0,31034	5,817304	0,0023773	Mzt1
ENSMUSG00000022193.8	-0,31033	5,281786	0,0119662	Psm5
ENSMUSG00000047712.9	-0,31008	3,949452	0,0229348	Ust
ENSMUSG00000036545.10	-0,30883	4,317351	0,0470844	Adams2
ENSMUSG00000039166.17	-0,30809	5,946428	0,0324838	Akap7
ENSMUSG00000067199.5	-0,3077	3,748008	0,0252703	Frat1
ENSMUSG00000021928.10	-0,30729	3,910003	0,0067376	Ebpl
ENSMUSG00000037190.13	-0,30644	3,93754	0,0121095	Cyb56d2
ENSMUSG00000021957.8	-0,30606	7,839272	4,482E-05	Tkt
ENSMUSG00000015843.11	-0,30587	4,496902	0,0100467	Rxrg
ENSMUSG00000020163.13	-0,30559	5,498768	0,0011208	Uqcr11
ENSMUSG00000029231.16	-0,30553	6,389851	0,0346866	Pdgfra
ENSMUSG00000049760.7	-0,3049	4,642339	0,0060316	Micos13
ENSMUSG00000075012.5	-0,30482	6,183459	3,771E-05	Fjx1
ENSMUSG00000033066.17	-0,30461	7,759266	0,0022856	Gas7
ENSMUSG00000028832.12	-0,30456	9,987195	0,0020816	Stmn1
ENSMUSG00000048148.19	-0,30455	5,493449	0,0246539	Nwd1
ENSMUSG00000029482.5	-0,30448	6,478503	0,0018015	Aacs
ENSMUSG00000025226.12	-0,30391	2,979218	0,0405165	Fbxl15
ENSMUSG00000043398.6	-0,30368	3,97256	0,0084559	Gpr135
ENSMUSG00000016763.16	-0,30339	6,03424	0,0427897	Scube1

ENSMUSG00000056596.9	-0,30191	4,270535	0,0222877	Trnp1
ENSMUSG00000038425.19	-0,30062	3,579482	0,028761	Poli
ENSMUSG00000021238.12	-0,29894	5,167771	0,0033806	Aldh6a1
ENSMUSG00000020592.15	-0,29888	4,314025	0,0076534	Sdc1
ENSMUSG00000026278.15	-0,29879	5,251931	0,0328614	Bok
ENSMUSG00000087260.6	-0,29845	4,820086	0,0171278	Lamtor5
ENSMUSG00000034164.18	-0,29844	3,440556	0,0190295	Emid1
ENSMUSG00000032518.7	-0,2984	9,45707	0,0063395	Rpsa
ENSMUSG00000025731.17	-0,29833	4,052589	0,0116232	Mettl26
ENSMUSG00000038065.14	-0,298	8,764125	0,0001261	Mturn
ENSMUSG00000051185.10	-0,29799	3,776249	0,0368891	Fam174a
ENSMUSG00000049907.9	-0,29659	3,796536	0,0098793	Rasl11b
ENSMUSG00000023110.13	-0,29644	6,506821	0,0001686	Prmt5
ENSMUSG00000015575.16	-0,29582	4,17046	0,0070001	Atp6v0e
ENSMUSG00000034201.14	-0,295	4,615893	0,016684	Gas2l1
ENSMUSG00000027221.6	-0,29472	6,013514	0,0005879	Chst1
ENSMUSG00000049036.8	-0,29444	4,495141	0,0040342	Tmem121
ENSMUSG00000040855.16	-0,29427	6,03824	0,0007596	Reps2
ENSMUSG00000029999.15	-0,29412	5,551964	0,0147086	Tgfa
ENSMUSG00000068696.7	-0,29386	4,695937	0,0049135	Gpr88
ENSMUSG000000110523.2	-0,29355	4,24689	0,0135555	NA
ENSMUSG00000028780.14	-0,29353	6,302631	0,0134893	Sema3c
ENSMUSG00000007892.9	-0,29231	8,755561	0,0007099	Rplp1
ENSMUSG00000004961.8	-0,29224	6,887287	0,0008567	Syt5
ENSMUSG00000034345.15	-0,29203	6,231462	0,0003905	Gtf2h5
ENSMUSG00000022756.18	-0,29179	4,816717	0,0014593	Slc7a4
ENSMUSG00000029729.13	-0,29178	6,81586	0,0002151	Zkscan1
ENSMUSG00000040653.7	-0,29174	5,719036	0,0100201	Ppp1r14c
ENSMUSG00000021483.9	-0,29137	4,577265	0,0064914	Cdk20
ENSMUSG00000017493.13	-0,29119	6,349037	0,0126618	Igfbp4
ENSMUSG00000032018.15	-0,28921	6,529123	0,0020939	Sc5d
ENSMUSG00000021567.16	-0,28895	4,967234	0,0069035	Nkd2
ENSMUSG00000001270.10	-0,28795	8,719646	0,0077518	Ckb
ENSMUSG00000029580.15	-0,28785	10,4799	0,0014974	Actb
ENSMUSG00000021108.19	-0,28698	4,106878	0,0123843	Prkch
ENSMUSG00000005949.10	-0,28698	4,327353	0,0063825	Ctns
ENSMUSG00000018040.10	-0,28657	5,699655	0,0003722	Rrp7a
ENSMUSG00000031788.15	-0,2865	4,921882	0,0051337	Kifc3
ENSMUSG00000025221.17	-0,28511	4,524626	0,0116982	Kcnip2
ENSMUSG00000022296.11	-0,28499	5,452134	0,0444919	Baalc
ENSMUSG00000008734.10	-0,28499	4,670876	0,0092009	Gprc5b
ENSMUSG00000039001.13	-0,28477	6,919468	0,000942	Rps21
ENSMUSG00000056296.18	-0,28475	4,979311	0,0399205	Synpr
ENSMUSG00000060032.7	-0,28446	4,334349	0,0083174	H2aj
ENSMUSG00000045176.4	-0,28429	3,442537	0,047045	Borcs6

ENSMUSG00000004415.16	-0,28421	5,567409	0,0220825	Col26a1
ENSMUSG000000023192.13	-0,28397	4,712788	0,0300809	Grm2
ENSMUSG000000020108.5	-0,28371	6,347583	0,0017073	Ddit4
ENSMUSG00000003746.17	-0,28337	4,569307	0,0138436	Man1a
ENSMUSG000000042650.4	-0,28319	6,142235	0,0027612	Alkbh5
ENSMUSG000000059534.9	-0,2825	5,536056	0,0031904	Uqcr10
ENSMUSG000000045136.7	-0,28245	11,86425	0,0009016	Tubb2b
ENSMUSG000000027274.17	-0,28167	3,321358	0,0461217	Mkks
ENSMUSG000000039706.12	-0,28166	5,886605	0,0221611	Ldb2
ENSMUSG000000037852.9	-0,28137	9,289372	0,0026907	Cpe
ENSMUSG000000039316.15	-0,28126	4,674575	0,0053981	Rftn1
ENSMUSG000000055538.8	-0,28099	5,699049	0,0063298	Zcchc24
ENSMUSG000000025558.20	-0,28096	7,390807	0,0223787	Dock9
ENSMUSG000000026890.20	-0,28005	5,965369	0,0224304	Lhx6
ENSMUSG000000024537.6	-0,27975	4,236184	0,0170559	Psmg2
ENSMUSG000000028914.14	-0,27961	5,504844	0,015024	Casp9
ENSMUSG000000030323.14	-0,2793	5,628091	0,0010727	Ift122
ENSMUSG000000028447.12	-0,27797	5,704103	0,0026117	Dctn3
ENSMUSG000000026826.14	-0,27787	5,534708	0,0475434	Nr4a2
ENSMUSG000000050856.17	-0,27759	5,661234	0,0421584	Atp5k
ENSMUSG000000068748.8	-0,27641	9,368326	0,0075317	Ptprz1
ENSMUSG000000054733.10	-0,27605	5,066052	0,0320531	Msra
ENSMUSG000000029838.12	-0,27582	8,919504	0,0227328	Ptn
ENSMUSG000000002343.12	-0,27513	6,001042	0,000322	Armc6
ENSMUSG000000026185.9	-0,27483	8,060445	0,0125233	Igfbp5
ENSMUSG000000004929.13	-0,2747	5,750253	0,001836	Thop1
ENSMUSG000000008683.17	-0,27462	8,312493	0,0032812	Rps15a
ENSMUSG000000018507.17	-0,27457	4,420671	0,0340689	Trpv2
ENSMUSG000000016382.16	-0,27454	5,518475	0,0093283	Pls3
ENSMUSG000000047721.9	-0,27448	4,341051	0,0100939	Bola2
ENSMUSG000000057863.7	-0,27422	7,015398	0,0020647	Rpl36
ENSMUSG000000067818.7	-0,27416	4,149904	0,0217727	Myl9
ENSMUSG000000038957.14	-0,27341	5,586096	0,0006307	Edc3
ENSMUSG000000024208.17	-0,27314	5,119514	0,0235644	Uqcc2
ENSMUSG000000029126.8	-0,27292	9,296184	0,0026001	Nsg1
ENSMUSG000000079641.4	-0,27262	6,956898	0,0171861	Rpl39
ENSMUSG000000022340.16	-0,27201	7,118499	0,0121571	Sybu
ENSMUSG000000040631.9	-0,27162	6,324846	0,0007898	Dok4
ENSMUSG000000039058.12	-0,27159	4,579197	0,0342853	Ak5
ENSMUSG000000019139.11	-0,27091	6,073024	0,0007434	Isyna1
ENSMUSG000000025468.16	-0,27058	6,396473	0,0110169	Caly
ENSMUSG000000087385.9	-0,27053	3,379863	0,0491277	Frg2f1
ENSMUSG000000037990.19	-0,26983	6,087231	0,0082426	Sh3rf3
ENSMUSG000000024213.15	-0,2693	7,308317	0,0001401	Nudt3
ENSMUSG000000069670.9	-0,26928	5,835295	0,0130243	Nkain2

ENSMUSG00000001227.13	-0,26924	6,534194	0,0014491	Sema6b
ENSMUSG000000050640.17	-0,26876	5,7634	0,0149903	Tmem150c
ENSMUSG000000066705.8	-0,26839	8,447888	0,0016369	Fxyd6
ENSMUSG000000035521.14	-0,26803	5,426629	0,0194656	Gnptg
ENSMUSG000000061762.13	-0,26764	4,220245	0,0457544	Tac1
ENSMUSG000000022044.15	-0,2674	8,385904	0,0018946	Stmn4
ENSMUSG000000054716.5	-0,26652	4,690437	0,0046374	Zfp771
ENSMUSG000000068922.15	-0,26607	4,624216	0,0113263	Msto1
ENSMUSG000000055723.7	-0,26589	5,192955	0,0182662	Rras2
ENSMUSG000000063802.6	-0,26544	5,696936	0,0046385	Hspbp1
ENSMUSG000000031790.9	-0,26466	6,009526	0,0009401	Mmp15
ENSMUSG000000057667.8	-0,26445	3,862732	0,0340529	Bloc1s3
ENSMUSG000000036752.5	-0,26403	7,363283	0,0104555	Tubb4b
ENSMUSG000000044952.6	-0,26378	3,348725	0,0479634	Kctd21
ENSMUSG000000020102.16	-0,26366	5,788314	0,0337839	Slc16a7
ENSMUSG000000057897.15	-0,26357	8,657949	0,0177047	Camk2b
ENSMUSG000000025153.10	-0,2635	9,626633	0,0118535	Fasn
ENSMUSG000000028443.7	-0,26328	4,334253	0,0122676	Nudt2
ENSMUSG000000067879.4	-0,26196	5,641139	0,0259995	Vxn
ENSMUSG000000006476.20	-0,26181	7,461375	0,0005396	Nsmf
ENSMUSG000000024012.19	-0,26165	8,41981	0,0015359	Mtch1
ENSMUSG000000032500.11	-0,26162	4,014901	0,0168848	Dclk3
ENSMUSG000000030102.12	-0,26147	6,347091	0,0271429	Itpr1
ENSMUSG000000022474.16	-0,26145	5,709691	0,0132335	Pmm1
ENSMUSG000000022577.18	-0,2613	7,841096	0,0037762	Ly6h
ENSMUSG000000041141.8	-0,26096	6,54592	0,0014415	Pnmal1
ENSMUSG000000003363.16	-0,26088	6,998396	0,0254341	Pld3
ENSMUSG000000000056.8	-0,26075	6,799727	0,0005344	Narf
ENSMUSG000000047649.10	-0,2604	4,368595	0,0170662	Cd3eap
ENSMUSG000000071711.13	-0,26019	5,333942	0,0295389	Mpst
ENSMUSG000000020848.8	-0,25973	5,788113	0,0072409	Doc2b
ENSMUSG000000024176.11	-0,25971	4,741119	0,0160396	Sox8
ENSMUSG000000030093.8	-0,25948	4,717781	0,0121535	Wnt7a
ENSMUSG000000028671.17	-0,25796	3,945139	0,0215826	Gale
ENSMUSG000000051243.15	-0,25783	9,291449	0,0485157	Islr2
ENSMUSG000000027162.8	-0,25766	8,186371	0,001898	Lin7c
ENSMUSG00000008090.15	-0,25765	3,578692	0,043431	Fgfr1
ENSMUSG000000025026.16	-0,25742	6,067877	0,0482785	Add3
ENSMUSG000000026701.16	-0,25687	5,698631	0,0066283	Prdx6
ENSMUSG000000020277.11	-0,25646	7,099797	0,0002428	Pfkl
ENSMUSG000000006589.9	-0,25645	5,071347	0,00883	Aprt
ENSMUSG000000035397.9	-0,25633	4,241566	0,0211824	Klf16
ENSMUSG000000053297.15	-0,25631	4,664984	0,0174881	AI854703
ENSMUSG000000021373.17	-0,256	4,540804	0,0267277	Cap2
ENSMUSG000000054920.13	-0,25483	6,438587	0,0008572	Klhl5

ENSMUSG00000029722.16	-0,25479	4,209512	0,0178502	Agfg2
ENSMUSG00000021913.9	-0,25469	5,663122	0,0110967	Ogdhl
ENSMUSG00000028063.16	-0,25413	4,898941	0,0337336	Lmna
ENSMUSG00000050552.9	-0,25378	4,776055	0,0147514	Lamtor4
ENSMUSG00000066235.8	-0,25378	4,841016	0,0070013	Pomgnt2
ENSMUSG00000016179.12	-0,25371	5,319755	0,0048515	Camk1g
ENSMUSG00000037035.6	-0,25339	4,146662	0,0492921	Inhbb
ENSMUSG00000023175.16	-0,25311	8,553535	0,0043397	Bsg
ENSMUSG00000031605.9	-0,25242	6,354066	0,0049178	Klhl2
ENSMUSG00000026443.4	-0,25206	6,682558	0,0033768	Lrrn2
ENSMUSG00000050821.15	-0,25171	5,431972	0,0020525	Fam131a
ENSMUSG00000022895.17	-0,25159	5,149324	0,0062504	Ets2
ENSMUSG00000061983.8	-0,25154	8,350984	0,0008557	Rps12
ENSMUSG00000029649.11	-0,25143	6,219182	0,0107404	Pomp
ENSMUSG00000032299.11	-0,25138	5,695193	0,0017105	Commd4
ENSMUSG00000040488.19	-0,25119	5,881486	0,0318622	Ltbp4
ENSMUSG00000039016.6	-0,25023	5,233439	0,0075043	Timm8b
ENSMUSG00000057666.19	-0,25001	9,104625	0,0069919	Gapdh
ENSMUSG00000027581.13	-0,24985	8,75649	0,0253098	Stmn3
ENSMUSG00000044629.6	-0,24977	6,286762	0,0079186	Cnrip1
ENSMUSG00000020219.8	-0,2496	5,356618	0,0050651	Timm13
ENSMUSG00000021573.16	-0,24924	5,480963	0,0104913	Tppp
ENSMUSG00000113902.2	-0,24887	5,150119	0,0279018	Ndufb1
ENSMUSG00000017778.15	-0,24847	5,84652	0,0039923	Cox7c
ENSMUSG00000074884.13	-0,24842	4,21537	0,0237998	Serf2
ENSMUSG00000026688.6	-0,24786	5,439764	0,0198388	Mgst3
ENSMUSG00000003273.15	-0,24729	5,858078	0,0268043	Car11
ENSMUSG00000098087.2	-0,24727	4,404629	0,0371679	Gm17750
ENSMUSG00000053395.16	-0,24707	4,684309	0,0331447	Cacng8
ENSMUSG00000040111.18	-0,247	7,204263	0,0074292	Gramd1b
ENSMUSG00000028833.14	-0,24658	7,684749	0,004637	Ncdn
ENSMUSG00000072875.3	-0,24648	6,489395	0,0043556	Gpr27
ENSMUSG00000024787.15	-0,2459	4,965648	0,0063027	Snx15
ENSMUSG00000037905.14	-0,24529	6,464652	0,0160343	Bri3bp
ENSMUSG00000038807.20	-0,2451	6,184296	0,0022303	Rap1gap2
ENSMUSG00000028266.18	-0,24465	7,200656	0,0069816	Lmo4
ENSMUSG00000034825.15	-0,24441	4,623949	0,0364129	Nrip3
ENSMUSG00000092203.8	-0,24427	4,786613	0,017679	1110038B12Rik
ENSMUSG00000070394.11	-0,24401	4,421861	0,0459757	Tmem256
ENSMUSG00000022848.9	-0,2438	6,428298	0,0016841	Slc49a4
ENSMUSG00000044835.16	-0,24359	5,373432	0,0122708	Ankrd45
ENSMUSG00000073616.11	-0,24343	5,419463	0,0386845	Cops9
ENSMUSG00000057375.14	-0,24317	4,273687	0,0399065	Yipf1
ENSMUSG00000020153.15	-0,24272	5,302558	0,0070916	Ndufs7
ENSMUSG00000060780.3	-0,24248	5,268983	0,0415699	Lrrtm1

ENSMUSG00000018012.12	-0,24244	7,444897	0,0152036	Rac3
ENSMUSG00000054364.6	-0,24236	7,517626	0,0142953	Rhob
ENSMUSG00000036850.5	-0,24236	4,297532	0,0197763	Mrpl41
ENSMUSG00000057497.9	-0,24212	5,37265	0,0077513	Fam136a
ENSMUSG00000043614.14	-0,24049	5,213713	0,0060019	Vps37d
ENSMUSG00000028398.9	-0,24018	4,174646	0,0472448	Dmac1
ENSMUSG00000035285.7	-0,24003	4,434887	0,0175906	Nat14
ENSMUSG00000031970.17	-0,23986	5,691621	0,004206	Dbnidd1
ENSMUSG00000024169.17	-0,23975	5,720507	0,0075763	Ift140
ENSMUSG00000003033.16	-0,23962	7,049681	0,0213419	Ap1m1
ENSMUSG00000032320.8	-0,2392	6,878724	0,0026299	Rcn2
ENSMUSG00000060803.7	-0,23902	5,367725	0,0496415	Gstp1
ENSMUSG00000039640.8	-0,23882	5,568371	0,0164173	Mrpl12
ENSMUSG00000003346.15	-0,23809	6,19503	0,0079116	Abhd17a
ENSMUSG00000044894.15	-0,23775	6,005118	0,0269638	Uqcrq
ENSMUSG00000039234.12	-0,23747	4,730883	0,0202773	Sec24d
ENSMUSG00000002102.16	-0,23703	6,83987	0,0009931	Psmc3
ENSMUSG00000056209.8	-0,23668	4,109058	0,0326976	Npm3
ENSMUSG00000028937.15	-0,23602	7,633881	0,0133105	Acot7
ENSMUSG00000038690.16	-0,23602	6,371811	0,0117397	Atp5j2
ENSMUSG00000029642.12	-0,23574	4,968523	0,034012	Polr1d
ENSMUSG00000056145.6	-0,23569	5,573861	0,0498714	AI504432
ENSMUSG00000020893.18	-0,23563	5,259424	0,0075566	Per1
ENSMUSG00000037771.12	-0,23536	5,813762	0,0272692	Slc32a1
ENSMUSG00000026482.14	-0,23467	5,316847	0,007569	Rgl1
ENSMUSG00000033684.15	-0,23455	4,95452	0,024459	Qsox1
ENSMUSG00000057322.13	-0,23403	7,052276	0,0011298	Rpl38
ENSMUSG00000020284.17	-0,23393	4,842055	0,0136577	Cfap410
ENSMUSG00000035184.16	-0,23382	6,179947	0,0130447	Fam124a
ENSMUSG00000031604.11	-0,23288	6,332473	0,0026734	Msmo1
ENSMUSG00000067847.14	-0,23281	5,169571	0,0203467	Romo1
ENSMUSG00000036873.14	-0,2326	5,005168	0,0224577	2410004B18Rik
ENSMUSG00000025889.14	-0,23241	6,814971	0,0456584	Snca
ENSMUSG00000048644.9	-0,23188	7,492088	0,0038043	Ctxn1
ENSMUSG00000061477.5	-0,23117	8,224042	0,0285743	Rps7
ENSMUSG00000032615.15	-0,23104	4,784104	0,0140527	Nt5m
ENSMUSG00000045969.9	-0,23092	5,837584	0,0121992	Ing1
ENSMUSG00000030123.16	-0,23082	6,865059	0,0246483	Plxnd1
ENSMUSG00000026811.19	-0,23069	5,222374	0,0428552	St6galnac6
ENSMUSG00000025508.14	-0,23038	7,797246	0,0148658	Rplp2
ENSMUSG00000029571.15	-0,22969	6,741126	0,0078041	Tmem106b
ENSMUSG00000045287.7	-0,22913	4,414727	0,033934	Rtn4rl1
ENSMUSG00000036766.13	-0,22912	8,382995	0,0117362	Dner
ENSMUSG00000034880.8	-0,22863	4,19122	0,0419597	Mrpl34
ENSMUSG00000047260.5	-0,2285	4,910423	0,0228736	Emc6

