GLUCOCORTICOIDS AND SLEEP HOMEOSTASIS

Separating the Contribution of Glucocorticoids and Wakefulness to the Molecular and Electrophysiological Correlates of Sleep Homeostasis

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Study Objectives: The sleep-deprivation–induced changes in delta power, an electroencephalographical correlate of sleep need, and brain transcriptome profiles have importantly contributed to current hypotheses on sleep function. Because sleep deprivation also induces stress, we here determined the contribution of the corticosterone component of the stress response to the electrophysiological and molecular markers of sleep need in mice.

Design: N/A

Settings: Mouse sleep facility.

Participants: C57BL/6J, AKR/J, DBA/2J mice.

Interventions: Sleep deprivation, adenectomy (ADX).

Measurements and Results: Sleep deprivation elevated corticosterone levels in 3 inbred strains, but this increase was larger in DBA/2J mice; i.e., the strain for which the rebound in delta power after sleep deprivation failed to reach significance. Elimination of the sleep-deprivation–associated corticosterone surge through ADX in DBA/2J mice did not, however, rescue the delta power rebound but did greatly reduce the number of transcripts affected by sleep deprivation. Genes no longer affected by sleep deprivation cover pathways previously implicated in sleep homeostasis, such as lipid, cholesterol (e.g., Ldlr, Hmgcs1, Dhcr7, -24, Kfbp5), energy and carbohydrate metabolism (e.g., Eno3, G6pc3, Mpdu1, Ugdh, Man1b1), protein biosynthesis (e.g., Sgk1, Alad, Fads3, Elf2c2, -3, Mat2a), and some circadian genes (Per1, -3), whereas others, such as Homer1a, remained unchanged. Moreover, several microRNAs were affected both by sleep deprivation and ADX.

Conclusions: Our findings indicate that corticosterone contributes to the sleep-deprivation–induced changes in brain transcriptome that have been attributed to wakefulness per se. The study identified 78 transcripts that respond to sleep loss independent of corticosterone and time of day, among which genes involved in neuroprotection prominently feature, pointing to a molecular pathway directly relevant for sleep function.

Keywords: Sleep regulation, corticosterone, neuroprotection, microarray, microRNA

Citation: Mongrain V; Hernandez SA; Pradervand S; Dorsaz S; Curie T; Hagiwara G; Gip P; Heller HC; Franken P. Separating the contribution of glucocorticoids and wakefulness to the molecular and electrophysiological correlates of sleep homeostasis. SLEEP 2010;33(9):1147-1157.

A NEED OR PRESSURE FOR SLEEP ACCUMULATES WHILE AWAKE BUT, BECAUSE THE NEUROPHYSIOLOGICAL FUNCTION OF SLEEP REMAINS ELUSIVE, sleep need is not easily defined or objectively measured. Sleep research has profited much from the use of the electroencephalogram (EEG)-derived variable delta power, as illustrated by its central role in theories concerning sleep function (e.g.1). Delta power, a measure that quantifies the delta oscillations (1-4 Hz) that are characteristic of the non rapid-eye-movement (NREM) sleep EEG, is widely used to index sleep need in mammals.2,3 Using this sleep homeostatic index in a panel of 6 inbred strains of mice, we observed that the rate at which sleep need accumulates during wakefulness varies greatly according to genetic background. Specifically, within this panel of 6, the sleep deprivation–induced increase in delta power is smallest in DBA/2J (D2) and largest in AKR/J (AK) mice.3 Subsequent studies in humans confirmed the importance of genetic factors in sleep homeostasis.4 To gain insight into the genetic pathways underlying the homeostatic regulation of sleep, we and others have searched for molecular correlates of sleep need using microarrays and extensive changes in brain gene expression after sleep deprivation have been reported in both mice and rats.5 Also, these gene-profiling studies have contributed to current hypotheses on sleep function.5

Sleep deprivation–induced brain gene-expression profiles have been found to differ with genetic background as well, and one transcript, Homer1a, is considered to be of particular relevance because the sleep–deprivation–induced expression was smaller in D2 mice, compared with AK mice,4 thus matching the strain differences observed in delta power after sleep deprivation, as discussed above. Moreover, mapping of the delta-power phenotype in recombinant offspring derived from D2 and C57BL/6J (B6) mice yielded a quantitative trait locus centered around Homer1,3,6 suggesting a causal implication of Homer1 in the homeostatic regulation of delta power. Other transcripts implicated in sleep homeostasis, such as clock genes,7 also vary according to genetic background (i.e., we observed large strain differences in the rate at which the expression of the Period1 (Per1) and -2 genes increased in the forebrain over the course of sleep deprivation).8

An unavoidable confound in sleep-deprivation studies is that, besides activating sleep homeostatic processes, sleep deprivation also activates the hypothalamic-pituitary-adrenal (HPA) axis, as evidenced by the surge in circulating levels of glucocorticoids; i.e., corticosterone in rodents9,10 and cortisol...
in humans. Accordingly, stress and differences in stress susceptibility could contribute to the reported strain differences on the effects of sleep deprivation on both delta power and brain gene expression. For some types of stress, a relationship with delta power has been demonstrated, although the directions of change are not consistent. For example, mice selected for high stress susceptibility have been found to show lower delta power, whereas social-defeat stress increases delta power in the rat. Similarly, in humans, a negative correlation has been reported between rates of endogenous cortisol secretion and delta power, whereas the administration of the stress hormone cortisol has been found to increase delta power. The stress-related surge in plasma corticosterone, which affects the expression of many genes in the brain, including the expression and protein levels of some clock genes, has never been directly controlled for in studies that have investigated the molecular correlates of sleep homeostasis.

The present study aimed at determining the contribution of the corticosterone component of the stress response to the sleep-wake associated changes in the electrophysiological and molecular correlates of sleep need. We first compared the changes in corticosterone plasma levels after sleep deprivation in the two mouse strains that differed for the increase in delta power after sleep deprivation (i.e., D2 and AK), and in B6 mice, a strain with an intermediate response to sleep deprivation. We found that removing the sleep deprivation–dependent corticosterone increase through adrenalectomy (ADX) did not ‘rescue’ the blunted delta-power response to sleep deprivation in D2 mice. Conversely, in a last experiment of similar design, inactivating the corticosterone component of the HPA axis profoundly diminished the brain transcriptome response to enforced wakefulness.

**METHODS**

**Animals and Surgery**

Adult male mice from 3 inbred strains were used in this study: C57BL/6J (B6), AKR/J (AK), and DBA/2J (D2). Mice were purchased from Jackson Laboratory and maintained under standard animal housing conditions, with free access to food and water, and a 12-hour light/12-hour dark cycle. Age was 12 weeks at the time of the experiment. For the first experiment, 10 B6, 8 AK, and 9 D2 mice were used to assess the corticosterone increase after sleep deprivation ending at ZT6 (Zeitgeber time 6; i.e., 6 h after light onset), and 11 B6, 9 AK, and 9 D2 were used as non-sleep-deprived control animals. Also, 6 B6, 8 AK, and 6 D2 mice were sacrificed at ZT18 to measure basal corticosterone levels after the main active period. For the sleep recording experiment, 16 D2 animals were used (control: n = 16; sham-lesioned: n = 9; ADX: n = 7). For the gene-expression experiment, D2 mice (n = 26: control, n = 7 and 6; sleep deprivation, n = 7 and 6 in sham-lesioned and ADX, respectively) were raised on site, and animals between 8 and 12 weeks were used. Bilateral ADX or sham lesions were performed under deep anesthesia (pentobarbital sodium 65-75 mg/kg or ketamine/xylazine 75 and 10 mg/kg, respectively, intraperitoneal injection). Animals were allowed to recover for a week while supplemented with either saline (gene expression experiment) or corticosterone (sleep and EEG experiment; Sigma, St. Louis, MO; 25 μg/mL in 0.2% ethanol-0.5% NaCl) in drinking water. Mice supplemented with saline were adapted to this before surgery.

Electrode implantation for EEG and electromyography (EMG) recordings was performed as detailed previously. Briefly, surgery was carried out under deep pentobarbital sodium anesthesia (65-75 mg/kg, intraperitoneal injection). Two gold-plated screws (diameter 1.1 mm) served as EEG electrodes and were screwed through the skull over the right cerebral hemisphere (frontal: 1.7 mm lateral to midline, 1.5 mm anterior to bregma; parietal: 1.7 mm lateral to midline, 1.0 mm anterior to lambda). Two other screws were implanted at the same coordinates over the left hemisphere as anchor screws. Two gold wires served as electromyography electrodes and were inserted between 2 neck muscles. The EEG and EMG electrodes were soldered to a connector and, together with the anchor screws, were cemented to the skull. Recording leads were connected to a swivel contact, and animals were allowed 10 to 14 days of recovery from surgery and habituation before the experiment.

**Corticosterone Measurements**

For corticosterone and gene-expression measurements, mice were rapidly killed by cervical dislocation immediately at the end of the sleep deprivation (ZT6) together with their non–sleep-deprived controls. The brain and blood plasma were rapidly collected, frozen on dry ice, and stored at -80°C. The measurements of corticosterone levels of animals undergoing sleep recordings were achieved by radioimmunoassay. Briefly, triplicate samples of plasma (10 μL) were heat denatured at 80°C. [3H] corticosterone (Sigma) and corticosterone antiserum (Endocrine Sciences, Agoura Hills, CA) were added to the samples that were incubated overnight. [3H] corticosterone was separated from nonradioabeled corticosterone using Dextran T70 (Amersham Pharmacia Biotech AB, Uppsala, Sweden) coated charcoal, and quantified in a liquid scintillation counter (Beckman model LS 3801, Brea, CA). Competition binding was assessed against a standard curve of corticosterone (Sigma) ranging from 0.001 to 5 ng/mL and analyzed using a nonlinear least-squares formula and best-fit analysis based on the F distribution. The quantification of corticosterone levels of animals involved in gene-expression assays was performed according to manufacturer instructions using an enzyme immunoassay commercial kit (Assay Designs, Ann Arbor, MI).

**EEG Recordings and Analysis**

All mice were recorded continuously for 48 hours, of which the first 24 hours served as baseline, followed by 6 hours of sleep deprivation, initiated at ZT0, and 18 hours of recovery sleep. Sleep deprivation was achieved by gentle handling. All mice were submitted to the same sleep recording protocol twice; i.e., before and after undergoing ADX or sham lesion. The EEG and EMG signals were amplified, filtered and analog-to-digital converted. Behavioral states (wakefulness, NREM sleep and rapid eye movement (REM) sleep) were visually as-
the RNeasy Lipid Tissue Midi kit and was Dnase-treated (QIAgen, Hombrechtikon, Switzerland). All RNA sample amounts were measured with a NanoDrop ND-1000 spectrophotometer (Thermo Scientific, Wilmington, DE), and the quality of RNA samples was verified on Agilent 2100 bioanalyzer chips (Agilent Technologies, Basel, Switzerland). For each sample, reverse transcription was performed on 0.5 μg of RNA. First, RNA, 0.25 μg random hexamers, and 10μM dNTP mix was incubated for 5 minutes at 65°C for the denaturation step. Then, first-strand buffer, 0.1 M DTT, RNAzin Plus Rnase inhibitor, and SuperScript II reverse transcriptase (Invitrogen, Basel, Switzerland) were added to the denaturation mix and incubated for 10 minutes at 25°C followed by 60 minutes at 42°C.

Quantitative PCR
RNA was isolated from forebrain (hindbrain excised) using the RNeasy Lipid Tissue Midi kit and was Dnase-treated (QIAgen, Hombrechtikon, Switzerland). All RNA sample amounts were measured with a NanoDrop ND-1000 spectrophotometer (Thermo Scientific, Wilmington, DE), and the quality of RNA samples was verified on Agilent 2100 bioanalyzer chips (Agilent Technologies, Basel, Switzerland). For each sample, reverse transcription was performed on 0.5 μg of RNA. First, RNA, 0.25 μg random hexamers, and 10μM dNTP mix was incubated for 5 minutes at 65°C for the denaturation step. Then, first-strand buffer, 0.1 M DTT, RNAzin Plus Rnase inhibitor, and SuperScript II reverse transcriptase (Invitrogen, Basel, Switzerland) were added to the denaturation mix and incubated for 10 minutes at 25°C followed by 60 minutes at 42°C.

Quantitative polymerase chain reaction (qPCR) was performed according to Applied Biosystems protocol using a real-time cycler ABI Prism 7700 (Applied Biosystems, Foster City, CA). Briefly, approximately 14 ng of cDNA was used in 10 μL for qPCR with Master Mix reagent (Applied Biosystems) under the following cycling conditions: 95°C for 10 minutes, followed by 40 cycles of 95°C for 15 seconds, and 60°C for 1 minute. The assays, designed at exon-exon junctions, were performed with oligos (sequences provided in Supplementary Table 6 [Supplementary tables and figures are available online only at www.journalsleep.org]). Primers were purchased from Invitrogen or Microsynth (Balgach, Switzerland) and probes from Eurogentec SA (Seraing, Belgium). Each PCR reaction was done in triplicate. Tbp, GusB, and Rps9 were used as endogenous controls after selection of the most stable control genes using geNorm v3.5 program and relative quantification of mRNA levels was evaluated using the modified ΔΔCt method from qBase v1.3.5 program, as performed previously.6

Statistical Analysis
To assess the differential effects of sleep deprivation on corticosterone secretion in inbred mouse strains, a 2-way analysis of variance (ANOVA) with factors Strain (B6, AK, D2) and Condition (sleep deprivation vs control) was performed. To evaluate the effects of time on corticosterone secretion, a 2-way ANOVA was used with Strain and Time (ZT6 vs ZT18) as factors. The effect of ADX on accumulation of mRNA sleep time after sleep deprivation was assessed at each time point using 1-way ANOVA with factor Group (control, sham, ADX). The effect of ADX on delta power was tested using a repeated-measures ANOVA with factors Group (sham vs ADX), Condition (control vs sleep deprivation), and Interval (1 to 8). Lastly, the effect of ADX on sleep-deprivation–induced forebrain gene expression was assessed using 2-way ANOVA with factors Group (sham vs ADX) and Condition (control vs sleep deprivation). Significant interactions were decomposed using posthoc t tests, Tukey HSD test, or simple effect analysis (contrasts). Statistical analyses were done using SAS (SAS Institute Inc, Cary, NC) or Statistica (Statsoft Inc, Tulsa, OK). Statistical significance was set to P = 0.05, and results are reported as mean ± SEM.

Microarray
RNA samples isolated from forebrain were diluted to 300 ng/3μL and independently used to perform the target preparation using the whole transcript sense target labeling protocol procedure (Affymetrix, High Wycombe, UK). Then, 5.5 μg of each fragmented cDNA was end labeled with biotin and hybridized to a GeneChip Mouse Gene 1.0 ST array (Affymetrix), processed, and scanned according to standard procedures. Normalized expression signals were calculated from Affymetrix CEL files using RMA normalization method implemented in the Affymetrix Expression Console software, as in our previous publication.8 RMA processing was performed separately for each animal. All subsequent statistical analyses were performed using R (R Core, 2004, http://www.R-project.org) and Bioconductor packages (http://www.Bioconductor.org). Control and unannotated probe sets were removed, leaving 28,198 probe sets for statistical analysis. Differential hybridized features were identified using Bioconductor package “limma”, as before.6 P values were adjusted for multiple testing with the Benjamini and Hochberg method to control the false discovery rate (FDR).20 We fitted a model with a coefficient for each of the 4 factor combinations (Sham-control, Sham-sleep deprivation, ADX-control, ADX-sleep deprivation) and then extracted the comparisons of interest as contrasts. Functional enrichment analysis was performed using Ingenuity Pathway Analysis Tool (Ingenuity Systems, Inc., Redwood City, CA). MicroRNA (miRNA) targets enrichment analysis was performed using Miranda Musculus putative targets (microrna.sanger.ac.uk/cgi-bin/targets/v5/download.pl). Enrichment of putative targets of mmu-miR-29c, -410, -212, -151-3p and -151-5p were tested separately among genes upregulated or downregulated by sleep deprivation (FDR < 0.05) using Fisher exact test.

RESULTS
Genotype Influences the Sleep Deprivation-Induced Corticosterone Surge
To evaluate the effect of genetic background on the corticosterone surge associated with sleep deprivation, corticosterone levels were measured in 3 inbred mouse strains (i.e., B6, D2, and AK). Consistent with previous work,9,10 a 6-hour sleep deprivation increased corticosterone levels in all 3 strains compared with baseline levels (Figure 1A). Across genotypes, significant differences in the corticosterone response to sleep deprivation were noted, and the relative increase was 2- to 3-fold larger for D2 mice compared with B6 and AK mice (Figure 1B). The strain differences in plasma corticosterone levels were specific to the enforced wakefulness because concentra-
Adrenalectomy Does Not Influence the Delta-Power Response to Sleep Deprivation

To determine whether the higher corticosterone increase following sleep deprivation in D2 mice contributed to their blunted delta power rebound, we performed ADX with corticosterone replacement. We contrasted the effects of sleep deprivation on delta power in this group with the sleep-deprivation effects before the surgery in the same mice and to the sleep-deprivation effects in a group of sham-lesioned mice recorded in parallel.

Also in this cohort of D2 mice, the sleep-deprivation–induced rebound in delta power was low compared with previously published data for other strains, and the levels reached in both intact controls and the sham-lesioned mice (171% ± 6% and 183% ± 10%, respectively; Figure 2A) were well within the range of values previously reported for this strain (179% ± 14%). Although ADX successfully abolished the sleep-deprivation–induced increase in corticosterone secretion (Figure 2B), ADX affected neither the baseline dynamics of delta power nor the increase in delta power after sleep deprivation (178% ± 10%; Figure 2A). Not only delta power during NREM sleep, but also baseline amount and distribution of total sleep time

Figure 1—Corticosterone (CORT) secretion induced by sleep deprivation (SD) in inbred mice. (A) CORT was measured at ZT6 in control condition, at ZT6 after 6 h of SD, and at ZT18 after an extended period of spontaneous wakefulness in AK, B6, and D2 mice. SD induced an increase in CORT secretion in all 3 strains (sleep deprivation effect: \(F_{1,20} = 45.2, P < 0.0001\), but this increase depended on strain (Interaction: \(F_{2,20} = 10.5, P < 0.001\)), with a larger increase in CORT in D2 mice (\(P < 0.01\)). At ZT18, CORT in AK was higher than in other strains (Interaction: \(F_{2,20} = 5.6, P < 0.01\); t test \(P < 0.02\)). Asterisks indicate significant difference (\(P < 0.05\)) from the control ZT6 condition. (B) Fold increases in CORT secretion after sleep deprivation (black circles, left y axis) and the rate of increase of delta power as a function of time spent awake (triangles, right y axis; taken from Franken et al.3) in the 3 strains. D2 mice show the largest increase in CORT after sleep deprivation but the lowest increase in delta power.

Figure 2—Effects of adrenalectomy (ADX) on recovery from sleep deprivation (SD). (A) Delta power time course during the light period of baseline (ZT0-ZT12) or after 6 hours of SD (ZT6-ZT12) in control, sham-lesioned, and ADX mice. Delta power changes during baseline and recovery did not differ among experimental groups (Interaction: \(F_{2,30} = 0.2, P > 0.99\)). (B) Corticosterone (CORT) secretion was assessed at ZT6 in control condition or after 6 hours of SD in D2 mice having received sham-lesion or ADX. ADX abolished the SD-dependent increase in CORT secretion (Interaction: \(F_{1,12} = 5.7, P < 0.05\)). (C) Accumulated differences in non-rapid eye movement sleep (NREMS) time between baseline (BL) and recovery (REC) for the first 6 hours after SD. NREMS rebound after SD did not differ among control, sham-lesioned, and ADX mice (\(F_{1,12} < 1.0, P > 0.3\)).

Adrenalectomy (ADX) abolished the SD-dependent increase in CORT secretion (Figure 1B), but this increase depended on strain (Interaction: \(F_{2,20} = 10.5, P < 0.001\)) with ADX mice showing the lowest increase in delta power (Figure 1B).3 Indeed, D2 mice showed the lowest delta power rebound and the highest corticosterone surge with sleep deprivation, whereas AK mice showed the reverse and B6 mice had intermediate phenotypes. This raises the possibility that the strain differences in the corticosterone response might have contributed to the strain differences in the expression of delta power during recovery sleep.
Adrenalectomy Attenuates the Effect of Sleep Deprivation on Period (Per) Gene Expression

The contribution of the increase in corticosterone to the sleep-deprivation–dependent increase in the expression of the clock genes Per1–3 was investigated in a separate set of D2 mice by comparing forebrain expression using qPCR among ADX and sham-operated mice that were either sleep deprived or were allowed to sleep ad lib prior to sacrifice at ZT6. Also in this experiment, sleep deprivation elevated corticosterone in sham-operated mice only (Figure 3, bottom left panel). Similar to previous studies,6,8,23,24 sleep deprivation induced an increase in the expression of the Per genes in the forebrain of sham-operated mice. This increase was strongly attenuated in ADX mice (Figure 3). Also Rev-Erba mRNA levels were decreased with sleep deprivation, but this decrease was significant in sham-operated mice only. Similarly, a significant increase in Npas2 expression after sleep deprivation was found only in sham mice. Although ANOVA analyses identified a significant interaction between factors Sleep Deprivation and ADX for the transcripts Per2 and -3 only, ADX seemed, in general, to attenuate the sleep-deprivation–induced changes in clock-gene expression.

Finally, we examined the expression of the activity-induced transcript Homer1a, which we previously identified as a core molecular marker of sleep pressure.9 In contrast with the clock genes, Homer1a was not affected by ADX and showed a robust increase in both experimental groups (Figure 3, bottom right panel). Thus, like delta power (see above), Homer1a also proved to be a reliable marker of time spent awake not affected by the corticosterone component of the HPA axis.

Adrenalectomy Reduces the Sleep-Deprivation–Dependent Changes in Brain Transcriptome

In addition to evaluating the aforementioned candidate genes that we and others had previously found to be implicated in the homeostatic regulation of sleep, we performed a transcriptome analysis to quantify for which forebrain transcripts the sleep-deprivation–induced changes in expression were modulated by ADX. Using an FDR of 5%, we identified 1,476 probe sets significantly affected by sleep deprivation in the brain of sham-operated mice, with 634 being increased and 842 being decreased (Figure 4A; Supplementary Table 1). Transcripts increased by sleep deprivation included synaptic plasticity genes (e.g., Homer1, Arc, Bdnf), genes encoding heat-shock proteins (Hsp1, -90, and -40), early response genes (Fos, Egr, Hif), potassium channel subunits (Kcnf1, Kcnq2, Kcnk1), and clock genes (Per1, Per2). Functional clustering of these probes highlights their involvement in transcriptional and posttranslational processes, in cell cycle regulation, and in cell development (Supplementary Figure 1) and recovery time spent in NREM sleep following the sleep deprivation (Figure 2C) did not vary across the 3 experimental groups.
Among the transcripts decreased by sleep deprivation were RNA-binding proteins (Rbm and Cirbp), adhesion proteins (synaptotagmin [Syt1, Syt3], Meam, Cadm4), and regulatory enzymes of neurotransmitters (Maoa, Ache). These transcripts belong to a variety of functional categories, such as lipid, steroid, and cholesterol metabolism; protein synthesis and degradation, and cell-to-cell signaling and interaction (Supplementary Table 2). Many of the brain transcripts that changed in expression after sleep deprivation in the current study have been reported previously, (Supplementary Table 1) demonstrating the reproducibility of these findings in general and the validity of our present findings specifically.

Comparison of the ADX and sham-operated mice that were not sleep deprived demonstrated that ADX, per se, did not affect forebrain gene-expression levels; none of the 28,198 probe sets reached the 5% FDR (best adjusted P value 0.33; second best > 0.99). ADX did, however, alter the brain transcriptome response to sleep deprivation; the expression of only 469 transcripts (i.e., 68% fewer compared with shams) was significantly affected by sleep deprivation (FDR < 5%) in ADX mice, 349 of which overlapped with those changed by sleep deprivation in sham-operated mice (Figure 4A, Supplementary Table 1). The 1,127 probes changed by sleep deprivation in sham animals but not in ADX are part of a variety of functional groups among which are genes coding for heat-shock proteins (Hspa4, Hspd1, Hspel, Hsp90aa1, Dnajb1, Dnajb4), metabolic enzymes (Pdk4, Gpt2, Dgat2, Hmgcs1, Dhcr7-24, G6pc3, Ugdh), histone and histone-regulatory proteins, (Hdac4, Hdac6, Jhdm1d, H1f0, H2afj, Hist1h4i), and adhesion proteins (Pcdh10, Pcdhb11, Pcdhb13, Pcdhb15, Pcdhb20). To compare, in a quantitative way, the sleep-deprivation–responses between ADX and sham-operated mice, we contrasted the fold-change in the ADX group with that for the sham group for each of the 1,476 probe sets affected by sleep deprivation in sham-operated mice (Figure 4B). We observed that, for the vast majority of probe sets, the absolute sleep-deprivation response was reduced in ADX animals.

To further identify specific probe sets within the 1,476 that respond differently to sleep deprivation in ADX and sham-operated mice, we calculated an FDR for the interaction between the factors Sleep Deprivation and ADX. Since for only 18 probe sets an FDR < 0.04 was reached, we designed a data-mining approach to select the top affected genes. We used a range of FDR cutoffs to define growing lists of affected probe sets. Then, hierarchical clustering was applied to the gene-expression data for each of these probe-set lists to select a FDR cutoff at which non–sleep-deprived animals would segregate together while separating sleep-deprived ADX and sleep-deprived sham-operated mice (Supplementary Figure 2). The lowest FDR at which such segregation was achieved for the Sleep Deprivation-ADX interaction was 0.23, corresponding here with a nominal P value of 0.04. At this FDR, 260 probes were identified showing an interaction due to attenuation of both the increases and decreases in gene expression after sleep deprivation in ADX mice (Figure 4B). We observed that, for the vast majority of probe sets, the absolute sleep-deprivation response was reduced in ADX animals.

For 5 of those 260 transcripts, we verified whether the interaction could be confirmed using qPCR analysis (i.e., Sgk1,
The expression of 349 probe sets was significantly affected by sleep deprivation in both sham-lesioned and ADX mice (Figure 4A). As pointed out for Homer1a (see above), molecules modulated by sleep deprivation, independent of the activation of the HPA axis, might be part of the circuitry underlying sleep homeostasis or, at least, be used as molecular markers of sleep pressure, as reflected by the dynamics of delta power. Among these 349 probe sets are immediate/early response genes (Fos2, Fos, Egr1,3), specific heat shock protein genes (Hspa1a, Hspa5, Hspa8, Hspb1, Dnajb5, Dnajc3), RNA-binding protein genes (Rbm3, Rbm11, Rbm14), and plasticity and growth-factor genes (Homer1, Arc, Bdnf, Vgf, Vegla). We verified whether the expression of this set of genes was similarly affected by a spontaneous period of wakefulness under undisturbed baseline conditions (ZT18) because, also under these conditions, delta power is high,3 whereas corticosterone levels are low (Figure 1A). Contrasting ZT18 versus ZT12 baseline data (i.e., just after and before the main period of sustained wakefulness) in D2 mice from our previous microarray study,3 we found that, among the 297 genes that were represented by the 349 probe sets and that were present on both microarray platforms, more than one-quarter (i.e., 78) were similarly affected by sustained spontaneous wakefulness (Supplementary Table 4; Supplementary Figure 3). These 78 genes can be regarded as core molecular components of the sleep homeostatic response, as exemplified by the activity-induced transcript Homer1a.

The functional clusters not covered by the transcripts for which a significant interaction was observed (Supplementary Table 2) are also likely to encompass molecular correlates of sleep pressure independent of corticosterone signaling. These clusters include protein synthesis and folding, RNA posttranscriptional modification, and several molecular pathways, such as endoplasmic reticulum stress pathway, ERK/MAPK signaling, and the Nrf2-mediated oxidative stress response. MiRNAs have been implicated in the posttranscriptional control of cellular proliferation, development, and differentiation.34 Indeed, we ob-
erved 10 miRNAs for which the expression changed with sleep deprivation in sham-lesioned mice (Supplementary Table 1), 5 of which increased (miR-410, -212, -29c, -29b-2, and -708) and 5 decreased (let-7e, miR-137, -22, -219-2, and -99a) with sleep deprivation. A recent study in the rat also reported significant changes in let-7e and miR-99a expression after sleep deprivation, but, contrary to our findings, let-7e was increased by sleep deprivation in hippocampus and hypothalamus. 35 As in our study, miR-99a was decreased in prefrontal and somatosensory cortex and hypothalamus after sleep deprivation. Corticosterone appears to also target the transcriptional regulation of miRNAs because, of the 10 miRNA transcripts affected by sleep deprivation in sham-operated mice, only 3 reached transcriptome-wide statistical significance in ADX mice (miR-410, -212, and -29c; Supplementary Table 1), one of which, miR-29c, showed a significant interaction (Supplementary Table 3). In addition, we identified 1 miRNA, miR-151, that was increased by sleep deprivation in ADX mice (FDR 0.01 and 0.08 for ADX and sham, respectively). MiRNAs favor translational repression and/or destabilization of target mRNAs,34 and we therefore verified for miR-410, -212, -29c, and -151 whether the potential target transcripts of these miRNAs were among those affected by sleep deprivation. Among the 842 probes significantly decreased with sleep deprivation, we observed a significant enrichment of potential gene targets of miR-29c while among the 634 probes that increased with sleep deprivation, we observed a significant enrichment of potential targets of the 5' direction of miR-151 and a tendency for enrichment (P = 0.06) of miR-212 targets (Supplementary Table 5). No significant enrichment was found for the potential targets of miR-410. Hence, miRNA function in sleep and wakefulness deserves attention both in the context of sleep homeostasis as well as in corticosterone signaling.

**DISCUSSION**

In this study, we demonstrated that the corticosterone response to enforced wakefulness depends on genetic background in mice. Subsequently, using ADX, we aimed at assessing the contribution of the sleep deprivation-associated increase in plasma corticosterone levels to the molecular and electrophysiological response to sleep loss. Our results indicate that corticosterone greatly amplifies the molecular changes in the brain, which previously were attributed to extended wakefulness per se, resulting in a two-thirds reduction in the number of transcripts significantly affected by sleep deprivation. In contrast, delta power, a widely used electrophysiological marker of sleep pressure, proved to reliably follow the sleep-wake distribution independently of the changes in corticosterone under both baseline and sleep-deprivation conditions. The analyses also enabled us to identify 78 transcripts that, similar to delta power, varied with sleep and waking independent of changes in corticosterone.

**Adrenalectomy and Delta Power**

Abolishing the sleep-deprivation–dependent surge in corticosterone through ADX did not rescue the blunted delta power rebound in D2 mice. Although we cannot rule out other secondary effects of this intervention, this observation suggests that the increase in corticosterone does not contribute to the level of delta power reached after sleep deprivation. This result is consistent with that of a comparable study performed in rats36 and with the observation in mice that the duration of both spontaneous and enforced bouts of wakefulness equally predict delta power in subsequent sleep.3 As shown here, ADX eliminated the stress-induced increase in corticosterone secretion; ADX does, however, not eliminate the endocrine stress response at other levels of the HPA axis, such as elevated CRH (corticotrophin-releasing hormone) and ACTH (adrenocorticotropic hormone) levels that might have contributed to the strain-specific sleep-deprivation–dependent changes in delta power. Although CRH and ACTH tend to modulate sleep duration, in particular that of REM sleep,37,38 the effect of CRH on delta power seems minor.38 Overall, the data indicate that the strain differences in the delta-power rebound after sleep deprivation must be due to other (genetic) factors independent of the corticosterone component of the HPA-mediated stress response.

**Adrenalectomy and Clock Genes**

Numerous studies point to a close interrelationship between corticosterone signaling and *Per* expression. *Per1* transcription, in particular, has been shown to be directly controlled by corticosterone through glucocorticoid responsive elements (GRE) in its promoter.17 Our present results suggest that most of the sleep-deprivation–dependent increase in *Per1* expression is mediated through corticosterone signaling and not related to the increased time spent awake per se. Although *Per2* expression seems less affected by stress and corticosterone,39 *Per2* protein levels were, nonetheless, found to be modulated by corticosterone,18 and, recently, a functional GRE sequence was also identified for *Per2*.40 Based on observations made in Npas2 knockout mice24 and *Cryptochrome1,2* double-knockout mice41 that showed a reduced and an augmented increase, respectively, in *Per2* after sleep deprivation compared with wild-type mice, we concluded that the sleep-deprivation–dependent changes in *Per2* were mediated, in part, through the negative feedback loop made up of clock genes that underlie circadian-rhythm generation.7 Therefore, the reduced increase in *Per2* expression in ADX mice suggests that sleep deprivation activates both clock-gene and corticosterone-signaling pathways and that both pathways, in turn, affect *Per2* expression. These two closely associated pathways are both implicated in metabolism and are essential to cope with and anticipate energy demands.42,43 Because extended wakefulness is thought to represent a metabolic challenge to the brain, the sleep–wake–related changes in *Per2* in the forebrain underscore the notion that this molecule plays a role in homeostatic sleep need.7

Although our study focused on the sleep-deprivation–induced changes in corticosterone, it should be noted that HPA activation is only one of several mechanisms affecting circulating corticosterone levels. The daily changes observed under undisturbed baseline conditions are controlled by various factors, including suprachiasmatic nucleus output, light, and circadian oscillations intrinsic to the adrenal.44,45 Also, these baseline variations in corticosterone, the amplitude of which approaches those reported here for the effect of sleep deprivation,46 are accompanied by changes in clock-gene expression, and it has been proposed that increases in circulating corticosterone levels set the phase of circadian rhythms in the periphery.44 Given the important role of corticosterone in normal physiology and in gene expression, it is surprising that the absence of circadian
changes in corticosterone in ADX mice did not affect the baseline expression of any of the transcripts, at least at this time of day when corticosterone was low in both experimental groups. Because corticosterone was supplemented in the experiment assessing delta power, levels of circulating corticosterone are likely to have followed the drinking rhythm.18

Adrenalectomy and the Brain Transcriptome
Corticosterone can bind and activate mineralocorticoid and glucocorticoid receptors in the brain. Both are highly expressed in forebrain areas such as the hippocampus and amygdala, which are involved in emotional regulation in and learning and memory processes.46 These nuclear receptors, when ligand activated, can initiate transcription by binding to specific DNA sequences in the promoter regions of target genes or, by interacting with other transcription factors, can decrease transcription.16,46 Numerous transcripts in the brain, mainly concerning metabolism and neuronal function,46 are affected by this signaling pathway. The importance of corticosterone in gene regulation is compellingly illustrated by our microarray results because the transcriptional response associated with sleep deprivation in the forebrain was greatly reduced after ADX. Although addressing a different question, the extensive 68% reduction in the number of transcripts affected by sleep deprivation is reminiscent of the 60% decrease in the number of transcripts that maintained circadian rhythmicity in the liver of ADX mice.39 Similarly, we have previously established that 80% of the brain transcripts that were considered to be circadian because expression changed according to time of day were, in fact, sleep-wake driven.6 These studies illustrate the necessity of distinguishing between primary and consequent effects (e.g., sleep loss and corticosterone, or circadian and sleep-wake driven, respectively), especially when the influence of the latter exceeds those of the former.

The Molecular Wiring of Sleep Homeostasis
We assembled an exclusive list of 78 sleep homeostatic transcripts that responded to sleep loss independent of corticosterone and time of day. This list includes an important subset of immediate/activity-dependent genes linked to neuronal plasticity and memory (e.g., Fos, Arc, Egr1, Egr3, Nr4a3), which corroborates the proposed direct involvement of plastic neuronal changes in sleep homeostasis.1 Also, genes associated with the ERK/MAPK pathway of intracellular signaling, which is closely linked to the immediate early gene response, are well represented in the 78 transcripts (e.g., Dusp6, Dusp1, Dusp4, Trib2). Maret et al.2 proposed a neuroprotective function for sleep, based on the role of Homer1a in intracellular calcium homeostasis. Also Npas4 and Nr4a1, which feature among our set of 78, were recently found to be part of a gene program involved in neuroprotection, which is activated upon synaptic activity-induced calcium signaling,50 further supporting such a role for sleep. Moreover, other transcripts on our list, such as Egr1, Fos, and Nr4a3, have also been involved in the molecular neuroprotective response triggered by ischemia,51 as is the case for Hspa5, Xbp1, Hsp90b1, and Stip1, which are responsive to cellular stress and implicated in the unfolded protein response,52-54 and Bcl2, a well-known apoptotic mediator.55 Overall, these findings confirm that extended wakefulness activates molecular pathways associated with the preservation of neuronal integrity and the modulation of neuronal connections. Our list also contains Nfil3 (or E4bp4), which drives circadian gene expression and is a molecular partner of PER2,56 providing additional support for an involvement of specific clock components in homeostatic sleep regulation. Furthermore, in addition to the presence of RNA-binding proteins (Cirbp, Rbm3, Rbm11) in the list of homeostatic transcripts, our miRNA findings confirm a role for RNA posttranscriptional processing in sleep homeostasis.35 Of the 10 miRNAs that changed with sleep deprivation in sham-operated mice, only mir-410, -212, and -29c did so independently of ADX. Thus, as for the entire transcriptome, a second reduction occurred, indicating an important role for corticosterone in miRNA expression, which has not been demonstrated previously in vivo. Importantly, among the miR-212 potential target genes, 5 feature on our list of homeostatic genes (i.e., Npas4, Nfil3, Homer1, Ier5, and Hspa1a). The relevance of miR-212 to sleep homeostasis is a lead we are currently following up on. Thus, in addition to their relevance for circadian rhythms,57,58 our findings, which need to be confirmed using more-specific miRNA extraction protocols, show an additional role for miRNA in sleep regulation directly through sleep homeostasis.

CONCLUSIONS
We report on the central relationship between the molecular and physiological markers of sleep need and their response to one component of the stress response in mice. Also, in humans, sleep restriction can increase the level of the glucocorticoid cortisol.11 Our EEG findings suggest that, at least for acute forms of stress, this effect does not have an important impact on the recuperative value of sleep, as indexed by delta power. Glucocorticoids mediate most of the central effects of stress, which is well documented for the hippocampus, where it affects energy metabolism, memory, synaptic plasticity, dendritic morphology, neurogenesis, and neurotoxicity.59,60 Several of these effects, such as the modulation of energy metabolism, the changes in synaptic plasticity, and the changes in mediators of cell death, have also been observed after sleep deprivation, where they have been attributed to sleep loss.3 At the molecular level, our findings support a large contribution of glucocorticoids, especially regarding the general regulation of various metabolic routes, an effect that has not been directly assessed previously. The analyses allowed for the identification of those transcripts that respond to sleep loss independent of glucocorticoids and time of day and suggest that sustained wakefulness activates a neuroprotective signaling pathway likely to be of direct relevance for sleep function.

ACKNOWLEDGMENTS
We are thankful to Sabine Dhir, Brice Petit, and Yann Emmenegger for technical help. We also thank Sophie Wicker, Otto Hagenbuche, and Keith Harshman (Lausanne Genomic Technologies Facility) for the microarray profiling study. This work was supported by the University of Lausanne, Canton de Vaud (Switzerland), the National Institutes of Health (grant MH67752), the Swiss National Science Foundation (grants 108478 and 111974), and a fellowship from the National Sciences and Engineering Research Council of Canada to VM.

