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Integrated Transcriptomic, Phenotypic, and Functional Study Reveals Tissue-Specific Immune Properties of Mesenchymal Stromal Cells

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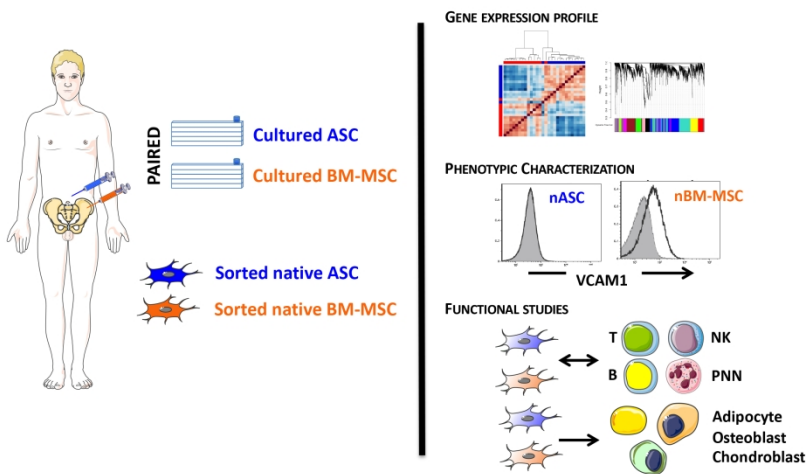
**Integrated transcriptomic, phenotypic, and functional study
reveals tissue-specific immune properties of mesenchymal
stromal cells**

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Clinical-grade mesenchymal stromal cells (MSCs) derived from adipose tissue *versus* bone marrow display tissue-imprinted gene expression profile, phenotype, and functional properties as highlighted by the comprehensive analysis of paired cultures MSC batches obtained from the same donors and the validation on native sorted MSCs.

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3 **Integrated transcriptomic, phenotypic, and functional study**
4 **reveals tissue-specific immune properties of mesenchymal stromal cells**
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53 **RUNNING TITLE:** MSC properties rely on their tissue of origin
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57
58 C.M.: collection and assembly of data, data analysis and interpretation, manuscript
59 writing and final approval; J.D., B.H., L.V., I.B., N.B., M.G., P.C: collection and
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3 assembly of data; D.R: data analysis and interpretation, manuscript writing; C.P.,
4 V.S.: data analysis and interpretation; B.H., N.B., E.F.: provision of study material or
5 donors; L.S.: contribution to data interpretation and manuscript writing; L.C., P.B.,
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8 N.E.: conception and design of the study; K.T.: conception and design of the study,
9 financial support, data analysis and interpretation, manuscript writing and final
10 approval.
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For Peer Review

ABSTRACT

Clinical-grade mesenchymal stromal cells (MSCs) can be expanded from bone marrow and adipose tissue to treat inflammatory diseases and degenerative disorders. However the influence of their tissue of origin on their functional properties, including their immunosuppressive activity, remains unsolved. In this study, we produced paired bone marrow-derived stromal cell (BM-MSC) and adipose-derived stromal cell (ASC) batches from 14 healthy donors. We then compared them using transcriptomic, phenotypic, and functional analyses and validated our results on purified native MSCs to infer which differences were really endowed by tissue of origin. Cultured MSCs segregated together owing to their tissue of origin based on their gene expression profile analyzed using differential expression and weighted gene co-expression network analysis. This translated into distinct immune-related gene signatures, phenotypes, and functional cell interactions. Importantly, sorted native BM-MSCs and ASCs essentially displayed the same distinctive patterns than their *in vitro*-expanded counterparts. As a whole, ASCs exhibited an immune profile consistent with a stronger inhibition of immune response and a lower immunogenicity, supporting the use of adipose tissue as a valuable source for clinical applications.

SIGNIFICANCE STATEMENT

Numerous clinical trials are evaluating the therapeutic potential of mesenchymal stromal cells (MSCs) in degenerative and inflammatory diseases. Whereas their tissue of origin has been proposed as a crucial determinant influencing MSC biological function, the comparison of adipose-derived (ASCs) versus bone marrow-derived (BM-MSCs) stromal cells has been essentially performed using MSC batches obtained from different donors, with the confounding influence of inter-individual variability. By evaluating transcriptomic, phenotypic, and functional features of paired ASCs and BM-MSCs expanded from the same donors, and analyzing their native purified counterpart, we highlighted an imprinting of tissue source on MSC immune properties and proposed adipose tissue as a source of MSCs for the treatment of immune-mediated diseases.

INTRODUCTION

Mesenchymal stromal cell (MSC) therapy has gained tremendous interest over the past decade, since the seminal proof of concept of its beneficial effect in steroid-resistant graft-versus-host disease [1,2]. MSCs have thereafter been proposed as a valuable innovative approach in a wide array of inflammatory diseases, acute tissue injury syndromes, and chronic degenerative disorders, and more than 900 clinical trials involving MSCs have been registered (<http://www.clinicaltrials.gov>). Nevertheless, the limited evidence of their effectiveness in prospective randomized phase III trials, the lack of defined *in vivo* mechanism of action allowing the design of relevant potency assays and patient monitoring strategies, together with the high cost of regulatory approved cell productions have hampered their development in the clinic [2,3]. Besides heterogeneity of recipients, one possible explanation for the inconsistency in clinical results is the heterogeneity of transplanted MSC batches. In addition to inter-individual variability in MSC donors, several critical culture-related parameters affect MSC properties, including culture medium, scale of culture expansion, or cell freezing [4-6]. Accordingly, we have recently shown that replicative senescence associated with industrial-scale expansion of MSCs is associated with a decreased capacity to inhibit T-cell proliferation [7]. Moreover, cryopreservation may behave as an additive detrimental determinant of MSC function and potency [8].

The tissue source of MSCs was identified early as a major parameter modulating MSC functional properties. The two major sources of clinical-grade MSCs are adult bone marrow and adipose tissue. Both of them allow the generation of large number of cells expressing the minimal MSC phenotype, i.e. CD45^{neg}CD31^{neg}CD14^{neg}CD105^{pos}CD73^{pos}CD90^{pos}, and displaying anti-inflammatory properties *in vitro* [4]. Cultured adipose-derived stromal cells (ASCs) and bone marrow-derived stromal cells (BM-MSCs) have been proposed to exhibit specific phenotypes, differentiation potentials, secretomes, exosome contents, DNA methylation signatures, as well as transcriptomic, proteomic, and metabolomic profiles [9-14]. However these findings are not consistent, raising the hypothesis that *in vitro* culture could alter the impact of MSC tissue source. Importantly, MSC clinical efficacy relies on their paracrine activity including their ability to dampen innate and adaptive immune response [1]. Heterogeneity of MSC production processes but also of immunological assays used to evaluate the impact of MSC tissue sources on their anti-inflammatory and immunosuppressive properties have produced conflicting results [15,16].