ENSMUSG00000025931.16	-0,22843	6,272934	0,0420678	Paqr8
ENSMUSG00000021967.5	-0,22748	4,49991	0,0353119	Mrpl57
ENSMUSG00000046330.11	-0,22743	7,551395	0,0013055	Rpl37a
ENSMUSG00000040972.9	-0,22736	5,831517	0,0165201	Igsf21
ENSMUSG00000010064.16	-0,22715	5,731878	0,0160495	Slc38a3
ENSMUSG00000039976.5	-0,22702	8,935724	0,001439	Tbc1d16
ENSMUSG00000039886.9	-0,227	5,011922	0,0237191	Tmem120a
ENSMUSG00000021448.9	-0,22687	4,818859	0,0373144	Shc3
ENSMUSG00000031104.3	-0,22687	4,899373	0,0398123	Rab33a
ENSMUSG00000030554.17	-0,2268	4,887251	0,0453746	Synm
ENSMUSG00000014856.13	-0,22672	4,579068	0,0185982	Tmem208
ENSMUSG00000026568.7	-0,22618	5,32779	0,0251495	Mpc2
ENSMUSG00000037772.14	-0,22602	4,134923	0,0386119	Mrpl23
ENSMUSG00000018572.11	-0,22586	5,501407	0,0116752	Phf23
ENSMUSG00000024772.10	-0,22577	6,8519	0,0041009	Ehd1
ENSMUSG00000036615.8	-0,22559	5,397866	0,0259307	Rfxap
ENSMUSG00000021044.16	-0,2255	4,809936	0,0210876	Adck1
ENSMUSG00000021993.11	-0,22544	4,629165	0,0345313	Mipep
ENSMUSG00000026796.17	-0,22507	6,121593	0,0054163	Niban2
ENSMUSG00000022265.8	-0,2248	5,776195	0,0285294	Ank
ENSMUSG00000033350.8	-0,22428	6,432752	0,0018067	Chst2
ENSMUSG00000040563.14	-0,22416	7,464048	0,0022629	Plppr2
ENSMUSG00000034412.14	-0,22413	4,428962	0,0372185	Tbc1d10a
ENSMUSG00000034892.9	-0,22378	8,157297	0,0010604	Rps29
ENSMUSG00000075033.5	-0,22315	3,944772	0,0488417	Nxpe3
ENSMUSG00000032306.15	-0,22272	5,324498	0,0137516	Mpi
ENSMUSG00000036186.6	-0,2227	5,178909	0,0120549	Dipk1b
ENSMUSG00000028070.8	-0,22236	5,264948	0,0152479	Naxe
ENSMUSG00000031570.18	-0,22208	4,850407	0,0230207	Plpp5
ENSMUSG00000025266.12	-0,22193	7,9401	0,0006571	Gnl3l
ENSMUSG00000037152.12	-0,22104	4,81022	0,0363704	Ndufc1
ENSMUSG00000026134.12	-0,22103	4,213125	0,0360132	Prim2
ENSMUSG00000025204.11	-0,22097	5,530593	0,0415937	Ndufb8
ENSMUSG00000029030.15	-0,22043	6,670901	0,0029189	Tprgl
ENSMUSG00000068923.15	-0,22009	8,444991	0,0016566	Syt11
ENSMUSG00000027937.16	-0,21998	4,697056	0,0379187	Jtb
ENSMUSG00000047473.15	-0,21933	4,619755	0,0482165	Zfp30
ENSMUSG00000060739.9	-0,21929	5,963064	0,0363047	Nsa2
ENSMUSG00000028517.9	-0,21914	6,462459	0,0411313	Plpp3
ENSMUSG00000064264.15	-0,21903	5,397899	0,0141551	Zfp428
ENSMUSG00000020267.7	-0,21888	7,096177	0,0283571	Hint1
ENSMUSG00000066607.6	-0,21886	5,771404	0,0173345	Insyn1
ENSMUSG00000058756.14	-0,21867	9,5098	0,0129274	Thra
ENSMUSG00000022332.9	-0,21837	7,05259	0,0489122	Khdrbs3
ENSMUSG00000047675.16	-0,21827	8,379707	0,0033793	Rps8

ENSMUSG00000024248.15	-0,21801	6,395847	0,0109547	Cox7a2l
ENSMUSG00000042616.9	-0,21781	4,706652	0,0185605	Oscp1
ENSMUSG00000022428.9	-0,2178	5,005744	0,020997	Cby1
ENSMUSG00000032959.13	-0,21779	7,973848	0,0092513	Pebp1
ENSMUSG00000049807.17	-0,21757	6,710985	0,00856	Arhgap23
ENSMUSG00000071757.11	-0,217	4,758997	0,0454583	Zhx2
ENSMUSG00000052584.11	-0,21688	5,477816	0,0324764	Serp2
ENSMUSG00000053702.17	-0,21582	4,687871	0,0368021	Nebi
ENSMUSG00000001436.16	-0,21561	4,656569	0,0414386	Slc19a1
ENSMUSG00000059447.14	-0,21527	4,750001	0,0359059	Hadhb
ENSMUSG00000062380.5	-0,21484	11,04197	0,010964	Tubb3
ENSMUSG00000030584.15	-0,21477	6,931011	0,0099734	Dpf1
ENSMUSG00000117924.2	-0,21472	4,349327	0,0393	Tmem223
ENSMUSG00000034685.5	-0,21437	8,039693	0,0029119	Fam171a2
ENSMUSG00000021608.16	-0,21429	7,057122	0,0026892	Lpcat1
ENSMUSG00000000253.14	-0,21416	4,156834	0,0420102	Gmpr
ENSMUSG00000031176.9	-0,21411	5,155098	0,0461576	Dynlt3
ENSMUSG00000047921.18	-0,21308	5,955429	0,0037484	Trappc9
ENSMUSG00000006356.11	-0,21279	7,115429	0,0040612	Crip2
ENSMUSG00000031517.9	-0,2127	9,812258	0,0351742	Gpm6a
ENSMUSG00000073293.5	-0,21259	4,846558	0,032598	Nudt10
ENSMUSG00000029120.11	-0,21251	8,048697	0,0240121	Ppp2r2c
ENSMUSG00000074923.11	-0,21239	6,962406	0,0092203	Pak6
ENSMUSG00000024937.16	-0,21196	5,643322	0,032937	Ehbp1l1
ENSMUSG00000006731.11	-0,21185	5,794931	0,0168023	B4galnt1
ENSMUSG00000034006.18	-0,21184	4,96522	0,0460454	Slc66a2
ENSMUSG00000006494.12	-0,21142	5,875064	0,0079163	Pdk1
ENSMUSG00000010057.9	-0,21141	5,083331	0,0228128	Nprl2
ENSMUSG00000039470.16	-0,21139	6,177654	0,0270139	Zdhhc2
ENSMUSG00000090071.5	-0,21135	6,95732	0,0464028	Cdk5r2
ENSMUSG00000093674.8	-0,21133	8,401715	0,0284997	Rpl41
ENSMUSG00000032172.9	-0,21131	7,36517	0,0057689	Olfm2
ENSMUSG00000019590.17	-0,21119	5,223914	0,0223674	Cyb561
ENSMUSG00000008140.19	-0,211	6,783324	0,0215526	Emc10
ENSMUSG00000020083.14	-0,21096	5,560166	0,0254323	Fam241b
ENSMUSG00000032112.11	-0,21092	5,816565	0,0109422	Trappc4
ENSMUSG00000006941.6	-0,21028	6,617611	0,0305339	Eif1b
ENSMUSG00000022773.20	-0,21002	6,29911	0,0155651	Ypel1
ENSMUSG00000035674.14	-0,20993	5,401633	0,0457007	Ndufa3
ENSMUSG00000021194.7	-0,20977	6,696073	0,0495916	Chga
ENSMUSG00000040722.8	-0,20806	8,182118	0,00846	Scamp5
ENSMUSG00000028654.14	-0,20761	6,711648	0,0260978	Mycl
ENSMUSG00000058546.9	-0,20745	6,094021	0,0082568	Rpl23a
ENSMUSG00000037710.9	-0,20734	5,808285	0,0250323	Cisd1
ENSMUSG00000026156.9	-0,20717	4,685562	0,0362049	B3gat2

ENSMUSG00000004151.18	-0,20715	5,484672	0,0369306	Etv1
ENSMUSG00000016427.8	-0,20692	4,935348	0,0303044	Ndufa1
ENSMUSG000000035131.15	-0,20662	4,896937	0,03027	Brinp3
ENSMUSG000000070802.6	-0,2065	8,392957	0,0055612	Pnmal2
ENSMUSG000000052373.15	-0,20643	5,733222	0,0332015	Mpp3
ENSMUSG00000007039.13	-0,2058	6,878709	0,0039156	Ddah2
ENSMUSG000000025422.11	-0,20568	9,103839	0,0279529	Agap2
ENSMUSG000000043419.12	-0,20546	6,842121	0,0205396	Rnf227
ENSMUSG000000028096.14	-0,20525	4,687414	0,0494735	Gpr89
ENSMUSG000000022454.18	-0,20464	8,447824	0,0251419	Nell2
ENSMUSG000000063696.8	-0,20425	5,41267	0,0294931	Gm8730
ENSMUSG000000033793.13	-0,20418	6,765435	0,0143806	Atp6v1h
ENSMUSG000000046865.8	-0,20376	5,888307	0,0129256	Fbl
ENSMUSG000000037563.16	-0,20334	7,83185	0,003332	Rps16
ENSMUSG000000006095.13	-0,20324	6,472559	0,0053614	Tbcb
ENSMUSG000000063882.13	-0,20311	6,625588	0,0341055	Uqcrh
ENSMUSG000000035268.15	-0,20306	5,245434	0,0403211	Pkig
ENSMUSG000000025027.19	-0,20285	6,095772	0,0367809	Xpnpep1
ENSMUSG000000021701.9	-0,20269	7,156753	0,0213307	Plk2
ENSMUSG000000044667.13	-0,20241	6,380012	0,0212012	Plppr4
ENSMUSG000000030376.9	-0,20198	6,457578	0,0112504	Slc8a2
ENSMUSG000000007021.6	-0,20187	6,896259	0,0403663	Syngn3
ENSMUSG000000031834.16	-0,20155	7,18397	0,002949	Pik3r2
ENSMUSG000000028289.13	-0,20086	6,517775	0,0145078	Epha7
ENSMUSG000000009013.6	-0,20033	7,694408	0,0144148	Dynll1
ENSMUSG000000036966.16	-0,19991	6,346531	0,0300534	Spryd3
ENSMUSG000000043300.3	-0,19974	5,508885	0,0298097	B3galnt1
ENSMUSG000000002332.17	-0,19974	5,276984	0,0369855	Dhrs1
ENSMUSG000000056612.8	-0,19974	6,670549	0,0102522	Ppp1r14b
ENSMUSG000000020297.11	-0,19894	10,13206	0,0195555	Nsg2
ENSMUSG000000015536.15	-0,19839	5,321781	0,0308601	Mocs2
ENSMUSG000000049866.13	-0,19836	7,175683	0,009392	Arl4c
ENSMUSG000000025790.15	-0,19819	5,539235	0,0241998	Slco3a1
ENSMUSG000000033065.15	-0,19785	7,188585	0,0047025	Pfkm
ENSMUSG000000041841.9	-0,19773	7,564281	0,0044753	Rpl37
ENSMUSG000000031347.13	-0,19744	4,816986	0,0436161	Cetn2
ENSMUSG000000031950.8	-0,19738	6,202799	0,0420641	Gabarapl2
ENSMUSG000000076437.12	-0,19698	5,190666	0,0178716	Selenoh
ENSMUSG000000020684.15	-0,19686	7,014357	0,0360535	Rasl10b
ENSMUSG000000024914.17	-0,19677	6,585332	0,0108945	Drap1
ENSMUSG000000096914.4	-0,19669	4,471352	0,0474216	Galntl6
ENSMUSG000000007987.13	-0,19663	5,033299	0,0492825	Ift22
ENSMUSG000000051615.15	-0,19637	6,774012	0,0235473	Rap2a
ENSMUSG000000042066.17	-0,19624	7,069508	0,0031544	Tmcc2
ENSMUSG000000029465.15	-0,19618	6,71467	0,0110597	Arpc3

ENSMUSG00000035215.10	-0,19614	4,545482	0,0434195	Lsm7
ENSMUSG00000046269.18	-0,19612	4,664251	0,0287204	Usp27x
ENSMUSG00000037126.17	-0,19581	8,25434	0,0234298	Psd
ENSMUSG00000026385.17	-0,19563	6,931779	0,0363596	Dbi
ENSMUSG00000011096.18	-0,19557	5,592755	0,0362214	Akt1s1
ENSMUSG00000006315.10	-0,19554	5,825852	0,0191782	Tmem147
ENSMUSG00000045045.8	-0,19551	6,712226	0,0098236	Lrfn4
ENSMUSG00000034190.10	-0,19536	7,003241	0,0043458	Chmp7
ENSMUSG00000030744.14	-0,19504	8,576397	0,0420208	Rps3
ENSMUSG00000078794.5	-0,19481	5,621553	0,043797	Dact3
ENSMUSG00000038900.18	-0,19469	8,029511	0,0235102	Rpl12
ENSMUSG00000020230.16	-0,19422	7,464089	0,0059408	Prmt2
ENSMUSG00000025417.9	-0,19391	4,628752	0,0370169	Pip4k2c
ENSMUSG00000024319.19	-0,19376	6,582395	0,0231314	Vps52
ENSMUSG00000040339.11	-0,19373	6,830773	0,0128943	Fam102b
ENSMUSG00000024664.6	-0,19344	5,966476	0,019014	Fads3
ENSMUSG00000032470.18	-0,19315	6,705099	0,0044149	Mras
ENSMUSG00000008035.13	-0,19301	5,203285	0,0411061	Mid1ip1
ENSMUSG00000048696.12	-0,19227	6,571209	0,0136151	Mex3d
ENSMUSG00000020109.14	-0,19225	5,034698	0,0273694	Dnajb12
ENSMUSG00000015092.10	-0,1922	6,003527	0,0213022	Edf1
ENSMUSG00000013698.13	-0,19141	8,636497	0,0236505	Pea15a
ENSMUSG00000043670.5	-0,19135	6,890801	0,0154226	Diras1
ENSMUSG00000020519.6	-0,19134	4,286853	0,0492275	Sap30l
ENSMUSG00000003153.11	-0,19116	6,353193	0,0228889	Slc2a3
ENSMUSG00000000740.13	-0,19089	8,371886	0,0064968	Rpl13
ENSMUSG00000029875.6	-0,19065	6,198652	0,034931	Ccdc184
ENSMUSG00000024891.7	-0,19044	4,666792	0,0448166	Slc29a2
ENSMUSG00000016257.16	-0,19005	5,553568	0,0153078	Prelid3b
ENSMUSG00000027332.12	-0,18976	5,706667	0,0445591	Ivd
ENSMUSG00000029029.15	-0,18971	4,856841	0,0328128	Wrap73
ENSMUSG00000020737.13	-0,18969	8,843316	0,0158001	Jpt1
ENSMUSG00000048834.17	-0,1893	6,223506	0,0245936	Vstm2a
ENSMUSG00000041598.8	-0,18926	6,580153	0,00777	Cdc42ep4
ENSMUSG00000001143.14	-0,18922	5,778163	0,020677	Lman2l
ENSMUSG00000044030.5	-0,18907	6,009504	0,0194862	Irf2bp1
ENSMUSG00000067288.14	-0,18889	7,302266	0,003664	Rps28
ENSMUSG00000084845.10	-0,1887	5,109387	0,0340511	Tmem240
ENSMUSG00000033763.15	-0,18823	8,429645	0,0294449	Mtss2
ENSMUSG00000038976.13	-0,18796	8,229281	0,0099065	Ppp1r9b
ENSMUSG00000047085.15	-0,18731	8,005529	0,0190117	Lrrc4b
ENSMUSG00000033307.8	-0,18703	7,238956	0,0157187	Mif
ENSMUSG00000033917.16	-0,18693	6,307033	0,0357487	Gde1
ENSMUSG00000028082.15	-0,18675	5,937964	0,028255	Sh3d19
ENSMUSG00000040048.15	-0,1866	5,950253	0,0337158	Ndufb10

ENSMUSG00000069662.6	-0,18659	9,607466	0,0264669	Marcks
ENSMUSG00000022964.15	-0,1865	6,096356	0,0166854	Tmem50b
ENSMUSG00000063065.14	-0,18642	6,960858	0,0121265	Mapk3
ENSMUSG00000026103.15	-0,18604	8,051277	0,0189221	Gls
ENSMUSG00000035049.5	-0,18589	5,326799	0,0361657	Rrp12
ENSMUSG00000029121.17	-0,18583	10,46213	0,0270408	Crmp1
ENSMUSG00000054309.10	-0,18577	5,975466	0,0265836	Cpsf3
ENSMUSG00000049556.6	-0,18531	7,480657	0,0212048	Lingo1
ENSMUSG00000021256.6	-0,18479	6,519144	0,0327012	Vash1
ENSMUSG00000079435.10	-0,18459	7,091218	0,0460213	Rpl36a
ENSMUSG0000003970.10	-0,18417	8,648096	0,0177406	Rpl8
ENSMUSG00000039660.17	-0,18408	4,880914	0,0494432	Spout1
ENSMUSG00000026817.15	-0,18381	5,861514	0,0494539	Ak1
ENSMUSG00000007950.10	-0,18375	6,738135	0,007624	Abhd8
ENSMUSG00000072214.8	-0,18372	5,487816	0,0252252	Septin5
ENSMUSG00000037706.18	-0,18363	7,08919	0,0309909	Cd81
ENSMUSG00000076432.14	-0,18334	7,789418	0,0201807	Ywhaq
ENSMUSG00000032997.17	-0,18323	5,966516	0,0169196	Chpf
ENSMUSG00000068039.14	-0,18272	7,591662	0,0062013	Tcp1
ENSMUSG00000031672.9	-0,18269	6,51662	0,0226559	Got2
ENSMUSG00000028234.7	-0,18264	7,759367	0,013091	Rps20
ENSMUSG00000033965.11	-0,1819	6,413299	0,0159845	Slc16a2
ENSMUSG00000025967.17	-0,18178	8,027712	0,0398767	Eef1b2
ENSMUSG00000040236.5	-0,18147	5,643251	0,0348385	Trappc5
ENSMUSG00000022024.11	-0,18134	6,335717	0,0229312	Sugt1
ENSMUSG00000022490.8	-0,1813	5,945944	0,0334587	Ppp1r1a
ENSMUSG00000005575.17	-0,18041	6,944986	0,0097507	Ube2m
ENSMUSG00000024597.12	-0,18029	6,378456	0,0233699	Slc12a2
ENSMUSG00000022982.11	-0,18026	7,156489	0,0214254	Sod1
ENSMUSG00000055652.15	-0,18018	5,36077	0,0283093	Klhl25
ENSMUSG00000032324.12	-0,17995	7,807233	0,0409028	Tspan3
ENSMUSG00000050627.14	-0,1798	6,725921	0,0296503	Gpd1l
ENSMUSG00000056812.15	-0,17941	6,520003	0,0475768	St8sia3
ENSMUSG00000033701.14	-0,17927	5,699952	0,0362382	Acbd6
ENSMUSG00000024958.14	-0,17909	5,547502	0,0287219	Gpr137
ENSMUSG00000062006.13	-0,17885	6,512269	0,0326522	Rpl34
ENSMUSG00000046364.15	-0,17877	7,721593	0,0209158	Rpl27a
ENSMUSG00000006517.6	-0,1782	5,588377	0,0436245	Mvd
ENSMUSG00000057841.6	-0,1782	7,914359	0,0380343	Rpl32
ENSMUSG00000055839.7	-0,1782	6,912319	0,0195687	Elob
ENSMUSG00000053080.11	-0,17803	8,173206	0,039194	2700081015Rik
ENSMUSG00000067274.11	-0,17787	9,40339	0,0206209	Rplp0
ENSMUSG00000074637.8	-0,17775	6,04181	0,0408706	Sox2
ENSMUSG00000018451.8	-0,17766	8,11266	0,0234586	6330403K07Rik
ENSMUSG00000022048.9	-0,17764	8,292058	0,0259957	Dpysl2

ENSMUSG00000021290.7	-0,17762	5,644319	0,0435029	Atp5mpl
ENSMUSG00000040652.17	-0,17746	6,901168	0,0292985	Oaz2
ENSMUSG00000008393.10	-0,17731	7,157527	0,0264415	Carhsp1
ENSMUSG00000007944.9	-0,17726	5,872018	0,0473041	Ttc9b
ENSMUSG000000061518.12	-0,17711	6,636847	0,0326943	Cox5b
ENSMUSG00000028756.13	-0,17711	6,86563	0,0219022	Pink1
ENSMUSG00000079037.10	-0,17703	7,570322	0,0422657	Prnp
ENSMUSG00000043388.9	-0,177	8,607463	0,0341113	Tmem130
ENSMUSG00000030120.15	-0,17691	8,111839	0,0188751	Mlf2
ENSMUSG00000006333.15	-0,17664	8,58778	0,0440186	Rps9
ENSMUSG00000025384.16	-0,17651	6,539837	0,0209337	Faap100
ENSMUSG00000079003.4	-0,17633	5,544443	0,0356349	Samd1
ENSMUSG00000071866.13	-0,17631	9,002546	0,049999	Ppia
ENSMUSG00000031467.11	-0,17624	6,117875	0,0118313	Agpat5
ENSMUSG00000028822.12	-0,17617	6,04196	0,0328974	Tmem50a
ENSMUSG00000028013.17	-0,17607	4,690641	0,0466898	Ppa2
ENSMUSG00000025855.14	-0,17519	8,231947	0,0405575	Prkar1b
ENSMUSG00000071074.10	-0,17424	5,248156	0,0479935	Yipf3
ENSMUSG00000052428.11	-0,17424	5,302559	0,0388808	Tmco1
ENSMUSG00000054277.9	-0,17395	4,941587	0,0455316	Arfgap3
ENSMUSG00000035828.12	-0,17366	5,303829	0,0459247	Pim3
ENSMUSG00000032330.8	-0,17351	6,574228	0,0470664	Cox7a2
ENSMUSG00000024646.15	-0,17341	5,583076	0,049084	Cyb5a
ENSMUSG00000038365.9	-0,17314	6,151016	0,013636	Fbxo25
ENSMUSG00000026895.8	-0,17303	5,937006	0,0294505	Ndufa8
ENSMUSG00000006651.9	-0,17272	9,280354	0,0363373	Aplp1
ENSMUSG00000068099.6	-0,1727	5,685823	0,0443576	1500009C09Rik
ENSMUSG00000004285.13	-0,17176	5,758837	0,040477	Atp6v1f
ENSMUSG00000026773.20	-0,1715	6,581335	0,0284256	Pfkfb3
ENSMUSG00000031985.10	-0,1714	6,155004	0,0346377	Gnpat
ENSMUSG00000042523.13	-0,17122	6,256794	0,0320643	Dnal1
ENSMUSG00000108616.2	-0,17092	5,779799	0,0406677	NA
ENSMUSG00000003528.16	-0,16975	6,320363	0,0304666	Slc25a1
ENSMUSG00000018001.19	-0,16966	6,151647	0,033943	Cyth3
ENSMUSG00000041037.9	-0,16906	7,588946	0,0208297	Irgq
ENSMUSG00000036819.15	-0,16894	5,645842	0,0382146	Jmjd4
ENSMUSG00000063146.12	-0,16887	8,059501	0,0307097	Clip2
ENSMUSG00000025854.16	-0,16831	6,714469	0,0321974	Fam20c
ENSMUSG00000044502.17	-0,16733	6,342007	0,0189326	Bod1
ENSMUSG00000001552.15	-0,16723	6,283873	0,039527	Jup
ENSMUSG00000012848.16	-0,16714	8,616396	0,0316394	Rps5
ENSMUSG00000034675.18	-0,16533	9,319082	0,0452573	Dbn1
ENSMUSG00000028032.14	-0,16514	6,76725	0,0316912	Papss1
ENSMUSG00000014606.15	-0,16497	6,08773	0,0311732	Slc25a11
ENSMUSG00000029053.17	-0,16475	6,80048	0,041239	Prkcz

