MicroRNAs are required for the feature maintenance and differentiation of brown adipocytes

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Abstract:

Brown adipose tissue is specialized to burn lipids for heat generation as a natural defense against cold and obesity. Previous studies established microRNAs as essential regulators of brown adipocyte differentiation, but it remains unknown whether microRNAs are required for the feature maintenance of mature brown adipocytes. To address this question, we ablated Dgcr8, a key regulator of the microRNA biogenesis pathway, in mature brown as well as white adipocytes. The adipose tissue -specific Dgcr8 knockout mice displayed enlarged but pale interscapular brown fat with decreased expression of genes characteristic of brown fat, and the mice were intolerant to cold exposure. *In vitro* primary brown adipocyte cultures confirmed that microRNAs are required for marker gene expression in mature brown adipocytes. We also demonstrated that microRNAs are essential for the browning of subcutaneous white adipocyte both *in vitro* and *in vivo*. Using this animal model, we performed microRNA expression profiling analysis and identified a set of BAT-specific microRNAs that are up-regulated during brown adipocyte differentiation and enriched in brown fat compared to other organs. We identified miR-182 and miR-203 as new regulators of brown adipocyte development. Taken together, our study demonstrates an essential role of microRNAs in the maintenance as well as the differentiation of brown adipocytes.
Introduction

There are two principal types of adipose tissues in mammals, white adipose tissue (WAT) and brown adipose tissue (BAT) (1). The main function of WAT is to store energy as triacylglycerol (TAG) during periods of food surplus and to mobilize these stores when food is scarce. BAT is specialized to dissipate energy as heat through Uncoupling protein 1 (Ucp1)-mediated uncoupling of oxidative phosphorylation from ATP synthesis. While WAT is found widespread throughout the mammalian body, BAT is localized in the interscapular region in small rodents (1) and in human infants (2). This type of BAT, known as classical BAT, has a different developmental origin from WAT and is derived from a Myf5+ lineage precursor (3). Recently, a subpopulation of subcutaneous WAT cells has been identified as inducible BAT cells, also referred to as beige or brite adipocytes. Before activation, these inducible brown adipocytes contain a small number of mitochondria and have low thermogenic activity. Once activated these cells display abundant mitochondria, express high Ucp1 levels, and exhibit thermogenesis and energy expenditure features of brown fat (4; 5). Induction of either classical or inducible BAT can improve the metabolic phenotype of rodent models (5; 6); this is the basis for development of BAT-based therapies for obesity.

The prevalence of BAT in human adults was not appreciated until recently. Using positron emission tomography-computer tomography (PET-CT), researchers detected Ucp1 positive metabolically active adipose cells in the cervical, supraclavicular, axillary, and paravertebral regions of adult human subjects (7-11). Gene expression signature comparisons indicated that in adults BAT expresses beige fat-enriched markers such as Tbx1 and Tmem26, suggesting that these
organs may be beige fat while the interscapular BAT in infants resembles the classical BAT found in rodents (4; 12) (2). However other reports showed that both beige fat markers and classical brown-selective markers such as Zic1 and Lhx8 can be detected in adult BAT samples (11; 13), arguing that human adult BAT may consist of a mixture of classical BAT and beige fat.

Brown adipocyte development is regulated by a cascade of protein factors including transcriptional factors (e.g. Ppary, Foxc2), co-factors (e.g. Prdm16, Pgc1α) and hormones (e.g. Bmp7, Fgf21) (reviewed in (5; 14; 15)), but the role of microRNAs in this process is not well understood. Recently, we and other groups have demonstrated that microRNAs constitute a critical regulatory layer governing brown adipocyte development and beige fat activation (16). The miR-193b-365 cluster were the first reported microRNAs that sustain brown adipocyte differentiation by repressing the myogenic potential of preadipocytes (17). Ectopic expression of miR-196a can induce a browning effect in WAT both in vitro and in vivo but does not have appreciable effects on classical BAT (18). On the other hand, several microRNAs negatively regulate brown fat development. Upon cold exposure, expression of miR-133 is downregulated by Mef2 and de-represses PRDM16, thereby promoting a browning phenotype in subcutaneous WAT (19; 20) and skeletal muscle (21). MiR-155 was originally identified as a key regulator of the mammalian immune system (22), but a recent study showed that MiR-155 null mice exhibit enhanced BAT function and ‘browning’ of WAT; in contrast, transgenic expression of microRNA 155 impairs BAT functions (23). However, our understanding of the microRNA regulatory network in brown fat differentiation and function is incomplete – although previous studies have demonstrated that microRNAs are essential for brown fat cell formation.
from precursors *in vitro* and *in vivo*, it remains unknown whether microRNAs are required to maintain brown fat features in mature brown adipocytes.

To address this question, we crossed an Adiponectin-Cre transgenic mouse strain with a Dgcr8$^{lox/lox}$ conditional strain to block microRNA biogenesis in mature adipocytes. The knockout (KO) mice developed BAT dysfunction and exhibited impaired thermogenesis upon cold exposure. Genome-wide microRNA profiling revealed a set of BAT-enriched microRNAs that we showed are important for brown adipocyte development or function.
Methods

Animals, glucose intolerance test and insulin intolerance test

Adiponectin-Cre transgenic mouse strain and Dgcr8<sup>flox/flox</sup> strain were generous gifts from Dr. Evan Rosen in Harvard University and Dr. Robert Blelloch in University of California, San Francisco, respectively. Adipose tissue -specific Dgcr8 knockout mice were generated by crossing Adiponectin-Cre with Dgcr8<sup>flox/flox</sup> mice. The sequences of genotyping primers are forward: CAGATGATCAAATGCCATCAG and reverse: CATCTCCACCTTCTCAAAACC). The size of amplicon is 627bp for KO allele and 1101bp for WT allele (25).

Mice were housed in a temperature-controlled facility (21ºC) with a 12 h light/12 h dark cycle. All animal experimental protocols were approved by the Institutional Animal Care and Use Committee (IACUC) by the SingHealth Research Facilities in Singapore. Body weight and food intake were measured every week. For the glucose tolerance test (GTT), mice were fasted overnight followed by intraperitoneal glucose injection (2g/kg). For the insulin tolerance test (ITT), human insulin (Sigma) was injected (1u/kg) to randomly fed mice. Plasma insulin levels were measured by ELISA (Millipore).

For cold exposure, 6 weeks old mice were housed at 8ºC for 24hr. The rectal body temperature was recorded every hour with a probe thermometer (Advance technology) at a constant depth.

RNA extraction and quantitative real time PCR

Total RNA from cultured cells or tissues was isolated using Qiagen miRNeasy kit. RNA was reverse transcribed with M-MLV (Promega). Real-time PCR for microRNA
and mRNA were performed as described before (17). Briefly, mRNA SYBR green qRT-PCR (Applied Biosystems) was performed to detect expression of mRNA levels in HT7900 FAST Real Time PCR System. 18S was used as the internal control. miRNA qRT-PCR was performed according to the instruction of microRNA assay kit (Applied biosystems). snoRNA202 was used as the internal control.

miRNA microarray

Total RNAs were extracted from brown fat tissue and sent to Exiqon in Denmark. The quality of the total RNA was verified by an Agilent 2100 Bioanalyzer profile. 500 ng total RNA from both sample and reference was labeled with Hy3™ and Hy5™ fluorescent label, respectively, using the miRCURY LNA™ microRNA Hi-Power Labeling Kit, Hy3™/Hy5™ (Exiqon, Denmark) following the procedure described by the manufacturer. The Hy3™-labeled samples and a Hy5™-labeled reference RNA sample were mixed pair-wise and hybridized to the miRCURY LNA™ microRNA Array 7th Gen (Exiqon, Denmark), which contains capture probes targeting all microRNAs for human, mouse or rat registered in the miRBASE 18.0. The hybridization was performed according to the miRCURY LNA™ microRNA Array Instruction manual using a Tecan HS4800™ hybridization station (Tecan, Austria). After hybridization the microarray slides were scanned and stored in an ozone free environment (ozone level below 2.0 ppb) in order to prevent potential bleaching of the fluorescent dyes. The miRCURY LNA™ microRNA Array slides were scanned using the Agilent G2565BA Microarray Scanner System (Agilent Technologies, Inc., USA) and the image analysis was carried out using the ImaGene® 9 (miRCURY LNA™ microRNA Array Analysis Software, Exiqon, Denmark). The quantified signals
were background corrected and normalized using the global Lowess (LOcally WEighted Scatterplot Smoothing) regression algorithm.

Western blotting
Tissues were homogenized in RIPA buffer (Roche Applied Science), and protein concentration was determined by BCA protein assay (Pierce). Even concentration of protein lysates was separated in SDS-PAGE gels, transferred to nitrocellulose membranes (Millipore), and incubated with Ucp-1, Cytochrome C, NADH dehydrogenase Fe-S protein 3 (NDUFS3), ATP5a and Gapdh antibodies (Abcam). Quantification of signals was performed using a Gel Doc XR system (Bio-rad).

Histological analysis and cell number calculation
For histological analysis, tissues were fixed and embedded in paraffin. Hematoxylin and eosin staining (H&E) was performed on 5um paraffin-embedded sections. Immunofluorescence (IF) staining was performed on paraffin sections, with a UCP1 antibody (Abcam), and anti-mouse IgG Alexa 633 (Invitrogen) and DAPI (Invitrogen). Images were acquired with a Leica DMI 3000B microscope system (Switzerland) and analyzed with LAS V4.0 and ImageJ software. The diameter of more than 100 cells in each tissue was measured with Image J and the cell volume was calculated based on the cell diameter. Relative cell number was estimated by the ratio between tissue weight and average cell volume, then normalized to the cell number in control mice for presentation.

Adipose SVF cell isolation and culture
The stromal vascular fraction (SVF) cells from white fat tissue and brown fat tissue were isolated as described before (17). Briefly, tissue depots were digested in 0.2% collagenase at 37°C for 25-30min. Digested tissues were filtered through a 100um membrane and SVF cells were collected by centrifugation at 1500rpm for 5min. After centrifugation, the mature adipocytes floating on top were collected for genotyping analysis. The freshly isolated SVF cells were seeded and cultured in DMEM containing 10% new born calf serum and 0.5% penicillin/streptomycin at 37°C with 5% CO2. On confluence, the cells were induced to differentiate for 2 days with DMEM containing 10% FBS, 850nM of insulin, 0.5uM of dexamethasone (Sigma), 250uM of 3-isobutyl-methylxanthine (IBMX) (Sigma) and 1µM of rosiglitazone (Sigma) in DMEM. The induction medium was replaced with DMEM containing 10% FBS and 160nM insulin for 2 days. Then cell were incubated in DMEM with 10% FBS. For transfection, primary preadiocytes were kept in culture medium until 80-90% confluence. Then Locked Nucleic Acid (LNAs) miRNA inhibitors (100nM) were transfected by Lipofectamime RNAi Max (Invitrogen) according to the manufacturer’s instruction. 8 hours after transfection, cells were recovered in full culture media and induced to differentiation. Four days after differentiation RNAs were harvested for analysis.

**Oil red O (ORO) staining**

Differentiated cells were washed with PBS twice and fixed with 2% paraformaldehyde for 15 min at room temperature. After fixation, cells were washed with PBS and stained with freshly prepared ORO working solution for 1h at room temperature. 0.5g Oil Red O was dissolved in 100ml isopropanol to prepare ORO
stock solution, and 6ml stock solution was mixed with 4ml H₂O to prepare working solution.

**Gene set enrichment analysis (GSEA)**

Gene set enrichment analysis was performed as described (43). For each microRNA inhibition experiment, rank-ordered gene list according to gene expression fold changes with respect to the control experiment was generated. The ranked lists were used as input to GSEA, which mapped genes from the C2 curated gene sets from Molecular Signatures Database (MSigDB) to the ranked-ordered lists. A normalized enrichment score (NES) and a p-value is generated for each gene set. A negative NES implies that the gene set is negatively correlated to the ranked gene list.
Results

Dgcr8 adipose knockout mice exhibit enlarged and pale BAT.

To determine the role of microRNAs in mature adipocytes in vivo, we generated adipose tissue-specific Dgcr8 knockout mice by crossing Dgcr8\textsuperscript{flox/flox} mice (24; 25) with Adiponectin-Cre transgenic mice (26). Both control and knockout (KO) mice were viable and were born in the expected Mendelian ratios. We observed 80-90\% Dgcr8 deletion in interscapular BAT and epididymal (Epi) WAT in KO mice, but only 20-40\% deletion in subcutaneous (Sub) WAT (Fig 1A, upper panel). To determine whether Adiponectin-Cre specifically deletes Dgcr8 in mature adipocytes but not in preadipocytes, we examined Dgcr8 deletion in isolated mature adipocytes as well as the stromal vesicular fraction (SVF) that is enriched for preadipocytes. We observed more than 80\% deletion of Dgcr8 in mature adipocytes in all three fat tissues, but no deletion in brown and Sub SVF cells, indicating a specific deletion of Dgcr8 in mature adipocytes (Fig 1A, lower panel). A slight deletion was detected in SVF from Epi WAT, suggesting that some cell types in the Epi SVF can express AdipoQ.

Control and KO mice did not exhibit significant differences in body weight or food intake (Fig 1B, C; Fig S1A). The KO mice have smaller Epi WAT but enlarged BAT and Sub WAT (Fig 1D and E, Fig S1B). Although BAT is larger in the KO mice it has a pale appearance, suggesting that the function of brown fat is impaired. Hematoxylin and eosin (H&E) staining of biopsies revealed that Epi white adipocytes in KO mice were smaller than normal, while brown adipocytes and Sub white adipocytes were larger (Fig 1F). However, the cell numbers, estimated by the ratio of tissue weight and cell size, didn’t show significant difference (Fig 1F), indicating that
adipocyte recruitment was not affected. The total fat mass, as detected by magnetic resonance imaging (MRI), did not show a significant difference (Fig 1G).

**Adipose-specific Dgcr8 knockout results in impaired insulin sensitivity.**

Since changes in the size of adipose tissue often results in a systemic metabolic phenotype, we performed glucose tolerance (GTT) and insulin tolerance tests (ITT). Blood glucose levels were similar between control and KO mice during GTT (Fig 1H, Fig S1C). However, the KO mice exhibited higher blood glucose levels than control group during the ITT, indicating impaired insulin sensitivity (Fig 1I, Fig S1 D). Because the KO mice showed a normal GTT response but had an impaired ITT response, we suspected that the KO mice might develop hyperinsulinemia as a compensatory mechanism for insulin resistance to maintain glucose homeostasis. Indeed, ELISA showed that the insulin level was significantly higher in the KO mice (Fig 1J). Because an enlarged Sub WAT and a smaller Epi WAT are usually associated with beneficial metabolic effects (27; 28), the insulin resistance in KO mice might be due to brown fat dysfunction (29). However, the relative contribution of each adipose to the insulin resistance remains to be further investigated.

**Deletion of Dgcr8 impairs the function of BAT in vivo.**

To further examine the effect of Dgcr8 deletion in BAT, we performed real-time PCR to compare the expression of selected marker genes. Deletion of Dgcr8 in BAT resulted in significant decrease in brown fat and mitochondrial marker genes such as Ucp1, Cebpβ, Cidea and Ppara, Cox4, Cox7 and Cox8, and, to a lesser extent, common adipocyte marker genes such as Ppary, Fabp4, and Glut4 (Fig 2A). Western Blots showed lower protein levels of Ucp1 as well as mitochondrial proteins
CytoC and Ndufs3 (Fig 2B). Immunofluorescence staining also showed a decrease of Ucp1 expression in the BAT from KO mice (Fig 2C). Taken together, these data indicate that microRNAs in mature brown adipocytes are essential for maintaining the expression of brown fat- important genes.

Because Dgcr8 deletion caused a dramatic reduction of Ucp1 at both mRNA and protein levels, we suspected that the thermogenic response of these KO mice would be impaired upon cold exposure. At an ambient temperature of 21°C, control and KO mice had similar body temperatures; at 8°C KO mice experienced a more rapid decline in body temperature than controls (Fig 2D) and the cold intolerance phenotype in KO mice remained after 24hr cold exposure (Fig2E). This phenotype is likely to be attributed to the defect in BAT, but we can’t exclude the possible contribution of indirect effect on shivering (detailed in Discussion).

**Deletion of Dgcr8 in mature brown adipocytes results in impaired gene expression *in vitro.*

To test whether the phenotype observed in BAT is cell autonomous, we isolated the brown fat stromal vascular fraction (SVF) cells from KO and control mice and differentiated them to brown adipocytes. To avoid activation of AdipoQ-Cre expression at early stage, we reduced the concentration of Rosiglitazone from 1µM to 0.2µM. Genotyping at different time points during differentiation showed no deletion of Dgcr8 before the induction of differentiation, less than 20% deletion at day 4 when mature adipocytes had formed, but a complete deletion at day 6, indicating that the Adiponectin-Cre-driven target deletion occurred only at the mature adipocyte stage (Fig 3A).
Eight days after differentiation, we isolated RNAs and used microRNA real-time PCR to confirm whether microRNA biogenesis was blocked. We examined the expression of miR-193a, miR-193b and miR-365 that were previously reported as essential regulators of brown fat development (17) and found that these microRNAs were all down-regulated in BAT cells from the KO mice (Fig 3B), indicating a loss-of-function of Dgcr8 in our cell culture system.

No significant difference was observed in Oil red O (ORO) staining (Fig 3C), indicating that loss of microRNAs in mature brown adipocytes did not cause any defect in lipid accumulation. However, real-time PCR revealed a significant decrease in expression of key brown fat and mitochondria mRNAs including Ucp1, Cidea, Ppara, Cox4 and Cox7 in KO brown fat adipocytes. KO also resulted in a slight decrease in two common adipogenic markers Pparγ and Fabp4. Consistent with the phenotype shown in vivo in adipose tissue-specific Dgcr8 mice, these data demonstrated that microRNAs are required to maintain the expression of brown fat genes required for thermogenesis and mitochondrial biogenesis in a cell autonomous manner.

**Deletion of Dgcr8 in brown adipocyte precursors impairs the formation of brown adipocytes.**

Since Adiponectin-Cre will only delete the target gene after mature adipocytes are formed, using this system we cannot address whether microRNAs, as a group, are required for brown adipocyte formation. To answer this question, we isolated brown fat SVF cells from Dgcr8\textsuperscript{flox/flox} mice and infected these cells with adenovirus
expressing Cre recombinase (Ad-Cre) or GFP (Ad-GFP) two days before
differentiation. Four days after differentiation, Ad-Cre-infected cells showed a
marked decrease of lipid accumulation (Fig S2 A), accompanied with decreased
marker gene expression including both brown fat markers and common
adipogenesis markers (Fig S2 C). Thus, as expected, microRNAs are required for
both lipid droplet accumulation and gene expression in the process of brown
adipocyte differentiation from precursors.

**Dgcr8 deficiency causes attenuation of browning of subcutaneous white fat.**

In contrast to the strong phenotype observed in KO brown fat, the phenotype in
white fat was mild. In Epi WAT, Dgcr8 knockout resulted in a decrease in the
expression levels of Pparγ and AdipoQ, but not Fabp4, Glut4 or Cebpα (Figure S3
A). Lipolysis assay using explants from Epi WAT didn’t reveal significant difference
between CON and KO tissues (Figure S3B). However, because the KO Epi WAT
was much smaller, its overall capacity of lipolysis and TAG storage should be
reduced, even if the remaining pads seem to be normal.

In Sub WAT, Dgcr8 deletion did not cause significant changes in all the examined
marker mRNAs except for Pparγ (Fig 4A). These data suggest that microRNAs have
limited effects on gene expression in mature white adipocytes. Since Dgcr8 knockout
had a preferential influence on brown fat markers but not the common adipogenesis
marker in brown fat (Fig 3 D), we examined whether Dgcr8 deletion affected
“browning” of inguinal WAT. We housed knockout and control animals at 8°C for 48
hours and isolated total RNAs for Real-time PCR analysis. Before cold stimulation,
all the “browning” markers examined, such as Ucp1, Ppara, Cidea and Cox7, showed little difference; after stimulation, these markers were markedly increased in control mice, but the extent of induction was significantly lower in KO mice. Western blot confirmed the blunted induction of Ucp1 protein in KO inguinal WAT upon cold exposure (Figure 3C). These data demonstrates that microRNAs are important regulators for browning of subcutaneous WAT.

To test whether microRNAs are required for the browning of subcutaneous adipocytes in vitro, we differentiated SVF cells isolated from inguinal WAT in the presence or the absence of “browning” stimulators, rosiglitazone and norepinephrine. We did not observe significant differences in lipid accumulation or common adipogenic marker gene expression (Fig S4 A, B and C). However, we found that the “browning” markers induced by rosiglitazone and norepinephrine were significantly lower in knockout cells (fig S4 D), indicating that microRNAs are essential for the browning of white adipocytes in vitro.

**Microarray study reveals a set of BAT-enriched microRNAs.**

Since Dgcr8 is a key regulator of microRNA biogenesis, the impaired BAT function observed in vivo and in vitro should be due to the loss of some key microRNAs. Key regulators are often up-regulated during adipogenesis and enriched in brown adipocytes relative to other cell types. To identify microRNAs that meet these criteria, we used microRNA microarrays to examine genome-wide microRNA expression in BAT in control and KO mice. Because BAT consists of a variety of cell types including mature brown adipocytes, brown adipocyte precursors, endothelial cells, and some immune cells, and because Adiponectin-Cre only deletes floxed
genes in mature brown adipocytes (Figure 1A), this microRNA gene expression analysis should reveal microRNAs that are enriched in mature brown adipocytes and whose formation is dependent on Dgcr8.

We selected the 10 most downregulated microRNAs in the Dgcr8 KO brown adipocytes for further investigation: miR-107, miR-182, miR-203, miR-378a, miR-378b, miR 708, miR-193a, miR-193b, miR-365 and miR-30e (Fig 5A). Using qPCR we confirmed the downregulation of these 10 microRNAs in the Dgcr8 KO brown adipocytes (Fig 5B). We also found that these microRNAs were up-regulated during primary BAT adipogenesis (Figure 5C) and most of them, except miR-30e and miR-708, were enriched in BAT compared to other tissues (Figure 5D). These results imply that these identified microRNAs play an important role in BAT development or function.

To test whether these BAT-enriched microRNAs are sufficient to maintain brown fat marker gene expression in the absence of other microRNAs, we introduced RNA mimics of these microRNAs into mature brown adipocytes from KO mice maintained in cell culture. The overexpression of these microRNAs could not rescue the molecular phenotype in Dgcr8 KO brown adipocyte cells (Fig S5). This result suggests that other miRNAs are necessary to constitute the microRNA regulatory core for marker gene expression.

**MiR-203 and miR-182 are required for brown adipocyte development.**

Among the BAT-specific microRNA that were identified from the microarray analysis, miR-107 (30) and the miR-193a/b-365 cluster (17) have been reported as regulators
of adipogenesis; miR-378a/b are involved in mitochondrial fatty acid metabolism and oxygen consumption (31; 32), but the role of miR-182, miR-203, and miR-708 in BAT remains unknown. To test their functions, we transfected LNA-microRNA inhibitors into brown adipocyte precursors and then induced the transfected cells to differentiate. Four days after differentiation, we performed real-time PCR to confirm their inhibition of target microRNA expression (Fig 6A). We didn’t observe a significant difference in lipid accumulation detected by ORO staining, indicating that these microRNAs were not essential for lipid accumulation per se (Fig 6B).

Interestingly, we found that blocking miR-182 or miR-203 caused reduction of brown fat marker mRNAs such as Ucp1, Pgc1α, Cidea, Pparα and mitochondrial markers such as Cox 7 and Cox8, but not the common adipogenic markers including Pparγ, Fabp4 and AdipoQ. To determine the effects of microRNA knockdown on global gene expression, we performed RNA seq, followed by Gene Set Enrichment Analysis (GSEA). The expression of gene sets controlling respiratory electron transport and oxidative phosphorylation was significantly down-regulated upon blocking miR-182 and miR-203 but not miR-708 (Figure 6D). Taken together, these data indicate that miR-182 and miR-203 are required for the full differentiation of brown adipocytes.

To identify mRNA targets of miR-182 and miR-203, we examined the expression levels of TargetScan-predicted candidates. Among the conserved microRNA targets are Insulin Induced Gene 1 (Insig1) and Platelet-derived growth factor receptor α (Pdgfα), targeted by both miR-182 and miR-203. Both Insig1 and Pdgfα were reported as inhibitors of adipocyte differentiation (33; 34). Real-time PCR analysis showed that the expression of Insig1 and Pdgfα was up-regulated upon miR-182
and miR-203 knockdown, suggesting that miR-182 and miR-203 function partially by targeting two common targets, Insig1 and Pdgfra.

To test whether miR-182 and miR-203 are sufficient to promote brown adipocyte differentiation, we transfected miR-182 and miR-203 mimics into brown adipocyte culture, but we did not observed any alteration in lipid accumulation and BAT marker expression (Data not shown). Thus, miR-182 and miR-203 are not sufficient but are required for a full brown adipocyte differentiation.
Discussion

Because of the energy expenditure feature of brown fat, researchers are interested in understanding the detailed regulation of brown fat development and function. Recently, several studies have demonstrated that microRNAs comprise an important regulatory network for brown fat differentiation (16). However, it is still unclear whether microRNAs are essential for the maintenance of brown fat function. To address this question, we generated an adipose tissue-specific Dgcr8 KO mouse model using Adiponectin-Cre mice, in which microRNA biogenesis was ablated specifically in mature adipocytes but not preadipocytes. The KO mice developed brown fat dysfunction and cold intolerance with reduced expression of brown fat markers. Both in vivo and in vitro data support a key role of microRNAs in the maintenance of brown fat marker expression. Additionally, deletion of Dgcr8 by Adeno-Cre virus during brown adipocyte differentiation clearly impaired lipid accumulation and marker expression (Figure S2), indicating that microRNAs are also key regulators during brown adipocyte differentiation. To identify microRNAs that are important for brown fat, we performed microRNA arrays followed by LNA inhibitor-mediated functional analysis. We identified miR-182 and miR-203 as two novel microRNAs regulators for brown fat development.

We noticed that although Dgcr8 was well deleted in mature adipocytes from different adipose depots, these adipocytes displayed distinct phenotypes. In Epi WAT adipocytes, Dgcr8 deletion had a limited effect on marker gene expression but caused a significant reduction in cell size. Since the deletion of Dgcr8 mainly occurred in mature adipocytes (Figure 1A), the reduced size of epi WAT is more likely due to the impaired lipid accumulation but not adipocyte differentiation.
exact mechanism of how microRNAs regulate lipid accumulation in Epi WAT remains to be further investigated. In Sub WAT adipocytes, Dgcr8 deletion has a mild effect on gene expression but resulted in an increase of cell size and impaired browning; in BAT adipocytes, Dgcr8 knockout led to much stronger molecular and cellular phenotypes. These results indicate that microRNAs play different roles in different types of adipocytes.

Although Dgcr8 deletion resulted in little effect on common adipogenic marker expression in subcutaneous WAT, it blunted the full induction of browning (Figure 4). Browning could be due to de novo beige adipocyte adipogenesis or activation of resident beige adipocytes in subcutaneous WAT. Despite many studies on the subject of browning resources, a definitive and consensus view has yet to emerge. These two points of view are not mutually exclusive; it is likely that both of them are contributing to the overall “browning” phenotype (35). In our mouse model, because the time of cold exposure (48 hours) doesn’t allow much de novo adipogenesis to occur (36), the blunted “browning” in subcutaneous WAT is likely to be accounted by the impaired activation of resident beige adipocytes.

Although the defect in brown fat is an obvious cause of the cold tolerance phenotype, we can’t exclude the possible contribution from other resources. Recent studies demonstrated significant similarities between classical brown adipocytes and activated beige adipocytes (37), and the Ucp1 protein in both cell types is functionally thermogenic (38). Theoretically, the reduction in browning of subcutaneous WAT (Figure 4D) could be a contributing factor to the cold intolerance. However, the acute cold exposure (4hr) in our experiments is too short for activation
of beige adipocytes, so the defect in subcutaneous WAT should make, if any, little
contribution to the cold intolerance in our mouse model. In addition, the cold
tolerance phenotype might result from decreased capacity of lipolysis in Epi WAT,
because the fatty acid released from WAT is a major resource for thermogenic
muscle shivering in response to acute cold exposure. Whether muscle shivering is
impaired due to lack of fatty acid supply and, if yes, what is the relative contribution
to the overall phenotype remains to be further investigated.

To determine the role of microRNAs in mature brown or white adipocytes, it is
necessary to use a transgenic Cre mouse strain that can specifically delete the
target genes in mature adipocytes. In a previous attempt, we bred Dgcr8<sup>flox/flox</sup> mice
with aP2-Cre and found that all the aP2-Cre driven KO mice succumbed two weeks
after birth (Data not shown), which limited a detailed characterization of these animals. Consistently, in another independent study, Mudhasani et al deleted Dicer in adipose by breeding Dicer<sup>flox/flox</sup> mice with an aP2-Cre mouse strain (39), and the KO animals also died postnatally. This is likely due to non-specific deletion of target genes in other organs by aP2-Cre (40; 41). Here we solved this issue by breeding Dgcr8<sup>flox/flox</sup> mice with adiponectin-Cre mice, since all animals were born at an expected ratio and the KO animals grew normally but with a defect in brown adipocytes. To the best of our knowledge, our study is the first one to clearly illustrate the role of microRNAs in mature brown adipocytes.