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3 Nevertheless, several reports argue for a superiority of ASCs over BM-MSCs to
4 inhibit T-cell activation, in relationship with an increased capacity to produce the
5 immunosuppressive enzyme indoleamine-2,3 dioxygenase (IDO) [17-19].
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8 Strikingly, comparative studies of ASC *versus* BM-MSc properties almost exclusively
9 analyze MSCs obtained from different donors, sometimes even propagated in
10 different culture conditions, thus precluding any conclusion on the specific role of
11 MSC tissue-of-origin on the observed variability [15]. In addition, they generally
12 include low numbers of MSC batches, maximizing the influence of inter-individual
13 variability. The only large comparison of ASCs and BM-MSCs obtained from the
14 same donors exclusively focused on *in vitro* immunological functional assays without
15 any evaluation of the molecular mechanisms underlying differences in MSC-driven
16 immunosuppression [20]. Finally no study has checked whether the observed
17 differences could be detected *in situ* in native MSCs. Overall, the decision to use
18 ASCs *versus* BM-MSCs is typically motivated by proprietary concerns rather than by
19 validation of their superiority in standardized assays.
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22 The present work was designed to conclude on the biological significance of taking
23 into account MSC tissue source in the design of MSC-based trials. For the first time,
24 we combined transcriptomic, phenotypic, and functional analyses performed on
25 ASCs and BM-MSCs obtained from the same 14 donors, and cultured under identical
26 clinical grade-like conditions. We identified, using a combination of differential
27 expression, pathway analysis, and weighted gene co-expression network analysis
28 (WGCNA), a specific gene expression profile (GEP) of BM-MSCs *versus* ASCs with
29 enrichment for niche-related *versus* immune related genes. Importantly, we
30 highlighted the same specificities in sorted native BM-MSCs (nBM-MSCs) *versus*
31 ASCs (nASCs), reinforcing the hypothesis of an imprinting of tissue source on MSC
32 properties. Interestingly, these differences have direct functional consequences on
33 the capacity of MSCs to interact with immune cells. Our results add a new rationale
34 to support the use of adipose tissue as a source of MSCs for the treatment of
35 immune-mediated diseases.
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54 **MATERIALS AND METHODS**

55 *Cultured MSC production and phenotypic characterization*

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57 Healthy donor recruitment followed institutional review board approval and written
58 informed content process according to the revised Declaration of Helsinki was
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3 obtained. Fourteen donors were enrolled in this study (3 women and 11 men; median
4 age: 36 [21-57]; Body Mass Index: 16.5 to 25) and provided bone marrow aspirates
5 (iliac crest) and lipoaspirates (abdominal fat layer). ASCs were obtained after
6 digestion with 0.4U/mL clinical grade-NB4 collagenase (Roche Diagnostics,
7 Mannheim, Germany) for 45 min at 37°C, filtration, and centrifugation to obtain the
8 stromal vascular fraction (SVF) [21]. SVF was seeded at $4 \cdot 10^3$ cells/cm² onto
9 CellSTACK closed cell culture chambers (Corning, Lowell, MA) in α MEM
10 (Macopharma, Tourcoing, France) supplemented with 10% screened fetal calf serum
11 (Hyclone, Logan, UT) and 10 μ g/mL ciprofloxacin. Paired BM-MSCs were produced in
12 parallel from unprocessed bone marrow seeded at $5 \cdot 10^4$ cells/cm² in the same
13 culture dishes and medium as those used for ASCs. For both MSC types, medium
14 was renewed twice weekly until cells reached confluence (end of passage 0 (P0)).
15 Cells were then detached using trypsin, reseeded at 1000/cm² until near confluence
16 (end of P1) and subsequently harvested and cryopreserved until use. Additional ASC
17 and BM-MSC batches were obtained with the same process from an independent set
18 of healthy donors for validation experiments. For further use, MSCs were thawed,
19 seeded at 1000 cells/cm² and cultured until 80% confluence. All subsequent
20 phenotypic and functional experiments were performed at the end of P2. In particular,
21 MSCs were assessed by flow cytometry for HLA-DR, CD14, CD90, CD73, CD45,
22 CD34, CD105, CD146 (Beckman Coulter, Villepinte, France), CD31 (eBioscience,
23 Paris, France), and VCAM-1 (Becton-Dickinson, Le Pont de Claix, France) as
24 previously described [17]. Acquisition files were analyzed with Kaluza software
25 (Beckman-Coulter) and data expressed as the ratio of mean fluorescence intensity
26 (rMFI) obtained for each marker and its matched isotopic control antibody.
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46 *Gene expression profiling of cultured MSC*

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48 Whole genome gene expression profiling was performed on 14 BM-MSCs and 14
49 autologous ASCs at the end of P1 using Affymetrix Human Gene 1.0 ST microarrays
50 (Affymetrix, Santa Clara, CA) and data were analyzed with R package Limma
51 (v3.32.10). Non-redundant gene datasets were first generated after GCRMA
52 normalization by retaining for each gene the probeset with the highest expression.
53 Normalized data were visualized by PCA analysis using the R package EMA.
54 Pearson correlation with pairwise complete observation was then performed and
55 visualized using heatmap function of the R package made4. Euclidian distance was
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3 calculated with the R package stats with ward D2 parameter. Differentially expressed
4 genes were identified based on an adjusted p-value <0.05 (by Benjamini-Hochberg
5 method) and were visualized as an heatmap with the heatmap function in R.
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8 As a secondary method of analysis, we used the WGCNA R package [22] to identify
9 modules of co-expressed genes among the 13 paired MSC batches identified as
10 correctly segregated by the unsupervised Pearson correlation analysis. For this
11 analysis, we retained the top 25% most variable genes. Expression matrix was log2
12 transformed and the network was constructed by Pearson correlation considering a
13 soft threshold power (β) value identified with the function Pick Soft Threshold in order
14 to avoid the selection of an arbitrary cut-off. Then, a topological overlap metric (TOM)
15 matrix was derived from the gene expression matrix and the dissimilarity of TOM was
16 calculated. Hierarchical clustering tree was created and modules were generated by
17 the dynamic tree cut method, with a minimum module size of 100 and a deepSplit of
18 2. Each module was marked by a color. The module eigengenes (ME) were then
19 assigned to each cell type and visualized as a box-plot. To determine if co-
20 expression modules were associated with tissue of origin, we performed a Wilcoxon
21 Signed-Rank test. For the most relevant modules, gene expression was visualized
22 with a heatmap using the heatmap function of the R package. Finally, module
23 gene lists were used for downstream enrichment pathway using the Ingenuity
24 Pathway Analysis software (QIAGEN Bioinformatics).
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27 For some genes, expression level was also assessed by Q-PCR, as previously
28 described [17]. Briefly, after RNA extraction, gene expression was quantified using
29 Taqman assay-on-demand reagents and an ABI Prism 7000 (Applied Biosystems,
30 Courtaboeuf, France) with the CT calculation method. PCR data were normalized to
31 the geometric mean of the two housekeeping genes (*CDKN1B* and *EIF2B1*). Results
32 were further standardized by comparison to gene expression of a pool of 5 peripheral
33 blood mononuclear cells (PBMC).
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51 *Analysis of native MSCs*