ENSMUSG00000054793.9	-0,16397	8,134458	0,029956	Cadm4
ENSMUSG00000030223.15	-0,16358	7,62793	0,016917	Ptpro
ENSMUSG00000022841.16	-0,1631	8,496365	0,0393539	Ap2m1
ENSMUSG00000038845.12	-0,16303	6,238634	0,0341238	Phb
ENSMUSG00000063457.15	-0,16189	8,354929	0,0470584	Rps15
ENSMUSG00000049119.15	-0,16182	6,119968	0,0354994	Fam110b
ENSMUSG00000063160.13	-0,16179	6,56277	0,0311049	Numbl
ENSMUSG00000033940.9	-0,16041	6,392553	0,0371986	Brk1
ENSMUSG0000003500.14	-0,15922	6,123441	0,0439423	Impdh1
ENSMUSG00000021275.17	-0,15865	6,115751	0,0349726	Tecpr2
ENSMUSG00000024222.18	-0,15843	6,209	0,0295495	Fkbp5
ENSMUSG00000019210.11	-0,15801	7,013534	0,048491	Atp6v1e1
ENSMUSG00000028300.15	-0,15767	5,944306	0,0407855	C9orf72
ENSMUSG00000032349.14	-0,15725	6,173209	0,0493879	Elovl5
ENSMUSG00000049517.9	-0,15718	7,989275	0,0490747	Rps23
ENSMUSG00000042750.8	-0,1568	7,532259	0,0241559	Bex2
ENSMUSG00000028405.10	-0,15654	6,265169	0,0405179	Aco1
ENSMUSG0000002012.14	-0,1554	6,472787	0,0367208	Pnck
ENSMUSG00000029657.16	-0,15435	7,462761	0,0240484	Hsph1
ENSMUSG00000030310.11	-0,15318	8,10046	0,0465987	Slc6a1
ENSMUSG00000008036.12	-0,15276	6,902776	0,0369293	Ap2s1
ENSMUSG00000001036.18	-0,15215	6,910595	0,039151	Epn2
ENSMUSG00000062591.6	-0,15108	8,25086	0,0287757	Tubb4a
ENSMUSG00000023915.6	-0,15076	6,554346	0,0372619	Tnfrsf21
ENSMUSG00000059070.17	-0,15044	7,599345	0,041624	Rpl18
ENSMUSG00000032562.14	-0,15004	8,149927	0,0414833	Gnai2
ENSMUSG00000038552.15	-0,14944	6,583068	0,0357584	Fndc4
ENSMUSG00000029713.16	-0,14873	8,247376	0,0417497	Gnb2
ENSMUSG00000031827.14	-0,14799	7,273394	0,0347046	Cotl1
ENSMUSG00000028541.15	-0,14794	6,920595	0,0351189	B4galt2
ENSMUSG00000031934.15	-0,14737	7,3812	0,0330414	Panx1
ENSMUSG00000021131.15	-0,14679	6,450866	0,0435928	Erh
ENSMUSG00000034850.16	-0,14631	7,332493	0,0424856	Tmem127
ENSMUSG00000026000.17	-0,14623	6,268624	0,0424563	Lanc1
ENSMUSG00000040390.14	-0,14389	7,047136	0,0454173	Map3k10
ENSMUSG00000048307.9	-0,14376	7,142498	0,0441942	Ankrd46
ENSMUSG00000034781.6	-0,14189	7,010669	0,0449129	Gna11
ENSMUSG00000024665.9	-0,14175	8,416216	0,0468387	Fads2
ENSMUSG00000032890.18	-0,14109	7,852328	0,047768	Rims3
ENSMUSG00000018428.16	-0,13955	6,239463	0,0466514	Akap1
ENSMUSG00000031988.11	-0,13643	7,487785	0,0484991	Vps26b
ENSMUSG00000057177.13	-0,13591	6,818755	0,0448943	Gsk3a
ENSMUSG00000029763.18	-0,13406	6,870026	0,0460999	Exoc4
ENSMUSG00000000838.18	0,140006	6,784937	0,0430882	Fmr1
ENSMUSG00000042406.9	0,150958	6,871863	0,0301052	Atf4

ENSMUSG00000049659.16	0,152795	6,240267	0,0477851	Aftph
ENSMUSG00000025278.10	0,153381	6,535536	0,0401403	Flnb
ENSMUSG00000042446.17	0,153572	7,160962	0,0184117	Zmym4
ENSMUSG00000032253.14	0,155751	7,446493	0,0437013	Phip
ENSMUSG00000026596.14	0,157473	6,859479	0,0357626	Abl2
ENSMUSG00000048279.20	0,158185	7,263955	0,0328786	Sacs
ENSMUSG00000027002.14	0,158934	8,347315	0,0314542	Nckap1
ENSMUSG00000046139.9	0,159202	5,712251	0,0397344	Patl1
ENSMUSG00000028995.15	0,161025	7,041036	0,0400746	Fam126a
ENSMUSG00000003119.15	0,163266	5,553333	0,0498482	Cdk12
ENSMUSG00000041870.18	0,166426	5,951314	0,0214415	Ankrd13a
ENSMUSG00000033557.18	0,167378	6,617712	0,0161431	Fam20b
ENSMUSG00000092060.5	0,168933	5,690434	0,043557	Bend4
ENSMUSG00000027423.16	0,168991	6,101527	0,0418571	Snx5
ENSMUSG00000017677.12	0,169189	8,437786	0,0320337	Wsb1
ENSMUSG00000029924.13	0,169383	6,403859	0,0157245	Slc37a3
ENSMUSG00000021133.10	0,169525	5,153739	0,0474879	Susd6
ENSMUSG00000033671.19	0,170071	6,899465	0,0363723	Cep350
ENSMUSG00000050272.11	0,170431	6,896052	0,0382488	Dscam
ENSMUSG00000033909.18	0,171509	5,630963	0,0420671	Usp36
ENSMUSG00000020463.16	0,171907	6,443642	0,0434737	Ppp4r3b
ENSMUSG00000020211.16	0,172327	5,361307	0,0468638	Sf3a2
ENSMUSG00000028060.15	0,173658	6,74099	0,0342302	Khdc4
ENSMUSG00000037434.8	0,17368	5,040613	0,0496118	Slc30a1
ENSMUSG00000041702.8	0,17491	6,518806	0,0357999	Btbd7
ENSMUSG00000021000.18	0,175962	5,070992	0,0458165	Mia2
ENSMUSG00000058407.13	0,176343	5,85834	0,0351521	Txndc9
ENSMUSG00000044150.13	0,176434	4,766685	0,0495817	Bclaf3
ENSMUSG00000040097.17	0,176491	6,223509	0,0435278	Flywch1
ENSMUSG00000032560.15	0,177383	6,824501	0,0188317	Dnajc13
ENSMUSG00000057421.13	0,178394	6,70451	0,0266683	Las1l
ENSMUSG00000027508.16	0,179269	6,052343	0,0431918	Pag1
ENSMUSG00000057530.15	0,179692	5,503548	0,0260172	Ece1
ENSMUSG00000027366.13	0,179847	6,265013	0,0191733	Sppl2a
ENSMUSG00000028382.16	0,180113	5,373698	0,0433006	Ptbp3
ENSMUSG00000027763.14	0,180333	5,360895	0,0302957	Mbnl1
ENSMUSG00000037110.21	0,18198	6,218362	0,0297221	Ralgapa2
ENSMUSG00000063808.15	0,182175	4,645215	0,0428706	Gpatch1
ENSMUSG00000034032.16	0,182212	5,354582	0,0406476	Rpap1
ENSMUSG00000042249.12	0,182555	6,37996	0,0496925	Grk3
ENSMUSG00000009739.18	0,182731	7,18478	0,0460437	Pou6f1
ENSMUSG00000024807.19	0,182994	5,837831	0,0316031	Syvn1
ENSMUSG00000021466.13	0,184153	6,495778	0,0431787	Ptch1
ENSMUSG00000054823.18	0,185427	7,267645	0,0191344	Nsd3
ENSMUSG00000032409.16	0,18563	5,369786	0,040343	Atr

ENSMUSG00000053819.17	0,186065	6,981579	0,0378997	Camk2d
ENSMUSG00000002413.16	0,186947	6,945996	0,0071218	Braf
ENSMUSG000000025665.17	0,18732	5,957333	0,0281998	Rps6ka6
ENSMUSG00000050310.10	0,188178	6,584671	0,0258495	Rictor
ENSMUSG000000052812.6	0,188373	6,243617	0,0367425	Atad2b
ENSMUSG000000027550.15	0,188912	5,67023	0,0163983	Lrrcc1
ENSMUSG000000099083.8	0,190539	5,446546	0,0485767	Atf7
ENSMUSG000000027829.16	0,190892	6,024495	0,0327483	Ccnl1
ENSMUSG000000078671.12	0,191831	6,69972	0,0144651	Chd2
ENSMUSG000000018160.16	0,192085	6,614014	0,0223783	Med1
ENSMUSG000000038718.16	0,192101	6,673373	0,0429168	Pbx3
ENSMUSG000000039178.10	0,192206	5,491651	0,0184397	Tbc1d19
ENSMUSG000000028907.8	0,192264	4,528286	0,0497733	Utp11
ENSMUSG000000024477.5	0,193152	5,779656	0,015203	Pggt1b
ENSMUSG000000016495.13	0,193449	5,03164	0,0455016	Plgrkt
ENSMUSG000000035469.18	0,193458	6,410632	0,0339101	Rcbtb1
ENSMUSG000000036712.16	0,193605	5,685818	0,0148517	Cyld
ENSMUSG000000034154.16	0,19375	5,583505	0,0280476	Ino80
ENSMUSG000000036943.10	0,194494	6,103491	0,0356619	Rab8b
ENSMUSG000000071064.16	0,194605	6,295933	0,0161214	Zfp827
ENSMUSG000000015757.11	0,194734	6,163802	0,0168379	Ppil4
ENSMUSG000000027435.9	0,195772	5,320969	0,0482868	Cd93
ENSMUSG000000010066.16	0,196026	7,130324	0,0441976	Cacna2d2
ENSMUSG000000022139.18	0,196208	5,253022	0,0162142	Mbnl2
ENSMUSG000000035248.10	0,197017	6,314786	0,0217741	Tut7
ENSMUSG000000000787.13	0,197181	8,804059	0,0185222	Ddx3x
ENSMUSG000000068735.15	0,197472	7,410728	0,0220439	Trp53i11
ENSMUSG000000014859.10	0,197806	5,146399	0,0168473	E2f4
ENSMUSG000000008206.17	0,197927	6,820492	0,0159645	Cers4
ENSMUSG000000020611.15	0,199257	6,51586	0,0038932	Gna13
ENSMUSG000000061607.16	0,199663	6,151438	0,0181349	Mdc1
ENSMUSG000000038095.16	0,200125	7,312821	0,0423926	Sbno1
ENSMUSG000000040865.16	0,200592	6,259892	0,0157355	Ino80d
ENSMUSG000000034462.10	0,201379	6,178412	0,0138633	Pkd2
ENSMUSG000000006276.11	0,202424	6,509035	0,0210832	Eps15l1
ENSMUSG000000039219.19	0,203373	6,567293	0,0430867	Arid4b
ENSMUSG000000040018.10	0,203559	5,328346	0,019027	Cox15
ENSMUSG000000059920.10	0,204959	4,767512	0,0368253	4930453N24Rik
ENSMUSG000000027217.14	0,205894	5,779279	0,0225456	Tspan18
ENSMUSG000000016559.15	0,206022	9,251561	0,0313634	H3f3b
ENSMUSG000000016200.15	0,206112	5,739649	0,0379137	Syt14
ENSMUSG000000026987.17	0,206364	6,749686	0,0309546	Baz2b
ENSMUSG000000037851.14	0,206578	6,538633	0,0066124	Iars
ENSMUSG000000058761.6	0,206584	4,999072	0,0251526	Rnf169
ENSMUSG000000033075.18	0,207198	5,658812	0,0148866	Senp1

ENSMUSG00000022035.7	0,207385	5,261896	0,0284201	Ccdc25
ENSMUSG00000027433.6	0,207746	7,20856	0,0136209	Xrn2
ENSMUSG00000027422.16	0,20859	6,441019	0,0117389	Rrbp1
ENSMUSG00000022538.21	0,20879	4,854834	0,0203347	Lsg1
ENSMUSG00000033799.11	0,209623	6,690039	0,0083334	Tasor2
ENSMUSG00000020212.15	0,209655	4,598984	0,043645	Mdm1
ENSMUSG00000037533.21	0,209721	6,388574	0,0070604	Rapgef6
ENSMUSG00000020063.17	0,210218	4,872668	0,0247128	Sirt1
ENSMUSG00000030757.14	0,210239	6,839516	0,0099676	Zkscan2
ENSMUSG00000031928.16	0,210616	4,442473	0,0360435	Mre11a
ENSMUSG00000042308.15	0,210648	4,754086	0,044367	Setd1a
ENSMUSG00000031577.11	0,21094	4,324595	0,0335333	Tti2
ENSMUSG00000044770.15	0,210965	4,910916	0,0155585	Scml4
ENSMUSG00000028901.14	0,211093	5,6544	0,0212177	Gmeb1
ENSMUSG00000034218.17	0,211426	5,627493	0,0138242	Atm
ENSMUSG00000058440.15	0,21235	5,412427	0,0450838	Nrf1
ENSMUSG00000087143.10	0,212352	4,817327	0,0428833	NA
ENSMUSG00000015522.19	0,212826	5,723611	0,0095394	Arnt
ENSMUSG00000029823.17	0,213123	7,996789	0,0065573	Luc7l2
ENSMUSG00000069769.14	0,213176	6,997522	0,0066622	Msi2
ENSMUSG00000019856.15	0,21333	5,022819	0,012165	Fam184a
ENSMUSG00000031295.14	0,213338	4,470342	0,0492767	Phka2
ENSMUSG00000028698.14	0,214171	6,838849	0,0079018	Pik3r3
ENSMUSG00000033705.18	0,214194	5,310228	0,0291275	Stard9
ENSMUSG00000027244.15	0,215381	5,696855	0,0133299	Atg13
ENSMUSG00000006362.17	0,216348	5,888602	0,0230892	Cbfa2t3
ENSMUSG000000100826.7	0,216429	7,297737	0,0058162	lpw
ENSMUSG00000050244.10	0,21682	5,375174	0,032645	Heatr1
ENSMUSG00000021807.7	0,218147	6,193881	0,0082034	Rtraf
ENSMUSG00000024539.18	0,218386	4,571274	0,0326211	Ptpn2
ENSMUSG00000032727.15	0,218501	5,359797	0,0101129	Mier3
ENSMUSG00000034858.17	0,219077	5,504914	0,0055583	Fam214a
ENSMUSG00000042726.15	0,219191	6,708414	0,0063286	Trafd1
ENSMUSG00000009207.16	0,22172	5,688044	0,0055165	Ln timer
ENSMUSG00000062627.10	0,221979	5,670257	0,0129719	Mysm1
ENSMUSG00000039087.18	0,222786	4,48696	0,0482298	Rreb1
ENSMUSG00000030199.17	0,223464	4,481113	0,0356377	Etv6
ENSMUSG00000057914.16	0,223568	4,616554	0,0210603	Cacnb2
ENSMUSG00000031652.12	0,22403	6,259587	0,00237	N4bp1
ENSMUSG00000029714.12	0,22445	7,015427	0,0254257	Gigyf1
ENSMUSG00000038393.15	0,224639	5,540621	0,0309162	Txn timer
ENSMUSG00000038766.17	0,224809	5,285603	0,0164796	Gabpb2
ENSMUSG00000021969.9	0,224959	6,076814	0,0325013	Zdhhc20
ENSMUSG00000011179.9	0,225063	7,006058	0,0045273	Odc1
ENSMUSG00000022641.16	0,225936	4,934375	0,0177808	Bbx

ENSMUSG00000047388.11	0,226231	6,046064	0,004336	Atmin
ENSMUSG00000021036.11	0,227929	6,424978	0,0399505	Sptlc2
ENSMUSG00000063406.12	0,227948	4,355693	0,0412941	Tmed5
ENSMUSG00000045215.18	0,229166	6,7522	0,0109727	Asxl3
ENSMUSG00000028955.4	0,229753	5,359766	0,030466	Vamp3
ENSMUSG00000001018.16	0,230077	4,8636	0,0155633	Snapin
ENSMUSG00000027569.16	0,230623	5,443229	0,0052575	Mrgbp
ENSMUSG00000001768.17	0,230957	4,761728	0,0458896	Rin2
ENSMUSG00000040473.16	0,231691	4,003403	0,0461174	Cfap69
ENSMUSG00000045071.15	0,231822	5,380065	0,034177	E130308A19Rik
ENSMUSG00000026614.8	0,232345	5,476169	0,0470868	Slc30a10
ENSMUSG00000040040.17	0,232502	4,788905	0,0070956	lft88
ENSMUSG00000044791.17	0,233683	7,604097	0,0010712	Setd2
ENSMUSG00000038538.18	0,233878	7,062399	0,0349527	Ubn2
ENSMUSG00000010755.18	0,234338	5,984982	0,0073726	Cars
ENSMUSG00000041935.11	0,234402	6,678913	0,0016575	AW549877
ENSMUSG00000008496.20	0,234689	5,726457	0,0311497	Pou2f2
ENSMUSG00000074578.15	0,234764	4,725341	0,0251228	Zfas1
ENSMUSG00000026349.15	0,234833	7,231366	0,0073145	Ccnt2
ENSMUSG00000038535.18	0,236049	5,565872	0,0143548	Zfp280d
ENSMUSG00000064043.16	0,23681	5,452694	0,0312796	Trerf1
ENSMUSG00000027281.17	0,23692	5,044817	0,0061059	Slx4ip
ENSMUSG00000020564.18	0,238194	4,714684	0,0189167	Atxn7l1
ENSMUSG00000037395.17	0,238199	4,95887	0,0067413	Rcor3
ENSMUSG00000044224.17	0,239304	4,300346	0,0297098	Dnajc21
ENSMUSG00000030231.12	0,239916	6,653834	0,0027573	Plekha5
ENSMUSG00000042772.16	0,241093	6,942737	0,0010359	Smg7
ENSMUSG00000019338.14	0,241433	5,395464	0,0073658	Zfp687
ENSMUSG00000055639.17	0,241846	5,251771	0,0375709	Dach1
ENSMUSG00000022108.9	0,241979	8,030921	0,0162216	Itm2b
ENSMUSG00000022987.13	0,243096	5,282399	0,0067742	Zfp641
ENSMUSG00000040124.6	0,243108	3,9928	0,0305688	Gorab
ENSMUSG00000039943.17	0,243154	6,028865	0,0154068	Plcb4
ENSMUSG00000036898.17	0,2449	6,215947	0,0028524	Zfp157
ENSMUSG00000038126.18	0,244922	5,409731	0,0347918	Mphosph9
ENSMUSG00000031871.10	0,245012	5,445165	0,0366114	Cdh5
ENSMUSG00000112964.2	0,245415	4,677046	0,0363885	NA
ENSMUSG00000034310.9	0,245954	4,364528	0,0241288	Tmem132d
ENSMUSG00000029426.9	0,24625	7,939525	0,0004736	Scarb2
ENSMUSG00000051166.11	0,246308	6,938737	0,0259837	Eml5
ENSMUSG00000032525.16	0,246468	7,816608	0,0144787	Nktr
ENSMUSG00000096210.3	0,246543	7,242906	0,0316264	H1f0
ENSMUSG00000041757.18	0,247101	6,99937	0,0267111	Plekha6
ENSMUSG00000063804.9	0,247301	4,734636	0,0137096	Lin28b
ENSMUSG00000039512.13	0,247789	6,231585	0,0135353	Uhrf1bp1

ENSMUSG00000020630.10	0,248141	4,070943	0,0252563	Rnaseh1
ENSMUSG00000021047.8	0,248276	7,834408	0,0050539	Nova1
ENSMUSG00000040010.11	0,248309	7,202004	0,0005236	Slc7a5
ENSMUSG00000023008.19	0,248653	5,043269	0,0126216	Fmnl3
ENSMUSG00000027247.17	0,248689	6,431239	0,0008246	Arhgap1
ENSMUSG00000043668.14	0,249111	5,529002	0,0051092	Tox3
ENSMUSG00000097023.9	0,24921	5,500846	0,0065101	Mir9-3hg
ENSMUSG00000000416.17	0,249715	7,056371	0,0120321	Cttnbp2
ENSMUSG00000001642.19	0,251582	4,848071	0,0311091	Akr1b3
ENSMUSG00000027007.17	0,252365	4,937791	0,0033667	Itprid2
ENSMUSG00000106099.2	0,252502	4,76467	0,0466024	NA
ENSMUSG00000040188.11	0,253137	5,107759	0,003285	Scamp2
ENSMUSG00000022075.8	0,253476	6,643123	0,000202	Rhobtb2
ENSMUSG00000021203.16	0,253753	4,783333	0,0038441	Otub2
ENSMUSG00000059820.15	0,254326	5,160528	0,0113673	Nkapd1
ENSMUSG00000054717.8	0,255676	5,869713	0,0419468	Hmgb2
ENSMUSG00000025262.9	0,255807	5,652824	0,018554	Fam120c
ENSMUSG00000040618.8	0,256172	4,479341	0,0322295	Pck2
ENSMUSG00000037492.17	0,256535	4,227225	0,0435777	Zmat4
ENSMUSG00000028163.18	0,257648	4,71941	0,0039894	Nfkb1
ENSMUSG00000029814.11	0,258046	4,370779	0,0241241	Igf2bp3
ENSMUSG00000020599.14	0,258606	4,712364	0,0383121	Rgs9
ENSMUSG00000030766.16	0,258673	4,50912	0,0431473	Arhgap17
ENSMUSG00000037486.19	0,259893	5,454539	0,0042378	Asxl2
ENSMUSG00000034424.6	0,259993	4,75097	0,0155001	Gcsh
ENSMUSG00000047496.7	0,259998	7,365796	0,0009708	Rnf152
ENSMUSG00000042599.9	0,261859	5,318229	0,0185103	Kdm7a
ENSMUSG00000066880.16	0,262748	4,200359	0,0100518	Zfp617
ENSMUSG00000085385.8	0,262875	5,067837	0,0029591	NA
ENSMUSG00000025815.14	0,26417	4,457713	0,0367856	Dhtkd1
ENSMUSG00000072568.5	0,26478	4,252612	0,0496493	Lratd2
ENSMUSG00000068015.9	0,264976	4,948695	0,0092302	Lrch1
ENSMUSG00000051790.16	0,26533	8,599777	0,0024026	Nlgn2
ENSMUSG00000028560.12	0,265794	5,391947	0,0049568	Usp1
ENSMUSG00000022799.5	0,26609	4,885322	0,0256118	Arhgap31
ENSMUSG00000020101.15	0,266945	3,239887	0,0488949	Vsir
ENSMUSG00000051413.18	0,267379	4,77515	0,0229958	Plagl2
ENSMUSG00000019817.19	0,26746	6,483568	0,0179393	Plagl1
ENSMUSG00000050619.15	0,268019	4,078235	0,017059	Zscan29
ENSMUSG00000032913.14	0,268423	6,298211	0,0001411	Lrig2
ENSMUSG00000022843.18	0,269034	5,521405	0,0131121	Clcn2
ENSMUSG00000019971.11	0,269044	5,06796	0,0053129	Cep290
ENSMUSG00000020902.13	0,270432	6,306041	0,0296253	Ntn1
ENSMUSG00000005501.15	0,270746	5,527163	0,0048272	Usp40
ENSMUSG00000059142.17	0,270997	5,522893	0,0037451	Zfp945