Although our studies and those of others have demonstrated that microRNAs are
necessary for BAT development and function, an outstanding question is whether
there exist a set of microRNAs sufficient to maintain brown fat features. In this study,
we identified a set of BAT-enriched microRNAs that are enriched in mature brown adipocytes. Interestingly, most of these microRNAs are functionally important based on previous work and on this study (17; 19; 31; 32; 42). We tested whether the top brown fat enriched microRNAs were sufficient to support brown fat development by introducing microRNA mimics of these genes into Dgcr8 knockout brown adipocytes in primary cell culture, but the results were negative (Fig S5). Thus more efforts are required to identify the full core set of microRNAs that sustain key BAT functions. Nonetheless, our Dgcr8 knockout primary cell culture has provided a unique platform to address this question. Our identification of these microRNAs may lead to new methods to activate BAT and develop new therapies for obesity.
Author contributions

H.K., L.S. researched data, wrote manuscript
H.C., R.A., H.P., M.G., K.L., D.X., V.G., L.V., C.H., X.C., S.G., researched data
J.K., M.T., H.L., D.S. contributed discussion, edited manuscript

Guarantor statement

Dr. Lei Sun has full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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Conflict of interest

The authors have declared that no conflict of interest exists.
Figure Legends

**Fig1. Dgcr8 knockout mice showed increased but pale BAT.**

(A). PCR genotyping results in interscapular BAT (BAT), subcutaneous WAT (SUB) and Epi WAT (EPI) from 12-week-old control (CON) and knockout (KO) mice (upper panel) or in mature adipocytes and SVF from each fat tissue (lower panel). (B). Body weights curves of control and KO mice at indicated time points under normal chow diet (n=8 each group). (C) Food intake of control and KO mice at 16 weeks old. (D) Photographs of BAT, SUB and EPI from 16-week-old control and KO mice. (E) Weight of each fat tissue in control and KO mice (n=8 each group). (F) Representative data of hematoxylin and eosin (H&E) staining of fat tissues from 16-week-old control and KO mice (Scale bar: 50 µm). Relative cell number in each tissue was estimated by the ratio between tissue weight and cell volume, and then normalized to the cell number in control tissue for presentation on the right. (G) fat mass (left panel), and lean mass (right panel) from 14-week-old control and KO mice. Blood glucose levels during glucose tolerance test and (H) insulin tolerance test (I) of 14 weeks old mice (n=8 each group). (J) Plasma insulin levels of 16-week-old mice (n=8 each group). *P<0.05, Student’s t-test ; Means ± SEM

**Fig2. Deletion of Dgcr8 in BAT results in impaired marker gene expression and thermogenic response.**

(A) Real-time PCR to examine the expression of thermogenesis related markers (Ucp1 and Pgc1α), brown fat markers (Prdm16, Cidea, Cebpβ and Pparα), common adipocyte differentiation markers (Ppary, Fabp4, AdipoQ and Glut4) and mitochondria markers (Cox7, Cox8 and Cox4) of BAT in control and KO 12-week old
mice. (n=8 each group). (B) Western blot for brown fat marker UCP1, and mitochondrial marker Cytochrome C (CytoC) and Ndusf3 of BAT in control and KO mice. (C) Immunofluorescence of Ucp1 (red) and DAPI (blue) in the brown fat of control and KO mice. Scale bar: 50µm. (D) 5-week old Control and KO mice were exposed to 8ºC and their body temperature was measured by rectal probe at indicated time and (E) 24hr after exposure. *P<0.05, Student’s t-test; Means ± SEM

**Fig3. Deletion of DGCR8 results in reduced expression of brown fat markers in primary brown adipocytes.**

(A) Genotyping results during adipogenesis of primary brown adipocyte cultures. Genomic DNA was extracted at indicated day and deletion efficiency of Dgcr8 was examined by PCR as described in the methods. (B) Real-time PCR result of microRNA expression 8 days after differentiation. (C) Oil red O staining of primary brown adipocyte cultures 8 days after differentiation. (D) Real-time PCR results of marker gene expression 8 days after differentiation. (n=3). *P<0.05, Student’s t-test ; Means ± SEM

**Figure 4. Deletion of DGCR8 causes reduced browning of inguinal WAT.**

(A). Real-time PCR to examine the expression of common adipocyte differentiation markers in inguinal WAT from control and KO mice. (n=6 each group). (B) Control and KO mice (6-weeks old) were exposed to 4ºC for 48 hours and inguinal WAT total RNAs were isolated to examine BAT-selective marker expression by Real-time PCR (n=6). (C) 6-week old mice were exposed to 4ºC for 48 hours. Inguinal WAT was isolated for Western Blot analysis. Each lane represents a pooled tissue lysate from three individual mice. ). *P<0.05, Student’s t-test ; Means ± SEM.
**Fig5. Microarray study reveals a set of brown fat-enriched miRNAs.**

(A) Scatter plot of the logarithmic maximum intensity (x axis) vs. the fold change of the miRNAs expression (y axis). (B) Real-time PCR results of selected microRNAs expression in the BAT of control vs KO mice (n=4 each group) (C) miRNAs expression during adipogenesis of primary brown adipocyte cultures. (D) Heatmap of real-time PCR result to show the expression of selected miRNAs in BAT and other organs. Red denotes higher and green denotes lower relative to the mean of the samples for each miRNA. *P<0.05, Student’s t-test; Means ± SEM

**Fig6. Knockdown of miR-182 or miR-203 causes reduction of BAT markers in primary brown adipocytes.**

(A) LNA microRNA inhibitors for miR-182 (i-miR 182), miR-203 (i-miR 203) and miR708 (i-miR 708) were transfected into brown preadipocytes before differentiation. 4 days after differentiation, real-time PCR was performed to examine the expression of indicated markers. (B) Brown preadipocytes were transfected with miRNA inhibitors before differentiation and ORO staining was performed 4 days after differentiation. (C) Real-time PCR was performed to examine indicated marker gene expression at 4 days after differentiation. n=3, (D) Profiles from gene set enrichment analysis. Respiratory electron transport (Upper panel) and Oxidative phosphorylation pathway (Lower panel). Genes were ranked based on the expression fold change of microRNA-inhibited cells vs control. Black lines represent genes “hits” that with the specified annotation. Shown on each is the normalized enrichment score (NES) and nominal p-value. (E) Real-time PCR of miR-182 targets, Insig-1 and Pdgfra and (F) miR-203 target, Pdgfra. *P<0.05, Student’s t-test ; Means ± SEM
References

1. Cannon B, Nedergaard J: Brown adipose tissue: function and physiological significance. *Physiological reviews* 84:277-359, 2004
2. Lidell ME, Betz MJ, Leinhard OD, Heglund M, Elander L, Slawik M, Mussack T, Nilsson D, Romu T, Nuutila P, Virtanen KA, Beuschlein F, Persson A, Borga M, Enerback S: Evidence for two types of brown adipose tissue in humans. *Nature medicine*, 2013
3. Seale P, Bjork B, Yang W, Kajimura S, Chin S, Kuang S, Scime A, Devarakonda S, Conroe HM, Erdjument-Bromage H, Tempst P, Rudnicki MA, Beier DR, Spiegelman BM: PRDM16 controls a brown fat/skeletal muscle switch. *Nature* 454:961-967, 2008
4. Wu J, Bostrom P, Sparks LM, Ye L, Choi JH, Giang AH, Khandekar M, Virtanen KA, Nuutila P, Schaart G, Huang K, Tu H, van Marken Lichtenbelt WD, Hoeks J, Enerback S, Schrauwen P, Spiegelman BM: Beige adipocytes are a distinct type of thermogenic fat cell in mouse and human. *Cell* 150:366-376, 2012
5. Wu J, Cohen P, Spiegelman BM: Adaptive thermogenesis in adipocytes: Is beige the new brown? *Genes & development* 27:234-250, 2013
6. Tseng Y-H, Cypess AM, Kahn CR: Cellular bioenergetics as a target for obesity therapy. *Nature Reviews Drug Discovery* 9:465-482, 2010
7. Virtanen KA, Lidell ME, Orava J, Heglund M, Westergren R, Niemi T, Taittonen M, Laine J, Savisto NJ, Enerback S, Nuutila P: Functional brown adipose tissue in healthy adults. *N Engl J Med* 360:1518-1525, 2009
8. Cypess AM, Lehman S, Williams G, Tal I, Rodman D, Goldfine AB, Kuo FC, Palmer EL, Tseng YH, Doria A, Kolodny GM, Kahn CR: Identification and importance of brown adipose tissue in adult humans. *N Engl J Med* 360:1509-1517, 2009
9. van Marken Lichtenbelt WD, Vanhommerig JW, Smulders NM, Drossaerts JM, Kemerink GJ, Bouvy ND, Schrauwen P, Teule GJ: Cold-activated brown adipose tissue in healthy men. *N Engl J Med* 360:1500-1508, 2009
10. Zingaretti MC, Crosta F, Vitali A, Guerrieri M, Frontini A, Cannon B, Nedergaard J, Cinti S: The presence of UCP1 demonstrates that metabolically active adipose tissue in the neck of adult humans truly represents brown adipose tissue. *FASEB journal : official publication of the Federation of American Societies for Experimental Biology* 23:3113-3120, 2009
11. Cypess AM, White AP, Vernochet C, Schulz TJ, Xue R, Sass CA, Huang TL, Roberts-Toler C, Weiner LS, Sze C, Chacko AT, Deschamps LN, Herder LM, Truchan N, Glasgow AL, Holman AR, Gavrilova A, Hasselgren PO, Mori MA, Molla M, Tseng YH: Anatomical localization, gene expression profiling and functional characterization of adult human neck brown fat. *Nature medicine*, 2013
12. Sharp LZ, Shinoda K, Ohno H, Scheel DW, Tomoda E, Ruiz L, Hu H, Wang L, Pavlova Z, Gilsanz V, Kajimura S: Human BAT possesses molecular signatures that resemble beige/brite cells. *PloS one* 7:e49452, 2012
13. Jespersen NZ, Larsen TJ, Peijs L, Daugaard S, Homoe P, Loft A, de Jong J, Mathur N, Cannon B, Nedergaard J, Pedersen BK, Moller K, Scheele C: A classical brown adipose tissue mRNA signature partly overlaps with brite in the supraclavicular region of adult humans. *Cell metabolism* 17:798-805, 2013
14. Seale P, Kajimura S, Spiegelman BM: Transcriptional control of brown adipocyte development and physiological function—of mice and men. *Genes Dev* 23:788-797, 2009
15. Lo KA, Sun L: Turning WAT into BAT: a review on regulators controlling the browning of white adipocytes. *Bioscience reports*, 2013
16. Trajkovski M, Lodish H: MicroRNA networks regulate development of brown adipocytes. *Trends in endocrinology and metabolism: TEM*, 2013
17. Sun L, Xie H, Mori MA, Alexander R, Yuan B, Hattangadi SM, Liu Q, Kahn CR, Lodish HF: Mir193b-365 is essential for brown fat differentiation. *Nat Cell Biol* 13:958-965, 2011
18. Mori M, Nakagami H, Rodriguez-Araujo G, Nimura K, Kaneda Y: Essential role for miR-196a in brown adipogenesis of white fat progenitor cells. *PLoS biology* 10:e1001314, 2012
19. Trajkovski M, Ahmed K, Esau CC, Stoffel M: MyomiR-133 regulates brown fat differentiation through Prdm16. *Nature cell biology* 14:1330-1335, 2012
20. Liu W, Bi P, Shan T, Yang X, Yin H, Wang YX, Liu N, Rudnicki MA, Kuang S: miR-133a Regulates Adipocyte Browning In Vivo. *PLoS genetics* 9:e1003626, 2013
21. Yin H, Pasut A, Soleimani VD, Bentzinger CF, Antoun G, Thorn S, Seale P, Fernando P, van Ijken W, Grosveld F, Dekemp RA, Boushel R, Harper ME, Rudnicki MA: MicroRNA-133 controls brown adipose determination in skeletal muscle satellite cells by targeting Prdm16. *Cell metabolism* 17:210-224, 2013
22. Thai TH, Calado DP, Casola S, Ansel KM, Xiao C, Xue Y, Murphy A, Frendewey D, Valenzuela D, Kutok JL, Schmidt-Supprian M, Rajewsky N, Yancopoulos G, Rao A, Rajewsky K: Regulation of the germinal center response by microRNA-155. *Science* 316:604-608, 2007
23. Chen Y, Siegel F, Kipschull S, Haas B, Frohlich H, Meister G, Pfeifer A: miR-155 regulates differentiation of brown and beige adipocytes via a bistable circuit. *Nature communications* 4:1769, 2013
24. Wang Y, Medvid R, Melton C, Jaenisch R, Blelloch R: DGCR8 is essential for microRNA biogenesis and silencing of embryonic stem cell self-renewal. *Nat Genet* 39:380-385, 2007
25. Rao PK, Toyama Y, Chiang HR, Gupta S, Bauer M, Medvid R, Reinhardt F, Liao R, Krieger M, Jaenisch R, Lodish HF, Blelloch R: Loss of cardiac microRNA-mediated regulation leads to dilated cardiomyopathy and heart failure. *Circulation research* 105:585-594, 2009
26. Eguchi J, Wang X, Yu S, Kershaw EE, Chiu PC, Dushay J, Estall JL, Klein U, Maratos-Flier E, Rosen ED: Transcriptional control of adipose lipid handling by IRF4. *Cell metabolism* 13:249-259, 2011
27. Misra A, Garg A, Abate N, Peshock RM, Stray-Gundersen J, Grundy SM: Relationship of anterior and posterior subcutaneous abdominal fat to insulin sensitivity in nondiabetic men. *Obesity research* 5:93-99, 1997
28. Snijder MB, Dekker JM, Visser M, Bouter LM, Stehouwer CD, Kostense PJ, Yudkin JS, Heine RJ, Nijpels G, Seidell JC: Associations of hip and thigh circumferences independent of waist circumference with the incidence of type 2 diabetes: the Hoorn Study. *The American journal of clinical nutrition* 77:1192-1197, 2003
29. Lowell BB, V SS, Hamann A, Lawitts JA, Himms-Hagen J, Boyer BB, Kozak LP, Flier JS: Development of obesity in transgenic mice after genetic ablation of brown adipose tissue. *Nature* 366:740-742, 1993
30. Trajkovski M, Hausser J, Soutschek J, Bhat B, Akin A, Zavolan M, Heim MH, Stoffel M: MicroRNAs 103 and 107 regulate insulin sensitivity. *Nature* **474**:649-653, 2011

31. Eichner LJ, Perry MC, Dufour CR, Bertos N, Park M, St-Pierre J, Giguere V: miR-378(*) mediates metabolic shift in breast cancer cells via the PGC-1beta/ERRgamma transcriptional pathway. *Cell metabolism* **12**:352-361, 2010

32. Carrer M, Liu N, Grueter CE, Williams AH, Frisard MI, Hulver MW, Bassel-Duby R, Olson EN: Control of mitochondrial metabolism and systemic energy homeostasis by microRNAs 378 and 378*. *Proceedings of the National Academy of Sciences of the United States of America* **109**:15330-15335, 2012

33. Fitter S, Vandyke K, Gronthos S, Zannettino AC: Suppression of PDGF-induced PI3 kinase activity by imatinib promotes adipogenesis and adiponectin secretion. *J Mol Endocrinol* **48**:229-240

34. Li J, Takaishi K, Cook W, McCorkle SK, Unger RH: Insig-1 "brakes" lipogenesis in adipocytes and inhibits differentiation of preadipocytes. *Proc Natl Acad Sci U S A* **100**:9476-9481, 2003

35. Harms M, Seale P: Brown and beige fat: development, function and therapeutic potential. *Nature medicine* **19**:1252-1263, 2013

36. Wang QA, Tao C, Gupta RK, Scherer PE: Tracking adipogenesis during white adipose tissue development, expansion and regeneration. *Nature medicine* **19**:1338-1344, 2013

37. Long JZ, Svensson KJ, Tsai L, Zeng X, Roh HC, Kong X, Rao RR, Lou J, Lokurkar I, Baur W, Castellot JJ, Jr., Rosen ED, Spiegelman BM: A smooth muscle-like origin for beige adipocytes. *Cell metabolism* **19**:810-820, 2014

38. Shabalina IG, Petrovic N, de Jong JM, Kalinovich AV, Cannon B, Nedergaard J: UCP1 in brite/beige adipose tissue mitochondria is functionally thermogenic. *Cell reports* **5**:1196-1203, 2013

39. Mudhasani R, Puri V, Hoover K, Czech MP, Imbalzano AN, Jones SN: Dicer is required for the formation of white but not brown adipose tissue. *Journal of cellular physiology*:1399-1406, 2010

40. Urs S, Harrington A, Liaw L, Small D: Selective expression of an aP2/Fatty Acid Binding Protein 4-Cre transgene in non-adipogenic tissues during embryonic development. *Transgenic research* **15**:647-653, 2006

41. Lee KY, Russell SJ, Ussar S, Boucher J, Vernochet C, Mori MA, Smyth G, Rourk M, Cederquist C, Rosen ED, Kahn BB, Kahn CR: Lessons on conditional gene targeting in mouse adipose tissue. *Diabetes* **62**:864-874, 2013

42. Eichner LJ, Perry M-C, Dufour CR, Bertos N, Park M, St-Pierre J, Giguère V: miR-378(*) Mediates Metabolic Shift in Breast Cancer Cells via the PGC-1β/ERRγ Transcriptional Pathway. *Cell metabolism* **12**:352-361, 2010

43. Subramanian A, Tamayo P, Mootha VK, Mukherjee S, Ebert BL, Gillette MA, Paulovich A, Pomeroy SL, Golub TR, Lander ES, Mesirov JP: Gene set enrichment analysis: a knowledge-based approach for interpreting genome-wide expression profiles. *Proc Natl Acad Sci U S A* **102**:15545-15550, 2005
A  

Thermogenesis markers

| Protein | Fold change | CON | KO |
|---------|-------------|-----|----|
| Ucp1    | 1.0         | 0.5 | *  |
| Pgc1α   | 1.0         | 0.5 | *  |

| Protein | Fold change | CON | KO |
|---------|-------------|-----|----|
| Prdm16  | 1.5         | 0.5 | *  |
| Cidea   | 1.5         | 0.5 | *  |
| Cebpβ   | 1.5         | 0.5 | *  |
| Pparα   | 1.5         | 0.5 | *  |

Mitochondria markers

| Protein | Fold change | CON | KO |
|---------|-------------|-----|----|
| Cox7    | 1.5         | 0.5 | *  |
| Cox8    | 1.5         | 0.5 | *  |
| Cox4    | 1.5         | 0.5 | *  |

| Protein | Fold change | CON | KO |
|---------|-------------|-----|----|
| PparY  | 1.5         | 0.5 | *  |
| Fabp4  | 1.5         | 0.5 | *  |
| AdipoQ | 1.5         | 0.5 | *  |
| Glut4  | 1.5         | 0.5 | *  |

B  

| Protein | CON | KO |
|---------|-----|----|
| Ucp1    |     |    |
| CytoC   |     |    |
| Ndufs3  |     |    |
| Atp5A   |     |    |
| Gapdh   |     |    |

C  

CON KO

UCP1/DAPI UCP1/DAPI

D  

Body temperature (°C)

| Time (h) | CON | KO |
|----------|-----|----|
| 0        | 38  |    |
| 1        | 36  |    |
| 2        | 34  |    |
| 3        | 32  |    |
| 4        | 30  |    |

E  

Body temperature (°C)

| | CON | KO |
|---|-----|----|
| Body temperature | 36 | 34 |
**Figure 4**

**A**

| Gene   | CON (fold) | KO (fold) |
|--------|------------|-----------|
| AdipoQ |            |           |
| PparaY |            |           |
| Fabp4  |            |           |
| Glut4  |            |           |
| Leptin |            |           |
| Cebpα  |            |           |

**B**

| Gene   | CON (fold)  | KO (fold)  | CON+COLD (fold) | KO+COLD (fold) |
|--------|-------------|------------|-----------------|----------------|
| Ucp1   |             | *          |                 |                |
| Cidea  |             | *          |                 |                |
| Pgc1α  |             | *          |                 |                |
| Prdm16 |             |            |                 |                |
| Cox4   |             | *          |                 |                |
| Cox7   |             | *          |                 |                |
| Cox8   |             |            |                 |                |

**C**

| Temperature | CON | KO | CON | KO |
|-------------|-----|----|-----|----|
| 21°C        |     |    |     |    |
| 4°C         |     |    |     |    |

[Images and graphs showing mRNA expression levels for various genes under different conditions.]
A miRNA-30e
miRNA 365
miRNA 193a
miRNA 378a-3p
miRNA 107
miRNA 708
miRNA 378a-5p
miRNA 203
miRNA 193b
miRNA 182
miRNA 378b
miRNA-143

B Fold change

C Days after differentiation

D

| Tissue   | miR 107 | miR 30e | miR 378a | miR 378b | miR 182 | miR 203 | miR 193b |
|----------|---------|---------|----------|----------|---------|---------|----------|
| Epidymal |         |         |          |          |         |         |          |
| Inguinal |         |         |          |          |         |         |          |
| Brain    |         |         |          |          |         |         |          |
| Heart    |         |         |          |          |         |         |          |
| Kidney   |         |         |          |          |         |         |          |
| Liver    |         |         |          |          |         |         |          |
| Lung     |         |         |          |          |         |         |          |
| Muscle   |         |         |          |          |         |         |          |
| Spleen   |         |         |          |          |         |         |          |
| Thymus   |         |         |          |          |         |         |          |
**A**

Fold change

- **NC:** negative control
- **Inhibitor of miR 182**
- **Inhibitor of miR 203**
- **Inhibitor of miR 708**

**B**

- **NC**
- **i-miR 182**
- **i-miR 203**
- **i-miR 708**

**C**

**Diabetes**

**D**

- **Respiratory electron transport**
- **Oxidative phosphorylation**

**E**

- **Fold change**
  - **Insig1**
  - **Pdgfra**

**F**

- **Fold change**
  - **Insig1**
  - **Pdgfra**
Supplemental Materials

Fig S1. Body weights (A) and interscapular BAT (BAT) weights (B) of control and KO female mice. (n=4 each group). Glucose tolerance test (C) and insulin tolerance test (D) of 20 weeks old female mice (n=4 each group). *P<0.05, t-test ; Means ± SEM

Fig S2. (A) Oil red O staining of primary brown adipocyte cultures 4 days after differentiation with Ad-GFP or Ad-Cre infection. (B) Real-PCR results of miR-143, miR-193a, miR-193b and miR-365 expression 4 days after differentiation of primary brown adipocyte with Ad-GFP or Ad-Cre infection. (C) Real-time PCR results of thermogenesis related markers (Ucp1 and Pgc1a), brown fat markers (Prdm16, Cidea and Ppar α) and adipocyte differentiation markers (Ppary, Fabp4, AdipoQ and Cebpα) 4 days after differentiation of primary brown adipocyte with Ad-GFP or Ad-Cre infection (n=3 each group) *P<0.05, t-test ; Means ± SEM

Fig S3. (A) Real-time PCR to examine RNA expression of Ppary, Fabp4, Glut4, AdipoQ, Leptin and Cebpα of Epididymal fat (EPI) *P<0.05, t-test ; Means ± SEM. (B) Quantification of fatty acid release from fat pad explants. 20 mg of epididymal fat pads were removed from mice and incubated at 37 ℃ in Krebs-Ringer buffer (12 mM HEPES, 121 NaCl, 4.9 mM KCl, 1.2 mM MgSO4, and 0.33 mM CaCl2) with 3.5% fatty acid-free BSA and 3 mM glucose (KRB), with 200 nM isoproterenol (Sigma). Medium was collected at 1, 2, and 4 h, and glycerol content was measured enzymatically (Sigma).

Fig S4. (A) Genotyping results of deletion efficiency of Dgcr8 in primary white adipocyte cultures. (B) Oil red O staining of primary white adipocyte cultures 8 days after differentiation. (C) Real-time PCR results of adipocyte differentiation markers (AdipoQ, Cebpα, Fabp4, Glut4, Ppary and Leptin) 8 days after differentiation of primary subcutaneous white adipocyte culture from control and KO mice (n=3 each group). (D) Subcutaneous white adipocyte culture was treated with Rosiglitazone (1µM) and Norepinephrine (1µM) for 8 days to induce “browning” and Real-time PCR was used to examine the browning marker expression. *P<0.05, t-test ; Means ± SEM

Fig S5. MicroRNA mimics (5nM for each mimic) for all 10 BAT-enriched microRNAs identified in Fig 4 were pooled together and transfected into the primary brown adipocytes from Control and KO mice at day 4 during the differentiation. After transfection, the cells were further differentiated for 4 more days. Real-time PCR was performed to examine the expression of Ucp1, Fabp4 and Ppary. (n=3 each group) *P<0.05, t-test ; Means ± SEM
A. Body weight (g) comparison between CON and KO.

B. BAT Weight (g) comparison between CON and KO.

C. Blood glucose (mg/dL) changes over time for CON and KO.

D. Blood glucose (%) changes over time for CON and KO.
**Thermogenesis markers**

- Ucp1
- Pgc1a

**BAT markers**

- Cideα
- Pparα
- Prdm16

**Common adipogenesis markers**

- Pparγ
- Fabp4
- AdipoQ
- Cebpα

*AdUGFP AdUCre

Kim_FigS2
**Kim_FigS5**

- **UCP-1**
  - Fold change: CON, KO, KO+miRNAs

- **Fabp4**
  - Fold change: CON, KO, KO+miRNAs

- **PPARγ**
  - Fold change: CON, KO, KO+miRNAs

* indicates statistically significant differences.
Supplementary Table I: Real-time PCR primers