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Supplementary Figures and Tables for Separating the Contribution of Glucocorticoids and Wakefulness to the Molecular and Electrophysiological Correlates of Sleep Homeostasis

Supplementary Figure 1—Total sleep time observed in control condition (before surgery) and after adrenalectomy (ADX) or sham-lesion in D2 mice. A) Time course of total sleep time (NREM and REM sleep) averaged per hour during the 24h baseline, during sleep deprivation (SD), and 18h of recovery. B) Total sleep time calculated per 12h light or dark period during baseline in the three experimental groups. Time course of total sleep time and total sleep time per 12h did not differ among control (n = 16), ADX (n = 7), and sham-lesioned (n = 9) mice. See Figure 2C for the effect of SD on NREM sleep.
Supplementary Figure 2—Hierarchical clustering, using Ward's linkage method, of all 26 individual mice based on a variable number of probe sets displaying a significant interaction between the effects of ADX and of SD. This clustering approach was performed to delineate the genes for which the SD effect on expression was altered by ADX. In each graph an increasing FDR significance threshold was used (varying from 0.1 to 0.6; upper left – lower right) to assess the interaction. The lowest FDR threshold with which the Sham-SD, ADX-SD, and control (CT) groups could be separated was 0.23. This cut-off was subsequently used to evaluate probe sets for which a significant interaction between Group (sham vs. ADX) and Condition (CT vs. SD) was found among the 1476 probe sets affected by SD (See Supplementary Table 3). Using this approach, a significant interaction was found for 260 probe sets (see data points marked green in Figure 4B and the heatmap of Figure 4C). Pearson correlation was used as a distance metric for clustering analysis.
Supplementary Figure 2 (continued)—Hierarchical clustering, using Ward's linkage method, of all 26 individual mice based on a variable number of probe sets displaying a significant interaction between the effects of ADX and of SD. This clustering approach was performed to delineate the genes for which the SD effect on expression was altered by ADX. In each graph an increasing FDR significance threshold was used (varying from 0.1 to 0.6; upper left – lower right) to assess the interaction. The lowest FDR threshold with which the Sham-SD, ADX-SD, and control (CT) groups could be separated was 0.23. This cut-off was subsequently used to evaluate probe sets for which a significant interaction between Group (sham vs. ADX) and Condition (CT vs. SD) was found among the 1476 probe sets affected by SD (See Supplementary Table 3). Using this approach, a significant interaction was found for 260 probe sets (see data points marked green in Figure 4B and the heatmap of Figure 4C). Pearson correlation was used as a distance metric for clustering analysis.
Supplementary Figure 3—Scatter plot of the fold-change in expression induced by the sleep deprivation (SD) \([\log(\text{SD/control})]\) in sham-lesioned animals plotted against the fold-change in expression between ZT18 and ZT12 in DBA/2J mice during baseline conditions \([\log(\text{ZT18/ZT12})]\) (analysis of previously published micro-array data from Maret et al., 2007). The 297 gene sequences representing the 349 probe sets that were significantly modified by SD in both sham and ADX mice in the present study (Supplementary Table 1 and Figure 4A) were compared to the Maret et al. (2007) study to verify whether they were equally affected by a comparable extended period of spontaneous wakefulness. Among the 297 genes represented, 78 genes showed a significant and similar change between ZT18 and ZT12 (green symbols, see Supplementary Table 4). The 45 degree line of equality is indicated with a dashed red line.
Supplementary Table 1: Probes significantly affected by sleep deprivation (SD) in sham-operated D2 mice (1476 probe sets). The FDR of 5% for the ANOVA with factor SD was taken to adjust nominal P-values (Adj. P value). The direction indicates whether SD increased (up) or decreased (down) the expression of the transcript. The last two columns show the adjusted FDR P values calculated for sham and ADX mice separately. Gene symbols highlighted in yellow (378 probes) were also found to be affected by SD (ZT0 to -6) by Maret et al. (2007); gene symbols in bold (701 probes) have been reported to be affected by sleep and wakefulness by Mackiewicz et al. (2007). Probe sets affected by SD in ADX mice only (120) are listed at the end. ns: p ≥ 0.05; * difference between studies terminology for HrasL.

| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|---------------|-------------|--------------------------|-----------|-----------|------------------|------------------|
| 10471586      | Hspa5       | heat shock protein 5     | NM_022310 | up        | 1.4e-10          | 1.88e-08         |
| 10429491      | Arc         | activity regulated cytoskeletal-associated protein | NM_018790 | up        | 1.52e-09         | 3.50e-08         |
| 10556114      | Rbm3        | RNA binding motif protein 3 | ENSMUST0 0000115616 | down      | 2.66e-09         | 2.73e-07         |
| 10358454      | Rbm3        | RNA binding motif protein 3 | ENSMUST0 0000115616 | down      | 2.66e-09         | 2.02e-07         |
| 10603469      | Rbm3        | RNA binding motif protein 3 | NM_016809 | down      | 2.66e-09         | 2.21e-07         |
| 10364712      | Cirbp       | cold inducible RNA binding protein | NM_007075 | down      | 4.11e-09         | 1.57e-06         |
| 10394735      | Pdia6       | protein disulfide isomerase associated 6 | NM_027959 | up        | 5.99e-09         | 5.94e-07         |
| 10406626      | Homer1      | homer homolog 1 (Drosophila) | NM_147176 | up        | 4.64e-08         | 4.08e-07         |
| 10435975      | Tfre        | transferrin receptor      | NM_016138 | down      | 4.66e-08         | 3.75e-05         |
| 10426098      | Crdt12      | cysteine-rich with EGF-like domains 2 | NM_029720 | up        | 4.66e-08         | 7.00e-06         |
| 10363350      | P4ha1       | procollagen-proline, 2-oxoglutarate 4-dioxygenase (proline 4-hydroxylase), alpha 1 polypeptide | NM_011030 | up        | 8.47e-08         | 6.33e-05         |
| 10448471      | Dnase1l2    | deoxyribonuclease 1-like 2 | NM_025718 | up        | 9.46e-08         | 4.79e-05         |
| 10399680      | Cys1        | cystin 1                  | NM_138668 | up        | 1.01e-07         | 0.008            |
| 10401743      | 4933437F05Rik | RIKEN cDNA 4933437F05 gene | BC125331 | up        | 1.66e-07         | 3.75e-05         |
| 10535904      | Hsp1        | heat shock 105kDa/110kDa protein 1 | NM_013559 | up        | 1.91e-07         | 7.03e-05         |
| 10595324      | Htr1b       | 5-hydroxytryptamine (serotonin) receptor 1B | NM_010482 | up        | 2.55e-07         | 7.03e-05         |
| 10488048      | Mksk        | McKusick-Kaufman syndrome protein | NM_021527 | up        | 2.55e-07         | 0.002            |
| 10544525      | Pdia4       | protein disulfide isomerase associated 4 | NM_009787 | up        | 2.55e-07         | 2.73e-05         |
| 10438098      | Sdf21       | stromal cell-derived factor 2-like 1 | NM_022324 | up        | 2.55e-07         | 3.75e-05         |
| 10401841      | Dio2        | deiodinase, iodothyronine, type II | NM_010050 | up        | 2.55e-07         | 0.0004           |
| 10436552      | Rbm11       | RNA binding motif protein 11 | NM_198302 | up        | 2.55e-07         | 0.0002           |
| 10436945      | Slc5a3      | solute carrier family 5 (inositol transporters), member 3 | NM_017391 | up        | 3.04e-07         | 0.0001           |
| 10381474      | Arid4       | ADP-ribosylation factor-like 4D | NM_025404 | up        | 3.23e-07         | 0.02             |
| 10511580      | Ppm2e       | protein phosphatase 2C, magnesium dependent, catalytic subunit | NM_001098 230 | up        | 7.60e-07         | 9.70e-05         |
| 10504218      | Dnaajb5     | DnaJ (Hsp40) homolog, subfamily B, member 5 | NM_019874 | up        | 7.60e-07         | 1.81e-05         |
| 10520862      | Fosl2       | fos-like antigen 2       | NM_008037 | up        | 7.60e-07         | 4.21e-05         |
| 10554863      | Sytl2       | synaptotagmin-like 2    | NM_000104 085 | down      | 7.81e-07         | 0.0001           |
| 10572271      | Tm6sf2      | transmembrane 6 superfamily member 2 | NM_181540 | up        | 7.75e-07         | 0.001            |
| 10606989      | Tsc22d3     | TSC22 domain family, member 3 | NM_001077 364 | up        | 7.75e-07         | ns               |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                               | Accession | Direction | Sham Adjusted P value | ADX Adjusted P value |
|--------------|-------------|------------------------------------------------------------------------|-----------|-----------|-----------------------|----------------------|
| 10596575     | Armet       | arginine-rich, mutated in early stage tumors                           | NM_029103 | up        | 8.18e-07              | 0.0002               |
| 10371482     | Hsp90b1     | heat shock protein 90, beta (Grp94), member 1                          | NM_011631 | up        | 9.40e-07              | 0.004                |
| 10362073     | Sgk1        | serum/glucocorticoid regulated kinase 1                                | NM_011381 | up        | 1.42e-06              | ns                   |
| 10352918     | ---         | M10000577 Mus musculus mir-29c stem-loop                                | ---       | up        | 1.60e-06              | 0.007                |
| 10511136     | B930041F14Rik| RIKEN cDNA B930041F14 gene                                             | NM_178699 | down      | 1.61e-06              | ns                   |
| 10459602     | Ptn2        | protein tyrosine phosphatase, non-receptor type 2                      | NM_001127 | up        | 1.61e-06              | 0.002                |
| 10352918     | ---         | M10000712 Mus musculus mir-29b-2 stem-loop                              | ---       | up        | 1.61e-06              | ns                   |
| 10478160     | B210007D09Rik| RIKEN cDNA B210007D09 gene                                             | BC068129  | up        | 2.26e-06              | ns                   |
| 10397346     | Fox2        | FBK osteosarcoma oncogene                                              | NM_010234 | up        | 2.32e-06              | 2.57e-06             |
| 10571824     | Egs57103    | predicted gene, EGS57103                                               | ENSMUST0 0000098764 | down | 3.17e-06 | 0.0003 |
| 10357660     | Mfsd4       | major facilitator superfamily domain containing 4                      | NM_00174 | down      | 3.19e-06              | 7.03e-05             |
| 10544629     | Tra2a       | Transformer 2 alpha homolog (Drosophila)                               | NM_198102 | up        | 3.42e-06              | 0.0001               |
| 10550605     | Eml2        | Echinoderm microtubule associated protein like 2                       | BC055476  | down      | 3.42e-06              | 0.001                |
| 10584580     | ---         | snoRNA, chromosome: NCBI: M37: 9: 40612831: 40612920:1 gene: ENSMUSG000000064791 | ENSMUST0 0000082657 | up | 3.42e-06 | 0.0002 |
| 10417013     | DnaJ3       | DnaJ (Hsp40) homolog, subfamily C, member 3                            | NM_008929 | up        | 3.42e-06              | 0.0008               |
| 10417034     | DnaJ3       | DnaJ (Hsp40) homolog, subfamily C, member 3                            | NM_008929 | up        | 3.42e-06              | 0.0008               |
| 10356601     | Per2        | period homolog 2 (Drosophila)                                          | NM_011666 | down     | 3.70e-06              | ns                   |
| 10385052     | Ranbp17     | RAN binding protein 17                                                | NM_023146 | down      | 3.95e-06              | 0.004                |
| 10352914     | A330023F24Rik| RIKEN cDNA A330023F24 gene                                             | AK17382   | up        | 3.95e-06              | 0.005                |
| 10398442     | M10001161    | Mus musculus mir-410 stem-loop                                          | ---       | up        | 5.57e-06              | 9.38e-05             |
| 10498302     | Gm410       | gene model 410, (NCBI)                                                 | NM_001033 | up        | 5.83e-06              | ns                   |
| 10443453     | Cdkn1a      | cyclin-dependent kinase inhibitor 1A (P21)                             | NM_007669 | up        | 5.93e-06              | 0.003                |
| 10485402     | Fxj1        | four jointed box 1 (Drosophila)                                        | NM_010218 | up        | 5.96e-06              | ns                   |
| 10467529     | Opalin      | oligodendrocytic myelin paranodal and inner loop protein               | NM_153520 | down      | 7.05e-06              | 0.04                 |
| 10517005     | Gpr3        | G-protein coupled receptor 3                                           | NM_008154 | up        | 7.61e-06              | 0.0001               |
| 10366043     | Dusp6       | dual specificity phosphatase 6                                         | NM_026288 | up        | 7.61e-06              | 8.56e-05             |
| 10603860     | Cfp         | complement factor proteininLD                                        | NM_00823 | up        | 7.61e-06              | 0.004                |
| 10362372     | 9330159F19Rik| RIKEN cDNA 9330159F19 gene                                             | AK034414  | up        | 7.67e-06              | ns                   |
| 10524234     | Ga1nt9      | UDP-N-acetyl-alpha-D-galactosamine:peptide N-acetylglactosaminyltransferase 9 | NM_198306 | up        | 9.46e-06              | 0.0002               |
| 10541071     | 830408G22Rik | RIKEN cDNA 830408G22 gene                                             | BC058515  | up        | 9.71e-06              | ns                   |
| 10583347     | Chordc1     | cysteine and histidine-rich domain (CHORD)-containing, zinc-binding protein 1 | NM_025844 | up        | 1.07e-05              | 0.03                 |
| 10426315     | Lrrk2       | leucine-rich repeat kinase 2                                           | NM_025730 | up        | 1.07e-05              | 0.0004               |
| 10580765     | Pllp        | plasma membrane proteolipid                                            | NM_026385 | down      | 1.07e-05              | 0.005                |
| 10580219     | Caf1        | calreticulin                                                          | NM_007591 | up        | 1.07e-05              | 0.0004               |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|-----------------|
| 10375735     | Hnrrph1     | heterogeneous nuclear ribonucleoprotein H1 | NM_021510 | up        | 1.01e-05         | 0.02            |
| 10464905     | Npas4       | neuronal PAS domain protein 4 | NM_153553 | up        | 1.17e-05         | 0.005           |
| 10505163     | Zksce16     | zinc finger with KRAB and SCAN domains 16 | NM_001099 323 | down    | 4.14e-05         | 0.0002          |
| 10571312     | Dusp4       | dual specificity phosphatase 4 | NM_176933 | up        | 1.43e-05         | 0.0002          |
| 10408926     | Hspb1       | heat shock protein 1 | NM_013560 | up        | 1.46e-05         | 4.84e-05        |
| 10561907     | 0119010E21Rik | RIKEN cDNA 0119010E21 gene | NM_001033 140 | down    | 1.61e-05         | 0.008           |
| 10486403     | Plag1e      | phospholipase A2, group IVE | NM_177845 | down    | 1.61e-05         | 0.006           |
| 10532954     | 241016A08Rik | RIKEN cDNA 241016A08 gene | NM_175403 | up        | 1.61e-05         | 0.004           |
| 10361250     | Camk1g      | calcium/calmodulin-dependent protein kinase I gamma | NM_144817 | up        | 1.61e-05         | 0.01            |
| 10564101     | Hspb1       | heat shock protein 1 | NM_013560 | up        | 1.61e-05         | 3.75e-05        |
| 10474129     | E430002G05Rik | RIKEN cDNA E430002G05 gene | NM_173749 | down    | 1.61e-05         | 0.002           |
| 10427035     | Nr4a1       | nuclear receptor subfamily 4, group A, member 1 | NM_010444 | up        | 1.91e-05         | 0.0004          |
| 10431894     | Scl38a2     | solute carrier family 38, member 2 | NM_175121 | up        | 1.91e-05         | 0.005           |
| 10506668     | Tnfrsf25    | tumor necrosis factor receptor superfamily, member 25 | NM_033042 | up        | 1.91e-05         | 0.0001          |
| 10532944     | 241016A08Rik | RIKEN cDNA 241016A08 gene | NM_175403 | up        | 1.97e-05         | 0.003           |
| 10584712     | Hyou1       | hypoxia up-regulated 1 | NM_021395 | up        | 2.07e-05         | 0.0001          |
| 10568873     | Adam8       | a disintegrin and metalloproteinase domain 8 | NM_007403 | up        | 2.09e-05         | 0.02            |
| 10591419     | Akap2 // Palm2 // RP23-334A5.2 | A kinase (PRKA) anchor protein 2 // paralemmin 2 // Palm2-Akap2 protein | ENSMUS70 0000107600 | down | 2.09e-05 | 0.002 |
| 10593225     | Zbtb16      | zinc finger and BTB domain containing 16 | NM_001033 324 | up        | 2.09e-05         | ns              |
| 10477286     | Pofut1      | protein O-fucosyltransferase 1 | NM_080463 | up        | 2.17e-05         | 0.002           |
| 10583992     | Igf9b       | immunoglobulin superfamily, member 9B | NM_001129 767 | up | 2.20e-05 | 0.0002 |
| 10536294     | Pcc10       | paternally expressed 10 | NM_001040 611 | up | 2.21e-05 | 0.005 |
| 10408879     | Gfod1       | glucose-fructose oxidoreductase domain containing 1 | NM_001033 399 | up | 2.38e-05 | 3.75e-05 |
| 10439130     | Ump1        | uridine monophosphate synthetase | NM_009471 | up | 2.45e-05 | 0.006 |
| 10596931     | Wdr6        | WD repeat domain 6 | NM_031392 | up | 2.53e-05 | 0.005 |
| 10390283     | Cdk5rap3    | CDK5 regulatory subunit associated protein 3 | NM_030248 | down | 2.60e-05 | ns |
| 10458461     | Hdc3        | histone deacetylase 3 | NM_010411 | down | 2.94e-05 | 0.02 |
| 10514713     | Wdr78       | WD repeat domain 78 | NM_146254 | up | 3.03e-05 | 0.003 |
| 10398356     | Wdr78       | WD repeat domain 78 | NM_146254 | up | 3.03e-05 | 0.003 |
| 10567589     | Usp31       | ubiquitin specific peptidase 31 | AK048747 | up | 3.26e-05 | 0.0077 |
| 10564424     | Cek1        | reversion-inducing-cysteine-rich protein with kazal motifs | AK021686 | up | 3.49e-05 | 0.008 |
| 10374303     | Xbp1        | X-box binding protein 1 | NM_011678 | down | 3.78e-05 | 0.004 |
| 10560481     | Fosb        | FBJ osteosarcoma oncogene B | NM_008036 | up | 3.93e-05 | 0.002 |
| 10489620     | Ncoa5       | nuclear receptor coactivator 5 | NM_144892 | up | 3.94e-05 | 0.004 |
| 10358057     | Shisa4      | shisa homolog 4 (Xenopus laevis) | NM_175259 | down | 3.98e-05 | ns |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|------------------|
| 10516765     | Serinc2     | serine incorporator 2     | NM_172702 | up        | 4.12e-05         | 0.0002           |
| 10376074     | P4ha2       | procollagen-proline, 2-oxoglutarate 4-dioxygenase (proline 4-hydroxylase), alpha II polypeptide | NM_011031 | up        | 4.20e-05         | 0.03             |
| 10363144     | EG547103    | predicted gene, EG547103  | ENSMUST0 000098764 | down    | 4.22e-05         | 0.006            |
| 10504838     | Nr4a3       | nuclear receptor subfamily 4, group A, member 3 | NM_015743 | up        | 4.22e-05         | 0.0001           |
| 10444066     | Zdb22       | zinc finger and BTB domain containing 22 | NM_020625 | down    | 4.22e-05         | 0.01             |
| 10456184     | Apcda1      | adenosaminos polyposis coli down-regulated 1 | NM_133237 | down    | 4.34e-05         | ns               |
| 10443482     | BC004004    | cDNA sequence BC004004 | BC056575 | down    | 4.64e-05         | 0.01             |
| 10400405     | Nkbia       | nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, alpha | NM_010907 | up        | 4.75e-05         | ns               |
| 10479510     | RIKEN cDNA 9230112E08 gene | ENSMUST0 000094214 | up | 4.83e-05 | 0.0009 |
| 10415319     | Inf9        | interferon regulatory factor 9 | NM_006394 | up | 5.07e-05 | 0.008 |
| 10573198     | DnaJb1      | DnaJ (Hsp40) homolog, subfamily B, member 1 | NM_018808 | up | 5.12e-05 | 0.003 |
| 10409520     | Dock3       | docking protein 3         | NM_013739 | up | 5.65e-05 | 0.0003 |
| 10449284     | Dusp1       | dual specificity phosphatase 1 | NM_013642 | up | 6.25e-05 | 0.008 |
| 10063259     | Itm2a       | integral membrane protein 2A | NM_008489 | up | 7.45e-05 | ns |
| 10508217     | Spf2        | splicing factor proline/glutamine rich (polypyrimidine tract binding protein associated) | NM_023603 | up | 7.55e-05 | 0.02 |
| 10535458     | Zdhhc4      | zinc finger, DHHC domain containing 4 | NM_028379 | down | 7.62e-05 | ns |
| 10474399     | Bdnf        | brain derived neurotrophic factor | NM_001048 129 | up | 7.66e-05 | 0.0001 |
| 10475941     | Zc3h6       | zinc finger CCCH type containing 6 | NM_174604 | up | 7.66e-05 | 0.0001 |
| 10403743     | Inhba       | inhibin beta-A             | NM_000830 | up | 7.73e-05 | 0.0003 |
| 10568982     | BC066029    | cDNA sequence BC066029     | NM_001001 180 | down | 8.00e-05 | 0.001 |
| 10503602     | Fbx4        | F-box and leucine-rich repeat protein 4 | NM_172968 | down | 8.63e-05 | 0.008 |
| 10364841     | 9030607L17Rik | RIKEN cDNA 9030607L17 gene | NM_027829 | down | 8.75e-05 | ns |
| 10406229     | Pcsk1       | proprotein convertase subtilisin/kexin type 1 | NM_013628 | up | 8.75e-05 | 0.0001 |
| 10521587     | DnaJ1       | DnaJ (Hsp40) homolog, subfamily A, member 1 | NM_158004 | up | 9.38e-05 | ns |
| 10353871     | Lmnb2       | lecin, mannose-binding 2-like | BC158024 | up | 9.50e-05 | 0.002 |
| 10514708     | Ins15       | insulin-like 5             | NM_011831 | up | 9.93e-05 | ns |
| 10415095     | 1700123O20Rik | RIKEN cDNA 1700123O20 gene | BC011283 | up | 0.0001 | 0.006 |
| 10388254     | Aspa        | aspartoacylase              | NM_023113 | down | 0.0001 | 0.02 |
| 10483624     | Dl1as       | distal-less homeobox 1, antisense | NR_028754 | up | 0.0001 | ns |
| 10397966     | Otub2       | OTU domain, ubiquitin aldehyde binding 2 | NM_028580 | up | 0.0001 | 0.001 |
| 10363901     | ---         | cdna:Genscan chromosome: NCBIM37.10:71167116:71168033.1 | GENSCAN00006070 | up | 0.0001 | 6.33e-05 |
| 10489556     | Pitp        | phospholipid transfer protein | NM_011125 | down | 0.0001 | ns |
| 10526553     | Vgf         | VGF nerve growth factor inducible | NM_001039 | up | 0.0001 | 3.75e-05 |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|-----------------|
| 10541785     | Acrbp       | proacrosin binding protein | NM_016845 | up        | 0.0001           | 0.005           |
| 10455942     | A730017C20Rik | RIKEN cDNA A7.30017C20 gene | BC075669  | down      | 0.0001           | 0.01            |
| 10480035     | Plkfb3      | 6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 3 | NM_133232 | up        | 0.0001           | 0.001           |
| 10381697     | Hexim1      | hexamethylene bis-acetamide inducible 1 | NM_138753 | up        | 0.0001           | 0.003           |
| 10475946     | Zc3h6       | zinc finger CCCH type containing 6 | NM_178404 | down      | 0.0001           | 0.02            |
| 10436788     | Hunk        | hormonally upregulated Neu-associated kinase | NM_015755 | down      | 0.0001           | ns              |
| 10509218     | Zfp46       | zinc finger protein 46 | NM_009587 | down      | 0.0001           | 0.002           |
| 10540122     | Sica6b      | solute carrier family 6 (neurotransmitter transporter, taurine), member 6 | NM_09520 | down      | 0.0001           | 0.03            |
| 10424370     | Trib1       | tribbles homolog 1 (Drosophila) | NM_144549 | up        | 0.0001           | ns              |
| 10454782     | Egr1        | early growth response 1 | NM_007913 | up        | 0.0002           | 0.001           |
| 10383993     | Ccnc117     | coiled-coil domain containing 117 | NM_134033 | up        | 0.0002           | ns              |
| 10450367     | Hspa1b      | heat shock protein 1B | NM_010478 | up        | 0.0002           | 0.02            |
| 10531201     | Adams3      | a disintegrin-like and metallopeptidase (reprolysin type) with thrombospondin type 1 motif, 3 | NM_001081 | down      | 0.0002           | ns              |
| 10517540     | Zbbb40      | zinc finger and BTB domain containing 40 | NM_198248 | up        | 0.0002           | 0.003           |
| 10541873     | Mrpl51      | mitochondrial ribosomal protein L51 | NM_025995 | up        | 0.0002           | ns              |
| 10449741     | Snf1k       | SNF1-like kinase | NM_010831 | up        | 0.0002           | ns              |
| 10543017     | Pdk4        | pyruvate dehydrogenase kinase, isoenzyme 4 | NM_013743 | up        | 0.0002           | ns              |
| 10531177     | Adams3      | a disintegrin-like and metallopeptidase (reprolysin type) with thrombospondin type 1 motif, 3 | NM_001081 | down      | 0.0002           | 0.009           |
| 10548996     | Sico1a4     | solute carrier organic anion transporter family, member 1a4 | NM_03067 | down      | 0.0002           | ns              |
| 10548194     | Fkbp4       | FK506 binding protein 4 | NM_010219 | up        | 0.0002           | 0.0003           |
| 10598771     | Mcao        | monoamine oxidase A | NM_173740 | down      | 0.0002           | 0.01            |
| 10438293     | Zdhhc8      | zinc finger, DHHC domain containing 8 | NM_172151 | down      | 0.0002           | ns              |
| 10600114     | Prma3       | paraneoplastic antigen MA3 | NM_153169 | down      | 0.0002           | 0.004           |
| 10465604     | Sli1        | stress-induced phosphoprotein 1 | NM_016737 | up        | 0.0002           | 0.006           |
| 10437778     | Parn        | poly(A)-specific ribonuclease (deadenylation nuclease) | NM_028761 | down      | 0.0002           | 0.007           |
| 10573626     | Gpt2        | glutamic pyruvate transaminase (alanine aminotransferase) 2 | NM_173866 | up        | 0.0002           | ns              |
| 10545417     | Mat2a       | methionine adenosyltransferase ll, alpha | NM_145569 | up        | 0.0002           | ns              |
| 10346943     | Creb1       | cAMP responsive element binding protein 1 | NM_133828 | up        | 0.0002           | ns              |
| 10417972     | Camk2g      | calcium/calmodulin-dependent protein kinase II gamma | NM_178597 | down      | 0.0002           | 0.02            |
| 10434675     | Dnajb11     | DnaJ (Hsp40) homolog, subfamily B, member 11 | NM_026400 | up        | 0.0002           | 0.02            |
| 10505779     | Asah3l      | N-aclysphingosine amidohydrolase 3-like | NM_139306 | up        | 0.0002           | ns              |
| 10450006     | Hnrnpm      | heterogeneous nuclear ribonucleoprotein M | NM_029804 | up        | 0.0002           | ns              |
| 10547386     | Adipor2     | adiponectin receptor 2 | NM_197985 | up        | 0.0002           | ns              |
| 10550509     | Pglyrp1     | peptidoglycan recognition protein 1 | NM_009402 | up        | 0.0003           | ns              |
| 10494160     | Tmod4       | tropomodulin 4 | NM_016712 | up        | 0.0003           | 0.03            |
| 10467206     | Ppp1r3c     | protein phosphatase 1, regulatory (inhibitor) subunit 3C | NM_016854 | up        | 0.0003           | 0.002           |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|-----------------|-----------------|
| 10532680     | Sqsml1      | small G protein signaling modulator 1 | NM_172718 | up        | 0.0003          | 0.0005          |
| 10352905     | Cd34        | CD34 antigen              | NM_001111 059 | down     | 0.0003          | 0.03            |
| 10496872     | Eltd1       | EGFR, latent protein seven transmembrane domain containing 1 | NM_133222 | up        | 0.0003          | ns              |
| 10441456     | Syn2        | synaptoplakin 2            | NM_011523 | up        | 0.0003          | 0.002           |
| 10553092     | Dbp         | D site albumin promoter binding protein | NM_016974 | down     | 0.0003          | ns              |
| 10429573     | Ly6c1       | lymphocyte antigen 6 complex, locus C1 | NM_010741 | up        | 0.0003          | ns              |
| 10462454     | Uhrf2       | ubiquitin-like, containing PHD and RING finger domains 2 | NM_144873 | up        | 0.0003          | ns              |
| 10575728     | Al316807    | expressed sequence AL316807 | BC048809 | down     | 0.0003          | 0.003           |
| 10475910     | ---         | snoRNA chromosome:NCBIM37:2: 128606112: 128606235:1 gene: ENSMUSG00000064937 | ENSMUST0 0000083003 | up        | 0.0003          | ns              |
| 10582664     | 2310022B05Rik | RIKEN CDNA 2310022B05 gene | BC058626 | down     | 0.0003          | ns              |
| 10544660     | Osbp3       | oxysterol binding protein-like 3 | NM_027881 | up        | 0.0003          | 0.01            |
| 10363735     | Egr2        | early growth response 2    | NM_010118 | up        | 0.0003          | ns              |
| 10390299     | Pnpo        | pyridoxine 5'-phosphate oxidase | NM_134021 | down     | 0.0003          | ns              |
| 10479872     | Tce2        | transcription elongation factor A (SII), 2 | NM_009326 | down     | 0.0003          | 0.02            |
| 10576073     | Banp        | BT3G associated nuclear protein | NM_001110 100 | up       | 0.0003          | 0.0007          |
| 10544583     | Gimap6      | GTPase, IMPA family member 6 | NM_153175 | up        | 0.0003          | ns              |
| 10586184     | Tipin       | timeless interacting protein | NM_025372 | down     | 0.0003          | 0.02            |
| 10557399     | Sbk1        | SH3-binding kinase 1       | NM_145587 | up        | 0.0003          | 0.0004          |
| 10449487     | Sic26a8     | solute carrier family 26, member 8 | NM_146076 | down     | 0.0004          | 0.007           |
| 10577048     | Ankr10      | ankyrin repeat domain 10   | NM_133971 | up        | 0.0004          | 0.005           |
| 10377439     | Per1        | period homolog 1 (Drosophila) | NM_011065 | up        | 0.0004          | ns              |
| 10475890     | Merk        | c-myc proto-oncogene tyrosine kinase | NM_008587 | up        | 0.0004          | ns              |
| 10447938     | Dact2       | dapper homolog 2, antagonist of beta-catenin (xenopus) | NM_172826 | down     | 0.0004          | ns              |
| 10530201     | Ugdh        | UDP-glucose dehydrogenase   | NM_009468 | up        | 0.0004          | ns              |
| 10397518     | Ahsa1       | AHA1, activator of heat shock protein ATPase homolog 1 (yeast) | NM_146036 | up        | 0.0004          | 0.009           |
| 10600017     | Hmgb3       | high mobility group box 3   | NM_008253 | down     | 0.0004          | 0.008           |
| 10546137     | Abtb1       | ankyrin repeat and BTB (POZ) domain containing 1 | NM_030251 | down     | 0.0004          | ns              |
| 10492248     | Tiparp      | TCDD-inducible poly(ADP-ribose) polymerase | NM_178892 | up        | 0.0004          | ns              |
| 10429754     | Nrnb2       | nuclear receptor binding protein 2 | NM_144847 | down     | 0.0004          | ns              |
| 10579219     | Ddx49       | DEAD (Asp-Glu-Ala-Asp) box polypeptide 49 | NM_001024 922 | down | 0.0004          | ns              |
| 10474671     | Spred1      | sprouty protein with EVH-1 domain 1, related sequence | NM_033524 | up        | 0.0004          | 0.008           |
| 10464819     | Rbm14       | RNA binding motif protein 14 | NM_019869 | up        | 0.0004          | 0.04            |
| 10488655     | Bcl21       | BCL2-like 1                | NM_009743 | up        | 0.0004          | ns              |
| 10585428     | Dna4a       | DnaJ (Hsp40) homolog, subfamily A, member 4 | NM_021422 | up        | 0.0005          | 0.003           |
| 10420413     | Lats2       | large tumor suppressor 2    | NM_015771 | up        | 0.0005          | 0.02            |
| 10345074     | Cetn4       | centrin 4                  | BC087905 | down     | 0.0005          | 0.02            |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|-----------------|
| 10562548     | C80913      | expressed sequence C80913 | NM_011274 | down      | 0.0005           | 0.006           |
| 10398147     | Papola      | poly (A) polymerase alpha | NM_011112 | up        | 0.0005           | ns              |
| 10460591     | Fbp         | fibroblast growth factor (acidic) intracellular binding protein | NM_021438 | up        | 0.0005           | 0.05            |
| 10378482     | Melt10d     | methyltransferase 10 domain containing | NM_026197 | up        | 0.0005           | 0.02            |
| 10604505     | 6720401G13Rik | RIKEN cDNA 6720401G13 gene | BC066100 | down      | 0.0005           | ns              |
| 10470959     | Phthd1      | phytanoyl-CoA dioxygenase domain containing 1 | NM_172267 | up        | 0.0005           | ns              |
| 10394358     | BC068281    | cDNA sequence BC068281   | BC068281  | up        | 0.0005           | 0.02            |
| 10531183     | Adamts3     | a disintegrin-like and metalloproteinase (reprolysin type) with thrombospondin type 1 motif, 3 | NM_001081401 | down | 0.0005 | ns |
| 10587878     | ---         | snoRNA chromosome:NCBI37:9:95524879:95525030:1 gene:ENSMUSG00000065346 | ENSMUST0000083412 | down | 0.0005 | 0.02 |
| 10406672     | Arsb        | arylsulfatase B | NM_009712 | up | 0.0005 | 0.007 |
| 10419691     | Mettl3      | methyltransferase-like 3 | NM_019721 | up | 0.0005 | ns |
| 10437399     | Coro7       | coronin 7 | NM_030205 | down | 0.0005 | ns |
| 10350516     | Ptgds2      | prostaglandin-endoperoxide synthase 2 | NM_011198 | up | 0.0005 | ns |
| 10469936     | Nrarp       | Notch-regulated ankyrin repeat protein | NM_025980 | down | 0.0005 | ns |
| 10399470     | Trib2       | tribbles homolog 2 (Drosophila) | NM_144551 | up | 0.0005 | 0.004 |
| 10569848     | Stxbp2      | syntaxin binding protein 2 | NM_011503 | down | 0.0005 | ns |
| 10510574     | Erff1       | ERBB receptor feedback inhibitor 1 | NM_133753 | up | 0.0005 | ns |
| 10357043     | Bcl2        | B-cell leukemia/lymphoma 2 | NM_009741 | up | 0.0005 | 0.03 |
| 10488029     | Zfand1      | zinc finger, AN1-type domain 1 | NM_025512 | down | 0.0005 | 0.01 |
| 10452815     | Xdh         | xanthine dehydrogenase | NM_011723 | up | 0.0005 | ns |
| 10576971     | Irs2        | insulin receptor substrate 2 | NM_001081212 | up | 0.0006 | 0.03 |
| 10352954     | Hmgb3       | high mobility group box 3 | ENSMUST0000072699 | down | 0.0006 | 0.004 |
| 10557816     | Bcdk        | branched chain ketoacid dehydrogenase kinase | NM_009739 | down | 0.0006 | 0.04 |
| 10490872     | Lrcc1       | leucine rich repeat and coiled-coil domain containing 1 | NM_028915 | down | 0.0006 | 0.002 |
| 10413559     | Rft1        | RFT1 homolog (S. cerevisiae) | NM_177815 | down | 0.0006 | ns |
| 10395129     | Tmem18      | transmembrane protein 18 | NM_172049 | down | 0.0006 | 0.02 |
| 10358658     | Hmnc1       | hemicentin 1 | NM_001024720 | down | 0.0006 | ns |
| 10520842     | Bre         | brain and reproductive organ-expressed protein | NM_181279 | down | 0.0006 | 0.01 |
| 10588927     | 1700102P08Rik | RIKEN cDNA 1700102P08 gene | BC061048 | up | 0.0006 | 0.01 |
| 10449018     | Hagh1       | hydroxycycliglutathione hydrolase-like | NM_026897 | down | 0.0006 | ns |
| 10445992     | Shd         | src homology 2 domain-containing transforming protein D | NM_009678 | down | 0.0006 | ns |
| 10531187     | Adamts4     | a disintegrin-like and metalloproteinase (reprolysin type) with thrombospondin type 1 motif, 3 | NM_001081401 | down | 0.0006 | 0.004 |
| 10354564     | Pecr        | peroxisomal trans-2-enoyl-CoA reductase | NM_023523 | down | 0.0006 | ns |
| 10497689     | Gnb4        | guanine nucleotide binding protein (G protein), beta 4 | NM_013531 | down | 0.0006 | 0.02 |
| 10352110     | EG545391    | predicted gene, EG545391 | BC147679 | down | 0.0006 | 0.01 |