ENSMUSG00000029782.21	0,271158	5,217718	0,0088749	Tmem209
ENSMUSG00000040729.9	0,271625	3,923856	0,036959	Cep126
ENSMUSG00000023307.15	0,272226	6,508365	0,0018897	Marchf5
ENSMUSG00000039246.9	0,272876	3,503337	0,032161	Lyplal1
ENSMUSG00000030956.16	0,272965	4,426222	0,0120897	Fam53b
ENSMUSG00000090626.10	0,274705	3,639045	0,0484077	Tex9
ENSMUSG00000038593.19	0,274803	4,771938	0,0279886	Tctn1
ENSMUSG00000095123.2	0,276618	4,766637	0,0389695	NA
ENSMUSG00000026605.15	0,277241	5,261236	0,0261701	Cenpf
ENSMUSG00000028358.16	0,277386	6,314787	0,0122754	Zfp618
ENSMUSG00000034206.16	0,277866	3,638751	0,0362648	Polq
ENSMUSG00000097392.5	0,278785	5,994894	0,0008325	Thoc2l
ENSMUSG00000055320.19	0,279534	6,403883	0,0105303	Tead1
ENSMUSG00000020413.12	0,279904	4,086558	0,0128752	Hus1
ENSMUSG00000037326.11	0,279909	5,524761	0,0051332	Capn15
ENSMUSG00000074415.15	0,280402	8,666751	0,0244509	Mir100hg
ENSMUSG00000009772.16	0,282048	3,753087	0,0248444	Nuak2
ENSMUSG00000034327.18	0,28235	3,887392	0,0147329	Kctd9
ENSMUSG00000027346.16	0,283438	6,505164	8,883E-05	Gpcpd1
ENSMUSG00000010505.17	0,283775	6,080526	0,023413	Myt1
ENSMUSG00000027168.22	0,284841	5,217488	0,0350844	Pax6
ENSMUSG00000042063.12	0,285098	5,452942	0,0131749	Zfp386
ENSMUSG00000045795.11	0,286865	3,894263	0,031356	Whamm
ENSMUSG00000030203.18	0,288067	4,125264	0,0086758	Dusp16
ENSMUSG00000024030.8	0,289	4,661702	0,0034385	Abcg1
ENSMUSG000000117183.2	0,289385	4,776339	0,0435422	Gm20008
ENSMUSG00000029177.10	0,291454	4,106506	0,029608	Cenpa
ENSMUSG00000034560.7	0,292016	6,030689	4,716E-05	Washc4
ENSMUSG000000117333.2	0,292293	4,28806	0,048349	NA
ENSMUSG00000036916.14	0,292475	5,484329	0,0026393	Zfp280c
ENSMUSG00000054676.18	0,292503	4,530584	0,0210956	1600014C10Rik
ENSMUSG00000046808.18	0,292646	4,028338	0,0401207	Atp10d
ENSMUSG00000020423.7	0,293653	4,263328	0,0078135	Btg2
ENSMUSG00000027808.9	0,294046	6,124051	0,0067235	Serp1
ENSMUSG00000025236.12	0,29451	4,709107	0,0021326	Adpgk
ENSMUSG00000078919.11	0,295376	3,831826	0,0431913	Dpm1
ENSMUSG00000040943.13	0,297412	6,247527	0,0066461	Tet2
ENSMUSG00000025742.6	0,297781	4,558905	0,0325188	Prps2
ENSMUSG00000025403.6	0,297789	5,414394	0,0007557	Shmt2
ENSMUSG00000022360.9	0,297845	4,555555	0,0148402	Atad2
ENSMUSG00000027287.15	0,298094	4,275738	0,0054978	Snap23
ENSMUSG00000062785.15	0,298742	5,20122	0,0301054	Kcnc3
ENSMUSG00000079036.11	0,299341	4,936294	0,0008278	Alkbh1
ENSMUSG00000022687.13	0,299582	4,838433	0,0157164	Boc
ENSMUSG00000021939.9	0,30187	8,000411	0,0170273	Ctsb

ENSMUSG00000026219.15	0,303198	8,361514	7,123E-05	Trip12
ENSMUSG00000030275.7	0,304084	8,477044	0,000106	Etnk1
ENSMUSG00000037816.11	0,304699	4,539754	0,003844	Fbxw17
ENSMUSG00000050875.12	0,304953	6,537083	0,0317016	Minar2
ENSMUSG00000037965.16	0,30599	6,310684	0,0001843	Zc3h7a
ENSMUSG00000048402.15	0,306884	3,835601	0,0174462	Gli2
ENSMUSG00000055334.5	0,308358	3,483288	0,0201881	Snupn
ENSMUSG00000026970.17	0,308776	5,769367	0,0009479	Rbms1
ENSMUSG00000005397.9	0,309018	6,852356	0,0123562	Nid1
ENSMUSG00000024376.8	0,309093	5,115349	0,0050848	Epb41l4a
ENSMUSG00000001517.15	0,3098	4,615393	0,0358901	Foxm1
ENSMUSG00000024691.14	0,310021	4,050624	0,0080621	Fam111a
ENSMUSG00000041645.15	0,3101	7,013854	4,619E-06	Ddx24
ENSMUSG00000005198.16	0,310224	7,285474	0,0025413	Polr2a
ENSMUSG00000071753.14	0,310423	6,404014	0,0120883	Cdr1os
ENSMUSG00000011382.9	0,31059	3,031346	0,0475107	Dhdh
ENSMUSG00000030671.10	0,310695	4,544798	0,007081	Pde3b
ENSMUSG00000036833.17	0,310907	2,788824	0,0387532	Pnpla7
ENSMUSG00000003847.17	0,311589	7,136649	0,0067501	Nfat5
ENSMUSG00000059921.16	0,313394	5,91721	0,0085772	Unc5c
ENSMUSG00000055980.3	0,314057	5,377411	0,0010386	Irs1
ENSMUSG00000024420.10	0,314069	6,020066	0,001079	Zfp521
ENSMUSG00000043015.16	0,314283	4,383648	0,0169292	Nemp2
ENSMUSG00000055322.17	0,314816	5,464368	0,0011069	Tns1
ENSMUSG00000022849.6	0,314908	3,65004	0,0100891	Hspbap1
ENSMUSG00000017756.10	0,316037	4,940373	0,0133443	Slc12a7
ENSMUSG00000022246.15	0,316073	5,223786	0,0144275	Rai14
ENSMUSG00000037938.5	0,317957	3,366425	0,0204931	Chchd5
ENSMUSG00000052395.18	0,319349	3,586517	0,0150152	Rft1
ENSMUSG00000031659.14	0,320233	4,231439	0,0262349	Adcy7
ENSMUSG00000031480.16	0,320324	3,555543	0,0326603	Thsd1
ENSMUSG00000037646.11	0,320332	5,915511	0,0160253	Vps13b
ENSMUSG00000055884.9	0,320996	5,045464	0,0105783	Fancm
ENSMUSG00000037474.14	0,321041	3,614175	0,0477766	Dtl
ENSMUSG00000034485.11	0,321121	5,193338	0,0160534	Uaca
ENSMUSG00000089809.10	0,321187	5,530677	0,0091588	A930011G23Rik
ENSMUSG00000040043.18	0,323375	4,3225	0,0398417	Rbms2
ENSMUSG00000107962.2	0,324297	4,620387	0,0199634	NA
ENSMUSG00000028041.18	0,324546	5,311555	0,0013565	Adam15
ENSMUSG00000056919.10	0,324945	4,748403	0,0023087	Cep162
ENSMUSG00000029595.10	0,325176	4,115829	0,036591	Lhx5
ENSMUSG00000025332.15	0,325983	7,026281	0,0063758	Kdm5c
ENSMUSG00000021221.16	0,328304	4,450738	0,0361357	Dpf3
ENSMUSG00000066440.6	0,328359	5,191654	0,00036	Zfyve26
ENSMUSG00000032313.12	0,328365	3,476768	0,0254579	Tmem266

ENSMUSG00000031207.17	0,328452	5,940091	0,0005336	Msn
ENSMUSG00000022500.16	0,328608	4,034356	0,0020651	Litaf
ENSMUSG00000012443.5	0,330025	4,762803	0,0481417	Kif11
ENSMUSG00000039126.11	0,330375	4,817502	0,0041035	Prune2
ENSMUSG00000029009.18	0,33093	5,619347	0,0001493	Mthfr
ENSMUSG00000040204.7	0,330963	3,461713	0,0256084	Pclaf
ENSMUSG00000022385.12	0,330975	2,620244	0,0395237	Gtse1
ENSMUSG00000027962.15	0,332157	5,53744	0,0103583	Vcam1
ENSMUSG00000074794.11	0,333626	6,341411	0,0002046	Arrdc3
ENSMUSG00000032440.14	0,334343	4,630973	0,0100583	Tgfb2
ENSMUSG00000075040.10	0,334382	4,722584	0,0075996	Zfp408
ENSMUSG00000052056.15	0,335152	3,914928	0,0081994	Zfp217
ENSMUSG00000109394.3	0,33605	5,706885	0,0117544	A230057D06Rik
ENSMUSG00000025747.13	0,336054	3,77724	0,0329106	Tyms
ENSMUSG00000005233.17	0,336623	3,226276	0,0198403	Spc25
ENSMUSG00000063849.7	0,337823	3,621064	0,0168038	Ppcdc
ENSMUSG00000030760.15	0,338284	4,043509	0,0023929	Acer3
ENSMUSG00000034121.13	0,3386	3,352406	0,0142817	Mks1
ENSMUSG00000035021.14	0,338944	3,427657	0,0176145	Baz1a
ENSMUSG00000041219.15	0,34023	4,695953	0,0437927	Arhgap11a
ENSMUSG00000021453.3	0,34046	3,628829	0,0316371	Gadd45g
ENSMUSG00000038872.11	0,340711	6,312531	0,0027469	Zfhx3
ENSMUSG00000002668.9	0,341211	2,86401	0,035355	Dennd1c
ENSMUSG00000036768.7	0,341313	4,201899	0,0181141	Kif15
ENSMUSG00000022130.11	0,34188	3,63772	0,0081301	Tgds
ENSMUSG00000015880.14	0,342496	3,255129	0,0288381	Ncapg
ENSMUSG00000027669.15	0,342577	6,845657	1,143E-06	Gnb4
ENSMUSG00000033487.15	0,34368	7,122133	3,908E-07	Fndc3a
ENSMUSG00000001435.16	0,343816	5,411472	0,03638	Col18a1
ENSMUSG00000033628.16	0,343957	5,563477	6,036E-06	Pik3c3
ENSMUSG00000112358.2	0,344003	3,837084	0,0307808	NA
ENSMUSG00000035150.16	0,344421	6,356473	0,0098267	Eif2s3x
ENSMUSG00000087174.8	0,345021	4,612607	0,0088947	5530601H04Rik
ENSMUSG00000000409.15	0,345488	3,249375	0,0480958	Lck
ENSMUSG00000008200.16	0,345718	7,117102	8,724E-05	Fnbp4
ENSMUSG00000032712.17	0,345863	4,943634	0,000517	Resf1
ENSMUSG00000051048.18	0,346193	3,508071	0,0198213	P4ha3
ENSMUSG00000025370.8	0,346693	3,434255	0,0409197	Cdh9
ENSMUSG00000016624.16	0,346731	5,490786	0,0244269	Phf21b
ENSMUSG00000032295.16	0,350903	6,576445	0,0001347	Man2c1
ENSMUSG00000030924.17	0,350976	2,770125	0,0326187	Rexo5
ENSMUSG00000025993.11	0,351069	4,562566	0,0020154	Slc40a1
ENSMUSG00000022622.6	0,351576	2,399253	0,0385053	Acr
ENSMUSG00000021268.18	0,352736	12,09106	0,0088661	Meg3
ENSMUSG00000051678.5	0,354592	2,668665	0,0421877	Pcdhb6

ENSMUSG00000035941.16	0,354643	5,982709	6,33E-07	Ibtk
ENSMUSG00000029313.19	0,354716	3,665509	0,0169669	Aff1
ENSMUSG00000056268.16	0,354874	4,53641	0,0011345	Dennd1b
ENSMUSG00000021685.13	0,355415	3,9728	0,0202842	Otp
ENSMUSG00000040624.19	0,356246	5,055028	0,0002486	Plekhg1
ENSMUSG00000037313.17	0,35691	4,371376	0,0042556	Tacc3
ENSMUSG00000027009.19	0,357154	3,774572	0,0033734	Itga4
ENSMUSG00000041936.19	0,360697	9,788963	0,0002628	Agri
ENSMUSG00000024036.17	0,361268	3,919838	0,0042794	Slc37a1
ENSMUSG00000036315.14	0,361502	4,13001	0,0298196	Znrd1
ENSMUSG00000053198.15	0,364181	2,320504	0,0466917	Prx
ENSMUSG00000000794.10	0,365002	5,437519	5,171E-05	Kcnn3
ENSMUSG00000031004.9	0,365075	6,687372	0,0020706	Mki67
ENSMUSG00000017747.14	0,365499	3,394188	0,0339924	Ghdc
ENSMUSG00000021848.17	0,365879	4,6965	0,0187932	Otx2
ENSMUSG00000069844.13	0,366446	3,889382	0,0034511	Sco1
ENSMUSG00000047534.18	0,366617	3,578426	0,0379568	Mis18bp1
ENSMUSG00000055720.11	0,367464	5,458743	7,597E-06	Ubl7
ENSMUSG00000001998.16	0,368709	4,991414	0,0013416	Ap4e1
ENSMUSG00000042082.8	0,369209	5,191868	0,0006316	Arsb
ENSMUSG00000039349.6	0,369783	4,202395	0,0093523	C130074G19Rik
ENSMUSG00000038539.16	0,372512	4,322725	0,0116955	Atf5
ENSMUSG00000041235.13	0,372629	6,334152	0,0025877	Chd7
ENSMUSG00000097290.10	0,372849	3,162646	0,0424056	1300002E11Rik
ENSMUSG00000031297.15	0,373405	4,062315	0,0037919	Slc7a3
ENSMUSG00000028718.17	0,374563	2,835092	0,0285346	Stil
ENSMUSG00000041779.6	0,374846	3,52899	0,0123046	Tram2
ENSMUSG00000004347.18	0,374954	5,25668	0,0080408	Pde1c
ENSMUSG00000027715.10	0,375295	4,842741	0,0040068	Ccna2
ENSMUSG00000026610.14	0,375508	5,682843	0,0045872	Esrrg
ENSMUSG00000022514.15	0,375925	4,154387	0,0046008	Il1rap
ENSMUSG00000101609.3	0,377906	5,237171	0,0019692	Kcnq1ot1
ENSMUSG00000086219.8	0,378105	3,233798	0,0361983	Srrm4os
ENSMUSG00000068299.12	0,378679	3,174062	0,0126227	Nat8f4
ENSMUSG00000060336.7	0,380886	3,093324	0,0238967	Zfp937
ENSMUSG00000037997.13	0,383044	6,52712	1,12E-06	Parp11
ENSMUSG00000044349.17	0,384857	10,0632	0,0016884	Snhg11
ENSMUSG00000032410.14	0,38608	6,68353	1,678E-06	Xrn1
ENSMUSG00000062991.10	0,387013	4,55579	0,0002963	Nrg1
ENSMUSG00000107000.2	0,387558	2,881625	0,0198273	NA
ENSMUSG00000059791.15	0,387657	3,089077	0,0145106	Nrm
ENSMUSG00000034575.14	0,387908	6,279399	4,454E-06	Tent4a
ENSMUSG00000080316.12	0,388712	5,488797	0,0058765	Spaca6
ENSMUSG00000020415.17	0,389456	3,391738	0,0038895	Pttg1
ENSMUSG00000033721.17	0,390153	4,1757	0,001274	Vav3

ENSMUSG00000039607.18	0,390371	5,992413	0,0003885	Rbms3
ENSMUSG00000039954.10	0,390522	3,560395	0,0127483	Stk32a
ENSMUSG00000037306.14	0,391672	4,659785	0,0068546	Man1c1
ENSMUSG00000021876.16	0,392243	3,511793	0,0322376	Rnase4
ENSMUSG000000102729.2	0,392823	3,613367	0,0110308	NA
ENSMUSG000000061186.16	0,394279	3,668972	0,0045896	Sfmbt2
ENSMUSG000000027977.16	0,394421	5,053335	0,000601	Ndst3
ENSMUSG000000025001.12	0,394959	4,270838	0,0021602	Hells
ENSMUSG000000031387.15	0,395614	2,235069	0,0275048	Renbp
ENSMUSG000000085156.9	0,396155	2,472595	0,0264652	Snhg15
ENSMUSG000000020357.4	0,396994	2,931827	0,0135686	Flt4
ENSMUSG000000040274.12	0,397329	4,926396	0,0063388	Cdk6
ENSMUSG000000035067.10	0,397559	4,00148	0,0044104	Xkr6
ENSMUSG000000086782.3	0,398607	2,315478	0,035884	E130102H24Rik
ENSMUSG000000026648.19	0,39948	3,899809	0,0118075	Dclre1c
ENSMUSG000000102205.2	0,399824	2,750337	0,0174583	NA
ENSMUSG000000027641.14	0,39987	4,234145	0,0031202	Rbl1
ENSMUSG000000106535.2	0,401897	2,377121	0,0328962	NA
ENSMUSG000000107182.2	0,40222	3,952787	0,0189189	NA
ENSMUSG000000113328.2	0,402445	3,135314	0,0064793	NA
ENSMUSG000000044338.10	0,402661	4,757287	0,018997	Aplnr
ENSMUSG000000060636.15	0,404042	6,196032	0,0073613	Rpl35a
ENSMUSG000000080717.11	0,404066	2,496167	0,02847	B230307C23Rik
ENSMUSG000000087574.2	0,404124	2,799637	0,0362824	NA
ENSMUSG000000021676.11	0,404983	4,286871	0,0023219	lqgap2
ENSMUSG000000020620.15	0,405404	4,006822	0,0025829	Abca8b
ENSMUSG000000029994.18	0,405428	2,662912	0,045234	Anxa4
ENSMUSG000000068130.12	0,405907	2,891904	0,0303255	Zfp442
ENSMUSG000000023961.17	0,406659	3,459537	0,0109469	Enpp4
ENSMUSG00000000708.15	0,408719	4,750929	9,631E-06	Kat2b
ENSMUSG000000021665.10	0,409532	4,568489	0,0018881	Hexb
ENSMUSG000000020897.13	0,409757	3,429146	0,0099782	Aurkb
ENSMUSG000000037860.16	0,410465	1,977498	0,038349	Aim2
ENSMUSG000000085828.2	0,411155	3,77179	0,0182634	Gm15612
ENSMUSG000000006418.18	0,412359	6,335655	6,976E-09	Rnf114
ENSMUSG000000028954.12	0,412679	6,202701	9,27E-08	Nub1
ENSMUSG000000054199.18	0,413804	6,086835	1,123E-06	Gon4l
ENSMUSG000000031813.9	0,415141	4,565256	0,0001178	Mvb12a
ENSMUSG000000032238.18	0,417559	5,127984	0,0003132	Rora
ENSMUSG000000042489.16	0,417736	3,276724	0,0215221	Clspn
ENSMUSG000000020412.17	0,418139	5,751545	7,086E-05	Ascc2
ENSMUSG000000025255.19	0,418474	6,835527	0,0006594	Zfhx4
ENSMUSG000000043456.18	0,418701	4,993981	2,449E-05	Zfp536
ENSMUSG000000049516.10	0,419721	4,046782	0,0001895	Spty2d1
ENSMUSG000000112117.2	0,419979	3,935928	0,0083162	Rmst