| Gene   | FORWARD                        | REVERSE                        |
|--------|--------------------------------|--------------------------------|
| 18S    | GTAACCAGTGAACCCATT             | CCATCCAACTCGGTAGTACG            |
| AdipoQ | CGATTGCTGAGCGATGGAGCGG        | CAACAGTACGATCCTGGAGGCTG        |
| CebpA  | TGCAGCAAGCGGGAGAGTTAA         | CTTCTGTTGCGGCTCCACG            |
| Cidea  | TGGCTTTCTGATATGGCAGTGA        | GGCGTGAAAGGAATGCTTG            |
| Cox8b  | GACACATGAAGGCCACGACT           | GCAGATCCACTAGTGGTTCC           |
| Fabp4  | ACAAGCTGTGGGTGGGAAGTTG        | CTTTGCGCTCATGCCCTTT            |
| Glut4  | CTGTGACTGTGTTTCTGGACT         | CACCATCAGCTGGCAATGAT           |
| Pgc1a  | CCCTGACATTGTAAAGACC           | TCTGACTGTTCTGCTTTTG            |
| Ppara  | AGAGCCCATCTGTCTGGCAGTGA       | ACGTTGCTGGACAAACAAA            |
| Pparg  | GACAGATCCTATGTGAAGAGTGCATG    | GGGCATCCGATGTGATGATTGA         |
| Prdm16  | CAGCAGCGGAAGGAGCTCATT         | GCGTGATCGCCCGCTTG              |
| Ucp1   | ACTGCGACACTCCTGACGTATAGA      | TTTGGGCTGACTCCAGGATG          |
| CebpB  | CGATTGTACGGCGACGTGCG          | AGGGGCTGAAGTGTAGGCGG            |
| Cox4   | ACCAAGCGGAATGCTGAGCATATG     | GGGGGAGGAGGCGCTGAA             |
| Cox7   | CAGCGTCTAGTGTCCAGGCTCTGT     | AGAAAAAGGTGCGAGGAGA            |
| Leptin | GAGACCCCTGACGCTTGG            | CTGGGCTGTGGAATGTGCTG           |
| ProbeID | Annotation         | BAT DGCR KO 2 | BAT DGCR KO 1 | BAT DGCR con 2 |
|---------|--------------------|---------------|---------------|----------------|
| 168981  | mmu-miR-378b       | 8.022         | 7.991         | 13.344         |
| 148668  | mmu-miR-378a-3p    | 8.116         | 8.039         | 13.381         |
| 10986   | mmu-miR-193a-3p    | 7.829         | 7.874         | 12.519         |
| 11078   | mmu-miR-365-3p     | 7.287         | 7.320         | 11.808         |
| 148028  | mghv-miR-M1-14-5p  | 7.709         | 7.671         | 11.578         |
| 11092   | mmu-miR-378a-5p    | 5.661         | 5.813         | 9.250          |
| 29190   | mmu-miR-708-5p     | 6.305         | 6.368         | 9.333          |
| 10975   | mmu-miR-182-5p     | 5.211         | 5.486         | 8.277          |
| 10923   | mmu-miR-107-3p     | 7.180         | 7.196         | 10.010         |
| 17729   | mmu-miR-193b-3p    | 5.633         | 5.780         | 8.508          |
| 28191   | mmu-miR-30e-5p     | 9.739         | 9.545         | 12.370         |
| 11004   | mmu-miR-203-3p     | 6.546         | 6.684         | 9.033          |
| 11040   | mmu-miR-29b-3p     | 9.889         | 9.903         | 12.230         |
| 42923   | mmu-miR-30c-5p     | 10.762        | 10.769        | 12.962         |
| 11020   | mmu-miR-22-3p      | 10.658        | 10.566        | 12.758         |
| 33114   | mmu-miR-455-3p     | 6.582         | 6.531         | 8.590          |
| 10919   | mmu-miR-103-3p     | 8.219         | 8.293         | 10.228         |
| 13147   | mmu-miR-96-5p      | 5.887         | 6.075         | 7.820          |
| 145676  | mmu-miR-30e-3p     | 7.421         | 7.357         | 9.288          |
| 146112  | mmu-miR-30b-5p     | 10.459        | 10.371        | 12.276         |
| 11041   | mmu-miR-29c-3p     | 9.456         | 9.361         | 11.271         |
| 146086  | mmu-miR-30a-5p     | 9.181         | 9.072         | 10.996         |
| 42708   | mmu-miR-99a-5p     | 7.438         | 7.492         | 9.105          |
| 168859  | mmu-miR-3962       | 9.471         | 9.392         | 10.999         |
| 148017  | mmu-miR-743a-5p    | 5.912         | 6.053         | 7.534          |
| 10955   | mmu-miR-148a-3p    | 6.507         | 6.466         | 8.060          |
| 17752   | mmu-let-7f-5p      | 8.212         | 8.272         | 9.822          |
| 46438   | mmu-let-7g-5p      | 10.304        | 10.360        | 11.782         |
| 42953   | mmu-miR-101b-3p    | 7.439         | 7.297         | 8.854          |
| 11182   | mmu-miR-98-5p      | 8.142         | 8.337         | 9.795          |
| 168586  | mmu-miR-34a-5p     | 6.950         | 6.853         | 8.295          |
| 17610   | mmu-miR-677-5p     | 6.452         | 6.561         | 8.022          |
| 19596   | mmu-miR-30d-5p     | 8.836         | 8.814         | 10.193         |
| 145968  | mmu-let-7d-5p      | 9.657         | 9.848         | 11.109         |
| 168687  | mmu-miR-29a-3p     | 11.297        | 11.258        | 12.498         |
| 148450  | mmu-miR-210-5p     | 8.575         | 8.520         | 9.907          |
| 27568   | mmu-miR-744-5p     | 7.306         | 7.620         | 8.801          |
| 145820  | mmu-let-7c-5p      | 10.850        | 10.993        | 12.178         |
| 42509   | mmu-miR-219-5p     | 5.980         | 6.219         | 7.264          |
| 10977   | mmu-miR-183-5p     | 5.143         | 5.483         | 6.285          |
| 42579   | mmu-miR-193a-5p    | 5.984         | 6.123         | 7.130          |
| 169420  | mmu-miR-193b-5p    | 5.122         | 5.247         | 6.193          |
| 145852  | mmu-miR-210-3p     | 5.999         | 6.112         | 7.088          |
| 10985   | mmu-miR-191-5p     | 8.508         | 8.293         | 9.483          |
| 10916   | mmu-miR-1a-3p      | 10.835        | 9.975         | 11.617         |
| 147165  | mmu-let-7b-5p      | 10.853        | 10.957        | 11.885         |
| 147162  | mmu-let-7a-5p      | 10.385        | 10.486        | 11.490         |
| 148484  | mmu-miR-3084-3p    | 9.144         | 9.240         | 10.244         |
| 148523  | mghv-miR-M1-8-3p   | 9.376         | 9.310         | 10.362         |
| ID     | miRNA       | Log2 Fold Change 1 | Log2 Fold Change 2 | Log2 Fold Change 3 |
|--------|-------------|--------------------|--------------------|--------------------|
| 42532  | mmu-miR-22-5p | 7.681              | 7.580              | 8.543              |
| 19595  | mmu-miR-30a-3p | 6.072              | 5.976              | 6.945              |
| 13179  | mmu-miR-455-5p | 5.627              | 5.902              | 6.639              |
| 27720  | mmu-miR-15a-5p | 10.356             | 10.317             | 11.262             |
| 145943 | mmu-miR-100-5p | 6.950              | 6.997              | 7.878              |
| 148035 | mmu-miR-3084-5p | 8.322              | 8.434              | 9.355              |
| 148656 | mmu-miR-3099-3p | 8.238              | 8.043              | 9.138              |
| 11231  | mmu-miR-345-5p | 5.414              | 5.633              | 6.378              |
| 30687  | mmu-miR-93-5p | 8.147              | 7.925              | 8.923              |
| 10967  | mmu-miR-16-5p | 11.619             | 11.530             | 12.441             |
| 17608  | mmu-miR-425-5p | 6.185              | 6.238              | 7.050              |
| 30787  | mmu-miR-125b-5p | 10.746             | 10.615             | 11.505             |
| 147199 | mmu-miR-27b-3p | 9.274              | 9.266              | 10.116             |
| 169277 | mmu-miR-3970 | 7.470              | 7.619              | 8.412              |
| 17896  | mmu-miR-21a-3p | 7.528              | 7.747              | 8.602              |
| 17676  | mmu-miR-152-3p | 7.828              | 7.797              | 8.581              |
| 17888  | mmu-let-7a-1-3p/mmu-let-7c-2-3p | 6.060              | 6.359              | 6.966              |
| 146199 | mmu-miR-1961 | 6.314              | 6.593              | 7.307              |
| 10998  | mmu-miR-19b-3p | 8.919              | 8.929              | 9.749              |
| 19599  | mmu-miR-106a-5p | 7.913              | 7.820              | 8.693              |
| 169127 | mmu-miR-101a-3p/mmu-miR-101c | 9.544              | 9.438              | 10.310             |
| 10988  | mmu-miR-194-5p | 6.332              | 6.327              | 6.983              |
| 14302  | mmu-miR-374b-5p/mmu-miR-374c-5p | 6.077              | 5.713              | 6.660              |
| 11053  | mmu-miR-32-5p | 8.483              | 8.364              | 9.123              |
| 42739  | mmu-miR-339-5p | 6.835              | 6.759              | 7.450              |
| 145640 | mmu-miR-328-3p | 6.527              | 6.473              | 7.137              |
| 146176 | mmu-miR-1971 | 7.334              | 7.512              | 8.222              |
| 17904  | mmu-miR-185-3p | 7.294              | 7.513              | 8.098              |
| 148101 | mmu-miR-669d-2-3p/mmu-miR-669d-3p | 8.408              | 8.424              | 9.202              |
| 146008 | mmu-miR-26b-5p | 10.892             | 10.853             | 11.621             |
| 17347  | mmu-miR-708-3p | 5.470              | 5.345              | 5.926              |
| 145859 | mmu-miR-33-5p | 7.330              | 7.266              | 7.926              |
| 168819 | mmu-miR-200a-3p | 4.485              | 4.742              | 5.055              |
| 42640  | mmu-miR-20b-5p | 6.884              | 7.025              | 7.671              |
| 10997  | mmu-miR-19a-3p | 7.959              | 7.895              | 8.598              |
| 33163  | mmu-miR-676-3p | 6.249              | 6.419              | 6.865              |
| 169336 | mmu-miR-17-5p | 7.386              | 7.403              | 8.036              |
| 42571  | mmu-miR-129-1-3p | 7.334              | 7.266              | 7.861              |
| 146012 | mmu-miR-1949 | 6.744              | 6.817              | 7.417              |
| 148059 | mmu-miR-493-5p | 8.253              | 8.373              | 9.034              |
| 148614 | mmu-miR-7a-2-3p | 5.843              | 5.961              | 6.475              |
| 31026  | mmu-miR-101a-3p | 10.427             | 10.332             | 11.038             |
| 17653  | mmu-miR-133a-5p | 5.986              | 5.569              | 6.368              |
| 11234  | mmu-miR-350-3p | 6.876              | 7.023              | 7.485              |
| 147536 | mmu-miR-107-5p | 5.689              | 6.063              | 6.325              |
| 148098 | mmu-miR-374b-5p | 6.663              | 6.553              | 7.209              |
| 146137 | mmu-miR-133a-3p | 8.520              | 8.277              | 8.999              |
| 11007  | mmu-miR-206-3p | 7.358              | 6.848              | 7.648              |
| 42682  | mmu-miR-25-3p | 7.534              | 7.530              | 8.117              |
| 148428 | mmu-miR-3069-5p | 5.954              | 6.021              | 6.479              |
| Gene ID  | miRNA Name          | miRNA ID | miRNA ID | miRNA ID |
|----------|---------------------|----------|----------|----------|
| 146192   | mmu-miR-669m-3p     | 7.656    | 7.657    | 8.382    |
| 42827    | mmu-miR-652-3p      | 6.579    | 6.528    | 7.060    |
| 145638   | mmu-miR-29a-5p      | 6.923    | 6.982    | 7.421    |
| 147198   | mmu-miR-26a-5p      | 9.155    | 9.173    | 9.769    |
| 46917    | mmu-miR-205-5p      | 6.020    | 6.247    | 6.460    |
| 148344   | mmu-miR-669l-3p     | 8.013    | 7.991    | 8.646    |
| 42702    | mmu-miR-30c-1-3p    | 5.383    | 5.554    | 5.877    |
| 19585    | mmu-miR-148b-3p     | 6.788    | 6.864    | 7.269    |
| 146160   | mmu-miR-133b-3p     | 9.219    | 8.891    | 9.543    |
| 168826   | mmu-miR-5624-5p     | 7.745    | 8.000    | 8.533    |
| 148166   | mmu-miR-3069-3p     | 7.717    | 7.862    | 8.348    |
| 27536    | mmu-miR-190a-5p     | 6.689    | 6.921    | 7.257    |
| 9938     | mmu-let-7i-5p       | 9.590    | 9.508    | 10.002   |
| 42779    | mmu-miR-125b-2-3p   | 5.310    | 5.436    | 5.761    |
| 17732    | mmu-miR-192-5p      | 5.828    | 5.839    | 6.196    |
| 148099   | mmu-miR-344h-3p     | 6.458    | 6.477    | 6.979    |
| 11235    | mmu-miR-351-5p      | 7.633    | 7.564    | 7.967    |
| 46626    | mmu-miR-30c-2-3p    | 5.222    | 5.602    | 5.762    |
| 148364   | mmu-miR-1912-3p     | 6.138    | 6.164    | 6.562    |
| 145845   | mmu-miR-20a-5p      | 8.435    | 8.423    | 8.874    |
| 148259   | mmu-miR-3070a-5p/mm-3070b-5p | 5.385 | 5.814 | 5.998 |
| 146172   | mmu-miR-1892        | 6.598    | 6.762    | 7.068    |
| 46390    | mmu-miR-1192        | 8.417    | 8.504    | 9.095    |
| 42730    | mmu-miR-423-3p      | 6.096    | 6.208    | 6.524    |
| 42530    | mmu-let-7a-2-3p     | 6.126    | 6.323    | 6.742    |
| 148036   | mghv-miR-M1-3-5p    | 6.714    | 6.751    | 7.142    |
| 168872   | mmu-miR-24-1-5p     | 6.651    | 6.672    | 7.063    |
| 147501   | mmu-miR-98-3p       | 5.593    | 5.720    | 5.953    |
| 10946    | mmu-miR-141-3p      | 5.900    | 5.998    | 6.144    |
| 169284   | mmu-miR-28b         | 5.329    | 5.538    | 5.784    |
| 11208    | mmu-miR-207         | 9.603    | 9.627    | 10.022   |
| 148376   | mmu-miR-1a-2-5p     | 5.694    | 5.598    | 6.018    |
| 42538    | mmu-miR-196a-2-3p   | 5.181    | 5.413    | 5.749    |
| 148579   | mmu-miR-3544-3p     | 5.351    | 5.593    | 5.751    |
| 42724    | mmu-miR-34b-3p      | 7.747    | 7.841    | 8.335    |
| 146021   | mmu-miR-1935        | 7.005    | 7.067    | 7.465    |
| 17506    | mmu-miR-24-3p       | 11.152   | 11.194   | 11.552   |
| 146170   | mmu-miR-1902        | 6.380    | 6.605    | 6.897    |
| 148286   | mmu-miR-3066-3p     | 4.654    | 5.025    | 5.253    |
| 18739    | mmu-miR-186-5p      | 6.303    | 6.441    | 6.691    |
| 25117    | mmu-miR-742-3p      | 6.005    | 6.156    | 6.431    |
| 13143    | mmu-miR-301a-3p     | 6.863    | 6.824    | 7.182    |
| 14300    | mmu-miR-29c-5p      | 5.978    | 6.202    | 6.287    |
| 42769    | mmu-let-7b-3p       | 6.081    | 6.187    | 6.419    |
| 146187   | mmu-miR-1941-3p     | 6.259    | 6.338    | 6.530    |
| 46483    | mmu-miR-27a-3p      | 10.464   | 10.445   | 10.895   |
| 42902    | mmu-miR-185-5p      | 6.486    | 6.490    | 6.775    |
| 145840   | mmu-let-7f-1-3p     | 6.090    | 6.104    | 6.359    |
| 169191   | mmu-miR-5623-5p     | 4.738    | 5.080    | 5.432    |
| 42888    | mmu-miR-875-3p      | 9.710    | 9.396    | 10.005   |
| Accession  | miRNA          | High | Low | Avg  |
|------------|----------------|------|-----|------|
| 168797     | mmu-miR-3968   | 10.116 | 10.170 | 10.477 |
| 14285      | mmu-miR-487b-3p| 8.173  | 8.188 | 8.539  |
| 27565      | mmu-miR-423-5p | 6.891  | 6.874 | 7.149  |
| 169374     | mmu-miR-184-5p | 8.951  | 9.090 | 9.406  |
| 42462      | mmu-miR-883a-5p| 8.266  | 8.396 | 8.738  |
| 145897     | mmu-miR-92b-3p | 5.534  | 5.689 | 5.771  |
| 146054     | mmu-miR-1952   | 8.186  | 8.344 | 8.543  |
| 28505      | mmu-miR-676-5p | 5.465  | 5.663 | 5.734  |
| 148548     | mmu-miR-3090-3p| 4.700  | 5.025 | 5.039  |
| 28944      | mmu-miR-667-3p | 8.710  | 8.574 | 8.999  |
| 148448     | mmu-miR-3112-3p| 9.077  | 9.034 | 9.311  |
| 17427      | mmu-miR-200c-3p| 5.098  | 5.366 | 5.354  |
| 146088     | mmu-miR-1983   | 12.085 | 11.917 | 12.246 |
| 148309     | mmu-miR-3068-3p| 9.679  | 9.544 | 9.930  |
| 148175     | mmu-miR-1843a-3p| 8.487  | 8.433 | 8.718  |
| 148645     | mmu-miR-129-5p | 5.675  | 6.034 | 5.847  |
| 146111     | mmu-miR-767    | 7.646  | 7.863 | 8.085  |
| 17743      | mmu-miR-488-5p | 4.567  | 4.898 | 4.860  |
| 42813      | mmu-miR-876-5p | 4.809  | 5.089 | 5.112  |
| 168762     | mmu-miR-3964   | 5.158  | 5.283 | 5.395  |
| 147186     | mmu-miR-200b-3p| 6.240  | 6.467 | 6.486  |
| 10972      | mmu-miR-181b-5p| 5.952  | 6.051 | 6.188  |
| 146049     | mmu-miR-28a-5p | 5.749  | 5.889 | 5.971  |
| 42767      | mmu-miR-34c-3p | 5.287  | 5.461 | 5.574  |
| 17935      | mmu-miR-101a-5p| 4.961  | 5.251 | 5.171  |
| 148076     | mmu-miR-3103-5p| 5.693  | 5.921 | 6.044  |
| 29872      | mmu-miR-340-5p | 7.333  | 7.494 | 7.704  |
| 42697      | mmu-miR-15a-3p | 5.282  | 5.448 | 5.439  |
| 148200     | mmu-miR-3100-3p| 6.611  | 6.487 | 6.804  |
| 148416     | mmu-miR-3102-5p| 6.905  | 7.170 | 7.084  |
| 42587      | mmu-miR-881-5p | 5.928  | 6.060 | 6.288  |
| 148632     | mmu-miR-2861   | 6.917  | 6.641 | 6.878  |
| 168966     | mmu-miR-28a-5p/mmu-miR-28c| 7.638  | 7.628 | 7.881  |
| 169075     | mmu-miR-92a-3p | 7.866  | 7.827 | 8.014  |
| 42835      | mmu-miR-16-1-3p| 5.707  | 5.905 | 5.974  |
| 169175     | mmu-miR-3966   | 4.676  | 5.004 | 4.987  |
| 42641      | mmu-miR-145a-5p| 9.379  | 9.537 | 9.669  |
| 27572      | mmu-miR-298-5p | 5.121  | 5.378 | 5.491  |
| 146163     | mmu-miR-224-3p | 5.924  | 5.785 | 5.940  |
| 29490      | mmu-miR-7a-5p  | 6.741  | 6.705 | 6.881  |
| 148033     | mmu-miR-3065-5p| 5.279  | 5.598 | 5.482  |
| 42887      | mmu-miR-331-3p | 5.957  | 5.982 | 6.094  |
| 46621      | mcmv-miR-m88-1-3p| 6.415  | 6.700 | 6.737  |
| 148536     | mmu-miR-1a-1-5p | 6.138  | 5.901 | 6.143  |
| 169024     | mmu-miR-3960   | 6.949  | 6.942 | 7.052  |
| 14301      | mmu-miR-361-5p | 7.508  | 7.580 | 7.703  |
| 42826      | mmu-miR-300-5p | 8.691  | 8.714 | 9.044  |
| 148608     | mmu-miR-551b-5p| 5.834  | 5.703 | 5.967  |
| 168842     | mmu-miR-5105   | 6.455  | 6.664 | 6.726  |
| 42927      | mmu-miR-673-3p | 6.303  | 6.422 | 6.505  |
| ID      | miRNA         | Fold Change 1 | Fold Change 2 | Fold Change 3 |
|---------|---------------|---------------|---------------|---------------|
| 11245   | mmu-miR-433-5p| 8.219         | 8.263         | 8.458         |
| 145701  | mmu-miR-668-3p| 6.763         | 7.005         | 7.149         |
| 17825   | mmu-miR-338-5p| 6.059         | 6.297         | 6.341         |
| 169104  | mmu-miR-5099  | 8.171         | 8.206         | 8.303         |
| 42778   | mmu-let-7g-3p | 4.856         | 5.404         | 5.207         |
| 27558   | mmu-miR-155-5p| 6.383         | 6.569         | 6.534         |
| 42847   | mmu-miR-497-5p| 7.381         | 7.462         | 7.616         |
| 31053   | mmu-miR-668-3p| 5.635         | 5.647         | 5.682         |
| 17953   | mmu-miR-183-3p| 5.417         | 5.487         | 5.540         |
| 42636   | mmu-miR-28a-3p| 6.100         | 6.200         | 6.166         |
| 168913  | mmu-miR-5115  | 5.562         | 5.401         | 5.479         |
| 148446  | mmu-miR-346-3p| 6.538         | 6.633         | 6.755         |
| 146193  | mmu-miR-1957a | 6.359         | 6.568         | 6.644         |
| 46288   | mmu-miR-1196-5p| 8.579        | 8.550         | 8.840         |
| 19582   | mmu-miR-106b-5p| 9.547        | 9.478         | 9.667         |
| 148230  | mmu-miR-450a-1-3p| 6.211      | 6.407         | 6.418         |
| 17872   | mmu-miR-148a-5p| 4.783         | 4.968         | 4.942         |
| 27672   | mmu-miR-615-3p | 6.190         | 6.159         | 6.263         |
| 148531  | mmu-miR-544-5p | 6.176         | 6.351         | 6.443         |
| 148030  | mmu-miR-208b-5p| 6.058         | 6.098         | 6.168         |
| 42511   | mmu-miR-99a-3p | 5.597         | 5.659         | 5.650         |
| 4700    | mmu-miR-140-5p | 7.474         | 7.528         | 7.622         |
| 148419  | mmu-miR-344c-5p| 5.794         | 5.854         | 5.989         |
| 169153  | mmu-miR-5116  | 8.080         | 7.907         | 8.039         |
| 168740  | mmu-miR-5113  | 9.865         | 9.796         | 10.200        |
| 11044   | mmu-miR-302c-3p| 5.429         | 5.770         | 5.666         |
| 148248  | mmu-miR-344e-3p| 4.693         | 5.042         | 4.956         |
| 11108   | mmu-miR-425-3p | 4.884         | 5.220         | 5.066         |
| 148276  | mmu-miR-3073a-3p| 6.285        | 6.301         | 6.439         |
| 11277   | mmu-miR-7a-1-3p | 4.882         | 5.198         | 5.016         |
| 17478   | mmu-miR-429-3p | 5.446         | 5.714         | 5.539         |
| 148470  | mmu-miR-1264-3p| 8.900         | 8.972         | 9.083         |
| 42570   | mmu-miR-194-2-3p| 5.310        | 5.761         | 5.545         |
| 168828  | mmu-miR-5125  | 7.322         | 7.370         | 7.560         |
| 42452   | mmu-miR-141-5p | 5.245         | 5.595         | 5.485         |
| 42474   | mmu-miR-362-3p | 6.698         | 6.681         | 6.777         |
| 145846  | mmu-let-7e-5p  | 9.471         | 9.440         | 9.666         |
| 146030  | mmu-miR-2183  | 6.826         | 7.064         | 7.018         |
| 146155  | mmu-miR-2137  | 8.047         | 7.928         | 7.836         |
| 148314  | mmu-miR-873a-3p| 4.940         | 5.181         | 5.050         |
| 169408  | mmu-miR-181d-5p| 6.294         | 6.334         | 6.434         |
| 17853   | mmu-miR-30d-3p | 5.610         | 6.042         | 5.849         |
| 169330  | mmu-miR-23b-3p | 11.328        | 11.320        | 11.495        |
| 10138   | mmu-miR-130a-3p| 8.904         | 8.827         | 8.950         |
| 148171  | mmu-miR-7b-3p  | 5.329         | 5.503         | 5.499         |
| 11005   | mmu-miR-204-5p | 6.675         | 6.962         | 6.877         |
| 169290  | mmu-miR-5617-5p| 4.737         | 5.010         | 4.772         |
| 168738  | mmu-miR-5127  | 5.099         | 5.402         | 5.265         |
| 148249  | mghv-miR-M1-6-5p| 7.303        | 7.415         | 7.467         |
| 148212  | mmu-miR-3103-3p| 7.720         | 7.920         | 8.030         |
| ID       | Name                      | Value 1 | Value 2 | Value 3 |
|----------|---------------------------|---------|---------|---------|
| 147506   | mmu-miR-21a-5p            | 9.102   | 9.088   | 9.285   |
| 148046   | mmu-miR-344-5p            | 5.037   | 5.348   | 5.176   |
| 145633   | mmu-let-7d-3p             | 6.654   | 6.719   | 6.746   |
| 17511    | mmu-miR-713               | 5.336   | 5.663   | 5.688   |
| 42919    | mmu-miR-203-5p            | 5.579   | 5.893   | 5.749   |
| 148328   | mmu-miR-147-5p            | 5.024   | 5.127   | 5.064   |
| 168761   | mmu-miR-3965              | 4.898   | 5.007   | 4.938   |
| 42842    | mmu-miR-654-5p            | 4.569   | 4.920   | 4.670   |
| 168654   | mmu-miR-5709              | 4.946   | 5.064   | 4.937   |
| 19007    | SNORD3@                   | 7.573   | 7.556   | 7.773   |
| 42668    | mmu-let-7c-1-3p           | 5.363   | 5.549   | 5.440   |
| 148094   | mmu-miR-669c-3p           | 9.028   | 8.886   | 9.139   |
| 42471    | mmu-miR-290-5p            | 8.949   | 8.933   | 8.971   |
| 148423   | mmu-miR-652-5p            | 8.312   | 8.282   | 8.409   |
| 148198   | mmu-miR-653-3p            | 6.444   | 6.399   | 6.505   |
| 169053   | mmu-miR-130b-5p           | 5.127   | 5.307   | 5.301   |
| 148560   | mmu-miR-3066-5p           | 6.237   | 6.154   | 6.320   |
| 148321   | mmu-miR-679-3p            | 5.269   | 5.533   | 5.402   |
| 19600    | mmu-miR-17-3p             | 6.274   | 6.256   | 6.272   |
| 46617    | mmu-miR-1197-3p           | 4.611   | 4.882   | 4.704   |
| 145798   | mmu-miR-142-5p            | 8.364   | 8.028   | 8.087   |
| 42808    | mmu-miR-874-3p            | 5.109   | 5.471   | 5.317   |
| 148494   | mmu-miR-448-5p            | 4.933   | 5.117   | 4.995   |
| 168890   | mmu-miR-1306-5p           | 5.926   | 6.077   | 6.050   |
| 148330   | mmu-miR-190a-3p           | 4.615   | 4.930   | 4.660   |
| 145970   | mmu-miR-129-2-3p          | 5.121   | 5.456   | 5.226   |
| 148278   | mmu-miR-138-2-3p          | 8.662   | 8.756   | 8.884   |
| 169044   | mmu-miR-3544-5p           | 4.495   | 5.015   | 4.619   |
| 169291   | mmu-miR-5126              | 5.322   | 5.295   | 5.133   |
| 146028   | mmu-miR-1941-5p           | 5.100   | 5.590   | 5.295   |
| 46844    | mcmv-miR-m107-1-5p        | 4.891   | 5.266   | 5.029   |
| 17280    | mmu-miR-15b-5p            | 8.821   | 8.671   | 8.870   |
| 148087   | mmu-miR-669d-2-3p         | 5.933   | 6.192   | 6.170   |
| 46636    | mcmv-miR-M23-1-5p         | 6.449   | 6.606   | 6.601   |