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| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|------------------|
| 10350758     | ENSMUSG0000066798 | predicted gene, ENSMUSG0000066798 | AK080751 | up | 0.0007 | ns |
| 10368484     | ENSMUSG0000056316 | predicted gene, ENSMUSG0000056316 | ENSMUST0 0000075359 | down | 0.0007 | 0.008 |
| 10473690     | Fnb4        | formin binding protein 4 | NM_018828 | down | 0.0007 | ns |
| 10400157     | Nova1       | neuro-ontological ventral antigen 1 | ENSMUST0 0000021439 | down | 0.0007 | ns |
| 10399725     | Sox11       | SRY-box containing gene 11 | NM_009234 | up | 0.0007 | ns |
| 10417561     | BC055107    | cDNA sequence BC055107 | NM_183187 | up | 0.0007 | ns |
| 10406364     | 221040812Trik | RIKEN cDNA 2210408121 gene | BC157949 | down | 0.0007 | 0.01 |
| 10544150     | Jhdm1d      | jumonji C domain-containing histone demethylase 1 homolog D (S. cerevisiae) | NM_001033 430 | up | 0.0007 | ns |
| 10500042     | Zfp687      | zinc finger protein 687 | NM_030074 | down | 0.0007 | 0.02 |
| 10475335     | Pdia3       | protein disulfide isomerase associated 3 | NM_007952 | up | 0.0007 | 0.03 |
| 10551736     | Ppi114a     | protein phosphatase 1, regulatory (inhibitor) subunit 14A | NM_026731 | down | 0.0007 | ns |
| 10447190     | Plekhh2     | pleckstrin homology domain containing, family H (with MYTH4 domain) member 2 | NM_177606 | up | 0.0007 | ns |
| 10409629     | EG627648    | predicted gene, EG627648 | ENSMUST0 000091583 | up | 0.0007 | 0.007 |
| 10350506     | B330045N13Rik | RIKEN cDNA B330045N13 gene | NM_153539 | down | 0.0007 | 0.04 |
| 10390691     | Nr1d1       | nuclear receptor subfamily 1, group D, member 1 | NM_145434 | down | 0.0007 | ns |
| 10405001     | Bicd2       | bicaudal D homolog 2 (Drosophila) | NM_001039 179 | up | 0.0007 | ns |
| 10406614     | LOC238771   | similar to Metaxin 1 | AK090249 | down | 0.0007 | 0.006 |
| 10585214     | Cryab       | crystallin, alpha B | NM_009964 | up | 0.0008 | 0.007 |
| 10411532     | Mcce2       | methylcrotonoyl-Coenzyme A carboxylase 2 (beta) | NM_0030026 | down | 0.0008 | 0.02 |
| 10505954     | Tek         | endothelial-specific receptor tyrosine kinase | NM_013600 | down | 0.0008 | ns |
| 10475199     | Snap23      | synaptosomal-associated protein 23 | NM_009222 | down | 0.0008 | ns |
| 10400866     | Trim9       | tripartite motif-containing 9 | NM_053167 | up | 0.0008 | 0.02 |
| 10424968     | Rgs11       | regulator of G-protein signaling 11 | NM_001081 069 | down | 0.0008 | ns |
| 10468802     | D19Rerd737e | DNA segment, Chr 19, ERATO Doi 737, expressed | BC061459 | down | 0.0008 | ns |
| 10429568     | Ly6c1       | lymphocyte antigen 6 complex, locus C1 | NM_0010741 | up | 0.0008 | ns |
| 10438480     | Parl        | presenilin associated, rhomboid-like | NM_001005 767 | down | 0.0008 | 0.04 |
| 10420216     | 2310014G06Rik | RIKEN cDNA 2310014G06 gene | NM_001082 975 | down | 0.0008 | ns |
| 10583732     | Ldr         | low density lipoprotein receptor | NM_0010700 | down | 0.0008 | ns |
| 10358619     | Hmnc1       | hemicentin 1 | NM_001024 720 | down | 0.0008 | ns |
| 10379044     | Rab34       | RAB34, member of RAS oncogene family | NM_033475 | down | 0.0008 | ns |
| 10567725     | Zkscan2     | zinc finger with KRAB and SCAN domains 2 | NM_001081 | down | 0.0008 | 0.001 |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                                                 | Accession   | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|-----------------------------------------------------------------------------------------|-------------|-----------|-------------------|-----------------|
| 10376216     | Slic36a1    | solute carrier family 36 (proton/amino acid symporter), member 1                        | NM_153139   | up        | 0.0008            | 0.03            |
| 10426891     | Mettl7a1    | methyltransferase like 7A1                                                            | NM_027334   | up        | 0.0009            | ns              |
| 10428796     | Fbxo32      | F-box protein 32                                                                        | NM_026346   | down      | 0.0009            | ns              |
| 10585068     | D930028f11Rik | RIKEN cDNA D930028F11 gene                                                                | BC094249    | down      | 0.0009            | 0.02            |
| 10591763     | Zip810      | zinc finger protein 810                                                                  | NM_145612   | down      | 0.0009            | ns              |
| 10478654     | Slic9a8     | solute carrier family 9 (sodium/hydrogen exchanger), member 8                          | NM_148929   | down      | 0.0009            | 0.01            |
| 10497300     | Zfand1      | zinc finger, AN1-type domain 1                                                          | NM_025512   | down      | 0.0009            | 0.009           |
| 10521391     | Ac0x3       | acyl-Coenzyme A oxidase 3, pristanoyl                                                  | NM_030721   | down      | 0.0009            | 0.01            |
| 10508089     | Mrps15      | mitochondrial ribosomal protein S15                                                     | NM_025544   | down      | 0.0009            | ns              |
| 10584674     | Mcam        | melanoma cell adhesion molecule                                                        | NM_023061   | down      | 0.0009            | ns              |
| 10556242     | ---         | snoRNA chromosome:NCBI:M37:7:117166724:117166856:1 gene:ENSMUSG00000064600             | ENSMUST01   | up        | 0.0009            | ns              |
| 10584576     | Hspa5       | heat shock protein 8                                                                    | M13967      | up        | 0.0009            | 0.009           |
| 10517948     | Spen        | SPEN homolog, transcriptional regulator (Drosophila)                                    | NM_019763   | down      | 0.0009            | 0.04            |
| 10504849     | Slix17      | syntaxin 17                                                                             | NM_026343   | down      | 0.0009            | 0.004           |
| 10436941     | Mrps6       | mitochondrial ribosomal protein S6                                                      | NM_080456   | down      | 0.0009            | 0.03            |
| 10556581     | ENSMUSG0000 0073861 | predicted gene, ENSMUSG00000073861                                                      | ENSMUST01   | up        | 0.0009            | ns              |
| 10382271     | Arsg        | arylsulfatase G                                                                        | NM_028710   | down      | 0.0009            | 0.03            |
| 10531179     | Adaml3      | a disintegrin-like and metallopeptidase (reprolysin type) with thrombospondin type 1 motif, 3 | NM_001081 40T | down      | 0.0009            | 0.01            |
| 10472598     | Khl23       | kelch-like 23 (Drosophila)                                                              | NM_177784   | down      | 0.0009            | 0.04            |
| 10456046     | Pdgfrb      | platelet derived growth factor receptor, beta polypeptide                              | NM_008809   | down      | 0.0009            | ns              |
| 10387525     | Mpdud1      | mannose-P-dolichol utilization defect 1                                                 | NM_011900   | down      | 0.001             | ns              |
| 10354816     | Ckl1        | CDC-like kinase 1                                                                       | NM_001042 634 | up        | 0.001             | ns              |
| 10378857     | Coro6       | coronin, actin binding protein 6                                                        | NM_139128   | down      | 0.001             | ns              |
| 10539840     | Myo19       | myosin XIX                                                                             | BC007156    | up        | 0.001             | 0.004           |
| 10584578     | Hspa5       | heat shock protein 8                                                                    | M13967      | up        | 0.001             | 0.008           |
| 10476759     | Rhn2        | Ras and Rab interactor 2                                                                | NM_028724   | up        | 0.001             | ns              |
| 10588506     | Pih1d2      | P11H1 domain containing 2                                                               | NM_028300   | down      | 0.001             | ns              |
| 10503334     | Gsm         | GTP binding protein (gene overexpressed in skeletal muscle)                           | NM_010276   | down      | 0.001             | 0.01            |
| 10419854     | Slic7a8     | solute carrier family 7 (cationic amino acid transporter, y+ system), member 8         | NM_016972   | down      | 0.001             | 0.01            |
| 10562576     | Plecksh1    | pleckstrin homology domain containing, family F (with FYVE domain) member 1           | NM_024413   | up        | 0.001             | ns              |
| 10416251     | Egr3        | early growth response 3                                                                 | NM_018781   | up        | 0.001             | 0.0002          |
| 10375240     | Hspd1       | heat shock protein 1 (chaperonin)                                                       | NM_010477   | up        | 0.001             | ns              |
| 10503023     | Cth         | cystathionase (cystathionine gamma-lyase)                                               | NM_144955   | up        | 0.001             | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|-----------------|
| 10549760     | Zfp580      | zinc finger protein 580   | BC066001  | down      | 0.001            | 0.02            |
| 10520362     | Insig1      | insulin induced gene 1   | NM_153526 | down      | 0.001            | ns              |
| 10376017     | ENSMUSG00000054450 | predicted gene, ENSMUSG00000054450 | ENSMUST00000054450 | up | 0.001 | ns |
| 10478073     | ---         | snoRNA chromosome:NCBI37:2:158203958:158204090:1 gene:ENSMUSG00000058840 | ENSMUST00000058840 | down | 0.001 | ns |
| 10426169     | 1300018J18Rik | RIKEN cDNA 1300018J18 gene | NM_027995 | down | 0.001 | ns |
| 10375880     | Nola2       | nucleolar protein family A, member 2 | NM_026631 | down | 0.001 | ns |
| 10345183     | Cdk10       | cyclin-dependent kinase (CDC2-like) 10 | NM_194446 | down | 0.001 | ns |
| 10363518     | Hexdc       | hexosaminidase (glycosyl hydrolase family 20, catalytic domain) containing | NM_001001333 | down | 0.001 | 0.04 |
| 10593430     | Snf1lk2     | SNF1-like kinase 2        | NM_178710 | up | 0.001 | 0.002 |
| 10410709     | Rfesd       | Rieske (Fe-S) domain containing | NM_178716 | down | 0.001 | ns |
| 10532150     | 2900024C23Rik | RIKEN cDNA 2900024C23 gene | BC116868 | down | 0.001 | ns |
| 10458555     | Spry4       | sprouty homolog 4 (Drosophila) | NM_011898 | up | 0.001 | 0.004 |
| 10438478     | Abcc5       | ATP-binding cassette, sub-family C (CFTR/MRP), member 5 | NM_013790 | up | 0.001 | 0.03 |
| 10569203     | Chid1       | chitinase domain containing 1 | NM_026622 | down | 0.001 | ns |
| 10491780     | Hspa4l      | heat shock protein 4 like | NM_011020 | up | 0.001 | 0.04 |
| 10550833     | Zfp180      | zinc finger protein 180   | NM_001045486 | up | 0.001 | 0.04 |
| 10531185     | Adamts3     | a disintegrin-like and metallopeptidase (reprolysin type) with thrombospondin type 1 motif, 3 | NM_001081401 | down | 0.001 | 0.006 |
| 10420366     | Gjb6        | gap junction protein, beta 6 | NM_001010937 | up | 0.001 | ns |
| 10556381     | Mica2       | microtubule associated monoxygenase, calponin and LIM domain containing 2 | NM_177282 | up | 0.001 | 0.005 |
| 10547100     | Plxnd1      | plexin D1                  | NM_026376 | down | 0.001 | ns |
| 10369290     | Ddit4       | DNA-damage-inducible transcript 4 | NM_029083 | up | 0.001 | ns |
| 10449452     | Fkbp5       | FK506 binding protein 5   | NM_010220 | up | 0.001 | ns |
| 10518957     | Dffb        | DNA fragmentation factor, beta subunit | NM_007859 | down | 0.001 | ns |
| 10455852     | Prcc1       | proline-rich coiled-coil 1 | NM_028447 | down | 0.001 | ns |
| 10599192     | Lonrf3      | LON peptidase N-terminal domain and ring finger 3 | NM_028894 | up | 0.001 | ns |
| 10393334     | Caclybp     | calcyclin binding protein | NM_009786 | up | 0.001 | ns |
| 10494467     | Itgai10     | integrin, alpha 10        | NM_001081053 | up | 0.001 | ns |
| 10450369     | Hspa1a      | heat shock protein 1A      | NM_010479 | up | 0.001 | 0.04 |
| 10560329     | Hif3a       | hypoxia inducible factor 3, alpha subunit | NM_016888 | up | 0.001 | ns |
| 10411287     | Btl3li4     | basic transcription factor 3-like 4 | ENSMUST000000012742 | down | 0.001 | 0.01 |
| 10385203     | Oda2        | odd Oz/ten-m homolog 2 (Drosophila) | NM_011888 | down | 0.001 | ns |
| 10381280     | Tubg2       | tubulin, gamma 2           | NM_134098 | down | 0.001 | ns |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|-----------------|
| 10434108     | Synap1      | synaptic Ras GTPase activating protein 1 homolog (rat) | XM_915205 | down      | 0.001            | ns              |
| 10457963     | Gpr1Z       | G protein-coupled receptor 17 | NM_001025 381 | up        | 0.001            | ns              |
| 10557843     | Fus         | fusion, derived from t(t2;16) malignant liposarcoma (human) | NM_139149 | down      | 0.001            | ns              |
| 10481155     | Roxo4       | REX4, RNA exonuclease 4 homolog (S. cerevisiae) | NM_207234 | up         | 0.001            | ns              |
| 10372844     | Rassf3      | Ras association (RaiGDS/AF-6) domain family member 3 | NM_138956 | down      | 0.001            | ns              |
| 10366939     | Khdcl9      | kelch domain containing 9 | NM_0010933 039 | down     | 0.001            | 0.01            |
| 10558773     | B4galnt4    | beta-1,4-N-acetyl-galactosaminyl transferase 4 | NM_177897 | down      | 0.001            | ns              |
| 10353803     | Uegcl1      | UDP-glucose ceramide glucosyltransferase-like 1 | NM_198889 | up        | 0.001            | 0.03            |
| 10451198     | Vegfa       | vascular endothelial growth factor A | NM_001025 250 | up        | 0.001            | 8.56e-05        |
| 10501235     | Gstm4       | glutathione S-transferase, mu 4 | NM_026764 | down      | 0.002            | ns              |
| 10552622     | 2410002F23Rik | RIKEN cDNA 2410002F23 gene | BC059896 | down      | 0.002            | ns              |
| 10378024     | Mis12       | MIS12 homolog (yeast) | NM_025993 | up         | 0.002            | ns              |
| 10488472     | 2310001A20Rik | RIKEN cDNA 2310001A20 gene | AJ310838 | down      | 0.002            | 0.04            |
| 10528021     | Hspa8       | heat shock protein 8 | NM_031165 | up         | 0.002            | 0.01            |
| 10559420     | Tmc4        | transmembrane channel-like gene family 4 | NM_181820 | up        | 0.002            | ns              |
| 10381361     | Aoc2        | amine oxidase, copper containing 2 (retina-specific) | NM_178932 | up         | 0.002            | ns              |
| 10379615     | Slfn5       | schlafen 5 | NM_183201 | up         | 0.002            | ns              |
| 10376555     | ENSMUSG00000072890 | predicted gene, ENSMUSG00000072890 | AK144909 | up         | 0.002            | ns              |
| 10592830     | Vps11       | vacuolar protein sorting 11 (yeast) | NM_207898 | down      | 0.002            | 0.04            |
| 10450796     | EG667915    | predicted gene, EG667915 | XR_004307 | down      | 0.002            | ns              |
| 10552812     | Ifr3        | interferon regulatory factor 3 | NM_016849 | up         | 0.002            | 0.003           |
| 10597469     | Stt3b       | STT3, subunit of the oligosaccharyltransferase complex, homolog B (S. cerevisiae) | NM_024222 | up         | 0.002            | ns              |
| 10349174     | Serpinb6    | serine (or cysteine) peptidase inhibitor, clade B, member 8 | NM_011459 | up        | 0.002            | ns              |
| 10379968     | Tubd1       | tubulin, delta 1 | NM_010756 | up         | 0.002            | 0.02            |
| 10367154     | Epmt2a      | epilepsy, progressive myoclonic epilepsy, type 2 gene alpha | NM_010146 | down      | 0.002            | ns              |
| 10385790     | Hsp4        | heat shock protein 4 | NM_008300 | up         | 0.002            | ns              |
| 10408490     | Exoc2       | exocyst complex component 2 | NM_025588 | down      | 0.002            | 0.02            |
| 10478615     | Pof1        | PDX1 C-terminal inhibiting factor 1 | NM_146129 | down      | 0.002            | ns              |
| 10400109     | Zfp277      | zinc finger protein 277 | NM_172575 | down      | 0.002            | ns              |
| 10577882     | Hgsnat      | heparan-alpha-glucosaminide N-acetyltansferase | NM_029884 | down      | 0.002            | ns              |
| 10557508     | Doc2a       | double C2, alpha | NM_010069 | down      | 0.002            | ns              |
| 10451955     | Sema6b      | sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaphorin) 6B | NM_013662 | down      | 0.002            | ns              |
| 10451974     | Sema6b      | sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaphorin) 6B | NM_013662 | down      | 0.002            | ns              |
| 10556076     | Olfml1      | olfactomedin-like 1 | NM_172907 | down      | 0.002            | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                                                 | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|------------------------------------------------------------------------------------------|-----------|-----------|------------------|------------------|
| 10554269     | Abhd2       | Abhydrolase domain containing 2                                                          | NM_018811 | down      | 0.002            | ns               |
| 10378545     | ---         | MI0000696 Mus musculus miR-212 stem-loop                                                | ---       | up        | 0.002            | 0.009            |
| 10362394     | Hddc2       | HD domain containing 2                                                                  | NM_027168 | down      | 0.002            | 0.04             |
| 10515335     | C530005A16Rik| RIKEN cDNA C530005A16 gene                                                               | AR039789  | down      | 0.002            | ns               |
| 10351769     | Igsf8       | immunoglobulin superfamily, member 8                                                    | NM_080419 | down      | 0.002            | ns               |
| 10531911     | Adamts3     | a disintegrin-like and metalloproteinase (reprolysin type) with thrombospondin type 1 motif, 3 | NM_001081 401 | down | 0.002 | 0.01 |
| 10505132     | Akap2       | A kinase (PRKA) anchor protein 2                                                         | NM_001035 533 | down | 0.002 | ns |
| 10516529     | Adc         | arginine decarboxylase                                                                   | NM_172875 | down      | 0.002            | ns               |
| 10489723     | Prkcb1      | protein kinase C binding protein 1                                                        | NM_027230 | up         | 0.002            | 0.03             |
| 10551989     | Tmem149     | transmembrane protein 149                                                                | NM_145580 | up         | 0.002            | 0.02             |
| 10468639     | Dcol1a      | DNA cross-link repair 1A, PSO2 homolog (S. cerevisiae)                                    | NM_018831 | down      | 0.002            | ns               |
| 10509838     | Padi2       | peptidyl arginine deiminase, type I                                                     | NM_008812 | down      | 0.002            | 0.01             |
| 10460221     | Chka        | choline kinase alpha                                                                     | NM_013490 | up         | 0.002            | ns               |
| 10487871     | Cenpb       | centromere protein B                                                                     | NM_007682 | down      | 0.002            | ns               |
| 10382376     | Ttyh2       | tweety homolog 2 (Drosophila)                                                            | NM_053273 | down      | 0.002            | ns               |
| 10455588     | Hspx1       | heat shock protein 1 (chaperonin 10)                                                    | ENSMUST0 0000057242 | up | 0.002 | ns |
| 10382010     | Wdr68       | WD repeat domain 68                                                                     | NM_027946 | down      | 0.002            | 0.02             |
| 10529937     | Kcnip4      | Kv channel interacting protein 4                                                         | NM_030265 | down      | 0.002            | 0.01             |
| 10534694     | Ars2        | arsenate resistance protein 2                                                            | NM_031405 | up         | 0.002            | 0.09             |
| 10399208     | Tmem196     | transmembrane protein 196                                                                | ENSMUST0 0000058644 | down | 0.002 | 0.009 |
| 10474619     | Fmn1        | formin 1                                                                                | NM_010230 | down      | 0.002            | ns               |
| 10565016     | Iqgap1      | IQ motif containing GTPase activating protein 1                                           | NM_016721 | up         | 0.002            | ns               |
| 10371591     | 4930547N16Rik| RIKEN cDNA 4930547N16 gene                                                               | NM_029249 | down      | 0.002            | ns               |
| 10476252     | Cdc25b      | cell division cycle 25 homolog B (S. pombe)                                             | NM_023117 | down      | 0.002            | ns               |
| 10462363     | Jak2        | Janus kinase 2                                                                           | NM_008413 | up         | 0.002            | ns               |
| 10409278     | Nfil3       | nuclear factor, interleukin 3, regulated                                                | NM_017373 | up         | 0.002            | 0.005            |
| 10568897     | Tubbcp2     | tubulin, gamma complex associated protein 2                                              | NM_133755 | down      | 0.002            | ns               |
| 10458843     | Semat6a     | sema domain, transmembrane domain (TM), and cytoplasmal domain, (semaphorin) 6A         | NM_018744 | down      | 0.002            | ns               |
| 10491486     | Atp11b      | ATPase, class VI, type 11B                                                                | NM_029570 | down      | 0.002            | 0.001            |
| 10376004     | Gdf9        | growth differentiation factor 9                                                          | NM_008110 | up         | 0.002            | ns               |
| 10461115     | Sic22a8     | solute carrier family 22 (organic anion transporter), member 8                           | NM_031194 | down      | 0.002            | ns               |
| 10407993     | Fus1p       | FUS interacting protein (serine-arginine rich) 1                                         | NM_001080 387 | up | 0.002 | ns |
| 10449061     | Rbhd1       | rhomboid, veinlet-like 1 (Drosophila)                                                   | NM_144816 | down      | 0.002            | ns               |
| 10544148     | Jhdm1d      | jumonji C domain-containing histone demethylase 1 homolog D (S. cerevisiae)              | NM_001033 430 | up | 0.002 | ns |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|---------------|-------------|--------------------------|-----------|-----------|------------------|-----------------|
| 10498620      | Trm59       | tripartite motif-containing 59 | NM_025883 | down      | 0.002            | ns              |
| 10457665      | 492153312Rik | Riken cDNA 492153312 gene | AK076809  | up        | 0.002            | ns              |
| 10406817      | Enc1        | ectodermal-neural cortex 1 | NM_007930 | up        | 0.002            | 0.009           |
| 10363333      | Sh3fl3      | SH3 domain containing ring finger 3 | NM_172788 | up        | 0.002            | ns              |
| 10424062      | A930017M01Rik | Riken cDNA A930017M01 gene | XR_035330 | down      | 0.002            | 0.01            |
| 10361270      | Cd46        | CD46 antigen, complement regulatory protein | NM_010778 | down      | 0.002            | 0.03            |
| 10482766      | Rpml        | reprimol, TP53 dependent G2 arrest mediator candidate | NM_023396 | down      | 0.002            | ns              |
| 10420372      | Cry1        | crystallin, lambda 1 | NM_030004 | down      | 0.002            | ns              |
| 10556246      | Zfp143      | zinc finger protein 143 | NM_009281 | up        | 0.002            | ns              |
| 10526559      | Ache        | acetylcholinesterase | NM_009599 | down      | 0.002            | ns              |
| 10543466      | Gpr37       | G protein-coupled receptor 37 | NM_010338 | down      | 0.002            | ns              |
| 10385004      | Mare        | alpha globin regulatory element containing gene | NM_181569 | down      | 0.002            | ns              |
| 10388936      | Wsb1        | WD repeat and SOCS box-containing 1 | NM_019653 | down      | 0.002            | ns              |
| 10451932      | S3-12       | plasma membrane associated protein, S3-12 | NM_020568 | up        | 0.002            | ns              |
| 10346303      | Hape1       | heat shock protein 1 (chaperonin 10) | NM_008303 | up        | 0.002            | ns              |
| 10451650      | Nfya        | nuclear transcription factor-Y alpha | NM_001110 | up        | 0.002            | ns              |
| 10531645      | Hnrpol      | heterogeneous nuclear ribonucleoprotein D-like | NM_016690 | down      | 0.002            | ns              |
| 10344817      | Capp1       | centrosome and spindle pole associated protein 1 | NM_026493 | down      | 0.002            | 0.001           |
| 10565775      | Dgat2       | diacylglycerol O-acetyltransferase 2 | NM_026384 | down      | 0.002            | ns              |
| 10495945      | 4930422G04Rik | Riken cDNA 4930422G04 gene | BC030185  | down      | 0.002            | ns              |
| 10504375      | Npr2        | natriuretic peptide receptor 2 | NM_117388 | down      | 0.003            | ns              |
| 10533026      | Prkab1      | protein kinase, AMP-activated, beta 1 non-catalytic subunit | NM_001899 | down      | 0.003            | ns              |
| 10496852      | Guac1a3     | guanylate cyclase 1, soluble, alpha 3 | NM_018695 | down      | 0.003            | 0.02            |
| 10476291      | Sfrs6       | splicing factor, arginine/serine-rich 6 | NM_026499 | up        | 0.003            | ns              |
| 10492774      | Dchs2       | dachsous (Drosophila) | ENSMUST0000016329 | down | 0.003            | 0.004           |
| 10588326      | Nphp3       | nephronphthisis 3 (adolescent) | NM_028721 | down      | 0.003            | ns              |
| 10472630      | Ubr3        | ubiquitin protein ligase E3 component n-recognin 3 | NM_001061 | down      | 0.003            | 0.01            |
| 10499438      | Mstol       | misato homolog 1 (Drosophila) | NM_144898 | down      | 0.003            | ns              |
| 1018604       | Pht7        | PHD finger protein 7 | NM_027949 | down      | 0.003            | ns              |
| 10450845      | Mog         | myelin oligodendrocyte glycoprotein | NM_010814 | down      | 0.003            | ns              |
| 10581036      | Tk2         | thymidine kinase 2, mitochondrial | NM_021028 | down      | 0.003            | ns              |
| 10404885      | Gmpr        | guanosine monophosphate reductase | NM_025508 | down      | 0.003            | ns              |
| 10552656      | Syl3        | synaptotagmin III | NM_016683 | down      | 0.003            | ns              |
| 10399337      | Kii29       | kelch-like 29 (Drosophila) | BC145748  | up         | 0.003            | 0.03            |
| 10386636      | Usp22       | ubiquitin specific peptidase 22 | NM_001004 | down      | 0.003            | ns              |
| 10369704      | Hnrnp3      | heterogeneous nuclear ribonucleoprotein H3 | NM_001079 | up        | 0.003            | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|------------------|
| 10408755     | Muted       | muted                    | NM_139063 | down      | 0.003            | ns               |
| 10485282     | Alkbh3      | alkb, alkylation repair homolog 3 (E. coli) | NM_026944 | down      | 0.003            | ns               |
| 10543737     | Cogp2       | coatomer protein complex, subunit gamma 2 | NM_017478 | down      | 0.003            | 0.04             |
| 10345203     | Paox        | polyamine oxidase (exo-N4-amino) | NM_153763 | down      | 0.003            | ns               |
| 10397651     | Spata7      | spermatogenesis associated 7 | NM_178914 | down      | 0.003            | ns               |
| 10547469     | Hsn2        | hereditary sensory neuropathy, type II | NM_001037 | down      | 0.003            | 0.05             |
| 10357814     | Zc3h11a     | zinc finger CCCH type containing 11A | NM_144530 | up        | 0.003            | ns               |
| 10579341     | BC051227    | cDNA sequence BC051227 | BC051227  | down      | 0.003            | ns               |
| 10455092     | Pcdhb12     | protocadherin beta 12 | NM_053137 | down      | 0.003            | 0.01             |
| 10502823     | Dnajb4      | Dnaj (Hsp40) homolog, subfamily B, member 4 | NM_025926 | up        | 0.003            | ns               |
| 10528102     | Crot        | carnitine O-octanoyltransferase | NM_023733 | up        | 0.003            | ns               |
| 10575598     | Znrf1       | zinc and ring finger 1 | NM_133206 | up        | 0.003            | 0.01             |
| 10561673     | Sprd3       | sprouty-related, EVH1 domain containing 3 | NM_182927 | up        | 0.003            | 0.0009           |
| 10386455     | Rass1       | RAS, dexamethasone-induced 1 | NM_009026 | up        | 0.003            | 0.04             |
| 10431463     | 1700027J05Rik | RIKEN cDNA 1700027J05 gene | NM_027061 | down      | 0.003            | ns               |
| 10347697     | Scl4a3      | solute carrier family 4 (anion exchanger), member 3 | NM_009208 | down      | 0.003            | ns               |
| 10436282     | Impg2       | interphotoreceptor matrix proteoglycan 2 | NM_174876 | up        | 0.003            | ns               |
| 10385239     | Mat2b       | methionine adenosyltransferase II, beta | NM_134017 | down      | 0.003            | ns               |
| 10347781     | 9430031J16Rik | RIKEN cDNA 9430031J16 gene | BC082310 | down      | 0.003            | ns               |
| 10359582     | Fmo2        | flavin containing monoxygenase 2 | NM_018881 | up        | 0.004            | ns               |
| 10410477     | Adamt16     | a disintegrin-like and metalloproteinase (reprolysin type) with thrombospondin type 1 motif, 16 | NM_172053 | down      | 0.004            | ns               |
| 10598138     | Sry3        | sprouty homolog 3 (Drosophila) | NM_001030 | up        | 0.004            | ns               |
| 10549615     | Leng8       | leukocyte receptor cluster (LRC) member 8 | NM_172736 | down      | 0.004            | ns               |
| 10535732     | Gpr12       | G-protein coupled receptor 12 | NM_001010 | down      | 0.004            | ns               |
| 10434880     | Hrasls *    | HRAS-like suppressor | NM_013751 | down      | 0.004            | ns               |
| 10475341     | Iti52       | intraflagellar transport 52 homolog (Chlamydomonas) | NM_172150 | down      | 0.004            | ns               |
| 10579508     | Ano8        | anoctamin 8 | AK173222 | down      | 0.004            | ns               |
| 10590389     | Nktr        | natural killer tumor recognition sequence | NM_010918 | up        | 0.004            | ns               |
| 10350733     | Rgs16       | regulator of G-protein signaling 16 | NM_011267 | up        | 0.004            | ns               |
| 10576258     | Cdk10       | cyclin-dependent kinase (CDC2-like) 10 | NM_194446 | down      | 0.004            | ns               |
| 10586110     | Cin6        | ceroid-lipofuscinosis, neuronal 6 | NM_001033 | down      | 0.004            | 0.01             |
| 10361007     | Smyd2       | SET and MYND domain containing 2 | NM_026796 | down      | 0.004            | ns               |
| 10468990     | Farn        | preselin associated, rhomboid-like | NM_001005 | down      | 0.004            | 0.0005           |
| 10561212     | Ltbp4       | latent transforming growth factor beta binding protein 4 | NM_175641 | down      | 0.004            | ns               |
| 10492396     | Vmn2r1      | vomenosantal 2, receptor 1 | NM_019918 | down      | 0.004            | ns               |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|-------------------|------------------|
| 10383289     | Balap2      | brain-specific angiogenesis inhibitor 1-associated protein 2 | NM_130862 | up        | 0.004             | 0.008            |
| 10411882     | Nln         | neurolysin (metalloprotease M3 family) | NM_029447 | down      | 0.004             | ns               |
| 10401900     | Sel1        | sel-1 suppressor of lin-12-like (C. elegans) | NM_001039 089 | up        | 0.004             | 0.04             |
| 10381539     | G6pc3       | glucose 6 phosphatase, catalytic, 3 | NM_175935 | down      | 0.004             | ns               |
| 10415052     | Mmp14       | matrix metalloprotease 14 (membrane-inserted) | NM_008608 | down      | 0.004             | ns               |
| 10601099     | Med12       | mediator of RNA polymerase II transcription, subunit 12 homolog (yeast) | NM_021521 | down      | 0.004             | ns               |
| 10374590     | Xpo1        | exportin 1, CRM1 homolog (yeast) | NM_134014 | up         | 0.004             | ns               |
| 10448459     | Tbc1d24     | TBC1 domain family, member 24 | NM_173186 | down      | 0.004             | ns               |
| 10583586     | SliC4a2     | solute carrier family 44, member 2 | NM_152808 | down      | 0.004             | ns               |
| 10384672     | Ahsa2       | AHA1, activator of heat shock protein ATPase homolog 2 (yeast) | NM_172391 | up         | 0.004             | ns               |
| 10504918     | Zfpl189     | zinc finger protein 189 | NM_145547 | up         | 0.004             | ns               |
| 10547610     | Ddx3x       | DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide 3, X-linked | BC063059 | down      | 0.004             | ns               |
| 10429329     | Eff2c2      | euarkyotic translation initiation factor 2C, 2 | NM_155178 | up         | 0.004             | ns               |
| 10531173     | Adams3      | a disintegrin-like and metallopeptase (reprolysin type) with thrombospondin type 1 motif, 3 | NM_001081 401 | down      | 0.004             | ns               |
| 10590245     | SliC25a38   | solute carrier family 25, member 38 | NM_144793 | up         | 0.004             | 0.01             |
| 10479884     | OTTMUSG0000 0010878 | predicted gene, OTTMUSG00000010878 | ENSMUST0 0000007106 | up | 0.004 | 0.04 |
| 10478075     | ---         | snoRNA chromosome:NCBI37:2:158205270: 158205402:1 gene:ENSMUSG0000004585 | ENSMUST0 0000002651 | down | 0.004 | 0.03 |
| 10444936     | Dhx16       | DEAD (Asp-Glu-Ala-Asp) box polypeptide 16 | NM_026987 | up         | 0.004             | 0.02             |
| 10522160     | N4bp2       | NEDD4 binding protein 2 | NM_001024 917 | up | 0.004 | ns |
| 10548735     | Dusp16      | dual specificity phosphatase 16 | NM_130447 | down      | 0.004             | ns               |
| 10495621     | ---         | MII000163 Mus musculus miR-137 stem-loop | --- | down | 0.004 | ns |
| 10441280     | Prdm15      | PR domain containing 15 | BC046433 | up | 0.004 | 0.002 |
| 10525718     | Arl6ip4     | ADP-ribosylation factor-like 6 interacting protein 4 | NM_144509 | down | 0.005 | ns |
| 10363563     | SliC25a16   | solute carrier family 25 (mitochondrial carrier, Graves disease autoantigen), member 16 | NM_175194 | down | 0.005 | ns |
| 10489484     | Sdc4        | syndecan 4 | NM_011821 | up | 0.005 | ns |
| 10529385     | Zfyve28     | zinc finger, FYVE domain containing 28 | NM_001015 039 | down | 0.005 | ns |
| 10530029     | Lgi2        | leucine-rich repeat LGI family, member 2 | NM_144945 | down | 0.005 | ns |
| 10386394     | BC050078    | cDNA sequence BC050078 | BC050078 | down | 0.005 | ns |
| 10517741     | 181001TOTORik | RIKEN cDNA 181001010T gene | NM_002931 | up | 0.005 | ns |
| 10522250     | Tmem33      | transmembrane protein 33 | NM_028975 | up | 0.005 | ns |
| 10517744     | Arhgef10il  | Rho guanine nucleotide exchange factor (GEF) 10-like | NM_172415 | down | 0.005 | ns |
| 10427816     | Pdzd2       | PDZ domain containing 2 | NM_001081 | up | 0.005 | ns |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|----------------------------|-----------|-----------|-----------------|----------------|
| 10512915     | 2810432L12Rik | RIKEN cDNA 2810432L12 gene | BC013800  | down      | 0.005           | ns             |
| 10594426     | Zwilch      | Zwilch, kinetochore associated, homolog (Drosophila) | NM_026507 | down      | 0.005           | 0.01           |
| 10601360     | Atp7a       | ATPase, Cu++ transporting, alpha polypeptide | NM_001109757 | up        | 0.005           | ns             |
| 10497417     | Crt         | corticotropin releasing hormone | NM_205769 | up        | 0.005           | ns             |
| 10571657     | Acsf1       | acyl-CoA synthetase long-chain family member 1 | NM_007981 | down      | 0.005           | ns             |
| 10564978     | Bim         | Bloom syndrome homolog (human) | NM_007550 | down      | 0.005           | ns             |
| 10490097     | Cbmn4       | cerebellin 4 precursor protein | NM_175631 | up        | 0.005           | 0.02           |
| 10607606     | Ofd1        | oral-facial-digital syndrome 1 gene homolog (human) | NM_177429 | down      | 0.005           | 0.03           |
| 10521331     | A930005i04Rik | RIKEN cDNA A930005i04 gene | BC116929  | up        | 0.005           | 0.02           |
| 10585874     | Hexa        | hexosaminidase A | NM_010421 | up        | 0.005           | ns             |
| 10571274     | Gsr         | glutathione reductase | NM_010344 | down      | 0.005           | ns             |
| 10527332     | Nptx2       | neuronal pentraxin 2 | NM_016789 | up        | 0.005           | 0.006          |
| 10416279     | Lgi3        | leucine-rich repeat LGI family, member 3 | NM_145219 | down      | 0.005           | ns             |
| 10597564     | Cmc1        | COX assembly mitochondrial protein homolog (S. cerevisiae) | ENSMUST0000044220 | down | 0.005          | ns             |
| 10392464     | BC029169    | cDNA sequence BC029169 | BC029169  | up        | 0.005           | ns             |
| 10520154     | Abcb8       | ATP-binding cassette, sub-family B (MDR/TAP), member 8 | NM_029020 | down      | 0.005           | ns             |
| 10545629     | Htra2       | Htra serine peptidase 2 | NM_019752 | down      | 0.005           | ns             |
| 10594645     | Rab8b       | RAB8B, member RAS oncogene family | NM_173413 | up        | 0.005           | ns             |
| 10584634     | Usp2        | ubiquitin specific peptidase 2 | NM_198092 | down      | 0.005           | 0.04           |
| 10395376     | Ankmy2      | ankyrin repeat and MYND domain containing 2 | NM_146033 | down      | 0.005           | ns             |
| 10372264     | Nav3        | neuron navigator 3 | NM_001081035 | down | 0.005          | 0.01           |
| 10388520     | Glod4       | glyoxalase domain containing 4 | NM_026029 | down      | 0.005           | ns             |
| 10478897     | Pttn1       | protein tyrosine phosphatase, non-receptor type 1 | NM_011201 | up        | 0.005           | 0.03           |
| 10569134     | Defa1       | defomed epidermal autoregulatory factor 1 (Drosophila) | NM_016874 | down      | 0.005           | ns             |
| 10468329     | Obfc1       | oligonucleotide/oligosaccharide-binding fold containing 1 | NM_175630 | down      | 0.005           | ns             |
| 10582429     | Cbfa2f3     | core-binding factor, runt domain, alpha subunit 2, translocated to, 3 (human) | NM_009824 | up        | 0.005           | 0.005          |
| 10522303     | Guf1        | GUF1 GTPase homolog (S. cerevisiae) | NM_172711 | down      | 0.005           | ns             |
| 10568948     | Spm         | shadow of prion protein | NM_183147 | down      | 0.005           | ns             |
| 10561004     | Erf         | Ets2 repressor factor | NM_010155 | down      | 0.005           | ns             |
| 10531166     | Adams3      | a disintegrin-like and metallopeptidase (reprolysin type) with thrombospondin type 1 motif, 3 | NM_001081401 | down | 0.005          | 0.02           |
| 10393620     | Cbx4        | chromobox homolog 4 (Drosophila Pc class) | NM_007625 | down      | 0.005           | ns             |
| 10559825     | 2810409K11Rik | RIKEN cDNA 2810409K11 gene | BC117497  | up        | 0.005           | ns             |
| 10578109     | Ubxn8       | UBX domain protein 8 | NM_178648 | down      | 0.005           | ns             |
| 10596053     | Pccb        | propionyl Coenzyme A carboxylase, beta polypeptide | NM_025835 | down      | 0.005           | ns             |
| 10453867     | Rbbp8       | retinoblastoma binding protein 8 | NM_001081 | down      | 0.005           | ns             |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                                                 | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------------------------------------------------------------------------|-----------|-----------|------------------|-----------------|
| 10584862     | Scn4b       | sodium channel, type IV, beta                                                            | NM_001013 | down      | 0.005            | ns              |
| 10521626     | Ccd2a       | coiled-coil and C2 domain containing 2A                                                   | NM_172274 | down      | 0.005            | ns              |
| 10507418     | Elf2b3      | eukaryotic translation initiation factor 2B, subunit 3                                   | NM_001117 | down      | 0.006            | ns              |
| 10860034     | Gm1141      | gene model 1141, (NCBI)                                                                  | ENSMUST10 | up        | 0.006            | ns              |
| 10378902     | Nup9p2      | nuclear fragile X mental retardation protein interacting protein 2                       | NM_001024 | up        | 0.006            | ns              |
| 10460359     | Coro1b      | coronin, actin binding protein 1B                                                         | NM_011778 | down      | 0.006            | ns              |
| 10416640     | Mtrf1       | mitochondrial translational release factor 1                                              | NM_145960 | down      | 0.006            | ns              |
| 10377790     | Slc16a11    | solute carrier family 16 (monocarboxylic acid transporters), member 11                   | NM_153081 | down      | 0.006            | ns              |
| 10549552     | Prpf31      | PRP31 pre-mRNA processing factor 31 homolog (yeast)                                      | NM_027328 | down      | 0.006            | ns              |
| 10589413     | Nme6        | non-metastatic cells 6, protein expressed in (nucleoside-diphosphate kinase)             | NM_018757 | down      | 0.006            | ns              |
| 10487945     | Pre4        | preimplantation protein 4                                                                | NM_028802 | down      | 0.006            | 0.01            |
| 10424349     | Sque        | squalene epoxidase                                                                        | NM_009270 | down      | 0.006            | ns              |
| 10344713     | Aqcy        | S-adenosylhomocysteine hydrolase                                                          | L32836    | down      | 0.006            | ns              |
| 10558057     | Brwd2       | bromodomain and WD repeat domain containing 2                                             | NM_172255 | down      | 0.006            | 0.03            |
| 10479833     | Optn        | optineurin                                                                                | NM_181848 | down      | 0.006            | ns              |
| 10860492     | BC023829    | cDNA sequence BC023829                                                                   | NM_001033 | up        | 0.006            | ns              |
| 10514000     | Mpdz       | multiple PDZ domain protein                                                               | NM_010820 | up        | 0.006            | ns              |
| 10430384     | Naga        | N-acetyl galactosaminidase, alpha                                                          | NM_008669 | down      | 0.006            | ns              |
| 10436830     | Ifnar2      | interferon (alpha and beta) receptor 2                                                    | NM_010506 | down      | 0.006            | ns              |
| 10513608     | Atd        | aminolevulinate, delta-, dehydratase                                                      | NM_008525 | down      | 0.006            | ns              |
| 10397507     | Gsta1       | glutathione transferase zeta 1 (maleylacetoacetate isomerase)                            | NM_010363 | down      | 0.006            | ns              |
| 10364194     | Lss        | lanosterol synthase                                                                       | NM_146006 | down      | 0.006            | 0.03            |
| 10368025     | Hspa8       | heat shock protein 8                                                                      | NM_031165 | up        | 0.006            | 0.04            |
| 10479026     | Rae1        | RAE1 RNA export 1 homolog (S. pombe)                                                      | NM_175112 | down      | 0.006            | ns              |
| 10595298     | Filip1      | filamin A interacting protein 1                                                          | NM_001081 | down      | 0.006            | ns              |
| 10508490     | Sf55        | splicing factor, arginine/serine-rich 5 (SRp40, HRS)                                     | NM_001079 | down      | 0.006            | 0.005           |
| 10448016     | Tcte3       | t-complex-associated testis expressed 3                                                  | NM_011560 | down      | 0.006            | ns              |
| 10425207     | H1f0        | H1 histone family, member 0                                                               | NM_008197 | down      | 0.006            | ns              |
| 10578763     | Sap30       | sin3 associated polypeptide                                                               | NM_021788 | up        | 0.006            | ns              |
| 10460468     | Ctst        | cathepsin F                                                                               | NM_019861 | down      | 0.006            | ns              |
| 10487906     | Slc23a2     | solute carrier family 23 (nucleobase transporters), member 2                              | NM_018824 | down      | 0.006            | 0.04            |
| 10448559     | ---         | ---                                                                                       | ENSMUST10 | up        | 0.006            | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                      | Accession   | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|----------------------------------------------------------------|-------------|-----------|-------------------|-----------------|
| 10354374     | Slec40a1    | solute carrier family 40 (iron-regulated transporter), member 1 | NM_016917   | down      | 0.006             | ns              |
| 10414522     | Apex1       | apurinic/apyrimidinic endonuclease 1                           | NM_009887   | down      | 0.006             | ns              |
| 10483081     | Fap         | fibroblast activation protein                                  | NM_007986   | down      | 0.006             | ns              |
| 10528120     | Dmtf1       | cyclin D binding myb-like transcription factor 1               | NM_011806   | up         | 0.007             | ns              |
| 10580870     | Zfp319      | zinc finger protein 319                                       | ENSMUST0_000088479 | up         | 0.007             | ns              |
| 10430711     | Slec25a17   | solute carrier family 25 (mitochondrial carrier, peroxisomal membrane protein), member 17 | NM_011399 | down      | 0.007             | ns              |
| 10577388     | ---         | cdna:Genscan supercontig:NCBI37:NT_166309:110939:130509:-1     | GENSCAN0_000018646 | down      | 0.007             | 0.02            |
| 10394690     | E2f6        | E2F transcription factor 6                                      | NM_033270   | up         | 0.007             | ns              |
| 10473125     | Itga4       | integrin alpha 4                                              | NM_010576   | down      | 0.007             | 0.02            |
| 10394331     | Pfn4        | profilin family, member 4                                      | NM_028376   | down      | 0.007             | 0.007           |
| 10597095     | 3000002C10Rk | RIKEN cDNA 3000002C10 gene                                     | BCG06210    | down      | 0.007             | 0.03            |
| 10378453     | 130000110Rk | RIKEN cDNA 1300001101 gene                                     | BCG07257    | down      | 0.007             | ns              |
| 10405211     | Gad45g      | growth arrest and DNA-damage-inducible 45 gamma               | NM_011817   | up         | 0.007             | ns              |
| 10404595     | Ppp1r3g     | protein phosphatase 1, regulatory (inhibitor) subunit 3G       | XM_127272   | up         | 0.007             | ns              |
| 10518408     | Pld1        | procollagen-lysine, 2-oxoglutarate 5-dioxygenase 1            | NM_011122   | up         | 0.007             | ns              |
| 10354432     | Myo1b       | myosin IB                                                     | NM_010863   | down      | 0.007             | 0.008           |
| 10483809     | Nfe212      | nuclear factor, erythroid derived 2, like 2                   | NM_010902   | up         | 0.007             | ns              |
| 10534444     | 4930565B19Rk | RIKEN cDNA 4930565B19 gene                                    | ENSMUST0_000010746 | up         | 0.007             | ns              |
| 10360843     | Lars2       | isoleucine-tRNA synthetase 2, mitochondrial                  | NM_198653   | down      | 0.007             | ns              |
| 10575867     | Mlycd       | malonyl-CoA decarboxylase                                       | NM_019966   | up         | 0.007             | 0.005           |
| 10547087     | Herpud1     | homocysteine-inducible, endoplasmic reticulum stress-inducible, ubiquitin-like domain member 1 | NM_022331 | up         | 0.007             | 0.04            |
| 10562152     | Mag         | myelin-associated glycoprotein                                 | NM_010758   | down      | 0.007             | ns              |
| 10344807     | Csp1        | centrosome and spindle pole associated protein 1              | NM_026493   | up         | 0.007             | ns              |
| 10416533     | Ccdc122     | coiled-coil domain containing 122                            | NM_175369   | down      | 0.007             | ns              |
| 10386473     | Srebf1      | sterol regulatory element binding transcription factor 1     | NM_011480   | down      | 0.007             | ns              |
| 10521990     | Facd2       | transforming, acidic coiled-coil containing protein 3         | NM_001040_435 | down      | 0.007             | ns              |
| 10582477     | Spata2L     | spermatogenesis associated 2-like                             | NM_030176   | up         | 0.007             | 0.01            |
| 10378848     | Hsp90aa1-1  | heat shock protein 90, alpha (cytosolic), class A member 1    | NM_010480   | up         | 0.007             | ns              |
| 10578071     | Wnm         | Werner syndrome homolog (human)                               | NM_011721   | down      | 0.007             | 0.01            |
| 10540028     | Kif15       | Kruppel-like factor 15                                         | NM_023184   | up         | 0.007             | ns              |
| 10355205     | D630023F18Rk | RIKEN cDNA D630023F18 gene                                    | BC137870    | down      | 0.007             | 0.02            |
| 10498367     | P2ry13      | purinergic receptor P2Y, G-protein coupled 13                 | NM_028808   | down      | 0.007             | ns              |
| 10354598     | Hecw2       | HECT, C2 and WW domain containing E3 ubiquitin protein ligase 2 | NM_010001_883 | down      | 0.007             | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|-----------------|
| 10505213      | E130308A19Rik | RIKEN cDNA E130308A19 gene | NM_153158 | up        | 0.007            | ns              |
| 10388067      | Sept4       | septin 4                 | NM_011129 | down      | 0.007            | ns              |
| 10587627      | Cyb5r4      | cytochrome b5 reductase 4 | NM_024195 | up         | 0.007            | ns              |
| 10545897      | Dusp11      | dual specificity phosphatase 11 (RNA/RNP complex 1-interacting) | NM_028099 | up         | 0.007            | 0.01            |
| 10542872      | Rps4y2      | ribosomal protein S4, Y-linked 2 | NR_003634 | down      | 0.007            | ns              |
| 10423745      | Spag1       | sperm associated antigen 1 | NM_012031 | up         | 0.007            | ns              |
| 10519354      | Pex1        | peroxisome biogenesis factor 1 | NM_021777 | up         | 0.007            | ns              |
| 10432439      | Fmr1l3      | formin-like 3             | NM_017111 | down      | 0.008            | ns              |
| 10516348      | Eif2c3      | eukaryotic translation initiation factor 2C, 3 | NM_153102 | up         | 0.008            | ns              |
| 10402615      | Hsp90aa1    | heat shock protein 90, alpha (cytosolic), class A member 1 | NM_010480 | up         | 0.008            | ns              |
| 10360912      | EG677785    | predicted gene, EG677785  | XR_032381 | down      | 0.008            | ns              |
| 10556413      | Micalcl     | MICAL C-terminal like     | AB359922 | up         | 0.008            | ns              |
| 10401063      | Zbtb25      | zinc finger and BTB domain containing 25 | NM_028836 | down      | 0.008            | ns              |
| 10557035      | Polr3e      | polymerase (RNA) III (DNA directed) polypeptide E | NM_025928 | down      | 0.008            | ns              |
| 10508115      | Stk40       | serine/threonine kinase 40 | NM_028800 | up         | 0.008            | 0.04            |
| 10591781      | Anlin       | anillin, actin binding protein | NM_028390 | up         | 0.008            | ns              |
| 10416541      | Enox1       | ecto-NOX disulfide-thiol exchanger 1 | NM_172813 | up         | 0.008            | ns              |
| 10444431      | Pnt1        | proline-rich transmembrane protein 1 | NM_030890 | up         | 0.008            | 0.004           |
| 10603387      | Hdac6       | histone deacetylase 6     | NM_010413 | down      | 0.008            | ns              |
| 10378558      | MIO0000570  | Mus musculus mir-22 stem-loop | ---       | down      | 0.008            | ns              |
| 10408557      | Serpinb1a   | serine (or cysteine) peptidase inhibitor, clade B, member 1a | NM_025429 | down      | 0.008            | ns              |
| 10548105      | Cnd2        | cyclin D2                 | NM_009829 | up         | 0.008            | ns              |
| 10362201      | Ctgf        | connective tissue growth factor | NM_010217 | up         | 0.008            | ns              |
| 10374340      | Wdr92       | WD repeat domain 92       | NM_178909 | up         | 0.008            | ns              |
| 10449163      | Plgq        | phosphatidylinositol glycan anchor biosynthesis, class Q | NM_011822 | down      | 0.008            | ns              |
| 10434934      | Bdh1        | 3-hydroxybutyrate dehydrogenase, type 1 | NM_175177 | down      | 0.008            | ns              |
| 10596900      | Tcta        | T-cell leukemia translocation altered gene | NM_153586 | down      | 0.008            | ns              |
| 10480971      | Snapc4      | small nuclear RNA activating complex, polypeptide 4 | NM_172339 | down      | 0.008            | ns              |
| 10495416      | Vav3        | vav 3 oncogene            | NM_020905 | up         | 0.008            | ns              |
| 10602925      | Phka2       | phosphorylase kinase alpha 2 | NM_172783 | down      | 0.008            | ns              |
| 10419261      | Bmp4        | bone morphogenetic protein 4 | NM_007554 | up         | 0.008            | ns              |
| 10461191      | Nxt1        | nuclear RNA export factor 1 homolog (S. cerevisiae) | NM_016813 | up         | 0.008            | ns              |
| 10503995      | DnaJ1       | DnaJ (Hsp40) homolog, subfamily A, member 1 | NM_008298 | up         | 0.008            | ns              |
| 10603206      | BC022960    | cDNA sequence BC022960    | ENSMUST0 0000052929 | down | 0.008            | ns              |
| 10471154      | Ass1        | argininosuccinate synthetase 1 | NM_007494 | down      | 0.008            | ns              |
| 10406434      | Mef2c       | myocyte enhancer factor 2C | NM_025828 | down      | 0.008            | 0.04            |
| 10591537      | Tmed1       | transmembrane emp24 domain containing 1 | NM_010744 | down      | 0.008            | ns              |
| 10547200      | Hitm2b1     | heterogeneous nuclear ribonucleoprotein A2/B1 | NM_016806 | up         | 0.008            | ns              |
| 10451378      | ---         | Mus musculus mir-219-2 stem-loop | ---       | down      | 0.009            | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                              | Accession   | Direction | Sham Adj P value | ADX Adj P value |
|--------------|-------------|-------------------------------------------------------|-------------|-----------|-----------------|----------------|
| 10356628     | Hdac4       | histone deacetylase 4                                 | NM_207225   | up        | 0.009           | ns             |
| 10580247     | Mast1       | microtubule associated serine/threonine kinase 1     | NM_019945   | down      | 0.009           | ns             |
| 10461057     | Rcor2       | REST corepressor 2                                    | NM_054048   | down      | 0.009           | ns             |
| 10560911     | Rabac1      | Rab acceptor 1 (prenylated)                           | NM_010261   | down      | 0.009           | ns             |
| 10539933     | Txnr3       | thiorodoxin reductase 3                               | NM_153182   | down      | 0.009           | ns             |
| 10560043     | Zfp329      | zinc finger protein 329                               | NM_026046   | up         | 0.009           | ns             |
| 10454564     | Ercc3       | excision repair cross-complementing rodent repair deficiency, complementation group 3 | NM_133658   | down      | 0.009           | ns             |
| 10597883     | Ano10       | anoctamin 10                                          | NM_133979   | down      | 0.009           | 0.05           |
| 10557058     | Poi3e       | polymerase (RNA) III (DNA directed) polypeptide E     | ENSMUST00000098072 | up | 0.009           | ns             |
| 10462752     | Btaf1       | BTAF1 RNA polymerase II, B-TFIID transcription factor-associated, (Mot1 homolog, S. cerevisiae) | NM_001080076 | up | 0.009           | ns             |
| 10509014     | D4Wsu53e    | DNA segment, Chr 4, Wayne State University 53, expressed | BC043057    | down      | 0.009           | ns             |
| 10554521     | Pde8a       | phosphodiesterase 8A                                  | NM_008803   | down      | 0.009           | ns             |
| 10398578     | 4930573J19Rik | RIKEN cDNA 4930573J19 gene                            | NM_001081057 | down      | 0.009           | ns             |
| 10497754     | Dnajc19     | DnaJ (Hsp40) homolog, subfamily C, member 19          | NM_026332   | down      | 0.009           | ns             |
| 10488575     | Psms1f      | proteasome (prosome, macropain) inhibitor subunit 1   | NM_212446   | down      | 0.009           | ns             |
| 10429957     | Fbxl6       | F-box and leucine-rich repeat protein 6                | NM_013909   | down      | 0.009           | ns             |
| 10590865     | Ctn5        |/contactin 5                                           | ENSMUST0000074133 | down | 0.009           | 0.04           |
| 10419049     | Nrg3        | neuregulin 3                                          | NM_008734   | down      | 0.009           | 0.05           |
| 10366476     | Ptprb       | protein tyrosine phosphatase, receptor type, B         | NM_029928   | down      | 0.009           | ns             |
| 10577441     | Def9        | defensin beta 9                                       | NM_139219   | up         | 0.009           | ns             |
| 10399465     | Fam84a      | family with sequence similarity 84, member A           | NM_029007   | up         | 0.009           | ns             |
| 10526191     | Gats        | opposite strand transcription unit to Stag3            | BC026208    | up         | 0.009           | ns             |
| 10512074     | Exosc3      | exosome component 3                                   | NM_025513   | up         | 0.009           | ns             |
| 10508019     | Gnl2        | guanine nucleotide binding protein-like 2 (nucleolar)  | NM_145552   | down      | 0.01            | ns             |
| 10476633     | Pcsk2       | proprotein convertase subtilisin/kexin type 2          | NM_006792   | down      | 0.01            | 0.04           |
| 10540599     | Tlil2       | tubulin tyrosine ligase-like family, member 3          | NM_133923   | up         | 0.01            | 0.02           |
| 10467468     | ENSMUSG00000074878 | predicted gene, ENSMUSG00000074878     | AK132090    | up         | 0.01            | ns             |
| 10351749     | Wdr42a      | WD repeat domain 42A                                  | NM_153555   | down      | 0.01            | ns             |
| 10363341     | Ass1        | argininosuccinate synthetase 1                        | NM_007494   | down      | 0.01            | ns             |
| 10419825     | Acin1       | apoptotic chromatin condensation inducer 1            | NM_023190   | up         | 0.01            | ns             |
| 10346882     | Adam23      | a disintegrin and metalloproteinase domain 23         | NM_011780   | down      | 0.01            | 0.05           |
| 10567229     | 2610207J05Rik| RIKEN cDNA 2610207J05 gene                            | NM_001031051 | up | 0.01            | ns             |
| 10398618     | Traf3       | Tnf receptor-associated factor 3                      | NM_011632   | up         | 0.01            | ns             |
| 10458285     | S133400G04Rik | RIKEN cDNA S133400G04 gene                            | NM_029485   | down      | 0.01            | ns             |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|-----------------|
| 10582008     | 2310061C15Rik| RIKEN cDNA 2310061C15 gene | NM_026844 | up        | 0.01             | ns              |
| 10860689     | Rbm41       | RNA binding motif protein 41 | NM_001298 | up        | 0.01             | ns              |
| 10469954     | C730025P13Rik| RIKEN cDNA C730025P13 gene | NM_177344 | down      | 0.01             | ns              |
| 10576403     | AK122209    | cDNA sequence AK122209       | NM_001298 | up        | 0.01             | ns              |
| 10445565     | Mrpl2       | mitochondrial ribosomal protein L2 | NM_025302 | down      | 0.01             | ns              |
| 10368997     | C1300030K03Rik| RIKEN cDNA C1300030K03 gene | AK048022 | down      | 0.01             | ns              |
| 10421697     | 9030625A04Rik| RIKEN cDNA 9030625A04 gene | BC116748 | down      | 0.01             | ns              |
| 10571371     | Tusc3       | tumor suppressor candidate 3 | NM_030254 | down      | 0.01             | ns              |
| 10421188     | R3hcc1      | R3H domain and coiled-coil containing 1 | ENSMUST00000050669 | down | 0.01             | ns              |
| 10521759     | Slt2        | slt homolog 2 (Drosophila) | NM_178804 | down      | 0.01             | ns              |
| 10407766     | Lgals8      | lectin, galectose binding, soluble 8 | NM_018886 | down      | 0.01             | ns              |
| 10568001     | Sult1a1     | sulfotransferase family 1A, phenol-preferring, member 1 | NM_133670 | up        | 0.01             | ns              |
| 10478425     | Sorbs1      | sorbin and SH3 domain containing 1 | NM_178362 | up        | 0.01             | ns              |
| 10489253     | Znk2        | zinc fingers and homeoboxes 3 | NM_177283 | up        | 0.01             | ns              |
| 10486029     | Atph4       | ATP binding domain 4 | NM_025675 | down      | 0.01             | ns              |
| 10456988     | Pard6g      | par-6 partitioning defective 6 homolog gamma (C. elegans) | NM_053117 | down      | 0.01             | ns              |
| 10360187     | Vang2       | vang-like 2 (van gogh, Drosophila) | NM_033509 | down      | 0.01             | ns              |
| 10447036     | ---         | rRNA chromosome:NCBI:17:79258276: 79258390:1 gene:ENSMUSG000000064770 | ENSMUST00000082836 | down | 0.01             | ns              |
| 10434643     | Psmb3       | proteasome (prosome, macropain) subunit, beta type 3 | NM_011971 | down      | 0.01             | ns              |
| 10588505     | Abhd14b     | abhydrolase domain containing 14b | NM_029631 | down      | 0.01             | ns              |
| 10404538     | Prptf4b     | PRP4 pre-mRNA processing factor 4 homolog B (yeast) | NM_013830 | up        | 0.01             | ns              |
| 10441718     | Park2       | parkin | NM_016994 | down      | 0.01             | ns              |
| 10475211     | Cep27       | centrosomal protein 27 | NM_025475 | down      | 0.01             | ns              |
| 10463739     | Tof1        | TAF5 RNA polymerase II, TATA box binding protein (TBP)-associated factor | NM_177342 | up        | 0.01             | ns              |
| 10560300     | Fkrc        | fukutin related protein | NM_173430 | down      | 0.01             | ns              |
| 10460085     | Cndp2       | CNDP dipeptidase 2 (metallopeptidase M20 family) | NM_023149 | down      | 0.01             | ns              |
| 10522589     | Srd5a3      | steroid 5 alpha-reductase 3 | NM_020611 | down      | 0.01             | ns              |
| 10422240     | Sli1r1      | SLIT and NTRK-like family, member 1 | NM_199065 | down      | 0.01             | 0.02            |
| 10429100     | Lrcc6       | leucine rich repeat containing 6 (testis) | NM_019457 | down      | 0.01             | ns              |
| 10433887     | Pkap2      | plakophilin 2 | NM_026163 | up        | 0.01             | ns              |
| 10556266     | Wee1        | WEE 1 homolog (S. pombe) | NM_009616 | up        | 0.01             | ns              |
| 10549276     | Bhhb3       | basic helix-loop-helix domain containing, class B3 | NM_024469 | down      | 0.01             | ns              |
| 10381154     | Gnp5       | 2’3’-cyclic nucleotide 3’ phosphodiesterase | NM_030923 | down      | 0.01             | ns              |
| 10448030     | Cta3       | t-complex-associated tests expressed 3 | NM_011560 | down      | 0.01             | ns              |
| 10531195     | Adamts3     | a disintegrin-like and metalloproteinase (reprolysin type) with thrombospondin type 1 motif, 3 | NM_001081 | down      | 0.01             | 0.02            |
| 10503363     | Rbm12ab     | RNA binding motif protein 12B | NM_028226 | up        | 0.01             | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|-----------------|-----------------|
| 10393387     | Jmdj6       | jumonji domain containing 6 | NM_033398 | up        | 0.01            | 0.005           |
| 10527801     | Brca2       | breast cancer 2           | NM_001081 | down      | 0.01            | ns              |
| 10578253     | Sgcz        | sarcoglycan zeta          | NM_145841 | down      | 0.01            | ns              |
| 10541034     | Anub1       | AN1, ubiquitin-like, homolog (Xenopus laevis) | NM_001081 | down      | 0.01            | ns              |
| 10345037     | Pqr8        | progestin and adipoQ receptor family member VIII | NM_028829 | up         | 0.01            | ns              |
| 10364385     | IlvB        | ilvB (bacterial acetylcoenzyme synthase)-like | NM_173751 | down      | 0.01            | ns              |
| 10546349     | Xpc         | xeroderma pigmentosum, complementation group C | NM_009531 | down      | 0.01            | ns              |
| 10431017     | Tli1        | tubulin tyrosine ligase-like 1 | NM_178889 | down      | 0.01            | ns              |
| 10506170     | Efca7       | EF-hand calcium binding domain 7 | NM_145549 | down      | 0.01            | ns              |
| 10366163     | Slic6a15    | solute carrier family 6 (neurotransmitter transporter), member 15 | NM_175328 | down      | 0.01            | ns              |
| 10451110     | Hsp90ab1    | heat shock protein 90kDa alpha (cytosolic), class B member 1 | NM_008302 | up         | 0.01            | 0.04            |
| 10488093     | Pak7        | p21 (CDKN1A)-activated kinase 7 | NM_172858 | down      | 0.01            | ns              |
| 10421817     | Narg1       | NMDA receptor regulated 1-like | NM_025832 | up         | 0.01            | ns              |
| 10502655     | Cyr61       | cysteine rich protein 61 | NM_010516 | up         | 0.01            | ns              |
| 10502830     | Nexn        | nexilin                   | NM_199465 | down      | 0.01            | ns              |
| 10459421     | Atbp8b1     | ATPase, class I, type 8B, member 1 | NM_001001 | down      | 0.01            | ns              |
| 10393754     | Actg1       | actin, gamma, cytoplasmic 1 | NM_009609 | down      | 0.01            | ns              |
| 10450640     | Mrps18b     | mitochondrial ribosomal protein S18B | NM_025878 | down      | 0.01            | ns              |
| 10426894     | ENSMUSG00000068057 | predicted gene, ENSMUSG00000058057 | NM_001081 | up         | 0.01            | ns              |
| 10405576     | FbXL21      | F-box and leucine-rich repeat protein 21 | NM_178674 | down      | 0.01            | ns              |
| 10525923     | Tmem132b    | transmembrane protein 132B | XM_915709 | down      | 0.01            | ns              |
| 10596583     | Dock3       | dedicator of cyto-kinase 3 | NM_153413 | down      | 0.01            | 0.04            |
| 10345357     | Imp4        | IMP4, U3 small nucleolar ribonucleoprotein, homolog (yeast) | NM_178601 | up         | 0.01            | ns              |
| 10539472     | Nagk        | N-acetylglucosamine kinase | NM_019542 | down      | 0.01            | ns              |
| 10490169     | Ppp4r1l     | protein phosphatase 4, regulatory subunit 1-like | ENSMUST0000069669 | down | 0.01 | ns |
| 10484227     | Sestd1      | SEC14 and spectrin domains 1 | NM_175485 | down | 0.01 | ns |
| 10537657     | Ephb6       | Eph receptor B6           | NM_007680 | down | 0.01 | ns |
| 10397912     | 9030205A07Rik | RIKEN cDNA 9030205A07 Gene | AB257853 | up | 0.01 | ns |
| 10531181     | Adamts3     | a disintegrin-like and metallopeptidase (reprolysin type) with thrombospondin type 1 motif, 3 | NM_001081 | down | 0.01 | 0.02 |
| 10595404     | Fam46a      | cDNA sequence BC023892    | ENSMUST000034802 | up | 0.01 | 0.003 |
| 10386277     | Rps12       | ribosomal protein S12     | AF357393 | up | 0.01 | ns |
| 10476136     | Vps16       | vacuolar protein sorting 16 (yeast) | NM_030659 | down | 0.01 | ns |
| 10517141     | Himgn2      | high mobility group nucleosomal binding domain 2 | NM_016957 | down | 0.01 | ns |
| 10548729     | Manc1       | MANCE domain containing 1 | NM_026345 | down | 0.01 | ns |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                                                 | Accession   | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|----------------------------------------------------------------------------------------|-------------|-----------|------------------|------------------|
| 10531197     | Adamts3     | a disintegrin-like and metalloproteinase (reprolysin type) with thrombospondin type 1 motif, 3 | NM_001081   | down      | 0.01            | ns               |
| 10400155     | Nova1       | neuro-ocnological ventral antigen 1                                                   | ENSMUST00000066043 | down      | 0.01            | 0.02             |
| 10525921     | Tmem132b    | transmembrane protein 132B                                                             | XM_915769   | down      | 0.01            | ns               |
| 10533131     | 1300012G16Rik | RIKEN cDNA 1300012G16 gene                                                              | NM_023625   | down      | 0.01            | ns               |
| 10396926     | Sfrs5       | splicing factor, arginine/serine-rich 5 (SRp40, HRS)                                   | NM_001079   | down      | 0.01            | 0.01             |
| 10355266     | Lancl1      | LanC (bacterial lantibiotic synthetase component C)-like 1                             | NM_021295   | down      | 0.01            | ns               |
| 10538617     | Lancl2      | LanC (bacterial lantibiotic synthetase component C)-like 2                             | NM_133737   | down      | 0.01            | ns               |
| 10399299     | A830093I24Rik | RIKEN cDNA A830093I24 gene                                                              | BC146648    | down      | 0.01            | ns               |
| 10434229     | Cldn5       | claudin 5                                                                               | NM_013805   | down      | 0.01            | ns               |
| 10401684     | Angle1      | angi homolog 1 (Drosophila)                                                            | NM_144524   | down      | 0.01            | ns               |
| 10389245     | Yada21      | transcripational adaptor 2 (ADA2 homolog, yeast)-like                                  | NM_172562   | down      | 0.01            | ns               |
| 10444895     | Flot1       | flotillin 1                                                                             | NM_08027    | down      | 0.01            | ns               |
| 10349609     | Rbbp5       | retinoblastoma binding protein 5                                                       | NM_172517   | up        | 0.01            | ns               |
| 10444008     | Zfp414      | zinc finger protein 414                                                                | NM_028712   | down      | 0.01            | ns               |
| 10541968     | Ano2        | anoctamin 2                                                                            | NM_153589   | down      | 0.01            | 0.01             |
| 10381683     | Acdb4       | acyl-Coenzyme A binding domain containing 4                                             | NM_025988   | down      | 0.01            | ns               |
| 10440926     | Dnajc28     | Dnaj (Hsp40) homolog, subfamily C, member 28                                          | NM_001099   | up        | 0.01            | ns               |
| 10531189     | Adamts3     | a disintegrin-like and metalloproteinase (reprolysin type) with thrombospondin type 1 motif, 3 | NM_001081   | down      | 0.01            | ns               |
| 10358637     | Hmnc1       | hemicentin 1                                                                            | NM_001024   | down      | 0.01            | ns               |
| 10567316     | Tmc7        | transmembrane channel-like gene family 7                                               | NM_172476   | up        | 0.01            | ns               |
| 10396694     | Church1     | churchill domain containing 1                                                          | NM_206534   | down      | 0.01            | ns               |
| 10565456     | Prss23      | protease, serine, 23                                                                   | NM_029614   | up        | 0.01            | ns               |
| 10390780     | Kr222       | keratin 22                                                                             | BC079890    | down      | 0.01            | ns               |
| 10560434     | Qpctl       | glutaminyl-peptide cyclotransferase-like                                               | NM_026111   | down      | 0.01            | ns               |
| 10593421     | 1110032A03Rik | RIKEN cDNA 1110032A03 gene                                                              | CT010205    | down      | 0.01            | ns               |
| 10499839     | Snapin      | SNAP-associated protein                                                                | NM_133854   | down      | 0.01            | ns               |
| 10575578     | 4930402E16Rik | RIKEN cDNA 4930402E16 gene                                                              | NM_198308   | down      | 0.01            | ns               |
| 10446656     | Lpin2       | lipin 2                                                                                | NM_022882   | up        | 0.01            | ns               |
| 10403511     | Heatr1      | HEAT repeat containing 1                                                               | NM_144835   | up        | 0.01            | ns               |
| 10516064     | Mfsd2       | major facilitator superfamily domain containing 2                                      | NM_029662   | up        | 0.01            | ns               |
| 10511416     | Tox         | thymocyte selection-associated high mobility group box                                 | NM_145711   | down      | 0.01            | ns               |
| 10455104     | Pcdhb15     | protocadherin beta 15                                                                  | NM_053140   | down      | 0.01            | ns               |
| 10592981     | Phldb1      | pleckstrin homology-like domain, family B, member 1                                    | NM_153537   | down      | 0.01            | ns               |
| 10450579     | Ddr1        | discoidin domain receptor family, member 1                                             | NM_007584   | down      | 0.01            | ns               |
| 10383436     | Aspscr1     | alveolar soft part sarcoma chromosome region, candidate 1                               | NM_026877   | down      | 0.01            | ns               |
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|--------------|-------------|--------------------------|-----------|-----------|------------------|-----------------|
| 10394558     | Pcgf2       | polycomb group ring finger 2 | NM_009545 | down     | 0.01             | ns              |
| 10396030     | Fancm       | Fanconi anemia, complementation group M | NM_178912 | down     | 0.01             | ns              |
| 10545658     | Wdr54       | WD repeat domain 54       | NM_023790 | down     | 0.01             | ns              |
| 10423825     | Fzd6        | frizzled homolog 6 (Drosophila) | NM_008056 | down     | 0.01             | ns              |
| 10539592     | Smyd5       | SET and MYND domain containing 5 | NM_144918 | down     | 0.01             | ns              |
| 10497548     | Fnndc3b     | fibronectin type III domain containing 3B | NM_173182 | up        | 0.01             | ns              |
| 10495993     | Elov6       | ELOVL family member 6, elongation of long chain fatty acids (yeast) | NM_130450 | up        | 0.01             | ns              |
| 10552075     | Lgi4        | leucine-rich repeat LGI family, member 4 | NM_144556 | down     | 0.01             | ns              |
| 10544538     | ---         | pseudogene chromosome:NCBI:37:6;47753957:47754114:-1 gene:ENSMUSG00000045359 | ENSMUST0000052129 | up | 0.01 | ns |
| 10506424     | Actg1       | actin, gamma, cytoplasmic 1 | NM_009609 | down     | 0.01             | ns              |
| 10603087     | Pir         | pin | NM_027153 | down     | 0.01             | ns              |
| 10352125     | ENSMUSG00000055831 | predicted gene, ENSMUSG00000055831 | ENSMUST000005688 | up | 0.01 | ns |
| 10509246     | Luzp1       | leucine zipper protein 1 | NM_024452 | up | 0.01 | 0.04 |
| 10565057     | Wdr73       | WD repeat domain 73       | ENSMUST0000006816 | down | 0.01 | ns |
| 10439249     | Parp14      | poly (ADP-ribose) polymerase family, member 14 | NM_001039530 | up | 0.01 | ns |
| 10471062     | Mettl11a    | methyltransferase like 11A | ENSMUST0000041830 | down | 0.01 | ns |
| 10374464     | Sprd2       | sprouty-related, EVH1 domain containing 2 | BC040462 | up | 0.01 | ns |
| 10364093     | Der13       | Der1-like domain family, member 3 | NM_024440 | up | 0.01 | ns |
| 10606475     | Hdx         | highly divergent homeobox | NM_00108054 | down | 0.01 | ns |
| 10476196     | Top1        | topoisomerase (DNA) I | NM_009408 | up | 0.01 | ns |
| 10431697     | Abcd2       | ATP-binding cassette, sub-family D (ALD), member 2 | NM_011994 | down | 0.01 | ns |
| 10523277     | 9330159N05Rik | RIKEN cDNA 9330159N05 gene | AK034152 | up | 0.01 | 0.02 |
| 10410959     | Atg10       | autophagy-related 10 (yeast) | NM_025770 | down | 0.01 | ns |
| 10493770     | Ilf2        | interleukin enhancer binding factor 2 | NM_026374 | down | 0.01 | ns |
| 10567591     | ---         | Genscan chromosome:NCBI:37:7:128791698:128850767:-1 | GENSCAN0000018737 | up | 0.01 | 0.02 |
| 10432411     | Mcr5        | microspherule protein 1 | NM_016760 | down | 0.01 | ns |
| 10377938     | Eno3        | enolase 3, beta muscle | NM_007933 | down | 0.01 | ns |
| 10357888     | Ppia4       | protein tyrosine phosphatase, receptor type, f polypeptide (PTPRF), interacting protein (liprin), alpha 4 | AK173053 | down | 0.01 | ns |
| 10401673     | Tgf5b       | transforming growth factor, beta 3 | NM_009388 | up | 0.01 | 0.03 |
| 10472621     | Ubr3        | ubiquitin protein ligase E3 component n-recognin 3 | NM_001081548 | down | 0.01 | 0.009 |
| 10593499     | A593442     | expressed sequence A593442 | NM_178906 | down | 0.01 | 0.04 |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|---------------|-------------|--------------------------|-----------|-----------|------------------|------------------|
| 10604375      | Apin        | apelin                   | NM_013912 | up        | 0.01             | ns               |
| 10375704      | 301002609Rik | RIKEN cDNA 301002609 gene | BC028428  | down      | 0.01             | ns               |
| 10504504      | Grhr        | glyoxylate reductase/hydroxyprolyl reductase | NM_080289 | down      | 0.01             | ns               |
| 10366052      | Kit         | kit ligand               | NM_013598 | up         | 0.01             | 0.05             |
| 10587604      | Rwd2a       | RWD domain containing 2A | NM_027100 | down      | 0.01             | ns               |
| 10384423      | Cobi        | cordon-bleu              | NM_172496 | up         | 0.01             | ns               |
| 10408870      | Tbc1d7      | TBC1 domain family, member 7 | NM_025935 | down      | 0.01             | ns               |
| 10511099      | A530082C11Rik | RIKEN cDNA A530082C11 gene | NM_177186 | down      | 0.01             | ns               |
| 10434446      | Ece2        | endothelin converting enzyme 2 | NM_139293 | down      | 0.01             | ns               |
| 10592303      | Robo3       | roundabout homolog 3 (Drosophila) | AF060570  | up         | 0.01             | ns               |
| 10555777      | ---         | Genscan chromosome.NCBIM37:7:110335117:110384869:1 | GENSCAN0 0000023102 | up         | 0.01             | ns               |
| 10381395      | Rundc1      | RUN domain containing 1  | NM_172566 | up         | 0.01             | ns               |
| 10492671      | Ppid        | peptidylprolyl isomerase D (cyclophilin D) | NM_026352 | up         | 0.01             | ns               |
| 10538658      | Herc3       | hecat domain and RLD 3   | NM_028705 | down      | 0.01             | ns               |
| 10559312      | Dhcr7       | 7-dehydrocholesterol reductase | NM_007856 | down      | 0.01             | ns               |
| 10558049      | Ppapdc1a    | phosphatidic acid phosphatase type 2 domain containing 1A | NM_001080 963 | up         | 0.01             | ns               |
| 10424188      | Mibp        | Mdm2, transformed 3T3 cell double minute p53 binding protein | NM_134092 | down      | 0.01             | ns               |
| 10358677      | 1200016B10Rik | RIKEN cDNA 1200016B10 gene | BC060204  | up         | 0.01             | ns               |
| 10499652      | 4632404H12Rik | RIKEN cDNA 4632404H12 gene | ENSMUST0 000038450 | down      | 0.01             | ns               |
| 10379013      | Flot2       | flotillin 2               | NM_008028 | down      | 0.01             | ns               |
| 10493235      | Pdag6       | progestin and adipoQ receptor family member VI | NM_198410 | down      | 0.01             | ns               |
| 10572739      | ENSMUSG0000060719 | predicted gene, ENSMUSG0000060719 | AK032580  | up         | 0.01             | ns               |
| 10407072      | Elov7       | ELOVL family member 7, elongation of long chain fatty acids (yeast) | NM_029001 | down      | 0.01             | ns               |
| 10592140      | Ddx25       | DEAD (Asp-Glu-Ala-Asp) box polypeptide 25 | NM_013932 | down      | 0.01             | ns               |
| 10481349      | Ntn2g       | netrin G2                 | NM_133501 | down      | 0.01             | ns               |
| 10360589      | Ahctf1       | AT hook containing transcription factor 1 | NM_026375 | up         | 0.01             | ns               |
| 10599849      | ---         | Genscan chromosome.NCBIM37:7:58500749:58545291:1 | GENSCAN0 000003190 | down      | 0.02             | ns               |
| 10518132      | Prdm2       | PR domain containing 2, with ZNF domain | NM_001081 355 | up         | 0.02             | ns               |
| 10578193      | Thex1       | three prime histone mRNA exonuclease 1 | NM_026067 | up         | 0.02             | ns               |
| 10601551      | LOC100039300 | similar to enhancer of yellow 2 homolog (Drosophila) | ENSMUST0 0000055309 | down      | 0.02             | 0.04             |
| 10441489      | Gtf2h5      | general transcription factor IIH, polypeptide 5 | NM_181392 | down      | 0.02             | ns               |
| 10469425      | Art5b       | ADP-ribosylation factor-like 5B | NM_029466 | up         | 0.02             | ns               |
| 10536541      | St7         | Suppression of tumorigenicity 7 | NM_022332 | up         | 0.02             | ns               |
| 10526614      | Acti6b      | actin-like 6B              | NM_031404 | down      | 0.02             | ns               |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|----------|----------|------------------|-----------------|
| 10575184     | Wwp2        | WW domain containing E3 ubiquitin protein ligase 2 | NM_025830 | down     | 0.02             | ns              |
| 10551981     | U2af114     | U2 small nuclear RNA auxiliary factor 1-like 4 | NM_170760 | up       | 0.02             | ns              |
| 10491331     | Plk3ca      | phosphatidylinositol 3-kinase, catalytic, alpha polypeptide | NM_008839 | up       | 0.02             | ns              |
| 10459844     | Cdc5        | coiled-coil domain containing 5 | NM_146089 | down     | 0.02             | ns              |
| 10442057     | Rok2        | RIO kinase 2 (yeast) | NM_025934 | down     | 0.02             | ns              |
| 10581378     | Psmn10      | proteasome (prosome, macropain) subunit, beta type 10 | NM_013640 | down     | 0.02             | ns              |
| 10417579     | 4930452B06Rik| RIKEN cDNA 4930452B06 gene | BC046168 | down     | 0.02             | ns              |
| 10445239     | EG546797    | predicted gene, EG546797 | ENSMUST0 000071458 | down     | 0.02             | ns              |
| 10541098     | Zip239      | zinc finger protein 239 | NM_001001 792 | down     | 0.02             | ns              |
| 10545130     | Gadd45a     | growth arrest and DNA-damage-inducible 45 alpha | NM_007836 | up       | 0.02             | 0.05            |
| 10437210     | Bace2       | beta-site APP-cleaving enzyme 2 | NM_019517 | down     | 0.02             | 0.01            |
| 10544837     | 1200009O22Rik| RIKEN cDNA 1200009O22 gene | BC043099 | down     | 0.02             | ns              |
| 10364950     | Gadd45b     | growth arrest and DNA-damage-inducible 45 beta | NM_009655 | up       | 0.02             | 0.005           |
| 10444055     | Rdbp        | RD RNA-binding protein | NM_001045 864 | down     | 0.02             | ns              |
| 10441038     | Hics        | holocarboxylase synthetase (biotin-[propiony-Coenzyme A-carboxylase (ATP-hydrolysing)] ligase) | NM_139145 | down     | 0.02             | ns              |
| 10495854     | Prss12      | protease, serine, 12 neutrophil (motopsin) | NM_008939 | down     | 0.02             | ns              |
| 10560826     | Zip109      | zinc finger protein 109 | NM_020626 | up       | 0.02             | ns              |
| 10465076     | Syn1        | synovial apoptosis inhibitor 1, synoviolin | NM_028769 | up       | 0.02             | ns              |
| 10446013     | Mpn1        | MPN domain containing | NM_028530 | down     | 0.02             | ns              |
| 10539220     | AW146020    | expressed sequence AW146020 | NM_177884 | down     | 0.02             | ns              |
| 10471171     | Fupb3       | far upstream element (FUSE) binding protein 3 | NM_001033 389 | down     | 0.02             | ns              |
| 10481272     | 1700007K13Rik| RIKEN cDNA 1700007K13 gene | BC099566 | up       | 0.02             | 0.03            |
| 10549473     | Caprin2     | caprin family member 2 | NM_161541 | down     | 0.02             | ns              |
| 10462091     | Klf9        | Kruppel-like factor 9 | NM_010638 | up       | 0.02             | ns              |
| 10423963     | Eny2        | enhancer of yellow 2 homolog (Drosophila) | NM_175009 | down     | 0.02             | ns              |
| 10582403     | Galns       | galactosamine (N-acetyl)-6-sulfate sulfatase | NM_016722 | down     | 0.02             | ns              |
| 10401933     | ---         | Mouse mammary tumor virus clone 66C env precursor and vSAG protein mRNA, complete cds. | AF043690 | up       | 0.02             | ns              |
| 10504759     | ---         | Mouse mammary tumor virus clone 66C env precursor and vSAG protein mRNA, complete cds. | AF043690 | up       | 0.02             | ns              |
| 10387659     | Nlgn2       | neuregulin 2 | NM_198862 | down     | 0.02             | ns              |
| 10417920     | Usp54       | ubiquitin specific peptidase 54 | NM_030780 | up       | 0.02             | ns              |
| 10357381     | Ysk4        | Yeast Sps1/Ste20-related kinase 4 (S. cerevisiae) | XM_914055 | up       | 0.02             | ns              |
| 10573490     | Hook2       | hook homolog 2 (Drosophila) | NM_132925 | down     | 0.02             | ns              |
| 10380859     | Crks        | CDC2-related kinase, arginine/serine-rich | BC057057 | down     | 0.02             | ns              |
| 10415030     | Oxa11       | oxidase assembly 1-like | NM_026936 | down     | 0.02             | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                | Accession | Direction | Sham Adj P value | ADX Adj P value |
|--------------|-------------|--------------------------------------------------------|-----------|-----------|-----------------|----------------|
| 10528145     | Grm3        | glutamate receptor, metabotropic 3                     | NM_181850 | down      | 0.02            | ns             |
| 10389627     | Rad51c      | Rad51 homolog c (S. cerevisiae)                        | NM_053269 | up        | 0.02            | ns             |
| 10581996     | Cdy2        | chromodomain protein, Y chromosome-like 2              | NM_029441 | up        | 0.02            | ns             |
| 10511865     | Ptges3      | prostaglandin E synthase 3 (cytotoxic)                | AF153479  | up        | 0.02            | ns             |
| 10480808     | Gm996       | gene model 996, (NCBI)                                 | NM_001005424 | down  | 0.02            | ns             |
| 10483604     | Slec25a12   | solute carrier family 25 (mitochondrial carrier, Aralar), member 12 | NM_172436 | down  | 0.02            | ns             |
| 10354677     | Ankrd44     | ankyrin repeat domain 44                              | NM_001081433 | down  | 0.02            | ns             |
| 10368380     | L3mbt1L     | l(3)mbt-like 3 (Drosophila)                           | NM_172787 | up        | 0.02            | ns             |
| 10469609     | OTMUSG0000011664 | predicted gene, OTMUSG00000011664         | ENSMUST0000100373 | down  | 0.02            | 0.02          |
| 10376929     | 1810036I24Rik | RIKEN cDNA 1810036I24 gene                        | BC115504  | up        | 0.02            | ns             |
| 10578138     | Dctn6       | dynactin 6                                            | NM_011722 | down  | 0.02            | ns             |
| 10588509     | Pcbp4       | poly(rC) binding protein 4                            | NM_021567 | down  | 0.02            | ns             |
| 10529953     | EG625026    | predicted gene, EG625026                              | AK036806  | down  | 0.02            | 0.03          |
| 10436600     | --          | MIl000146 Mus musculus miR-99a stem-loop              | ---       | down  | 0.02            | ns             |
| 10451167     | Tmem63b     | transmembrane protein 63b                             | NM_198167 | down  | 0.02            | ns             |
| 10458834     | Atg12       | autophagy-related 12 (yeast)                          | NM_026217 | up        | 0.02            | ns             |
| 10549921     | Vmmzr43     | vomeronasal 2, receptor 43                            | NM_189061 | up        | 0.02            | ns             |
| 10363667     | ENSMUSG00000062298 | predicted gene, ENSMUSG00000062298 | ENSMUST000074437 | down  | 0.02            | ns             |
| 10539606     | Cct7        | chaperonin containing Tcp1, subunit 7 (eta)           | NM_007638 | up        | 0.02            | ns             |
| 10423505     | Cmb1        | carboxymethylnebutanolidase-like (Pseudomonas)         | NM_181588 | down  | 0.02            | ns             |
| 10484987     | Nrth3       | nuclear receptor subfamily 1, group H, member 3      | NM_013839 | up        | 0.02            | ns             |
| 10392560     | Abca9       | ATP-binding cassette, sub-family A (ABC1), member 9   | NM_147220 | up        | 0.02            | ns             |
| 10381708     | Fmn1        | formin-1                                              | NM_019679 | up        | 0.02            | 0.0004        |
| 10570634     | 4930467E23Rik // EG665756 | RIKEN cDNA 4930467E23 gene // predicted gene, EG665756 | ENSMUST000094046 | down  | 0.02            | 0.05          |
| 10520638     | 0610007C21Rik | RIKEN cDNA 0610007C21 gene                                  | NM_027555 | down  | 0.02            | ns             |
| 10507238     | Lrc41       | leucine rich repeat containing 41                     | NM_153521 | down  | 0.02            | ns             |
| 10462281     | Vldr        | very low density lipoprotein receptor                 | NM_013703 | down  | 0.02            | ns             |
| 10589889     | Gbl1        | galactosidase, beta 1                                  | NM_009752 | down  | 0.02            | ns             |
| 10522134     | Lias        | lipoic acid synthetase                                 | NM_024471 | down  | 0.02            | 0.03          |
| 10433389     | Alg1        | asparagine-linked glycosylation 1 homolog (yeast, beta-1,4-mannosyltransferase) | NM_145362 | down  | 0.02            | ns             |
| 10353459     | 4921533L14Rik | RIKEN cDNA 4921533L14 gene                       | BC074466  | down  | 0.02            | 0.04          |
| 10511515     | Cnt12       | cyclin L2                                              | NM_207678 | up        | 0.02            | 0.04          |
| 10373756     | Pla2g3      | phospholipase A2, group III                           | NM_172791 | up        | 0.02            | ns             |
| 10472022     | Lypd6b      | LYL6/PLAUR domain containing 6B                      | BC126943  | down  | 0.02            | ns             |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                                                 | Accession   | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------------------------------------------------------------------------|-------------|-----------|------------------|-----------------|
| 10473022     | Plp2        | protein lipid 2                                                                            | NM_019755   | down      | 0.02             | ns              |
| 10545827     | Rab11flip5  | Rab11 family interacting protein 5 (class 1)                                               | NM_001003   | down      | 0.02             | ns              |
| 10522802     | Ythdc1      | YTH domain containing 1                                                                     | NM_177680   | up        | 0.02             | ns              |
| 10539993     | Slc15a4     | solute carrier family 15, member 4                                                          | NM_133985   | up        | 0.02             | ns              |
| 10359034     | Qsox1       | quiescin Q6 sulfhydryl oxidase 1                                                            | NM_001024   | down      | 0.02             | ns              |
| 10508829     | Map3k6      | mitogen-activated protein kinase kinase kinase 6                                            | NM_016693   | up        | 0.02             | ns              |
| 10566516     | 15000030O22Rik | RIKEN cDNA 15000030O22 gene                                                               | BC022923    | up        | 0.02             | ns              |
| 10439762     | Ahcy        | S-adenosylhomocysteine hydrolase                                                            | ENSMUST00000045607 | down      | 0.02             | ns              |
| 10438626     | Etv5        | ets variant gene 5                                                                         | NM_023794   | up        | 0.02             | 0.01            |
| 10353878     | Ankrd23     | ankyrin repeat domain 23                                                                    | NM_153502   | up        | 0.02             | ns              |
| 10542319     | Apold1      | apolipoprotein L domain containing 1                                                        | NM_001109   | up        | 0.02             | ns              |
| 10532896     | 2610524H06Rik | RIKEN cDNA 2610524H06 gene                                                                 | NM_181075   | down      | 0.02             | ns              |
| 10583485     | A230050P20Rik | RIKEN cDNA A230050P20 gene                                                                  | NM_175887   | down      | 0.02             | ns              |
| 10599693     | 6330419J24Rik | RIKEN cDNA 6330419J24 gene                                                                  | BC052359    | down      | 0.02             | ns              |
| 10483025     | Rbms1       | RNA binding motif, single stranded interacting protein 1                                    | NM_020296   | down      | 0.02             | ns              |
| 10445544     | Crip3       | cysteine-rich protein 3                                                                     | NM_053250   | up        | 0.02             | ns              |
| 10487040     | Fbn1        | fibrillin 1                                                                                | NM_007993   | down      | 0.02             | ns              |
| 10455094     | Podhh13     | podocadherin beta 1                                                                        | NM_053138   | down      | 0.02             | ns              |
| 10424060     | A5330017M01Rik | RIKEN cDNA A5330017M01 gene                                                                | AK080719    | down      | 0.02             | ns              |
| 10462333     | Cdc37f1     | cell division cycle 37 homolog (S. cerevisiae)-like 1                                      | NM_025950   | up        | 0.02             | ns              |
| 10512165     | Nol6        | nucleolar protein family 6 (RNA-associated)                                                 | NM_139236   | down      | 0.02             | ns              |
| 10489784     | BC067047    | cDNA sequence BC067047                                                                     | NM_177782   | up        | 0.02             | ns              |
| 10457886     | ENSMUSG00000054990 | predicted gene, ENSMUSG00000054990                                                         | ENSMUST00000054990 | up        | 0.02             | ns              |
| 10431558     | 2010001J22Rik | RIKEN cDNA 2010001J22 gene                                                                  | BC087902    | down      | 0.02             | ns              |
| 10441422     | Ezdhc14     | zinc finger, DHHC domain containing 14                                                      | NM_146073   | up        | 0.02             | 0.02            |
| 10484201     | 2610301F02Rik | RIKEN cDNA 2610301F02 gene                                                                  | ENSMUST00000045944 | up        | 0.02             | ns              |
| 10377380     | 1500010J02Rik | RIKEN cDNA 1500010J02 gene                                                                  | NM_028889   | down      | 0.02             | ns              |
| 10374455     | Spred2      | sprouty-related, EVH1 domain containing 2                                                   | NM_033523   | up        | 0.02             | 0.03            |
| 10439424     | 493242524Rik | RIKEN cDNA 493242524                                                                        | NM_001081   | up        | 0.02             | ns              |
| 10519578     | Abcb4       | ATP-binding cassette, sub-family B (MDR/TAP), member 4                                      | NM_008830   | down      | 0.02             | ns              |
| 10431974     | RasgeL3     | Rap guanine nucleotide exchange factor (GEF) 3                                              | NM_144850   | up        | 0.02             | ns              |
| 10531610     | Rasgef1b    | RasGEF domain family, member 1B                                                             | NM_145839   | down      | 0.02             | ns              |
| 10558150     | Htra1       | HtrA serine peptidase 1                                                                    | NM_019564   | up        | 0.02             | ns              |
| 10374564     | Cct4        | chaperonin containing Tcp1, subunit 4 (delta)                                              | NM_009837   | up        | 0.02             | ns              |
| 10583291     | 2200002K05Rik | RIKEN cDNA 2200002K05                                                                        | BC055786    | down      | 0.02             | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                      | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|---------------------------------------------------------------|-----------|-----------|-------------------|-----------------|
| 10453887     | Cables1     | Cdk5 and Abi enzyme substrate 1                              | NM_022021 | up        | 0.02              | ns              |
| 10534002     | Tmem132d    | transmembrane protein 132D                                   | NM_172885 | down      | 0.02              | ns              |
| 10506571     | Dhcr24      | 24-dehydrocholesterol reductase                              | NM_053272 | down      | 0.02              | ns              |
| 10420730     | Fdft1       | farnesyl diphotophosphate farnesyl transferase 1              | NM_010191 | down      | 0.02              | ns              |
| 10564877     | Rccd1       | RCC1 domain containing 1                                     | NM_173445 | down      | 0.02              | ns              |
| 10601980     | Mum11I      | melanoma associated antigen (mutated) 1-like 1               | NM_175541 | up         | 0.02              | ns              |
| 10533401     | Cux2        | cut-like homeobox 2                                          | ENSMUST0000111752 | down | 0.02              | ns              |
| 10411359     | Plp2        | proteolipid protein 2                                        | NM_019755 | down      | 0.02              | ns              |
| 10437655     | BC068110    | cDNA sequence BC068110                                       | BC068110  | down      | 0.02              | ns              |
| 10599530     | Rab33a      | RAB33A, member of RAS oncogene family                        | NM_011228 | down      | 0.02              | ns              |
| 10568221     | Septa2      | selenophosphate synthetase 2                                 | NM_009266 | down      | 0.02              | ns              |
| 10366346     | Phlda1      | pleckstrin homology-like domain, family A, member 1          | NM_009344 | up         | 0.02              | ns              |
| 10505532     | OTTMUSG0000000000266 | predicted gene, OTTMUSG0000000000266 | XR_033213 | up         | 0.02              | ns              |
| 10480459     | Hmmt        | histamine N-methyltransferase                                | NM_080462 | down      | 0.02              | ns              |
| 10484197     | 2610301F02Rik | RIKEN cDNA 2610301F02 gene                                   | ENSMUST0000049544 | up | 0.02              | ns              |
| 10471058     | Cstad       | CSA-conditional, T cell activation-dependent protein         | NM_030137 | down      | 0.02              | ns              |
| 10455128     | P3dhb20     | protocadherin beta 20                                       | NM_053145 | down      | 0.02              | ns              |
| 10598467     | Pim2        | proviral integration site 2                                  | NM_138606 | up         | 0.02              | ns              |
| 10582823     | Rbm34       | RNA binding motif protein 34                                 | NM_172762 | down      | 0.02              | ns              |
| 10416406     | Htr2a       | 5-hydroxytryptamine (serotonin) receptor 2A                   | NM_172812 | up         | 0.02              | ns              |
| 10457853     | Ino80c      | INO80 complex subunit C                                     | BC006901 | down      | 0.02              | ns              |
| 10582330     | Rnfl66      | ring finger protein 16                                       | NM_001033 | up         | 0.02              | ns              |
| 10412466     | Hmgcs1      | 3-hydroxy-3-methylglutaryl-Coenzyme A synthase 1              | NM_145942 | down      | 0.02              | ns              |
| 10561247     | Shkbp1      | SH3kbp1 binding protein 1                                    | NM_138670 | up         | 0.02              | ns              |
| 10533148     | Pp62        | protein phosphatase, EF hand calcium-binding domain 2        | NM_011148 | up         | 0.02              | ns              |
| 10361156     | Rcor3       | REST coressor 3                                             | NM_144814 | down      | 0.02              | ns              |
| 10424979     | Gpt         | glutamic pyruvic transaminase, soluble                        | NM_182805 | up         | 0.02              | ns              |
| 10387922     | Slic2a11     | solute carrier family 25 (mitochondrial carrier oxoglutarate carrier), member 11 | NM_024211 | down      | 0.02              | ns              |
| 10470283     | Egfll7      | EGF-like domain 7                                            | NM_198724 | down      | 0.02              | ns              |
| 10450533     | Vars2       | valyl-tRNA synthetase 2, mitochondrial (putative)            | NM_175137 | down      | 0.02              | ns              |
| 10591022     | 4931406MC07Rik | RIKEN cDNA 4931406C07 gene                                 | NM_145942 | down      | 0.02              | ns              |
| 10378754     | 2310047D13Rik | RIKEN cDNA 2310047D13 gene                                 | BC016078 | down      | 0.02              | ns              |
| 10438738     | Bel6        | B-cell leukemia/lymphoma 6                                   | NM_009744 | up         | 0.02              | ns              |
| 10530910     | Uba6        | ubiquitin-like modifier activating enzyme 6                   | NM_172712 | up         | 0.02              | ns              |
| 10400510     | Clec14a     | C-type lectin domain family 14, member a                      | NM_025809 | down      | 0.02              | ns              |
| 10388884     | Nk          | nemo like kinase                                            | NM_008702 | up         | 0.02              | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                                                 | Accession         | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|----------------------------------------------------------------------------------------|-------------------|-----------|-----------------|-----------------|
| 10448136     | ---         | pseudogene chromosome:NCBI:17:18613394:18613645:-1 gene:ENSMUSG00000051878            | ENSMUST00000078796 | down      | 0.02            | ns              |
| 10368101     | D10Bwg1379e | DNA segment, Chr 10, Brigham & Women's Genetics 1379 expressed                          | NM_001033258      | down      | 0.02            | ns              |
| 10465263     | Dpf2        | D4, zinc and double PHD fingers family 2                                                | NM_011262         | up         | 0.02            | ns              |
| 10377508     | Trappc1     | trafficking protein particle complex 1                                                 | NM_001024206      | down      | 0.02            | ns              |
| 10439976     | DB10061J03Rik| RIKEN cDNA 2310061J03 gene                                                                | BC017620          | down      | 0.02            | 0.02            |
| 10385747     | Phf15       | PHD finger protein 15                                                                   | NM_199299         | up         | 0.02            | ns              |
| 10436678     | Gabpa       | GA repeat binding protein, alpha                                                        | NM_008065         | up         | 0.02            | ns              |
| 10600504     | Fundc2      | FUN14 domain containing 2                                                               | NM_026126         | down      | 0.02            | ns              |
| 10519203     | A230069A22Rik| RIKEN cDNA A230069A22 gene                                                               | BC147318          | down      | 0.02            | ns              |
| 10379652     | Ala450353   | expressed sequence Ala450353                                                          | AJ007734          | up         | 0.02            | ns              |
| 10360648     | Psen2       | presenilin 2                                                                           | NM_011183         | down      | 0.02            | ns              |
| 10405372     | Zip346      | zinc finger protein 346                                                                 | NM_012017         | down      | 0.02            | ns              |
| 10519140     | Mmp23       | matrix metalloproteinase 2                                                               | NM_011985         | up         | 0.02            | ns              |
| 10410919     | EG435373    | predicted gene, EG435373                                                                 | XR_034009         | down      | 0.02            | ns              |
| 10539649     | Ptgds3      | prostaglandin E synthase 3 (cytosolic)                                                 | AY281130          | up         | 0.02            | ns              |
| 10598723     | Ddx3        | DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide 3, X-linked                               | NM_010028         | down      | 0.02            | ns              |
| 10487969     | Trmt6       | RNA methyltransferase 6 homolog (S. cerevisiae)                                         | NM_175113         | down      | 0.02            | ns              |
| 10526897     | Unc84a      | unc-84 homolog A (C. elegans)                                                           | NM_024451         | down      | 0.02            | ns              |
| 10469505     | Commd3      | COMM domain containing 3                                                               | NM_147778         | down      | 0.02            | ns              |
| 10572747     | Tpm4        | tropomyosin 4                                                                          | NM_001001491      | up         | 0.02            | ns              |
| 10603346     | Pip2        | proteolipid protein 2                                                                   | NM_019755         | down      | 0.02            | ns              |
| 10366938     | Stac3       | SH3 and cysteine rich domain 3                                                          | NM_177707         | up         | 0.02            | ns              |
| 10513020     | Ikkap       | inhibitor of kappa light polypeptide enhancer in B-cells, kinase complex-associated protein | NM_026079         | down      | 0.02            | ns              |
| 10394812     | EG245297    | predicted gene, EG245297                                                                | BC030401          | down      | 0.02            | ns              |
| 10406417     | Actg1       | actin, gamma, cytoplasmic 1                                                             | NM_009609         | down      | 0.02            | ns              |
| 10475544     | Sema6d      | sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaphorin) 6D        | NM_172537         | down      | 0.02            | ns              |
| 10587942     | Xrn1        | 5'-3' exoribonuclease 1                                                                  | NM_011916         | down      | 0.02            | ns              |
| 10399555     | Kcnf1       | potassium voltage-gated channel, subfamily F, member 1                                 | NM_201931         | up         | 0.02            | ns              |
| 10383399     | Sic25a10    | solute carrier family 25 (mitochondrial carrier, dicarboxylate transporter), member 10| NM_013770         | down      | 0.02            | ns              |
| 10379363     | Atad5       | ATPase family, AAA domain containing 5                                                  | NM_00102985       | down      | 0.02            | ns              |
| 10563314     | Ddhh        | dihydrodiol dehydrogenase (dimeric)                                                     | NM_027903         | down      | 0.02            | ns              |
| 10358660     | Hmcn1       | hemicentin 1                                                                            | NM_001024720      | down      | 0.02            | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|---------------|-------------|--------------------------|-----------|-----------|------------------|-----------------|
| 10601091      | Foxo4       | forkhead box O4          | NM_016789 | up        | 0.02             | ns              |
| 10408113      | Hist1H4l    | histone cluster 1, H4i   | NM_176565 | up        | 0.02             | ns              |
| 10440918      | Trem50b     | transmembrane protein 50B| NM_030018 | up        | 0.02             | ns              |
| 10497920      | Ankrd50     | ankrin repeat domain 50  | NM_001033 | up        | 0.02             | ns              |
| 1049643       | Chrb2       | cholinergic receptor, nicotinic, beta polypeptide 2 (neuronal)| NM_009602 | down     | 0.02             | ns              |
| 10586039      | Tie3        | transducin-like enhancer of split 3, homolog of Drosophila E(spl)| NM_001080 | down     | 0.02             | ns              |
| 10482434      | Gtdc1       | glycosyltransferase-like domain containing 1| NM_172662 | down     | 0.02             | ns              |
| 10543697      | Zc3hc1      | zinc finger, C3HC type 1 | NM_172735 | down     | 0.02             | ns              |
| 10524941      | Fbxo21      | F-box protein 21         | NM_145564 | down     | 0.02             | ns              |
| 10471443      | Pip5Ki1     | phosphatidylinositol-4-phosphate 5-kinase-like 1| NM_198191 | down     | 0.02             | ns              |
| 10491091      | Tnfsf10     | tumor necrosis factor (ligand) superfamily, member 10| NM_009425 | down     | 0.02             | ns              |
| 10455088      | Pcdh11      | protocadherin beta 11   | NM_053136 | down     | 0.02             | ns              |
| 10400057      | Arid4a      | ADP-ribosylation factor-like 4A| NM_001039 | down     | 0.02             | 0.02            |
| 10426284      | Acr         | acrosin prepropeptide    | NM_013455 | down     | 0.02             | ns              |
| 10545835      | 1700040103Rik| RIKEN cDNA 1700040103 gene| BC115452 | down     | 0.02             | ns              |
| 10583834      | 9530077C05Rik| RIKEN cDNA 9530077C05 gene| BC054761 | up        | 0.02             | ns              |
| 10376685      | Aikb5       | alkB, alkylation repair homolog 5 (E. coli)| NM_172943 | up        | 0.02             | ns              |
| 10501555      | Amy1        | amylase 1, salivary      | NM_007446 | down     | 0.02             | 0.002           |
| 10488816      | Ahcy        | S-adenosylhomocysteine hydrolase| NM_016661 | down     | 0.02             | ns              |
| 10528482      | BC050254    | cDNA sequence BC050254   | BC050254 | up        | 0.02             | ns              |
| 10458340      | Hbegf       | heparin-binding EGF-like growth factor| NM_010415 | up        | 0.02             | 0.02            |
| 10353785      | Gib1        | galactosidase, beta 1-like| BC021773 | down     | 0.02             | ns              |
| 10519224      | Pusi1       | pseudouridylate synthase-like 1| ENSMUST0 000097737 | down | 0.02             | ns              |
| 10393970      | Fasn        | fatty acid synthase      | NM_007988 | down     | 0.03             | ns              |
| 10604735      | Rbmx        | RNA binding motif protein, X chromosome| NM_011252 | down     | 0.03             | ns              |
| 1057129       | Gm501       | gene model 501, (NCBI)   | XM_146277 | down     | 0.03             | ns              |
| 10358648      | Hmcn1       | hemicentin 1             | NM_001024 | down     | 0.03             | ns              |
| 10547288      | Ankrd26     | ankyrin repeat domain 26 | NM_001081 | up        | 0.03             | ns              |
| 10554156      | Fam174b     | family with sequence similarity 174, member B| BC034069 | up        | 0.03             | ns              |
| 10346224      | 5330401P04Rik| RIKEN cDNA 5330401P04 gene| ENSMUST0 000067708 | down | 0.03             | ns              |
| 10544563      | Zfp467      | zinc finger protein 467  | NM_020689 | down     | 0.03             | ns              |
| 10365302      | A230046K03Rik| RIKEN cDNA A230046K03 gene| NM_001033 | up        | 0.03             | ns              |
| 10447675      | Rnaset2a    | ribonuclease T2A         | NM_001083 | down     | 0.03             | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                                                 | Accession       | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|------------------------------------------------------------------------------------------|----------------|-----------|------------------|----------------|
| 10560035     | Zscan18     | zinc finger and SCAN domain containing 18                                                  | BC094341        | down      | 0.03             | ns             |
| 10396919     | 4933426M11Rik | RIKEN cDNA 4933426M11 gene                                                                | BC040401        | up         | 0.03             | ns             |
| 10572253     | Sf4         | splicing factor 4                                                                         | NM_027481       | down      | 0.03             | 0.05           |
| 10430956     | Cyb5r3      | cytochrome b5 reductase 3                                                                  | NM_029787       | down      | 0.03             | ns             |
| 10444978     | Gna-rs1     | guanine nucleotide binding protein, related sequence 1                                    | NM_008136       | down      | 0.03             | ns             |
| 10463836     | Gsto1       | glutathione S-transferase omega 1                                                          | NM_010362       | down      | 0.03             | ns             |
| 10414612     | Slc39a2     | solute carrier family 39 (zinc transporter), member 2                                     | NM_001039       | up         | 0.03             | ns             |
| 10544689     | 4921507P07Rik | RIKEN cDNA 4921507P07 gene                                                                | BC055110        | down      | 0.03             | ns             |
| 10556962     | Vwa3a       | von Willebrand factor A domain containing 3A                                               | NM_177697       | down      | 0.03             | ns             |
| 10576010     | Gse1        | genetic suppressor element 1                                                               | NM_198671       | up         | 0.03             | ns             |
| 10515716     | BC059842    | cDNA sequence BC059842                                                                     | ENSMUST00000075406 | down    | 0.03             | ns             |
| 10573115     | Rnf150      | ring finger protein 15                                                                     | NM_177376       | up         | 0.03             | ns             |
| 10345882     | Mrps9       | mitochondrial ribosomal protein S9                                                         | NM_022514       | down      | 0.03             | ns             |
| 10579406     | Arrdc2      | arrestin domain containing 2                                                               | NM_027560       | up         | 0.03             | ns             |
| 10542104     | ENSMUSG0000059659 | predicted gene, ENSMUSG0000059659                                                          | ENSMUST00000082030 | up     | 0.03             | ns             |
| 10586128     | ---         | snRNA chromosome:NCBI37:9:63290126:63290267:1 gene:ENSMUSG00000065679                   | ENSMUST0000003745 | up       | 0.03             | ns             |
| 10469951     | Rnf208      | ring finger protein 208                                                                    | NM_176834       | down      | 0.03             | ns             |
| 10576857     | Timm44      | translocase of inner mitochondrial membrane 44                                             | NM_011592       | down      | 0.03             | ns             |
| 10538290     | Snx10       | sorting nexin 10                                                                          | NM_028035       | down      | 0.03             | ns             |
| 10592629     | Grik4       | glutamate receptor, ionotropic, kainate 4                                                  | NM_175481       | down      | 0.03             | ns             |
| 10589494     | Cspg5       | chondroitin sulfate proteoglycan 5                                                         | NM_013884       | down      | 0.03             | ns             |
| 10434436     | EG328644    | predicted gene, EG328644                                                                   | BC125016        | down      | 0.03             | ns             |
| 10579659     | Hmgr2       | high mobility group nucleosomal binding domain 2                                           | NM_016957       | down      | 0.03             | ns             |
| 10492252     | Schip1      | schwannomin interacting protein 1                                                          | NM_001113       | up         | 0.03             | 0.04           |
| 10542714     | Lym5        | LYR motif containing 5                                                                    | NM_133688       | down      | 0.03             | ns             |
| 10599224     | T1T0002L01Rik | RIKEN cDNA T1T0002L01 gene                                                                | ENSMUST0000005903 | up       | 0.03             | ns             |
| 10591773     | Hmgr2       | high mobility group nucleosomal binding domain 2                                           | NM_016957       | down      | 0.03             | ns             |
| 10533323     | Adam1a      | a disintegrin and metalloproteinase domain 1a                                              | NM_172126       | up         | 0.03             | ns             |
| 10384192     | Tbrg4       | transforming growth factor beta regulated gene 4                                            | NM_134011       | down      | 0.03             | ns             |
| 10433163     | Ppp1r1a     | protein phosphatase 1, regulatory (inhibitor) subunit 1A                                    | NM_021391       | down      | 0.03             | ns             |
| 10386785     | Rapl23a     | ribosomal protein L23a                                                                     | AF583567        | down      | 0.03             | ns             |
| 10369661     | Ccarr1      | cell division cycle and apoptosis regulator 1                                               | NM_026201       | up         | 0.03             | ns             |
| 10423577     | Mdh1        | metallothalin                                                                             | NM_026002       | down      | 0.03             | ns             |
| 10532984     | Dynl1       | dynein light chain LC8-type 1                                                              | NM_019682       | up         | 0.03             | ns             |
| 10607116     | Ammecr1     | Alport syndrome, mental retardation, midface hypoplasia and                               | NM_019496       | down      | 0.03             | ns             |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|-----------------|----------------|
| 10397189     | Ptg2        | prostaaglandin reductase 2 | NM_029880 | down      | 0.03            | ns             |
| 10572679     | Glt25d1     | glycoyltransferase 25 domain containing 1 | NM_146211 | down      | 0.03            | ns             |
| 10562055     | Gbas        | glioblastoma amplified sequence | NM_008095 | down      | 0.03            | ns             |
| 10439442     | Pla1a       | phospholipase A1 member A | NM_134102 | up         | 0.03            | ns             |
| 10377612     | Plscr3      | phospholipid scramblase 3 | NM_023564 | down      | 0.03            | ns             |
| 10458033     | Stard4      | STAR-related lipid transfer (START) domain containing 4 | NM_133774 | down      | 0.03            | ns             |
| 10472418     | OTTUG00000 0013098 | predicted gene, OTTUG00000013098 | AK039017 | down      | 0.03            | ns             |
| 10592600     | 6030438E02Rik | RIKEN cDNA 6030438E02 gene | ENSMUST0 000094889 | up         | 0.03            | ns             |
| 10579054     | 4930467E23Rik // EG665756 | RIKEN cDNA 4930467E23 gene // predicted gene, EG665756 | ENSMUST0 000084046 | down      | 0.03            | 0.04           |
| 10364030     | Adora2a     | adenosine A2a receptor | NM_009630 | down      | 0.03            | ns             |
| 10502205     | Hadh        | hydroxacyl-Coenzyme A dehydrogenase | NM_008212 | down      | 0.03            | ns             |
| 10597751     | Axud1       | AXIN1 up-regulated 1 | NM_153287 | up         | 0.03            | ns             |
| 10408047     | OTTUG00000 0018077 | predicted gene, OTTUG0000018077 | AK132930 | down      | 0.03            | ns             |
| 10438445     | Kih6        | kelch-like 6 (Drosophila) | NM_183390 | down      | 0.03            | ns             |
| 10591164     | ---         | known chromosome:NCBI:37:9:18265539: 18282707::1 gene:ENSMUSG00000074500 | ENSMUST0 000034646 | down      | 0.03            | ns             |
| 10441055     | Pdgf        | phosphatidylinositol glycan anchor biosynthesis, class P | NM_019543 | down      | 0.03            | ns             |
| 10378038     | Wscd1       | WSC domain containing 1 | NM_177618 | down      | 0.03            | ns             |
| 10595658     | Rbm15b      | RNA binding motif protein 15B | ENSMUST0 000096424 | up         | 0.03            | ns             |
| 10560551     | Sfrs16      | splicing factor, arginine/serine-rich 16 | NM_016680 | down      | 0.03            | ns             |
| 10358565     | Hmcn1       | hemicentin 1 | NM_001024 | down      | 0.03            | ns             |
| 10584208     | Cdon        | cell adhesion molecule-related/down-regulated by oncogenes | NM_021339 | down      | 0.03            | ns             |
| 10448707     | Tbl3        | transducin (beta)-like 3 | NM_145396 | down      | 0.03            | ns             |
| 10354031     | Jsga10      | testis specific 10 | NM_207228 | up         | 0.03            | ns             |
| 10471519     | Tor2a       | torsin family 2, member A | NM_152800 | down      | 0.03            | ns             |
| 10528090     | Kudc3b      | RUN domain containing 3B | NM_198620 | down      | 0.03            | ns             |
| 10403945     | Hbt1h4      | histone cluster 1, H4j | NM_176210 | up         | 0.03            | 0.008          |
| 10577608     | Tacc1       | transforming, acidic coiled-coil containing protein 1 | NM_177089 | up         | 0.03            | ns             |
| 10365123     | Dohh        | deoxyhypusine hydroxylase/monoxygenase | AK080664 | up         | 0.03            | ns             |
| 10417275     | ---         | novel chromosome:NCBI:14:20434352: 20436596:1 gene:ENSMUSG00000068776 | ENSMUST0 000090639 | up         | 0.03            | ns             |
| 10387936     | Spag7       | sperm associated antigen 7 | NM_172561 | down      | 0.03            | ns             |
| 10587012     | Ccpg1       | cell cycle progression 1 | NM_001114 | up         | 0.03            | ns             |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|------------------|
| LOC675799    | Mtrm4       | similar to suppressor of cytokine signaling 6 | XR_032694 | up        | 0.03             | ns               |
| NM_133215    | Grm2        | glutamate receptor, metabotropic 2 | NM_010041 | up        | 0.03             | 0.04             |
| NM_175031    | Stk36       | serine/threonine kinase 36 (fused homolog, Drosophila) | NM_01081636 | up        | 0.03             | ns               |
| NM_027986    | Cdadc1      | cytidine and dCMP deaminase domain containing 1 | NM_026410 | down      | 0.03             | ns               |
| NM_005388    | S100a16      | S100 calcium binding protein A16 | NM_145412 | up        | 0.03             | ns               |
| NM_001081315 | Tkt          | transketolase | ---       | ---       | 0.03             | ns               |
| NM_5830457O10Rik | RIKEN cDNA 5830457O10 gene | GENSCAN0000035901 | ---       | ---       | 0.03             | ns               |
| NM_01081315 | Brpf3       | bromodomain and PHD finger containing, 3 | NM_015795 | down      | 0.03             | ns               |
| NM_027698 | Cpm          | carboxypeptidase M | NM_011189 | down      | 0.03             | ns               |
| NM_019424 | Hps1         | Hermansky-Pudlak syndrome 1 homolog (human) | NM_01029983 | down      | 0.03             | ns               |
| NM_013762 | Rpl3         | ribosomal protein L3 | NM_178746 | up        | 0.03             | ns               |
| NM_010041720 | Slc38a9      | solute carrier family 38, member 9 | NM_01024188 | down      | 0.03             | ns               |
| NM_1830457F14 | Hmn1        | hemicentin 1 | NM_01113185 | up        | 0.03             | ns               |
| NM_01080796 | Aff1         | AF-4/FMR2 family, member 1 | NM_019250 | up        | 0.03             | ns               |
| NM_0100007465 | Notch4      | Notch gene homolog 4 (Drosophila) | NM_010929 | up        | 0.03             | ns               |
| NM_015730 | Chrn4        | cholinergic receptor, nicotinic, alpha polypeptide 4 | AK134580 | down      | 0.03             | ns               |
| NM_009129 | Sgcl2        | secretogranin II | NM_008503 | up        | 0.03             | 0.05             |
| NM_010480 | Rps2         | ribosomal protein S2 | NM_008503 | down      | 0.03             | ns               |
| NM_010480 | Hspa9a1      | heat shock protein 90, alpha (cytosolic), class A member 1 | NM_01081636 | up        | 0.03             | ns               |
| NM_007862 | Dlg1         | discs, large homolog 1 (Drosophila) | NM_145595 | down      | 0.03             | ns               |
| NM_022410 | Myh9         | myosin, heavy polypeptide 9, non-muscle | NM_010480 | up        | 0.03             | ns               |
| NM_010480 | ---          | --- | --- | --- | --- | --- | --- |
| NM_01007642 | ---          | --- | --- | --- | --- | --- | --- |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|------------------|
| 10442240     | Zfp760      | zinc finger protein 760  | NM_001008 | up        | 0.03             | ns               |
| 10439766     | Prv1        | poliovirus receptor-related 3 | NM_021496 | down      | 0.03             | ns               |
| 10505623     | D4Bwg0951e  | DNA segment, Chr 4, Brigham & Women's Genetics 0951 expressed | BC030404   | up        | 0.03             | ns               |
| 10576118     | 9330133O14Rik | RIKEN cDNA 9330133O14 gene | BC094355   | down      | 0.03             | ns               |
| 10462702     | Hectd2      | HECT domain containing 2  | NM_172637 | up         | 0.03             | ns               |
| 10443021     | Alp6V0e     | ATPase, H+ transporting, lysosomal V0 subunit E | NM_029272 | up         | 0.03             | ns               |
| 10365845     | Fgd6        | FYVE, RhoGEF and PH domain containing 6 | NM_053072 | up         | 0.03             | ns               |
| 10495134     | 10043129    | predicted gene, 10043129  | XM_001479 | down      | 0.03             | ns               |
| 10502696     | Spata1      | spermatogenesis associated 1 | NM_027617 | up         | 0.03             | ns               |
| 10396421     | Hif1a       | hypoxia inducible factor 1, alpha subunit | NM_010431 | down      | 0.03             | ns               |
| 10418905     | 3110001K24Rik | RIKEN cDNA 3110001K24 gene | NM_029389 | down      | 0.03             | ns               |
| 10601857     | Ngfrap1     | nerve growth factor receptor (TNFRSF16) associated protein 1 | NM_009750 | down      | 0.03             | ns               |
| 10472277     | March7      | membrane-associated ring finger (C3HC4) 7 | NM_020575 | down      | 0.03             | ns               |
| 10601569     | Pcdh11x     | protocadherin 11 X-linked | NM_001081 | down      | 0.03             | ns               |
| 10427255     | Tarbp2      | TAR (HIV) RNA binding protein 2 | NM_009319 | down      | 0.03             | ns               |
| 10465314     | Capn1       | calpain 1                | NM_007600 | down      | 0.03             | ns               |
| 10373027     | Tspan31     | tetraspanin 31           | NM_025982 | up         | 0.03             | ns               |
| 10457546     | Osbpl1a     | oxysterol binding protein-like 1A | NM_207530 | down      | 0.03             | 0.03             |
| 10560983     | Dedd2       | death effector domain-containing DNA binding protein 2 | NM_207677 | up         | 0.03             | ns               |
| 10472514     | Nostrin     | nitric oxide synthase trafficker | NM_181547 | up         | 0.03             | ns               |
| 10571705     | Ifr2        | interferon regulatory factor 2 | NM_008391 | up         | 0.03             | ns               |
| 10357875     | Btg2        | B-cell translocation gene 2, anti-proliferative | NM_005750 | up         | 0.03             | ns               |
| 10365219     | EG237412    | predicted gene, EG237412  | DQ459435  | down      | 0.03             | ns               |
| 10443817     | Pknox1      | Pbx/knotted 1 homebox    | NM_016670 | up         | 0.03             | ns               |
| 10413897     | Ercc6       | excision repair cross-complementing rodent repair deficiency, complementation group 6 | NM_001081 | up         | 0.03             | ns               |
| 10413220     | ENSMUSG00000072684 | predicted gene, ENSMUSG00000072684 | ENSMUSG00000072684 | up | 0.03 | ns |
| 10565250     | Mesdc1      | mesoderm development candidate 1 | NM_030705 | up         | 0.03             | ns               |
| 10445976     | A1314976    | expressed sequence A1314976 | BC022574 | down      | 0.03             | ns               |
| 10542397     | H2afj       | H2A histone family, member J | NM_177688 | up         | 0.03             | ns               |
| 10535979     | Rfci        | replication factor C (activator 1) 3 | NM_022009 | up         | 0.03             | ns               |
| 10524338     | Grib1       | crystallin, beta B1      | NM_023695 | up         | 0.03             | ns               |
| 10512499     | Tpm2        | tropomyosin 2, beta      | NM_009416 | down      | 0.03             | ns               |
| 10490569     | Kcnq2       | potassium voltage-gated channel, subfamily Q, member 2 | NM_010611 | up         | 0.03             | ns               |
| 10523766     | Lrcc8c      | leucine rich repeat containing 8 family, member C | NM_133897 | up         | 0.03             | ns               |
| 10457225     | Map3k8      | mitogen-activated protein kinase kinase kinase 8 | NM_007746 | up         | 0.03             | ns               |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|-----------------|-----------------|
| 10362717     | Wasf1       | WASP family 1            | NM_031877 | down      | 0.03            | ns              |
| 10574743     | Plekha4     | pleckstrin homology domain containing, family G (with RhoGef domain) member 4 | NM_001081 | up        | 0.03            | ns              |
| 10358627     | Hmcn1       | hemicentin 1             | NM_001024 | down      | 0.03            | ns              |
| 10597823     | Lyz4        | lysozyme-like 4          | NM_026915 | up        | 0.03            | ns              |
| 10556812     | Lyr1        | LYT motif containing 1   | NM_029610 | down      | 0.03            | ns              |
| 10607752     | Bmx         | BMX non-receptor tyrosine kinase | NM_009759 | down      | 0.03            | ns              |
| 10524889     | Ksr2        | kinase suppressor of ras 2 | NM_001114 | down      | 0.03            | ns              |
| 10358605     | Hmcn1       | hemicentin 1             | NM_001024 | down      | 0.03            | ns              |
| 10565794     | Serpinh1    | serine (or cysteine) peptidase inhibitor, clade H, member 1 | NM_009825 | up        | 0.03            | ns              |
| 10490706     | Znf512b     | zinc finger protein 512B | ENSMUST0 000108789 | down | 0.03 | ns |
| 10553849     | Rilpol1     | Rab interacting lysosomal protein-like 1 | NM_021430 | up        | 0.03            | ns              |
| 10576152     | Trappc2l     | trafficking protein particle complex 2-like | NM_021502 | down      | 0.03            | ns              |
| 10522467     | Ras11b      | RAS-like, family 11, member B | NM_026878 | down      | 0.03            | ns              |
| 10460926     | Sf1         | splicing factor 1        | NM_001110 | up        | 0.03            | ns              |
| 10424909     | Hsf1        | heat shock factor 1      | NM_008296 | up        | 0.03            | ns              |
| 10422946     | Ranbp3l     | Ran binding protein 3-like | NM_198024 | down      | 0.03            | ns              |
| 10532816     | Myo18b      | myosin XVIIb             | XM_912851 | up        | 0.03            | ns              |
| 10395807     | 1110008L16Rik | RIKEN cDNA 1110008L16 gene | BC034876 | down      | 0.03            | ns              |
| 10470788     | Odf2        | outer dense fiber of sperm tails 2 | NM_001113 | down      | 0.03            | ns              |
| 10437432     | Nmrl1       | Nmrl-like family domain containing 1 | NM_026393 | down      | 0.03            | ns              |
| 10404069     | Hist11h1a   | histone cluster 1, H1a   | NM_030609 | down      | 0.03            | ns              |
| 10575651     | Kcnn1       | potassium channel, subfamily K, member 1 | NM_008430 | up        | 0.03            | ns              |
| 10448506     | Ccnf        | cyclin F                 | NM_007634 | up        | 0.03            | ns              |
| 10418766     | Ankrd28     | ankyrin repeat domain 28 | NM_001024 | down      | 0.03            | ns              |
| 10430725     | Sf13        | suppression of tumorigenicity 13 | NM_133726 | up        | 0.03            | ns              |
| 10550915     | Cadm4       | cell adhesion molecule 4 | NM_153112 | down      | 0.03            | ns              |
| 10358654     | Hmcn1       | hemicentin 1             | NM_001024 | down      | 0.03            | ns              |
| 10381304     | Vps25       | vacuolar protein sorting 25 (yeast) | NM_026776 | down      | 0.03            | ns              |
| 10387483     | Efnb3       | ephrin B3                | NM_007911 | down      | 0.03            | ns              |
| 10478285     | 9430021M05Rik | RIKEN cDNA 9430021M05 gene | ENSMUST0 000097526 | down | 0.03 | ns |
| 10421922     | ---         | Genscan chromosome:NCBI37:14:93001677: 93003616-1 | GENSCAN0 000018713 | up | 0.03 | 0.005 |
| 10430929     | Tbrg3       | transforming growth factor beta regulated gene 3 | BC095996 | up        | 0.03            | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|-----------------|
| 10543273     | Ctnbp2      | cortactin binding protein 2 | NM_080285 | up        | 0.03             | ns               |
| 10479596     | Zgpat       | zinc finger, CCCH-type with G patch domain | NM_001048-148 | up        | 0.03             | 0.004            |
| 10448307     | Tnfrsf12a   | tumor necrosis factor receptor superfamily, member 12a | NM_013749 | up        | 0.03             | ns               |
| 10582474     | Chmp1a      | chromatin modifying protein 1A | NM_145606 | down      | 0.03             | ns               |
| 10564849     | 2610034B18Rik | RIKEN cDNA 2610034B18 gene | BC031379 | down      | 0.04             | ns               |
| 10536746     | Arf6        | ADP-ribosylation factor 5 | NM_0017480 | down      | 0.04             | ns               |
| 10594631     | Aph1b       | anterior pharynx defective 1b homolog (C. elegans) | NM_177583 | up        | 0.04             | ns               |
| 10398678     | Eif5        | eukaryotic translation initiation factor 5 | NM_173363 | down      | 0.04             | ns               |
| 10446235     | Trip10      | thyroid hormone receptor interactor 10 | NM_134125 | up        | 0.04             | ns               |
| 10480714     | Uap1f11     | UDP-N-acetylglicosamine pyrophosphorylase 1-like 1 | NM_001033-203 | down      | 0.04             | ns               |
| 10600480     | 4930408F14Rik | RIKEN cDNA 4930408F14 gene | BC117726 | up        | 0.04             | ns               |
| 10603230     | 4930408F14Rik | RIKEN cDNA 4930408F14 gene | BC117726 | up        | 0.04             | ns               |
| 10605353     | 4930408F14Rik | RIKEN cDNA 4930408F14 gene | BC117726 | up        | 0.04             | ns               |
| 10555262     | Xra1        | X-ray radiation resistance associated 1 | BC151014 | down      | 0.04             | ns               |
| 10433702     | Mpvl7       | Mpvl7 transgene, kidney disease mutant-like | NM_033564 | down      | 0.04             | ns               |
| 10572527     | EG665858    | predicted gene, EG665858 | ENSMUST000010075 | down      | 0.04             | 0.02             |
| 10388954     | Omg         | oligodendrocyte myelin glycoprotein | NM_019409 | down      | 0.04             | ns               |
| 10607475     | Prdx4       | peroxiredoxin 4 | NM_016764 | down      | 0.04             | ns               |
| 10576439     | Cog2        | component of oligomeric golgi complex 2 | NM_028746 | down      | 0.04             | ns               |
| 10497514     | Col20a1     | collagen, type XX, alpha 1 | BC016112 | up        | 0.04             | ns               |
| 10474096     | Lrrc4c      | leucine rich repeat containing 4C | NM_178725 | down      | 0.04             | ns               |
| 10561461     | Samd4b      | sterile alpha motif domain containing 4B | NM_175021 | up        | 0.04             | ns               |
| 10590497     | Zfp167      | zinc finger protein 167 | BC119591 | down      | 0.04             | ns               |
| 10564573     | Chd2        | chromodomain helicase DNA binding protein 2 | NM_001081-345 | up        | 0.04             | ns               |
| 10490352     | Taf4a       | TAF4A RNA polymerase II, TATA box binding protein (TBP)-associated factor | NM_001081-092 | up        | 0.04             | ns               |
| 10350188     | Tmem9       | transmembrane protein 9 | NM_025439 | down      | 0.04             | ns               |
| 10593492     | Zc3h12c     | zinc finger CCCH type containing 12C | AK220416 | up        | 0.04             | ns               |
| 10345368     | D1Ertd448e  | DNA segment, Chr 1, ERATO Dori 448, expressed | ENSMUST0000097783 | up        | 0.04             | ns               |
| 10369932     | Sus2d       | sushio domain containing 2 | NM_027890 | down      | 0.04             | ns               |
| 10486616     | Ubr1        | ubiquitin protein ligase E3 component n-reccognin 1 | NM_009461 | down      | 0.04             | ns               |
| 10507250     | Pomgnt1     | protein O-linked mannose beta 1,2-N-acetylglicosaminyltransferase | NM_026651 | down      | 0.04             | ns               |
| 10497481     | 2810416G20Rik | RIKEN cDNA 2810416G20 gene | ENSMUST0000057404 | down      | 0.04             | ns               |
| 10558285     | Zranb1      | zinc finger, RAN-binding domain containing 1 | NM_207302 | down      | 0.04             | 0.01             |
| 10413598     | Tmem110     | transmembrane protein 110 | NM_028839 | down      | 0.04             | ns               |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|------------------|
| 10427436     | C7          | complement component 7   | XM_356827 | down      | 0.04             | ns               |
| 10442083     | ---         | M10000561 Mus musculus let-7e stem-loop | --- | down | 0.04 | ns |
| 10481734     | Lrsam1      | leucine rich repeat and sterile alpha motif containing 1 | NM_199302 | down | 0.04 | ns |
| 10586011     | Larp6       | La ribonucleoprotein domain family, member 6 | NM_026235 | down | 0.04 | ns |
| 10373367     | Coq10a      | coenzyme Q10 homolog A (yeast) | NM_001081 040 | down | 0.04 | ns |
| 10511084     | Nudk        | NAD kinase               | NM_138871 | up | 0.04 | ns |
| 10428983     | D910001A06Rik | RIKEN cDNA 0910001A06 gene | BC011343 | down | 0.04 | ns |
| 10512739     | Xpa         | xeroderma pigmentosum, complementation group A | NM_011728 | down | 0.04 | ns |
| 10424945     | Kifc2       | kinesin family member C2 | NM_010630 | down | 0.04 | ns |
| 10411927     | Sdcag10     | serologically defined colon cancer antigen 10 | NM_026072 | down | 0.04 | ns |
| 10556208     | D930014E17Rik | RIKEN cDNA D930014E17 gene | NM_020616 | down | 0.04 | ns |
| 10586405     | Spg21       | spastic paraplegia 21 homolog (human) | NM_138584 | down | 0.04 | ns |
| 10481508     | Asb6        | ankyrin repeat and SOCS box-containing 6 | NM_133346 | up | 0.04 | ns |
| 10507594     | Slc2a1      | solute carrier family 2 (facilitated glucose transporter), member 1 | NM_011400 | up | 0.04 | ns |
| 10358978     | Iret5       | immediate early response 5 | NM_010500 | up | 0.04 | 3.96e-06 |
| 10571653     | Actg1       | actin, gamma, cytoplasmic 1 | NM_009609 | down | 0.04 | ns |
| 10456836     | St8a1a5     | ST8 alpha-N-acetyl-neuraminide alpha-2,8-sialyltransferase 5 | NM_153124 | up | 0.04 | 0.005 |
| 10543785     | AB041803    | cDNA sequence AB041803 | ENSMUST0 000015107 | up | 0.04 | ns |
| 10595402     | BC023892    | cDNA sequence BC023892 | ENSMUST0 0000098501 | up | 0.04 | ns |
| 10458251     | Sil1        | endoplasmic reticulum chaperone SIL1 homolog (S. cerevisiae) | NM_030749 | down | 0.04 | ns |
| 10488231     | Rps2        | ribosomal protein S2 | NM_008503 | down | 0.04 | ns |
| 10515220     | Faah        | fatty acid amidase hydrolase | NM_010173 | down | 0.04 | ns |
| 10442643     | Nme3        | non-metastatic cells 3, protein expressed in | NM_019730 | down | 0.04 | ns |
| 10468200     | Cuedc2      | CUE domain containing 2 | NM_024192 | down | 0.04 | ns |
| 10499309     | Apoa1bp     | apolipoprotein A1-binding protein | NM_144897 | down | 0.04 | ns |
| 10454514     | Lim2        | LIM and senescent cell antigen like domains 2 | NM_144862 | up | 0.04 | ns |
| 10451093     | Spats1      | spermatogenesis associated, senine-rich 1 | NM_027649 | down | 0.04 | ns |
| 10599641     | C230004F18Rik | RIKEN cDNA C230004F18 gene | AK062088 | up | 0.04 | ns |
| 10400357     | Bdz1a       | bromodomain adjacent to zinc finger domain 1A | NM_013815 | up | 0.04 | ns |
| 10453102     | Sfra7       | splicing factor, arginine/serine-rich 7 | NM_146083 | up | 0.04 | ns |
| 10605222     | Ira1k       | interleukin-1 receptor-associated kinase 1 | NM_005836 | down | 0.04 | ns |
| 10404061     | Histh2bb    | histone cluster 1, H2bb | NM_175664 | up | 0.04 | ns |
| 10572949     | Nrb3c2      | nuclear receptor subfamily 3, group C, member 2 | NM_001083 906 | down | 0.04 | 0.02 |
| 10572533     | Myo9b       | myosin IXb | NM_015742 | up | 0.04 | ns |
| 10468916     | Fam171a1    | family with sequence similarity 171, member A1 | NM_001081 161 | up | 0.04 | ns |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|------------------|
| 10511510     | Ints8       | integrator complex subunit 8 | NM_178112 | up        | 0.04             | ns               |
| 10403558     | Ero1l       | ERO1-like beta (S. cerevisiae) | NM_026184 | up        | 0.04             | ns               |
| 10346562     | Cfar        | CASP8 and FADD-like apoptosis regulator | NM_207653 | up        | 0.04             | ns               |
| 10579999     | Unc5d       | unc-5 homolog D (C. elegans) | NM_153135 | down      | 0.04             | ns               |
| 10555009     | ---         | MIO004692 Mus musculus miR-708 stem-loop | --- | up        | 0.04             | ns               |
| 10604566     | Gpc4        | glypican 4                | NM_008150 | down      | 0.04             | ns               |
| 10474526     | Lpcat4      | lysophosphatidylcholine acyltransferase 4 | NM_207206 | down      | 0.04             | ns               |
| 10378555     | Smyd4       | SET and MYND domain containing 4 | NM_001102 | down      | 0.04             | ns               |
| 10461369     | Ahnak       | AHNAK nucleoprotein (desmoyokin) | NM_009643 | up        | 0.04             | ns               |
| 10395719     | Npas3       | neuronal PAS domain protein 3 | NM_013780 | down      | 0.04             | ns               |
| 10561927     | Aplp1       | amyloid beta (A4) precursor-like protein 1 | NM_007467 | down      | 0.04             | ns               |
| 10569707     | Myadm       | myeloid-associated differentiation marker | NM_001093 | up        | 0.04             | ns               |
| 10572838     | Sin3b       | transcriptional regulator, SIN3B (yeast) | NM_009188 | up        | 0.04             | ns               |
| 10382022     | Ccdc44      | coiled-coil domain containing 44 | NM_027346 | up        | 0.04             | ns               |
| 10392449     | Wipi1       | WD repeat domain, phosphoinositide interacting 1 | NM_145940 | down      | 0.04             | ns               |
| 10576216     | Rpl13       | ribosomal protein L13        | AF357327  | down      | 0.04             | ns               |
| 10525733     | Setd8       | SET domain containing (lysine methyltransferase) 8 | NM_030241 | up        | 0.04             | ns               |
| 10404928     | C78339      | expressed sequence C78339     | NM_001033 | up        | 0.04             | ns               |
| 10481383     | Wdr34       | WD repeat domain 34          | NM_001008 | down      | 0.04             | ns               |
| 10580010     | Pkn1        | protein kinase N1            | NM_177262 | down      | 0.04             | ns               |
| 10356172     | 5033414K04Rik| RIKEN CDNA 5033414K04 gene   | BC002090  | up        | 0.04             | ns               |
| 10506843     | Ccd21b      | coiled-coil and C2 domain containing 1B | NM_177045 | down      | 0.04             | ns               |
| 10572580     | Use1        | unconventional SNARE in the ER 1 homolog (S. cerevisiae) | NM_025917 | down      | 0.04             | ns               |
| 10581538     | Nqo1        | NAD(P)H dehydrogenase, quinone 1    | NM_008706 | down      | 0.04             | ns               |
| 10473224     | Dusp19      | dual specificity phosphatase 19 | NM_024438 | up        | 0.04             | ns               |
| 10509228     | Hmnrpr      | heterogeneous nuclear ribonucleoprotein R    | NM_028871 | down      | 0.04             | ns               |
| 10355401     | Acp1        | acid phosphatase 1, soluble    | ENSMUST0 0000074039 | down      | 0.04             | ns               |
| 10410766     | Nr2f1       | nuclear receptor subfamily 2, group F, member 1 | NM_10151 | down      | 0.04             | ns               |
| 10379204     | Poldip2     | polymerase (DNA-directed), delta interacting protein 2 | NM_026389 | down      | 0.04             | ns               |
| 10449608     | Mdga1       | MAM domain containing glycosylphosphatidylinositol anchor 1 | NM_001081 | up        | 0.04             | ns               |
| 10490370     | Psm67       | proteasome (prosome, macropain) subunit, alpha type 7 | NM_011969 | down      | 0.04             | ns               |
| 10526923     | 1110007L15Rik| RIKEN CDNA 1110007L15 gene | BC019557 | down      | 0.04             | ns               |
| 10420155     | Dhrs1       | dehydrogenase/reductase (SDR family) member 1 | NM_026819 | down      | 0.04             | ns               |
| 10605999     | ---         | snoRNA chromosome:NCBI37:X:98336772:98336891-1 gene:ENSMUSG00000065180 | ENSMUST0 0000083246 | up        | 0.04             | ns               |
| 10578557     | Ccdc111     | coiled-coil domain containing 111 | NM_001001 | down      | 0.04             | ns               |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|-----------------|-----------------|
| 10456405     | Slomo1      | slowmo homolog 1 (Drosophila) | NM_144867 | down     | 0.04            | ns              |
| 10522596     | Tmem165     | transmembrane protein 165 | NM_011626 | down     | 0.04            | ns              |
| 10506254     | Raver2      | ribonucleoprotein, PTB-binding 2 | NM_183024 | up        | 0.04            | ns              |
| 10453318     | Abcg5       | ATP-binding cassette, sub-family G (WHITE), member 5 | NM_031884 | up        | 0.04            | ns              |
| 10588939     | Ech1        | enoyl Coenzyme A hydratase, short chain, 1, mitochondrial | NM_053119 | down     | 0.04            | ns              |
| 10506154     | Alg6        | asparagine-linked glycosylation 6 homolog (yeast, alpha 1,3- glucosyltransferase) | NM_001081 | down     | 0.04            | ns              |
| 10567095     | Calca       | calcitonin/calcitonin-related polypeptide, alpha | NM_207587 | up        | 0.04            | ns              |
| 10394245     | DnaJC27     | DnaJ (Hsp40) homolog, subfamily C, member 27 | NM_153082 | down     | 0.04            | ns              |
| 10578964     | 1810029B16Rik | RIKEN cDNA 1810029B16 gene | BC016246 | up        | 0.04            | ns              |
| 10374790     | ---         | Genscan chromosome;NCBI 11:128646529; 288657608:1 | GENSCAN0000027048 | up | 0.04        | ns              |
| 10543428     | Iqub        | IQ motif and ubiquitin domain containing | NM_172535 | up        | 0.04            | ns              |
| 10361110     | DlI         | denticleless homolog (Drosophila) | NM_029566 | down     | 0.04            | ns              |
| 10395142     | Sh3y1       | Sh3 domain YSC-like 1 | NM_031709 | down     | 0.04            | ns              |
| 10579663     | Eps15f1     | epidermal growth factor receptor pathway substrate 15-like 1 | NM_007944 | down     | 0.04            | ns              |
| 10497944     | Mfsd8       | major facilitator superfamily domain containing 8 | NM_028140 | up        | 0.04            | ns              |
| 10533176     | 1110008J03Rik | RIKEN cDNA 1110008J03 gene | BC021365 | up        | 0.04            | ns              |
| 10454369     | Fhod3       | formin homology 2 domain containing 3 | NM_175276 | down     | 0.04            | ns              |
| 10562911     | Tbc1d17     | TBC1 domain family, member 17 | NM_001042 | down     | 0.04            | ns              |
| 10494821     | Tsap2       | tetraspanin 2 | NM_027533 | down     | 0.04            | 0.02            |
| 10380137     | Bzrap1      | benzo diazepine receptor associated protein 1 | NM_172449 | down     | 0.04            | ns              |
| 10393879     | Mafg        | v-maf musculoaponeurotic fibrosarcoma oncogene family, protein G (avian) | AK047224 | up        | 0.04            | ns              |
| 10458046     | D0H4S114    | DNA segment, human D4S114 | NM_055078 | down     | 0.04            | ns              |
| 10499988     | 2310007A19Rik | RIKEN cDNA 2310007A19 gene | BC107021 | down     | 0.04            | ns              |
| 10511042     | C030017K20Rik | RIKEN cDNA C030017K20 gene | BC113188 | up        | 0.04            | ns              |
| 10494227     | Lass2       | LAG1 homolog, ceramide synthase 2 | NM_029789 | down     | 0.04            | ns              |
| 10456392     | Cidea       | cell death-inducing DNA fragmentation factor, alpha subunit-like effector A | NM_057702 | down     | 0.04            | ns              |
| 10515700     | BC059842    | cDNA sequence BC059842 | ENSMUST0000075406 | down     | 0.04            | ns              |
| 10374012     | Ras10a      | RAS-like family 10, member A | NM_145216 | up        | 0.04            | 0.01            |
| 10404059     | Hist1h1c    | histone cluster 1, H1c | NM_015786 | down     | 0.04            | ns              |
| 10438530     | Clcn2       | chloride channel 2 | NM_009900 | down     | 0.04            | ns              |
| 10368486     | Rnf146      | ring finger protein 146 | NM_001110 | down     | 0.04            | ns              |
| 10347748     | Acs13       | acyl-CoA synthetase long-chain family member 3 | NM_028817 | up        | 0.04            | ns              |
| 10458424     | Taf7        | TAF7 RNA polymerase II, TATA box binding protein (TBP)- | NM_175770 | up        | 0.04            | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                                                 | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|-----------------------------------------------------------------------------------------|-----------|-----------|------------------|-----------------|
| 10531193     | Adarnt3     | associated factor                                                                        | NM_001081 | down      | 0.04             | ns              |
| 10383575     | Tbcd        | tubulin-specific chaperone d                                                           | NM_029878 | down      | 0.04             | ns              |
| 10467688     | Exosc1      | exosome component 1                                                                     | NM_025644 | down      | 0.04             | ns              |
| 10511901     | Ankrd6      | ankyrin repeat domain 6                                                                 | NM_001012 | up        | 0.04             | ns              |
| 10459138     | Slc6a7      | solute carrier family 6 (neurotransmitter transporter, L-proline), member 7            | NM_201353 | down      | 0.04             | ns              |
| 10531987     | Gbp4        | guanylate binding protein 4                                                             | NM_008620 | down      | 0.04             | ns              |
| 10517250     | Ext1        | exostoses (multiple)-like 1                                                             | NM_019578 | down      | 0.04             | ns              |
| 10394843     | ---         | Genescan chromosome:NCBIM37:12:20274447: 20283883:1                                     | GENSCAN0000015114 | down     | 0.04             | ns              |
| 10435714     | Tmem39a     | transmembrane protein 39a                                                               | NM_026407 | up        | 0.04             | ns              |
| 10437687     | Lita1       | LPS-induced TN factor                                                                   | NM_019980 | down      | 0.04             | ns              |
| 10574676     | Noi3        | nucleolar protein 3 (apoptosis repressor with CARD domain)                              | NM_030152 | down      | 0.04             | ns              |
| 10538100     | Repin1      | replication initiator 1                                                                 | NM_001079 | down      | 0.04             | ns              |
| 10565152     | 9330120H11Rik| RIKEN cDNA 9330120H11 gene                                                               | ENSMUST0000098326 | up        | 0.04             | ns              |
| 10541522     | Rps2        | ribosomal protein S2                                                                    | NM_008503 | down      | 0.04             | ns              |
| 10365601     | Gnatb       | N-acetylglucosamine-1-phosphate transferase, alpha and beta subunits                    | NM_001004 | up        | 0.04             | ns              |
| 10428052     | Cc5         | chaperonin containing Tcp1, subunit 5 (epsilon)                                        | NM_007637 | up        | 0.04             | ns              |
| 10348000     | 2810459M11Rik| RIKEN cDNA 2810459M11 gene                                                               | BC137675  | down      | 0.04             | ns              |
| 10376263     | Mfap3       | microfilibrar-associated protein 3                                                      | NM_145426 | up        | 0.04             | ns              |
| 10553788     | Atp10a      | ATPase, class V. type 10A                                                                | NM_009728 | up        | 0.04             | ns              |
| 10430770     | Tob2        | transducer of ERBB2, 2                                                                   | NM_020507 | up        | 0.04             | ns              |
| 10578623     | Wwc2        | WW, C2 and coiled-coil domain containing 2                                              | NM_133791 | down      | 0.04             | ns              |
| 10350753     | Olii        | glutamate-ammonia ligase (glutamine synthetase)                                         | NM_008131 | up        | 0.04             | ns              |
| 10359982     | Mr1         | major histocompatibility complex, class I-related                                        | NM_008209 | down      | 0.04             | ns              |
| 10438376     | Rps2        | ribosomal protein S2                                                                    | NM_008503 | down      | 0.04             | ns              |
| 10501827     | A730020M07Rik| RIKEN cDNA A730020M07 gene                                                               | ENSMUST0000050571 | up | 0.04             | ns              |
| 10553015     | Bcat2       | branched chain aminotransferase 2, mitochondrial                                       | NM_009737 | up        | 0.04             | ns              |
| 10427538     | Nipbl       | Nipped-B homolog (Drosophila)                                                          | NM_201232 | up        | 0.04             | ns              |
| 10412559     | Slbp        | stem-loop binding protein                                                                | NM_009193 | down      | 0.04             | ns              |
| 10351056     | Ankrd45     | ankyrin repeat domain 45                                                                 | BC549713  | up        | 0.04             | ns              |
| 10582094     | Mbtbs1      | membrane-bound transcription factor peptidase, site 1                                   | NM_019709 | down      | 0.04             | ns              |
| 10369732     | Arid5b      | A1 rich interactive domain 5B (MRF1-like)                                              | NM_023598 | up        | 0.04             | 0.05            |
| 10460312     | Cdk2ap2     | CDK2-associated protein 2                                                                | NM_026373 | up        | 0.04             | 0.05            |
| 10451547     | LOC100043385| similar to high mobility group nucleosomal binding domain 2                             | ENSMUST0000098326 | down | 0.04             | ns              |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|------------------|
| 10579060 | 4930467E23Rik // EG665756 | RIKEN cDNA 4930467E23 gene // predicted gene, EG665756 | ENSMUST00000071525 | down | 0.04 | ns |
| 10494509 | Pias3 | protein inhibitor of activated STAT 3 | NM_146135 | down | 0.04 | ns |
| 10508711 | Taf12 | TAF12 RNA polymerase II, TATA box binding protein (TBP)-associated factor | NM_025579 | up | 0.04 | 0.02 |
| 10560945 | Grik5 | glutamate receptor, ionotropic, kainate 5 (gamma 2) | NM_008168 | down | 0.04 | ns |
| 10420659 | L330409N04Rik | RIKEN cDNA L330409N04 gene | BC070115 | down | 0.04 | ns |
| 10378988 | Phf12 | PHD finger protein 12 | NM_174852 | down | 0.04 | ns |
| 10430166 | Grik3044G20Rik | RIKEN cDNA Grik3044G20 gene | NM_053264 | up | 0.05 | ns |
| 10520234 | 2010209O12Rik | RIKEN cDNA 2010209O12 gene | NM_133913 | down | 0.05 | ns |
| 10526181 | Gats | opposite strand transcription unit to Stag3 | NM_030719 | up | 0.05 | 0.03 |
| 10465424 | OTTUSG0000018617 | predicted gene, OTTUSG0000018617 | ENSMUST00000071525 | down | 0.05 | ns |
| 10501860 | Fnbp11 | formin binding protein 1-like | NM_001114665 | up | 0.05 | ns |
| 10547282 | Zfp9 | zinc finger protein 9 | NM_011763 | down | 0.05 | ns |
| 10350146 | Phlda3 | pleckstrin homology-like domain, family A, member 3 | NM_013750 | down | 0.05 | ns |
| 10488156 | Kif16b | kinesin family member 16B | NM_001081133 | down | 0.05 | ns |
| 10482772 | Nra4a | nuclear receptor subfamily 4, group A, member 2 | NM_013613 | up | 0.05 | ns |
| 10575021 | Zfp90 | zinc finger protein 90 | NM_011764 | down | 0.05 | ns |
| 10375439 | Med7 | mediator complex subunit 7 | NM_025426 | up | 0.05 | ns |
| 10519857 | Hgf | hepatocyte growth factor | NM_010427 | down | 0.05 | ns |
| 10579852 | Mmaa | methylmalonic aciduria (cobalamin deficiency) type A | NM_133823 | up | 0.05 | ns |
| 10542395 | Aif7ip | activating transcription factor 7 interacting protein | ENSMUST0000006689 | down | 0.05 | ns |
| 10396362 | Rian | RNA imprinted and accumulated in nucleus | AF357355 | up | 0.05 | ns |
| 10570418 | Uf3a | UPF3 regulator of nonsense transcripts homolog (yeast) | NM_025924 | down | 0.05 | ns |
| 10468292 | ENSMUSG0000071525 | predicted gene, ENSMUSG00000071525 | AK086428 | up | 0.05 | ns |
| 10361375 | Fbox5 | F-box protein 5 | NM_025995 | down | 0.05 | 0.05 |
| 10590821 | 9230110C19Rik | RIKEN cDNA 9230110C19 gene | BC115525 | up | 0.05 | ns |
| 10597960 | Sld6a20a | solute carrier family 6 (neurotransmitter transporter), member 20A | NM_139142 | down | 0.05 | 0.04 |
| 10410452 | Srd5a1 | steroid 5 alpha-reductase 1 | NM_175283 | down | 0.05 | ns |
| 10453166 | Cdk14 | cyclin-dependent kinase-like 4 | NM_001033443 | down | 0.05 | ns |
| 10406663 | Arsh | arylsulfatase B | NM_009712 | down | 0.05 | ns |
| 10464504 | Lrp5 | low density lipoprotein receptor-related protein 5 | NM_008513 | up | 0.05 | ns |
| 10358583 | Hmnc1 | hemicentin 1 | NM_001024720 | down | 0.05 | ns |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                                                 | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|-----------------------------------------------------------------------------------------|-----------|-----------|------------------|------------------|
| 10381018     | 4121402D02Rik | RIKEN cDNA 4121402D02 gene                                                              | NM_028722 | up        | 0.05             | ns               |
| 10346260     | Osgepl      | O-sialoglycoprotein endopeptidase-like 1                                               | NM_028091 | down      | 0.05             | ns               |
| 10415159     | Thtpa       | thiamine triphosphatase                                                                 | NM_153083 | down      | 0.05             | 0.04             |
| 10447602     | Ezr         | ezrin                                                                                    | NM_009510 | up         | 0.05             | ns               |
| 10449258     | Arhdig      | Rho GDP dissociation inhibitor (GDI) gamma                                               | NM_008113 | down      | 0.05             | ns               |
| 10507218     | Mknk1       | MAP kinase-interacting serine/threonine kinase 1                                         | NM_021461 | down      | 0.05             | 0.007            |
| 10567564     | Cdr2        | cerebellar degeneration-related 2                                                       | NM_007672 | up         | 0.05             | ns               |
| 10461423     | Fads3       | fatty acid desaturase 3                                                                 | NM_021890 | down      | 0.05             | ns               |
| 10495675     | F3          | coagulation factor III                                                                  | NM_018171 | up         | 0.05             | ns               |
| 10377927     | Rnf167      | ring finger protein 16                                                                   | NM_027445 | down      | 0.05             | ns               |
| 10402314     | Rps2        | ribosomal protein S2                                                                    | NM_008503 | down      | 0.05             | ns               |
| 10501649     | Rtdc1       | RNA terminal phosphate cyclase domain 1                                                 | NM_025517 | down      | 0.05             | ns               |
| 10365983     | Lum         | lumican                                                                                  | NM_008524 | down      | 0.05             | ns               |
| 10523772     | Lrc8d       | leucine rich repeat containing 8D                                                       | NM_178701 | down      | 0.05             | ns               |
| 10604424     | Zip280c     | zinc finger protein 280c                                                                 | NM_153532 | down      | 0.05             | ns               |
| 10368993     | Lace1       | lactation elevated 1                                                                    | NM_145743 | up         | 0.05             | ns               |
| 10476886     | Sstr4       | somatostatin receptor 4                                                                  | NM_009219 | up         | 0.05             | ns               |
| 1037357      | Ormdl2      | ORMT-like 2 (S. cerevisiae)                                                              | NM_024180 | up         | 0.05             | ns               |
| 10487382     | Fahd2a      | fumarylacetoacetate hydrolase domain containing 2A                                       | NM_029629 | down      | 0.05             | ns               |
| 10472199     | Upp2        | uridine phosphorylase 2                                                                 | NM_029692 | down      | 0.05             | ns               |
| 10594353     | Map2k5      | mitogen-activated protein kinase kinase 5                                               | NM_011840 | down      | 0.05             | ns               |
| 10585328     | 4930510E17Rik | RIKEN cDNA 4930510E17 gene                                                             | ENSMUST0 0000034550 | up | 0.05             | ns               |
| 10498064     | Setd7       | SET domain containing (lysine methyltransferase) 7                                      | NM_080793 | up         | 0.05             | ns               |
| 10477604     | Itch        | itchy, E3 ubiquitin protein ligase                                                      | NM_008395 | up         | 0.05             | ns               |
| 10362538     | Lama4       | laminin, alpha 4                                                                        | NM_010681 | down      | 0.05             | ns               |
| 10430997     | Pacsin2     | protein kinase C and casein kinase substrate in neurons 2                               | NM_011862 | up         | 0.05             | ns               |
| 10551215     | Rnf170      | ring finger protein 17                                                                   | ENSEMBL0 000014022 | down | 0.05             | ns               |
| 10467139     | Lipa        | lysosomal acid lipase A                                                                  | NM_021460 | up         | 0.05             | ns               |
| 10412562     | Flnb        | filamin, beta                                                                           | NM_134080 | down      | 0.05             | ns               |
| 10364702     | Midn        | midnolin                                                                                 | NM_021565 | up         | 0.05             | 0.0006           |
| 10469867     | Phnla7      | patatin-like phospholipase domain containing 7                                          | NM_146251 | up         | 0.05             | ns               |
| 10495316     | Pscr1       | proline/serine-rich coiled-coil 1                                                       | NM_019976 | up         | 0.05             | ns               |
| 10448341     | 4930505H01Rik | RIKEN cDNA 4930505H01 gene                                                               | ARTS2667  | up         | 0.05             | ns               |
| 10439881     | 5330426P16Rik | RIKEN cDNA 5330426P16 gene                                                               | ENSEMBL0 000008998 | up | 0.05             | ns               |
| 10505526     | ---         | Mouse LLRep3 protein mRNA, complete cds                                                 | M20632   | down      | 0.05             | ns               |
| 10477929     | 1110008F13Rik | RIKEN cDNA 1110008F13 gene                                                               | NM_026124 | up         | 0.05             | ns               |
| 10494069     | Tnrc4       | trinucleotide repeat containing 4                                                      | NM_172434 | down      | 0.05             | ns               |
| 10582743     | Pcnxl2      | pecane-like 2 (Drosophila)                                                              | NM_175561 | down      | 0.05             | ns               |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                      | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------------------------------------------|-----------|-----------|------------------|------------------|
| 10393767     | Osbp2       | oxysterol binding protein 2                                   | NM_152818 | down      | 0.05             | ns               |
| 10484440     | Zdhc5       | zinc finger, DHHC domain containing 5                        | NM_144887 | up        | 0.05             | ns               |
| 10488797     | Pxm4        | peroxisomal membrane protein 4                               | NM_021534 | down      | 0.05             | ns               |
| 10500327     | Hist2h3c2   | histone cluster 2, H3c2                                       | NM_054045 | up        | 0.05             | ns               |
| 10385599     | Canx        | calnexin                                                     | NM_007597 | up        | 0.05             | ns               |
| 10595109     | Lrcc1       | leucine rich repeat containing 1                             | NM_172528 | up        | 0.05             | ns               |
| 10438262     | Slic25a1    | solute carrier family 25 (mitochondrial carrier, citrate transporter), member 1 | NM_153150 | down      | 0.05             | ns               |
| 10534889     | Hrbl        | HIV-1 Rev binding protein-like                               | NM_178162 | down      | 0.05             | ns               |
| 10496892     | Fubp1       | far upstream element (FUSE) binding protein 1                 | NM_057172 | up        | 0.05             | ns               |
| 10428370     | Abra        | actin-binding Rho activating protein                         | NM_175456 | up        | 0.05             | ns               |
| 10414433     | 6720456H20Rik| RIKEN CDNA 6720456H20 gene                                    | NM_172600 | up        | 0.05             | ns               |
| 10566132     | Rhog        | ras homolog gene family, member G                            | NM_019566 | down      | 0.05             | ns               |
| 10505747     | Rraga       | Ras-related GTP binding A                                    | NM_178376 | down      | 0.05             | ns               |
| 10455118     | Pcdh18      | protocadherin beta 18                                        | NM_053143 | down      | 0.05             | ns               |
| 10491885     | Pcdh10      | protocadherin 10                                             | NM_001098 | down      | 0.05             | ns               |
| 10447224     | Dync2li1     | dynein cytoplasmic 2 light intermediate chain 1             | NM_172256 | down      | 0.05             | ns               |
| 10508099     | 1810007P19Rik| RIKEN CDNA 1810007P19 gene                                    | NM_172701 | down      | 0.05             | ns               |
| 10511703     | Ripk2       | receptor (TNFRSF)-interacting serine-threonine kinase 2     | NM_138952 | down      | 0.05             | ns               |
| 10399308     | Fkbp1b      | FK506 binding protein 1b                                      | NM_016863 | down      | 0.05             | ns               |

| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                      | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------------------------------------------|-----------|-----------|------------------|------------------|
| 10428302     | Kif10       | Kruppel-like factor 10                                       | NM_013692 | up        | ns               | 0.001            |
| 10431410     | Mapk11      | mitogen-activated protein kinase 11                          | NM_011161 | up        | ns               | 0.004            |
| 10376019     | OTTMSG0000 0005637 | predicted gene, OTTMSG0000000005637 | NM_010917 | up        | ns               | 0.004            |
| 10410166     | Ctnnap3     | contactin associated protein-like 3                          | NM_001081 | down      | ns               | 0.005            |
| 10580282     | Junb        | Jun-B oncogene                                               | NM_008416 | up        | ns               | 0.006            |
| 10489406     | Rims4       | regulating synaptic membrane exocytosis 4                   | NM_183023 | up        | ns               | 0.007            |
| 10413229     | Anxa11      | annexin A11                                                  | NM_013469 | up        | ns               | 0.008            |
| 10432986     | Aas9        | achalasia, adrenocortical insufficiency, alacrima             | NM_153416 | down      | ns               | 0.008            |
| 10518069     | Efhd2       | EF hand domain containing 2                                  | NM_025994 | up        | ns               | 0.008            |
| 10427026     | Grasp       | GPR1 (general receptor for phosphoinositides 1)-associated scaffold protein | NM_019519 | up        | ns               | 0.009            |
| 10393662     | Nptx1       | neuronal pentraxin 1                                         | NM_008730 | up        | ns               | 0.009            |
| 10587085     | BC031353    | cDNA sequence BC031353                                       | NM_001113 | down      | ns               | 0.009            |
| 10501762     | Snx7        | sorting nexin 7                                              | NM_029655 | down      | ns               | 0.01             |
| 10469070     | Nudt5       | nudix (nucleoside diphosphate linked moiety X)-type motif 5  | NM_016918 | up        | ns               | 0.01             |
| 10485594     | OTTMSG0000  | predicted gene, OTTMSG000014964                              | BC147362  | up        | ns               | 0.01             |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                                                 | Accession     | Direction Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------------------------------------------------------------------------|---------------|------------------------|------------------|
| 10429385     | ---         | M10000173 Mus musculus miR-151 stem-loop                                                   | ---           | up                      | ns               |
| 10528877     | Lmb1        | limb region 1                                                                              | NM_020295     | down                   | ns               |
| 10425364     | Atf4        | activating transcription factor 4                                                           | NM_009716     | up                      | ns               |
| 10574220     | Cx3cl1      | chemokine (C-X3-C motif) ligand 1                                                           | NM_009142     | up                      | ns               |
| 10492538     | ENSMUSG00000074573 | predicted gene, ENSMUSG00000074573                                                        | ENSMUST00000000074573 | down                   | ns               |
| 10363845     | Ccdc6       | coiled-coil domain containing 6                                                            | NM_00111112    | up                      | ns               |
| 10574727     | Scl9a5      | solute carrier family 9 (sodium/hydrogen exchanger), member 5                               | NM_001081332  | up                      | ns               |
| 10515797     | Tmem125     | transmembrane protein 125                                                                  | NM_172383     | down                   | ns               |
| 10421418     | Ebp4.9      | erythrocyte protein band 4.9                                                               | NM_013514     | up                      | ns               |
| 10451363     | Srf         | serum response factor                                                                      | NM_020493     | up                      | ns               |
| 10461152     | Snhg1       | small nucleolar RNA host gene (non-protein coding) 1                                        | AK051045      | down                   | ns               |
| 10461158     | Snhg1       | small nucleolar RNA host gene (non-protein coding) 1                                        | AK051045      | down                   | ns               |
| 10607738     | Car5b       | carbonic anhydrase 5b, mitochondrial                                                      | NM_181315     | down                   | ns               |
| 10390560     | Stac2       | SH3 and cysteine rich domain 2                                                             | NM_146028     | up                      | ns               |
| 10385709     | C3300160O10Rik | RIKEN cDNA C3300160O10 gene                                                                  | NM_145974     | up                      | ns               |
| 10601595     | 311007F17Rik | RIKEN cDNA 311007F17 gene                                                                    | BC027572      | down                   | ns               |
| 10548038     | Ntf3        | neurotrophin 3                                                                             | NM_008742     | down                   | ns               |
| 10479607     | Lmna1       | Lck interacting transmembrane adaptor 1                                                     | NM_023684     | up                      | ns               |
| 10524310     | Toc28       | tetratricopeptide repeat domain 28                                                          | BC022922      | down                   | ns               |
| 10356403     | Kcnj13      | potassium inwardly-rectifying channel, subfamily J, member 13                               | NM_001110227  | up                      | ns               |
| 10404038     | Hlist1h3d   | histone cluster 1, H3d                                                                     | NM_178204     | up                      | ns               |
| 10515168     | Cyp4x1      | cytochrome P450, family 4, subfamily x, polypeptide 1                                       | NM_001003947  | down                   | ns               |
| 10452188     | Mll1        | myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, Drosophila); translocated to, 1 | NM_022328     | up                      | ns               |
| 10430660     | Pdgbf       | platelet derived growth factor, B polypeptide                                              | NM_011057     | up                      | ns               |
| 10421351     | Polr3d      | polymerase (RNA) III (DNA directed) polypeptide D                                           | NM_029945     | up                      | ns               |
| 10571111     | Zfp703      | zinc finger protein 703                                                                     | NM_001101502  | up                      | ns               |
| 10371379     | Nuak1       | NUAK family, SNF1-like kinase, 1                                                           | NM_001004363  | up                      | ns               |
| 10440238     | Nsn3        | NOL1/NOP2/Sun domain family member 3                                                        | NM_178925     | down                   | ns               |
| 10368585     | Nkain2      | Na+/K+ transporting ATPase interacting 2                                                    | NM_001013411  | down                   | ns               |
| 10582719     | Sipa1l2     | signal-induced proliferation-associated 1 like 2                                            | NM_001081337  | up                      | ns               |
| 10491732     | Fat4        | FAT tumor suppressor homolog 4 (Drosophila)                                                | NM_183221     | down                   | ns               |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|-----------------|
| 10527268     | Pms2        | postmeiotic segregation increased 2 (S. cerevisiae) | NM_008886 | down     | ns               | 0.02            |
| 10511808     | 4930528A17Rik | RIKEN cDNA 4930528A17 gene | ENSMUSG010000062777 | down     | ns               | 0.02            |
| 10603627     | Bcor        | BCL6 interacting corepressor | NM_175045 | up        | ns               | 0.03            |
| 10429222     | 1700010C24Rik | RIKEN cDNA 1700010C24 gene | BC025645 | up        | ns               | 0.03            |
| 10539211     | Lrrm4       | leucine rich repeat transmembrane neuronal 4 | NM_178731 | down     | ns               | 0.03            |
| 10430941     | Rrp7a       | ribosomal RNA processing 7 homolog A (S. cerevisiae) | BC012523 | down     | ns               | 0.03            |
| 10451303     | Tlk1        | lau tubulin kinase 1 | BC059249 | up        | ns               | 0.03            |
| 10531484     | Ankrd56     | ankyrin repeat domain 56 | NM_175270 | up        | ns               | 0.03            |
| 10579373     | Mast3       | microtubule associated serine/threonine kinase 3 | BC024285 | up        | ns               | 0.03            |
| 10468795     | Rab11flp2   | RAB11 family interacting protein 2 (class I) | NM_001033172 | down     | ns               | 0.03            |
| 10600317     | Opn1mW      | opsin 1 (cone pigments), medium-wave-sensitive (color blindness, deutan) | NM_008106 | up        | ns               | 0.03            |
| 10462442     | IL33        | interleukin 33 | NM_133775 | down     | ns               | 0.03            |
| 10601598     | 3110007F17Rik | RIKEN cDNA 3110007F17 gene | BC027572 | down     | ns               | 0.03            |
| 10506569     | Usp24       | ubiquitin specific peptidase 24 | BC030081 | down     | ns               | 0.03            |
| 10601771     | Armcx1      | armadillo repeat containing, X-linked 1 | NM_030066 | down     | ns               | 0.03            |
| 10481634     | Scl25a25    | solute carrier family 25 (mitochondrial carrier, phosphate carrier), member 25 | NM_146118 | up        | ns               | 0.03            |
| 10369474     | Eif4ebp2    | eukaryotic translation initiation factor 4E binding protein 2 | NM_010124 | up        | ns               | 0.03            |
| 10362450     | --          | chromosome NCBI:M7:10:33062878:33194324:1 gene:ENSMUSG00000071344 | -- | up        | ns               | 0.03            |
| 10389238     | Dusp14      | dual specificity phosphatase 14 | NM_019819 | up        | ns               | 0.03            |
| 10391744     | ENSMUSG00000075516 | predicted gene, ENSMUSG00000075516 | AK135410 | up        | ns               | 0.03            |
| 10491056     | Tgfr1x1     | transducin (beta)-like 1X-linked receptor 1 | NM_030732 | down     | ns               | 0.03            |
| 10545528     | Pgp         | phosphatidylinositol glycan anchor biosynthesis, class P | BC061176 | down     | ns               | 0.03            |
| 10386582     | Top2a       | topoisomerase (DNA) II alpha | NM_009410 | down     | ns               | 0.03            |
| 10484683     | Olf1134     | olfactory receptor 1134 | NM_147930 | down     | ns               | 0.03            |
| 10412517     | ENSMUSG00000057445 | predicted gene, ENSMUSG00000057445 | ENSMUSG00000090647 | down     | ns               | 0.03            |
| 10387372     | Jmj3        | jumonji domain containing 3 | NM_001017426 | up        | ns               | 0.03            |
| 10499168     | Kirre       | kin of IRRE like (Drosophila) | NM_139067 | up        | ns               | 0.03            |
| 10455080     | Pcdtb9      | protocadherin beta 9 | NM_053134 | down     | ns               | 0.03            |
| 10482500     | Rnd3        | Rho family GTPase 3 | NM_028910 | up        | ns               | 0.03            |
| 10565627     | Aqp11       | aquaporin 11 | NM_175105 | down     | ns               | 0.03            |
| 10524955     | Tesc        | tescalcin | NM_021344 | up        | ns               | 0.03            |
| 10397085     | Rbm25       | RNA binding motif protein 25 | NM_027349 | down     | ns               | 0.04            |
| 10541264     | Il17ra      | interleukin 17 receptor A | NM_008359 | up        | ns               | 0.04            |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|-------------|-------------|--------------------------|-----------|-----------|-----------------|-----------------|
| 10413482    | Wnt5a       | wingless-related MMTV integration site 5A | NM_009524 | down      | ns              | 0.04            |
| 10382341    | Sstr2       | somatostatin receptor 2 | NM_009217 | up         | ns              | 0.04            |
| 10498146    | Nhrc3       | NHL repeat containing 3 | NM_172501 | up         | ns              | 0.04            |
| 10574718    | Tmem208     | transmembrane protein 208 | NM_025486 | up         | ns              | 0.04            |
| 10352957    | Rgs20       | regulator of G-protein signaling 20 | NM_021374 | up         | ns              | 0.04            |
| 10601588    | 3110007F17Rik| RIKEN cDNA 3110007F17 gene | BCO27572  | down       | ns              | 0.04            |
| 10440993    | Rcan1       | regulator of calcineurin 1 | NM_001081 | up         | 549             | 0.04            |
| 10515399    | Plik3       | polo-like kinase 3 (Drosophila) | NM_013807 | up         | ns              | 0.04            |
| 10534405    | Wbscr22     | Williams Beuren syndrome chromosome region 22 | NM_025375 | up         | ns              | 0.04            |
| 10544062    | D630045J12Rik| RIKEN cDNA D630045J12 gene | ENSMUSM10 0000078942 | up         |    | 0.04            |
| 10403943    | Hstl1h2bm    | histone cluster 1, H2bm | NM_178200 | up         | ns              | 0.04            |
| 10377695    | Phf23        | PHD finger protein 23 | NM_030664 | up         | ns              | 0.04            |
| 10368409    | Larna2       | laminin, alpha 2 | NM_008481 | down       | ns              | 0.04            |
| 10479560    | Rtel1       | regulator of telomere elongation helicase 1 | NM_001001 | down       | 882             | 0.04            |
| 10404772    | ENSMUSG0000 0074927 | predicted gene, ENSMUSG00000074927 | ENSMUSM10 0000099561 | down       | ns              | 0.04            |
| 10504203    | 4930578G10Rik| RIKEN cDNA 4930578G10 gene | AK006581  | down       | ns              | 0.04            |
| 10570982    | Fgfr1        | fibroblast growth factor receptor 1 | NM_010206 | up         | ns              | 0.04            |
| 10511298    | 9430015G10Rik| RIKEN cDNA 9430015G10 gene | BC004010  | up         | ns              | 0.04            |
| 10436304    | Abi3bp       | ABI gene family, member 3 (NESH) binding protein | NM_001074 423 | down       | ns              | 0.04            |
| 10603066    | Ace2        | angiotensin I converting enzyme (peptidyl-dipeptidase A) 2 | NM_027286 | down       | ns              | 0.04            |
| 10587854    | Sic9a9       | solute carrier family 9 (sodium/hydrogen exchanger), member 9 | NM_177909 | down       | ns              | 0.04            |
| 10436106    | C330027C09Rik| RIKEN cDNA C330027C09 gene | NM_172616 | down       | ns              | 0.04            |
| 10473473    | Oflr1022     | olfactory receptor 1022 | NM_146589 | up         | ns              | 0.04            |
| 10589061    | Dald3        | DALR anticondon binding domain containing 3 | NM_026379 | up         | ns              | 0.04            |
| 10459837    | 8030462N17Rik| RIKEN cDNA 8030462N17 gene | BC120869  | up         | ns              | 0.04            |
| 10603870    | Elk1         | ELK1, member of ETS oncogene family | NM_007922 | up         | ns              | 0.04            |
| 10451883    | Stap2        | signal transducing adaptor family member 2 | NM_146934 | up         | ns              | 0.04            |
| 10521068    | 4933407H18Rik| RIKEN cDNA 4933407H18 gene | NM_001081 101 | down       | ns              | 0.04            |
| 10493498    | ---          | Mus musculus mammary gland RCB-0526 Jyg-MC(A) cDNA, RIKEN full-length enriched library, clone:G830001D04 product:hypothetical protein, full insert sequence. | --- | down       | ns              | 0.04            |
| 10514510    | Cyp2i6       | cytochrome P450, family 2, subfamily i, polypeptide 6 | NM_010008 | down       | ns              | 0.04            |
| 10438220    | Car15        | carbonic anhydrase 15 | NM_030558 | up         | ns              | 0.04            |
| 10409190    | Cenpp        | centromere protein P | NM_025495 | down       | ns              | 0.04            |
| 10606376    | 2610002M06Rik| RIKEN cDNA 2610002M06 gene | BC016070  | up         | ns              | 0.04            |
| 10528880    | Lmbr1        | limb region 1 | NM_020295 | down       | ns              | 0.05            |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Direction | Sham Adj. P value | ADX Adj. P value |
|--------------|-------------|--------------------------|-----------|-----------|------------------|-----------------|
| 10404913     | Cap2        | CAP, adenylate cyclase-associated protein, 2 (yeast) | NM_026056 | up        | ns               | 0.05            |
| 10605143     | Arhgap4     | Rho GTPase activating protein 4 | NM_138630 | up        | ns               | 0.05            |
| 10595094     | 2310046A06Rik | RIKEN cDNA 2310046A06 gene | BC089626  | down      | ns               | 0.05            |
| 10375501     | ---         | ncRNA: snoRNA chromosome:NCBIM37:11:48616641:48616708:1 gene:ENSMUSG00000064780 | ---       | down      | ns               | 0.05            |
| 10415408     | BC030046    | cDNA sequence BC030046 | ENSMUST0000100529 | down | ns | 0.05 |
| 10535659     | Cyp3a16     | cytochrome P450, family 3, subfamily a, polypeptide 16 | NM_007820 | up        | ns               | 0.05            |
| 10543709     | Tmem209     | transmembrane protein 209 | NM_178626 | down      | ns               | 0.05            |
Supplementary Table 2: Functional clustering of probe sets significantly affected by sleep deprivation (SD) in sham-operated D2 mice (Ingenuity Pathways Analysis; Ingenuity Systems). Indicated for each functional cluster are the range of P values based on all 1476 probes significantly affected by SD and the number of probes decreased (down) or increased (up) by SD. Clusters for which probes are mostly down or up have been highlighted in yellow. Last column presents the results of the functional clustering of the 260 probes showing interaction (see text and gene list in Supplementary Table 3). Clusters lacking a significant number of transcripts with interaction could depend less on corticosterone signaling and are highlighted in yellow, ns: p ≥ 0.05.