ENSMUSG00000058396.8	0,421188	2,04161	0,0439906	Gpr182
ENSMUSG00000021190.15	0,421348	6,383575	0,0002273	Lgmn
ENSMUSG00000024781.17	0,423105	4,996663	2,049E-05	Lipa
ENSMUSG00000073077.8	0,424441	2,239263	0,0147701	Cfap47
ENSMUSG00000049969.4	0,424868	3,858445	0,0012958	Plekhf2
ENSMUSG00000005667.9	0,42622	4,384302	0,0009324	Mthfd2
ENSMUSG00000022639.15	0,427401	4,403022	0,0090162	NA
ENSMUSG00000060591.10	0,428285	2,906757	0,0201989	Ifitm2
ENSMUSG00000016534.16	0,430228	6,315265	7,383E-05	Lamp2
ENSMUSG00000022887.10	0,430947	6,238732	4,556E-09	Masp1
ENSMUSG00000097743.2	0,431001	3,095445	0,035275	NA
ENSMUSG00000035505.15	0,431217	4,050203	0,0028388	Cox18
ENSMUSG00000038172.15	0,431616	4,782576	1,352E-05	Ttc39b
ENSMUSG000000104362.2	0,432783	4,336162	0,0021813	NA
ENSMUSG00000023940.15	0,433684	2,703105	0,0061714	Sgo1
ENSMUSG00000097428.2	0,434247	3,463564	0,0038567	NA
ENSMUSG00000021809.11	0,434587	3,73468	0,0006579	Nudt13
ENSMUSG00000071424.11	0,43481	4,52005	0,0094519	Grid2
ENSMUSG00000050002.15	0,434908	4,261002	1,836E-05	Idnk
ENSMUSG00000048922.19	0,434968	3,363487	0,0125065	Cdca2
ENSMUSG00000042596.8	0,436885	3,305155	0,0357206	Tfap2d
ENSMUSG00000074340.10	0,437209	2,898877	0,0053031	Ovgp1
ENSMUSG00000037369.18	0,437587	5,688119	0,0017192	Kdm6a
ENSMUSG00000006930.16	0,438029	8,913413	2,575E-06	Hap1
ENSMUSG00000036098.16	0,439059	2,243762	0,0459959	Myrf
ENSMUSG00000040350.17	0,439275	2,477942	0,014668	Trim7
ENSMUSG00000025241.17	0,439875	5,448645	0,0004706	Fyco1
ENSMUSG00000041498.14	0,440543	2,783924	0,0223332	Kif14
ENSMUSG00000036523.17	0,441277	2,02303	0,0417677	Greb1
ENSMUSG00000024301.11	0,4416	2,842581	0,008159	Kifc5b
ENSMUSG00000028494.13	0,442336	4,706179	0,0002637	Plin2
ENSMUSG00000025036.8	0,44248	4,772923	0,0020227	Sfxn2
ENSMUSG00000033987.17	0,442499	2,205269	0,0360727	Dnah17
ENSMUSG00000071226.12	0,442573	4,004869	0,0007793	Cecr2
ENSMUSG00000068758.9	0,443822	2,153837	0,0491462	Il3ra
ENSMUSG00000042901.11	0,444475	6,377113	3,675E-08	Aida
ENSMUSG00000092274.4	0,444542	3,725528	0,005265	Neat1
ENSMUSG00000037405.9	0,444772	1,568461	0,0382589	Icam1
ENSMUSG00000055214.16	0,445233	2,570269	0,014238	Pld5
ENSMUSG00000022369.14	0,446016	3,161615	0,0014224	Mtbp
ENSMUSG00000002307.17	0,447276	5,512938	2,299E-07	Daxx
ENSMUSG00000033102.16	0,448135	2,861907	0,0070473	Cdc14b
ENSMUSG000000103983.2	0,448162	3,290217	0,0294389	NA
ENSMUSG00000028370.8	0,448725	2,834657	0,0322694	Pappa
ENSMUSG00000006281.9	0,452408	3,178687	0,0063118	Tep1

ENSMUSG00000063972.14	0,452635	3,100066	0,0188194	Nr6a1
ENSMUSG00000064325.5	0,45605	2,424015	0,0485491	Hhip
ENSMUSG00000036353.14	0,456176	3,02839	0,0023965	P2ry12
ENSMUSG00000045328.12	0,456552	4,404816	0,0034453	Cenpe
ENSMUSG00000025283.16	0,456669	4,396899	0,0023966	Sat1
ENSMUSG00000004366.5	0,457782	6,495425	4,614E-09	Sst
ENSMUSG00000102555.2	0,459867	1,934943	0,0401946	NA
ENSMUSG00000027245.12	0,461027	1,4049	0,0474833	Hypk
ENSMUSG00000115338.3	0,461313	2,18809	0,0250495	Pnp
ENSMUSG000000041445.10	0,461683	2,550045	0,0056885	Mmrn2
ENSMUSG00000005951.14	0,461781	2,09936	0,024087	Shpk
ENSMUSG00000032783.10	0,461831	2,254794	0,0171323	Troap
ENSMUSG00000024472.10	0,462491	6,775756	4,433E-12	Dcp2
ENSMUSG00000028042.16	0,463176	2,288266	0,0081943	Zbtb7b
ENSMUSG00000050565.17	0,463748	6,261654	2,572E-10	Tor1aip2
ENSMUSG00000027070.15	0,463759	3,620235	0,0132322	Lrp2
ENSMUSG00000021697.13	0,464651	1,959548	0,0380372	Depdc1b
ENSMUSG00000030047.15	0,466182	1,551744	0,024881	Arhgap25
ENSMUSG000000042349.14	0,466986	1,596534	0,0357891	Ikbke
ENSMUSG00000025366.9	0,467764	4,682878	0,0001462	Esy1
ENSMUSG00000022867.12	0,468701	4,95013	1,361E-05	Usp25
ENSMUSG00000021904.7	0,468801	2,715346	0,024163	Sema3g
ENSMUSG00000035004.4	0,472632	2,000543	0,0226284	Igsf6
ENSMUSG000000004936.9	0,473378	5,988928	2,386E-07	Map2k1
ENSMUSG00000024818.16	0,473701	1,651888	0,0310203	Slc25a45
ENSMUSG00000037855.16	0,473765	4,669885	3,86E-06	Zfp365
ENSMUSG00000024013.16	0,474314	3,074878	0,0080092	Fgd2
ENSMUSG00000036854.15	0,474549	2,328998	0,010506	Hspb6
ENSMUSG00000092035.9	0,474888	7,70611	5,308E-06	Peg10
ENSMUSG00000071350.13	0,47499	2,687075	0,0021676	Setdb2
ENSMUSG00000026779.7	0,477278	2,48637	0,0093492	Mastl
ENSMUSG00000051278.13	0,478371	3,46816	0,0005268	Zgrf1
ENSMUSG00000028709.4	0,478684	2,789029	0,0021593	Mob3c
ENSMUSG00000055202.12	0,479016	6,084687	4,484E-05	Zfp811
ENSMUSG00000048440.17	0,479913	2,989752	0,0375059	Cyp4f16
ENSMUSG00000042129.9	0,481267	4,537889	0,0279437	Rassf4
ENSMUSG00000073821.12	0,483267	1,721882	0,0313674	NA
ENSMUSG00000037826.6	0,483491	4,359477	3,358E-06	Ppm1k
ENSMUSG00000024397.15	0,483707	2,730801	0,0289463	Aif1
ENSMUSG00000044250.9	0,483951	2,360984	0,0095391	Pced1b
ENSMUSG00000078952.10	0,484038	1,698191	0,0273758	Lncenc1
ENSMUSG00000025225.16	0,487375	2,051168	0,0367634	Nfkb2
ENSMUSG00000027954.10	0,487466	1,941493	0,0202436	Efna1
ENSMUSG00000041741.11	0,490284	4,268235	4,35E-06	Pde3a
ENSMUSG00000021998.17	0,493917	3,83019	0,0003556	Lcp1

ENSMUSG00000097571.10	0,495152	3,531593	0,0015303	Jpx
ENSMUSG00000097287.4	0,495456	4,20755	0,000237	NA
ENSMUSG00000047407.18	0,496806	2,489314	0,0121111	Tgif1
ENSMUSG00000017146.13	0,496831	3,577861	0,0148616	Brca1
ENSMUSG00000028838.12	0,497487	0,913971	0,0427194	Extl1
ENSMUSG00000038235.5	0,498713	2,957946	0,0219736	F11r
ENSMUSG00000052102.16	0,499185	3,437148	0,0002361	Gnpda1
ENSMUSG00000046410.11	0,500982	1,426454	0,0201002	Kcnk6
ENSMUSG00000018654.18	0,502676	3,260127	0,011186	Ikzf1
ENSMUSG00000027544.17	0,502935	3,187229	0,0020024	Nfatc2
ENSMUSG00000085084.8	0,503053	3,333602	0,000347	4930570G19Rik
ENSMUSG00000098090.9	0,503132	2,185303	0,02366	2700099C18Rik
ENSMUSG00000109408.2	0,503508	2,114776	0,0154753	A930037H05Rik
ENSMUSG00000057818.9	0,511994	2,574278	0,0082607	1600029O15Rik
ENSMUSG00000026669.15	0,512346	2,766354	0,0027196	Mcm10
ENSMUSG00000111163.2	0,513173	1,501431	0,0258122	NA
ENSMUSG00000036334.13	0,513587	4,638042	4,234E-06	Igsf10
ENSMUSG00000097585.3	0,516897	1,414094	0,0499409	E230029C05Rik
ENSMUSG00000050721.10	0,516928	3,375782	0,0029313	Plekho2
ENSMUSG00000075576.13	0,516959	1,295567	0,0393995	Gm12359
ENSMUSG00000039396.12	0,517959	2,958046	0,0143536	Neil3
ENSMUSG00000057098.15	0,518076	5,366733	0,0079222	Ebf1
ENSMUSG00000041135.16	0,519456	2,688552	0,0017126	Ripk2
ENSMUSG00000006519.12	0,519599	2,506877	0,0109743	Cyba
ENSMUSG00000029546.13	0,519859	3,190866	0,0086644	Uncx
ENSMUSG00000066553.6	0,52073	4,276653	0,0268213	NA
ENSMUSG00000002204.10	0,521052	0,801966	0,0351648	Napsa
ENSMUSG00000078503.10	0,521608	3,507708	0,0106516	Zfp990
ENSMUSG00000112054.2	0,522322	1,555613	0,0101695	Gm33680
ENSMUSG00000116883.2	0,523674	1,064497	0,0303718	NA
ENSMUSG00000074345.5	0,524306	1,914309	0,0380349	Tnfaip8l3
ENSMUSG00000019832.6	0,526664	1,285548	0,0380516	Rab32
ENSMUSG00000016256.11	0,527664	5,314845	1,699E-06	Ctsz
ENSMUSG00000109122.2	0,528668	2,464394	0,020978	NA
ENSMUSG00000078486.4	0,531196	3,903565	0,0001278	Perm1
ENSMUSG00000030722.8	0,531621	3,721468	7,375E-05	Nfatc2ip
ENSMUSG00000020790.15	0,533056	7,544232	1,522E-13	Ankfy1
ENSMUSG00000042055.14	0,533074	6,488286	0,0009131	Wdr11
ENSMUSG00000090083.12	0,533529	3,869377	0,0030784	Rnf8
ENSMUSG00000025450.5	0,534697	1,464612	0,0408718	NA
ENSMUSG00000033386.11	0,534835	3,074085	0,0005466	Frrs1
ENSMUSG00000116635.2	0,536886	0,791961	0,0313147	NA
ENSMUSG00000022216.18	0,538323	6,433576	3,69E-11	Psme1
ENSMUSG00000098488.8	0,538932	1,888252	0,0322495	Pla2g4b
ENSMUSG00000043993.7	0,541538	2,129544	0,0046379	NA

ENSMUSG00000024621.17	0,542727	5,372543	0,0012082	Csf1r
ENSMUSG00000037949.9	0,543888	5,349931	3,536E-09	Ano10
ENSMUSG00000032373.16	0,545787	4,299706	0,036347	Car12
ENSMUSG00000066057.8	0,546871	3,652819	0,0096934	Gm1976
ENSMUSG00000031734.14	0,547712	2,896189	0,0389964	Irx3
ENSMUSG00000063415.13	0,54827	5,824504	0,0206071	Cyp26b1
ENSMUSG00000033847.16	0,548796	1,551629	0,0135724	Pla2g4c
ENSMUSG00000039131.16	0,549661	1,128945	0,0253024	Gipc2
ENSMUSG00000046961.9	0,549884	3,127672	0,0005397	Gpr156
ENSMUSG00000086915.8	0,549987	0,72217	0,0418186	Gm16364
ENSMUSG00000036918.17	0,550923	3,111202	0,000682	Ttc7
ENSMUSG00000053626.6	0,552525	2,845758	0,0005293	Tll1
ENSMUSG00000032308.10	0,553025	4,700138	6,545E-07	Ulk3
ENSMUSG00000049577.16	0,554426	4,014342	0,000347	Zfpm1
ENSMUSG00000022322.9	0,55443	2,82016	0,0019367	Shcbp1
ENSMUSG00000091784.3	0,554472	0,660343	0,037445	NA
ENSMUSG00000020805.15	0,554899	2,619168	0,0298507	Slc13a5
ENSMUSG00000029470.16	0,555577	3,262265	0,000128	P2rx4
ENSMUSG00000092167.9	0,557572	1,424833	0,0163891	Gm3696
ENSMUSG00000028587.19	0,558199	1,009746	0,0331092	Orc1
ENSMUSG00000098649.3	0,558354	1,142853	0,0401351	NA
ENSMUSG00000034329.17	0,560263	1,787807	0,0043428	Brip1
ENSMUSG00000031896.8	0,56249	1,307333	0,0225503	Ctrl
ENSMUSG00000106944.2	0,564376	3,49106	1,183E-05	NA
ENSMUSG00000038866.16	0,564912	5,279378	5,173E-11	Zcchc2
ENSMUSG00000004952.14	0,567287	4,539023	5,521E-07	Rasa4
ENSMUSG00000066477.14	0,56763	0,903741	0,034892	Gm16551
ENSMUSG00000032023.8	0,568881	0,680066	0,0325433	Jhy
ENSMUSG00000045518.9	0,569565	2,81819	0,0088239	Onecut3
ENSMUSG00000090799.3	0,570478	2,543989	0,0161895	Klhl33
ENSMUSG00000109362.2	0,571486	1,413697	0,0208942	NA
ENSMUSG00000097623.8	0,572	2,011981	0,0019343	B230323A14Rik
ENSMUSG00000021510.12	0,57447	5,523544	0,000866	Zfp729a
ENSMUSG00000095403.9	0,575174	2,45561	0,0480234	Gm21092
ENSMUSG00000002602.17	0,575532	5,205124	3,614E-07	Axl
ENSMUSG00000114230.2	0,576153	3,32818	0,0076282	NA
ENSMUSG00000029151.15	0,57646	3,265338	0,0456158	Slc30a3
ENSMUSG00000103507.2	0,579915	0,744342	0,04993	NA
ENSMUSG00000086288.2	0,581364	0,39813	0,0496453	NA
ENSMUSG00000098024.2	0,583132	1,037199	0,021314	NA
ENSMUSG00000039005.14	0,583501	0,715678	0,0190434	Tlr4
ENSMUSG00000107726.2	0,583768	0,338808	0,0451318	NA
ENSMUSG00000111547.2	0,58532	0,94013	0,0237705	NA
ENSMUSG00000097379.3	0,585548	1,836825	0,0097798	NA
ENSMUSG00000112346.2	0,58588	0,390975	0,0364768	NA

ENSMUSG00000018698.16	0,588206	4,726015	0,0009676	Lhx1
ENSMUSG000000109575.2	0,589943	1,028133	0,0312285	NA
ENSMUSG00000009035.16	0,591877	6,081787	1,692E-11	Tmem184b
ENSMUSG00000097876.2	0,592761	1,114228	0,0165056	NA
ENSMUSG00000097961.2	0,59398	0,503447	0,0455089	NA
ENSMUSG00000043773.6	0,594684	4,01563	0,0243374	1700048O20Rik
ENSMUSG00000073647.5	0,596273	3,889795	0,0063846	NA
ENSMUSG00000038213.8	0,597286	2,467555	0,0006802	Tapbpl
ENSMUSG00000087014.2	0,601068	1,35603	0,0290111	NA
ENSMUSG00000024215.15	0,605602	1,068657	0,0465817	Spdef
ENSMUSG00000097797.7	0,606737	1,504884	0,0076585	NA
ENSMUSG00000075304.3	0,607006	2,267648	0,0215605	Sp5
ENSMUSG00000060429.13	0,607366	2,33817	0,0049705	Sntb1
ENSMUSG000000111092.2	0,607609	1,494759	0,0295486	NA
ENSMUSG00000079645.3	0,609602	1,55465	0,0055973	NA
ENSMUSG000000108551.2	0,609677	0,291768	0,0451592	NA
ENSMUSG00000026928.15	0,611638	1,234524	0,0163081	Card9
ENSMUSG00000050541.15	0,612759	3,503499	0,0030458	Adra1b
ENSMUSG00000075569.11	0,613429	2,329506	0,0079599	Pms2
ENSMUSG00000071112.13	0,613717	1,085315	0,0189285	Spx
ENSMUSG00000087035.2	0,613863	0,003041	0,0494316	NA
ENSMUSG00000093726.2	0,614737	0,288786	0,0293599	NA
ENSMUSG00000085526.2	0,614802	0,645578	0,0193703	NA
ENSMUSG00000053158.11	0,615776	2,502127	0,005302	Fes
ENSMUSG00000060791.16	0,617333	0,755582	0,030534	Gmfg
ENSMUSG00000048349.10	0,617396	3,979759	0,0439001	Pou4f1
ENSMUSG00000029919.6	0,617917	2,730483	0,0008377	Hpgds
ENSMUSG000000110529.2	0,618032	0,860478	0,0242298	NA
ENSMUSG00000071793.13	0,618962	4,729634	0,003367	2610005L07Rik
ENSMUSG00000045991.20	0,623369	4,659059	0,0001691	Onecut2
ENSMUSG000000114602.2	0,623578	0,107109	0,0428345	NA
ENSMUSG00000030866.9	0,625499	1,156538	0,008265	Ern2
ENSMUSG000000104164.2	0,625843	0,72016	0,0337279	NA
ENSMUSG00000026979.17	0,625881	1,601118	0,0298107	Psd4
ENSMUSG000000104271.2	0,626104	0,29988	0,045707	NA
ENSMUSG00000027939.12	0,626386	1,204359	0,0088314	Nup210l
ENSMUSG00000067370.5	0,627718	2,058057	0,003113	B3galt4
ENSMUSG00000086224.9	0,628806	1,718854	0,0029339	NA
ENSMUSG00000037580.11	0,628893	2,217754	0,0059545	Gch1
ENSMUSG00000036461.17	0,628969	3,464289	2,687E-06	Elf1
ENSMUSG00000046027.18	0,630368	2,950697	0,0001078	Stard5
ENSMUSG00000027208.15	0,630801	0,767527	0,0269226	Fgf7
ENSMUSG00000044165.13	0,631876	0,28268	0,0293863	Bcl2l15
ENSMUSG000000103831.2	0,632542	2,53774	0,0135655	NA
ENSMUSG000000115373.2	0,632931	0,996337	0,016084	NA

ENSMUSG000000118138.2	0,633072	0,914265	0,019808	NA
ENSMUSG000000087018.2	0,633489	0,520019	0,0153589	NA
ENSMUSG000000098620.2	0,638385	1,128262	0,0208307	NA
ENSMUSG000000037216.6	0,640185	1,9947	0,0009278	Lipt1
ENSMUSG000000032128.16	0,641709	3,488962	0,0441185	Robo3
ENSMUSG000000034330.11	0,643601	1,932601	0,0067428	Plcg2
ENSMUSG000000111837.2	0,645119	0,618424	0,0300046	NA
ENSMUSG000000019838.12	0,645902	2,374813	0,0166783	Slc16a10
ENSMUSG000000021255.18	0,646576	2,790062	0,0055875	Esrrb
ENSMUSG000000031490.7	0,64797	1,925037	0,0050115	Eif4ebp1
ENSMUSG000000017652.17	0,648116	1,425311	0,0075991	Cd40
ENSMUSG000000024965.10	0,650197	3,040521	0,0001059	Fermt3
ENSMUSG000000110320.2	0,650349	0,697863	0,0397265	NA
ENSMUSG000000063935.4	0,652578	0,655318	0,0393929	Zar1
ENSMUSG000000027951.17	0,652807	7,266675	5,373E-17	Adar
ENSMUSG000000020707.7	0,654078	1,661205	0,0055895	Rnf135
ENSMUSG000000054582.5	0,654385	0,704894	0,017875	Pabpc1l
ENSMUSG000000079018.11	0,655399	2,52887	0,0007874	Ly6c1
ENSMUSG000000020072.16	0,655606	0,687144	0,0139295	Pbld2
ENSMUSG000000087366.8	0,655945	0,272397	0,0303732	NA
ENSMUSG000000019866.16	0,65602	0,959	0,0296569	Crybg1
ENSMUSG000000065524.3	0,656571	0,443937	0,015867	Mir135a-2
ENSMUSG000000087211.8	0,657218	3,081376	0,0065973	Lhx1os
ENSMUSG000000084915.3	0,657726	0,56916	0,0243128	NA
ENSMUSG000000023186.15	0,659119	4,11908	2,735E-05	Vwa5a
ENSMUSG000000085376.2	0,659903	0,643287	0,0244895	NA
ENSMUSG000000098183.2	0,661651	1,405243	0,0248036	NA
ENSMUSG000000022488.10	0,663068	3,302592	0,0001456	Nckap1l
ENSMUSG000000020709.16	0,66309	1,597709	0,0072115	Adap2
ENSMUSG000000061132.14	0,666222	0,215044	0,0437195	Blnk
ENSMUSG000000024887.11	0,669967	2,416602	0,000206	Asah2
ENSMUSG000000054435.17	0,670562	0,964184	0,0078452	Gimap4
ENSMUSG000000054675.6	0,670575	2,306963	0,0003771	Tmem119
ENSMUSG000000045827.11	0,671741	2,041353	0,0066977	Serpinb9
ENSMUSG000000038074.17	0,672724	3,683299	5,432E-07	Fkbp14
ENSMUSG000000085891.8	0,673329	1,916072	0,0098783	Gm14634
ENSMUSG000000042228.15	0,674519	3,382062	3,184E-05	Lyn
ENSMUSG000000104548.2	0,675673	1,096865	0,0150589	NA
ENSMUSG000000102995.2	0,676146	1,884528	0,0019	NA
ENSMUSG000000038765.15	0,676999	3,470873	0,0339014	Lmx1b
ENSMUSG000000109031.2	0,677548	0,226045	0,0402957	NA
ENSMUSG000000078442.4	0,677917	0,454398	0,0159208	Ccdc105
ENSMUSG000000005237.15	0,68236	4,513466	0,0034928	Dnah2
ENSMUSG000000020572.9	0,682851	6,378955	3,792E-21	Nampt
ENSMUSG000000050335.18	0,683669	1,309121	0,0189386	Lgals3