| 42796    | mmu-miR-489-3p            | 5.127   | 5.417   | 5.268   |
| 147366   | mmu-miR-320-5p            | 6.189   | 6.391   | 6.356   |
| 42490    | mmu-miR-505-5p            | 6.658   | 6.523   | 6.676   |
| 169051   | mmu-miR-5120              | 5.474   | 5.539   | 5.598   |
| 169111   | mmu-miR-5616-3p           | 5.024   | 5.328   | 5.254   |
| 42945    | mmu-miR-297c-5p           | 6.195   | 6.341   | 6.289   |
| 42605    | mmu-miR-503-3p            | 9.178   | 9.167   | 9.304   |
| 148300   | mmu-miR-370-5p            | 7.855   | 7.785   | 7.958   |
| 148179   | mmu-miR-3095-3p           | 5.915   | 6.009   | 6.081   |
| 42946    | mmu-miR-3107-3p/mmum-miR-486-3p | 4.756 | 5.056 | 4.839 |
| 42916    | mmu-miR-471-5p            | 4.850   | 5.206   | 5.027   |
| 146083   | mmu-miR-1906              | 4.853   | 5.225   | 4.971   |
| 17465    | mmu-miR-678               | 6.048   | 6.340   | 6.228   |
| 148027   | mmu-miR-3063-3p           | 4.904   | 5.124   | 4.909   |
| 148128   | mmu-miR-3090-5p           | 6.550   | 6.824   | 6.605   |
| 42899    | mmu-miR-377-5p            | 5.873   | 6.076   | 5.939   |
| ID     | miRNA          | Expression 1 | Expression 2 | Expression 3 |
|--------|----------------|--------------|--------------|--------------|
| 42863  | mmu-miR-743b-3p| 4.873        | 4.978        | 4.894        |
| 46292  | mmu-miR-5097   | 10.155       | 10.275       | 10.304       |
| 145744 | mmu-miR-568    | 4.667        | 4.982        | 4.898        |
| 148609 | mmu-miR-487b-5p| 5.650        | 5.891        | 5.787        |
| 27575  | mmu-miR-711    | 6.208        | 6.260        | 6.174        |
| 146147 | mmu-miR-1897-5p| 9.240        | 9.092        | 9.382        |
| 16681  | mmu-miR-721    | 5.279        | 5.575        | 5.427        |
| 11256  | mmu-miR-470-5p | 6.202        | 6.286        | 6.268        |
| 42687  | mmu-miR-883b-5p| 6.209        | 6.260        | 6.287        |
| 148626 | mmu-miR-30b-3p | 6.843        | 6.825        | 6.876        |
| 148596 | mmu-miR-344d-3p| 5.833        | 6.348        | 6.197        |
| 145716 | mmu-miR-671-5p | 5.132        | 5.544        | 5.285        |
| 28250  | mmu-miR-872-5p | 6.036        | 6.095        | 6.000        |
| 42445  | mmu-miR-693-5p | 6.894        | 7.202        | 7.242        |
| 29779  | mmu-miR-764-5p | 5.039        | 5.375        | 5.119        |
| 148607 | mmu-miR-1955-3p| 4.897        | 5.106        | 4.879        |
| 42494  | mmu-miR-712-3p | 5.552        | 5.831        | 5.696        |
| 42822  | mmu-miR-466g   | 4.805        | 5.171        | 4.860        |
| 14316  | mmu-miR-664-3p | 6.998        | 7.044        | 7.119        |
| 146055 | mmu-miR-1954  | 5.658        | 5.870        | 5.882        |
| 148362 | mmu-miR-592-3p | 5.973        | 6.015        | 5.937        |
| 146015 | mmu-miR-1940  | 5.235        | 5.498        | 5.327        |
| 148281 | mmu-miR-467e-3p| 9.339        | 9.332        | 9.531        |
| 30768  | mmu-miR-674-5p | 6.859        | 7.002        | 6.946        |
| 168831 | mmu-miR-433-3p | 4.664        | 4.923        | 4.771        |
| 17810  | mmu-miR-29b-1-5p| 6.122        | 6.414        | 6.215        |
| 13140  | mmu-miR-138-5p | 5.628        | 5.700        | 5.656        |
| 148528 | mmu-miR-196a-1-3p| 6.598       | 6.682        | 6.690        |
| 42703  | mmu-miR-490-3p | 5.600        | 5.646        | 5.748        |
| 169058 | mmu-miR-1231-3p| 5.196        | 5.401        | 5.327        |
| 168835 | mmu-miR-5621-5p| 4.599        | 4.748        | 4.561        |
| 148496 | mmu-miR-3108-3p| 4.973        | 5.312        | 5.101        |
| 169150 | mmu-miR-5103  | 4.684        | 5.067        | 4.800        |
| 46285  | mmu-miR-1194  | 4.697        | 4.846        | 4.616        |
| 145977 | mmu-miR-1247-5p| 5.816        | 5.980        | 5.905        |
| 145692 | mmu-miR-499-3p | 4.900        | 5.204        | 5.033        |
| 28456  | mmu-miR-675-3p | 5.283        | 5.437        | 5.337        |
| 147514 | mmu-miR-494-3p | 4.827        | 5.165        | 4.896        |
| 148424 | mmu-miR-201-3p | 5.214        | 5.536        | 5.357        |
| 42929  | mmu-miR-25-5p  | 6.248        | 6.462        | 6.345        |
| 17835  | mmu-miR-450a-5p| 5.469        | 5.877        | 5.620        |
| 146181 | mmu-miR-1955-5p| 4.910        | 5.303        | 4.996        |
| 46683  | mrcmv-miR-m22-1| 5.035        | 5.329        | 5.100        |
| 42525  | mmu-miR-671-3p | 5.063        | 5.429        | 5.149        |
| 30442  | mmu-miR-802-5p | 4.657        | 5.056        | 4.713        |
| 10936  | mmu-miR-130b-3p| 5.726        | 5.861        | 5.777        |
| 148235 | mmu-miR-3083-3p| 4.779        | 5.092        | 4.826        |
| 169060 | mmu-miR-3961  | 8.882        | 8.819        | 9.008        |
| 148571 | mmu-miR-344e-5p/mmu-miR-344h-5p| 4.810 | 5.095 | 4.840 |
| 145825 | mmu-miR-383-5p | 4.772        | 5.191        | 4.890        |
|   |   |   |   |
|---|---|---|---|
| 17818 | mmu-miR-27a-5p | 5.080 | 5.482 | 5.190 |
| 148408 | mmu-miR-880-5p | 4.974 | 5.354 | 5.052 |
| 148498 | mmu-miR-3110-3p | 4.852 | 5.102 | 4.987 |
| 148653 | mmu-miR-3474 | 6.900 | 6.986 | 6.981 |
| 42646 | mmu-miR-878-3p | 4.902 | 5.344 | 5.084 |
| 42878 | mmu-miR-882 | 7.096 | 7.236 | 7.274 |
| 147949 | mmu-miR-101b-5p | 5.133 | 5.477 | 5.181 |
| 147195 | mmu-miR-18a-5p | 5.007 | 5.445 | 5.217 |
| 148190 | mmu-miR-3091-3p | 4.961 | 5.300 | 5.029 |
| 42911 | mmu-miR-470-3p | 5.007 | 5.073 | 4.988 |
| 148338 | mmu-miR-3064-3p | 5.633 | 5.518 | 5.533 |
| 147953 | mmu-miR-491-5p | 4.983 | 5.276 | 5.093 |
| 28161 | mmu-miR-380-5p | 5.049 | 5.233 | 5.052 |
| 148487 | mmu-miR-1934-3p | 5.355 | 5.676 | 5.447 |
| 168771 | mmu-miR-5624-3p | 6.369 | 6.417 | 6.560 |
| 10947 | mmu-miR-142-3p | 10.587 | 10.415 | 10.440 |
| 148485 | mghv-miR-M1-12-3p | 5.166 | 5.596 | 5.304 |
| 169246 | mmu-miR-5618-5p | 4.652 | 4.878 | 4.732 |
| 148586 | mmu-miR-3087-3p | 5.972 | 6.060 | 6.090 |
| 42599 | mmu-miR-153-3p | 4.965 | 5.288 | 5.031 |
| 11225 | mmu-miR-322-3p | 5.256 | 5.524 | 5.356 |
| 33596 | mmu-miR-126-5p | 11.132 | 11.261 | 11.288 |
| 148352 | mmu-miR-3071-3p | 4.887 | 5.163 | 4.933 |
| 17632 | mmu-miR-691 | 10.681 | 10.634 | 10.911 |
| 42706 | mmu-miR-325-3p | 6.830 | 6.982 | 7.052 |
| 146095 | mmu-miR-1928 | 4.955 | 5.244 | 5.013 |
| 169352 | mmu-miR-5101 | 4.768 | 5.069 | 4.762 |
| 148303 | mmu-miR-3106-5p | 5.166 | 5.596 | 5.304 |
| 19606 | SNORD12 | 7.120 | 7.281 | 7.193 |
| 168720 | mmu-miR-5619-5p | 4.745 | 5.084 | 4.844 |
| 148367 | mmu-miR-181b-1-3p | 4.851 | 5.294 | 4.888 |
| 32731 | mmu-miR-190b-5p | 5.296 | 5.694 | 5.429 |
| 147203 | mmu-miR-302a-3p | 5.166 | 5.596 | 5.304 |
| 169351 | mmu-miR-5618-3p | 4.930 | 5.046 | 5.208 |
| 148651 | mmu-miR-3072-3p | 7.263 | 7.157 | 7.233 |
| 148515 | mmu-miR-344d-3-5p | 4.875 | 5.258 | 4.975 |
| 17942 | mmu-miR-125a-3p | 5.608 | 5.823 | 5.661 |
| 42809 | mmu-miR-878-5p | 4.950 | 5.008 | 4.813 |
| 168969 | mmu-miR-5623-3p | 4.742 | 5.027 | 4.760 |
| 42786 | mmu-miR-188-3p | 4.806 | 5.244 | 4.907 |
| 42799 | mmu-miR-544-3p | 5.020 | 5.354 | 5.089 |
| 145666 | SNORD110 | 6.993 | 7.238 | 7.138 |
| 148114 | mmu-miR-26a-2-3p | 5.301 | 5.675 | 5.397 |
| 42950 | mmu-miR-24-2-5p | 7.697 | 7.736 | 7.715 |
| 17665 | mmu-miR-686 | 5.226 | 5.679 | 5.365 |
| 148514 | mmu-miR-365-1-5p | 5.305 | 5.627 | 5.361 |
| 17422 | mmu-miR-695 | 6.307 | 6.549 | 6.450 |
| 145751 | mmu-miR-23b-5p | 5.159 | 5.581 | 5.224 |
| 169268 | mmu-miR-5112 | 4.639 | 5.036 | 4.674 |
| ID      | Name                  | Value1 | Value2 | Value3 |
|---------|-----------------------|--------|--------|--------|
| 148646  | mmu-miR-467a-3p       | 7.684  | 7.855  | 7.906  |
| 148138  | mmu-miR-3079-5p       | 4.878  | 5.031  | 4.823  |
| 148368  | mmu-miR-3097-3p       | 4.932  | 5.210  | 4.939  |
| 169158  | mmu-miR-344i          | 4.912  | 5.023  | 4.874  |
| 169025  | mmu-miR-5620-5p       | 4.930  | 5.297  | 4.991  |
| 17290   | mghv-miR-M1-7-3p      | 5.861  | 6.060  | 5.871  |
| 46289   | mcmv-miR-m01-3-5p     | 5.196  | 5.530  | 5.262  |
| 148437  | mmu-miR-3086-3p       | 4.981  | 5.377  | 5.071  |
| 146191  | mmu-miR-1948-3p       | 5.137  | 5.188  | 5.046  |
| 148672  | mmu-miR-344-3p        | 5.125  | 5.366  | 5.165  |
| 148068  | mmu-miR-758-5p        | 5.740  | 5.800  | 5.852  |
| 168617  | mmu-miR-5131          | 4.629  | 4.972  | 4.648  |
| 148533  | mmu-miR-1943-3p       | 6.977  | 7.067  | 7.036  |
| 145946  | mmu-miR-449a-5p       | 5.143  | 5.482  | 5.199  |
| 4040    | mmu-miR-9-5p          | 5.949  | 6.235  | 6.074  |
| 168706  | mmu-miR-5129-5p       | 5.829  | 6.004  | 5.822  |
| 148266  | mmu-miR-3112-5p       | 4.899  | 5.216  | 4.929  |
| 42752   | mmu-miR-872-3p        | 8.484  | 8.489  | 8.613  |
| 42502   | mmu-miR-204-3p        | 6.686  | 6.923  | 6.844  |
| 148193  | mmu-miR-466h-3p       | 4.741  | 5.073  | 4.812  |
| 42743   | mmu-let-7e-3p         | 5.213  | 5.589  | 5.281  |
| 146082  | mmu-miR-1956          | 5.281  | 5.738  | 5.484  |
| 17918   | mmu-miR-222-5p        | 5.034  | 5.327  | 5.037  |
| 148610  | mmu-miR-26a-1-3p      | 4.937  | 5.284  | 4.983  |
| 17883   | mmu-miR-19b-1-5p      | 4.888  | 5.169  | 4.924  |
| 42637   | mmu-miR-449b          | 5.138  | 5.467  | 5.230  |
| 148472  | mmu-miR-201-5p        | 5.432  | 5.771  | 5.479  |
| 32707   | mmu-miR-703           | 4.804  | 4.975  | 4.883  |
| 148542  | mmu-miR-3058-5p       | 4.894  | 5.335  | 4.931  |
| 17537   | mghv-miR-M1-3-3p      | 6.137  | 6.287  | 6.304  |
| 146097  | mmu-miR-1934-5p       | 6.168  | 6.227  | 6.228  |
| 17528   | mmu-miR-704           | 4.904  | 5.211  | 4.903  |
| 28624   | mmu-miR-666-5p        | 4.637  | 4.945  | 4.716  |
| 147943  | mmu-miR-3074-1-3p     | 4.803  | 5.019  | 4.813  |
| 148186  | mmu-miR-152-5p        | 5.007  | 5.430  | 5.086  |
| 42500   | mmu-miR-483-3p        | 6.423  | 6.649  | 6.430  |
| 46764   | mcmv-miR-m01-4-5p     | 5.059  | 5.097  | 4.967  |
| 42925   | mmu-miR-409-5p        | 5.012  | 5.268  | 5.026  |
| 46918   | mmu-miR-375-3p        | 5.345  | 5.739  | 5.417  |
| 42867   | mmu-miR-337-5p        | 4.843  | 5.182  | 4.868  |
| 11184   | mmu-miR-99b-5p        | 7.665  | 7.722  | 7.648  |
| 46218   | mmu-miR-1190          | 5.421  | 5.732  | 5.440  |
| 148605  | mmu-miR-128-2-5p      | 4.989  | 5.266  | 5.022  |
| 42631   | mmu-miR-186-3p        | 5.223  | 5.541  | 5.270  |
| 148187  | mmu-miR-410-5p        | 5.461  | 5.864  | 5.534  |
| 46467   | mmu-miR-143-5p        | 6.333  | 6.569  | 6.400  |
| 46322   | mmu-miR-669g          | 4.992  | 5.318  | 5.030  |
| 42738   | mmu-miR-340-3p        | 5.792  | 6.065  | 5.889  |
| 46204   | SNORD38B              | 8.037  | 8.081  | 8.074  |
| 42630   | mmu-miR-140-3p        | 8.140  | 8.106  | 8.151  |
| ID       | miRNA          | Value1 | Value2 | Value3 |
|----------|----------------|--------|--------|--------|
| 46773    | mcmv-miR-m01-3-3p | 4.697  | 4.948  | 4.685  |
| 46761    | mcmv-miR-m01-1  | 4.713  | 4.762  | 4.545  |
| 148141   | mmu-miR-133b-5p | 5.266  | 5.565  | 5.354  |
| 148045   | mmu-miR-3094-3p | 4.927  | 5.278  | 4.941  |
| 42518    | mmu-miR-465b-5p | 6.830  | 6.902  | 6.977  |
| 148613   | mmu-miR-3110-5p | 5.992  | 6.241  | 6.075  |
| 46283    | mcmv-miR-M23-2-3p | 5.040  | 5.401  | 5.074  |
| 42849    | mmu-miR-146b-3p | 5.217  | 5.527  | 5.236  |
| 169114   | mmu-miR-5617-3p | 4.813  | 4.993  | 4.678  |
| 148383   | mmu-miR-103-2-5p | 4.779  | 5.141  | 4.865  |
| 46726    | mmu-miR-669j    | 4.809  | 4.959  | 4.746  |
| 31867    | mmu-miR-145a-3p | 6.412  | 6.406  | 6.411  |
| 42565    | mmu-miR-463-3p  | 4.801  | 5.170  | 4.857  |
| 169146   | mmu-miR-1929-3p | 4.755  | 4.905  | 4.671  |
| 148510   | mmu-miR-3080-5p | 4.916  | 5.251  | 4.973  |
| 148478   | mmu-miR-344c-3p | 4.900  | 5.224  | 4.923  |
| 42844    | mmu-miR-384-5p  | 4.600  | 4.941  | 4.551  |
| 168688   | mmu-miR-1843b-3p | 9.597  | 9.486  | 9.595  |
| 148447   | mmu-miR-383-3p  | 5.072  | 5.461  | 5.114  |
| 30831    | mmu-miR-804     | 6.876  | 6.785  | 6.767  |
| 42957    | mmu-miR-323-3p  | 4.607  | 4.925  | 4.595  |
| 42834    | mmu-miR-219-2-3p | 4.868  | 5.297  | 4.966  |
| 42676    | mmu-miR-495-3p  | 4.708  | 5.056  | 4.717  |
| 11253    | mmu-miR-467d-3p | 6.087  | 6.165  | 6.108  |
| 42792    | mmu-miR-29b-2-5p | 5.574  | 5.556  | 5.452  |
| 168927   | mmu-miR-5136    | 4.785  | 5.045  | 4.769  |
| 148360   | mmu-miR-375-5p  | 5.499  | 5.760  | 5.567  |
| 146018   | mmu-miR-1933-5p | 5.267  | 5.612  | 5.299  |
| 46434    | mcmv-miR-m59-1  | 5.035  | 5.467  | 5.089  |
| 169148   | mmu-miR-5130    | 4.732  | 4.979  | 4.700  |
| 42810    | mmu-miR-149-5p  | 5.593  | 5.958  | 5.658  |
| 42572    | mmu-miR-154-3p  | 4.821  | 5.135  | 4.835  |
| 148678   | mmu-miR-301a-5p | 5.774  | 5.873  | 5.741  |
| 46839    | mmu-miR-327     | 4.893  | 5.333  | 4.977  |
| 146071   | mmu-miR-1893    | 4.722  | 5.100  | 4.761  |
| 145721   | mmu-miR-875-5p  | 4.896  | 5.192  | 4.888  |
| 42865    | mmu-miR-181a-5p | 7.806  | 7.774  | 7.882  |
| 145838   | mmu-miR-125b-1-3p | 5.777  | 6.095  | 5.887  |
| 145746   | mmu-let-7i-3p   | 5.802  | 5.799  | 5.705  |
| 148061   | mmu-miR-153-5p  | 5.150  | 5.536  | 5.213  |
| 148297   | mmu-miR-92a-1-5p | 5.148  | 5.532  | 5.210  |
| 148556   | mmu-miR-1298-3p | 4.925  | 5.350  | 4.979  |
| 148170   | mmu-miR-741-5p  | 4.855  | 5.227  | 4.983  |
| 42886    | mmu-miR-879-5p  | 4.865  | 5.152  | 4.847  |
| 148294   | mmu-miR-217-3p  | 4.924  | 5.366  | 4.982  |
| 11210    | mmu-miR-215-5p  | 5.107  | 5.387  | 5.164  |
| 168817   | mmu-miR-5621-3p | 4.743  | 5.049  | 4.750  |
| 42549    | mmu-miR-19a-5p  | 5.113  | 5.481  | 5.177  |
| 168822   | mmu-miR-5117-5p | 4.720  | 5.008  | 4.775  |
| 148279   | mmu-miR-449a-3p | 4.756  | 5.177  | 4.805  |
| ID           | miRNA          | Value1 | Value2 | Value3 |
|--------------|----------------|--------|--------|--------|
| 146130       | mmu-miR-1946a  | 5.266  | 5.479  | 5.278  |
| 42551        | mmu-miR-122-3p | 4.911  | 5.264  | 4.952  |
| 42836        | mmu-miR-302c-5p| 5.084  | 5.499  | 5.105  |
| 46271        | mcmv-miR-m88-1p| 5.159  | 5.504  | 5.191  |
| 148427       | mmu-miR-3101-3p| 5.154  | 5.524  | 5.175  |
| 42771        | mmu-miR-877-3p | 5.785  | 5.898  | 5.701  |
| 46658        | mcmv-miR-m108-2-5p | 5.156 | 5.520  | 5.196  |
| 19604        | SNORD4A        | 5.170  | 5.475  | 5.194  |
| 148525       | mmu-miR-1964-5p| 4.964  | 5.324  | 5.009  |
| 42609        | mmu-miR-135a-1-3p| 5.754 | 6.055  | 5.823  |
| 148089       | mmu-miR-208a-3p| 4.677  | 5.192  | 4.746  |
| 168713       | mmu-miR-5135   | 5.042  | 5.370  | 5.071  |
| 145914       | mmu-miR-135b-5p| 5.102  | 5.322  | 5.052  |
| 28979        | mmu-miR-670-5p | 5.618  | 5.913  | 5.658  |
| 42664        | mmu-miR-301b-3p| 4.806  | 5.214  | 4.850  |
| 42604        | mmu-miR-346-5p | 5.150  | 5.373  | 5.095  |
| 42456        | mmu-miR-598-3p | 5.852  | 6.115  | 5.860  |
| 148375       | mmu-miR-149-3p | 5.210  | 5.464  | 5.198  |
| 11043        | mmu-miR-302b-3p| 5.223  | 5.541  | 5.229  |
| 11018        | mmu-miR-218-5p | 5.935  | 6.167  | 5.948  |
| 148203       | mmu-miR-1198-3p| 4.954  | 5.372  | 5.031  |
| 148056       | mmu-miR-299a-3p/mmu-miR-299b-3p| 4.998 | 5.391  | 5.017  |
| 146125       | mmu-miR-1903   | 6.431  | 6.635  | 6.582  |
| 146128       | mmu-miR-1982.1-3p/mmu-miR-1982.2-3p| 5.364 | 5.804  | 5.485  |
| 17378        | mmu-miR-698-3p | 5.811  | 6.143  | 5.844  |
| 146106       | mmu-miR-1931   | 5.465  | 6.122  | 5.709  |
| 42913        | mmu-miR-345-3p | 5.978  | 6.302  | 6.011  |
| 148274       | mmu-miR-1968-3p| 5.173  | 5.635  | 5.247  |
| 148366       | mmu-miR-344d-1-5p| 4.913 | 5.304  | 4.960  |
| 169077       | mmu-miR-449c-3p| 4.610  | 4.823  | 4.531  |
| 42536        | mmu-miR-666-3p | 5.057  | 5.544  | 5.092  |
| 46205        | SNORD48        | 5.681  | 6.086  | 5.831  |
| 148220       | mmu-miR-3093-5p| 4.993  | 5.222  | 4.951  |
| 148598       | mmu-miR-4660-3p| 4.874  | 5.210  | 4.876  |
| 42627        | mmu-miR-212-3p | 5.499  | 5.720  | 5.536  |
| 17624        | mmu-miR-532-5p | 5.698  | 5.766  | 5.655  |
| 17503        | mmu-miR-590-5p | 5.015  | 5.424  | 5.080  |
| 148081       | mmu-miR-3102-3p.2-3p| 5.811 | 5.983  | 5.809  |
| 17620        | mghv-miR-M1-9  | 5.174  | 5.386  | 5.105  |
| 148205       | mmu-miR-3077-5p| 5.659  | 5.931  | 5.689  |
| 145698       | mmu-miR-496a-3p| 5.023  | 5.286  | 4.985  |
| 147486       | mmu-miR-421-5p | 5.202  | 5.626  | 5.271  |
| 17854        | mmu-miR-106b-3p| 6.283  | 6.442  | 6.279  |
| 169373       | mmu-miR-5626-5p| 7.212  | 7.352  | 7.176  |
| 148088       | mghv-miR-M1-13-3p| 5.100 | 5.473  | 5.106  |
| 146007       | mmu-miR-1969   | 5.211  | 5.552  | 5.203  |
| 27574        | mmu-miR-705    | 6.918  | 6.741  | 6.844  |
| 42732        | mmu-miR-532-3p | 5.812  | 5.989  | 5.742  |
| 10976        | mmu-miR-182-3p | 4.998  | 5.492  | 5.096  |
| 148575        | mmu-miR-700-5p | 5.524  | 6.146  | 5.704  |
| ID     | miRNA Name       | Start | Stop  | End   |
|--------|------------------|-------|-------|-------|
| 46331  | mcmv-miR-m108-1-5p | 4.883 | 5.277 | 4.926 |
| 28019  | mmu-miR-10a-3p    | 5.619 | 5.681 | 5.599 |
| 19601  | mmu-miR-211-5p    | 5.459 | 5.810 | 5.479 |
| 148194 | mmu-miR-3108-5p   | 4.921 | 5.360 | 4.968 |
| 147386 | mmu-miR-212-5p    | 5.061 | 5.490 | 5.101 |
| 17316  | mmu-miR-488-3p    | 5.412 | 5.665 | 5.388 |
| 42723  | mmu-miR-195a-3p   | 5.755 | 6.024 | 5.814 |
| 46239  | mmu-miR-1191     | 5.025 | 5.412 | 5.082 |
| 146047 | mmu-miR-1962     | 4.830 | 5.215 | 4.826 |
| 148151 | mmu-miR-3101-5p  | 5.404 | 5.707 | 5.387 |
| 19607  | SNORD15A         | 5.588 | 5.933 | 5.623 |
| 42898  | mmu-miR-124-5p   | 5.756 | 6.133 | 5.850 |
| 168807 | mmu-miR-3473c    | 6.863 | 6.946 | 6.777 |
| 42790  | mmu-miR-337-3p   | 6.141 | 6.348 | 6.160 |
| 10937  | mmu-miR-132-3p   | 4.964 | 5.251 | 5.020 |
| 169301 | mmu-miR-3967     | 5.038 | 4.854 | 4.813 |
| 168694 | mmu-miR-5616-5p  | 7.096 | 7.134 | 7.154 |
| 148403 | mmu-miR-3065-3p  | 5.121 | 5.530 | 5.190 |
| 148124 | mmu-miR-350-5p   | 5.117 | 5.460 | 5.152 |
| 169415 | mmu-miR-187-5p   | 4.602 | 5.017 | 4.762 |
| 46639  | mmu-miR-467f     | 7.927 | 7.879 | 8.005 |
| 17898  | mmu-miR-99b-3p   | 6.271 | 6.420 | 6.247 |
| 148432 | mghv-miR-M1-10-3p| 5.146 | 5.453 | 5.168 |
| 145836 | mmu-miR-218-2-3p | 5.532 | 5.699 | 5.460 |
| 148654 | mmu-miR-184-3p   | 5.396 | 5.764 | 5.448 |
| 168787 | mmu-miR-5114     | 5.108 | 5.454 | 5.307 |
| 148209 | mghv-miR-M1-11-5p| 5.039 | 5.392 | 5.048 |
| 146119 | mmu-miR-1982.1-3p| 5.308 | 5.640 | 5.365 |
| 168641 | mmu-miR-5710     | 4.877 | 5.056 | 4.856 |
| 46211  | mcmv-miR-M95-1-5p| 5.364 | 5.673 | 5.369 |
| 19016  | mmu-miR-217-5p   | 4.900 | 5.129 | 4.850 |
| 42528  | mmu-miR-296-3p   | 5.607 | 5.902 | 5.674 |
| 17618  | mmu-miR-687      | 5.070 | 5.354 | 5.042 |
| 148041 | mmu-miR-344g-3p  | 5.255 | 5.635 | 5.297 |
| 17431  | mghv-miR-M1-8-5p | 8.170 | 8.048 | 8.074 |
| 46734  | mmu-miR-467h     | 6.539 | 6.702 | 6.677 |
| 42846  | mmu-miR-696      | 5.755 | 6.049 | 5.765 |
| 168774 | mmu-miR-3073b-3p | 4.503 | 4.946 | 4.576 |
| 148284 | mmu-miR-208b-3p  | 4.918 | 5.279 | 4.931 |
| 148553 | mmu-miR-1948-5p  | 5.505 | 5.719 | 5.548 |
| 46315  | mcmv-miR-M95-1-3p| 5.218 | 5.515 | 5.206 |
| 42741  | mmu-miR-760-5p   | 4.668 | 4.910 | 4.649 |
| 17866  | mmu-miR-331-5p   | 5.036 | 5.297 | 4.986 |
| 148543 | mmu-miR-3092-5p  | 5.009 | 5.436 | 5.054 |
| 148261 | mmu-miR-208a-5p  | 6.437 | 6.478 | 6.425 |
| 148453 | mmu-miR-3074-5p  | 5.213 | 5.614 | 5.266 |
| 145634 | mmu-miR-132-5p   | 5.332 | 5.691 | 5.349 |
| 42464  | mghv-miR-M1-2-3p | 6.518 | 6.726 | 6.527 |
| 148310 | mmu-miR-3094-5p  | 5.159 | 5.597 | 5.193 |
| 168636 | mmu-miR-122-5p   | 5.212 | 5.601 | 5.278 |
| ID      | miRNA Description         | Fold Change 1 | Fold Change 2 | Fold Change 3 |
|---------|----------------------------|---------------|---------------|---------------|
| 42569   | mmu-miR-871-5p             | 5.393         | 5.815         | 5.415         |
| 42748   | mmu-miR-191-3p             | 5.661         | 5.968         | 5.676         |
| 17851   | mmu-miR-200c-5p            | 5.436         | 5.756         | 5.484         |
| 168566  | mmu-miR-5625-3p            | 4.678         | 4.984         | 4.678         |
| 148313  | mmu-miR-3095-5p            | 5.814         | 5.847         | 5.733         |
| 17822   | mmu-miR-490-5p             | 5.078         | 5.330         | 4.997         |
| 148169  | mmu-miR-1188-3p            | 5.566         | 5.829         | 5.563         |
| 168751  | mmu-miR-512                | 4.662         | 5.142         | 4.757         |
| 168592  | mmu-miR-5622-3p            | 5.151         | 5.452         | 5.161         |
| 168937  | mmu-miR-138-1-3p           | 4.709         | 5.058         | 4.696         |
| 42830   | mmu-miR-302a-5p            | 5.230         | 5.605         | 5.221         |
| 148121  | mmu-miR-155-3p             | 6.452         | 6.432         | 6.407         |
| 42744   | mmu-miR-23a-3p             | 11.465        | 11.495        | 11.504        |
| 145843  | mmu-miR-330-5p             | 5.469         | 5.895         | 5.547         |
| 148163  | mmu-miR-3061-5p            | 5.246         | 5.660         | 5.275         |
| 148210  | mmu-miR-3060-3p            | 5.500         | 5.788         | 5.586         |
| 148052  | mmu-miR-374c-3p            | 5.522         | 5.909         | 5.592         |
| 168662  | mmu-miR-5132-5p            | 5.138         | 5.324         | 5.130         |
| 42942   | mmu-miR-134-5p             | 5.018         | 5.164         | 4.945         |
| 149565  | mmu-miR-3113-3p            | 5.401         | 5.801         | 5.449         |
| 145759  | mmu-miR-181c-3p            | 4.820         | 5.196         | 4.805         |
| 11249   | mmu-miR-463-5p             | 5.452         | 5.766         | 5.415         |
| 145689  | mmu-miR-543-3p             | 5.173         | 5.558         | 5.164         |
| 42805   | mmu-miR-707                | 5.329         | 5.431         | 5.214         |
| 146063  | mmu-miR-1945               | 5.295         | 5.589         | 5.270         |
| 46284   | mmu-miR-1b-5p              | 4.910         | 5.285         | 4.909         |
| 17388   | mmu-miR-669a-5p/mmu-miR-669p-5p | 6.654     | 6.838         | 6.686         |
| 148292  | mmu-miR-3109-3p            | 4.882         | 5.286         | 4.868         |
| 42620   | mmu-miR-188-5p             | 5.328         | 5.663         | 5.347         |
| 27571   | mmu-miR-292-5p             | 5.920         | 6.154         | 5.936         |
| 148480  | mmu-miR-494-5p             | 5.541         | 5.914         | 5.606         |
| 148500  | mmu-miR-3067-3p            | 4.981         | 5.262         | 4.931         |
| 168784  | mmu-miR-5098               | 4.798         | 5.059         | 4.737         |
| 148567  | mmu-miR-1249-5p            | 4.972         | 5.326         | 4.998         |
| 148070  | mmu-miR-1197-5p            | 4.862         | 5.241         | 4.832         |
| 42457   | mmu-miR-323-5p             | 5.103         | 5.491         | 5.077         |
| 148546  | mmu-miR-500-5p             | 5.589         | 5.979         | 5.632         |
| 17597   | mmu-miR-467b-3p            | 6.208         | 6.196         | 6.136         |
| 32608   | mmu-miR-761                | 5.024         | 5.413         | 5.061         |