52 VCAM-1 and HLA-DR expression was assessed on native MSCs after enzymatic
53 digestion of 6 lipoaspirates and 6 BM aspirations with the same protocol. Briefly,
54 unprocessed tissue samples were incubated for 45min at 37°C with 200IU/mL type
55 IV collagenase, 1.6IU/mL neutral protease (Worthington, Lakewood, NJ), and
56 10U/mL DNase (Pulmozyme®, Genentech, San Francisco, CA). Digested tissues
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3 were then filtered, washed, and stained with DAPI viability dye and for CD45,
4 CD235a, CD11b (Beckman Coulter) and CD31 (eBioscience) to gate out
5 hematopoietic and endothelial cells, and CD73, CD146, CD106 (Becton-Dickinson),
6 CD34 (eBioscience), and CD271 (Miltenyi Biotec, Bergisch Gladbach, Germany) to
7 gate stromal cells subsets. nBM-MSCs were gated as
8 CD45^{pos}/CD235a^{neg}/CD11b^{neg}/CD31^{neg}CD34^{neg}CD73^{pos}CD271^{pos} and nASCs as
9 CD45^{pos}/CD235a^{neg}/CD11b^{neg}/CD31^{neg}CD34^{pos}CD73^{pos}CD146^{neg} (see gating strategy in
10 Figure S1) and VCAM-1 and HLA-DR expression was evaluated on both subsets.
11 For sorting of nBM-MSCs, BM mononuclear cells were first collected from
12 enzymatically-digested BM using Ficoll gradient and depleted for CD45^{pos} cells using
13 CD45-coupled magnetic beads (Dynabeads, Thermo Fisher Scientific). nBM-MSCs
14 (n=7) and nASCs (n=10) were purified on a FACS Aria II cell sorter (Becton Dickinson).
15 Gene expression level in native MSCs was assessed using the Fluidigm BioMark HD
16 system. Briefly, cDNAs were obtained using the Fluidigm reverse transcription
17 Master Mix and were then pre-amplified for 18 cycles in the presence of Pre-Amp
18 Master Mix and pooled Taqman assay mix. Gene expression was then measured
19 with the TaqMan Gene Expression Master Mix on a 48.48 Dynamic Array IFC. After
20 quality control check, gene expression was calculated with the CT calculation method
21 and *CDKN1B* and *EIF2B1* as housekeeping genes.

Impact of MSCs on immune cell apoptosis and adhesion

22 MSC ability to support survival of immune cells was evaluated as described [17].
23 Briefly, paired ASCs and BM-MSCs obtained from the same donors were cocultured
24 with peripheral blood B (1/1 B/MSC ratio), and T cells (10/1 T/MSC ratio) purified
25 using negative selection kits (Miltenyi Biotec, purity >97%). After 3 (B cells) or 7 (T
26 cells) days of coculture, the percentage of apoptotic lymphocytes was assessed by
27 flow cytometry with the Active Caspase-3 Apoptosis kit (Becton-Dickinson) after
28 gating on CD45^{pos} events. This allowed for the calculation of the percentage of
29 inhibition of apoptosis with the following formula: (percentage of caspase-3^{pos} without
30 MSC - percentage of caspase-3^{pos} with MSC) / (percentage of caspase-3^{pos} without
31 MSC)*100.

32 For adhesion experiments, B cells were stained with 2 μ M CFSE (Interchim,
33 Montluçon, France) and plated onto MSC layer for 2 hours as described [23]. After
34 washing in PBS, fluorescence of residual adherent B cells was recorded on a

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3 Varioskan (Thermofisher) and the percentage of adherent cells was calculated by
4 comparing with the fluorescence of the input. In some experiments, BM-MSCs were
5 transfected with VCAM-1 siRNA (3 pooled Stealth iRNA, Life Technologies, Saint-
6 Aubin, France) or a control siRNA (Negative Control Medium GC, Life Technologies)
7 with HiPerfect Transfection Reagent (Qiagen). Briefly, 20.000 BM-MSC were plated
8 in 96-wells flat-bottomed plates and incubated for 2 days with the transfection mix
9 containing siRNA (50nM each). Efficient downregulation of VCAM-1 expression was
10 confirmed by flow cytometry (Figure S2).
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19 *MSC chemoattractive properties*

20 CXCL1 and CXCL16 were quantified in MSC supernatant at the end of P2 by ELISA
21 (R&D Systems, Abington, UK) and expressed as the quantity per million of cultured
22 MSCs.
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25 Migration of neutrophils in response to conditioned MSC supernatants was assessed
26 as previously described [24] with slight modifications. Briefly, peripheral blood
27 neutrophils freshly purified using whole blood CD15 microbeads on an AutoMACS®
28 apparatus (Miltenyi Biotec) were added to the upper compartment of Transwell
29 chambers with 5- μ m pore filters in migration medium (RPMI supplemented with 0.1%
30 human albumin). Lower chambers contained MSC-conditioned supernatants
31 obtained after 3 days of MSC culture in migration medium. The absolute number of
32 viable DAPI^{neg}CD66^{pos}CD16^{pos} neutrophils was quantified in the lower chamber after
33 a 2-hour migration using FlowCount beads by flow cytometry.
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43 *MSC immunosuppressive properties*

44 Inhibition of T and NK cells proliferation was performed as previously described [17].
45 Briefly, purified peripheral blood T and NK cells were stained with 0.2 μ M CFSE and
46 activated for 6 days in coculture with MSCs at 10/1 and 1/1 ratios respectively. T
47 cells were activated with 0.5 μ g/mL agonistic anti-CD3 and anti-CD28 antibodies
48 (Sanquin, Amsterdam, The Netherlands) whereas NK cells were activated by
49 100IU/mL rhIL-2 (Proleukin®, Novartis Pharma, Basel, Switzerland). The percentage
50 of proliferating immune cells was quantified by flow cytometry as the proportion of
51 cells having undergone more than one division using ModFit LT 3.0 software (Verity
52 Software, Topsham, ME). This allowed for the calculation of the percentage of
53 inhibition of proliferation with the following formula: (percentage of proliferation
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3 without MSC - percentage of proliferation with MSC) / (percentage of proliferation
4 without MSC)*100.