ENSMUSG00000030346.17	0,685122	2,989297	8,023E-06	Rad51ap1
ENSMUSG00000064090.15	0,685318	0,419571	0,0464257	Vrk2
ENSMUSG00000026321.9	0,686279	1,911474	0,0111549	Tnfrsf11a
ENSMUSG00000028072.7	0,688481	1,106779	0,0106437	Ntrk1
ENSMUSG00000028885.9	0,688831	-0,16845	0,0474399	Smpdl3b
ENSMUSG00000027360.6	0,689224	1,297971	0,0256637	Hdc
ENSMUSG00000102331.2	0,690097	0,528604	0,0216874	NA
ENSMUSG00000031103.13	0,691003	2,206469	0,0029171	Elf4
ENSMUSG00000029468.18	0,691753	2,972867	0,0003801	P2rx7
ENSMUSG00000006411.13	0,692781	1,851003	0,0010876	Nectin4
ENSMUSG00000031074.15	0,693181	1,39707	0,0322801	Fgf3
ENSMUSG00000070780.12	0,694266	1,262091	0,010367	Rbm47
ENSMUSG00000057457.12	0,695021	0,015872	0,0264617	Phex
ENSMUSG00000020327.5	0,695405	-0,031539	0,0375379	Fgf22
ENSMUSG00000108242.2	0,696967	0,581573	0,0097839	NA
ENSMUSG00000004043.15	0,697686	1,487411	0,0035419	Stat5a
ENSMUSG00000032443.18	0,70183	-0,054177	0,0411405	NA
ENSMUSG00000004609.12	0,702399	2,049613	0,0093353	Cd33
ENSMUSG000000097415.3	0,702979	3,349794	1,649E-07	NA
ENSMUSG00000035697.15	0,70309	2,317647	0,0046491	Arhgap45
ENSMUSG00000018774.14	0,703697	2,896895	2,894E-06	Cd68
ENSMUSG000000087484.2	0,704061	0,635002	0,0067167	NA
ENSMUSG00000073406.11	0,704126	1,694738	0,0048113	H2-BI
ENSMUSG00000027947.12	0,707482	2,104556	0,0076753	Il6ra
ENSMUSG00000020806.16	0,70856	1,276414	0,00397	Rhbdf2
ENSMUSG00000022952.18	0,709707	0,858562	0,016183	Runx1
ENSMUSG00000025193.15	0,711758	1,569303	0,0014101	Cutc
ENSMUSG00000031736.12	0,712889	1,423372	0,0055602	Crnede
ENSMUSG00000034652.13	0,713247	1,149761	0,0384842	Cd300a
ENSMUSG00000084274.3	0,714312	0,107683	0,0228663	NA
ENSMUSG00000028893.9	0,714892	4,047931	0,0096783	Sesn2
ENSMUSG00000046688.15	0,717155	1,578007	0,0022732	Tifa
ENSMUSG00000032122.16	0,717813	1,878909	0,0008738	Slc37a2
ENSMUSG00000052760.17	0,71785	0,005423	0,0270809	A630001G21Rik
ENSMUSG00000067870.6	0,718649	1,624626	0,0204903	NA
ENSMUSG00000059555.7	0,72166	1,883246	0,0003652	Tor4a
ENSMUSG00000020160.19	0,725674	5,039294	0,0028044	Meis1
ENSMUSG00000056671.8	0,726375	-0,089331	0,0381105	Prelid2
ENSMUSG00000097275.2	0,728099	1,64956	0,0013282	NA
ENSMUSG00000024019.19	0,728339	2,315487	2,291E-05	Cmtr1
ENSMUSG00000045842.10	0,72838	0,709419	0,010804	NA
ENSMUSG00000102605.2	0,728748	-0,234159	0,0307066	NA
ENSMUSG00000055093.11	0,729131	0,340419	0,0435815	Rps27a-ps3
ENSMUSG00000109501.2	0,729635	0,551934	0,006511	NA
ENSMUSG00000038188.18	0,730549	2,483154	4,752E-05	Scarf1

ENSMUSG00000105655.2	0,734007	0,520376	0,0060137	NA
ENSMUSG00000026480.13	0,734492	1,575885	0,0005453	Ncf2
ENSMUSG00000052384.15	0,734919	2,85293	8,11E-06	Nrros
ENSMUSG00000047986.13	0,734978	3,125013	0,0003219	Palm3
ENSMUSG00000032698.16	0,736759	4,583374	9,568E-16	Lmo2
ENSMUSG00000026170.7	0,737777	1,075562	0,0080949	Cyp27a1
ENSMUSG00000030263.14	0,738666	0,900213	0,0098286	Lrmp
ENSMUSG00000044786.7	0,739564	1,895039	0,0032202	Zfp36
ENSMUSG00000079051.6	0,739946	0,584059	0,0329863	Vinac1
ENSMUSG00000114536.2	0,740941	1,321646	0,0093603	NA
ENSMUSG00000031727.9	0,743079	2,419522	0,0010625	Pmfbbp1
ENSMUSG00000052336.8	0,744114	4,477088	6,026E-06	Cx3cr1
ENSMUSG00000032515.9	0,7457	1,520014	0,0016422	Csrnp1
ENSMUSG00000060204.7	0,748583	1,506048	0,0004826	Slc10a4-ps
ENSMUSG00000023992.15	0,749545	2,257414	0,0044589	Trem2
ENSMUSG00000027940.19	0,751469	7,279366	3,382E-10	Tpm3
ENSMUSG00000036585.17	0,75208	1,400572	0,0356945	Fgf1
ENSMUSG00000031165.7	0,752166	0,556702	0,0278333	Was
ENSMUSG00000020682.18	0,753164	2,240392	0,0052456	Mmp28
ENSMUSG00000086425.8	0,753359	-0,03237	0,0364764	NA
ENSMUSG00000044083.13	0,754795	-0,167519	0,0341208	Efcab8
ENSMUSG00000031519.5	0,75509	-0,09419	0,0422062	Asb5
ENSMUSG00000032436.18	0,755792	1,386471	0,0070211	Cmtm7
ENSMUSG00000030798.16	0,756721	0,509427	0,0405022	Cd37
ENSMUSG00000045493.5	0,758704	0,531956	0,0302795	Bhlhe23
ENSMUSG00000100833.2	0,762923	-0,178563	0,0389798	NA
ENSMUSG00000043008.10	0,763931	1,664093	0,0037699	Klhl6
ENSMUSG00000068428.8	0,768236	1,480125	0,0210009	Gmnc
ENSMUSG00000033222.17	0,768866	3,080302	0,0003401	Ttf2
ENSMUSG00000066000.13	0,769459	1,88025	0,0184242	Zfp979
ENSMUSG00000031026.16	0,770619	3,712593	6,757E-07	Trim66
ENSMUSG00000115432.2	0,771217	-0,411284	0,0490207	D130009I18Rik
ENSMUSG00000087501.2	0,773686	1,100254	0,0020325	NA
ENSMUSG00000037661.15	0,774985	0,076197	0,0368608	Gpr160
ENSMUSG00000104396.2	0,775494	-0,474546	0,0401558	NA
ENSMUSG00000027293.14	0,777679	3,967068	3,327E-07	Ehd4
ENSMUSG00000005413.9	0,778389	2,977996	4,933E-06	Hmox1
ENSMUSG00000005107.14	0,778807	0,673083	0,0107197	Slc2a9
ENSMUSG00000048779.6	0,783127	1,418428	0,0112307	P2ry6
ENSMUSG00000031627.10	0,783364	3,719118	2,029E-09	Irf2
ENSMUSG00000022429.12	0,786522	0,6027	0,0070134	Dmc1
ENSMUSG00000091472.3	0,787819	2,5031	0,0018201	Gm3739
ENSMUSG00000024727.10	0,789193	1,014091	0,0005451	Trpm6
ENSMUSG00000106858.2	0,790292	1,569984	0,0170329	NA
ENSMUSG00000032372.15	0,790411	0,616628	0,0197979	Plscr2

ENSMUSG00000050747.15	0,790857	0,587076	0,0061025	Trim15
ENSMUSG00000032000.18	0,791077	1,212593	0,0043159	Birc3
ENSMUSG00000039531.9	0,792901	4,456296	1,278E-11	Zup1
ENSMUSG00000032508.9	0,793952	2,191038	0,0001786	Myd88
ENSMUSG00000021209.13	0,794437	3,959311	1,913E-12	Ppp4r4
ENSMUSG00000026315.14	0,79833	-0,262414	0,0373478	Serpinb8
ENSMUSG00000026288.15	0,798512	2,977543	6,902E-06	Inpp5d
ENSMUSG00000078867.10	0,799389	0,611882	0,0102232	Gm14418
ENSMUSG00000023806.11	0,80081	3,567995	0,0196291	Rsph3b
ENSMUSG00000084899.2	0,801061	0,819542	0,0215285	NA
ENSMUSG00000098108.8	0,801483	-0,318722	0,0313304	NA
ENSMUSG00000030507.7	0,803132	0,589426	0,0334158	Dbx1
ENSMUSG00000090486.3	0,808158	1,248421	0,0187972	NA
ENSMUSG00000018008.9	0,808924	3,12549	3,223E-05	Cyth4
ENSMUSG000000114575.2	0,808947	1,286497	0,0105659	NA
ENSMUSG00000097828.3	0,811219	-0,346509	0,0370862	NA
ENSMUSG00000034773.17	0,812016	1,488881	0,04778	Hrob
ENSMUSG00000029075.7	0,812061	-0,165866	0,0342858	Tnfrsf4
ENSMUSG00000021250.14	0,814342	1,247199	0,0003011	Fos
ENSMUSG00000003283.16	0,814462	2,491212	0,0001182	Hck
ENSMUSG00000055271.6	0,814666	0,202445	0,0126215	NA
ENSMUSG00000006235.7	0,816265	0,007386	0,0095284	Epor
ENSMUSG000000116617.2	0,81632	-0,489611	0,0438942	NA
ENSMUSG00000022831.15	0,816736	1,922372	0,0005062	Hcls1
ENSMUSG00000068335.7	0,820464	0,580672	0,0163252	Dok1
ENSMUSG00000025877.15	0,822951	1,556311	0,0008962	Hk3
ENSMUSG000000108297.2	0,823023	0,320316	0,0195057	NA
ENSMUSG00000026029.15	0,826586	2,536319	1,329E-05	Casp8
ENSMUSG00000028644.18	0,830032	-0,039576	0,0121967	Ermap
ENSMUSG00000041309.18	0,830584	0,640954	0,0054548	Nkx6-2
ENSMUSG00000010476.15	0,833917	6,396744	0,0053885	Ebf3
ENSMUSG00000024805.17	0,834392	3,742504	4,721E-11	Pcgf5
ENSMUSG00000032715.10	0,834527	0,746801	0,0094368	Trib3
ENSMUSG00000073125.11	0,835417	3,04401	0,0077262	Xlr3b
ENSMUSG00000036928.15	0,836521	4,017712	5,899E-06	Stag3
ENSMUSG00000066800.12	0,83665	6,130384	0,022098	Rnasel
ENSMUSG00000027313.4	0,836756	2,571375	8,466E-07	Chac1
ENSMUSG000000109231.2	0,838882	0,208974	0,0422824	NA
ENSMUSG00000030786.19	0,839122	0,6154	0,0265595	Itgam
ENSMUSG000000103047.2	0,840207	1,507468	0,0006427	NA
ENSMUSG00000047875.7	0,841876	1,688876	0,000119	Gpr157
ENSMUSG000000107216.2	0,842886	-0,207137	0,0211035	NA
ENSMUSG00000037447.17	0,843139	2,37539	7,52E-05	Arid5a
ENSMUSG00000054580.15	0,844069	0,373811	0,0260308	Pla2r1
ENSMUSG00000060727.5	0,844535	-0,441328	0,0387741	NA

ENSMUSG00000113836.2	0,84739	2,560232	0,0003641	NA
ENSMUSG00000105571.2	0,848075	0,14909	0,0157316	NA
ENSMUSG00000052912.8	0,848092	-0,304842	0,0240014	Smarca5-ps
ENSMUSG00000031557.17	0,849271	2,506345	6,108E-06	Plekha2
ENSMUSG00000034842.17	0,851029	0,836655	0,0093285	Art3
ENSMUSG00000027075.17	0,852482	0,848975	0,0032275	Slc43a1
ENSMUSG00000018819.11	0,852648	2,305278	1,029E-05	Lsp1
ENSMUSG00000022439.10	0,853279	1,905202	0,0016948	Parvg
ENSMUSG00000005373.14	0,858705	0,830093	0,0017	Mlxipl
ENSMUSG00000055541.19	0,861579	1,940079	0,0076044	Lair1
ENSMUSG00000059498.14	0,861679	2,679733	0,0002236	Fcgr3
ENSMUSG00000026786.15	0,862077	1,584571	0,002049	Apbb1ip
ENSMUSG00000110341.2	0,862484	-0,394731	0,0237595	NA
ENSMUSG00000032344.18	0,865243	1,431564	5,875E-05	Cgas
ENSMUSG00000038774.10	0,865594	6,124945	2,964E-31	Ascc3
ENSMUSG00000030560.18	0,867474	3,933975	8,862E-08	Ctsc
ENSMUSG00000096056.2	0,867814	-0,078981	0,0126887	NA
ENSMUSG00000110649.2	0,868172	1,37157	0,0018169	NA
ENSMUSG00000092509.2	0,868734	1,100606	0,0446455	NA
ENSMUSG00000020120.16	0,869023	3,879449	8,829E-08	Plek
ENSMUSG00000029304.15	0,869495	4,219945	0,0291554	Spp1
ENSMUSG00000057554.14	0,872004	4,964536	8,809E-07	Lgals8
ENSMUSG00000028599.11	0,87232	2,690766	2,609E-07	Tnfrsf1b
ENSMUSG00000022053.14	0,87264	3,862125	0,0024402	Ebf2
ENSMUSG00000025496.6	0,87919	0,062891	0,0057442	Drd4
ENSMUSG00000030579.11	0,879403	2,909098	0,0003218	Tyrobp
ENSMUSG00000029917.16	0,879937	0,637868	0,0030189	Qrfprl
ENSMUSG00000042677.8	0,881026	-0,423564	0,0230251	Zc3h12a
ENSMUSG00000026269.15	0,881034	6,877264	0,0004929	Rnpepl1
ENSMUSG00000026466.17	0,8818	4,923501	1,357E-25	Tor1aip1
ENSMUSG00000027938.12	0,885114	-0,246429	0,0307736	Creb3l4
ENSMUSG00000025515.17	0,886062	1,011335	0,0016437	NA
ENSMUSG00000004730.16	0,886264	3,112164	1,316E-05	Adgre1
ENSMUSG00000025324.9	0,887008	3,458496	1,439E-07	Atp10a
ENSMUSG00000000579.15	0,890005	3,494978	0,010017	Dynlt1c
ENSMUSG00000047098.19	0,893175	5,591196	1,98E-21	Rnf31
ENSMUSG00000068762.12	0,893811	0,655302	0,0054677	Gstm6
ENSMUSG00000000732.10	0,8954	1,182253	0,000493	Icosl
ENSMUSG00000054901.8	0,895658	1,613254	0,0331147	Arhgef33
ENSMUSG00000030830.19	0,89578	0,776302	0,0020946	Itgal
ENSMUSG00000084866.3	0,89697	1,101806	0,0014001	A930006K02Rik
ENSMUSG00000051965.9	0,899681	-0,276203	0,0080749	Nanos2
ENSMUSG00000051147.11	0,900094	0,402669	0,0067921	Nat2
ENSMUSG00000056758.15	0,900261	1,234967	0,0312803	Hmga2
ENSMUSG00000095651.2	0,900287	-0,379435	0,0196722	NA

ENSMUSG00000047810.10	0,903377	1,493634	2,84E-05	Ccdc88b
ENSMUSG00000040838.11	0,90387	0,071856	0,0109799	NA
ENSMUSG00000081926.2	0,904854	-0,471328	0,0402865	NA
ENSMUSG00000078502.11	0,905137	-0,303424	0,0117321	Gm13212
ENSMUSG000000112627.2	0,907725	0,94485	0,0002305	4933412E12Rik
ENSMUSG000000103039.2	0,907909	1,062007	0,0006135	NA
ENSMUSG00000034708.13	0,907916	6,223283	2,081E-16	Grn
ENSMUSG00000036196.17	0,910104	2,071982	0,0451517	Slc26a8
ENSMUSG0000003206.8	0,913493	0,205167	0,0103773	Ebi3
ENSMUSG000000113055.2	0,915722	-0,646384	0,0330324	NA
ENSMUSG00000031264.14	0,915843	0,353324	0,0140127	Btk
ENSMUSG00000045591.7	0,916482	-0,094283	0,0490286	Olig3
ENSMUSG00000091705.9	0,918575	2,215716	0,0045216	H2-Q2
ENSMUSG000000113569.2	0,919369	-0,557892	0,0224878	LOC115488024
ENSMUSG000000102813.2	0,921682	-0,248957	0,0336948	NA
ENSMUSG00000097652.3	0,92373	-0,524067	0,0402577	Mhrt
ENSMUSG00000073471.4	0,926273	3,479759	0,0280524	Rsph3a
ENSMUSG00000098682.9	0,927843	-0,102347	0,0172745	Otx2os1
ENSMUSG00000030703.9	0,934161	1,480554	0,0114668	Gdpd3
ENSMUSG000000100183.2	0,93639	2,800364	0,0223712	NA
ENSMUSG00000087437.8	0,943538	0,021648	0,0094113	NA
ENSMUSG00000059422.6	0,945438	0,32182	0,0227544	NA
ENSMUSG00000079388.10	0,946481	0,977704	0,0414451	2610042L04Rik
ENSMUSG00000031101.7	0,948447	0,75435	0,0048253	Sash3
ENSMUSG00000046169.11	0,949148	4,264382	8,889E-17	Adamts6
ENSMUSG00000033192.6	0,949301	2,63764	1,706E-07	Lpcat2
ENSMUSG00000018845.15	0,949871	1,275522	0,0020129	Unc45b
ENSMUSG00000092090.3	0,950179	0,737217	0,0224526	NA
ENSMUSG00000097405.2	0,950187	-0,454172	0,0141867	D630044L22Rik
ENSMUSG00000078521.3	0,951506	-0,15187	0,0308089	Aunip
ENSMUSG00000040528.16	0,952799	-0,064645	0,003949	Milr1
ENSMUSG00000087115.8	0,953348	-0,662652	0,0203829	Pcsk2os2
ENSMUSG00000050936.6	0,955764	0,270034	0,0074197	NA
ENSMUSG00000049401.11	0,958548	7,079425	8,379E-43	Ogfr
ENSMUSG00000051251.4	0,958966	2,663338	1,819E-05	Nhlh1
ENSMUSG000000118081.2	0,95952	0,108106	0,0051632	NA
ENSMUSG00000057777.5	0,959901	3,959179	0,047793	Mab21l2
ENSMUSG00000020722.6	0,960311	0,04904	0,012647	Cacng1
ENSMUSG00000087390.2	0,960782	-0,573159	0,0169699	NA
ENSMUSG00000002699.14	0,963809	2,068737	0,0001599	Lcp2
ENSMUSG00000022548.15	0,965292	5,871918	6,696E-06	Apod
ENSMUSG00000047730.18	0,968585	-0,206647	0,01096	Fcgbp
ENSMUSG000000115263.2	0,969281	0,308398	0,0376702	NA
ENSMUSG00000032303.9	0,976045	3,452317	5,225E-07	Chrna3
ENSMUSG00000048163.14	0,978578	1,398001	0,000763	Selpg

ENSMUSG00000024457.17	0,979551	5,947975	7,455E-33	Trim26
ENSMUSG00000013707.4	0,98346	0,583462	0,0036693	Tnfaip8l2
ENSMUSG00000057123.15	0,985246	1,307936	0,0009159	Gja5
ENSMUSG00000022148.17	0,9853	1,529514	0,0010305	Fyb
ENSMUSG00000024235.12	0,986762	0,632349	0,0003175	Map3k8
ENSMUSG00000004872.16	0,988311	2,156952	0,0203272	Pax3
ENSMUSG00000099384.7	0,992371	0,728257	0,0003502	1700110C19Rik
ENSMUSG00000087326.2	0,993712	-0,680639	0,0217304	NA
ENSMUSG00000100706.7	0,994057	1,703796	2,908E-06	NA
ENSMUSG00000104094.2	0,994087	0,18747	0,0084882	NA
ENSMUSG00000006522.18	0,997119	2,591921	0,0004918	Itih3
ENSMUSG00000028581.18	1,001638	4,466379	5,741E-11	Laptm5
ENSMUSG00000110206.2	1,004673	1,291608	7,945E-06	Flt3l
ENSMUSG00000105947.2	1,006971	-0,393648	0,009176	NA
ENSMUSG00000040987.16	1,008385	2,136232	3,239E-07	Mill2
ENSMUSG00000111662.2	1,008885	1,103243	0,0003149	NA
ENSMUSG00000056220.15	1,009509	1,079353	0,0004779	Pla2g4a
ENSMUSG00000005952.16	1,010231	-0,425183	0,0210432	Trpv1
ENSMUSG00000119584.1	1,010451	10,33158	0,0106915	NA
ENSMUSG00000047180.9	1,012609	0,709016	0,0033441	Neurl3
ENSMUSG00000106962.2	1,014535	-0,140082	0,0099757	NA
ENSMUSG00000059395.5	1,014831	0,083765	0,005406	Nkapl
ENSMUSG00000084771.9	1,014839	-0,065902	0,0026388	A230072E10Rik
ENSMUSG00000036964.15	1,014856	2,021304	0,0029126	Trim17
ENSMUSG00000054702.15	1,017311	1,824717	0,0001247	Ap1s3
ENSMUSG00000004266.16	1,018491	2,089008	1,042E-05	Ptpn6
ENSMUSG00000005836.11	1,019543	-0,720463	0,0148278	Gata6
ENSMUSG00000110929.2	1,022226	-0,033805	0,0106676	NA
ENSMUSG00000043953.13	1,026731	0,045401	0,0040502	Ccr12
ENSMUSG00000062168.13	1,032593	-0,166937	0,0230354	Ppef1
ENSMUSG00000029204.8	1,033684	-0,453644	0,0073612	Rhoh
ENSMUSG00000015950.14	1,034116	2,021489	7,549E-07	Ncf1
ENSMUSG00000002111.9	1,035389	1,758463	0,0003384	Spi1
ENSMUSG00000036912.19	1,036552	-0,759115	0,0224498	Piwi4
ENSMUSG00000040345.11	1,03853	-0,376451	0,0053817	Arhgap9
ENSMUSG00000025172.4	1,038933	-0,570764	0,0141143	Ankrd2
ENSMUSG00000068079.6	1,04005	-0,45744	0,0080731	Tcf15
ENSMUSG00000045551.8	1,042643	-0,407028	0,0103446	Fpr1
ENSMUSG00000031506.12	1,043319	-0,375541	0,0090398	Ptpn7
ENSMUSG00000036362.3	1,044599	2,155462	2,797E-08	P2ry13
ENSMUSG00000051506.18	1,045392	1,496532	3,352E-05	Wdfy4
ENSMUSG00000048502.15	1,049193	2,707469	9,682E-08	Duxbl1
ENSMUSG00000031962.7	1,050306	1,729776	0,0019985	Cdh15
ENSMUSG00000111696.2	1,053346	-0,305902	0,0052923	NA
ENSMUSG00000112169.2	1,054328	-0,128036	0,0026287	NA