| 168957  | mmu-miR-3073b-5p           | 4.681         | 4.937         | 4.544         |
| 148443  | mmu-miR-19b-2-5p           | 5.121         | 5.544         | 5.143         |
| 148308  | mmu-miR-702-5p             | 5.489         | 5.829         | 5.518         |
| 42725   | mmu-miR-467a-5p            | 4.876         | 5.253         | 4.883         |
| 17313   | mmu-miR-297b-5p            | 5.257         | 5.689         | 5.319         |
| 148107  | mmu-miR-3104-3p            | 6.656         | 6.756         | 6.579         |
| 148224  | mmu-miR-3086-5p            | 4.926         | 5.245         | 4.905         |
| 148431  | mmu-miR-3088-3p            | 5.137         | 5.508         | 5.094         |
| 46210   | mmu-miR-1249-3p            | 6.748         | 6.902         | 6.688         |
| 11113   | mmu-miR-448-3p             | 4.911         | 5.376         | 4.946         |
| 168873  | mmu-miR-5134-5p            | 4.821         | 5.101         | 4.776         |
| ID      | miRNA Names                                      | miRNA ID | Expression 1 | Expression 2 | Expression 3 |
|---------|-------------------------------------------------|----------|--------------|--------------|--------------|
| 42852   | mmu-miR-760-3p                                   | 5.132    | 5.514        | 5.169        |
| 42585   | mmu-miR-297a-3p/mmum-R-297b-3p/n               | 7.173    |              |              |
| 148096  | mmu-miR-206-5p                                   | 5.017    | 5.496        | 5.085        |
| 42823   | mmu-miR-27b-5p                                   | 5.200    | 5.458        | 5.159        |
| 42816   | mmu-miR-700-3p                                   | 5.135    | 5.525        | 5.158        |
| 148342  | mmu-miR-670-3p                                   | 5.114    | 5.626        | 5.208        |
| 42747   | mmu-miR-93-3p                                    | 4.930    | 5.365        | 4.961        |
| 10995   | mmu-miR-199a-3p/mmum-R-199b-3p                  | 8.749    | 8.637        | 8.689        |
| 148312  | mmu-miR-3087-5p                                  | 5.469    | 5.745        | 5.467        |
| 148112  | mmu-miR-3063-5p                                  | 5.044    | 5.469        | 5.068        |
| 148306  | mmu-miR-381-3p                                   | 4.827    | 5.302        | 4.881        |
| 148074  | mmu-miR-539-3p                                   | 4.934    | 5.100        | 4.825        |
| 17352   | mghv-miR-M1-5-5p                                 | 6.191    | 6.323        | 6.113        |
| 148250  | mmu-let-7f-2-3p                                  | 5.297    | 5.452        | 5.222        |
| 13178   | mmu-miR-18a-3p                                   | 5.250    | 5.358        | 5.245        |
| 148538  | mmu-miR-146a-3p                                  | 5.136    | 5.505        | 5.140        |
| 45985   | mmu-miR-546                                     | 4.853    | 5.291        | 4.890        |
| 46699   | mghv-miR-M1-7-5p                                 | 5.153    | 5.463        | 5.144        |
| 146164  | mmu-miR-1958                                    | 6.282    | 6.219        | 6.270        |
| 145993  | mmu-miR-1899                                    | 5.554    | 5.774        | 5.556        |
| 46203   | SNORD49A                                        | 5.007    | 5.223        | 4.945        |
| 10943   | mmu-miR-136-5p                                   | 7.551    | 7.543        | 7.545        |
| 148522  | mmu-miR-412-5p                                   | 5.083    | 5.379        | 5.051        |
| 42460   | mmu-miR-223-5p                                   | 5.505    | 5.780        | 5.444        |
| 148580  | mmu-miR-134-3p                                   | 4.871    | 5.307        | 4.894        |
| 42519   | mmu-miR-465c-5p                                  | 6.031    | 6.281        | 6.055        |
| 147283  | mmu-miR-137-5p                                   | 5.718    | 5.965        | 5.684        |
| 148564  | mmu-miR-16b-3p                                   | 5.311    | 5.777        | 5.380        |
| 146183  | mmu-miR-432                                     | 5.097    | 5.528        | 5.097        |
| 42876   | mmu-miR-20a-3p                                   | 5.189    | 5.421        | 5.158        |
| 168607  | mmu-miR-299a-5p                                  | 7.106    | 6.969        | 7.010        |
| 148083  | mmu-miR-3089-3p                                  | 4.889    | 5.353        | 4.908        |
| 42576   | mmu-miR-342-5p                                   | 4.851    | 5.202        | 4.885        |
| 17495   | mmu-miR-697                                     | 5.464    | 5.482        | 5.464        |
| 42496   | mmu-miR-181c-5p                                  | 5.376    | 5.710        | 5.423        |
| 42638   | mmu-miR-23a-5p                                   | 5.420    | 5.676        | 5.411        |
| 46310   | mmu-miR-1187                                    | 7.486    | 7.490        | 7.493        |
| 10928   | mmu-miR-125a-5p                                  | 10.634   | 10.546       | 10.543       |
| 11207   | mmu-miR-202-3p                                   | 4.965    | 5.334        | 4.946        |
| 14268   | mmu-miR-376a-5p                                  | 5.406    | 5.746        | 5.406        |
| 168813  | mmu-miR-3473d                                   | 4.731    | 5.252        | 4.781        |
| 17621   | mmu-miR-701-5p                                   | 5.612    | 5.686        | 5.490        |
| 148492  | mmu-miR-3091-5p                                  | 5.533    | 5.884        | 5.547        |
| 148336  | mmu-miR-3071-5p                                  | 5.231    | 5.214        | 5.098        |
| 42621   | mmu-miR-879-3p                                   | 5.377    | 5.770        | 5.421        |
| 145827  | mmu-miR-200a-5p                                  | 5.059    | 5.525        | 5.122        |
| 148354  | mmu-miR-466a-5p                                  | 6.340    | 6.481        | 6.420        |
| 146156  | mmu-miR-1960                                    | 5.226    | 5.598        | 5.293        |
| 46297   | mmu-miR-3085-3p                                  | 5.767    | 5.712        | 5.534        |
| 148490  | mmu-miR-1224-3p                                  | 7.009    | 7.145        | 7.003        |
| ID      | Name               | Expression | Variance | Standard Deviation |
|---------|--------------------|------------|----------|--------------------|
| 42660   | mmu-miR-144-5p     | 6.228      | 5.995    | 6.134              |
| 42678   | mmu-miR-876-3p     | 4.880      | 5.265    | 4.834              |
| 145757  | mmu-miR-33-3p      | 5.171      | 5.677    | 5.244              |
| 148451  | mmu-miR-344g-5p    | 5.162      | 5.497    | 5.102              |
| 148395  | mghv-miR-M1-12-5p  | 4.865      | 5.319    | 4.869              |
| 42480   | mmu-miR-485-5p     | 5.196      | 5.615    | 5.228              |
| 148047  | mmu-miR-3058-3p    | 5.511      | 5.887    | 5.510              |
| 46787   | mcmv-miR-M87-1     | 5.030      | 5.538    | 5.024              |
| 146029  | mmu-miR-365-2-5p   | 5.208      | 5.613    | 5.227              |
| 11240   | mmu-miR-409-3p     | 5.080      | 5.472    | 5.102              |
| 42709   | mmu-miR-743b-5p    | 5.141      | 5.546    | 5.167              |
| 148137  | mmu-miR-1193-5p    | 5.201      | 5.599    | 5.197              |
| 17691   | mmu-miR-505-3p     | 5.415      | 5.875    | 5.469              |
| 168810  | mmu-miR-5110       | 4.998      | 5.178    | 4.924              |
| 146022  | mmu-miR-1947-5p    | 5.004      | 5.349    | 4.982              |
| 42449   | mmu-miR-293-5p     | 5.056      | 5.519    | 5.062              |
| 146150  | mmu-miR-1905       | 4.862      | 5.317    | 4.930              |
| 169190  | mmu-miR-5117-3p    | 9.042      | 8.977    | 9.044              |
| 146034  | mmu-miR-1933-3p    | 5.026      | 5.363    | 5.027              |
| 168907  | mmu-miR-582-3p     | 4.493      | 5.123    | 4.618              |
| 148037  | mmu-miR-363-5p     | 4.931      | 5.026    | 4.804              |
| 148020  | mmu-miR-3078-3p    | 5.776      | 6.082    | 5.771              |
| 146145  | mmu-miR-1895       | 6.779      | 6.839    | 6.770              |
| 28769   | mmu-miR-450b-5p    | 5.439      | 5.829    | 5.434              |
| 148183  | mmu-miR-429-5p     | 5.213      | 5.659    | 5.212              |
| 146065  | mmu-miR-1927       | 5.421      | 5.848    | 5.457              |
| 46275   | mmu-miR-1251-5p    | 5.326      | 5.719    | 5.306              |
| 14271   | mmu-miR-539-5p     | 5.508      | 5.923    | 5.508              |
| 148421  | mmu-miR-344f-3p    | 4.864      | 5.217    | 4.842              |
| 148295  | mmu-miR-216b-3p    | 5.119      | 5.372    | 5.028              |
| 145994  | mmu-miR-1900       | 8.016      | 8.174    | 8.101              |
| 42868   | mmu-miR-762        | 6.976      | 7.166    | 6.887              |
| 11227   | mmu-miR-329-3p     | 6.616      | 6.793    | 6.637              |
| 42615   | mmu-miR-135b-3p    | 5.346      | 5.746    | 5.335              |
| 148090  | mmu-miR-495-5p     | 6.506      | 6.747    | 6.631              |
| 11038   | mmu-miR-299a-5p/mmu-miR-299b-5p | 5.600 | 5.969 | 5.603 |
| 42489   | mmu-miR-467c-5p    | 5.250      | 5.616    | 5.255              |
| 146118  | mmu-miR-1894-5p    | 6.109      | 6.363    | 6.098              |
| 148013  | mmu-miR-3075-5p    | 5.319      | 5.610    | 5.289              |
| 42712   | mmu-miR-742-5p     | 5.376      | 5.720    | 5.362              |
| 146073  | mmu-miR-1930-5p    | 5.011      | 5.148    | 4.896              |
| 148148  | mmu-miR-3057-5p    | 5.061      | 5.440    | 5.059              |
| 148503  | mmu-miR-3098-5p    | 4.868      | 5.225    | 4.822              |
| 46206   | SNORD44            | 5.284      | 5.360    | 5.199              |
| 17446   | mmu-miR-680        | 5.119      | 5.478    | 5.126              |
| 46610   | mcmv-miR-M23-1-3p  | 4.932      | 5.450    | 4.972              |
| 42670   | mmu-miR-500-3p     | 7.155      | 7.265    | 7.100              |
| 42907   | mmu-miR-598-5p     | 5.115      | 5.502    | 5.101              |
| 14272   | mmu-miR-542-3p     | 6.582      | 6.570    | 6.531              |
| 148299  | mmu-miR-802-3p     | 5.060      | 5.334    | 5.009              |
| ID       | miRNA Name          | Value 1 | Value 2 | Value 3 |
|----------|---------------------|---------|---------|---------|
| 168945   | mmu-miR-326-3p      | 5.460   | 5.669   | 5.451   |
| 148145   | mmu-miR-3093-3p     | 5.413   | 5.844   | 5.471   |
| 29852    | mmu-miR-9-3p        | 5.351   | 5.590   | 5.384   |
| 148010   | mghv-miR-M1-10-5p   | 4.980   | 5.297   | 4.953   |
| 148634   | mmu-miR-3475        | 5.322   | 5.637   | 5.292   |
| 17525    | mmu-miR-682         | 5.104   | 5.424   | 5.038   |
| 147701   | mmu-miR-491-3p      | 12.832  | 12.674  | 12.793  |
| 19005    | SNORD118            | 5.127   | 5.466   | 5.089   |
| 42884    | mmu-miR-883a-3p     | 4.896   | 5.032   | 4.726   |
| 148324   | mmu-miR-1912-5p     | 5.254   | 5.616   | 5.251   |
| 145889   | mmu-miR-196b-5p     | 5.265   | 5.629   | 5.237   |
| 46293    | mcmv-miR-m21-1      | 5.334   | 5.721   | 5.324   |
| 148414   | mmu-miR-1930-3p     | 5.358   | 5.694   | 5.321   |
| 148192   | mmu-miR-421-3p      | 5.066   | 5.225   | 4.940   |
| 146051   | mmu-miR-1897-3p     | 5.107   | 5.619   | 5.193   |
| 148479   | mmu-miR-504-3p      | 5.082   | 5.441   | 5.060   |
| 169331   | mmu-miR-5104        | 4.909   | 5.159   | 4.855   |
| 148557   | mmu-miR-3105-5p     | 5.502   | 5.638   | 5.351   |
| 28346    | mmu-miR-374b-3p     | 5.104   | 5.566   | 5.111   |
| 42684    | mmu-miR-219-1-3p    | 5.036   | 5.458   | 5.028   |
| 145641   | mmu-miR-369-5p      | 4.903   | 5.290   | 4.871   |
| 42765    | mmu-miR-339-3p      | 5.258   | 5.358   | 5.131   |
| 168596   | mmu-miR-5620-3p     | 5.662   | 6.010   | 5.725   |
| 146133   | mmu-miR-1936        | 5.193   | 5.395   | 5.139   |
| 46729    | mmu-miR-302d-5p     | 5.165   | 5.480   | 5.095   |
| 148595   | mmu-miR-34a-3p      | 4.851   | 5.466   | 4.942   |
| 148120   | mmu-miR-106a-3p     | 5.244   | 5.637   | 5.236   |
| 11254    | mmu-miR-468-3p      | 6.674   | 6.747   | 6.638   |
| 11229    | mmu-miR-341-3p      | 5.640   | 5.773   | 5.535   |
| 11247    | mmu-miR-434-5p      | 5.017   | 5.285   | 4.962   |
| 146039   | mmu-miR-669o-5p     | 8.070   | 8.176   | 8.113   |
| 32946    | mmu-miR-3107-5p/mmu-miR-486-5p | 7.398 | 7.302 | 7.338 |
| 146026   | mmu-miR-1951        | 5.590   | 5.995   | 5.634   |
| 148537   | mmu-miR-3105-3p     | 5.365   | 5.618   | 5.333   |
| 11013    | mmu-miR-181a-1-3p   | 4.912   | 5.355   | 4.928   |
| 145974   | mmu-miR-200b-5p     | 5.204   | 5.571   | 5.177   |
| 11052    | mmu-miR-31-5p       | 5.012   | 5.481   | 4.995   |
| 13784    | mmu-miR-547-3p      | 5.612   | 5.961   | 5.605   |
| 148473   | mmu-miR-3473a       | 8.407   | 8.397   | 8.411   |
| 42574    | mmu-miR-467e-5p     | 6.233   | 6.264   | 6.235   |
| 17540    | mmu-miR-669b-5p     | 5.347   | 5.789   | 5.385   |
| 148333   | mmu-miR-96-3p       | 4.816   | 5.259   | 4.839   |
| 145822   | mmu-miR-214-5p      | 5.442   | 5.620   | 5.349   |
| 168573   | mmu-miR-5046        | 5.364   | 5.513   | 5.253   |
| 148630   | mmu-miR-3472        | 5.219   | 5.683   | 5.318   |
| 42595    | mmu-miR-291a-3p     | 6.361   | 6.306   | 6.219   |
| 148097   | mmu-miR-329-5p      | 5.882   | 6.041   | 5.772   |
| 42978    | mmu-miR-466a-3p/mmu-miR-466e-3p | 5.880 | 5.943 | 5.808 |
| ID     | Name                | Value1  | Value2  | Value3  |
|--------|---------------------|---------|---------|---------|
| 14189  | mmu-miR-302b-5p     | 5.137   | 5.708   | 5.208   |
| 148029 | mmu-miR-351-3p      | 5.456   | 5.728   | 5.418   |
| 168780 | mmu-miR-3969        | 4.483   | 5.578   | 5.019   |
| 148676 | mmu-miR-1186b       | 10.736  | 10.803  | 10.867  |
| 148631 | mmu-miR-466j        | 6.883   | 7.019   | 6.933   |
| 146027 | mmu-miR-1964-3p     | 5.274   | 5.826   | 5.351   |
| 169294 | mmu-miR-5615-3p     | 4.656   | 4.939   | 4.555   |
| 148258 | mmu-miR-3089-5p     | 5.213   | 5.491   | 5.108   |
| 17438  | mmu-miR-449c-5p     | 4.953   | 5.444   | 4.965   |
| 148561 | mmu-miR-547-5p      | 5.114   | 5.440   | 5.114   |
| 148582 | mmu-miR-298-3p      | 4.940   | 5.427   | 4.942   |
| 145995 | mmu-miR-196b-3p     | 4.882   | 5.318   | 4.870   |
| 17287  | mghv-miR-M1-1-3p    | 5.257   | 5.633   | 5.253   |
| 148680 | mmu-miR-3072-5p     | 5.269   | 5.690   | 5.260   |
| 148254 | mmu-miR-194-1-3p    | 5.088   | 5.461   | 5.039   |
| 42839  | mmu-miR-135a-5p     | 5.650   | 5.992   | 5.620   |
| 145637 | mmu-miR-187-3p      | 5.813   | 6.178   | 5.828   |
| 42553  | mmu-miR-216a-5p     | 5.255   | 5.625   | 5.180   |
| 148218 | mghv-miR-M1-11-3p   | 5.879   | 6.271   | 5.920   |
| 11202  | mmu-miR-151-3p      | 6.154   | 6.304   | 6.104   |
| 148355 | mmu-miR-3077-3p     | 6.349   | 6.465   | 6.308   |
| 148461 | mmu-miR-344b-5p     | 5.272   | 5.318   | 5.114   |
| 42877  | mmu-miR-18b-5p      | 5.037   | 5.489   | 5.060   |
| 14289  | mmu-miR-540-3p      | 4.678   | 5.020   | 4.617   |
| 148545 | mmu-miR-466l-5p     | 5.165   | 5.682   | 5.196   |
| 148339 | mmu-miR-665-5p      | 6.423   | 6.478   | 6.315   |
| 31015  | mmu-miR-693-3p      | 5.480   | 5.850   | 5.490   |
| 11226  | mmu-miR-325-5p      | 5.470   | 5.807   | 5.471   |
| 17513  | mmu-miR-694         | 5.228   | 5.536   | 5.155   |
| 168772 | mmu-miR-224-5p      | 4.717   | 4.872   | 4.535   |
| 168715 | mmu-miR-5119        | 5.049   | 5.203   | 4.913   |
| 42444  | mmu-miR-291b-3p     | 5.403   | 5.855   | 5.398   |
| 148681 | mmu-miR-344b-3p     | 5.030   | 5.409   | 5.011   |
| 28309  | mmu-miR-741-3p      | 5.651   | 5.644   | 5.451   |
| 148060 | mmu-miR-3057-3p     | 5.221   | 5.397   | 5.067   |
| 46491  | mcmv-miR-m59-2      | 4.644   | 5.116   | 4.626   |
| 148164 | mmu-miR-3074-2-3p   | 5.097   | 5.480   | 5.040   |
| 169286 | mmu-miR-5118        | 4.789   | 4.824   | 4.569   |
| 28966  | mmu-miR-574-3p      | 6.958   | 6.823   | 6.786   |
| 148202 | mghv-miR-M1-13-5p   | 5.550   | 5.812   | 5.519   |
| 42674  | mmu-miR-431-3p      | 5.645   | 5.920   | 5.586   |
| 42523  | mmu-miR-26b-3p      | 5.854   | 6.170   | 5.778   |
| 146081 | mmu-miR-1929-5p     | 6.673   | 6.836   | 6.718   |
| 148689 | mmu-miR-3099-5p     | 5.031   | 5.455   | 5.016   |
| 17273  | mghv-miR-M1-6-3p    | 6.306   | 6.479   | 6.203   |
| 146004 | mmu-miR-2136        | 5.765   | 6.098   | 5.738   |
| 21498  | mmu-miR-654-3p      | 5.536   | 5.859   | 5.537   |
| 146139 | mmu-miR-1943-5p     | 5.289   | 5.433   | 5.141   |
| 148275 | mmu-miR-3070b-3p    | 5.430   | 5.773   | 5.377   |
| 148091 | mmu-miR-3088-5p     | 5.137   | 5.607   | 5.131   |
| ID     | miRNA             | Expression | Expression | Expression |
|--------|-------------------|------------|------------|------------|
| 19011  | SNORD10           | 5.074      | 5.557      | 5.109      |
| 11260  | mmu-miR-151-5p    | 7.751      | 7.827      | 7.739      |
| 46243  | mmu-miR-1195      | 5.642      | 5.913      | 5.601      |
| 27855  | mmu-miR-763       | 5.422      | 5.666      | 5.452      |
| 42694  | mmu-miR-485-3p    | 6.663      | 6.769      | 6.627      |
| 148559 | mmu-miR-411-3p    | 5.331      | 5.678      | 5.281      |
| 46774  | mcmv-miR-m01-2-5p | 4.870      | 5.090      | 4.726      |
| 168777 | mmu-miR-5615-5p   | 4.973      | 5.330      | 4.970      |
| 146023 | mmu-miR-1946b     | 6.195      | 6.206      | 6.043      |
| 148486 | mmu-miR-3061-3p   | 4.905      | 5.502      | 4.976      |
| 168678 | mmu-miR-5106      | 5.182      | 5.086      | 5.077      |
| 148110 | mmu-miR-3075-3p   | 5.351      | 5.886      | 5.391      |
| 148615 | mmu-miR-672-3p    | 4.871      | 5.493      | 4.914      |
| 148177 | mmu-miR-344f-5p   | 5.481      | 6.274      | 5.686      |
| 146057 | mmu-miR-1967      | 5.114      | 5.494      | 5.095      |
| 168816 | mmu-miR-5124a     | 4.599      | 4.880      | 4.503      |
| 148100 | mmu-miR-1947-3p   | 6.195      | 6.232      | 6.049      |
| 146031 | mmu-miR-1963      | 4.962      | 5.360      | 4.939      |
| 42625  | mmu-miR-299a-3p   | 5.153      | 5.597      | 5.144      |
| 148411 | mmu-miR-215-3p    | 5.040      | 5.645      | 5.129      |
| 46306  | mmu-miR-466a-5p/mmu-miR-466p-5p | 7.955 | 7.919 | 8.001 |
| 10306  | mmu-miR-146b-5p   | 7.771      | 7.773      | 7.676      |
| 46457  | mcmv-miR-M23-2-5p | 5.285      | 5.789      | 5.329      |
| 148587 | mmu-miR-326-5p    | 5.580      | 5.954      | 5.533      |
| 148602 | mmu-miR-3104-5p   | 4.945      | 5.365      | 4.938      |
| 42665  | mmu-miR-543-5p    | 6.317      | 6.648      | 6.246      |
| 28759  | mmu-miR-758-3p    | 5.436      | 5.903      | 5.432      |
| 46279  | mcmv-miR-m107-1-3p| 5.279      | 5.775      | 5.275      |
| 148225 | mmu-miR-3102-5p.2-5p | 5.320 | 5.744 | 5.326 |
| 148415 | mmu-miR-668-5p    | 5.518      | 5.916      | 5.542      |
| 145989 | mmu-miR-599       | 5.145      | 5.311      | 4.965      |
| 46816  | mcmv-miR-m01-4-3p | 4.754      | 5.201      | 4.749      |
| 148270 | mmu-miR-669b-3p   | 8.210      | 8.231      | 8.287      |
| 148464 | mmu-miR-3062-5p   | 5.194      | 5.445      | 5.044      |
| 169347 | mmu-miR-5622-5p   | 6.607      | 6.584      | 6.514      |
| 42800  | mmu-miR-582-5p    | 4.729      | 5.196      | 4.705      |
| 148649 | mmu-miR-3470a     | 5.980      | 6.101      | 5.926      |
| 42546  | mmu-miR-511-5p    | 5.465      | 5.937      | 5.434      |
| 4390   | mmu-miR-7b-5p     | 6.138      | 6.396      | 6.054      |
| 42639  | mmu-miR-509-3p    | 5.349      | 5.607      | 5.250      |
| 168902 | mmu-miR-5619-3p   | 4.986      | 5.011      | 4.776      |
| 148370 | mmu-miR-466n-3p   | 4.862      | 5.436      | 4.975      |
| 42567  | mmu-miR-590-3p    | 5.179      | 5.670      | 5.159      |
| 146195 | mmu-miR-2139      | 5.521      | 5.885      | 5.550      |
| 168778 | mmu-miR-501-3p    | 4.808      | 5.188      | 4.739      |
| 148373 | mmu-miR-667-5p    | 5.215      | 5.726      | 5.227      |
| 148136 | mghv-miR-M1-14-3p | 5.033      | 5.095      | 4.833      |
| 17425  | mmu-miR-467b-5p   | 5.506      | 5.691      | 5.407      |
| 42692  | mmu-miR-127-5p    | 4.773      | 5.141      | 4.703      |
| 46835  | mmu-miR-483-5p    | 5.852      | 6.164      | 5.829      |
| MMU      | miRNA Description       | Fold Change 1 | Fold Change 2 | Fold Change 3 |
|----------|-------------------------|--------------|--------------|--------------|
| 42453    | mmu-miR-376c-5p         | 5.449        | 5.838        | 5.421        |
| 148574   | mmu-miR-16-2-3p         | 5.298        | 5.819        | 5.328        |
| 148040   | mmu-miR-1247-3p         | 4.998        | 5.458        | 4.998        |
| 14313    | mmu-miR-499-5p          | 6.041        | 6.373        | 6.010        |
| 148015   | mmu-miR-3085-5p         | 5.042        | 5.581        | 5.100        |
| 145643   | mmu-miR-382-5p          | 5.652        | 5.991        | 5.661        |
| 17527    | mmu-miR-717             | 5.184        | 5.674        | 5.180        |
| 19605    | SNORD6                  | 5.315        | 5.730        | 5.385        |
| 27773    | mmu-miR-764-3p          | 5.079        | 5.189        | 4.867        |
| 168977   | mmu-miR-5128            | 5.370        | 5.919        | 5.538        |
| 23767    | mmu-miR-759             | 4.938        | 5.359        | 4.917        |
| 29802    | mmu-miR-144-3p          | 11.432       | 11.063       | 11.350       |
| 42592    | mmu-miR-338-3p          | 7.806        | 7.725        | 7.671        |
| 14670    | mmu-miR-1932            | 5.363        | 5.761        | 5.293        |
| 42851    | mmu-miR-105             | 5.688        | 5.899        | 5.559        |
| 148095   | mmu-miR-1b-3p           | 5.112        | 5.408        | 5.046        |
| 17304    | mmu-miR-683             | 5.893        | 5.843        | 5.647        |
| 42937    | mmu-miR-493-3p          | 5.318        | 5.833        | 5.327        |
| 148527   | mmu-miR-669a-3p         | 8.759        | 8.746        | 8.785        |
| 46217    | mcmv-miR-m108-1-3p      | 5.715        | 6.000        | 5.629        |
| 148134   | mmu-miR-3067-5p         | 5.589        | 5.903        | 5.497        |
| 42558    | mmu-miR-497-3p          | 4.935        | 5.587        | 4.990        |
| 148019   | mmu-miR-3113-5p         | 5.422        | 5.519        | 5.234        |
| 17517    | mmu-miR-688             | 5.338        | 5.639        | 5.284        |
| 168752   | mmu-miR-5627-3p         | 4.935        | 5.389        | 4.914        |
| 11074    | mmu-miR-34c-5p          | 5.878        | 6.294        | 5.998        |
| 145745   | mmu-miR-335-3p          | 9.884        | 9.971        | 9.854        |
| 148161   | mmu-miR-3070a-3p        | 5.375        | 5.853        | 5.386        |
| 27838    | mmu-miR-302d-3p         | 5.645        | 6.009        | 5.609        |
| 11102    | mmu-miR-410-3p          | 5.259        | 5.559        | 5.143        |
| 42922    | mmu-miR-450a-2-3p       | 5.444        | 5.626        | 5.261        |
| 148184   | mmu-miR-466m-3p         | 5.589        | 5.497        | 5.330        |