| Class                                      | Functional Clusters                             | P values (for all) | N of Down probes | N of Up probes | N of probes with INTERACTION |
|--------------------------------------------|-------------------------------------------------|--------------------|------------------|----------------|-----------------------------|
| Molecular and cellular functions           | Post-translational modification                 | 1.3E-8 - 2.1E+3    | 3                | 73             | 14                          |
|                                            | Protein folding                                 | 1.3E-8 - 1.9E+3    | ns               | 18             | ns                          |
|                                            | Cellular compromise                             | 3.6E-8 - 2.3E+3    | 13               | 58             | 7                           |
|                                            | Cellular function and maintenance               | 1.1E-8 - 2.3E+3    | 20               | 18             | 15                          |
|                                            | Small molecule biochemistry                     | 4.7E-8 - 2.1E+3    | 63               | 59             | 37                          |
|                                            | RNA post-transcriptional modification           | 4.8E-8 - 1.7E+3    | 12               | 11             | ns                          |
|                                            | Drug metabolism                                 | 5.5E-8 - 2.1E+3    | 12               | 13             | 10                          |
|                                            | Lipid metabolism                                | 5.5E-8 - 1.8E+3    | 9                | 7              | 17                          |
|                                            | Cell death                                      | 1.1E-8 - 2.3E+3    | 16               | 136            | 27                          |
|                                            | Cell cycle                                      | 1.8E-8 - 2.3E+3    | 13               | 75             | 21                          |
|                                            | Neurological disease                            | 2.0E-8 - 2.3E+3    | 189              | 159            | 21                          |
|                                            | Cancer                                          | 6.5E-8 - 2.3E+3    | 75               | 163            | 37                          |
|                                            | Cellular growth and proliferation               | 6.5E-8 - 2.3E+3    | 9                | 134            | 13                          |
|                                            | Respiratory disease                             | 6.5E-8 - 2.1E+3    | 3                | 48             | 13                          |
|                                            | Gene expression                                 | 8.7E-8 - 2.3E+3    | 5                | 102            | 9                           |
|                                            | Genetic disorder                                | 1.3E-8 - 2.3E+3    | 306              | 259            | 29                          |
|                                            | Skeletal and muscular disorders                 | 1.3E-8 - 2.3E+3    | 44               | 125            | 30                          |
|                                            | Cell morphology                                 | 2.8E-8 - 2.3E+3    | 21               | 63             | 13                          |
|                                            | Cellular assembly and organization              | 2.8E-8 - 1.8E+3    | 38               | 34             | 17                          |
|                                            | Reproductive system disease                     | 3.2E-8 - 2.3E+3    | 20               | 85             | 16                          |
|                                            | Connective tissue disorders                     | 3.7E-8 - 2.3E+3    | 2                | 97             | 6                           |
|                                            | Immunological disease                           | 3.7E-8 - 2.3E+3    | 4                | 115            | 9                           |
|                                            | Inflammatory disease                            | 3.7E-8 - 2.2E+3    | 1                | 109            | 6                           |
|                                            | DNA replication, recombination and repair       | 4.9E-8 - 2.9E+3    | 26               | 37             | 4                           |
|                                            | Nucleic acid metabolism                         | 4.9E-8 - 1.2E+3    | 9                | 8              | 3                           |
|                                            | Gastrointestinal disease                        | 4.9E-8 - 2.3E+3    | 35               | 54             | 15                          |
|                                            | Cell signalling                                 | 5.1E-8 - 2.3E+3    | 1                | 11             | 2                           |
|                                            | Cellular development                            | 5.1E-8 - 2.3E+3    | 6                | 67             | 13                          |
|                                            | Tissue morphology                               | 5.1E-8 - 2.3E+3    | 12               | 50             | 15                          |
|                                            | Molecular transport                             | 2.5E-8 - 2.3E+3    | 34               | 33             | 19                          |
|                                            | Amino acid metabolism                           | 2.5E-8 - 2.1E+3    | 7                | 33             | 15                          |
|                                            | Behavior                                        | 3.7E-8 - 2.3E+3    | 16               | 26             | 2                           |
|                                            | Cellular movement                               | 4.3E-8 - 2.2E+3    | 18               | 53             | 13                          |
|                                            | Cell-to-cell signaling and interaction          | 4.3E-8 - 2.3E+3    | 30               | 7              | 14                          |
|                                            | Protein degradation                             | 6.1E-8 - 6.4E+3    | 25               | ns             | 10                          |
| Class                              | Functional Clusters                              | P values (for all) | N of Down probes | N of Up probes | N of probes with INTERACTION |
|-----------------------------------|--------------------------------------------------|--------------------|------------------|----------------|-----------------------------|
|                                   |                                                  |                    |                  |                |                             |
| Protein synthesis                 |                                                  | 6.4E⁻²              | 37               | ns             | ns                          |
| Metabolic disease                 |                                                  | 1.1E⁻²              | 117              | ns             | ns                          |
| Carbohydrate metabolism          |                                                  | 1.2E⁻² - 2.3E⁻²     | 9                | 11             | 13                          |
| **System development and function** | **Endocrine system development and function**  | 4.7E⁻³ - 1.2E⁻²    | 6                | 23             | 9                           |
|                                   | **Connective tissue development and function**  | 8.7E⁻³ - 2.3E⁻²    | 11               | 13             | 9                           |
|                                   | **Nervous system development and function**     | 2.8E⁻³ - 2.3E⁻²    | 47               | 39             | 14                          |
|                                   | **Organ development**                            | 3.2E⁻³ - 1.2E⁻²    | 5                | 19             | 11                          |
|                                   | **Organismal development**                       | 3.4E⁻³ - 2.3E⁻²    | 17               | 60             | 3                           |
|                                   | **Skeletal and muscular system development and function** | 4.2E⁻³ - 2.3E⁻² | 19               | 20             | 19                          |
|                                   | **Cardiovascular system development and function** | 5.1E⁻³ - 2.3E⁻² | 15               | 32             | 14                          |
|                                   | **Hepatic system development and function**     | 5.1E⁻⁺             | 1                | 5              | 2                           |
|                                   | **Hematological system development and function** | 1.8E⁻³ - 2.2E⁻²    | 12               | 61             | 15                          |
|                                   | **Cell-mediated immune response**                | 4.3E⁻³ - 2.3E⁻²    | 1                | 56             | 14                          |
| **Canonical pathways**            | **Biosynthesis of steroids**                     | 5.8E⁻³             | 6                | ns             | ns                          |
|                                   | **Glucocorticoid receptor signaling**           | 1.0E⁻²             | ns               | 24             | 5                           |
|                                   | **Glutamate metabolism**                        | 2.2E⁻²             | 3                | ns             | 3                           |
|                                   | **Phenylalanine metabolism**                    | 2.5E⁻²             | 4                | ns             | ns                          |
|                                   | **Endoplasmic reticulum stress pathway**        | 2.7E⁻²             | ns               | 3              | ns                          |
|                                   | **Cell cycle: G1/S checkpoint regulation**      | 2.8E⁻²             | ns               | 6              | ns                          |
|                                   | **LXR/RXR activation**                          | 3.2E⁻²             | 6                | ns             | 3                           |
|                                   | **Aldosterone signalling in epithelial cells**  | 3.3E⁻²             | ns               | 7              | ns                          |
|                                   | **Aryl hydrocarbone receptor signaling**        | 3.5E⁻²             | ns               | 10             | ns                          |
|                                   | **Fatty acid biosynthesis**                     | 3.9E⁻²             | 3                | ns             | ns                          |
|                                   | **Aminosugars metabolism**                      | 4.1E⁻²             | 6                | ns             | ns                          |
|                                   | **ERK/MAPK signaling**                          | 0.35               | ns               | 10             | ns                          |
| **Toxicity pathways**             | **Cholesterol biosynthesis and metabolism**     | 2.8E⁻³             | 5                | ns             | 2                           |
|                                   | **Oxidative stress response mediated by Nrf2**  | 4.0E⁻³             | ns               | 17             | ns                          |
|                                   | **Mechanism of gene regulation by peroxisome proliferators via PPARα** | 4.6E⁻² | ns             | 9              | 3                           |
|                                   | **p53 signaling**                               | 5.8E⁻²             | ns               | 8              | ns                          |
Supplementary Table 3: Listing of the 260 probe sets showing Group (sham vs. ADX) by Condition (control vs. SD) interaction (FDR < 0.23; see Supplementary text and Supplementary Figure 1) among the 1476 probes affected by sleep deprivation (SD) (see Supplementary Table 1). With the exception of two probe sets (highlighted), ADX caused an attenuation of the effect of SD both for probe sets that were increased and that were decreased by SD in sham operated mice. Probes in bold have been evaluated by qPCR analysis.

| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Adjusted P value |
|---------------|-------------|--------------------------|-----------|-----------------|
| 10478160      | 2310007D09Rik | RIKEN cDNA 2310007D09 gene | BC068129  | 0.0006          |
| 10362073      | Sgk1        | serum/glucocorticoid regulated kinase 1 | NM_011361 | 0.0009          |
| 10543017      | Pdk4        | pyruvate dehydrogenase kinase, isoenzyme 4 | NM_013743 | 0.009           |
| 10606989      | Tsc22d3     | TSC22 domain family, member 3 | NM_001077 364 | 0.01           |
| 10358619      | Hmcn1       | hemicentin 1 | NM_001024 720 | 0.02           |
| 10358978      | Ier5        | immediate early response 5 | NM_010500 | 0.02           |
| 10541071      | 8430408G22Rik | RIKEN cDNA 8430408G22 gene | BC058515  | 0.02           |
| 10505779      | Asah3I      | N-acylsphingosine amidohydrolase 3-like | NM_139306 | 0.02           |
| 10593225      | Zbtb16      | zinc finger and BTB domain containing 16 | NM_001033 324 | 0.03           |
| 10585328      | 4930510E17Rik | RIKEN cDNA 4930510E17 gene | ENSMUST0 000034550 | 0.03           |
| 10475910      | ---         | snoRNA chromosome:NCBIM37:2:128606112:128606235:1 gene:ENSMUSG00000064937 | ENSMUST0 000083003 | 0.03           |
| 10452815      | Xdh         | xanthine dehydrogenase | NM_011723 | 0.03           |
| 10433163      | Ppp1r1a     | protein phosphatase 1, regulatory (inhibitor) subunit 1A | NM_021391 | 0.04           |
| 10572739      | ENSMUSG0000 0060719 | predicted gene, ENSMUSG00000060719 | AK032580 | 0.05           |
| 10369290      | Ddt4        | DNA-damage-inducible transcript 4 | NM_029083 | 0.05           |
| 10552075      | Lgi4        | leucine-rich repeat LGI family, member 4 | NM_144556 | 0.05           |
| 10400405      | Nfkbia      | nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, alpha | NM_010907 | 0.05           |
| 10511136      | B930041F14Rik | RIKEN cDNA B930041F14 gene | NM_178699 | 0.05           |
| 10399680      | Cys1        | cystin 1 | NM_138686 | 0.05           |
| 10434643      | Psmb3       | proteasome (prosome, macropain) subunit, beta type 3 | NM_011971 | 0.06           |
| 10352916      | ---         | M10000712 Mus musculus miR-29b-2 stem-loop | --- | 0.06           |
| 10359582      | Fmo2        | flavin containing monoxygenase 2 | NM_018881 | 0.06           |
| 10539592      | Smyd5       | SET and MYND domain containing 5 | NM_144918 | 0.06           |
| 10381474      | Atr4d       | ADP-ribosylation factor-like 4D | NM_025404 | 0.06           |
| 10475890      | Mertk       | c-mer proto-oncogene tyrosine kinase | NM_008587 | 0.06           |
| 10557058      | Polr3e      | polymerase (RNA) III (DNA directed) polypeptide E | ENSMUST0 000088072 | 0.06           |
| 10450533      | Vars2       | valyl-tRNA synthetase 2, mitochondrial (putative) | NM_175137 | 0.06           |
| 10471519      | Tor2a       | torsin family 2, member A | NM_152800 | 0.06           |
| 10358658      | Hmcn1       | hemicentin 1 | NM_001024 720 | 0.06           |
| 10531348      | Ppef2       | protein phosphatase, EF hand calcium-binding domain 2 | NM_011148 | 0.06           |
| 10600480      | 4930408F14Rik | RIKEN cDNA 4930408F14 gene | BC117726  | 0.06           |
| 10603230      | 4930408F14Rik | RIKEN cDNA 4930408F14 gene | BC117726  | 0.06           |
| 10605353      | 4930408F14Rik | RIKEN cDNA 4930408F14 gene | BC117726  | 0.06           |
| 10498302      | Gm410       | gene model 410, (NCBI) | NM_001033 349 | 0.06           |
| 10484201      | 2610301F02Rik | RIKEN cDNA 2610301F02 gene | ENSMUST0 000049544 | 0.06           |
| 10461057      | Rcor2       | REST corepressor 2 | NM_054048 | 0.06           |
| 10457665      | 4921533I20Rik | Riken cDNA 4921533I20 gene | AK076609 | 0.06           |
| 10447036      | ---         | rRNA chromosome:NCBIM37:17:79258276: | ENSMUST0 000082836 | 0.06           |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession  | Adjusted P value |
|--------------|-------------|--------------------------|------------|-----------------|
| 10568001     | Sult1a1     | sulfotransferase family 1A, phenol-preferring, member 1 | NM_133670  | 0.07            |
| 10447938     | Dact2       | dapper homolog 2, antagonist of beta-catenin (xenopus) | NM_172826  | 0.07            |
| 10588509     | Pcbp4       | poly(rC) binding protein 4 | NM_021567  | 0.07            |
| 10578964     | 1810029B16Rik | RIKEN cDNA 1810029B16 gene | BC016246   | 0.07            |
| 10362372     | 9330159F19Rik | RIKEN cDNA 9330159F19 gene | AK034141   | 0.07            |
| 10469936     | Narp        | Notch-regulated ankyrin repeat protein | NM_025980  | 0.08            |
| 10505532     | OTTMUSG00000000266 | predicted gene, OTTMUSG00000000266 | XR_033213  | 0.08            |
| 10387525     | Mpdo1       | mannose-P-dolichol utilization defect 1 | NM_011900  | 0.08            |
| 10358648     | Hmcn1       | hemicentin 1 | NM_001024 720 | 0.08           |
| 10449452     | Fkbp5       | FK506 binding protein 5 | NM_010220  | 0.08            |
| 10467468     | ENSMUSG0000074878 | predicted gene, ENSMUSG00000074878 | AK132080   | 0.08            |
| 10547386     | Adipor2     | adiponectin receptor 2 | NM_197985  | 0.09            |
| 10470959     | Phyhd1      | phytanoyl-CoA dioxygenase domain containing 1 | NM_172267  | 0.09            |
| 10589413     | Nme6        | non-metastatic cells 6, protein expressed in (nucleoside-diphosphate kinase) | NM_018757  | 0.09            |
| 10376017     | ENSMUSG0000054450 | predicted gene, ENSMUSG00000054450 | ENSMUST0 000067523 | 0.09          |
| 10350758     | ENSMUSG0000066798 | predicted gene, ENSMUSG0000066798 | AK080751   | 0.09            |
| 10577641     | 1810011O10Rik | RIKEN cDNA 1810011O10 gene | NM_026931  | 0.10            |
| 10582664     | 2310022B05Rik | RIKEN cDNA 2310022B05 gene | BC058626   | 0.10            |
| 10417275     | ---         | novel chromosome:NCBIM37:14:2043432:20436596:1 gene:ENSMUSG00000068776 | ENSMUST0 000090639 | 0.10         |
| 10581378     | Psmb10      | proteasome (prosome, macropain) subunit, beta type 10 | NM_013640  | 0.10            |
| 10516529     | Adc         | arginine decarboxylase | NM_172875  | 0.10            |
| 10515700     | BC059842    | cDNA sequence BC059842 | ENSMUST0 000075406 | 0.10        |
| 10556242     | ---         | snoRNA chromosome:NCBIM37:7:117166724:11716856:1 gene:ENSMUSG00000064600 | ENSMUST0 000082666 | 0.10        |
| 10350146     | Phlda3      | pleckstrin homology-like domain, family A, member 3 | NM_013750  | 0.10            |
| 10356601     | Per2        | period homolog 2 (Drosophila) | NM_011066  | 0.10            |
| 10373756     | Pla2q3      | phospholipase A2, group III | NM_172791  | 0.10            |
| 10431558     | 2010001J22Rik | RIKEN cDNA 2010001J22 gene | BC087962   | 0.10            |
| 10584674     | Mcam        | melanoma cell adhesion molecule | NM_023061  | 0.10            |
| 10513608     | Alad        | aminolevulinate, delta-, dehydratase | NM_008525  | 0.10            |
| 10446013     | Mpnd        | MPN domain containing | NM_026530  | 0.10            |
| 10404885     | Gmpr        | guanosine monophosphate reductase | NM_025508  | 0.11            |
| 10496872     | Eltd1       | EGF, latrophilin seven transmembrane domain containing 1 | NM_133222  | 0.11            |
| 10523647     | Aff1        | AF4/FMR2 family, member 1 | NM_001080 798 | 0.11         |
| 10505954     | Tek         | endothelial-specific receptor tyrosine kinase | NM_013690  | 0.11            |
| 10526923     | 1110007L15Rik | RIKEN cDNA 1110007L15 gene | BC019557   | 0.11            |
| 10555777     | ---         | cdna:Genscan chromosome:NCBIM37:7:110335117:110384869:1 | GENSCAN0 000023102 | 0.11        |
| 10469425     | Arl5b       | ADP-ribosylation factor-like 5B | NM_029466  | 0.11            |
| 10475199     | Snap23      | synaptosomal-associated protein 23 | NM_009222  | 0.11            |
| 10583438     | A230505P20Rik | RIKEN cDNA A230505P20 gene | NM_175867  | 0.11            |
| 10378754     | 2310047D13Rik | RIKEN cDNA 2310047D13 gene | NM_027773  | 0.11            |
| 10439249     | Parp14      | poly (ADP-ribose) polymerase family, member 14 | NM_001039  | 0.11            |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Adjusted P value |
|--------------|-------------|--------------------------|-----------|-----------------|
| 10358057     | Shisa4      | shisa homolog 4 (Xenopus laevis) | NM_175259 | 0.11            |
| 10457963     | Gpr17       | G protein-coupled receptor 17 | NM_001025 | 0.11            |
| 10493798     | S100a16     | S100 calcium binding protein A16 | NM_026416 | 0.11            |
| 10560329     | Hif3a       | hypoxia inducible factor 3, alpha subunit | NM_016868 | 0.12            |
| 10485402     | Fjx1        | four jointed box 1 (Drosophila) | NM_010218 | 0.12            |
| 10381260     | Tubg2       | tubulin, gamma 2 | NM_134028 | 0.12            |
| 10375880     | Nola2       | nucleolar protein family A, member 2 | NM_026631 | 0.12            |
| 10561004     | Erf         | Ets2 repressor factor | NM_010155 | 0.12            |
| 10345183     | Cdk10       | cyclin-dependent kinase (CDC2-like) 10 | NM_194446 | 0.12            |
| 10553788     | Atp10a      | ATPase, class V, type 10A | NM_009728 | 0.12            |
| 10410452     | Srd5a1      | steroid 5 alpha-reductase 1 | NM_175283 | 0.12            |
| 10366546     | Cpm         | carboxypeptidase M | NM_027468 | 0.12            |
| 10495675     | F3          | coagulation factor III | NM_010171 | 0.12            |
| 10508829     | Map3k6      | mitogen-activated protein kinase kinase kinase 6 | NM_016693 | 0.12            |
| 10456046     | Pdgfrb      | platelet derived growth factor receptor, beta polypeptide | NM_008809 | 0.12            |
| 10573626     | Gpt2        | glutamic pyruvate transaminase (alanine aminotransferase) 2 | NM_173866 | 0.12            |
| 10378453     | 1300001I01Rik | RIKEN cDNA 1300001I01 gene | BC072573 | 0.12            |
| 10488048     | Mkks        | McKusick-Kaufman syndrome protein | NM_021527 | 0.12            |
| 10447190     | Plekhh2     | pleckstrin homology domain containing, family H (with MyTH4 domain) member 2 | NM_177606 | 0.12            |
| 10358565     | Hmcn1       | hemicentin 1 | NM_001024 | 0.13            |
| 10555009     | ---         | MI0004692 Mus musculus miR-708 stem-loop | --- | 0.13            |
| 10579406     | Arrdc2      | arrestin domain containing 2 | NM_027560 | 0.13            |
| 10549921     | Vmn2r43     | vomeronasal 2, receptor 43 | NM_198961 | 0.13            |
| 10437399     | Cor7        | coronin 7 | NM_030205 | 0.13            |
| 10429957     | Fbxl6       | F-box and leucine-rich repeat protein 6 | NM_013909 | 0.13            |
| 10445992     | Shd         | src homology 2 domain-containing transforming protein D | NM_009168 | 0.13            |
| 10562576     | Plekhf1     | pleckstrin homology domain containing, family F (with FYVE domain) member 1 | NM_024413 | 0.13            |
| 10461423     | Fads3       | fatty acid desaturase 3 | NM_021890 | 0.13            |
| 10499643     | Chrb2       | cholinergic receptor, nicotinic, beta polypeptide 2 (neuronal) | NM_009602 | 0.13            |
| 10376004     | Gdf9        | growth differentiation factor 9 | NM_008110 | 0.13            |
| 10575021     | Zfp90       | zinc finger protein 90 | NM_011764 | 0.13            |
| 10451932     | S3-12       | plasma membrane associated protein, S3-12 | NM_020568 | 0.13            |
| 10545827     | Rab11fip5   | RAB11 family interacting protein 5 (class I) | NM_001003 | 0.13            |
| 10576439     | Cog2        | component of oligomeric golgi complex 2 | NM_029746 | 0.13            |
| 10408047     | OTTMUSG00000018077 | predicted gene, OTTMUSG00000018077 | AK132930 | 0.13            |
| 10471000     | Plxnd1      | plexin D1 | NM_026376 | 0.13            |
| 10445636     | Zfp467      | zinc finger protein 467 | NM_020589 | 0.13            |
| 10417920     | Usp54       | ubiquitin specific peptidase 54 | NM_030180 | 0.13            |
| 10514708     | Insl5       | insulin-like 5 | NM_011831 | 0.13            |
| 10467529     | Opalin      | oligodendrocytic myelin paranodal and inner loop protein | NM_153520 | 0.13            |
| 10448559     | ---         | 16 days neonate thymus cDNA, RIKEN full-length enriched library, clone:A130072E10 product:hypothetical protein, full insert sequence gene:ENSMUSG00000073437 | ENSMUST0000084725 | 0.13            |
| 10520234     | 2010209O12Rik | RIKEN cDNA 2010209O12 gene | NM_133913 | 0.13            |
| 10456988     | Pard6g      | par-6 partitioning defective 6 homolog gamma | NM_053117 | 0.13            |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession | Adjusted P value |
|---------------|-------------|--------------------------|-----------|------------------|
| 10582474      | Chmp1a      | chromatin modifying protein 1A | NM_145606 | 0.13             |
| 10576403      | AK122209    | cDNA sequence AK122209 | NM_001029876 | 0.14             |
| 10530201      | Ugdh        | UDP-glucose dehydrogenase | NM_009466 | 0.14             |
| 10583732      | Ldlr        | low density lipoprotein receptor | NM_010700 | 0.14             |
| 10441055      | Pigp        | phosphatidylinositol glycan anchor biosynthesis, class P | NM_019543 | 0.14             |
| 10561212      | Ltbp4       | latent transforming growth factor beta binding protein 4 | NM_175641 | 0.14             |
| 10484987      | Nr1h3       | nuclear receptor subfamily 1, group H, member 3 | NM_013839 | 0.14             |
| 10489569      | Pltp        | phospholipid transfer protein | NM_011125 | 0.14             |
| 10414433      | 6720456H20Rik | RIKEN cDNA 6720456H20 gene | NM_172600 | 0.14             |
| 10424370      | Trib1       | tribbles homolog 1 (Drosophila) | NM_144549 | 0.14             |
| 10469867      | Pnpla7      | patatin-like phospholipase domain containing 7 | NM_146251 | 0.14             |
| 10552656      | Syt3        | synaptotagmin III | NM_016663 | 0.15             |
| 10446341      | 4930505H01Rik | RIKEN cDNA 4930505H01 gene | AK132847 | 0.15             |
| 10389627      | Rad51c      | Rad51 homolog c (S. cerevisiae) | NM_053269 | 0.15             |
| 10571274      | Gsr         | glutathione reductase | NM_010344 | 0.15             |
| 10603387      | Hdac6       | histone deacetylase 6 | NM_010413 | 0.15             |
| 10551736      | Ppp1r14a    | protein phosphatase 1, regulatory (inhibitor) subunit 14A | NM_026731 | 0.16             |
| 10489484      | Sdc4        | syndecan 4 | NM_011521 | 0.16             |
| 10492428      | Tiparp      | TCDD-inducible poly(ADP-ribose) polymerase | NM_178892 | 0.16             |
| 10390691      | Nr1d1       | nuclear receptor subfamily 1, group D, member 1 | NM_145434 | 0.16             |
| 10576216      | Rpl13       | ribosomal protein L13 | AF357327 | 0.16             |
| 10567095      | Calca       | calcitonin/calcitonin-related polypeptide, alpha | NM_007587 | 0.16             |
| 10449061      | Rbhd1       | rhomboid, veinlet-like 1 (Drosophila) | NM_144816 | 0.16             |
| 10408755      | Muted       | muted | NM_139063 | 0.16             |
| 10541873      | MrpL51      | mitochondrial ribosomal protein L51 | NM_025595 | 0.16             |
| 10562911      | Tbec1d17    | TBC1 domain family, member 17 | NM_001042655 | 0.16             |
| 10442083      | ---         | MII0000561 Mus musculus let-7e stem-loop | --- | 0.16             |
| 10352918      | ---         | MII0000577 Mus musculus miR-29c stem-loop | --- | 0.16             |
| 10365123      | Dohh        | deoxyhypusine hydroxylase/monoxygenase | AK080664 | 0.16             |
| 10606369      | Itm2a       | integral membrane protein 2A | NM_008409 | 0.17             |
| 10504504      | Grhpr       | glyoxylate reductase/hydroxypyruvate reductase | NM_080289 | 0.17             |
| 10566516      | 1500003O22Rik | RIKEN cDNA 1500003O22 gene | BC022923 | 0.17             |
| 10470283      | Egfl7       | EGF-like domain 7 | NM_198724 | 0.17             |
| 10516064      | Mfsd2       | major facilitator superfamily domain containing 2 | NM_029662 | 0.17             |
| 10387659      | Nlg2        | neurologin 2 | NM_198862 | 0.17             |
| 10436282      | Imp2        | interphotoreceptor matrix proteoglycan 2 | NM_174876 | 0.18             |
| 10384192      | Tbrg4       | transforming growth factor beta regulated gene 4 | NM_134011 | 0.18             |
| 10382376      | Tthy2       | tweety homolog 2 (Drosophila) | NM_053273 | 0.18             |
| 10536746      | Arf5        | ADP-ribosylation factor 5 | NM_007480 | 0.18             |
| 10380137      | Bzrap1      | benzodiazapine receptor associated protein 1 | NM_172449 | 0.18             |
| 10502696      | Spata1      | spermatogenesis associated 1 | NM_027617 | 0.18             |
| 10434229      | Cldn5       | claudin 5 | NM_013805 | 0.18             |
| 10591537      | Tmed1       | transmembrane emp24 domain containing 1 | NM_010744 | 0.18             |
| 10503334      | Gem         | GTP binding protein (gene overexpressed in skeletal muscle) | NM_010276 | 0.18             |
| 10444008      | Zfp414      | zinc finger protein 414 | NM_026712 | 0.18             |
| 10546137      | Abtb1       | ankyrin repeat and BTB (POZ) domain containing 1 | NM_030251 | 0.18             |
| 10512499      | Tpm2        | tropomyosin 2, beta | NM_009416 | 0.18             |
| 10586128      | ---         | ncrna:snRNA chromosome:NCBI:37:9:63290126:63290267:1 gene:ENSMUSG00000065679 | ENSMUST0000083745 | 0.18             |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description | Accession   | Adjusted P value |
|---------------|-------------|--------------------------|-------------|-----------------|
| 10371482      | Hsp90b1     | heat shock protein 90, beta (Grp94), member 1 | NM_011631   | 0.18            |
| 10504918      | Zfp189      | zinc finger protein 189  | NM_145547   | 0.18            |
| 10475544      | Sema6d      | sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaforin) 6D | NM_172537   | 0.18            |
| 10404069      | Hist1h1a    | histone cluster 1, H1a  | NM_030609   | 0.18            |
| 10547288      | Ankrd26     | ankyrin repeat domain 26 | NM_001081   | 0.18            |
| 10526559      | Ache        | acetylcholinesterase    | NM_009599   | 0.18            |
| 10428370      | Abra        | actin-binding Rho activating protein | NM_175456   | 0.18            |
| 10561927      | Aplp1       | amyloid beta (A4) precursor-like protein 1 | NM_007467   | 0.18            |
| 10488655      | Bcl21       | BCL2-like 1             | NM_009743   | 0.18            |
| 10464504      | Lrp5        | low density lipoprotein receptor-related protein 5 | NM_008513   | 0.18            |
| 10518957      | Dffb        | DNA fragmentation factor, beta subunit | NM_007859   | 0.18            |
| 10545417      | Mat2a       | methionine adenosyltransferase II, alpha | NM_145569   | 0.18            |
| 10442643      | Nme3        | non-metastatic cells 3, protein expressed in | NM_019730   | 0.18            |
| 10583347      | Chordc1     | cysteine and histidine-rich domain (CHORD)-containing, zinc-binding protein 1 | NM_025844   | 0.18            |
| 10432439      | Fmn13       | formin-like 3            | NM_011711   | 0.18            |
| 10540028      | Klf15       | Kruppel-like factor 15   | NM_023184   | 0.18            |
| 10535458      | Zdhhc4      | zinc finger, DHC domain containing 4 | NM_028379   | 0.18            |
| 10542872      | Rps4y2      | ribosomal protein S4, Y-linked 2 | NR_003634   | 0.18            |
| 10517250      | Extl1       | exostoses (multiple)-like 1 | NM_019578   | 0.18            |
| 10483624      | Dlx1as      | distal-less homeobox 1, antisense | NR_002854   | 0.18            |
| 10450579      | Ddr1        | discoidin domain receptor family, member 1 | NM_007584   | 0.18            |
| 10476759      | Rin2        | Ras and Rab interactor 2 | NM_028724   | 0.18            |
| 10350188      | Tmem9       | transmembrane protein 9  | NM_025439   | 0.18            |
| 10601980      | Mum111      | melanoma associated antigen (mutated) 1-like 1 | NM_175541   | 0.18            |
| 10530029      | Lgi2        | leucine-rich repeat LGI family, member 2 | NM_144945   | 0.18            |
| 10572679      | Glt2d1      | glycosyltransferase 25 domain containing 1 | NM_146211   | 0.18            |
| 10390299      | Pnpo        | pyridoxine 5'-phosphate oxidase | NM_134021   | 0.18            |
| 10364702      | Mdhn        | midnolin                 | NM_021565   | 0.18            |
| 10462454      | Uhrf2       | ubiquitin-like, containing PHD and RING finger domains 2 | NM_144873   | 0.19            |
| 10469987      | Man1b1      | mannosidase, alpha, class 1B, member 1 | NM_001029   | 0.19            |
| 10378024      | Mis12       | MIS12 homolog (yeast)    | NM_025993   | 0.19            |
| 10358660      | Hmcn1       | hemicentin 1             | NM_001024   | 0.19            |
| 10450006      | Hnrnpm      | heterogeneous nuclear ribonucleoprotein M | NM_029804   | 0.19            |
| 10418604      | Phf7        | PHD finger protein 7     | NM_027949   | 0.20            |
| 10438530      | Clcn2       | chloride channel 2       | NM_009900   | 0.20            |
| 10415282      | Psme1       | proteasome (prosome, macropain) 28 subunit, alpha | NM_011189   | 0.20            |
| 10544583      | Gimap6      | GTPase, IMAP family member 6 | NM_153175   | 0.20            |
| 10390283      | Cdk5rap3    | Cdk5 regulatory subunit associated protein 3 | NM_030248   | 0.20            |
| 10420366      | Gjb6        | gap junction protein, beta 6 | NM_001010   | 0.20            |
| 10432411      | Mcrs1       | microsphere protein 1    | NM_016766   | 0.20            |
| 10517744      | Arhgef10l   | Rho guanine nucleotide exchange factor (GEF) 10-like | NM_172415   | 0.20            |
| 10550509      | Pglyrp1     | peptidoglycan recognition protein 1 | NM_009402   | 0.20            |
| 10461369      | Ahnak       | AHNAK nucleoprotein (desmoyokin) | NM_009643   | 0.20            |
| 10512165      | Nol6        | nucleolar protein family 6 (RNA-associated) | NM_139236   | 0.21            |
| 10594645      | Rab8b       | RAB8B, member RAS oncogene family | NM_173413   | 0.21            |
| 10438293      | Zdhhc8      | zinc finger, DHHC domain containing 8 | NM_172151   | 0.21            |
| 10603206      | BC022960    | cDNA sequence BC022960   | ENSMUST0000052299 | 0.21            |
| 10375735      | Hnrnp1      | heterogeneous nuclear ribonucleoprotein H1 | NM_021510   | 0.21            |
| Affymetrix ID | Gene Symbol | Gene or mRNA Description                                      | Accession | Adjusted P value |
|--------------|-------------|----------------------------------------------------------------|-----------|------------------|
| 10507594     | Sclc2a1     | solute carrier family 2 (facilitated glucose transporter), member 1 | NM_011400 | 0.21             |
| 10394812     | EG245297    | predicted gene, EG245297                                    | BC030401  | 0.21             |
| 10597823     | Lzly4       | lysozyme-like 4                                              | NM_026915 | 0.21             |
| 10419261     | Bmp4        | bone morphogenetic protein 4                                 | NM_007554 | 0.21             |
| 10507238     | Lrrc41      | leucine rich repeat containing 41                            | NM_153521 | 0.21             |
| 10498367     | P2ry13      | purinergic receptor P2Y, G-protein coupled 13                | NM_028808 | 0.21             |
| 10498620     | Trim59      | tripartite motif-containing 59                               | NM_025863 | 0.21             |
| 10399725     | Sox11       | SRY-box containing gene 11                                   | NM_009234 | 0.21             |
| 10430770     | Tob2        | transducer of ERBB2, 2                                       | NM_020507 | 0.21             |
| 10358605     | Hmcn1       | hemicentin 1                                                 | NM_001024 | 0.21             |
| 10531201     | Adams3      | a disintegrin-like and metallopeptidase (reprolysin type) with thrombospondin type 1 motif, 3 | NM_001081 | 0.21             |
| 10439442     | Pla1a       | phospholipase A1 member A                                    | NM_134102 | 0.21             |
| 10439424     | 4932425I24Rik | RIKEN cDNA 4932425I24 gene                                    | NM_001081 | 0.21             |
| 10519140     | Mmp23       | matrix metallopeptidase 23                                   | NM_011985 | 0.21             |
| 10429573     | Ly6c1       | lymphocyte antigen 6 complex, locus C1                       | NM_010741 | 0.21             |
| 10371591     | 4930547N16Rik | RIKEN cDNA 4930547N16 gene                                   | NM_029249 | 0.21             |
| 10576258     | Cdk10       | cyclin-dependent kinase (CDC2-like) 10                       | NM_194446 | 0.21             |
| 10462333     | Cdc37I1     | cell division cycle 37 homolog (S. cerevisiae)-like 1        | NM_025950 | 0.21             |
| 10453867     | Rbbp8       | retinoblastoma binding protein 8                             | NM_001081 | 0.21             |
| 10595109     | Lrc1c       | leucine rich repeat containing 1                             | NM_172528 | 0.21             |
| 10439016     | 4930444G20Rik | RIKEN cDNA 4930444G20 gene                                  | NM_053264 | 0.21             |
| 10543697     | Zc3hc1      | zinc finger, C3HC type 1                                     | NM_172735 | 0.21             |
| 10462363     | Jak2        | Janus kinase 2                                               | NM_008413 | 0.21             |
| 10401841     | Dio2        | deiodinase, iodothyronine, type II                           | NM_010050 | 0.21             |
| 10532616     | Myo18b      | myosin XVIIIb                                                | XM_912851 | 0.21             |
| 10393620     | Cbx4        | chromobox homolog 4 (Drosophila Pc class)                    | NM_007625 | 0.21             |
| 10548735     | Dusp16      | dual specificity phosphatase 16                              | NM_130447 | 0.21             |
| 10497944     | Mfsd8       | major facilitator superfamily domain containing 8            | NM_028140 | 0.21             |
| 10358637     | Hmcn1       | hemicentin 1                                                 | NM_001024 | 0.21             |
| 10576152     | Trappc2I    | trafficking protein particle complex 2-like                   | NM_021502 | 0.22             |
| 10478615     | Pci1f       | PDX1 C-terminal inhibiting factor 1                          | NM_146129 | 0.22             |
| 10468639     | Dclre1a     | DNA cross-link repair 1A, PSO2 homolog (S. cerevisiae)        | NM_018831 | 0.22             |
| 10572271     | Tm6sf2      | transmembrane 6 superfamily member 2                         | NM_181540 | 0.22             |
| 10481734     | Lrsam1      | leucine rich repeat and sterile alpha motif containing 1     | NM_199302 | 0.22             |
| 10496892     | Fupb1       | far upstream element (FUSE) binding protein 1                | NM_057172 | 0.22             |
| 10519224     | Pusf1       | pseudouridylate synthase-like 1                              | ENSMUST0 000097737 | 0.22 |
| 10577441     | Defb9       | defensin beta 9                                              | NM_139219 | 0.22             |
| 10472514     | Nostrin     | nitric oxide synthase trafficker                             | NM_181547 | 0.23             |
| 10443421     | Brpf3       | bromodomain and PHD finger containing, 3                     | NM_001081 | 0.23             |
| 10506170     | Efcab7      | EF-hand calcium binding domain 7                             | NM_145549 | 0.23             |
| 10505623     | D4Bwg0951e  | DNA segment, Chr 4, Brigham & Women's Genetics 0951 expressed | BC030404  | 0.23             |
| 10404059     | Hist1h1c    | histone cluster 1, H1c                                       | NM_015786 | 0.23             |
Supplementary Table 4: List of the 78 genes showing a significant effect of sleep deprivation (SD) in both sham and ADX mice of the present micro-array and a significant effect of spontaneous wakefulness (from an analysis of the difference between baseline ZT18 and ZT12 micro-array data of Maret et al., 2007). Log fold-change (logFC) and FDR adjusted P values are shown for sham-lesioned mice between sleep deprivation (SD) and baseline (BL) and for DBA/2J mice between ZT18 and ZT12. The direction indicates whether SD and ZT18 timing increased (up) or decreased (down) the expression of the transcripts.