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6 IDO activity was calculated after quantification of tryptophan and kynurenine
7 catabolite by high-performance liquid chromatography using added 3-nitro-L-tyrosine
8 as an internal standard, as previously described [25]. Results were expressed as the
9 kynurenine to tryptophan ratio in the supernatant of MSC primed or not with IFN γ
10 (R&D Systems).
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16 17 *Statistical analysis*

18 Differences between groups were analyzed with Prism software version 5.03
19 (GraphPad, La Jolla, CA) using the Wilcoxon test for matched pairs or the Mann-
20 Whitney non-parametric *U* test for unpaired samples. Differences in dose-response
21 to IFN γ stimulation in ASCs versus BM-MSCs were tested with a 2-way ANOVA
22 using Bonferroni's post-hoc multiple comparisons tests. In all cases, a cutoff value of
23 $p < 0.05$ was used to reach statistical significance.
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30 31 **RESULTS**

32 *ASC and BM-MSC display tissue-specific molecular imprinting*

33 To investigate the net impact of tissue source on cultured MSC properties while
34 minimizing inter-individual variability, MSCs were produced in the same culture
35 medium from paired adipose tissue and bone marrow samples collected from 14
36 healthy individuals. At the end of the first passage (P1), all MSC batches fulfilled the
37 identity criteria including lack of residual hematopoietic and endothelial cells,
38 homogeneous expression of CD90, CD105 and CD73 (Figure S3A). As previously
39 reported CD34 was not expressed on BM-MSCs whereas it could be detected on
40 17.5 % [0.5-30.7%] of ASCs (n=14). All subsequent experiments were performed at
41 the end of P2 to limit the additional variability associated with large-scale expansion,
42 and closely mimic clinical grade-MSCs used in successful clinical trials.
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51 We first performed an unbiased transcriptomic analysis using Affymetrix microarrays.
52 Principal Component Analysis including all normalized unique genes (20507 genes)
53 adequately segregated ASCs from BM-MSCs (Figure 1A). Interestingly, ASC GEP
54 showed a higher heterogeneity than BM-MSC GEP, extending a previous report
55 obtained on a limited number of unpaired allogeneic samples [12]. These data were
56 confirmed by a Pearson correlation analysis in which paired ASCs and BM-MSCs
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3 were essentially segregated with a higher level of similarities between BM-MSCs
4 than ASCs (Figure 1B). To better compare the impact of tissue origin *versus* inter-
5 individual variability, we further calculated the Euclidian distance between each BM-
6 MSC and its paired ASC and compared it to the Euclidian distance between each
7 BM-MSC and all the other BM-MSCs (Figure 1C). BM-MSCs were significantly closer
8 to allogeneic BM-MSCs than to autologous ASCs confirming that MSC tissue source
9 impacted MSC transcriptomic heterogeneity to a greater extent than inter-individual
10 variability.

11 We next applied a WGCNA to identify transcriptional modules of co-expressed genes
12 and evaluate whether they were related to MSC tissue source. First, the sample
13 clustering based on Euclidian distance obtained with the WGCNA package (Figure
14 S4A) is in accordance with our previous observations, showing a separation between
15 ASCs and BM-MSCs and a higher heterogeneity of the ASCs population. The
16 coexpression network was constructed by Pearson correlation considering a soft-
17 thresholding power β of 8 (Figure S4B). Following dynamic tree cut, the gene
18 clustering dendrogram identified 12 distinct gene modules including the grey module
19 corresponding to unassigned gene (Figure 1D). After the modules were generated,
20 we evaluated their relationship with MSC tissue of origin by using a Wilcoxon Signed-
21 Rank test to determine whether the module eigengenes, defined as the principal
22 component of each module and summarizing the gene expression profile of these
23 modules, were significantly different in ASCs versus BM-MSCs (Figure 1E). Three
24 modules were significantly associated with the MSC tissue source: Purple module
25 (264 genes, $P= 1.346e-06$), Yellow module (459 genes, $P= 1.92e-07$), and Blue
26 module ($P= 1.92e-07$) (Figure 1E and S4C). Heatmap representation of these gene
27 modules revealed that, conversely to the Purple module, the gene expression profiles
28 of the Yellow and Blue modules perfectly segregated ASCs and BM-MSCs (Figure
29 S4D). In order to draw a functional profile of these 2 modules, we extracted two
30 gene lists per module, one corresponding to the genes overexpressed in ASCs and
31 one to the genes overexpressed in BM-MSCs, and analyzed them with IPA (Figure
32 1F-G). Interestingly, both Yellow and Blue modules revealed a strong enrichment for
33 immune-related pathways in ASCs. Altogether, our two unsupervised analysis
34 methods clearly indicate that ASCs and BM-MSCs display strongly different
35 transcriptomic profiles that could be functionally relevant for their clinical application.
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Differentially regulated functional pathways in BM-MSCs versus ASCs

Comparison of the GEP of the 28 paired BM-MSCs and ASCs revealed 3291 differentially expressed unique genes (adjusted P value <0.05 using Benjamini-Hochberg method, Figure 2A-B), including 208 genes up-regulated more than 2-fold in BM-MSCs and 263 genes up-regulated more than 2-fold in ASCs (log₂ FC >1 or <-1, Table S1).

As expected, BM-MSC signature was strongly enriched for genes involved in osteogenic and chondrogenic differentiation programs and in the function of osteoblasts and chondrocytes. These include the osteoblastic marker *BGLAP*, the chondrocytic marker *ACAN*, the transcription factors *RUNX3*, *RUNX2*, *DLX5*, *DLX6*, and *SOX9*, the regulator of bone formation *NRP3*, the modulators of pyrophosphate metabolism *ANKH* and *ENPP1*, or *TNFRSF19*, described as a positive regulator of MSC differentiation into osteoblasts while decreasing adipogenesis [26]. Similarly, RhoA signaling, identified as one of the most significant BM-MSC specific pathway using IPA (Figure 2C), has been proposed as a key driver of mechanotransduction in osteoblasts [27]. Canonical Wnt signaling is also essential for osteoblast differentiation and several members of the Wnt pathway were overexpressed in BM-MSCs, whereas ASCs overexpressed some of the main Wnt inhibitors such as *SFRP1* or *DKK1* (Figure 2C and Table S1). BM-MSCs exhibited a higher capacity to differentiate into chondroblasts *in vitro* compared to ASCs whereas osteoblastic differentiation was similar (Figure S5A-C). Conversely, ASCs displayed activation of molecular pathways related to cholesterol biosynthesis and *CD36*, the most strongly upregulated ASC gene, is a marker of human adipocyte precursors [28]. Moreover, ASCs displayed a higher capacity to differentiate into adipocytes *in vitro* (Figure S5D). Altogether, these data definitively confirm that *in vitro* cultured MSCs retain the main tissue-specific features of their anatomic origin.