| 148104   | mmu-miR-3092-3p         | 6.402        | 6.575        | 6.363        |
| 42594    | mmu-miR-453             | 5.665        | 6.153        | 5.675        |
| 46510    | mmu-miR-1188-5p         | 5.816        | 6.047        | 5.649        |
| 42821    | mmu-miR-295-5p          | 5.053        | 5.691        | 5.058        |
| 148440   | mmu-miR-452-3p          | 5.088        | 5.483        | 5.034        |
| 148655   | mmu-miR-3471            | 5.172        | 5.379        | 5.013        |
| 46979    | mmu-miR-669h-3p         | 5.266        | 5.627        | 5.237        |
| 46346    | mmu-miR-669e-5p         | 7.477        | 7.600        | 7.457        |
| 168580   | mmu-miR-5626-3p         | 4.717        | 5.257        | 4.689        |
| 42970    | mmu-miR-744-3p          | 5.388        | 5.731        | 5.311        |
| 10990    | mmu-miR-196a-5p         | 5.820        | 6.203        | 5.769        |
| 169208   | mmu-miR-3971            | 5.751        | 5.681        | 5.475        |
| 148491   | mmu-miR-501-5p          | 5.560        | 5.786        | 5.443        |
| 42714    | mmu-miR-509-5p          | 5.195        | 5.587        | 5.170        |
| 42477    | mmu-miR-324-5p          | 5.168        | 5.168        | 4.896        |
| 148155   | mghv-miR-M1-1-5p        | 5.410        | 5.681        | 5.310        |
| 42931    | mmu-miR-218-1-3p        | 5.158        | 5.399        | 4.998        |
| 148159   | mmu-miR-3080-3p         | 4.909        | 5.507        | 4.947        |
| ID         | miRNA                          | Value1 | Value2 | Value3 |
|------------|--------------------------------|--------|--------|--------|
| 148232     | mmu-miR-3082-3p                | 5.189  | 5.637  | 5.138  |
| 46724      | mcmv-miR-m108-2-5p.1           | 4.987  | 5.487  | 4.972  |
| 148226     | mmu-miR-467c-3p                | 6.081  | 5.934  | 5.919  |
| 169280     | mmu-miR-5123                  | 5.151  | 4.905  | 4.812  |
| 148048     | mmu-miR-190b-3p                | 4.977  | 5.315  | 4.887  |
| 14297      | mmu-miR-20b-3p                 | 4.939  | 5.609  | 5.040  |
| 11221      | mmu-miR-300-3p                 | 5.325  | 5.547  | 5.271  |
| 169300     | mmu-miR-1231-5p               | 4.735  | 5.170  | 4.632  |
| 17433      | mmu-miR-679-5p                 | 5.441  | 6.085  | 5.524  |
| 13148      | mmu-miR-195a-5p                | 10.459 | 10.342 | 10.280 |
| 11205      | mmu-miR-199b-5p                | 8.712  | 8.598  | 8.520  |
| 148505     | mmu-miR-341-5p                 | 5.144  | 5.676  | 5.129  |
| 148242     | mmu-miR-205-3p                 | 5.784  | 5.903  | 5.558  |
| 42469      | mmu-miR-181a-2-3p              | 4.503  | 4.937  | 4.428  |
| 146002     | mmu-miR-6691-5p                | 7.670  | 7.677  | 7.636  |
| 148236     | mghv-miR-M1-15                 | 5.658  | 6.104  | 5.650  |
| 6880       | mmu-miR-297a-5p                | 6.005  | 6.424  | 6.083  |
| 148191     | mmu-miR-3081-3p                | 5.505  | 5.717  | 5.395  |
| 145707     | mmu-miR-216b-5p                | 5.087  | 5.272  | 4.891  |
| 24736      | mmu-miR-148b-5p                | 5.245  | 5.593  | 5.110  |
| 17946      | mmu-miR-192-3p                 | 5.424  | 6.073  | 5.487  |
| 42686      | mmu-miR-136-3p                 | 5.378  | 5.752  | 5.361  |
| 17638      | mmu-miR-684                   | 5.237  | 5.541  | 5.102  |
| 148457     | mmu-miR-92b-5p                 | 5.427  | 5.782  | 5.322  |
| 148661     | mmu-miR-486-3p                 | 5.310  | 5.538  | 5.169  |
| 28547      | mmu-miR-675-5p                 | 8.271  | 8.191  | 8.070  |
| 42607      | mmu-miR-653-5p                 | 4.893  | 5.558  | 4.929  |
| 33902      | mmu-miR-128-3p                 | 6.103  | 5.537  | 5.614  |
| 146067     | mmu-miR-1898                  | 5.269  | 5.559  | 5.134  |
| 46320      | mmu-miR-31-3p                  | 4.852  | 5.498  | 4.858  |
| 46251      | mmu-miR-1193-3p                | 5.112  | 5.668  | 5.153  |
| 148426     | mmu-miR-466a-3p/mmu-miR-466b-3p | 7.097  | 7.140  | 6.982  |
| 42889      | mmu-miR-379-3p                 | 5.128  | 5.262  | 4.934  |
| 148517     | mmu-miR-3078-5p                | 4.867  | 5.328  | 4.808  |
| 46461      | mmu-miR-1224-5p                | 5.862  | 6.203  | 5.791  |
| 148589     | mmu-miR-3109-5p                | 5.190  | 5.600  | 5.159  |
| 147994     | mmu-miR-669d-5p                | 8.030  | 8.082  | 8.117  |
| 148180     | mmu-miR-669e-3p                | 6.663  | 6.691  | 6.483  |
| 42659      | mmu-miR-290-3p                 | 6.310  | 6.326  | 6.146  |
| 148108     | mmu-miR-344d-2-5p              | 5.425  | 5.472  | 5.193  |
| 42894      | mmu-miR-466e-5p                | 7.631  | 7.504  | 7.499  |
| 46453      | mmu-miR-466f-5p                | 7.157  | 7.334  | 7.154  |
| 46982      | mmu-miR-466k                  | 5.446  | 5.928  | 5.400  |
| 42969      | mmu-miR-10b-3p                 | 5.434  | 5.728  | 5.348  |
| 148298     | mmu-miR-3073a-5p               | 5.128  | 5.545  | 5.072  |
| ID       | Name                | A1   | A2   | A3   |
|----------|---------------------|------|------|------|
| 169105   | mmu-miR-3963        | 16.251 | 16.473 | 16.147 |
| 145678   | mmu-miR-150-5p      | 9.055   | 8.940   | 8.787   |
| 146087   | mmu-miR-1894-3p     | 6.152   | 6.506   | 6.088   |
| 17902    | mmu-miR-15b-3p      | 5.344   | 5.612   | 5.179   |
| 42764    | mmu-miR-412-3p      | 5.009   | 5.541   | 4.971   |
| 148535   | mmu-miR-3097-5p     | 5.869   | 6.079   | 5.837   |
| 42707    | mmu-miR-294-5p      | 7.399   | 7.366   | 7.273   |
| 148562   | mmu-miR-128-1-5p    | 5.246   | 5.842   | 5.248   |
| 46674    | mcmv-miR-M55-1      | 5.216   | 5.689   | 5.136   |
| 148409   | mmu-miR-669k-5p     | 8.067   | 7.974   | 8.044   |
| 148508   | mmu-miR-3062-3p     | 5.882   | 5.631   | 5.550   |
| 27740    | mmu-miR-574-5p      | 7.991   | 7.995   | 7.851   |
| 46385    | mmu-miR-1186a       | 6.050   | 6.090   | 5.888   |
| 146013   | mmu-miR-1966-5p     | 5.990   | 6.154   | 5.806   |
| 145988   | mmu-miR-1942        | 5.048   | 5.413   | 4.944   |
| 17639    | mmu-miR-692         | 5.271   | 5.800   | 5.232   |
| 46489    | mmu-miR-669h-5p     | 5.936   | 6.215   | 5.843   |
| 148444   | mghv-miR-M1-2-5p    | 6.561   | 6.687   | 6.504   |
| 148558   | mmu-miR-3064-5p     | 6.424   | 6.381   | 6.185   |
| 148636   | mmu-miR-466f        | 8.618   | 8.557   | 8.566   |
| 46974    | mmu-miR-466l-3p     | 4.551   | 5.306   | 4.549   |
| 148657   | mmu-miR-381-5p      | 5.814   | 5.669   | 5.484   |
| 145661   | SNORD65             | 5.792   | 5.869   | 5.582   |
| 42861    | mmu-miR-466d-3p     | 6.713   | 6.689   | 6.550   |
| 146184   | mmu-miR-1965        | 5.189   | 5.450   | 5.030   |
| 148140   | mmu-miR-181d-3p     | 6.582   | 6.579   | 6.341   |
| 146050   | mmu-miR-669n        | 8.428   | 8.378   | 8.324   |
| 148103   | mghv-miR-M1-4-3p    | 6.358   | 6.078   | 6.007   |
| 42507    | mmu-miR-202-5p      | 5.550   | 5.782   | 5.365   |
| 148267   | mmu-miR-3082-5p     | 9.003   | 8.932   | 8.916   |
| 148185   | mmu-miR-471-3p      | 5.092   | 5.595   | 5.057   |
| 148238   | mmu-miR-3096a-5p    | 5.999   | 6.100   | 5.821   |
| 46338    | mmu-miR-382-3p      | 5.347   | 5.684   | 5.238   |
| 148244   | mmu-miR-3098-3p     | 7.036   | 6.958   | 6.899   |
| 168630   | mmu-miR-5121        | 6.536   | 6.603   | 6.377   |
| 148109   | mmu-miR-669a-3p/mmu-miR-669o-3p | 8.061 | 8.074 | 7.976 |
| 148143   | mmu-miR-466b-5p/mmu-miR-466o-5p | 7.578 | 7.484 | 7.452 |
| 17291    | mghv-miR-M1-4-5p    | 7.494   | 7.322   | 7.268   |
| 169344   | mmu-miR-3473b       | 9.419   | 9.313   | 9.423   |
| 42811    | mmu-miR-542-5p      | 5.545   | 5.957   | 5.489   |
| 42803    | mmu-miR-466c-5p     | 7.834   | 7.740   | 7.789   |
| 148158   | mghv-miR-M1-5-3p    | 5.400   | 5.215   | 5.093   |
| 46374    | mmu-miR-466i-3p     | 7.181   | 7.249   | 7.075   |
| 19603    | SNORD13             | 7.730   | 7.629   | 7.452   |
| 46518    | mmu-miR-1198-5p     | 6.291   | 6.322   | 6.018   |
| 29575    | mmu-miR-32-3p       | 8.674   | 8.632   | 8.630   |
| 14279    | mmu-miR-362-5p      | 5.516   | 5.758   | 5.326   |
| 148407   | mmu-miR-871-3p      | 5.285   | 5.357   | 5.019   |
| 148092   | mmu-miR-3083-5p     | 5.331   | 5.399   | 5.073   |
| 11077    | mmu-miR-363-3p      | 5.266   | 5.844   | 5.229   |
| ID     | miRNA             | Mean 1 | Mean 2 | Mean 3 |
|--------|-------------------|--------|--------|--------|
| 42895  | mmu-miR-881-3p    | 6.078  | 5.977  | 5.806  |
| 148552 | mmu-miR-3076-5p   | 5.288  | 5.579  | 5.104  |
| 14280  | mmu-miR-367-3p    | 5.384  | 5.122  | 4.974  |
| 169348 | mmu-miR-468-5p    | 4.809  | 5.004  | 4.884  |
| 148283 | mmu-miR-1199-3p   | 5.261  | 5.521  | 5.078  |
| 169364 | mmu-miR-3572-3p   | 7.812  | 7.947  | 7.886  |
| 42879  | mmu-miR-92a-2-5p  | 6.211  | 6.491  | 6.101  |
| 46980  | mmu-miR-669k-3p   | 4.684  | 5.691  | 4.942  |
| 46615  | mmcmv-miR-m01-2-3p| 5.358  | 6.006  | 5.365  |
| 148197 | mmu-miR-3081-5p   | 6.008  | 6.153  | 5.846  |
| 46978  | mmu-miR-669i      | 5.734  | 6.001  | 5.654  |
| 42866  | mmu-miR-451a      | 13.909 | 13.708 | 13.674 |
| 146135 | mmu-miR-1968-5p   | 5.453  | 5.684  | 5.229  |
| 148627 | mmu-miR-615-5p    | 5.713  | 5.752  | 5.430  |
| 46485  | mmu-miR-669f-3p   | 8.528  | 8.457  | 8.422  |
| 169869 | mmu-miR-361-3p    | 6.782  | 6.448  | 6.279  |
| 169868 | mmu-miR-147-3p    | 5.332  | 5.618  | 5.213  |
| 148690 | mmu-miR-466d-5p   | 8.046  | 8.013  | 7.959  |
| 146221 | mmu-miR-669c-5p   | 9.057  | 9.060  | 9.040  |
| 148482 | mmu-miR-874-5p    | 6.071  | 6.068  | 5.743  |
| 42719  | mmu-miR-324-3p    | 5.683  | 5.974  | 5.550  |
| 46976  | mmu-miR-467g      | 8.328  | 8.284  | 8.216  |
| 145705 | mmu-miR-431-5p    | 6.042  | 6.231  | 5.837  |
| 13485  | mmu-miR-163-5p    | 10.174 | 10.172 | 9.977  |
| 42817  | mmu-miR-395-3p    | 6.385  | 6.379  | 6.121  |
| 46223  | mmu-miR-1216-3p   | 5.524  | 5.953  | 5.415  |
| 148172 | mmu-miR-216a-3p   | 5.244  | 5.570  | 5.091  |
| 148468 | mmu-miR-677-3p    | 8.784  | 8.754  | 8.486  |
| 146175 | mmu-miR-1896      | 5.852  | 6.242  | 5.752  |
| 25126  | mmu-miR-743a-3p   | 5.273  | 5.521  | 5.116  |
| 148521 | mmu-miR-466m-5p/mmum-miR-669m-5p| 6.854     | 6.854     | 6.676     |
| 14328  | mmu-miR-124-3p    | 5.711  | 6.032  | 5.567  |
| 148034 | mmu-miR-669f-5p   | 7.874  | 7.766  | 7.672  |
| 17482  | mmu-miR-411-5p    | 5.490  | 5.587  | 5.205  |
| 16528  | mmu-miR-706       | 8.409  | 8.155  | 8.400  |
| 28054  | mmu-miR-673-5p    | 5.243  | 5.964  | 5.221  |
| 17917  | mmu-miR-873a-5p   | 4.963  | 5.783  | 5.000  |
| 146222 | mmu-miR-718       | 5.344  | 5.780  | 5.192  |
| 148073 | mmu-miR-3100-5p   | 5.337  | 5.456  | 5.068  |
| 168699 | mmu-miR-5627-5p   | 5.400  | 5.460  | 4.976  |
| 11246  | mmu-miR-434-3p    | 6.037  | 6.114  | 5.754  |
| 11238  | mmu-miR-380-3p    | 5.339  | 5.446  | 5.028  |
| 30973  | mmu-miR-384-3p    | 5.212  | 5.359  | 4.904  |
| 168880 | mmu-miR-489-5p    | 6.060  | 5.448  | 5.030  |
| 148433 | mmu-miR-466i-5p   | 9.421  | 9.323  | 9.306  |
| 146201 | mmu-miR-1839-3p   | 7.906  | 7.917  | 7.656  |
| 46572  | mmcmv-miR-m108-2-3p| 5.315     | 5.221     | 4.923     |
| 28450  | mmu-miR-291b-5p   | 6.402  | 6.461  | 6.194  |
| 17669  | mmu-miR-690       | 13.342 | 13.084 | 13.023 |
| 148252 | mmu-miR-496a-5p   | 5.572  | 5.584  | 5.228  |
| ID     | miRNA        | log2FoldChange | P-Value  | FDR       |
|--------|--------------|----------------|----------|-----------|
| 42829  | mmu-miR-127-3p | 6.103          | 5.892    | 5.697     |
| 148043 | mmu-miR-367-5p | 5.081          | 5.792    | 5.080     |
| 13150  | mmu-miR-322-5p | 10.185         | 10.205   | 9.970     |
| 46381  | mmu-miR-1298-5p| 5.661          | 5.753    | 5.356     |
| 148422 | mmu-miR-301b-5p| 5.421          | 5.170    | 4.923     |
| 148022 | mmu-miR-664-5p | 5.819          | 6.119    | 5.610     |
| 146062 | mmu-miR-1901  | 5.352          | 5.422    | 5.024     |
| 14304  | mmu-miR-376b-3p| 5.265          | 5.314    | 4.979     |
| 148647 | mmu-miR-3470b  | 6.368          | 6.533    | 6.270     |
| 11217  | mmu-miR-293-5p | 5.360          | 5.530    | 5.081     |
| 42883  | mmu-miR-883b-3p| 5.528          | 5.248    | 5.041     |
| 168708 | mmu-miR-296-5p | 6.346          | 5.944    | 5.906     |
| 146154 | mmu-miR-1982-5p| 5.705          | 5.747    | 5.378     |
| 42475  | mmu-miR-221-5p | 5.612          | 5.904    | 5.466     |
| 11014  | mmu-miR-214-3p | 7.845          | 7.595    | 7.491     |
| 148233 | mmu-miR-3096a-3p| 7.207          | 7.242    | 6.932     |
| 169340 | mmu-miR-3096a-3p/mmu-miR-3096b-3p | 6.269     | 6.000    | 5.925     |
| 31388  | mmu-miR-291a-5p| 6.972          | 6.915    | 6.692     |
| 148253 | mmu-miR-130a-5p| 5.390          | 5.542    | 5.116     |
| 148122 | mmu-miR-669p-3p | 8.844          | 8.769    | 8.666     |
| 14288  | mmu-miR-503-5p | 7.508          | 7.447    | 7.253     |
| 148051 | mmu-miR-770-3p | 5.691          | 5.610    | 5.326     |
| 168651 | mmu-miR-466q  | 8.221          | 8.232    | 8.057     |
| 169329 | mmu-miR-370-3p | 5.296          | 5.239    | 4.868     |
| 13149  | mmu-miR-295-3p | 5.270          | 5.623    | 5.025     |
| 13177  | mmu-miR-143-3p| 12.266         | 12.150   | 11.951    |
| 42871  | mmu-miR-343   | 5.641          | 5.478    | 5.170     |
| 11091  | mmu-miR-377-3p| 5.824          | 5.949    | 5.560     |
| 169248 | mmu-miR-5108  | 5.615          | 5.421    | 5.172     |
| 147314 | mmu-miR-181b-2-3p| 4.669      | 5.399    | 4.628     |
| 46276  | mmu-miR-1199-5p| 5.624          | 5.582    | 5.179     |
| 42451  | mmu-miR-139-3p| 5.967          | 5.787    | 5.500     |
| 46807  | mmu-miR-466f-3p| 8.623          | 8.616    | 8.508     |
| 146171 | mmu-miR-1907  | 6.001          | 5.737    | 5.531     |
| 148123 | mmu-miR-100-3p| 5.272          | 5.456    | 4.929     |
| 168824 | mmu-miR-5100  | 15.855         | 15.736   | 15.513    |
| 4610   | mmu-miR-126-3p| 13.965         | 13.996   | 13.723    |
| 42488  | mmu-miR-466h-5p| 6.074          | 5.972    | 5.613     |
| 17312  | mmu-miR-592-5p| 5.657          | 5.679    | 5.252     |
| 146108 | mmu-miR-1970  | 5.675          | 5.543    | 5.165     |
| 169215 | mmu-miR-5133  | 4.838          | 5.434    | 4.711     |
| 32884  | mmu-miR-342-3p| 6.615          | 6.662    | 6.222     |
| 33177  | mmu-miR-672-5p| 5.656          | 6.257    | 5.509     |
| 29562  | mmu-miR-199a-5p| 9.335          | 9.162    | 8.904     |
| 148146 | mmu-miR-3076-3p| 6.405          | 6.583    | 6.170     |
| 10925  | mmu-miR-10b-5p | 9.937          | 9.919    | 9.624     |
| 148578 | mmu-miR-541-3p| 6.178          | 6.472    | 5.945     |
| 46859  | mmu-miR-135a-2-3p| 5.857       | 5.530    | 5.283     |
| 11093  | mmu-miR-379-5p | 6.028          | 6.239    | 5.729     |
| 27533  | mmu-miR-320-3p | 7.902          | 7.981    | 7.581     |
| Gene ID | miRNA Name | Log2 Fold Change | Log2 Fold Change | Log2 Fold Change |
|--------|------------|-----------------|-----------------|-----------------|
| 42804  | mmu-miR-712-5p | 6.320 | 6.093 | 5.807 |
| 14290  | mmu-miR-541-5p | 6.120 | 6.150 | 5.728 |
| 148199 | mmu-miR-3102-3p | 5.912 | 5.337 | 5.227 |
| 42611  | mmu-miR-467d-5p | 5.492 | 5.435 | 4.953 |
| 145663 | SNORD68 | 11.180 | 11.037 | 10.773 |
| 148378 | mmu-miR-511-3p | 6.249 | 6.367 | 5.979 |
| 11024  | mmu-miR-223-3p | 8.568 | 8.367 | 8.171 |
| 23524  | mmu-miR-465a-3p/mmu-miR-465b-3p/mmu-miR-465c-3p | 5.646 | 5.751 | 5.212 |
| 11218  | mmu-miR-294-3p | 9.640 | 9.493 | 9.142 |
| 19013  | SNORD14B | 11.180 | 11.037 | 10.773 |
| 146143 | mmu-miR-1904 | 5.675 | 5.682 | 5.260 |
| 42619  | mmu-miR-709 | 13.228 | 13.104 | 13.017 |
| 146092 | mmu-miR-1938 | 5.830 | 5.579 | 5.232 |
| 169250 | mmu-miR-5109 | 6.546 | 6.351 | 6.147 |
| 145749 | mmu-miR-137-3p | 4.700 | 5.832 | 4.864 |
| 42658  | mmu-miR-681 | 5.607 | 5.508 | 5.069 |
| 42606  | mmu-miR-330-3p | 5.805 | 5.360 | 5.030 |
| 145753 | mmu-miR-484 | 6.934 | 7.000 | 6.541 |
| 30681  | mmu-miR-376c-3p | 5.475 | 5.239 | 4.864 |
| 46601  | mmu-miR-3059-5p | 6.075 | 5.440 | 5.265 |
| 148544 | mmu-miR-211-3p | 5.546 | 5.467 | 4.974 |
| 169394 | mmu-miR-1843a-5p | 7.549 | 7.596 | 7.196 |
| 11023  | mmu-miR-222-3p | 6.946 | 6.972 | 6.507 |
| 46481  | mcmv-miR-M44-1 | 6.414 | 6.305 | 5.834 |
| 30033  | mmu-miR-877-5p | 6.852 | 6.808 | 6.465 |
| 14305  | mmu-miR-376b-5p | 6.654 | 6.228 | 6.001 |
| 29650  | mmu-miR-714 | 6.142 | 6.305 | 5.849 |
| 148550 | mmu-miR-328-5p | 5.828 | 5.317 | 5.043 |
| 168876 | mmu-miR-1843b-5p | 7.673 | 7.730 | 7.243 |
| 42850  | mmu-miR-150-3p | 5.656 | 5.320 | 4.918 |
| 168845 | mmu-miR-5625-5p | 4.751 | 5.981 | 4.790 |
| 10952  | mmu-miR-146a-5p | 8.065 | 8.032 | 7.502 |
| 168556 | mmu-miR-309b-5p | 6.138 | 5.533 | 5.370 |
| 29529  | mmu-miR-369-3p | 5.545 | 5.234 | 4.815 |
| 11065  | mmu-miR-335-5p | 7.083 | 7.197 | 6.750 |
| 14303  | mmu-miR-376a-3p | 6.112 | 5.472 | 5.297 |
| 145677 | mmu-miR-139-5p | 8.891 | 8.881 | 8.416 |
| 148325 | mmu-miR-1981-3p | 6.961 | 6.984 | 6.546 |
| 148644 | mmu-miR-551b-3p | 6.048 | 5.427 | 5.117 |
| 29153  | mmu-miR-34b-5p | 5.194 | 6.182 | 5.090 |
| 148130 | mmu-miR-3079-3p | 5.907 | 5.617 | 5.099 |
| 148055 | mmu-miR-3060-5p | 6.088 | 5.467 | 5.098 |
| 146017 | mmu-miR-1953 | 5.706 | 5.638 | 4.956 |
| 148563 | mmu-miR-701-3p | 5.772 | 5.128 | 4.753 |
| 147960 | mmu-miR-103-1-5p | 6.622 | 5.529 | 5.360 |
| 11215  | mmu-miR-292-3p | 6.518 | 5.984 | 5.542 |
| ID     | miRNA       | Value1 | Value2 | Value3 |
|--------|-------------|--------|--------|--------|
| 42651  | mmu-miR-880-3p | 5.593  | 6.244  | 5.099  |
| 145857 | mmu-miR-154-5p | 6.873  | 5.863  | 5.574  |
| 42601  | mmu-miR-540-5p | 6.419  | 5.475  | 5.034  |
| 148391 | mmu-miR-3068-5p | 7.559  | 7.645  | 6.625  |
| 19008  | SNORD2      | 10.764 | 10.594 | 9.677  |
| 146019 | mmu-miR-1839-5p | 7.287  | 7.311  | 6.220  |
| 146053 | mmu-miR-1981-5p | 7.393  | 7.468  | 5.998  |
| 42770  | mmu-miR-665-3p | 10.316 | 11.183 | 7.516  |
| BAT DGCR con 1 | Avg (CTL) | Avg(KO) | LogFC  | Avg (KO+CTL) |
|----------------|-----------|---------|--------|--------------|
| 13.384         | 13.364    | 8.007   | -5.357 | 10.685       |
| 13.342         | 13.361    | 8.077   | -5.284 | 10.719       |
| 12.378         | 12.449    | 7.852   | -4.597 | 10.150       |
| 11.730         | 11.769    | 7.304   | -4.466 | 9.536        |
| 11.470         | 11.524    | 7.690   | -3.843 | 9.607        |
| 9.072          | 9.161     | 5.737   | -3.424 | 7.449        |
| 9.417          | 9.375     | 6.336   | -3.039 | 7.856        |
| 8.462          | 8.369     | 5.348   | -3.021 | 6.859        |
| 9.946          | 9.978     | 7.188   | -2.790 | 8.583        |
| 8.462          | 8.486     | 5.707   | -2.779 | 7.096        |
| 12.254         | 12.312    | 9.642   | -2.670 | 10.977       |
| 9.052          | 9.043     | 6.615   | -2.428 | 7.829        |
| 12.189         | 12.306    | 9.896   | -2.410 | 11.101       |
| 12.970         | 12.966    | 10.765  | -2.201 | 11.866       |
| 12.799         | 12.778    | 10.612  | -2.167 | 11.695       |
| 8.544          | 8.567     | 6.557   | -2.010 | 7.562        |
| 10.210         | 10.219    | 8.256   | -1.963 | 9.238        |
| 7.940          | 7.880     | 5.981   | -1.899 | 6.931        |
| 9.274          | 9.281     | 7.389   | -1.892 | 8.335        |
| 12.233         | 12.255    | 10.415  | -1.840 | 11.335       |
| 11.137         | 11.204    | 9.408   | -1.795 | 10.306       |
| 10.792         | 10.894    | 9.127   | -1.767 | 10.010       |
| 8.992          | 9.049     | 7.465   | -1.583 | 8.257        |
| 11.017         | 11.008    | 9.432   | -1.576 | 10.220       |
| 7.503          | 7.519     | 5.982   | -1.536 | 6.750        |
| 7.931          | 7.996     | 6.486   | -1.510 | 7.241        |
| 9.679          | 9.751     | 8.242   | -1.509 | 8.996        |
| 11.791         | 11.787    | 10.332  | -1.455 | 11.059       |
| 8.783          | 8.818     | 7.368   | -1.450 | 8.093        |
| 9.508          | 9.651     | 8.240   | -1.412 | 8.945        |
| 8.332          | 8.313     | 6.902   | -1.412 | 7.608        |
| 7.807          | 7.914     | 6.506   | -1.408 | 7.210        |
| 10.025         | 10.109    | 8.825   | -1.283 | 9.467        |
| 10.915         | 11.012    | 9.752   | -1.260 | 10.382       |
| 12.521         | 12.510    | 11.278  | -1.232 | 11.894       |
| 9.636          | 9.772     | 8.547   | -1.224 | 9.159        |
| 8.468          | 8.634     | 7.463   | -1.171 | 8.049        |
| 11.948         | 12.063    | 10.921  | -1.142 | 11.492       |
| 7.206          | 7.235     | 6.099   | -1.135 | 6.667        |
| 6.515          | 6.400     | 5.313   | -1.087 | 5.857        |
| 7.149          | 7.140     | 6.053   | -1.086 | 6.597        |
| 6.304          | 6.249     | 5.185   | -1.064 | 5.717        |
| 7.144          | 7.116     | 6.056   | -1.060 | 6.586        |
| 9.343          | 9.413     | 8.401   | -1.012 | 8.907        |
| 11.143         | 11.380    | 10.405  | -0.975 | 10.893       |
| 11.866         | 11.876    | 10.905  | -0.971 | 11.390       |
| 11.313         | 11.401    | 10.436  | -0.966 | 10.918       |
| 10.014         | 10.129    | 9.192   | -0.937 | 9.660        |
| 10.190         | 10.276    | 9.343   | -0.933 | 9.809        |
| 8.581 | 8.562 | 7.630 | -0.932 | 8.096 |
| 6.926 | 6.935 | 6.024 | -0.912 | 6.480 |
| 6.708 | 6.674 | 5.765 | -0.909 | 6.219 |
| 11.156 | 11.209 | 10.336 | -0.873 | 10.773 |
| 7.803 | 7.841 | 6.973 | -0.867 | 7.407 |
| 9.127 | 9.241 | 8.378 | -0.863 | 8.810 |
| 8.859 | 8.998 | 8.140 | -0.832 | 8.452 |
| 12.359 | 12.400 | 11.574 | -0.826 | 11.987 |
| 7.025 | 7.037 | 6.212 | -0.825 | 6.625 |
| 11.498 | 11.502 | 10.680 | -0.821 | 11.091 |
| 10.040 | 10.078 | 9.270 | -0.808 | 9.674 |
| 8.289 | 8.350 | 7.544 | -0.806 | 7.947 |
| 8.257 | 8.429 | 7.637 | -0.792 | 8.033 |
| 8.596 | 8.589 | 7.813 | -0.776 | 8.201 |
| 6.988 | 6.977 | 6.209 | -0.768 | 6.593 |
| 7.117 | 7.212 | 6.453 | -0.759 | 6.833 |
| 9.597 | 9.673 | 8.924 | -0.750 | 9.299 |
| 8.469 | 8.581 | 7.866 | -0.715 | 8.224 |
| 10.084 | 10.197 | 9.491 | -0.706 | 9.844 |
| 7.082 | 7.032 | 6.329 | -0.703 | 6.681 |
| 6.510 | 6.585 | 5.895 | -0.690 | 6.240 |
| 9.094 | 9.108 | 8.424 | -0.685 | 8.766 |
| 7.504 | 7.477 | 6.797 | -0.680 | 7.137 |
| 7.220 | 7.178 | 6.500 | -0.678 | 6.839 |
| 7.975 | 8.098 | 7.423 | -0.675 | 7.761 |
| 8.009 | 8.054 | 7.403 | -0.650 | 7.728 |
| 8.925 | 9.063 | 8.416 | -0.647 | 8.740 |
| 11.418 | 11.520 | 10.873 | -0.647 | 11.196 |
| 6.129 | 6.028 | 5.408 | -0.620 | 5.718 |
| 7.909 | 7.917 | 7.298 | -0.619 | 7.608 |
| 5.399 | 5.227 | 4.613 | -0.614 | 4.920 |
| 7.461 | 7.566 | 6.955 | -0.611 | 7.260 |
| 8.451 | 8.525 | 7.927 | -0.598 | 8.226 |
| 6.997 | 6.931 | 6.334 | -0.597 | 6.632 |
| 7.938 | 7.987 | 7.395 | -0.592 | 7.691 |
| 7.911 | 7.886 | 7.300 | -0.586 | 7.593 |
| 7.305 | 7.361 | 6.780 | -0.581 | 7.071 |
| 8.753 | 8.894 | 8.313 | -0.580 | 8.603 |
| 6.486 | 6.480 | 5.902 | -0.579 | 6.191 |
| 10.872 | 10.955 | 10.379 | -0.576 | 10.667 |
| 6.332 | 6.350 | 5.777 | -0.573 | 6.064 |
| 7.557 | 7.521 | 6.950 | -0.571 | 7.235 |
| 6.566 | 6.446 | 5.876 | -0.569 | 6.161 |
| 7.140 | 7.175 | 6.608 | -0.567 | 6.891 |
| 8.929 | 8.964 | 8.399 | -0.566 | 8.681 |
| 7.685 | 7.666 | 7.103 | -0.563 | 7.385 |
| 8.035 | 8.076 | 7.532 | -0.544 | 7.804 |