| Gene Symbol | Sham SD/BL logFC | Sham SD/BL Adj. P value | ZT18/SD logFC | ZT18/SD Adj. P value | Direction |
|-------------|-----------------|------------------------|---------------|----------------------|-----------|
| Hspa1b      | 0.81            | 0.0002                 | 1.87          | 1.45e-05             | up        |
| Arc         | 1.40            | 1.52e-09               | 1.75          | 6.81e-05             | up        |
| Egr1        | 0.59            | 0.0002                 | 1.09          | 0.0001               | up        |
| Egr3        | 0.31            | 0.001                  | 1.00          | 0.0006               | up        |
| Hspa5       | 0.77            | 1.49e-10               | 0.86          | 0.0009               | up        |
| Cirbp       | -0.91           | 4.11e-09               | -1.02         | 0.001                | down      |
| P4ha1       | 0.70            | 8.47e-08               | 0.77          | 0.001                | up        |
| Cryab       | 0.35            | 0.0008                 | 0.73          | 0.001                | up        |
| Fam46a      | 0.22            | 0.01                   | 0.76          | 0.001                | up        |
| Fos         | 0.70            | 2.32e-06               | 1.70          | 0.001                | up        |
| Chordc1     | 0.68            | 1.01e-05               | 0.70          | 0.001                | up        |
| Dusp6       | 0.48            | 7.61e-06               | 0.71          | 0.002                | up        |
| Npas4       | 0.66            | 1.17e-05               | 1.15          | 0.002                | up        |
| Nr4a1       | 0.84            | 1.91e-05               | 1.14          | 0.002                | up        |
| Sfpq        | 0.31            | 7.55e-05               | 0.76          | 0.002                | up        |
| Nr4a3       | 0.46            | 4.22e-05               | 0.73          | 0.002                | up        |
| Mkks        | 0.40            | 2.55e-07               | 0.68          | 0.003                | up        |
| Sdf21l      | 0.80            | 2.55e-07               | 0.71          | 0.003                | up        |
| Rbm3        | -0.81           | 2.66e-09               | -0.68         | 0.003                | down      |
| Trim9       | 0.29            | 0.0008                 | 0.63          | 0.003                | up        |
| Etv5        | 0.31            | 0.02                   | 0.68          | 0.005                | up        |
| Cys1        | 0.49            | 1.01e-07               | 0.57          | 0.005                | up        |
| Tra2a       | 0.50            | 3.42e-06               | 0.60          | 0.005                | up        |
| Dusp1       | 0.66            | 6.25e-05               | 0.72          | 0.006                | up        |
| Dio2        | 0.75            | 2.55e-07               | 0.66          | 0.007                | up        |
| Spred1      | 0.37            | 0.0004                 | 0.63          | 0.007                | up        |
| Usp2        | -0.22           | 0.005                  | -0.57         | 0.008                | down      |
| Creltd2     | 0.58            | 4.66e-08               | 0.54          | 0.008                | up        |
| Nfil3       | 0.40            | 0.002                  | 0.57          | 0.008                | up        |
| Xbp1        | 0.41            | 3.78e-05               | 0.58          | 0.008                | up        |
| Calr        | 0.45            | 1.01e-05               | 0.53          | 0.009                | up        |
| Dusp11      | 0.23            | 0.007                  | 0.59          | 0.009                | up        |
| Hspa1a      | 0.53            | 0.001                  | 0.68          | 0.009                | up        |
| Pdia6       | 0.66            | 5.99e-09               | 0.59          | 0.009                | up        |
| Opalin      | -0.94           | 7.06e-06               | -0.81         | 0.009                | down      |
| Hsp90b1     | 0.46            | 9.40e-07               | 0.53          | 0.01                 | up        |
| Hexim1      | 0.34            | 0.0001                 | 0.51          | 0.01                 | up        |
| Hshp1       | 0.60            | 1.91e-07               | 0.54          | 0.01                 | up        |
| Plip4       | -0.43           | 1.01e-05               | -0.52         | 0.01                 | down      |
| Eny2        | -0.19           | 0.02                   | -0.51         | 0.01                 | down      |
| Homer1      | 0.52            | 4.64e-08               | 0.94          | 0.01                 | up        |
| Armet       | 0.58            | 8.18e-07               | 0.54          | 0.01                 | up        |
| Dnajb1      | 0.59            | 5.12e-05               | 0.44          | 0.02                 | up        |
| Lrrk2       | 0.39            | 1.01e-05               | 0.50          | 0.02                 | up        |
| Slc5a3      | 0.66            | 3.04e-07               | 0.59          | 0.02                 | up        |
| 4933437F05Rik | 0.80    | 1.66e-07               | 0.51          | 0.02                 | up        |
| Cbln4       | 0.24            | 0.005                  | 0.51          | 0.02                 | up        |
| EG665858 / EG665787 | -0.28  | 0.04                  | -0.44         | 0.02                 | down      |
| Aria4a      | -0.14           | 0.02                   | -0.49         | 0.02                 | down      |
| Synj2       | 0.28            | 0.0003                 | 0.57          | 0.02                 | up        |
| Bcl2        | 0.28            | 0.0005                 | 0.42          | 0.02                 | up        |
| Gene Symbol | Sham SD/BL logFC | Sham SD/BL Adj. P value | ZT18/ZT12 logFC | ZT18/ZT12 Adj. P value | Direction |
|-------------|-----------------|------------------------|-----------------|------------------------|-----------|
| Pdia3       | 0.42            | 0.0007                 | 0.41            | 0.02                   | up        |
| Enc1        | 0.20            | 0.002                  | 0.50            | 0.03                   | up        |
| Zbtb40      | 0.37            | 0.0002                 | 0.56            | 0.03                   | up        |
| Zbtb22      | -0.30           | 4.22e-05               | -0.43           | 0.03                   | down      |
| Mfsd4       | -0.33           | 3.19e-06               | -0.50           | 0.03                   | down      |
| Ppm2c       | 0.36            | 7.60e-07               | 0.41            | 0.03                   | up        |
| Tipin       | -0.51           | 0.0003                 | -0.41           | 0.04                   | down      |
| Ier5        | 0.17            | 0.04                   | 0.36            | 0.04                   | up        |
| Dnaja4      | 0.28            | 0.0005                 | 0.37            | 0.04                   | up        |
| Dnajb11     | 0.43            | 0.0002                 | 0.35            | 0.04                   | up        |
| Pcsk1       | 0.38            | 8.75e-05               | 0.55            | 0.04                   | up        |
| Gfod1       | 0.35            | 2.38e-05               | 0.36            | 0.04                   | up        |
| Snf1lk2     | 0.26            | 0.001                  | 0.42            | 0.04                   | up        |
| Dnajc3      | 0.40            | 3.42e-06               | 0.39            | 0.04                   | up        |
| Pfkfb3      | 0.33            | 0.0001                 | 0.42            | 0.04                   | up        |
| Hspa4l      | 0.25            | 0.001                  | 0.40            | 0.04                   | up        |
| Tubd1       | 0.33            | 0.002                  | 0.47            | 0.04                   | up        |
| BC004004    | -0.25           | 4.64e-05               | -0.37           | 0.04                   | down      |
| Stip1       | 0.43            | 0.0002                 | 0.37            | 0.04                   | up        |
| Fkbp4       | 0.29            | 0.0002                 | 0.33            | 0.04                   | up        |
| Rbm11       | -0.65           | 2.55e-07               | -0.55           | 0.04                   | down      |
| Otub2       | 0.44            | 0.0001                 | 0.44            | 0.05                   | up        |
| Mett10d     | 0.30            | 0.0005                 | 0.36            | 0.05                   | up        |
| Luzp1       | 0.20            | 0.01                   | 0.33            | 0.05                   | up        |
| Dusp4       | 0.59            | 1.43e-05               | 0.47            | 0.05                   | up        |
| Trib2       | 0.30            | 0.0005                 | 0.40            | 0.05                   | up        |
| Tfcc        | -0.59           | 4.66e-08               | -0.34           | 0.05                   | down      |
Supplementary Table 5: List of probe sets affected by SD (see Supplementary Table 1) that are considered potential targets of the microRNAs affected by sleep deprivation (SD) in both sham and ADX animals. Target genes among the probe sets that were either decreased (down) or increased (up) by SD were extracted from the Miranda data base. P values obtained from enrichment calculation using Fisher’s Exact test. Gene symbol in **bold** (Homer1 and ler5) have been analyzed by qPCR in the present study.