Interestingly, cultured BM-MSC overexpressed genes associated with pericytic BM niche, including a gene set associated with vascular smooth muscle contractility and pericyte identity (*CSPG4*, *ACTA2*, *MCAM*, *ITGA7*, *NOTCH3*, *MYH9*, and *MYH11*) [29,30] but also extracellular matrix components, including *FNDC1*, *ACAN*, *COL4A1*, *COL4A2*, *HAPLN1*, and *SRGN*; members of the TGFβ family (*GDF5*, *GDF6*, *TGFB2*); and numerous integrins (*ITGA3*, *ITGA7*, *ITGA8*, *ITGA11*, *ITGB2*) (Table S1). Overexpression of the pericytic marker CD146/MCAM was confirmed at the protein level (Figure S3B). Conversely, ASC-specific GEP revealed pathways related

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3 to inflammatory and immune response (Figures 2C). In agreement, numerous
4 immune-related genes were found differentially expressed between ASCs and BM-
5 MSCs (Table 1).
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8 In order to determine whether these differences reflected features of native MSCs or
9 represented a culture artifact, we sorted $CD45^{neg}CD235a^{neg}CD11b^{neg}$
10 $CD31^{neg}CD73^{pos}CD271^{pos}$ BM mononuclear cells, corresponding to nBM-MSCs, and
11 $CD45^{neg}CD235a^{neg}CD11b^{neg}CD31^{neg}CD34^{pos}CD146^{neg}$ cells from adipose tissue
12 stromal vascular fraction, corresponding to nASCs (Figure S1) and analyzed the
13 expression of 10 genes previously found differentially expressed on their cultured
14 counterpart [31,32]. Interestingly, we demonstrated that nASCs significantly
15 overexpressed *PTGS1*, involved in the production of the immunosuppressive
16 molecule PGE2, the complement system members *C3* and *CD55*, the adhesion
17 molecular *ICAM1*, and the CXCR2 ligands *CXCL1* and *CXCL2*. Similarly, nBM-MSCs
18 significantly overexpressed *VCAM1*, antigen presentation molecules *CD74* and *HLA-*
19 *DRA*, and the chemokine *CXCL16* (Figure 3). These data clearly argue for a strong
20 imprinting of the tissue of origin on the immune properties of cultured MSCs. We thus
21 decided to further examine the functional consequences of these molecular
22 differences on tissue-specific MSC immune properties.
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BM-MSCs and ASCs differentially trigger immune cell adhesion and recruitment

36 *VCAM-1* was the second most strongly upregulated gene in BM-MSCs. At the protein
37 level *VCAM-1* was consistently detected only on BM-MSCs but not on paired ASC
38 counterparts and we further validated this finding on independent MSC batches
39 (Figure 4A-B). Interestingly, nBM-MSCs systematically but variably expressed
40 *VCAM-1* whereas nASCs were virtually *VCAM-1* negative (Figure 4C). *VCAM-1* plays
41 a major role in the anti-apoptotic activity of stromal cells towards immune cells, in
42 particular immature and mature B and T cells expressing the *VCAM-1* ligand *VLA-4*.
43 Moreover, *VCAM-1/VLA-4* interaction was proposed years ago as a main
44 determinant of the interaction between pericytes and lymphocytes [33]. We thus
45 wondered whether cultured MSCs could differentially support B and T-cell survival
46 depending on their tissue origin. Strikingly, BM-MSCs protected B and T cells from
47 spontaneous apoptosis *in vitro* significantly better than their paired ASC counterparts
48 (Figure 4D). In addition, efficient inhibition of *VCAM-1* expression in BM-MSCs by
49 siRNA reduced their capacity to trigger B-cell adhesion (Figure 4E).
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3 Apart from adhesion molecules, chemokines also orchestrate the interaction between
4 MSCs and immune cells and both *CXCL1*, *CXCL2*, and *CXCL16* belonged to the
5 most strongly differentially expressed genes between cultured and native ASCs and
6 BM-MSCs (Table 1 and Figure 3). We validated these differences at the protein level
7 on our paired series of cultured BM-MSCs and ASCs as well as in independent MSC
8 batches. As expected, ASCs secreted higher amounts of *CXCL1*, involved in the
9 recruitment of innate myeloid cells in particular neutrophils, whereas BM-MSCs
10 secreted higher amounts of *CXCL16*, the ligand for *CXCR6*-expressing memory T
11 cells and monocytes (Figure 5 A-C). Moreover, we could show that, whereas BM-
12 MSCs and ASCs produced the same amount of *CXCL8/IL-8*, ASCs were significantly
13 more efficient in triggering neutrophil attraction, in agreement with their higher
14 production of *CXCL1* and *CXCL2*, the two other *CXCR2* ligands (Figure 5D).

BM-MSCs and ASCs differentially elicit immune response suppression

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26 The bidirectional crosstalk of infused MSCs with resident immune cells is pivotal for
27 their clinical efficacy. The detection of humoral alloimmunization in recipients of
28 allogeneic MSCs together with the lack of persistence of infused MSCs demonstrate
29 that MSCs are not immune-privileged [2]. However, protecting MSCs from immune
30 detection and prolonging their life-span *in vivo* may improve clinical outcome [34].
31 Cultured and native BM-MSCs were found to overexpress *HLA-DRA* and *CD74*, both
32 involved in antigen presentation to $CD4^{pos}$ T cells (Table 1 and Figure 3). We could
33 further confirm surface HLA-DR overexpression on BM-MSCs compared to ASCs in
34 our paired MSC samples, but also on independent cultured MSC batches, and on
35 native MSCs (Figure 6 A-C). HLA-DR is induced on MSCs upon exposition to
36 inflammatory cues [17]. We thus tested whether the differential HLA-DR expression
37 between ASCs and BM-MSCs was retained following stimulation by increasing doses
38 of $IFN\gamma$. Cultured ASCs and BM-MSCs similarly enhanced their HLA-DR expression
39 in response to inflammatory stimuli with a maximum of MHC class II expression at
40 100IU/mL of $IFN\gamma$, demonstrating their similar capacity to activate $IFN\gamma$ -dependent
41 signaling pathway. As a consequence, the level of expression of HLA-DR remained
42 lower on inflamed ASC than on inflamed BM-MSC (Figure 6D). These data
43 suggested that ASCs could better escape to recognition by $CD4^{pos}$ T cells. In
44 addition, their higher expression of the cell-surface complement inhibitor *CD55*
45 (Table 1), previously shown to crucially regulate MSC sensitivity to complement-

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3 dependent cytotoxicity [35], could favor their escape from initial immune attack *in*
4 *vivo*.
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6 We then used our previously established standardized tools to compare the capacity
7 of paired ASCs and BM-MSCs to inhibit activated T cell and NK cell proliferation *in*
8 *vitro* [17]. Strikingly, ASCs decreased significantly better T cell proliferation and BM-
9 MSCs significantly better NK cell proliferation (Figure 6E). We and others have
10 shown that IDO activity is the main mechanism supporting the capacity of human
11 MSCs to suppress T cells, unlike NK cells [17]. IDO is not expressed by resting
12 MSCs but is induced by IFN γ produced by activated T and NK cells. We thus
13 assessed IDO activity in ASCs and BM-MSCs licensed with increasing doses of IFN γ .
14 We showed that ASCs required significantly less IFN γ to reach the maximum IDO
15 activity than BM-MSCs (Figure 5 F-G). Thus, whereas ASCs and BM-MSCs have the
16 same intrinsic capacity to respond to IFN γ signaling, as highlighted by parallel curves
17 of HLA-DR induction, ASCs express higher functional immunosuppressive enzyme
18 IDO in response to a low dose of IFN γ .
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31 **DISCUSSION**