ENSMUSG00000105950.2	1,054404	-0,062761	0,0044473	NA
ENSMUSG00000056529.8	1,060829	0,578566	9,975E-05	Ptafr
ENSMUSG00000109370.2	1,064283	0,009117	0,0141844	NA
ENSMUSG00000091478.3	1,066901	-0,523162	0,0073642	NA
ENSMUSG00000031712.11	1,067922	-0,608958	0,008299	Il15
ENSMUSG00000030157.6	1,072093	1,833061	1,542E-05	Clec2d
ENSMUSG00000020143.16	1,072629	1,874004	0,0001941	Dock2
ENSMUSG00000037446.15	1,072638	0,746676	0,0140414	Tulp1
ENSMUSG00000039899.6	1,073169	2,576185	3,906E-08	Fgl2
ENSMUSG00000097006.8	1,084517	2,935807	3,975E-05	9530082P21Rik
ENSMUSG00000090257.2	1,084751	-0,643019	0,010151	NA
ENSMUSG00000073400.7	1,095938	-0,232863	0,0128833	Trim10
ENSMUSG00000025044.17	1,098722	1,107505	2,07E-06	Msr1
ENSMUSG00000028459.12	1,101394	0,393562	7,398E-05	Cd72
ENSMUSG00000034116.18	1,101693	1,57052	8,375E-05	Vav1
ENSMUSG00000030793.5	1,103266	0,585502	4,005E-05	Pycard
ENSMUSG00000002076.13	1,107157	-0,065343	0,0027454	Hsf2bp
ENSMUSG00000042190.13	1,112493	1,78115	1,181E-07	Cmklr1
ENSMUSG00000031897.10	1,116999	4,510917	1,508E-30	Psmb10
ENSMUSG00000029915.15	1,117707	-0,620798	0,0464217	Clec5a
ENSMUSG00000039501.15	1,123018	6,04732	7,003E-40	Znfx1
ENSMUSG00000021118.8	1,123189	0,971948	0,0001291	Plek2
ENSMUSG00000035085.6	1,123848	-0,020866	0,0026707	1700020L24Rik
ENSMUSG00000038147.15	1,13237	1,415717	2,608E-05	Cd84
ENSMUSG00000111509.2	1,134279	-0,333101	0,0019128	NA
ENSMUSG00000101166.7	1,135836	-0,411441	0,0044572	NA
ENSMUSG00000085888.8	1,136138	-0,487987	0,0039308	NA
ENSMUSG00000054509.8	1,13911	2,429532	2,342E-08	Parp4
ENSMUSG00000092202.2	1,139335	-0,316079	0,0072	NA
ENSMUSG00000034792.9	1,139513	-0,289948	0,001519	Gna15
ENSMUSG00000115424.2	1,139935	-0,335408	0,0102921	NA
ENSMUSG00000032528.6	1,140843	1,753532	0,0348697	Vipr1
ENSMUSG00000031803.9	1,141214	-0,571462	0,0062468	B3gnt3
ENSMUSG00000026567.17	1,142734	-0,091347	0,0013614	Adcy10
ENSMUSG00000107728.2	1,143456	-0,60921	0,0135225	NA
ENSMUSG00000048070.5	1,144435	0,443319	0,0151266	Pirt
ENSMUSG00000033220.8	1,144891	1,950254	2,284E-09	Rac2
ENSMUSG00000082691.7	1,145153	1,353622	0,0017576	NA
ENSMUSG00000022584.15	1,1499	-0,697028	0,0396705	Ly6c2
ENSMUSG00000094628.8	1,15111	0,733924	0,0017463	NA
ENSMUSG00000084846.2	1,15451	1,648013	3,819E-05	NA
ENSMUSG00000040747.10	1,154865	2,210169	1,859E-08	Cd53
ENSMUSG00000026656.16	1,1565	1,760847	1,297E-07	Fcgr2b
ENSMUSG00000049988.6	1,157715	0,588736	0,0003097	Lrrc25
ENSMUSG00000036915.18	1,168264	1,118798	0,0012466	Kirrel2

ENSMUSG00000108053.2	1,168644	0,017954	0,0004863	NA
ENSMUSG00000087298.4	1,169873	0,561309	0,0005179	NA
ENSMUSG00000049436.6	1,17341	-0,426154	0,0136948	Upk1b
ENSMUSG00000051354.15	1,173744	0,801295	0,002971	Samd3
ENSMUSG00000110554.2	1,179062	-0,554108	0,0260814	NA
ENSMUSG00000090691.4	1,179956	1,598527	0,0110219	Gm3667
ENSMUSG00000027639.17	1,185174	5,382179	1,057E-24	Samhd1
ENSMUSG00000036492.13	1,188023	1,768536	0,003484	Rnf39
ENSMUSG00000040428.20	1,194241	2,088383	6,192E-06	Plekha4
ENSMUSG00000028859.15	1,198606	1,522012	1,784E-07	Csf3r
ENSMUSG00000102465.2	1,203617	-0,881145	0,0112386	NA
ENSMUSG00000057836.13	1,204527	0,987072	5,382E-05	Xlr3a
ENSMUSG00000100141.2	1,206822	-0,625797	0,0042549	NA
ENSMUSG00000110499.2	1,208028	-0,815898	0,0346297	NA
ENSMUSG00000014599.11	1,210562	4,710913	4,816E-15	Csf1
ENSMUSG00000052085.8	1,212837	2,200206	7,373E-06	Dock8
ENSMUSG00000098259.3	1,214804	-0,572929	0,0031648	NA
ENSMUSG00000079197.11	1,219521	5,664753	2,302E-46	Psme2
ENSMUSG00000049625.7	1,219865	1,245792	0,0001018	Tifab
ENSMUSG00000097534.4	1,230397	-0,019328	0,0009146	Gm16675
ENSMUSG00000036908.18	1,237499	3,433079	1,564E-12	Unc93b1
ENSMUSG00000067235.15	1,246593	0,313011	0,0003403	H2-Q10
ENSMUSG00000030745.10	1,247368	0,516281	7,293E-05	Il21r
ENSMUSG00000036887.6	1,26068	4,077497	8,709E-11	C1qa
ENSMUSG00000029695.14	1,266369	0,37534	1,288E-05	Aass
ENSMUSG00000057191.14	1,271403	0,849688	0,0001111	AB124611
ENSMUSG00000055994.16	1,285986	0,226637	0,0003484	Nod2
ENSMUSG00000073411.13	1,287672	5,377223	0,0181488	H2-D1
ENSMUSG00000048865.17	1,300536	1,937251	2,556E-08	Arhgap30
ENSMUSG00000079941.2	1,308225	0,663899	0,0001694	NA
ENSMUSG00000020399.15	1,324663	0,075745	0,0002623	Havcr2
ENSMUSG00000071713.7	1,33488	1,184563	1,096E-06	Csf2rb
ENSMUSG00000070031.12	1,338186	1,19254	1,299E-07	Sp140
ENSMUSG00000018927.4	1,339639	0,546572	1,087E-05	Ccl6
ENSMUSG00000073607.3	1,343225	-0,045439	0,02832	Gm10548
ENSMUSG00000027843.14	1,343802	-0,288914	0,0006657	Ptpn22
ENSMUSG00000060063.10	1,344117	-0,004204	7,803E-05	Alox5ap
ENSMUSG00000078153.4	1,349632	0,00826	9,874E-05	Psme2b
ENSMUSG00000034438.17	1,351374	0,243868	3,564E-06	Gbp8
ENSMUSG00000000290.14	1,353398	1,04662	7,277E-05	Itgb2
ENSMUSG00000109847.2	1,355916	0,102599	0,001181	NA
ENSMUSG00000093985.8	1,358731	1,245491	0,0153492	Gm10406
ENSMUSG00000091144.3	1,360063	0,520688	1,38E-06	Phf11c
ENSMUSG00000108959.2	1,365684	-0,858675	0,0033566	NA
ENSMUSG00000097574.3	1,368292	0,33255	0,0056142	C920006O11Rik

ENSMUSG00000025888.7	1,371321	0,256186	1,71E-05	Casp1
ENSMUSG00000066975.13	1,373325	-0,590571	0,0011748	Cryba4
ENSMUSG00000058715.12	1,379023	2,425671	2,815E-06	Fcer1g
ENSMUSG00000032265.15	1,379518	3,919626	4,043E-29	Tent5a
ENSMUSG00000001750.17	1,381927	4,434489	2,085E-41	Tcirg1
ENSMUSG00000023274.15	1,389125	-0,440041	0,000237	Cd4
ENSMUSG00000036249.17	1,391648	3,615033	4,579E-19	Rbm43
ENSMUSG00000020464.16	1,401125	5,593168	6,639E-73	Pnpt1
ENSMUSG00000044811.14	1,40385	0,335704	2,989E-05	Cd300c2
ENSMUSG00000029771.13	1,404148	1,029235	1,803E-08	Irf5
ENSMUSG00000079227.11	1,422547	1,2628	0,0001309	Ccr5
ENSMUSG00000035517.18	1,423675	6,039529	4,45E-80	Tdrd7
ENSMUSG00000087084.2	1,425045	-0,406519	0,0009737	NA
ENSMUSG00000022575.6	1,429234	2,102706	4,611E-13	Gsdmd
ENSMUSG00000009585.19	1,429833	2,525043	2,366E-12	Apobec3
ENSMUSG00000069516.9	1,454452	3,453441	3,782E-07	Lyz2
ENSMUSG00000078771.11	1,455696	1,115374	3,208E-09	Evi2a
ENSMUSG00000027995.11	1,460002	1,388687	7,25E-05	Tlr2
ENSMUSG00000098112.9	1,465109	1,111748	3,218E-08	Bin2
ENSMUSG00000030148.16	1,481393	0,144397	2,9E-06	Clec4a2
ENSMUSG00000108732.2	1,482765	-0,518426	0,000359	NA
ENSMUSG00000111504.2	1,484467	-0,155616	0,0030682	NA
ENSMUSG00000042357.3	1,485949	-0,469969	0,000104	Gjb5
ENSMUSG00000036905.9	1,486631	4,227152	2,331E-23	C1qb
ENSMUSG00000117309.2	1,498393	-0,739092	0,0010339	NA
ENSMUSG00000028417.4	1,522602	0,873745	0,0061602	Tal2
ENSMUSG00000071551.14	1,522993	1,181588	0,0165535	Akr1c19
ENSMUSG00000109975.2	1,528629	0,48107	3,313E-08	Gm19196
ENSMUSG00000026177.12	1,529851	1,241804	1,206E-06	Slc11a1
ENSMUSG00000033777.5	1,535177	1,084095	1,1E-07	Tlr13
ENSMUSG00000079339.8	1,545463	0,794449	1,688E-08	Ifit1bl1
ENSMUSG00000038884.15	1,546448	4,879641	2,722E-26	Shfl
ENSMUSG00000078945.11	1,549684	0,13295	0,0005583	Naip2
ENSMUSG00000030137.9	1,552181	-0,305272	2,375E-05	Tuba8
ENSMUSG00000046080.18	1,55498	-0,537678	6,95E-05	Clec9a
ENSMUSG00000038045.15	1,56331	0,252893	2,347E-05	Sult6b1
ENSMUSG00000036896.6	1,567119	4,385515	3,15E-17	C1qc
ENSMUSG00000093880.4	1,570788	0,954364	0,0268766	NA
ENSMUSG00000025727.9	1,579552	0,530658	0,0081394	A930017K11Rik
ENSMUSG00000096775.2	1,590312	0,801653	0,0294809	Gm5796
ENSMUSG00000026395.17	1,593805	2,238251	8,773E-10	Ptpcr
ENSMUSG00000041515.11	1,594601	2,39222	1,303E-13	Irf8
ENSMUSG00000097354.8	1,594654	-0,272177	0,000148	2310001H17Rik
ENSMUSG00000115969.2	1,598379	1,48238	7,602E-07	NA
ENSMUSG00000025804.6	1,603346	0,835207	7,436E-06	Ccr1

ENSMUSG00000024371.15	1,604925	1,113641	8,031E-08	C2
ENSMUSG00000032089.17	1,606289	1,698458	1,516E-11	Il10ra
ENSMUSG00000052160.8	1,611395	3,087015	8,687E-12	Pld4
ENSMUSG00000041736.8	1,621179	1,711347	1,451E-10	Tspo
ENSMUSG00000052821.4	1,62283	-0,30046	2,538E-05	Cysltr1
ENSMUSG00000085218.8	1,626538	0,398056	0,0006502	BB218582
ENSMUSG00000024300.18	1,627237	2,14263	8,687E-10	Myo1f
ENSMUSG00000044827.11	1,640342	0,272952	7,334E-07	Tlr1
ENSMUSG00000043279.10	1,64161	4,591152	2,414E-58	Trim56
ENSMUSG00000040564.15	1,646811	0,224538	1,052E-05	Apoc1
ENSMUSG00000076617.10	1,646838	2,304634	6,22E-13	Ighm
ENSMUSG00000097141.3	1,660921	1,393608	0,0157123	NA
ENSMUSG00000110661.2	1,662197	1,101325	0,000425	NA
ENSMUSG00000092086.3	1,665807	-1,040702	0,0003615	NA
ENSMUSG00000019122.9	1,674414	1,79062	1,259E-08	Ccl9
ENSMUSG00000024672.12	1,683077	1,151324	1,58E-05	Ms4a7
ENSMUSG00000074342.5	1,696207	-0,085833	3,843E-06	I830077J02Rik
ENSMUSG00000061577.13	1,705995	-0,244188	1,545E-06	Adgrg5
ENSMUSG00000002227.16	1,714968	4,596134	8,397E-77	Mov10
ENSMUSG00000079507.11	1,72175	0,82817	7,15E-08	H2-Q1
ENSMUSG00000081824.6	1,727232	3,136718	0,0334111	NA
ENSMUSG00000025887.11	1,747103	0,312392	7,687E-09	Casp12
ENSMUSG00000000982.6	1,767192	-0,037357	6,779E-08	Ccl3
ENSMUSG00000040613.15	1,771741	1,945057	1,225E-14	Apobec1
ENSMUSG00000025647.17	1,773803	6,236105	4,272E-87	Shisa5
ENSMUSG00000026088.16	1,774553	4,050191	1,107E-44	Mitd1
ENSMUSG00000102202.2	1,777964	-0,30352	8,82E-07	NA
ENSMUSG00000071715.13	1,779289	0,364772	1,41E-05	Ncf4
ENSMUSG00000023249.16	1,796546	1,459663	4,499E-14	Parp3
ENSMUSG00000021583.8	1,798532	3,863355	8,225E-28	Erap1
ENSMUSG00000109875.2	1,810625	-0,292736	0,033675	NA
ENSMUSG00000118012.2	1,833243	1,231133	0,0191318	NA
ENSMUSG00000071202.6	1,837155	2,461553	0,0020776	Ccdc78
ENSMUSG00000021322.9	1,839026	-0,587797	5,122E-05	Aoah
ENSMUSG00000091617.9	1,841162	0,717714	0,0429583	Gm3005
ENSMUSG00000024679.11	1,861561	1,43651	2,91E-11	Ms4a6d
ENSMUSG00000022587.15	1,881228	6,895765	8,57E-106	Ly6e
ENSMUSG00000049037.9	1,88369	0,773489	1,522E-07	Clec4a1
ENSMUSG00000027855.14	1,931158	1,464086	0,030581	Sycp1
ENSMUSG00000020638.9	1,955232	5,193641	3,126E-94	Cmpk2
ENSMUSG00000039236.19	1,978355	2,067642	3,918E-05	Isg20
ENSMUSG00000071203.7	1,981341	0,067613	1,951E-07	Naip5
ENSMUSG00000015355.14	1,981899	-0,568533	1,138E-05	Cd48
ENSMUSG00000027078.15	2,006554	4,805531	8,346E-08	Ube2l6
ENSMUSG00000024696.10	2,009825	-0,059902	1,02E-06	Lpxn

ENSMUSG00000006649.18	2,029074	-0,005597	5,71E-08	Nphs1
ENSMUSG00000055172.11	2,036837	-0,190545	5,679E-07	C1ra
ENSMUSG00000001166.18	2,049319	0,69716	2,348E-11	Oas1c
ENSMUSG00000096793.8	2,050241	-0,268962	0,0008548	Gm3667
ENSMUSG00000044583.14	2,056467	1,785291	3,889E-14	Tlr7
ENSMUSG00000036986.17	2,05962	4,904708	6,293E-78	Pml
ENSMUSG00000024308.16	2,065087	5,590939	3,949E-57	Tapbp
ENSMUSG00000062132.11	2,066941	1,196412	0,0227213	Arhgap33os
ENSMUSG00000024066.10	2,090851	-0,148429	7,766E-08	Xdh
ENSMUSG00000021624.10	2,098413	1,982199	2,158E-15	Cd180
ENSMUSG00000085642.9	2,107032	1,096081	1,108E-13	NA
ENSMUSG00000079547.5	2,124596	-0,946091	1,251E-05	H2-DMb1
ENSMUSG00000016206.7	2,125521	0,352492	9,158E-10	H2-M3
ENSMUSG00000038037.6	2,144853	2,343048	2,095E-27	Socs1
ENSMUSG00000069793.13	2,145593	4,196469	1,23E-29	Slfn9
ENSMUSG00000081769.10	2,161084	-0,923603	8,409E-06	Gm12216
ENSMUSG00000039616.11	2,161907	-0,519405	1,208E-06	Mocos
ENSMUSG00000018986.11	2,165531	0,351326	2,474E-12	Slfn3
ENSMUSG000000111118.2	2,174799	0,265998	4,032E-08	Gm6545
ENSMUSG00000035273.15	2,17697	1,249708	2,391E-09	Hpse
ENSMUSG00000034947.14	2,185012	1,971639	5,972E-14	Tmem106a
ENSMUSG00000064215.14	2,187377	3,773968	1,742E-29	Ifi27
ENSMUSG00000018899.18	2,191826	2,539022	8,956E-30	Irf1
ENSMUSG00000043832.14	2,203925	-0,298841	6,646E-07	Clec4a3
ENSMUSG00000024737.3	2,204751	1,507937	1,293E-18	Slc15a3
ENSMUSG00000026628.14	2,218788	1,12565	2,224E-12	Atf3
ENSMUSG000000104301.4	2,222068	-0,228526	4,127E-09	Wdr49
ENSMUSG00000038642.11	2,223885	4,291337	1,791E-21	Ctss
ENSMUSG00000078942.11	2,22389	-0,484874	9,844E-08	Naip6
ENSMUSG00000032346.8	2,260845	0,384144	5,891E-06	Ooep
ENSMUSG00000073179.4	2,26104	0,241621	1,49E-09	NA
ENSMUSG00000078349.4	2,276953	4,614968	2,981E-85	AW011738
ENSMUSG00000034959.9	2,2921	0,183616	5,594E-10	Rubcnl
ENSMUSG00000040552.9	2,292836	2,811026	1,43E-30	C3ar1
ENSMUSG00000038580.14	2,298213	0,120276	6,267E-07	Sct
ENSMUSG00000057143.16	2,304457	3,826969	1,593E-20	Trim12c
ENSMUSG00000042333.17	2,318201	-0,215964	1,717E-09	Tnfrsf14
ENSMUSG00000040033.17	2,325602	6,7018	1,96E-134	Stat2
ENSMUSG00000091418.3	2,33721	0,210585	0,0002693	NA
ENSMUSG00000049103.15	2,345855	-0,640872	2,542E-07	Ccr2
ENSMUSG00000073403.12	2,347584	0,057616	4,964E-07	NA
ENSMUSG00000046805.11	2,350951	5,250976	1,262E-49	Mpeg1
ENSMUSG00000020437.13	2,355058	0,190835	4,228E-09	Myo1g
ENSMUSG00000079419.5	2,37469	1,637617	3,311E-10	Ms4a6c
ENSMUSG00000092021.9	2,383102	1,56581	2,613E-12	Gbp11

ENSMUSG00000025017.11	2,405932	3,08147	5,343E-28	Pik3ap1
ENSMUSG00000026946.10	2,433556	2,440287	1,093E-35	Nmi
ENSMUSG000000116812.2	2,437563	0,692208	0,0048981	Gm2792
ENSMUSG000000101389.2	2,455582	0,198762	1,371E-11	Ms4a4a
ENSMUSG000000033538.14	2,483189	0,067025	2,382E-13	Casp4
ENSMUSG000000045932.13	2,487663	5,589817	1,3E-138	Ifit2
ENSMUSG000000069755.6	2,492702	3,085058	1,598E-21	NA
ENSMUSG000000095681.8	2,49887	1,794843	0,0001116	Gm8281
ENSMUSG000000066258.14	2,520682	2,555234	3,83E-19	Trim12a
ENSMUSG000000073457.5	2,533005	-0,453577	0,0181877	Smok2b
ENSMUSG000000047798.16	2,545969	1,226578	1,767E-16	Cd300lf
ENSMUSG000000116560.2	2,577521	0,391015	0,005856	Gm2808
ENSMUSG000000045322.11	2,606247	0,742045	5,764E-16	Tlr9
ENSMUSG000000024677.14	2,610329	2,337909	1,717E-24	Ms4a6b
ENSMUSG000000111854.2	2,614254	-0,641742	7,49E-09	NA
ENSMUSG000000060550.17	2,625616	0,208794	1,103E-08	H2-Q7
ENSMUSG000000094634.9	2,646146	0,783552	1,703E-06	NA
ENSMUSG000000060441.16	2,649268	0,900924	3,594E-06	Trim5
ENSMUSG000000004707.15	2,676442	-0,327051	5,812E-10	Ly9
ENSMUSG000000024339.13	2,677018	2,497376	5,256E-28	Tap2
ENSMUSG000000037731.6	2,78322	1,531594	1,42E-24	Themis2
ENSMUSG000000073418.5	2,805989	2,544118	6,778E-17	C4b
ENSMUSG00000000682.8	2,818671	0,634962	6,496E-16	Cd52
ENSMUSG000000002325.16	2,820894	6,285541	1,22E-258	Irf9
ENSMUSG000000095649.4	2,846157	-1,063747	7,164E-07	NA
ENSMUSG000000071068.8	2,863886	0,486664	1,273E-13	Trem12
ENSMUSG000000079845.9	2,864462	0,093233	0,0065462	Xlr4a
ENSMUSG000000115867.2	2,870684	-0,451446	9,448E-11	NA
ENSMUSG000000063268.13	2,898694	3,834595	5,516E-72	Parp10
ENSMUSG000000069893.11	2,927307	-0,057125	1,37E-12	9930111J21Rik1
ENSMUSG000000030895.10	2,932513	-0,318774	4,299E-10	Hpx
ENSMUSG00000015340.11	2,942406	2,134123	4,828E-27	Cybb
ENSMUSG000000043740.16	2,948118	0,309135	2,361E-12	B430306N03Rik
ENSMUSG000000067203.9	2,954941	0,034146	1,215E-16	H2-K2
ENSMUSG000000061232.17	2,96529	6,157729	3,422E-78	H2-K1
ENSMUSG000000079491.10	2,972669	3,184112	1,893E-15	H2-T10
ENSMUSG000000079492.3	2,981062	0,727752	7,057E-15	Gm11127
ENSMUSG000000079363.8	2,992548	4,12161	1,062E-66	Gbp4
ENSMUSG000000112023.2	3,000221	-0,584987	5,733E-08	Lilr4b
ENSMUSG000000063286.8	3,017129	2,513685	2,054E-42	NA
ENSMUSG000000055413.13	3,029006	1,493481	2,081E-21	H2-Q5
ENSMUSG000000039304.12	3,030656	2,218843	1,458E-18	Tnfsf10
ENSMUSG000000031639.13	3,030738	3,542301	2,168E-80	Tlr3
ENSMUSG000000027580.18	3,052226	4,784596	2,31E-137	Helz2
ENSMUSG000000035929.12	3,083086	3,969764	6,954E-57	H2-Q4