| miRNA | Affymetrix ID | Gene symbol | Gene description | Accession | Direction (P value) |
|-------|---------------|-------------|------------------|-----------|--------------------|
| mir-29c | 10579219 | Ddx49 | DEAD (Asp-Glu-Ala-Asp) box polypeptide 49 | NM_001024922 | down (p = 0.02) |
| 10400157 | Nova1 | neuro-oncological ventral antigen 1 | ENSMUST00000021438 | |
| 10551736 | Ppp1r14a | protein phosphatase 1, regulatory (inhibitor) subunit 14A | NM_026731 | |
| 10378857 | Coro6 | coronin, actin binding protein 6 | NM_139128 | |
| 10516529 | Adc | arginine decarboxylase | NM_172875 | |
| 10491486 | Atp11b | ATPase, class VI, type 11B | NM_029570 | |
| 1020372 | Cry1 | crystallin, lambda 1 | NM_030004 | |
| 10543466 | Gpr37 | G protein-coupled receptor 37 | NM_010338 | |
| 10386636 | Usp22 | ubiquitin specific peptidase 22 | NM_001004 | |
| 10485282 | Alkbh3 | alkB, alklylation repair homolog 3 (E. coli) | NM_026944 | |
| 10546760 | Ddx3x | DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide 3, X-linked | BC083059 | |
| 10564978 | Blm | Bloom syndrome homolog (human) | NM_007550 | |
| 10373242 | Nav3 | neuron navigator 3 | NM_001081035 | |
| 10522303 | Guf1 | GUF1 GTPase homolog (S. cerevisiae) | NM_172711 | |
| 10593620 | Cbx4 | chromobox homolog 4 (Drosophila Pc class) | NM_007625 | |
| 10487945 | Prei4 | preimplantation protein 4 | NM_028802 | |
| 10460468 | Ctsf | cathepsin F | NM_019861 | |
| 10434934 | Bdh1 | 3-hydroxybutyrate dehydrogenase, type 1 | NM_175177 | |
| 10351749 | Wdr42a | WD repeat domain 42A | NM_153555 | |
| 10441718 | Park2 | parkin | NM_016694 | |
| 10429100 | Lrcc6 | leucine rich repeat containing 6 (testis) | NM_019457 | |
| 10546349 | Xpc | xeroderma pigmentosum, complementation group C | NM_009531 | |
| 10484227 | Sestd1 | SEC14 and spectrin domains 1 | NM_175455 | |
| 10400155 | Nova1 | neuro-oncological ventral antigen 1 | ENSMUST0000006043 | |
| 10603087 | Pir | pirin | NM_027153 | |
| 10357888 | Ppia4 | protein tyrosine phosphatase, receptor type, f polypeptide (PTPRF), interacting protein (liprin), alpha 4 | AK173053 | |
| 10408870 | Tbc1d7 | TBC1 domain family, member 7 | NM_025935 | |
| 10549473 | Caprin2 | caprin family member 2 | NM_181541 | |
| 10578138 | Dctn6 | dynactin 6 | NM_011722 | |
| 10589899 | Glb1 | galactosidase, beta 1 | NM_009752 | |
| 10487040 | Fbn1 | fibrillin 1 | NM_007993 | |
| 10377380 | 1500010J02Rik | RIKEN cDNA 1500010J02 gene | NM_026889 | |
| 10470283 | Egfl7 | EGF-like domain 7 | NM_198724 | |
| 10450533 | Vars2 | valyl-tRNA synthetase 2, mitochondrial (putative) | NM_175137 | |
| 10598723 | Ddx3x | DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide 3, X-linked | NM_010028 | |
| 10526897 | Unc84a | unc-84 homolog A (C. elegans) | NM_024451 | |
| 10589494 | Cspg5 | chondroitin sulfate proteoglycan 5 | NM_013584 | |
| 10434436 | EG328644 | predicted gene, EG328644 | BC125016 | |
| 10572679 | Glt25d1 | glycosyltransferase 25 domain containing 1 | NM_146211 | |
| 10512739 | Xpa | xeroderma pigmentosum, complementation group A | NM_011728 | |
| 10556208 | D930014E17Rik | RIKEN cDNA D930014E17 gene | NM_026016 | |
| 10395719 | Npas3 | neuronal PAS domain protein 3 | NM_013780 | |
| 10458046 | D0H4S114 | DNA segment, human D4S114 | NM_053078 | |

**mir-34a**

| miRNA | Affymetrix ID | Gene symbol | Gene description | Accession |
|-------|---------------|-------------|------------------|-----------|
| mir-34a | 10395719 | Npas3 | neuronal PAS domain protein 3 | NM_013780 |
| miRNA | Affymetrix ID | Gene symbol | Gene description | Accession | Direction (P value) |
|-------|---------------|-------------|------------------|-----------|---------------------|
| miR-151-5p | 10361250 | Camk1g | calcium/calmodulin-dependent protein kinase I gamma | NM_144817 | up (p = 0.03) |
|       | 10480035 | Pfkfb3 | 6-phosphofructo-2-kinase/fructose-2,6-bisphosphatase 3 | NM_133232 |
|       | 10399725 | Sox11 | SRY-box containing gene 11 | NM_009234 |
|       | 10562576 | Plekhf1 | pleckstrin homology domain containing, family F (with FYVE domain) member 1 | NM_024413 |
|       | 10438478 | Abcc5 | ATP-binding cassette, sub-family C (CFTR/MRP), member 5 | NM_013790 |
|       | 10491780 | Hspa4l | heat shock protein 4 like | NM_011020 |
|       | 10449452 | Fkbp5 | FK506 binding protein 5 | NM_010220 |
|       | 10350733 | Rgs16 | regulator of G-protein signaling 16 | NM_011267 |
|       | 10497417 | Crh | corticotropin releasing hormone | NM_205769 |
|       | 10521331 | A930005I04Rik | RIKEN cDNA A930005I04 gene | BC116928 |
|       | 10394890 | E2f6 | E2F transcription factor 6 | NM_033270 |
|       | 10505213 | E130308A19Rik | RIKEN cDNA E130308A19 gene | NM_153158 |
|       | 10416541 | Enox1 | ecto-NOX disulfide-thiol exchanger 1 | NM_172813 |
|       | 10356628 | Hdac4 | histone deacetylase 4 | NM_207225 |
|       | 10582008 | 2310061C15Rik | RIKEN cDNA 2310061C15 gene | NM_026844 |
|       | 10606969 | Rbm4 | RNA binding motif protein 41 | NM_153586 |
|       | 10397912 | 9030205A07Rik | RIKEN cDNA 9030205A07 Gene | AB257853 |
|       | 10516064 | Mfsd2 | major facilitator superfamily domain containing 2 | NM_029662 |
|       | 10535641 | St7 | Suppression of tumorigenicity 7 | NM_022332 |
|       | 10539606 | Cct7 | chaperonin containing Tcp1, subunit 7 (eta) | NM_007638 |
|       | 10561247 | Shkbp1 | Sh3kbp1 binding protein 1 | NM_138676 |
|       | 10366938 | Stac3 | SH3 and cysteine rich domain 3 | NM_177707 |
|       | 10347427 | Stk36 | serine/threonine kinase 36 (fused homolog, Drosophila) | NM_175031 |
|       | 10445688 | Ccnd3 | cyclin D3 | NM_001081 |
|       | 104020516 | Cdadc1 | cytidine and dCMP deaminase domain containing 1 | NM_027986 |
|       | 10346562 | Cflar | CASP8 and FADD-like apoptosis regulator | NM_207653 |
|       | 10430770 | Tob2 | transducer of ERBB2, 2 | NM_020507 |
|       | 10460312 | Cdk2ap2 | CDK2-associated protein 2 | NM_026373 |
|       | 10590821 | 9230110C19Rik | RIKEN cDNA 9230110C19 gene | BC115525 |
| miR-212 | 10394735 | Pdia6 | protein disulfide isomerase associated 6 | NM_027959 | up (p = 0.06) |
|       | 10406626 | Homer1 | homer homolog 1 (Drosophila) | NM_147176 |
|       | 10504218 | Dnajb5 | DnaJ (Hsp40) homolog, subfamily B, member 5 | NM_019874 |
|       | 10464905 | Npas4 | neuronal PAS domain protein 4 | NM_153553 |
|       | 10361250 | Camk1g | calcium/calmodulin-dependent protein kinase I gamma | NM_144817 |
|       | 10526553 | Vgf | VGF nerve growth factor inducible | NM_001039 |
|       | 10547386 | Adipor2 | adiponectin receptor 2 | NM_197985 |
|       | 10496872 | Eltd1 | EGF, latrophilin seven transmembrane domain containing 1 | NM_133222 |
|       | 10464819 | Rbm14 | RNA binding motif protein 14 | NM_019869 |
|       | 10398147 | Papola | poly (A) polymerase alpha | NM_011112 |
|       | 10419691 | Mettl3 | methyltransferase-like 3 | NM_019721 |
|       | 10562576 | Plekhf1 | pleckstrin homology domain containing, family F (with FYVE domain) member 1 | NM_024413 |
|       | 10450369 | Hspa1a | heat shock protein 1A | NM_010479 |
|       | 10335803 | Uggcl1 | UDP-glucose ceramide glucosyltransferase-like 1 | NM_198899 |
|       | 10409278 | Nfil3 | nuclear factor, interleukin 3, regulated | NM_017373 |
|       | 10527332 | Nptx2 | neuronal pentraxin 2 | NM_016789 |
| miRNA     | Affymetrix ID | Gene symbol | Gene description                                                                 | Accession    | Direction (P value) |
|-----------|---------------|-------------|----------------------------------------------------------------------------------|--------------|---------------------|
| 10600034  | Gm1141        | gene model 1141, (NCBI) |                                                                                   | ENSMUST0000101495 |                     |
| 10505213  | E130308A19Rik | RIKEN cDNA E130308A19 gene |                                                                                   | NM_153158    |                     |
| 10462752  | Btaf1         | BTAF1 RNA polymerase II, B-TFIID transcription factor-associated, (Mot1 homolog, S. cerevisiae) | NM_0010800706 |                     |
| 10462333  | Cdc37i1       | cell division cycle 37 homolog (S. cerevisiae)-like 1 |                                                                                   | NM_025950    |                     |
| 10453887  | Cables1       | Cdk5 and Abl enzyme substrate 1 |                                                                                   | NM_022021    |                     |
| 10583834  | 9530077C05Rik | RIKEN cDNA 9530077C05 gene |                                                                                   | BC054761     |                     |
| 10458340  | Hbegf         | heparin-binding EGF-like growth factor |                                                                                   | NM_010415    |                     |
| 10565250  | Mesdc1        | mesoderm development candidate 1 |                                                                                   | NM_030705    |                     |
| 10424909  | Hsf1          | heat shock factor 1 |                                                                                   | NM_008296    |                     |
| 10358978  | ler5          | immediate early response 5 |                                                                                   | NM_010500    |                     |
| 10400357  | Baz1a         | bromodomain adjacent to zinc finger domain 1A |                                                                                   | NM_013815    |                     |
| 10511510  | Ints8         | integrator complex subunit 8 |                                                                                   | NM_178112    |                     |
| 10350753  | Glul          | glutamate-ammonia ligase (glutamine synthetase) |                                                                                   | NM_008131    |                     |
| 10439016  | 4930444G20Rik | RIKEN cDNA 4930444G20 gene |                                                                                   | NM_053264    |                     |
| 10469867  | Pnpla7        | patatin-like phospholipase domain containing 7 |                                                                                   | NM_146251    |                     |
| Gene Symbol | Direction | Sequence 5’ to 3’  | Accession # |
|-------------|-----------|-------------------|-------------|
| mNpas2      | fwd       | GGTCATCGGATTCTTGCAGAA | NM_008719  |
|             | rev       | TCCAGTCTCTTGGCATGCTCA |           |
|             | probe     | CACAATGAAGTCTCAGCAAAATC |       |
| mPer1       | fwd       | ACCAGGCTGTGATGACATAC | NM_011065  |
|             | rev       | CTCTCCCGTGTTGCTTCAG  |           |
|             | probe     | CCGTCAGGGATGGAGCCTCT  |           |
| mPer2       | fwd       | ATGCTCGCCATCACAGAGA | NM_011066  |
|             | rev       | GCGGAAATCGAATGGAGAAT |           |
|             | probe     | ATCTACAGGGCGTGACAGC   |           |
| mPer3       | fwd       | CGCACAGTCTCCAACTCA    | NM_011067  |
|             | rev       | TTTCGCTTGGCAATTCTCAT |           |
|             | probe     | ACAACTGGACCAAGAGCTCGCAG |       |
| mDbp        | fwd       | CGTGGAGTGCTAATGACCTT  | NM_016974  |
|             | rev       | CATGCCCTGGAATGCTTGAGA |           |
|             | probe     | AAAGATGCTGCGTTTGGCC   |           |
| mRev-Erbα   | fwd       | CCAGCAGAGTGCCTCCAG    | NM_145434  |
|             | rev       | GCAAGCATTGGCGTTCTCCT |           |
|             | probe     | AGAGATGCTGCGTTTGGCC   |           |
| mHomer1α    | fwd       | GCATTGCGTCTGTCCATAG   | NM_011982  |
|             | rev       | ATGAACCTTCATATTACACCTT |       |
|             | probe     | ACACATTCCAATTCAGCAATCTAGA |     |
| mSgk1       | fwd       | ACGGTGGACTGGTGTTCT    | NM_013161  |
|             | rev       | GCGGCTGCCGGCTATAAAAA  |           |
|             | probe     | TATGAGATGCTCTACGCCGGCCC |       |
| mPdk4       | fwd       | TCACCCACATGCTCTCCAACTC | NM_013743  |
|             | rev       | GGGTCAAGGAAAGGACGTTT |           |
|             | probe     | TCAAGATGCCCCATGAGGGCCACG |       |
| mXdh        | fwd       | CAAGTCGCTGCGTCCAT    | NM_011723  |
|             | rev       | GCCATGACAGCCAGTGGTTGA |           |
|             | probe     | CATCATCACCCGGACGCCCCAT |       |
| mMertk      | fwd       | CGTGTTAATGAAACACCGGAAAG | NM_008587 |
|             | rev       | GGCCCTCACAGCTGGAAGACT |           |
|             | probe     | CTGTCCTAACCCTACCTGCTGAGAGAACA |       |
| mIer5       | fwd       | GAAGCGAAGGGGAGATGGGA  | NM_010500  |
|             | rev       | ATCTTGCAGCGGAGATGCT  |           |
|             | probe     | TTCAAGTGGAGCTCTCAGCCAC |       |
| mPpp1r1α    | fwd       | GGCAAGGAAAGGATGACAAA | NM_021391  |
|             | rev       | GCCCTAGGTGATGTTCAACCA |           |
|             | probe     | CACCCACAGTAAGAGCTCGACAGCG |       |
| mGusB       | fwd       | ACGGGATGGTGACTCCGA    | NM_010368  |
|             | rev       | TGACTGCTGGCAAAGACTCTGA |       |
|             | probe     | AGTGGTCCGGTGGGTGATG  |           |
| mTbp        | fwd       | TGGACCTAAGACCCATTGCCTC | NM_013684  |
|             | rev       | TTCTCATGATGACTGCAAGAAA |       |
|             | probe     | TGCAAGAAGATGCTGAAATCCCTCCAGAGC |       |
| mRsp9       | fwd       | GACCCAGGAGCTAAAGTTGATGTTGA | NM_029767 |
|             | rev       | TCTTGCCGCGGTAACCTTG   |           |
|             | probe     | AAAAACTCACCGTTTGGCAGGACTCTACT |       |