32 Tissue origin has been proposed for a long-time as a potential determinant of clinical-
33 grade MSC clinical efficacy. However, how intrinsic disparities between BM-MSCs
34 and ASCs could be related to their capacity to interact with immune effectors and
35 modulate immune response has not been extensively explored. In the present study,
36 we demonstrated for the first time on a large series of ASCs and BM-MSCs obtained
37 from the same donors and on purified nASCs and nBM-MSCs the strong impact of
38 tissue origin on MSC properties. Moreover, we pinpointed that ASCs could be an
39 interesting alternative to BM-MSCs for therapeutic applications considering their
40 huge expression of anti-inflammatory and immunosuppressive molecules.
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42 First, ASCs endorsed stronger IDO activity in response to low dose IFN- γ stimulation,
43 thereafter inhibiting more efficiently T-cell proliferation. Interestingly, ASCs display a
44 higher proliferative capacity *in vitro* and enter senescence at a later time-point
45 compared to BM-MSCs thus delaying the risk of proteasomal degradation of IDO that
46 characterizes senescent MSCs [7]. In agreement, the clinical impact of culture
47 expansion has been validated by the demonstration that late-passage MSCs were
48 less effective than early-passage MSCs to control acute graft-versus-host-disease
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3 [36]. Of note, the IDO^{hi} phenotype of ASCs could be further reinforced by the direct
4 contact with innate myeloid cells, a key step in tissue repair and regeneration. In fact
5 the interplay between MSCs and inflammatory macrophages was recently shown to
6 trigger IDO expression and activity in MSCs in a CD54-dependent manner [37] and
7 ASCs overexpressed CD54/ICAM-1 compared to BM-MSCs.
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11 Second, resting ASCs overexpressed TSG-6, involved in the early inhibition of
12 neutrophil and macrophage activity at sites of inflammation. Kynurenic acid, a
13 tryptophan metabolite generated by IDO, was recently shown to enhance TSG-6
14 expression through the activation of aryl hydrocarbon receptor (AhR), which binds to
15 *TNFAIP6* promoter [38]. This amplification loop between the two main MSC
16 immunosuppressive mediators could contribute to the higher TSG-6 expression in
17 ASCs primed by inflammatory stimuli. TSG-6 was proposed to directly impact the NF-
18 κ B dependent activation of macrophages by TLR ligands [39] whereas IDO has been
19 implicated in the differentiation of monocytes into IL-10-secreting immunosuppressive
20 macrophages [40]. It is thus tempting to speculate that, besides their strong capacity
21 to inhibit T cells and their interest for the treatment of T cell-mediated immune
22 disorders, ASCs would be particularly effective in modulating the inflammatory
23 response mediated by macrophages. In addition, we revealed that ASCs recruited
24 more efficiently neutrophils than BM-MSCs, whereas they overexpressed TSG-6,
25 recently identified as a CXCL8-binding protein inhibiting neutrophil transendothelial
26 migration and chemotaxis [41]. However, TSG-6 does not bind to CXCL1/CXCL2,
27 both upregulated in ASCs, and has no effect on CXCL1-mediated neutrophil
28 transmigration.
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32 Finally, ASCs were virtually HLA-DR^{neg} and retained a lower HLA-DR expression
33 under inflammatory stimuli compared to BM-MSCs. This property could be clinically
34 relevant in relationship with the increasing use of MSCs in allogeneic setting.
35 However, a comparison of alloimmunization rates in homogeneous patients receiving
36 ASCs *versus* BM-MSCs is currently lacking to conclude on the lower immunogenicity
37 of ASCs. Interestingly, we highlighted for the first time an upregulation of components
38 of the complement activation cascade in ASC transcriptomic profile. Complement
39 components were recently identified as promoters of immunological tolerance
40 through their capacity to promote development of myeloid-derived suppressor cells
41 (MDSCs) [42]. In particular, liver stromal cells, like ASCs, produce C3, Factor B, and
42 Factor D resulting in the formation of activation products iC3b and C3d that trigger
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3 dendritic cell differentiation into MDSCs [43]. The role of complement activation in the
4 immunosuppressive activity of MSCs deserves further investigations. Importantly, it
5 has to be noted that ASCs were conversely less potent than BM-MSCs at preventing
6 NK cell proliferation, in agreement with the lack of reversion of MSC-dependent NK-
7 suppressive activity by IDO inhibitors [44,45]. In addition, BM-MSCs overexpressed
8 PD-L1/CD274 and staniocalcin-2 (STC2), two suppressive molecules affecting
9 CD8^{pos} T cell activation and synthesis of inflammatory cytokines [44,45].

15 The mechanisms underlying the higher IDO activity in ASCs in response to IFN γ are
16 still unclear whereas IDO expression and activity has been reproducibly correlated
17 with the capacity of human MSCs to inhibit T-cell proliferation [17,40,46]. BM-MSCs
18 and ASCs expressed IFN γ receptor at the same level (data not shown) and similarly
19 upregulated HLA-DR in response to IFN γ stimulation, indicating a functional IFN γ
20 signaling pathway. Of note IDO mRNA level was also reduced in primed BM-MSCs
21 compared to primed ASCs (data not shown) suggesting a regulation at the
22 transcriptional level. Recently, histone modifications at *IDO1* promoter region were
23 shown to be induced upon inflammatory cytokine treatment of BM-MSCs, with a loss
24 of H3K9me3 repressive mark and a gain of permissive acH3K9 mark [47].
25 Methylation of the *IDO1* promoter was also proposed as an additional level of
26 regulation of IDO expression in breast cancer cells [48]. A deeper evaluation of
27 epigenetic regulation of *IDO1* in ASCs versus BM-MSCs should shed new light on
28 the regulation of this immunosuppressive mediator in the two cell subsets.

39 Importantly, we revealed for the first time, using purified nASCs and nBM-MSCs, that
40 the differential immune profile of *in vitro* expanded MSCs obtained from BM and
41 adipose tissue is essentially imprinted by their tissue of origin. Interestingly, murine
42 ASCs were proposed to be the precursors of lymphoid stromal cells that regulate
43 immune cell recruitment and guided trafficking inside secondary lymphoid organs and
44 ensure antigen delivery and B cell activation and selection [49]. We highlighted here
45 a lymphoid stroma signature, including *LTBR*, the NF-kB family members *IRAK1*,
46 *IRAK3*, and *TRAF3IP2*; *IL4R*, *IL13RA2*, *CLU*, and *CSTC* in cultured human ASCs
47 compared to BM-MSCs further confirming the relationship between *in vitro* expanded
48 ASCs and their native counterpart and suggested that these cells are prone to
49 interact with immune cells *in vivo*.