| 6.557 | 6.518 | 5.988 | -0.531 | 6.253 |
|   |   |   |   |   |
|---|---|---|---|---|
| 7.979 | 8.180 | 7.657 | -0.524 | 7.918 |
| 7.091 | 7.075 | 6.553 | -0.522 | 6.814 |
| 7.518 | 7.469 | 6.953 | -0.517 | 7.211 |
| 9.593 | 9.681 | 9.164 | -0.516 | 9.423 |
| 6.824 | 6.642 | 6.134 | -0.508 | 6.388 |
| 8.371 | 8.508 | 8.002 | -0.506 | 8.255 |
| 6.054 | 5.966 | 5.468 | -0.497 | 5.717 |
| 7.370 | 7.319 | 6.826 | -0.493 | 7.073 |
| 9.533 | 9.538 | 9.055 | -0.483 | 9.296 |
| 8.171 | 8.352 | 7.872 | -0.480 | 8.112 |
| 8.188 | 8.268 | 7.790 | -0.478 | 8.029 |
| 7.283 | 7.270 | 6.805 | -0.465 | 7.038 |
| 10.022 | 10.012 | 9.549 | -0.463 | 9.781 |
| 5.900 | 5.830 | 5.373 | -0.458 | 5.602 |
| 6.383 | 6.289 | 5.834 | -0.456 | 6.061 |
| 6.862 | 6.921 | 6.468 | -0.453 | 6.694 |
| 8.127 | 8.047 | 7.599 | -0.448 | 7.823 |
| 5.949 | 5.856 | 5.412 | -0.443 | 5.634 |
| 6.578 | 6.570 | 6.151 | -0.418 | 6.360 |
| 8.816 | 8.845 | 8.429 | -0.416 | 8.637 |
| 6.030 | 6.014 | 5.600 | -0.414 | 5.807 |
| 7.114 | 7.091 | 6.680 | -0.411 | 6.886 |
| 8.643 | 8.869 | 8.461 | -0.409 | 8.665 |
| 6.569 | 6.547 | 6.152 | -0.395 | 6.349 |
| 6.485 | 6.613 | 6.224 | -0.389 | 6.419 |
| 7.094 | 7.118 | 6.733 | -0.385 | 6.925 |
| 7.026 | 7.045 | 6.662 | -0.383 | 6.853 |
| 6.101 | 6.027 | 5.656 | -0.371 | 5.842 |
| 6.494 | 6.319 | 5.949 | -0.370 | 6.134 |
| 5.817 | 5.800 | 5.434 | -0.367 | 5.617 |
| 9.938 | 9.980 | 9.615 | -0.365 | 9.798 |
| 6.001 | 6.010 | 5.646 | -0.363 | 5.828 |
| 5.558 | 5.654 | 5.297 | -0.357 | 5.475 |
| 5.904 | 5.828 | 5.472 | -0.355 | 5.650 |
| 7.963 | 8.149 | 7.794 | -0.355 | 7.971 |
| 7.316 | 7.391 | 7.036 | -0.355 | 7.213 |
| 11.499 | 11.525 | 11.173 | -0.352 | 11.349 |
| 6.785 | 6.841 | 6.492 | -0.349 | 6.667 |
| 5.111 | 5.182 | 4.839 | -0.342 | 5.011 |
| 6.734 | 6.713 | 6.372 | -0.340 | 6.542 |
| 6.395 | 6.413 | 6.081 | -0.333 | 6.247 |
| 7.163 | 7.173 | 6.844 | -0.329 | 7.008 |
| 6.546 | 6.417 | 6.090 | -0.327 | 6.253 |
| 6.499 | 6.459 | 6.134 | -0.325 | 6.296 |
| 6.705 | 6.617 | 6.298 | -0.319 | 6.458 |
| 10.652 | 10.773 | 10.454 | -0.319 | 10.614 |
| 6.826 | 6.800 | 6.488 | -0.312 | 6.644 |
| 6.410 | 6.385 | 6.097 | -0.288 | 6.241 |
| 4.925 | 5.179 | 4.909 | -0.269 | 5.044 |
| 9.640 | 9.822 | 9.553 | -0.269 | 9.688 |
| 10.333 | 10.405 | 10.143 | -0.262 | 10.274 |
|--------|--------|--------|--------|--------|
| 8.340  | 8.439  | 8.180  | -0.259 | 8.310  |
| 7.119  | 7.134  | 8.83   | -0.251 | 7.008  |
| 9.133  | 9.269  | 9.020  | -0.249 | 9.145  |
| 8.420  | 8.579  | 8.331  | -0.248 | 8.455  |
| 5.948  | 5.860  | 5.612  | -0.248 | 5.736  |
| 8.482  | 8.513  | 8.265  | -0.248 | 8.389  |
| 5.878  | 5.806  | 5.564  | -0.242 | 5.685  |
| 5.167  | 5.103  | 4.863  | -0.241 | 4.983  |
| 8.766  | 8.882  | 8.642  | -0.240 | 8.762  |
| 9.280  | 9.295  | 9.055  | -0.240 | 9.175  |
| 5.564  | 5.459  | 5.232  | -0.228 | 5.346  |
| 12.200 | 12.223 | 12.001 | -0.222 | 12.112 |
| 9.734  | 9.832  | 9.611  | -0.221 | 9.722  |
| 8.643  | 8.680  | 8.460  | -0.220 | 8.570  |
| 6.299  | 6.073  | 5.854  | -0.218 | 5.964  |
| 7.851  | 7.968  | 7.755  | -0.213 | 7.861  |
| 5.031  | 4.945  | 4.733  | -0.213 | 4.839  |
| 5.211  | 5.162  | 4.949  | -0.213 | 5.055  |
| 5.470  | 5.432  | 5.220  | -0.212 | 5.326  |
| 6.643  | 6.564  | 6.354  | -0.210 | 6.459  |
| 6.223  | 6.205  | 6.001  | -0.204 | 6.103  |
| 6.061  | 6.016  | 5.819  | -0.197 | 5.918  |
| 5.554  | 5.564  | 5.374  | -0.190 | 5.469  |
| 5.407  | 5.289  | 5.106  | -0.184 | 5.198  |
| 5.936  | 5.990  | 5.807  | -0.183 | 5.899  |
| 7.488  | 7.596  | 7.413  | -0.182 | 7.505  |
| 5.653  | 5.546  | 5.365  | -0.181 | 5.456  |
| 6.651  | 6.727  | 6.549  | -0.178 | 6.638  |
| 7.343  | 7.214  | 7.038  | -0.176 | 7.126  |
| 6.049  | 6.169  | 5.994  | -0.174 | 6.081  |
| 7.027  | 6.952  | 6.779  | -0.173 | 6.866  |
| 7.729  | 7.805  | 7.633  | -0.172 | 7.719  |
| 8.022  | 8.018  | 7.846  | -0.172 | 7.932  |
| 5.981  | 5.978  | 5.806  | -0.172 | 5.892  |
| 5.035  | 5.011  | 4.840  | -0.171 | 4.926  |
| 9.586  | 9.628  | 9.458  | -0.170 | 9.543  |
| 5.344  | 5.417  | 5.250  | -0.168 | 5.333  |
| 6.103  | 6.021  | 5.854  | -0.167 | 5.938  |
| 6.895  | 6.888  | 6.723  | -0.164 | 6.806  |
| 5.723  | 5.602  | 5.438  | -0.164 | 5.520  |
| 6.166  | 6.130  | 5.969  | -0.161 | 6.050  |
| 6.699  | 6.718  | 6.557  | -0.160 | 6.638  |
| 6.216  | 6.180  | 6.019  | -0.160 | 6.099  |
| 7.158  | 7.105  | 6.945  | -0.159 | 7.025  |
| 7.702  | 7.703  | 7.544  | -0.159 | 7.623  |
| 8.677  | 8.861  | 8.703  | -0.158 | 8.782  |
| 5.884  | 5.926  | 5.769  | -0.157 | 5.847  |
| 6.706  | 6.716  | 6.559  | -0.156 | 6.638  |
| 6.532  | 6.519  | 6.363  | -0.156 | 6.441  |
|   |   |   |   |   |
|---|---|---|---|---|
| 9.089 | 9.187 | 9.095 | -0.092 | 9.141 |
| 5.392 | 5.284 | 5.192 | -0.091 | 5.238 |
| 6.810 | 6.778 | 6.686 | -0.091 | 6.732 |
| 5.493 | 5.590 | 5.499 | -0.091 | 5.545 |
| 5.904 | 5.826 | 5.736 | -0.090 | 5.781 |
| 5.266 | 5.165 | 5.075 | -0.090 | 5.120 |
| 5.146 | 5.042 | 4.953 | -0.089 | 4.997 |
| 4.994 | 4.832 | 4.744 | -0.087 | 4.788 |
| 5.246 | 5.092 | 5.005 | -0.087 | 5.048 |
| 7.528 | 7.650 | 7.565 | -0.086 | 7.608 |
| 5.643 | 5.541 | 5.456 | -0.085 | 5.499 |
| 8.944 | 9.042 | 8.957 | -0.085 | 8.999 |
| 9.081 | 9.026 | 8.941 | -0.084 | 8.983 |
| 8.352 | 8.381 | 8.297 | -0.084 | 8.339 |
| 6.503 | 6.504 | 6.421 | -0.083 | 6.463 |
| 5.297 | 5.299 | 5.217 | -0.082 | 5.258 |
| 6.229 | 6.274 | 6.195 | -0.079 | 6.235 |
| 5.556 | 5.479 | 5.401 | -0.078 | 5.440 |
| 6.412 | 6.342 | 6.265 | -0.078 | 6.304 |
| 4.943 | 4.824 | 4.746 | -0.077 | 4.785 |
| 8.458 | 8.272 | 8.196 | -0.077 | 8.234 |
| 5.412 | 5.365 | 5.290 | -0.075 | 5.327 |
| 5.203 | 5.099 | 5.025 | -0.074 | 5.062 |
| 6.097 | 6.074 | 6.001 | -0.072 | 6.037 |
| 5.027 | 4.843 | 4.772 | -0.071 | 4.808 |
| 5.492 | 5.359 | 5.289 | -0.070 | 5.324 |
| 8.673 | 8.779 | 8.709 | -0.070 | 8.744 |
| 5.029 | 4.824 | 4.755 | -0.069 | 4.789 |
| 5.620 | 5.376 | 5.308 | -0.068 | 5.342 |
| 5.528 | 5.412 | 5.345 | -0.067 | 5.378 |
| 5.261 | 5.145 | 5.079 | -0.067 | 5.112 |
| 8.753 | 8.811 | 8.746 | -0.066 | 8.778 |
| 6.085 | 6.128 | 6.062 | -0.065 | 6.095 |
| 6.585 | 6.593 | 6.528 | -0.065 | 6.560 |
| 5.406 | 5.337 | 5.272 | -0.065 | 5.305 |
| 6.353 | 6.355 | 6.290 | -0.065 | 6.322 |
| 6.634 | 6.655 | 6.591 | -0.064 | 6.623 |
| 5.542 | 5.570 | 5.507 | -0.063 | 5.538 |
| 5.222 | 5.238 | 5.176 | -0.062 | 5.207 |
| 6.371 | 6.330 | 6.268 | -0.062 | 6.299 |
| 9.163 | 9.234 | 9.173 | -0.061 | 9.203 |
| 7.803 | 7.880 | 7.820 | -0.060 | 7.850 |
| 5.962 | 6.022 | 5.962 | -0.060 | 5.992 |
| 5.093 | 4.966 | 4.906 | -0.060 | 4.936 |
| 5.145 | 5.086 | 5.028 | -0.058 | 5.057 |
| 5.219 | 5.095 | 5.039 | -0.056 | 5.067 |
| 6.271 | 6.250 | 6.194 | -0.056 | 6.222 |
| 5.230 | 5.070 | 5.014 | -0.056 | 5.042 |
| 6.882 | 6.743 | 6.687 | -0.056 | 6.715 |
| 6.121 | 6.030 | 5.975 | -0.055 | 6.002 |
| 5.066 | 4.980 | 4.925 | -0.054 | 4.952 |
|-------|-------|-------|--------|-------|
| 10.234 | 10.269 | 10.215 | -0.054 | 10.242 |
| 4.859 | 4.879 | 4.824 | -0.054 | 4.852 |
| 5.859 | 5.823 | 5.770 | -0.053 | 5.797 |
| 6.398 | 6.286 | 6.234 | -0.052 | 6.260 |
| 9.049 | 9.215 | 9.166 | -0.050 | 9.191 |
| 5.525 | 5.476 | 5.427 | -0.049 | 5.452 |
| 6.317 | 6.293 | 6.244 | -0.049 | 6.268 |
| 6.279 | 6.283 | 6.234 | -0.048 | 6.258 |
| 6.886 | 6.881 | 6.834 | -0.047 | 6.858 |
| 6.078 | 6.138 | 6.091 | -0.047 | 6.114 |
| 5.485 | 5.385 | 5.338 | -0.047 | 5.362 |
| 6.226 | 6.113 | 6.066 | -0.047 | 6.089 |
| 6.947 | 7.094 | 7.048 | -0.047 | 7.071 |
| 5.389 | 5.254 | 5.207 | -0.047 | 5.230 |
| 5.217 | 5.048 | 5.001 | -0.047 | 5.025 |
| 5.781 | 5.738 | 5.692 | -0.047 | 5.715 |
| 5.208 | 5.034 | 4.988 | -0.046 | 5.011 |
| 7.014 | 7.066 | 7.021 | -0.046 | 7.043 |
| 5.735 | 5.809 | 5.764 | -0.045 | 5.786 |
| 6.141 | 6.039 | 5.994 | -0.045 | 6.016 |
| 5.494 | 5.411 | 5.366 | -0.044 | 5.388 |
| 9.227 | 9.379 | 9.335 | -0.044 | 9.357 |
| 7.000 | 6.973 | 6.930 | -0.043 | 6.952 |
| 4.899 | 4.835 | 4.793 | -0.042 | 4.814 |
| 6.405 | 6.310 | 6.268 | -0.042 | 6.289 |
| 5.754 | 5.705 | 5.664 | -0.041 | 5.685 |
| 6.671 | 6.680 | 6.640 | -0.040 | 6.660 |
| 5.578 | 5.663 | 5.623 | -0.040 | 5.643 |
| 5.350 | 5.338 | 5.299 | -0.040 | 5.319 |
| 4.863 | 4.712 | 4.674 | -0.038 | 4.693 |
| 5.261 | 5.181 | 5.143 | -0.038 | 5.162 |
| 5.026 | 4.913 | 4.875 | -0.037 | 4.894 |
| 5.001 | 4.808 | 4.771 | -0.037 | 4.790 |
| 5.964 | 5.935 | 5.898 | -0.037 | 5.916 |
| 5.143 | 5.088 | 5.052 | -0.036 | 5.070 |
| 5.453 | 5.395 | 5.360 | -0.035 | 5.377 |
| 5.165 | 5.030 | 4.996 | -0.035 | 5.013 |
| 5.462 | 5.409 | 5.375 | -0.035 | 5.392 |
| 6.433 | 6.389 | 6.355 | -0.034 | 6.372 |
| 5.794 | 5.707 | 5.673 | -0.034 | 5.690 |
| 5.284 | 5.140 | 5.106 | -0.034 | 5.123 |
| 5.331 | 5.215 | 5.182 | -0.033 | 5.199 |
| 5.409 | 5.279 | 5.246 | -0.033 | 5.263 |
| 5.065 | 4.889 | 4.856 | -0.033 | 4.873 |
| 5.874 | 5.825 | 5.793 | -0.032 | 5.809 |
| 5.109 | 4.967 | 4.936 | -0.031 | 4.952 |
| 8.754 | 8.881 | 8.850 | -0.031 | 8.866 |
| 5.124 | 4.982 | 4.953 | -0.030 | 4.967 |
| 5.131 | 5.011 | 4.981 | -0.029 | 4.996 |
| 5.431 | 5.310   | 5.281 | -0.029 | 5.296 |
|-------|---------|-------|--------|-------|
| 5.334 | 5.193   | 5.164 | -0.029 | 5.179 |
| 5.024 | 5.006   | 4.977 | -0.029 | 4.991 |
| 6.962 | 6.971   | 6.943 | -0.028 | 6.957 |
| 5.216 | 5.150   | 5.123 | -0.027 | 5.137 |
| 7.112 | 7.193   | 7.166 | -0.027 | 7.180 |
| 5.483 | 5.332   | 5.305 | -0.027 | 5.318 |
| 5.289 | 5.253   | 5.226 | -0.027 | 5.240 |
| 5.283 | 5.156   | 5.131 | -0.026 | 5.143 |
| 5.142 | 5.065   | 5.040 | -0.025 | 5.052 |
| 5.668 | 5.601   | 5.576 | -0.025 | 5.588 |
| 5.216 | 5.154   | 5.129 | -0.025 | 5.142 |
| 5.279 | 5.165   | 5.141 | -0.024 | 5.153 |
| 5.633 | 5.540   | 5.516 | -0.024 | 5.528 |
| 6.274 | 6.417   | 6.393 | -0.024 | 6.405 |
| 10.610 | 10.525 | 10.501 | -0.024 | 10.513 |
| 6.659 | 6.617   | 6.593 | -0.024 | 6.605 |
| 5.506 | 5.405   | 5.381 | -0.024 | 5.393 |
| 4.845 | 4.788   | 4.765 | -0.023 | 4.777 |
| 5.989 | 6.039   | 6.016 | -0.023 | 6.028 |
| 5.268 | 5.150   | 5.126 | -0.023 | 5.138 |
| 5.469 | 5.413   | 5.390 | -0.022 | 5.401 |
| 11.149 | 11.219 | 11.197 | -0.022 | 11.208 |
| 5.161 | 5.047   | 5.025 | -0.022 | 5.036 |
| 10.446 | 10.678 | 10.657 | -0.021 | 10.668 |
| 6.803 | 6.928   | 6.906 | -0.021 | 6.917 |
| 5.228 | 5.120   | 5.099 | -0.021 | 5.110 |
| 5.116 | 4.939   | 4.918 | -0.021 | 4.929 |
| 5.196 | 5.076   | 5.056 | -0.021 | 5.066 |
| 7.249 | 7.221   | 7.200 | -0.021 | 7.211 |
| 5.025 | 4.935   | 4.914 | -0.020 | 4.925 |
| 5.298 | 5.093   | 5.073 | -0.020 | 5.083 |
| 5.601 | 5.515   | 5.495 | -0.020 | 5.505 |
| 7.253 | 7.374   | 7.354 | -0.020 | 7.364 |
| 5.168 | 5.188   | 5.168 | -0.020 | 5.178 |
| 7.227 | 7.230   | 7.210 | -0.020 | 7.220 |
| 5.197 | 5.086   | 5.066 | -0.020 | 5.076 |
| 5.809 | 5.735   | 5.715 | -0.019 | 5.725 |
| 5.184 | 4.998   | 4.979 | -0.019 | 4.989 |
| 5.047 | 4.904   | 4.884 | -0.019 | 4.894 |
| 5.180 | 5.043   | 5.025 | -0.019 | 5.034 |
| 5.321 | 5.205   | 5.187 | -0.018 | 5.196 |
| 7.128 | 7.133   | 7.116 | -0.017 | 7.124 |
| 5.613 | 5.505   | 5.488 | -0.017 | 5.496 |
| 7.752 | 7.734   | 7.717 | -0.017 | 7.725 |
| 5.572 | 5.469   | 5.452 | -0.016 | 5.460 |
| 5.603 | 5.482   | 5.466 | -0.016 | 5.474 |
| 6.437 | 6.444   | 6.428 | -0.016 | 6.436 |
| 5.547 | 5.385   | 5.370 | -0.015 | 5.377 |
| 5.031 | 4.852   | 4.837 | -0.015 | 4.845 |
| 7.664  | 7.785 | 7.770 | -0.015 | 7.777 |
| 5.115  | 4.969 | 4.955 | -0.015 | 4.962 |
| 5.231  | 5.085 | 5.071 | -0.014 | 5.078 |
| 5.088  | 4.981 | 4.967 | -0.013 | 4.974 |
| 5.262  | 5.127 | 5.114 | -0.013 | 5.120 |
| 6.076  | 5.974 | 5.961 | -0.013 | 5.967 |
| 5.489  | 5.376 | 5.363 | -0.013 | 5.369 |
| 5.312  | 5.191 | 5.179 | -0.013 | 5.185 |
| 5.305  | 5.175 | 5.163 | -0.013 | 5.169 |
| 5.351  | 5.258 | 5.246 | -0.012 | 5.252 |
| 5.709  | 5.781 | 5.770 | -0.011 | 5.775 |
| 4.974  | 4.811 | 4.800 | -0.011 | 4.806 |
| 7.029  | 7.033 | 7.022 | -0.010 | 7.027 |
| 5.446  | 5.323 | 5.313 | -0.010 | 5.318 |
| 6.128  | 6.101 | 6.092 | -0.009 | 6.096 |
| 6.029  | 5.925 | 5.916 | -0.009 | 5.921 |
| 5.202  | 5.065 | 5.057 | -0.008 | 5.061 |
| 8.375  | 8.494 | 8.486 | -0.008 | 8.490 |
| 6.781  | 6.812 | 6.805 | -0.008 | 6.809 |
| 5.016  | 4.914 | 4.907 | -0.007 | 4.910 |
| 5.534  | 5.408 | 5.401 | -0.007 | 5.404 |
| 5.548  | 5.516 | 5.509 | -0.007 | 5.513 |
| 5.336  | 5.187 | 5.180 | -0.007 | 5.183 |
| 5.251  | 5.117 | 5.110 | -0.007 | 5.114 |
| 5.147  | 5.035 | 5.029 | -0.006 | 5.032 |
| 5.388  | 5.309 | 5.303 | -0.006 | 5.306 |
| 5.736  | 5.607 | 5.601 | -0.006 | 5.604 |
| 4.907  | 4.895 | 4.890 | -0.005 | 4.892 |
| 5.307  | 5.119 | 5.114 | -0.005 | 5.117 |
| 6.128  | 6.216 | 6.212 | -0.004 | 6.214 |
| 6.176  | 6.202 | 6.198 | -0.004 | 6.200 |
| 5.219  | 5.061 | 5.057 | -0.004 | 5.059 |
| 4.873  | 4.795 | 4.791 | -0.003 | 4.793 |
| 5.015  | 4.914 | 4.911 | -0.003 | 4.913 |
| 5.356  | 5.221 | 5.218 | -0.002 | 5.220 |
| 6.647  | 6.538 | 6.536 | -0.002 | 6.537 |
| 5.193  | 5.080 | 5.078 | -0.002 | 5.079 |
| 5.257  | 5.141 | 5.140 | -0.002 | 5.141 |
| 5.671  | 5.544 | 5.542 | -0.001 | 5.543 |
| 5.159  | 5.014 | 5.012 | -0.001 | 5.013 |
| 7.742  | 7.695 | 7.694 | -0.001 | 7.694 |
| 5.715  | 5.577 | 5.576 | -0.001 | 5.577 |
| 5.236  | 5.129 | 5.128 | -0.001 | 5.128 |
| 5.496  | 5.383 | 5.382 | -0.001 | 5.382 |
| 5.791  | 5.663 | 5.662 | 0.000  | 5.663 |
| 6.502  | 6.451 | 6.451 | 0.000  | 6.451 |
| 5.279  | 5.154 | 5.155 | 0.000  | 5.155 |
| 5.967  | 5.928 | 5.928 | 0.001  | 5.928 |
| 8.043  | 8.058 | 8.059 | 0.001  | 8.059 |
| 8.094  | 8.122 | 8.123 | 0.001  | 8.123 |
|   |   |   |   |   |
|---|---|---|---|---|
|4.958|4.821|4.823|0.001|4.822|
|4.928|4.736|4.738|0.001|4.737|
|5.474|5.414|5.416|0.001|5.415|
|5.261|5.101|5.102|0.002|5.102|
|6.750|6.864|6.866|0.002|6.865|
|6.154|6.114|6.117|0.002|6.115|
|5.361|5.217|5.220|0.003|5.219|
|5.503|5.370|5.372|0.003|5.371|
|5.121|4.899|4.903|0.004|4.901|
|5.047|4.956|4.960|0.004|4.958|
|5.014|4.880|4.884|0.004|4.882|
|6.399|6.405|6.409|0.004|6.407|
|5.105|4.981|4.985|0.004|4.983|
|4.980|4.826|4.830|0.004|4.828|
|5.185|5.079|5.084|0.004|5.081|
|5.189|5.056|5.062|0.005|5.059|
|4.979|4.765|4.771|0.006|4.768|
|9.476|9.536|9.542|0.006|9.539|
|5.407|5.260|5.267|0.006|5.264|
|6.879|6.823|6.830|0.007|6.827|
|4.922|4.759|4.766|0.007|4.762|
|5.183|5.075|5.082|0.007|5.079|
|5.031|4.874|4.882|0.008|4.878|
|6.127|6.117|6.126|0.008|6.122|
|5.660|5.556|5.565|0.009|5.560|
|5.044|4.906|4.915|0.009|4.911|
|5.673|5.620|5.629|0.009|5.625|
|5.562|5.430|5.440|0.010|5.435|
|5.394|5.241|5.251|0.010|5.246|
|4.990|4.845|4.855|0.010|4.850|
|5.871|5.765|5.776|0.011|5.770|
|5.099|4.967|4.978|0.011|4.973|
|5.884|5.812|5.823|0.011|5.818|
|5.227|5.102|5.113|0.011|5.108|
|5.037|4.899|4.911|0.012|4.905|
|5.177|5.032|5.044|0.012|5.038|
|7.673|7.778|7.790|0.012|7.784|
|5.960|5.924|5.936|0.012|5.930|
|5.872|5.788|5.801|0.012|5.794|
|5.446|5.329|5.343|0.013|5.336|
|5.443|5.327|5.340|0.013|5.334|
|5.270|5.124|5.138|0.013|5.131|
|5.072|5.028|5.041|0.014|5.034|
|5.142|4.994|5.008|0.014|5.001|
|5.280|5.131|5.145|0.014|5.138|
|5.302|5.233|5.247|0.014|5.240|
|5.013|4.881|4.896|0.014|4.888|
|5.387|5.282|5.297|0.015|5.290|
|4.923|4.849|4.864|0.015|4.856|
|5.099|4.952|4.967|0.015|4.959|
|    |     |     |     |     |     |
|----|-----|-----|-----|-----|-----|
| 5.438 | 5.358 | 5.373 | 0.015 | 5.365 |
| 5.193 | 5.072 | 5.087 | 0.015 | 5.080 |
| 5.446 | 5.276 | 5.291 | 0.015 | 5.284 |
| 5.441 | 5.316 | 5.332 | 0.015 | 5.324 |
| 5.469 | 5.322 | 5.339 | 0.016 | 5.330 |
| 5.948 | 5.824 | 5.841 | 0.017 | 5.833 |
| 5.446 | 5.321 | 5.338 | 0.017 | 5.330 |
| 5.417 | 5.305 | 5.322 | 0.017 | 5.314 |
| 5.244 | 5.126 | 5.144 | 0.017 | 5.135 |
| 5.951 | 5.887 | 5.904 | 0.017 | 5.895 |
| 5.087 | 4.917 | 4.934 | 0.018 | 4.925 |
| 5.305 | 5.188 | 5.206 | 0.018 | 5.197 |
| 5.336 | 5.194 | 5.212 | 0.018 | 5.203 |
| 5.837 | 5.747 | 5.766 | 0.018 | 5.756 |
| 5.132 | 4.991 | 5.010 | 0.019 | 5.001 |
| 5.390 | 5.243 | 5.261 | 0.019 | 5.252 |
| 6.069 | 5.965 | 5.984 | 0.019 | 5.974 |
| 5.437 | 5.317 | 5.337 | 0.020 | 5.327 |
| 5.495 | 5.362 | 5.382 | 0.020 | 5.372 |
| 6.115 | 6.031 | 6.051 | 0.020 | 6.041 |
| 5.254 | 5.142 | 5.163 | 0.020 | 5.153 |
| 5.332 | 5.174 | 5.195 | 0.021 | 5.184 |
| 6.443 | 6.513 | 6.533 | 0.021 | 6.523 |
| 5.641 | 5.563 | 5.584 | 0.021 | 5.574 |
| 6.069 | 5.956 | 5.977 | 0.021 | 5.967 |
| 5.836 | 5.772 | 5.793 | 0.021 | 5.783 |
| 6.227 | 6.119 | 6.140 | 0.021 | 6.129 |
| 5.517 | 5.382 | 5.404 | 0.022 | 5.393 |
| 5.214 | 5.087 | 5.109 | 0.022 | 5.098 |
| 4.857 | 4.694 | 4.716 | 0.022 | 4.705 |
| 5.464 | 5.278 | 5.300 | 0.022 | 5.289 |
| 5.891 | 5.861 | 5.884 | 0.023 | 5.872 |
| 5.219 | 5.085 | 5.108 | 0.023 | 5.096 |
| 5.162 | 5.019 | 5.042 | 0.023 | 5.031 |
| 5.638 | 5.587 | 5.610 | 0.023 | 5.598 |
| 5.762 | 5.708 | 5.732 | 0.024 | 5.720 |
| 5.310 | 5.195 | 5.220 | 0.024 | 5.207 |
| 5.935 | 5.872 | 5.897 | 0.024 | 5.885 |
| 5.407 | 5.256 | 5.280 | 0.025 | 5.268 |
| 5.852 | 5.771 | 5.795 | 0.025 | 5.783 |
| 5.274 | 5.130 | 5.154 | 0.025 | 5.142 |
| 5.508 | 5.389 | 5.414 | 0.025 | 5.402 |
| 6.396 | 6.338 | 6.363 | 0.025 | 6.350 |
| 7.338 | 7.257 | 7.282 | 0.025 | 7.269 |
| 5.417 | 5.261 | 5.287 | 0.025 | 5.274 |
| 5.508 | 5.356 | 5.381 | 0.026 | 5.369 |
| 6.764 | 6.804 | 6.830 | 0.026 | 6.817 |
| 6.008 | 5.875 | 5.900 | 0.026 | 5.888 |
| 5.342 | 5.219 | 5.245 | 0.027 | 5.232 |
| 5.913 | 5.808 | 5.835 | 0.027 | 5.822 |
| Value | Column 1 | Column 2 | Column 3 | Column 4 | Column 5 |
|-------|----------|----------|----------|----------|----------|
| 5.181 | 5.053    | 5.080    | 0.027    | 5.067    |
| 5.646 | 5.623    | 5.650    | 0.027    | 5.636    |
| 5.734 | 5.607    | 5.634    | 0.027    | 5.621    |
| 5.258 | 5.113    | 5.141    | 0.028    | 5.127    |
| 5.393 | 5.247    | 5.275    | 0.028    | 5.261    |
| 5.633 | 5.510    | 5.538    | 0.028    | 5.524    |
| 5.908 | 5.861    | 5.889    | 0.028    | 5.875    |
| 5.297 | 5.190    | 5.219    | 0.029    | 5.204    |
| 5.160 | 4.993    | 5.023    | 0.029    | 5.008    |
| 5.665 | 5.526    | 5.556    | 0.030    | 5.541    |
| 5.839 | 5.731    | 5.760    | 0.030    | 5.746    |
| 5.981 | 5.915    | 5.945    | 0.030    | 5.930    |
| 6.972 | 6.875    | 6.905    | 0.030    | 6.890    |
| 6.268 | 6.214    | 6.244    | 0.030    | 6.229    |
| 5.134 | 5.077    | 5.107    | 0.030    | 5.092    |
| 5.018 | 4.915    | 4.946    | 0.031    | 4.931    |
| 7.012 | 7.083    | 7.115    | 0.032    | 7.099    |
| 5.394 | 5.292    | 5.326    | 0.034    | 5.309    |
| 5.356 | 5.254    | 5.288    | 0.034    | 5.271    |
| 4.789 | 4.775    | 4.809    | 0.034    | 4.792    |
| 7.733 | 7.869    | 7.903    | 0.034    | 7.886    |
| 6.374 | 6.311    | 6.345    | 0.035    | 6.328    |
| 5.361 | 5.264    | 5.299    | 0.035    | 5.282    |
| 5.701 | 5.581    | 5.616    | 0.035    | 5.598    |
| 5.640 | 5.544    | 5.580    | 0.036    | 5.562    |
| 5.181 | 5.244    | 5.281    | 0.037    | 5.263    |
| 5.308 | 5.178    | 5.216    | 0.038    | 5.197    |
| 5.508 | 5.436    | 5.474    | 0.038    | 5.455    |
| 5.001 | 4.929    | 4.967    | 0.038    | 4.948    |
| 5.590 | 5.479    | 5.519    | 0.039    | 5.499    |
| 5.100 | 4.975    | 5.014    | 0.039    | 4.995    |
| 5.756 | 5.715    | 5.755    | 0.040    | 5.735    |
| 5.303 | 5.172    | 5.212    | 0.040    | 5.192    |
| 5.512 | 5.405    | 5.445    | 0.040    | 5.425    |
| 8.063 | 8.068    | 8.109    | 0.040    | 8.089    |
| 6.482 | 6.580    | 6.620    | 0.040    | 6.600    |
| 5.958 | 5.861    | 5.902    | 0.041    | 5.882    |
| 4.792 | 4.684    | 4.725    | 0.041    | 4.704    |
| 5.184 | 5.058    | 5.099    | 0.041    | 5.078    |
| 5.594 | 5.571    | 5.612    | 0.041    | 5.592    |
| 5.444 | 5.325    | 5.366    | 0.041    | 5.346    |
| 4.846 | 4.748    | 4.789    | 0.041    | 4.768    |
| 5.265 | 5.125    | 5.167    | 0.042    | 5.146    |
| 5.308 | 5.181    | 5.223    | 0.042    | 5.202    |
| 6.405 | 6.415    | 6.457    | 0.042    | 6.436    |
| 5.477 | 5.372    | 5.414    | 0.042    | 5.393    |
| 5.590 | 5.469    | 5.512    | 0.042    | 5.491    |
| 6.632 | 6.580    | 6.622    | 0.042    | 6.601    |
| 5.478 | 5.335    | 5.378    | 0.042    | 5.357    |
| 5.450 | 5.364    | 5.406    | 0.042    | 5.385    |
| 5.708 | 5.561 | 5.604 | 0.042 | 5.582 |
| 5.869 | 5.772 | 5.815 | 0.042 | 5.794 |
| 5.622 | 5.553 | 5.596 | 0.043 | 5.574 |
| 4.900 | 4.789 | 4.831 | 0.043 | 4.810 |
| 5.843 | 5.788 | 5.831 | 0.043 | 5.809 |
| 5.326 | 5.161 | 5.204 | 0.043 | 5.183 |
| 5.745 | 5.654 | 5.697 | 0.043 | 5.676 |
| 4.960 | 4.859 | 4.902 | 0.043 | 4.880 |
| 5.355 | 5.258 | 5.301 | 0.043 | 5.280 |
| 4.985 | 4.840 | 4.884 | 0.044 | 4.862 |
| 5.527 | 5.374 | 5.418 | 0.044 | 5.396 |
| 6.389 | 6.398 | 6.442 | 0.044 | 6.420 |
| 11.368 | 11.436 | 11.480 | 0.044 | 11.458 |
| 5.729 | 5.638 | 5.682 | 0.044 | 5.660 |
| 5.542 | 5.408 | 5.453 | 0.044 | 5.431 |
| 5.614 | 5.600 | 5.644 | 0.044 | 5.622 |
| 5.750 | 5.671 | 5.715 | 0.044 | 5.693 |
| 5.243 | 5.186 | 5.231 | 0.045 | 5.209 |
| 5.147 | 5.046 | 5.091 | 0.045 | 5.068 |
| 5.662 | 5.556 | 5.601 | 0.045 | 5.578 |
| 5.120 | 4.963 | 5.008 | 0.045 | 4.985 |
| 5.713 | 5.564 | 5.609 | 0.045 | 5.586 |
| 5.475 | 5.319 | 5.365 | 0.046 | 5.342 |
| 5.454 | 5.334 | 5.380 | 0.046 | 5.357 |
| 5.521 | 5.396 | 5.442 | 0.046 | 5.419 |
| 5.193 | 5.051 | 5.097 | 0.046 | 5.074 |
| 6.713 | 6.699 | 6.746 | 0.046 | 6.723 |
| 5.207 | 5.037 | 5.084 | 0.047 | 5.061 |
| 5.551 | 5.449 | 5.496 | 0.047 | 5.473 |
| 6.045 | 5.991 | 6.037 | 0.047 | 6.014 |
| 5.755 | 5.681 | 5.727 | 0.047 | 5.704 |
| 5.219 | 5.075 | 5.122 | 0.047 | 5.098 |
| 5.027 | 4.882 | 4.929 | 0.047 | 4.905 |
| 5.205 | 5.102 | 5.149 | 0.047 | 5.125 |
| 5.176 | 5.004 | 5.052 | 0.047 | 5.028 |
| 5.421 | 5.249 | 5.297 | 0.048 | 5.273 |
| 5.839 | 5.736 | 5.784 | 0.048 | 5.760 |
| 6.173 | 6.154 | 6.202 | 0.048 | 6.178 |
| 5.280 | 5.170 | 5.218 | 0.048 | 5.194 |
| 4.978 | 4.761 | 4.809 | 0.048 | 4.785 |
| 5.426 | 5.284 | 5.333 | 0.048 | 5.308 |
| 5.703 | 5.611 | 5.659 | 0.048 | 5.635 |
| 5.150 | 5.016 | 5.065 | 0.048 | 5.040 |
| 5.530 | 5.424 | 5.473 | 0.049 | 5.449 |
| 6.736 | 6.657 | 6.706 | 0.049 | 6.682 |
| 5.169 | 5.037 | 5.086 | 0.049 | 5.061 |
| 5.453 | 5.274 | 5.323 | 0.049 | 5.298 |
| 6.864 | 6.776 | 6.825 | 0.049 | 6.801 |
| 5.242 | 5.094 | 5.143 | 0.049 | 5.119 |
| 5.047 | 4.912 | 4.961 | 0.049 | 4.936 |
| Diabetes | 5.379 | 5.274 | 5.323 | 0.049 | 5.298 |
|----------|-------|-------|-------|-------|-------|
| 7.067    | 7.167 | 7.217 | 0.050 | 7.192 |
| 5.328    | 5.206 | 5.256 | 0.050 | 5.231 |
| 5.398    | 5.279 | 5.329 | 0.050 | 5.304 |
| 5.401    | 5.279 | 5.330 | 0.051 | 5.305 |
| 5.430    | 5.319 | 5.370 | 0.051 | 5.345 |
| 5.231    | 5.096 | 5.147 | 0.051 | 5.122 |
| 8.595    | 8.642 | 8.693 | 0.051 | 8.668 |
| 5.643    | 5.555 | 5.607 | 0.051 | 5.581 |
| 5.342    | 5.205 | 5.257 | 0.052 | 5.231 |
| 5.144    | 5.013 | 5.065 | 0.052 | 5.039 |
| 5.104    | 4.965 | 5.017 | 0.052 | 4.991 |
| 6.297    | 6.205 | 6.257 | 0.052 | 6.231 |
| 5.422    | 5.322 | 5.375 | 0.052 | 5.349 |
| 5.439    | 5.342 | 5.394 | 0.052 | 5.368 |
| 5.395    | 5.268 | 5.320 | 0.053 | 5.294 |
| 5.149    | 5.020 | 5.072 | 0.053 | 5.046 |
| 5.365    | 5.255 | 5.308 | 0.053 | 5.281 |
| 6.125    | 6.198 | 6.251 | 0.053 | 6.224 |
| 5.666    | 5.611 | 5.664 | 0.053 | 5.638 |
| 5.179    | 5.062 | 5.115 | 0.053 | 5.088 |
| 7.441    | 7.493 | 7.547 | 0.054 | 7.520 |
| 5.303    | 5.177 | 5.231 | 0.054 | 5.204 |
| 5.733    | 5.588 | 5.642 | 0.054 | 5.615 |
| 5.175    | 5.034 | 5.089 | 0.054 | 5.062 |