ENSMUSG00000072244.12	3,092041	0,593331	4,589E-22	Trim6
ENSMUSG00000011008.14	3,149206	-1,219424	8,414E-08	Mcoln2
ENSMUSG00000015947.11	3,15172	2,77946	4,18E-57	Fcgr1
ENSMUSG00000054404.14	3,16622	4,36985	3,325E-90	Slfn5
ENSMUSG00000086513.4	3,201347	-0,990814	5,927E-09	NA
ENSMUSG00000090272.10	3,231	-1,166114	6,683E-09	Mndal
ENSMUSG00000060802.9	3,235548	6,551974	1,461E-83	B2m
ENSMUSG00000056144.15	3,25139	1,872837	4,36E-38	Trim34a
ENSMUSG00000060519.12	3,28055	4,521679	1,57E-179	Tor3a
ENSMUSG00000016496.8	3,297638	3,111863	4,657E-67	Cd274
ENSMUSG00000073409.13	3,30429	0,817485	2,472E-23	H2-Q6
ENSMUSG00000035385.6	3,309872	-0,602527	3,859E-11	Ccl2
ENSMUSG000000117964.2	3,327919	0,391434	2,59E-19	NA
ENSMUSG000000112148.2	3,344881	-0,008922	1,612E-09	Lilrb4a
ENSMUSG00000039853.19	3,361055	1,147186	4,092E-32	Trim14
ENSMUSG00000091275.2	3,362946	-0,1867	5,574E-09	NA
ENSMUSG00000000385.9	3,390963	0,035186	6,795E-19	Tmprss2
ENSMUSG00000039997.17	3,398266	2,445998	1,044E-23	Ifi203
ENSMUSG00000082292.4	3,41036	1,144392	2,31E-28	NA
ENSMUSG00000012519.15	3,415854	0,792888	1,252E-23	Mlkl
ENSMUSG00000000275.17	3,464949	5,972309	2,81E-227	Trim25
ENSMUSG00000070034.14	3,515312	1,609508	5,308E-34	Sp110
ENSMUSG00000010358.14	3,53507	2,892374	1,441E-59	Ifi35
ENSMUSG00000001123.16	3,574024	5,331567	1,81E-148	Lgals9
ENSMUSG00000072621.14	3,575093	-0,923402	9,981E-11	Slfn10-ps
ENSMUSG00000035352.4	3,576402	1,247807	8,458E-28	Ccl12
ENSMUSG00000017830.16	3,599572	3,50908	3,494E-86	Dhx58
ENSMUSG00000029816.11	3,611837	2,098882	3,309E-16	Gpnmb
ENSMUSG00000073144.5	3,661492	-1,087976	9,354E-10	4930599N23Rik
ENSMUSG00000035373.3	3,702009	-1,064494	4,484E-10	Ccl7
ENSMUSG000000107215.2	3,709451	2,97732	8,88E-67	NA
ENSMUSG00000073405.7	3,757393	1,402717	3,329E-30	H2-T-ps
ENSMUSG00000029298.16	3,768549	4,918303	3,11E-136	Gbp9
ENSMUSG00000073490.12	3,789236	1,954335	7,672E-38	Ifi207
ENSMUSG00000075602.11	3,795698	3,331384	8,057E-47	Ly6a
ENSMUSG00000037321.18	3,81005	4,490683	5,23E-185	Tap1
ENSMUSG000000106218.2	3,836968	-0,357967	4,987E-17	NA
ENSMUSG00000067212.9	3,848384	2,613251	6,073E-61	H2-T23
ENSMUSG00000096727.4	3,884146	1,91663	2,222E-48	Psbmb9
ENSMUSG00000056116.19	3,886094	4,364593	1,904E-57	H2-T22
ENSMUSG000000106734.4	3,915104	3,962589	2,29E-105	NA
ENSMUSG00000090222.3	3,924932	0,463597	4,996E-23	NA
ENSMUSG00000039699.15	3,941831	-0,450272	1,532E-15	Batf2
ENSMUSG00000072620.4	3,964791	2,033097	1,176E-32	Slfn2
ENSMUSG00000029826.15	4,009703	4,748924	5,17E-196	Zc3hav1

ENSMUSG00000067297.6	4,058494	1,723435	8,893E-39	Ifit1bl2
ENSMUSG00000113600.2	4,07489	-0,796557	1,003E-12	Gm7868
ENSMUSG00000091549.2	4,082327	4,567705	1,442E-97	NA
ENSMUSG00000105504.5	4,180268	2,565854	1,48E-75	Gbp5
ENSMUSG00000047735.15	4,18441	5,009391	1,74E-158	Samd9l
ENSMUSG00000073491.12	4,196704	-0,992611	5,453E-12	Ifi213
ENSMUSG00000040483.16	4,201377	4,79143	3,253E-17	Xaf1
ENSMUSG00000024079.5	4,223336	6,222736	0	Eif2ak2
ENSMUSG00000090215.10	4,225618	0,552361	7,507E-10	Trim34b
ENSMUSG00000030966.14	4,244533	4,629578	1,04E-217	Trim21
ENSMUSG00000025492.7	4,286896	6,149362	1,23E-200	Ifitm3
ENSMUSG00000029798.12	4,335856	4,020133	2,88E-155	Herc6
ENSMUSG00000099569.2	4,379461	-0,856638	9,437E-14	Gm18301
ENSMUSG00000074151.14	4,381752	3,913542	8,838E-66	Nlrc5
ENSMUSG00000057596.14	4,384676	2,543586	1,276E-52	Trim30d
ENSMUSG00000057346.13	4,392293	0,259509	2,357E-30	Apol9a
ENSMUSG00000069874.8	4,417312	3,885325	1,41E-129	Irgm2
ENSMUSG00000053835.18	4,42472	4,309829	1,8E-122	H2-T24
ENSMUSG00000040264.11	4,439733	0,452868	6,431E-33	Gbp2b
ENSMUSG00000097572.3	4,469946	2,785624	6,567E-78	NA
ENSMUSG00000000204.17	4,479205	0,829636	7,353E-14	Slfn4
ENSMUSG00000038507.7	4,495567	5,599235	2,29E-227	Parp12
ENSMUSG00000032661.10	4,515371	2,494862	1,336E-66	Oas3
ENSMUSG00000043939.17	4,550943	-1,112171	1,326E-11	A530064D06Rik
ENSMUSG00000028270.13	4,570163	3,519147	9,733E-48	Gbp2
ENSMUSG00000022906.16	4,585558	5,202185	2,64E-285	Parp9
ENSMUSG00000030921.18	4,587562	4,441982	2,5E-189	Trim30a
ENSMUSG00000059089.5	4,601772	0,591993	1,552E-20	Fcgr4
ENSMUSG00000040296.16	4,631443	6,030032	0	Ddx58
ENSMUSG00000029322.13	4,64679	2,170462	5,506E-55	Plac8
ENSMUSG00000107017.2	4,678259	1,984749	8,475E-51	NA
ENSMUSG00000024338.16	4,682874	2,469203	5,824E-60	Psmb8
ENSMUSG00000032596.15	4,717123	4,142913	6,9E-124	Uba7
ENSMUSG00000040253.16	4,720214	5,564727	3,54E-260	Gbp7
ENSMUSG00000027322.12	4,72796	3,481482	7,84E-108	Siglec1
ENSMUSG00000033880.12	4,763031	5,927153	1,32E-182	Lgals3bp
ENSMUSG00000058163.15	4,773905	1,013469	1,181E-43	Gm5431
ENSMUSG00000091649.4	4,776696	1,118958	1,037E-33	Phf11b
ENSMUSG00000022014.16	4,817215	2,044145	5,54E-71	Epsti1
ENSMUSG00000108068.2	4,890092	0,53342	3,984E-27	NA
ENSMUSG00000049502.18	4,897686	5,323959	0	Dtx3l
ENSMUSG00000026896.15	4,902441	4,966079	0	Ifih1
ENSMUSG00000068246.7	4,962028	-0,400848	1,126E-16	Apol9b
ENSMUSG00000020641.17	4,979342	5,265916	9,956E-31	Rsad2
ENSMUSG00000104713.5	5,022025	1,736947	4,841E-49	Gbp6

ENSMUSG00000068606.7	5,034991	-0,010973	1,703E-26	Gm4841
ENSMUSG00000094796.3	5,089873	-0,295309	2,811E-16	BC147527
ENSMUSG00000026535.10	5,133347	3,60644	2,21E-74	Ifi202b
ENSMUSG00000034422.15	5,165746	5,183881	0	Parp14
ENSMUSG000000105096.2	5,168827	2,127726	2,646E-55	Gbp10
ENSMUSG00000052749.10	5,170318	-0,215545	4,726E-22	Trim30b
ENSMUSG00000060183.7	5,183372	0,574454	2,208E-25	Cxcl11
ENSMUSG00000073902.6	5,242586	0,159032	4,696E-30	NA
ENSMUSG00000033355.7	5,326829	5,103379	1,67E-201	Rtp4
ENSMUSG00000078853.9	5,360289	4,182046	9,73E-166	Igtp
ENSMUSG00000040328.17	5,454665	0,025397	1,022E-26	Olfr56
ENSMUSG00000035042.3	5,5248	-0,342794	3,112E-21	Ccl5
ENSMUSG00000024675.20	5,622814	1,184019	1,319E-29	Ms4a4c
ENSMUSG00000026104.15	5,6405	6,896062	0	Stat1
ENSMUSG00000078763.3	5,642378	-0,263613	7,157E-14	Slfn1
ENSMUSG00000026222.17	5,686839	3,615818	7,22E-136	Sp100
ENSMUSG00000035208.17	5,708529	3,273411	1,22E-145	Slfn8
ENSMUSG00000026536.10	5,716329	0,857349	9,061E-32	Ifi211
ENSMUSG00000078920.4	5,750578	3,209673	6,43E-139	Ifi47
ENSMUSG00000028268.15	5,751337	5,55882	0	Gbp3
ENSMUSG00000046879.8	5,770562	6,250314	0	Irgm1
ENSMUSG00000090942.2	5,820059	-0,093773	1,227E-24	F830016B08Rik
ENSMUSG00000079017.4	5,848431	3,542888	1,51E-179	Ifi27l2a
ENSMUSG00000070327.15	5,863908	8,491699	1,25E-283	Rnf213
ENSMUSG00000044703.6	5,895903	-0,658067	8,729E-17	Phf11a
ENSMUSG00000086503.5	5,943165	9,614233	0,0040364	Xist
ENSMUSG00000046718.9	6,085345	6,601396	0	Bst2
ENSMUSG00000032690.17	6,131426	3,988497	1,77E-191	Oas2
ENSMUSG00000040026.9	6,2738	0,30389	3,293E-22	Saa3
ENSMUSG00000078922.10	6,299167	0,780583	5,426E-37	Tgtp1
ENSMUSG00000073489.7	6,299922	2,578921	1,843E-90	Ifi204
ENSMUSG00000028037.14	6,344324	5,528723	0	Ifi44
ENSMUSG00000078921.4	6,380697	0,862557	3,3E-28	Tgtp2
ENSMUSG00000066677.13	6,500035	0,974911	2,783E-51	Ifi208
ENSMUSG00000043263.14	6,506806	0,523802	2,355E-41	Ifi209
ENSMUSG00000068245.15	6,691513	2,222333	2,656E-67	Phf11d
ENSMUSG00000025498.16	6,697046	6,137395	0	Irf7
ENSMUSG00000035692.8	6,718759	6,089504	0	Isg15
ENSMUSG00000029605.17	6,756919	4,596078	0	Oas1b
ENSMUSG00000001168.17	6,877437	0,87224	1,57E-51	Oas1h
ENSMUSG00000074896.4	6,884476	5,291951	0	Ifit3
ENSMUSG00000086866.3	6,907557	0,21194	7,699E-35	NA
ENSMUSG00000034855.14	6,970771	2,052585	5,722E-87	Cxcl10
ENSMUSG00000023341.16	7,216407	5,856185	0	Mx2
ENSMUSG00000037849.9	7,341994	-0,773367	7,093E-19	Ifi206

ENSMUSG00000037921.16	7,456229	5,293561	0	Ddx60
ENSMUSG00000054072.13	7,520332	5,194879	0	ligp1
ENSMUSG00000063388.6	7,579741	-0,569742	1,355E-20	NA
ENSMUSG00000052776.11	7,610066	4,706408	0	Oas1a
ENSMUSG000000117465.2	7,647908	1,604002	3,771E-77	NA
ENSMUSG00000041827.16	7,683176	3,377624	1,05E-157	Oasl1
ENSMUSG00000029561.18	7,698207	7,943247	0	Oasl2
ENSMUSG00000073555.2	7,732452	1,685162	3,229E-61	Gm4951
ENSMUSG00000027514.15	7,8643	3,167906	9,57E-127	Zbp1
ENSMUSG00000085977.2	7,86917	-0,327305	1,587E-27	NA
ENSMUSG00000000386.17	7,875626	4,003135	1,03E-261	Mx1
ENSMUSG00000030107.11	7,903419	6,473651	0	Usp18
ENSMUSG00000062488.10	8,144421	4,389625	0	Ifit3b
ENSMUSG000000109729.2	8,327809	0,080963	2,296E-34	NA
ENSMUSG00000034459.9	8,436395	6,185611	0	Ifit1
ENSMUSG00000066861.15	8,845831	3,619625	5E-222	Oas1g
ENSMUSG00000097194.3	8,949416	0,643602	6,51E-29	NA

Figure 1. Zika virus congenital infection at E15 causes microcephaly and corpus callosum dysgenesis at P4.

(A, B) Dorsal views of MOCK animals and ZIKV-infected mice. Scale bar = 1mm.

(C, D) Quantitative analysis of brain and forebrain weights (g) of ZIKV and MOCK groups. N= MOCK (5) ZIKV (5).

(E, F) Immunohistochemical labelling for NS1 (red) and DAPI staining (blue) on MOCK and ZIKV-infected cerebral cortex. Scale bars = 50µm

(G) Quantitative analysis of infected particles in ZIKV animals by plaque assay. N= ZIKV (5).

(H, I) Sagittal sections of MOCK and ZIKV-infected brains, stained with cresyl-violet. The corpus callosum area is delimited by dashed lines. Scale bar = 100µm.

(J) Quantification of corpus callosum area normalized to cerebral cortex area in quasi-sagittal brain sections of ZIKV and MOCK animals. N= MOCK (3) ZIKV (3). Student's t-test* = p < 0.05; ** = p < 0.005; **** = p < 0.00005.

Figure 2. Zika virus congenital injection results in cell death only after 7 days post-infection.

(A, B) Immunohistochemistry for activated Caspase 3 (CASP3) on coronal sections of MOCK compared to ZIKV-infected E13 embryos, harvested at E18. DAPI staining in blue.

(C) Quantification of CASP3+ cell density in 300 µm² at E18. N= MOCK (3) ZIKV (3).

(D, E) Immunohistochemistry for CASP3 (green) on coronal sections of MOCK compared to ZIKV-infected E13 embryos, harvested at P0. Scale bars = 50 μ m

(F) Quantification of CASP3+ cell density in 300 μ m² at P0. N= MOCK (3) ZIKV (3).

(G, H) Immunocytochemistry for CASP3 (green) on coronal sections of MOCK compared to ZIKV-infected E15 embryos, harvested at P4. Scale bars = 50 μ m.

(I) Quantification of CASP3+ cell density in 300 μ m² at P4. N= MOCK (3) ZIKV (3). Data presented here as the mean $\pm$ SEM from at least six sections prepared from three animals obtained from two or three litters for each condition in this analysis and subsequent quantifications, unless stated otherwise. Student's t-test ** = p < 0.005; *** = p < 0.0005.

Figure 3. Zika virus *in utero* injection leads to intermediate progenitors and callosal neuron density reduction.

(A, B) Immunohistochemistry for callosal nuclear marker SATB2 (green) counterstained with DAPI (blue) in cortical coronal sections of MOCK and ZIKV mice injected *in utero* at E15 and harvested at E18.

(C) Quantifications of SATB2+/DAPI+ cells in the different cortical layers (I to VI). N= MOCK (3) ZIKV (3).

(D) Quantifications of SATB2+ cell density in 300 μ m². N= MOCK (3) ZIKV (3).

(E, F) Immunohistochemistry for phospho-histone 3 (PH3) of MOCK compared to ZIKV-infected E13 embryos, harvested at E16 in 300 μ m².

(G) Quantification PH3+ cell density in 300 μ m². N= MOCK (3) ZIKV (3).

(H, I) Immunohistochemistry for intermediate progenitors' marker TBR2 (green) in cortical sections of MOCK and ZIKV-infected E13 embryos, harvested in P0.

(J) Quantification of TBR2+ cell density in 300 μ m². N= MOCK (3) ZIKV (3).

Scale bars = 50 μ m. Student's t-test * = p < 0.05.

Figure 4. Zika virus *in vitro* infection reduces axon extension and dendritic arborization of callosal neurons.

(A, B) Primary dorsal cortical progenitors exposed to ZIKV or MOCK after 24 hours and cultivated for 3 days post infection (3dpi). Co-immunolabelling for TUJ1 (green) and SATB2 (red) to measure the longest neurite (dashed lines). Scale bars = 10 μ m

(C) Quantification of axonal length in ZIKV and MOCK primary neuron cultures. N= 3 independent experiments.

(D, E) Co-immunolabelling for MAP2 (red) and TAU1 (green). Sholl analysis was performed using concentric dashed circles to access arborization complexity in MOCK or ZIKV. Scale bars = 10µm

(F) Quantification of the number of dendritic intersections with the concentric circles in ZIKV and MOCK primary neuron cultures. Blue = DAPI. N= 3 independent experiments.

(G) ZIKV viral RNA was determined by real-time PCR after 3dpi from 4 independent experiments. Student's t-test * = $p < 0.05$; ** = $p < 0.005$.

Figure 5. Zika virus congenital infection impairs midline crossing of callosal axons at E18 *in vivo*.

(A-F) Rostro-caudal levels of Dil anterograde tracer (red) in E18 brains of MOCK and ZIKV infected animals at E13. Scale bar = 100µm.

(G, H) L1CAM labeling of callosal axons at midline region of MOCK or ZIKV infected animals at E13 and harvested at E18. Scale bars = 50µm

(I) Width measurement of callosal axons labeling for L1CAM (red) at midline region. Blue = DAPI. N= MOCK (8) ZIKV (10). Student's t-test * = $p < 0.05$.

(J, K) Brain coronal section of MOCK animal with Dil labelling fibers compared to the ZIKV-infected animal with defasciculated fibers at midline. Scale bars = 50µm

(K') Brain coronal section of ZIKV-infected animal with Dil labelling fibers showing misrouted axon fibers that fail to cross the midline. Scale bar = 50µm. CC = corpus callosum

Figure 6. Zika virus infection at E13 alters midline glial populations and leads to microglial activation.

(A, B) Immunocytochemistry for GFAP (green) at the midline regions of embryonic brain slices of MOCK (A) and ZIKV (B) animals.

(C) Quantification of GFAP signal intensity at the *indusium griseum glia* (IG) close to the midline of ZIKV and MOCK. N= MOCK (8) ZIKV (10).

(D) Quantification of analysis of GFAP signal intensity at the *midline zipper glia* (MZ) region of ZIKV and MOCK. N= MOCK (8) ZIKV (10).

(E-H) Immunocytochemistry for microglial marker IBA1 (green) at the cortical plate of embryonic brain slices of MOCK (E) and ZIKV (F) and midline regions of MOCK (G) an ZIKV (H) infected *in utero* at E13 and analyzed at P0.

(I) Quantification of IBA1+ density at cortical plate in 450 µm². N= MOCK (3) ZIKV (3).

(J) Quantification of IBA1+ density at cortical plate with amoeboid morphology (active microglia) in 450 µm². N= MOCK (3) ZIKV (3).

Scale bars = 50µm. Blue = DAPI. IG = *indusium griseum glia*; MZ = *midline zipper glia*. Student's t-test * = $p < 0.05$; ** = $p < 0.005$; *** = $p < 0.0005$.

Figure 7. Zika virus congenital infection at E15 deregulates gene expression in embryonic brains after 3dpi.

(A, B) Circos plot illustrating the hub genes in ZIKV-infected brain when compared to MOCK arranged in order of their expression level sharing relevant cellular processes. (A) Down-regulated genes. (B) Up-regulated genes. N= MOCK (5) ZIKV (3).

Supplementary Figure 1. Zika virus congenital infection at E15 causes reduces the total number of callosal neurons and increases pycnotic nuclei at P4.

(A, B) Cortical brain nuclei labelling with (A) DAPI (blue) and (B) SATB2 (red) after Isotropic fractionator technique. Scale bars = 10 µm

(C) Quantitative analysis for cortical absolute number of cells (DAPI staining in blue) in infected and control tissue. N= MOCK (5) ZIKV (5).

(D) Total number of callosal neurons - SATB2 staining (red) on cell nuclei isolated with the isotropic fractionator technique in ZIKV and MOCK animals. . N= MOCK (5) ZIKV (5).

(E) Quantification of pyknotic nuclei using the isotropic fractionator technique. . N= MOCK (5) ZIKV (5). Student's t-test ** = $p < 0.005$; *** = $p < 0.0005$.

Supplementary Figure 2. Zika virus congenital infection at E15 deregulates gene expression in embryonic brains after 3dpi.

(A, B) RNA-seq analyses of brains of ZIKV infected- animals compared to MOCK at E15 and harvest at E18. Enrichment analysis of GO terms for the 20 most down-regulated genes (A) and up-regulated genes (B).

(C). Circos plot illustrating the hub genes overrepresented in ZIKV-infected brain when compared to MOCK sharing GO biological process related to Nervous System arranged in order of their expression level. N= MOCK (5) ZIKV (3).

Supplementary Table 1. Differentially expressed genes between MOCK and ZIKV-infected brains. Embryos were infected *in utero* in E15 and harvested at E18. N= MOCK (5) ZIKV (3).