CONCLUSION

Besides variations in culture procedures, immunological properties of ASCs and BM-MSCs are strongly related to their tissue of origin and in vitro expanded MSCs retain the main features of their native counterpart. In particular, ASCs overexpress several molecules associated with an increased capacity to modulate immune cells and have a transcriptomic and phenotypic profile consistent with a lower immunogenicity. This study paves the way for a better definition of potency assays based on a simultaneous evaluation of molecular and cellular targets. In addition, it could also be helpful to evaluate how MSC modifications or reprogramming could enhance their clinical potency.

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DISCLOSURE OF POTENTIAL CONFLICTS OF INTEREST

The authors declare no competing financial interest.

DATA AVAILABILITY STATEMENT

Data are available via the NCBI Gene Expression Omnibus (<https://www.ncbi.nlm.nih.gov/geo/>; accession number GSE122778). During the reviewing process the data are retained in private status and are available for reviewers only using the secure token shazuskolhcbyb.

REFERENCES

- 1 Shi Y, Wang Y, Li Q, et al. Immunoregulatory mechanisms of mesenchymal stem and stromal cells in inflammatory diseases. *Nature Reviews Nephrology* 2018;14:493–507.
- 2 Galipeau J, Sensebé L. Mesenchymal Stromal Cells: Clinical Challenges and Therapeutic Opportunities. *Cell Stem Cell* 2018;22:824–833.
- 3 Galipeau J. The mesenchymal stromal cells dilemma--does a negative phase III trial of random donor mesenchymal stromal cells in steroid-resistant graft-

- 1
2
3 versus-host disease represent a death knell or a bump in the road? *Cytherapy* 2013;15:2–8.
- 4 4 Sensebé L, Bourin P, Tarte K. Good manufacturing practices production of
5 mesenchymal stem/stromal cells. *Human Gene Therapy* 2011;22:19–26.
- 6 5 Mendicino M, Bailey AM, Wonnacott K, et al. MSC-based product
7 characterization for clinical trials: an FDA perspective. *Cell Stem Cell*
8 2014;14:141–145.
- 9 6 Moll G, Alm JJ, Davies LC, et al. Do cryopreserved mesenchymal stromal cells
10 display impaired immunomodulatory and therapeutic properties? *Stem Cells*
11 2014;32:2430–2442.
- 12 7 Loisel S, Dulong J, Ménard C, et al. Brief Report: Proteasomal Indoleamine 2,3-
13 Dioxygenase Degradation Reduces the Immunosuppressive Potential of Clinical
14 Grade-Mesenchymal Stromal Cells Undergoing Replicative Senescence. *Stem*
15 *Cells* 2017;35:1431–1436.
- 16 8 Chinnadurai R, Copland IB, Garcia MA, et al. Cryopreserved Mesenchymal
17 Stromal Cells Are Susceptible to T-Cell Mediated Apoptosis Which Is Partly
18 Rescued by IFN γ Licensing. *Stem Cells* 2016;34:2429–2442.
- 19 9 Cho K-A, Park M, Kim Y-H, et al. RNA sequencing reveals a transcriptomic
20 portrait of human mesenchymal stem cells from bone marrow, adipose tissue,
21 and palatine tonsils. *Sci Rep* 2017;7:17114.
- 22 10 de Almeida DC, Ferreira MRP, Franzen J, et al. Epigenetic Classification of
23 Human Mesenchymal Stromal Cells. *Stem Cell Reports* 2016;6:168–175.
- 24 11 Jansen BJH, Gilissen C, Roelofs H, et al. Functional differences between
25 mesenchymal stem cell populations are reflected by their transcriptome. *Stem*
26 *Cells and Development* 2010;19:481–490.
- 27 12 Torensma R, Prins H-J, Schrama E, et al. The impact of cell source, culture
28 methodology, culture location, and individual donors on gene expression profiles
29 of bone marrow-derived and adipose-derived stromal cells. *Stem Cells and*
30 *Development* 2013;22:1086–1096.
- 31 13 Lee SJ, Yi T, Ahn SH, et al. Comparative study on metabolite level in tissue-
32 specific human mesenchymal stem cells by an ultra-performance liquid
33 chromatography quadrupole time of flight mass spectrometry. *Analytica Chimica*
34 *Acta* 2018;1024:112–122.
- 35 14 Reinisch A, Etchart N, Thomas D, et al. Epigenetic and in vivo comparison of
36 diverse MSC sources reveals an endochondral signature for human
37 hematopoietic niche formation. *Blood* 2015;125:249–260.
- 38 15 Mattar P, Bieback K. Comparing the Immunomodulatory Properties of Bone
39 Marrow, Adipose Tissue, and Birth-Associated Tissue Mesenchymal Stromal
40 Cells. *Front Immunol* 2015;6:560.
- 41 16 Ménard C, Tarte K. Immunoregulatory properties of clinical grade mesenchymal
42 stromal cells: evidence, uncertainties, and clinical application. *Stem Cell*
43 *Research & Therapy* 2013;4:64.
- 44 17 Ménard C, Pacelli L, Bassi G, et al. Clinical-grade mesenchymal stromal cells
45 produced under various good manufacturing practice processes differ in their
46 immunomodulatory properties: standardization of immune quality controls. *Stem*
47 *Cells and Development* 2013;22:1789–1801.
- 48 18 Melief SM, Zwaginga JJ, Fibbe WE, et al. Adipose tissue-derived multipotent
49 stromal cells have a higher immunomodulatory capacity than their bone marrow-
50 derived counterparts. *Stem Cells Translational Medicine* 2013;2:455–463.
- 51
52
53
54
55
56
57
58
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60