| 6.148    | 6.101 | 6.156 | 0.055 | 6.129 |
| 5.889    | 5.787 | 5.841 | 0.055 | 5.814 |
| 5.598    | 5.489 | 5.544 | 0.055 | 5.517 |
| 5.418    | 5.258 | 5.313 | 0.055 | 5.285 |
| 5.341    | 5.250 | 5.305 | 0.055 | 5.277 |
| 6.952    | 6.981 | 7.037 | 0.057 | 7.009 |
| 5.221    | 5.064 | 5.121 | 0.057 | 5.093 |
| 5.053    | 4.969 | 5.026 | 0.057 | 4.998 |
| 5.367    | 5.416 | 5.473 | 0.057 | 5.444 |
| 5.546    | 5.485 | 5.543 | 0.058 | 5.514 |
| 5.569    | 5.490 | 5.548 | 0.058 | 5.519 |
| 7.367    | 7.430 | 7.488 | 0.058 | 7.459 |
| 10.520   | 10.532 | 10.590 | 0.059 | 10.561 |
| 5.234    | 5.090 | 5.149 | 0.059 | 5.120 |
| 5.627    | 5.517 | 5.576 | 0.060 | 5.546 |
| 5.082    | 4.931 | 4.991 | 0.060 | 4.961 |
| 5.688    | 5.589 | 5.649 | 0.060 | 5.619 |
| 5.750    | 5.648 | 5.709 | 0.060 | 5.678 |
| 5.226    | 5.162 | 5.223 | 0.061 | 5.192 |
| 5.604    | 5.513 | 5.574 | 0.061 | 5.543 |
| 5.339    | 5.231 | 5.292 | 0.061 | 5.261 |
| 6.278    | 6.349 | 6.410 | 0.061 | 6.380 |
| 5.407    | 5.350 | 5.412 | 0.062 | 5.381 |
| 5.821    | 5.678 | 5.739 | 0.062 | 5.708 |
| 7.027    | 7.015 | 7.077 | 0.062 | 7.046 |
5.965  6.049  6.112  0.062  6.081
5.186  5.010  5.072  0.062  5.041
5.479  5.361  5.424  0.063  5.393
5.433  5.267  5.330  0.063  5.298
5.189  5.029  5.092  0.063  5.060
5.457  5.343  5.406  0.063  5.374
5.762  5.636  5.699  0.063  5.667
5.417  5.221  5.284  0.063  5.253
5.467  5.347  5.410  0.063  5.379
5.322  5.212  5.276  0.063  5.244
5.392  5.280  5.343  0.064  5.311
5.476  5.336  5.400  0.064  5.368
5.693  5.581  5.645  0.064  5.613
5.123  5.023  5.088  0.065  5.056
5.242  5.112  5.176  0.065  5.144
5.383  5.222  5.287  0.065  5.255
5.119  5.024  5.089  0.065  5.057
8.844  8.944  9.010  0.066  8.977
5.230  5.128  5.195  0.066  5.162
4.865  4.742  4.808  0.066  4.775
5.018  4.911  4.978  0.067  4.945
5.953  5.862  5.929  0.067  5.895
6.712  6.741  6.809  0.068  6.775
5.697  5.566  5.634  0.068  5.600
5.524  5.368  5.436  0.068  5.402
5.675  5.566  5.635  0.068  5.601
5.602  5.454  5.522  0.068  5.488
5.787  5.647  5.716  0.068  5.682
5.101  4.972  5.040  0.069  5.006
5.325  5.177  5.245  0.069  5.211
7.951  8.026  8.095  0.069  8.061
7.116  7.002  7.071  0.069  7.036
6.633  6.635  6.704  0.069  6.670
5.618  5.477  5.546  0.069  5.511
6.483  6.557  6.626  0.069  6.592
5.828  5.715  5.785  0.069  5.750
5.473  5.364  5.433  0.070  5.399
6.234  6.166  6.236  0.070  6.201
5.500  5.395  5.465  0.070  5.430
5.593  5.478  5.548  0.070  5.513
5.121  5.009  5.079  0.070  5.044
5.300  5.180  5.250  0.071  5.215
5.129  4.976  5.046  0.071  5.011
5.303  5.251  5.322  0.071  5.287
5.328  5.227  5.299  0.071  5.263
5.267  5.120  5.191  0.071  5.155
7.175  7.138  7.210  0.072  7.174
5.371  5.236  5.309  0.073  5.272
6.474  6.502  6.576  0.073  6.539
5.238  5.124  5.197  0.074  5.160
| Diabetes | 5.530 | 5.638 | 5.407 | 5.173 | 5.516 | 5.339 | 12.562 | 5.352 | 5.049 | 5.667 | 5.596 | 5.466 | 5.503 | 5.577 | 5.577 | 5.195 | 5.466 | 5.306 | 5.054 | 5.630 | 5.398 | 5.306 | 5.160 | 5.321 | 5.783 | 5.284 | 5.384 | 5.208 | 5.479 | 6.617 | 5.711 | 5.173 | 7.966 | 7.195 | 5.782 | 5.480 | 5.169 | 5.427 | 5.328 | 5.797 | 8.220 | 6.089 | 5.577 | 5.062 | 5.538 | 5.449 | 5.409 | 6.270 | 5.974 | 5.836 |
| Value  | Column 1 | Column 2 | Column 3 | Column 4 | Column 5 |
|--------|----------|----------|----------|----------|----------|
| 5.457  | 5.333    | 5.423    | 0.090    | 5.378    |
| 5.585  | 5.502    | 5.592    | 0.090    | 5.547    |
| 4.862  | 4.940    | 5.030    | 0.090    | 4.985    |
| 10.492 | 10.679   | 10.770   | 0.090    | 10.724   |
| 6.787  | 6.860    | 6.951    | 0.091    | 6.905    |
| 5.566  | 5.458    | 5.550    | 0.091    | 5.504    |
| 4.857  | 4.706    | 4.798    | 0.092    | 4.752    |
| 5.411  | 5.260    | 5.352    | 0.092    | 5.306    |
| 5.248  | 5.106    | 5.199    | 0.092    | 5.152    |
| 5.256  | 5.185    | 5.277    | 0.092    | 5.231    |
| 5.239  | 5.090    | 5.183    | 0.093    | 5.137    |
| 5.142  | 5.006    | 5.100    | 0.094    | 5.053    |
| 5.448  | 5.351    | 5.445    | 0.094    | 5.398    |
| 5.510  | 5.385    | 5.479    | 0.094    | 5.432    |
| 5.321  | 5.180    | 5.275    | 0.095    | 5.227    |
| 5.832  | 5.726    | 5.821    | 0.095    | 5.774    |
| 5.971  | 5.900    | 5.995    | 0.095    | 5.947    |
| 5.509  | 5.344    | 5.440    | 0.096    | 5.392    |
| 6.038  | 5.979    | 6.075    | 0.096    | 6.027    |
| 6.162  | 6.133    | 6.229    | 0.096    | 6.181    |
| 6.314  | 6.311    | 6.407    | 0.096    | 6.359    |
| 5.284  | 5.199    | 5.295    | 0.096    | 5.247    |
| 5.274  | 5.167    | 5.263    | 0.096    | 5.215    |
| 4.888  | 4.753    | 4.849    | 0.096    | 4.801    |
| 5.458  | 5.327    | 5.423    | 0.096    | 5.375    |
| 6.393  | 6.354    | 6.451    | 0.097    | 6.402    |
| 5.647  | 5.568    | 5.665    | 0.097    | 5.617    |
| 5.611  | 5.541    | 5.638    | 0.097    | 5.590    |
| 5.414  | 5.285    | 5.382    | 0.097    | 5.333    |
| 4.859  | 4.697    | 4.794    | 0.097    | 4.746    |
| 5.144  | 5.028    | 5.126    | 0.097    | 5.077    |
| 5.665  | 5.531    | 5.629    | 0.098    | 5.580    |
| 5.233  | 5.122    | 5.220    | 0.098    | 5.171    |
| 5.649  | 5.550    | 5.648    | 0.098    | 5.599    |
| 5.356  | 5.211    | 5.309    | 0.098    | 5.260    |
| 4.939  | 4.782    | 4.880    | 0.098    | 4.831    |
| 5.341  | 5.191    | 5.289    | 0.098    | 5.240    |
| 4.846  | 4.708    | 4.807    | 0.099    | 4.757    |
| 6.798  | 6.792    | 6.891    | 0.099    | 6.841    |
| 5.646  | 5.582    | 5.681    | 0.099    | 5.632    |
| 5.781  | 5.683    | 5.783    | 0.099    | 5.733    |
| 6.046  | 5.912    | 6.012    | 0.100    | 5.962    |
| 6.592  | 6.655    | 6.754    | 0.100    | 6.705    |
| 5.269  | 5.143    | 5.243    | 0.100    | 5.193    |
| 6.383  | 6.293    | 6.393    | 0.100    | 6.343    |
| 5.925  | 5.831    | 5.932    | 0.100    | 5.882    |
| 5.657  | 5.597    | 5.698    | 0.101    | 5.647    |
| 5.379  | 5.260    | 5.361    | 0.101    | 5.310    |
| 5.623  | 5.500    | 5.601    | 0.101    | 5.551    |
| 5.410  | 5.271    | 5.372    | 0.101    | 5.321    |
| 5.319 | 5.214 | 5.316 | 0.102 | 5.265 |
| 7.635 | 7.687 | 7.789 | 0.102 | 7.738 |
| 5.750 | 5.676 | 5.777 | 0.102 | 5.726 |
| 5.431 | 5.441 | 5.544 | 0.103 | 5.493 |
| 6.598 | 6.613 | 6.716 | 0.104 | 6.664 |
| 5.520 | 5.401 | 5.504 | 0.104 | 5.453 |
| 5.027 | 4.876 | 4.980 | 0.104 | 4.928 |
| 5.124 | 5.047 | 5.151 | 0.104 | 5.099 |
| 6.149 | 6.096 | 6.200 | 0.104 | 6.148 |
| 5.223 | 5.099 | 5.204 | 0.104 | 5.152 |
| 4.981 | 5.029 | 5.134 | 0.105 | 5.081 |
| 5.636 | 5.513 | 5.619 | 0.105 | 5.566 |
| 5.239 | 5.077 | 5.182 | 0.105 | 5.129 |
| 5.858 | 5.772 | 5.877 | 0.105 | 5.825 |
| 5.302 | 5.198 | 5.304 | 0.105 | 5.251 |
| 4.765 | 4.634 | 4.740 | 0.106 | 4.687 |
| 6.167 | 6.108 | 6.213 | 0.106 | 6.161 |
| 5.172 | 5.056 | 5.161 | 0.106 | 5.108 |
| 5.393 | 5.269 | 5.375 | 0.106 | 5.322 |
| 5.343 | 5.236 | 5.343 | 0.106 | 5.289 |
| 7.660 | 7.831 | 7.937 | 0.107 | 7.884 |
| 7.653 | 7.665 | 7.772 | 0.107 | 7.718 |
| 5.530 | 5.429 | 5.537 | 0.108 | 5.483 |
| 5.785 | 5.659 | 5.767 | 0.108 | 5.713 |
| 5.155 | 5.046 | 5.155 | 0.108 | 5.101 |
| 6.501 | 6.374 | 6.483 | 0.109 | 6.428 |
| 5.689 | 5.560 | 5.669 | 0.109 | 5.615 |
| 5.561 | 5.418 | 5.527 | 0.109 | 5.473 |
| 5.519 | 5.422 | 5.532 | 0.110 | 5.477 |
| 5.672 | 5.607 | 5.717 | 0.110 | 5.662 |
| 5.271 | 5.118 | 5.228 | 0.110 | 5.173 |
| 4.986 | 4.868 | 4.978 | 0.110 | 4.923 |
| 7.933 | 8.110 | 8.220 | 0.111 | 8.165 |
| 5.373 | 5.209 | 5.320 | 0.111 | 5.264 |
| 6.455 | 6.485 | 6.596 | 0.111 | 6.540 |
| 4.998 | 4.85 | 4.962 | 0.111 | 4.907 |
| 5.932 | 5.929 | 6.041 | 0.112 | 5.985 |
| 5.743 | 5.589 | 5.701 | 0.112 | 5.645 |
| 6.255 | 6.154 | 6.267 | 0.113 | 6.211 |
| 5.481 | 5.366 | 5.478 | 0.113 | 5.422 |
| 4.996 | 4.886 | 4.999 | 0.113 | 4.942 |
| 5.098 | 5.036 | 5.149 | 0.113 | 5.093 |
| 5.464 | 5.311 | 5.424 | 0.113 | 5.368 |
| 5.630 | 5.590 | 5.703 | 0.113 | 5.646 |
| 5.031 | 4.885 | 4.998 | 0.113 | 4.941 |
| 5.486 | 5.357 | 5.470 | 0.114 | 5.414 |
| 5.068 | 4.950 | 5.064 | 0.114 | 5.007 |
| 5.563 | 5.485 | 5.598 | 0.114 | 5.542 |
| 4.982 | 4.842 | 4.957 | 0.115 | 4.899 |
| 5.956 | 5.893 | 6.008 | 0.115 | 5.950 |
|     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|
| 5.633 | 5.527 | 5.643 | 0.116 | 5.585 |
| 5.556 | 5.442 | 5.558 | 0.116 | 5.500 |
| 5.225 | 5.111 | 5.228 | 0.116 | 5.170 |
| 6.170 | 6.090 | 6.207 | 0.117 | 6.149 |
| 5.288 | 5.194 | 5.311 | 0.117 | 5.253 |
| 5.748 | 5.704 | 5.822 | 0.117 | 5.763 |
| 5.444 | 5.312 | 5.429 | 0.117 | 5.371 |
| 5.426 | 5.405 | 5.523 | 0.117 | 5.464 |
| 5.164 | 5.016 | 5.134 | 0.118 | 5.075 |
| 5.516 | 5.527 | 5.645 | 0.118 | 5.586 |
| 5.144 | 5.030 | 5.149 | 0.118 | 5.090 |
| 10.907 | 11.129 | 11.248 | 0.119 | 11.188 |
| 7.622 | 7.646 | 7.766 | 0.119 | 7.706 |
| 5.591 | 5.442 | 5.562 | 0.120 | 5.502 |
| 5.789 | 5.674 | 5.794 | 0.120 | 5.734 |
| 5.234 | 5.140 | 5.260 | 0.120 | 5.200 |
| 5.847 | 5.747 | 5.868 | 0.121 | 5.808 |
| 5.583 | 5.455 | 5.576 | 0.121 | 5.515 |
| 8.477 | 8.631 | 8.753 | 0.122 | 8.692 |
| 5.841 | 5.735 | 5.858 | 0.123 | 5.796 |
| 5.749 | 5.623 | 5.746 | 0.123 | 5.685 |
| 5.285 | 5.137 | 5.261 | 0.124 | 5.199 |
| 5.459 | 5.346 | 5.471 | 0.124 | 5.409 |
| 5.444 | 5.364 | 5.488 | 0.124 | 5.426 |
| 5.159 | 5.037 | 5.162 | 0.125 | 5.099 |
| 5.922 | 5.960 | 6.086 | 0.126 | 6.023 |
| 9.749 | 9.801 | 9.927 | 0.126 | 9.864 |
| 5.590 | 5.488 | 5.614 | 0.126 | 5.551 |
| 5.791 | 5.700 | 5.827 | 0.127 | 5.764 |
| 5.420 | 5.282 | 5.409 | 0.127 | 5.345 |
| 5.554 | 5.408 | 5.535 | 0.127 | 5.471 |
| 5.501 | 5.416 | 5.543 | 0.127 | 5.479 |
| 6.358 | 6.361 | 6.489 | 0.128 | 6.425 |
| 5.885 | 5.780 | 5.909 | 0.129 | 5.844 |
| 5.956 | 5.802 | 5.932 | 0.129 | 5.867 |
| 5.427 | 5.242 | 5.372 | 0.130 | 5.307 |
| 5.278 | 5.156 | 5.286 | 0.130 | 5.221 |
| 5.278 | 5.145 | 5.276 | 0.130 | 5.211 |
| 5.395 | 5.316 | 5.446 | 0.131 | 5.381 |
| 7.358 | 7.408 | 7.539 | 0.131 | 7.473 |
| 5.021 | 4.855 | 4.987 | 0.132 | 4.921 |
| 5.543 | 5.427 | 5.559 | 0.132 | 5.493 |
| 5.989 | 5.879 | 6.012 | 0.133 | 5.945 |
| 5.692 | 5.583 | 5.716 | 0.133 | 5.650 |
| 5.635 | 5.539 | 5.673 | 0.134 | 5.606 |
| 5.344 | 5.257 | 5.391 | 0.134 | 5.324 |
| 5.171 | 5.034 | 5.168 | 0.134 | 5.101 |
| 5.510 | 5.410 | 5.546 | 0.136 | 5.478 |
| 5.287 | 5.142 | 5.278 | 0.136 | 5.210 |
| 5.195 | 5.071 | 5.208 | 0.137 | 5.139 |
|   | 5.415 | 5.277 | 5.413 | 0.137 | 5.345 |
|---|-------|-------|-------|-------|-------|
| 5.228 | 5.100 | 5.237 | 0.137 | 5.168 |
| 5.822 | 5.870 | 6.007 | 0.137 | 5.939 |
| 4.967 | 4.889 | 5.028 | 0.139 | 4.959 |
| 5.126 | 5.007 | 5.146 | 0.139 | 5.076 |
| 5.229 | 5.135 | 5.274 | 0.139 | 5.204 |
| 5.320 | 5.296 | 5.436 | 0.140 | 5.366 |
| 4.992 | 4.812 | 4.953 | 0.140 | 4.882 |
| 5.717 | 5.620 | 5.763 | 0.143 | 5.692 |
| 10.235 | 10.258 | 10.400 | 0.143 | 10.329 |
| 8.500 | 8.510 | 8.655 | 0.145 | 8.582 |
| 6.380 | 6.349 | 6.494 | 0.145 | 6.422 |
| 5.445 | 5.353 | 5.498 | 0.145 | 5.426 |
| 5.332 | 5.201 | 5.347 | 0.146 | 5.274 |
| 5.398 | 5.263 | 5.410 | 0.146 | 5.337 |
| 5.836 | 5.697 | 5.843 | 0.146 | 5.770 |
| 6.061 | 5.975 | 6.122 | 0.147 | 6.049 |
| 6.637 | 6.752 | 6.900 | 0.148 | 6.826 |
| 4.713 | 4.571 | 4.720 | 0.149 | 4.645 |
| 7.412 | 7.524 | 7.674 | 0.149 | 7.599 |
| 5.812 | 5.731 | 5.881 | 0.150 | 5.806 |
| 6.045 | 6.064 | 6.214 | 0.150 | 6.139 |
| 5.526 | 5.461 | 5.611 | 0.151 | 5.536 |
| 5.167 | 5.029 | 5.180 | 0.151 | 5.104 |
| 5.427 | 5.269 | 5.419 | 0.151 | 5.344 |
| 5.708 | 5.597 | 5.748 | 0.151 | 5.673 |
| 5.465 | 5.413 | 5.565 | 0.152 | 5.489 |
| 5.371 | 5.237 | 5.389 | 0.152 | 5.313 |
| 5.582 | 5.452 | 5.604 | 0.152 | 5.528 |
| 5.374 | 5.271 | 5.424 | 0.153 | 5.348 |
| 8.086 | 8.078 | 8.231 | 0.153 | 8.154 |
| 5.217 | 5.073 | 5.226 | 0.153 | 5.149 |
| 5.719 | 5.666 | 5.820 | 0.154 | 5.743 |
| 5.387 | 5.260 | 5.414 | 0.154 | 5.337 |
| 5.184 | 5.021 | 5.175 | 0.154 | 5.098 |
| 5.319 | 5.236 | 5.390 | 0.154 | 5.313 |
| 6.945 | 6.963 | 7.119 | 0.155 | 7.041 |
| 5.146 | 5.040 | 5.195 | 0.155 | 5.118 |
| 5.076 | 4.942 | 5.098 | 0.156 | 5.020 |
| 5.960 | 5.875 | 6.032 | 0.157 | 5.954 |
| 5.315 | 5.237 | 5.395 | 0.158 | 5.316 |
| 7.677 | 7.897 | 8.056 | 0.158 | 7.977 |
| 6.554 | 6.519 | 6.677 | 0.159 | 6.598 |
| 6.171 | 6.159 | 6.318 | 0.159 | 6.238 |
| 5.386 | 5.289 | 5.448 | 0.159 | 5.369 |
| 7.314 | 7.406 | 7.568 | 0.162 | 7.487 |
| 7.013 | 7.083 | 7.246 | 0.162 | 7.165 |
| 5.649 | 5.524 | 5.687 | 0.162 | 5.606 |
| 5.489 | 5.419 | 5.581 | 0.163 | 5.500 |
| 5.276 | 5.174 | 5.336 | 0.163 | 5.255 |
|       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 16.251 | 16.199 | 16.362 | 0.163 | 16.281 |
| 8.881  | 8.834 | 8.997 | 0.164 | 8.916  |
| 6.243  | 6.166 | 6.329 | 0.164 | 6.247  |
| 5.449  | 5.314 | 5.478 | 0.164 | 5.396  |
| 5.251  | 5.111 | 5.275 | 0.164 | 5.193  |
| 5.782  | 5.810 | 5.974 | 0.164 | 5.892  |
| 7.163  | 7.218 | 7.382 | 0.164 | 7.300  |
| 5.510  | 5.379 | 5.544 | 0.165 | 5.462  |
| 5.439  | 5.288 | 5.453 | 0.165 | 5.370  |
| 7.667  | 7.856 | 8.021 | 0.165 | 7.938  |
| 5.631  | 5.590 | 5.756 | 0.166 | 5.673  |
| 7.803  | 7.827 | 7.993 | 0.166 | 7.910  |
| 5.915  | 5.902 | 6.070 | 0.168 | 5.986  |
| 6.000  | 5.903 | 6.072 | 0.169 | 5.988  |
| 5.178  | 5.061 | 5.231 | 0.170 | 5.146  |
| 5.500  | 5.366 | 5.536 | 0.170 | 5.451  |
| 5.969  | 5.906 | 6.076 | 0.170 | 5.991  |
| 6.403  | 6.453 | 6.624 | 0.171 | 6.539  |
| 6.277  | 6.231 | 6.402 | 0.171 | 6.316  |
| 8.265  | 8.415 | 8.587 | 0.172 | 8.501  |
| 4.963  | 4.756 | 4.928 | 0.172 | 4.842  |
| 5.654  | 5.569 | 5.741 | 0.172 | 5.655  |
| 5.733  | 5.658 | 5.830 | 0.173 | 5.744  |
| 6.506  | 6.528 | 6.701 | 0.173 | 6.615  |
| 5.262  | 5.146 | 5.319 | 0.174 | 5.232  |
| 6.472  | 6.406 | 6.581 | 0.174 | 6.493  |
| 8.133  | 8.228 | 8.403 | 0.175 | 8.316  |
| 6.077  | 6.042 | 6.218 | 0.176 | 6.130  |
| 5.612  | 5.489 | 5.666 | 0.177 | 5.577  |
| 8.664  | 8.790 | 8.968 | 0.178 | 8.879  |
| 5.272  | 5.165 | 5.344 | 0.179 | 5.254  |
| 5.921  | 5.871 | 6.049 | 0.179 | 5.960  |
| 5.434  | 5.336 | 5.516 | 0.179 | 5.426  |
| 6.734  | 6.817 | 6.997 | 0.180 | 6.907  |
| 6.401  | 6.389 | 6.569 | 0.180 | 6.479  |
| 7.798  | 7.887 | 8.068 | 0.181 | 7.977  |
| 7.247  | 7.349 | 7.531 | 0.182 | 7.440  |
| 7.183  | 7.226 | 7.408 | 0.182 | 7.317  |
| 8.945  | 9.184 | 9.366 | 0.182 | 9.275  |
| 5.647  | 5.568 | 5.751 | 0.182 | 5.659  |
| 7.420  | 7.604 | 7.787 | 0.182 | 7.695  |
| 5.157  | 5.125 | 5.307 | 0.183 | 5.216  |
| 6.990  | 7.032 | 7.215 | 0.183 | 7.124  |
| 7.540  | 7.496 | 7.679 | 0.183 | 7.588  |
| 6.228  | 6.123 | 6.307 | 0.184 | 6.215  |
| 8.308  | 8.469 | 8.653 | 0.184 | 8.561  |
| 5.581  | 5.453 | 5.637 | 0.184 | 5.545  |
| 5.255  | 5.137 | 5.321 | 0.184 | 5.229  |
| 5.288  | 5.180 | 5.365 | 0.185 | 5.273  |
| 5.509  | 5.369 | 5.555 | 0.185 | 5.462  |
| Value (in mmHg) | Reading 1 | Reading 2 | Standard Deviation | Reading 3 |
|----------------|-----------|-----------|--------------------|-----------|
| 5.877          | 5.841     | 6.028     | 0.186              | 5.934     |
| 5.390          | 5.247     | 5.434     | 0.187              | 5.340     |
| 5.157          | 5.065     | 5.253     | 0.188              | 5.159     |
| 5.052          | 4.968     | 5.157     | 0.188              | 5.063     |
| 5.327          | 5.202     | 5.391     | 0.188              | 5.297     |
| 7.492          | 7.689     | 7.880     | 0.190              | 7.784     |
| 6.217          | 6.159     | 6.351     | 0.192              | 6.255     |
| 5.046          | 4.994     | 5.187     | 0.193              | 5.091     |
| 5.613          | 5.489     | 5.682     | 0.193              | 5.586     |
| 5.925          | 5.885     | 6.080     | 0.195              | 5.983     |
| 5.691          | 5.672     | 5.868     | 0.195              | 5.770     |
| 13.549         | 13.611    | 13.808    | 0.197              | 13.710    |
| 5.511          | 5.370     | 5.569     | 0.199              | 5.469     |
| 5.630          | 5.530     | 5.732     | 0.202              | 5.631     |
| 8.158          | 8.290     | 8.492     | 0.202              | 8.391     |
| 6.545          | 6.412     | 6.615     | 0.203              | 6.513     |
| 5.330          | 5.272     | 5.475     | 0.203              | 5.373     |
| 7.693          | 7.826     | 8.030     | 0.204              | 7.928     |
| 8.668          | 8.854     | 9.059     | 0.205              | 8.956     |
| 5.983          | 5.863     | 6.069     | 0.206              | 5.966     |
| 5.694          | 5.622     | 5.829     | 0.206              | 5.725     |
| 7.980          | 8.098     | 8.306     | 0.207              | 8.202     |
| 6.020          | 5.928     | 6.137     | 0.208              | 6.032     |
| 9.949          | 9.963     | 10.173    | 0.210              | 10.068    |
| 6.222          | 6.172     | 6.382     | 0.210              | 6.277     |
| 5.640          | 5.528     | 5.738     | 0.210              | 5.633     |
| 5.298          | 5.194     | 5.407     | 0.213              | 5.301     |
| 8.627          | 8.556     | 8.769     | 0.213              | 8.663     |
| 5.915          | 5.833     | 6.047     | 0.214              | 5.940     |
| 5.247          | 5.182     | 5.397     | 0.215              | 5.289     |
| 6.599          | 6.637     | 6.854     | 0.217              | 6.746     |
| 5.738          | 5.653     | 5.871     | 0.219              | 5.762     |
| 7.529          | 7.601     | 7.820     | 0.219              | 7.710     |
| 5.433          | 5.319     | 5.539     | 0.220              | 5.429     |
| 7.722          | 8.061     | 8.282     | 0.221              | 8.171     |
| 5.540          | 5.380     | 5.603     | 0.223              | 5.492     |
| 5.297          | 5.148     | 5.373     | 0.225              | 5.261     |
| 5.481          | 5.336     | 5.562     | 0.226              | 5.449     |
| 5.268          | 5.168     | 5.397     | 0.228              | 5.282     |
| 5.423          | 5.199     | 5.430     | 0.231              | 5.315     |
| 5.935          | 5.845     | 6.076     | 0.231              | 5.960     |
| 5.291          | 5.159     | 5.392     | 0.233              | 5.276     |
| 5.197          | 5.051     | 5.285     | 0.235              | 5.168     |
| 5.534          | 5.519     | 5.754     | 0.235              | 5.636     |
| 8.967          | 9.136     | 9.372     | 0.236              | 9.254     |
| 7.695          | 7.675     | 7.911     | 0.236              | 7.793     |
| 5.140          | 5.031     | 5.268     | 0.237              | 5.150     |
| 6.196          | 6.195     | 6.431     | 0.237              | 6.313     |
| 12.926         | 12.974    | 13.213    | 0.239              | 13.094    |
| 5.449          | 5.339     | 5.578     | 0.240              | 5.458     |
|     |     |     |     |     |
|-----|-----|-----|-----|-----|
| 5.815 | 5.756 | 5.997 | 0.241 | 5.877 |
| 5.310 | 5.195 | 5.437 | 0.242 | 5.316 |
| 9.935 | 9.952 | 10.195 | 0.243 | 10.074 |
| 5.572 | 5.464 | 5.707 | 0.243 | 5.586 |
| 5.179 | 5.051 | 5.295 | 0.244 | 5.173 |
| 5.839 | 5.725 | 5.969 | 0.245 | 5.847 |
| 5.259 | 5.142 | 5.387 | 0.245 | 5.264 |
| 5.110 | 5.044 | 5.290 | 0.245 | 5.167 |
| 6.138 | 6.204 | 6.451 | 0.247 | 6.327 |
| 5.312 | 5.196 | 5.445 | 0.249 | 5.321 |
| 5.237 | 5.139 | 5.388 | 0.249 | 5.263 |
| 5.886 | 5.896 | 6.145 | 0.249 | 6.021 |
| 5.576 | 5.477 | 5.726 | 0.249 | 5.602 |
| 5.547 | 5.507 | 5.758 | 0.251 | 5.632 |
| 7.445 | 7.468 | 7.720 | 0.252 | 7.594 |
| 7.014 | 6.973 | 7.225 | 0.252 | 7.099 |
| 5.839 | 5.882 | 6.134 | 0.253 | 6.008 |
| 6.688 | 6.690 | 6.943 | 0.253 | 6.817 |
| 5.311 | 5.213 | 5.466 | 0.253 | 5.340 |
| 8.437 | 8.552 | 8.806 | 0.255 | 8.679 |
| 7.188 | 7.220 | 7.477 | 0.257 | 7.349 |
| 5.458 | 5.392 | 5.650 | 0.258 | 5.521 |
| 7.856 | 7.957 | 8.222 | 0.265 | 8.090 |
| 5.136 | 5.002 | 5.268 | 0.266 | 5.135 |
| 5.333 | 5.179 | 5.446 | 0.267 | 5.313 |
| 11.928 | 11.939 | 12.208 | 0.269 | 12.074 |
| 5.406 | 5.288 | 5.560 | 0.271 | 5.424 |
| 5.653 | 5.606 | 5.887 | 0.281 | 5.746 |
| 5.301 | 5.237 | 5.518 | 0.281 | 5.377 |
| 4.876 | 4.752 | 5.034 | 0.282 | 4.893 |
| 5.463 | 5.321 | 5.603 | 0.282 | 5.462 |
| 5.688 | 5.594 | 5.877 | 0.283 | 5.736 |
| 8.165 | 8.336 | 8.620 | 0.284 | 8.478 |
| 5.634 | 5.583 | 5.869 | 0.286 | 5.726 |
| 5.226 | 5.077 | 5.364 | 0.287 | 5.221 |
| 15.498 | 15.506 | 15.796 | 0.290 | 15.651 |
| 13.656 | 13.689 | 13.980 | 0.291 | 13.835 |
| 5.844 | 5.729 | 6.023 | 0.295 | 5.876 |
| 5.486 | 5.369 | 5.668 | 0.300 | 5.518 |
| 5.444 | 5.305 | 5.609 | 0.304 | 5.457 |
| 4.953 | 4.832 | 5.136 | 0.304 | 4.984 |
| 6.443 | 6.333 | 6.638 | 0.305 | 6.486 |
| 5.789 | 5.649 | 5.956 | 0.307 | 5.803 |
| 8.977 | 8.941 | 9.249 | 0.308 | 9.095 |
| 6.200 | 6.185 | 6.494 | 0.309 | 6.339 |
| 9.614 | 9.619 | 9.928 | 0.309 | 9.773 |
| 6.082 | 6.013 | 6.325 | 0.311 | 6.169 |
| 5.480 | 5.381 | 5.693 | 0.312 | 5.537 |
| 5.912 | 5.820 | 6.133 | 0.313 | 5.977 |
| 7.672 | 7.626 | 7.941 | 0.315 | 7.784 |
|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 5.975 | 5.891 | 6.060 | 0.315 | 6.049 |
| 5.901 | 5.814 | 6.135 | 0.321 | 5.975 |
| 5.381 | 5.304 | 5.625 | 0.321 | 5.464 |
| 5.330 | 5.141 | 5.464 | 0.322 | 5.303 |
| 10.798 | 10.786 | 11.108 | 0.322 | 10.947 |
| 5.989 | 5.984 | 6.308 | 0.324 | 6.146 |
| 8.114 | 8.143 | 8.468 | 0.325 | 8.305 |
| 5.532 | 5.372 | 5.699 | 0.327 | 5.535 |
| 5.591 | 5.464 | 5.796 | 0.331 | 5.630 |
| 6.891 | 6.913 | 7.248 | 0.335 | 7.080 |
| 5.553 | 5.432 | 5.770 | 0.338 | 5.601 |
| 5.227 | 5.077 | 5.420 | 0.343 | 5.248 |
| 5.323 | 5.212 | 5.558 | 0.345 | 5.385 |
| 5.711 | 5.656 | 6.002 | 0.346 | 5.829 |
| 5.391 | 5.325 | 5.679 | 0.353 | 5.502 |
| 12.605 | 12.811 | 13.166 | 0.355 | 12.989 |
| 5.466 | 5.349 | 5.705 | 0.356 | 5.527 |
| 9.276 | 9.209 | 9.567 | 0.358 | 9.388 |
| 4.920 | 4.892 | 5.266 | 0.374 | 5.079 |
| 5.284 | 5.177 | 5.557 | 0.381 | 5.367 |
| 5.353 | 5.191 | 5.582 | 0.391 | 5.387 |
| 6.610 | 6.575 | 6.967 | 0.392 | 6.771 |
| 5.060 | 4.962 | 5.357 | 0.395 | 5.159 |
| 5.456 | 5.361 | 5.757 | 0.397 | 5.559 |
| 5.245 | 5.110 | 5.507 | 0.397 | 5.308 |
| 7.151 | 7.174 | 7.573 | 0.399 | 7.373 |
| 6.608 | 6.558 | 6.959 | 0.401 | 6.758 |
| 6.079 | 5.957 | 6.359 | 0.403 | 6.158 |
| 6.384 | 6.425 | 6.830 | 0.405 | 6.627 |
| 6.069 | 6.035 | 6.441 | 0.406 | 6.238 |
| 5.782 | 5.816 | 6.224 | 0.408 | 6.020 |
| 5.284 | 5.164 | 5.573 | 0.409 | 5.368 |
| 7.295 | 7.269 | 7.701 | 0.433 | 7.485 |
| 5.181 | 5.050 | 5.488 | 0.439 | 5.269 |
| 5.046 | 4.918 | 5.366 | 0.448 | 5.142 |
| 7.686 | 7.594 | 8.048 | 0.454 | 7.821 |
| 5.384 | 5.377 | 5.835 | 0.458 | 5.606 |
| 5.046 | 4.931 | 5.390 | 0.459 | 5.160 |
| 6.593 | 6.671 | 7.140 | 0.469 | 6.906 |
| 5.336 | 5.316 | 5.792 | 0.475 | 5.554 |
| 8.400 | 8.408 | 8.886 | 0.478 | 8.647 |
| 6.434 | 6.490 | 6.973 | 0.483 | 6.731 |
| 5.358 | 5.237 | 5.738 | 0.501 | 5.488 |
| 5.259 | 5.174 | 5.688 | 0.513 | 5.431 |
| 5.366 | 5.232 | 5.762 | 0.530 | 5.497 |
| 5.355 | 5.226 | 5.777 | 0.551 | 5.502 |
| 5.244 | 5.100 | 5.672 | 0.572 | 5.386 |
| 4.975 | 4.864 | 5.450 | 0.586 | 5.157 |
| 5.616 | 5.488 | 6.076 | 0.587 | 5.782 |
| 5.769 | 5.656 | 6.251 | 0.595 | 5.953 |
| Value | 5.281 | 5.919 | 0.638 | 5.600 |
|-------|-------|-------|-------|-------|
| 5.799 | 5.687 | 6.368 | 0.681 | 6.027 |
| 5.290 | 5.162 | 5.947 | 0.786 | 5.554 |
| 6.800 | 6.712 | 7.602 | 0.889 | 7.157 |
| 9.557 | 9.617 | 10.679| 1.062 | 10.148|
| 6.229 | 6.225 | 7.299 | 1.074 | 6.762 |
| 6.159 | 6.078 | 7.431 | 1.352 | 6.755 |
| 6.703 | 7.109 | 10.750| 3.640 | 8.930 |