- 19 Ribeiro A, Laranjeira P, Mendes S, et al. Mesenchymal stem cells from umbilical cord matrix, adipose tissue and bone marrow exhibit different capability to suppress peripheral blood B, natural killer and T cells. *Stem Cell Research & Therapy* 2013;4:125.
- 20 Valencia J, Blanco B, Yáñez R, et al. Comparative analysis of the immunomodulatory capacities of human bone marrow- and adipose tissue-derived mesenchymal stromal cells from the same donor. *Cytotherapy* 2016;18:1297–1311.
- 21 Bourin P, Peyrafitte J-A, Fleury-Cappellesso S. A first approach for the production of human adipose tissue-derived stromal cells for therapeutic use. *Methods Mol Biol* 2011;702:331–343.
- 22 Langfelder P, Horvath S. WGCNA: an R package for weighted correlation network analysis. *BMC Bioinformatics* 2008;9:559.
- 23 Pandey S, Mourcin F, Marchand T, et al. IL-4/CXCL12 loop is a key regulator of lymphoid stroma function in follicular lymphoma. *Blood* 2017;blood–2016–08–737239.
- 24 Grégoire M, Guilloton F, Pangault C, et al. Neutrophils trigger a NF- κ B dependent polarization of tumor-supportive stromal cells in germinal center B-cell lymphomas. *Oncotarget* 2015;6:16471–16487.
- 25 Tattevin P, Monnier D, Tribut O, et al. Enhanced indoleamine 2,3-dioxygenase activity in patients with severe sepsis and septic shock. *J Infect Dis* 2010;201:956–966.
- 26 Qiu W, Hu Y, Andersen TE, et al. Tumor necrosis factor receptor superfamily member 19 (TNFRSF19) regulates differentiation fate of human mesenchymal (stromal) stem cells through canonical Wnt signaling and C/EBP. *J Biol Chem* 2010;285:14438–14449.
- 27 Nobis M, Herrmann D, Warren SC, et al. A RhoA-FRET Biosensor Mouse for Intravital Imaging in Normal Tissue Homeostasis and Disease Contexts. *Cell Reports* 2017;21:274–288.
- 28 Gao H, Volat F, Sandhow L, et al. CD36 Is a Marker of Human Adipocyte Progenitors with Pronounced Adipogenic and Triglyceride Accumulation Potential. *Stem Cells* 2017;35:1799–1814.
- 29 Armulik A, Genové G, Betsholtz C. Pericytes: developmental, physiological, and pathological perspectives, problems, and promises. *Developmental Cell* 2011;21:193–215.
- 30 Astarita J, Lukacs-Kornek V, Tayalia P, et al. Transcriptional profiling of stroma from inflamed and resting lymph nodes defines immunological hallmarks. *Nat Immunol* 2012;13:499–510.
- 31 Li H, Ghazanfari R, Zacharaki D, et al. Isolation and characterization of primary bone marrow mesenchymal stromal cells. *Annals of the New York Academy of Sciences* 2016;1370:109–118.
- 32 Maumus M, Peyrafitte J-A, D'Angelo R, et al. Native human adipose stromal cells: localization, morphology and phenotype. *International Journal of Obesity* 2011;35:1141–1153.
- 33 Navarro R, Compte M, Álvarez-Vallina L, et al. Immune Regulation by Pericytes: Modulating Innate and Adaptive Immunity. *Front Immunol* 2016;7:480.
- 34 Ankrum JA, Ong JF, Karp JM. Mesenchymal stem cells: immune evasive, not immune privileged. *Nature Biotechnology* 2014;32:252–260.
- 35 Li Y, Lin F. Mesenchymal stem cells are injured by complement after their contact with serum. *Blood* 2012;120:3436–3443.

- 1
- 2
- 3 36 Bahr von L, Sundberg B, Lönnies L, et al. Long-term complications, immunologic effects, and role of passage for outcome in mesenchymal stromal cell therapy. *Biology of Blood and Marrow Transplantation : Journal of the American Society for Blood and Marrow Transplantation* 2012;18:557–564.
- 4
- 5
- 6
- 7
- 8 37 Espagnolle N, Balguerie A, Arnaud E, et al. CD54-Mediated Interaction with Pro-inflammatory Macrophages Increases the Immunosuppressive Function of Human Mesenchymal Stromal Cells. *Stem Cell Reports* 2017;8:961–976.
- 9
- 10 38 Wang G, Cao K, Liu K, et al. Kynurenic acid, an IDO metabolite, controls TSG-6-mediated immunosuppression of human mesenchymal stem cells. *Cell Death and Differentiation* 2018;25:1209–1223.
- 11
- 12 39 Choi H, Lee RH, Bazhanov N, et al. Anti-inflammatory protein TSG-6 secreted by activated MSCs attenuates zymosan-induced mouse peritonitis by decreasing TLR2/NF- κ B signaling in resident macrophages. *Blood* 2011;118:330–338.
- 13
- 14 40 François M, Romieu-Mourez R, Li M, et al. Human MSC suppression correlates with cytokine induction of indoleamine 2,3-dioxygenase and bystander M2 macrophage differentiation. *Molecular Therapy : the Journal of the American Society of Gene Therapy* 2012;20:187–195.
- 15
- 16 41 Dyer DP, Thomson JM, Hermant A, et al. TSG-6 inhibits neutrophil migration via direct interaction with the chemokine CXCL8. *J Immunol* 2014;192:2177–2185.
- 17
- 18 42 Luque A, Serrano I, Aran JM. Complement components as promoters of immunological tolerance in dendritic cells. *Semin Cell Dev Biol* 2017.
- 19
- 20 43 Hsieh C-C, Chou H-S, Yang H-R, et al. The role of complement component 3 (C3) in differentiation of myeloid-derived suppressor cells. *Blood* 2013;121:1760–1768.
- 21
- 22 44 Davies LC, Heldring N, Kadri N, et al. Mesenchymal Stromal Cell Secretion of Programmed Death-1 Ligands Regulates T Cell Mediated Immunosuppression. *Stem Cells* 2017;35:766–776.
- 23
- 24 45 Chen X, Liu Q, Huang W, et al. Stanniocalcin-2 contributes to mesenchymal stromal cells attenuating murine contact hypersensitivity mainly via reducing CD8⁺ Tc1 cells. *Cell Death & Disease* 2018;9:548.
- 25
- 26 46 Chinnadurai R, Rajan D, Qayed M, et al. Potency Analysis of Mesenchymal Stromal Cells Using a Combinatorial Assay Matrix Approach. *Cell Reports* 2018;22:2504–2517.
- 27
- 28 47 Rovira Gonzalez YI, Lynch PJ, Thompson EE, et al. In vitro cytokine licensing induces persistent permissive chromatin at the Indoleamine 2,3-dioxygenase promoter. *Cytotherapy* 2016;18:1114–1128.
- 29
- 30 48 Dewi DL, Mohapatra SR, Blanco Cabañes S, et al. Suppression of indoleamine-2,3-dioxygenase 1 expression by promoter hypermethylation in ER-positive breast cancer. *Oncoimmunology* 2017;6:e1274477.
- 31
- 32 49 Bénézech C, Mader E, Desanti G, et al. Lymphotoxin- β ; Receptor Signaling through NF- κ B2-RelB Pathway Reprograms Adipocyte Precursors as Lymph Node Stromal Cells. *Immunity* 2012:1–14.
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FIGURE LEGENDS

Figure 1. Paired ASC and BM-MSC transcriptomic analysis reveal tissue-specific signatures.

(A) Principal component analysis of data resulting from the gene expression profile analysis of 14 paired BM-MSC and ASC samples obtained from the same donors.

(B) Hierarchical clustering of correlation matrix of paired ASC and BM-MSC gene expression profile using the Pearson's correlation coefficients.

(C) Euclidian distance between each BM-MSC and its paired ASC *versus* the mean distance between a given BM-MSC and the geometric mean of the other BM-MSCs.

(D-G) WGCNA analysis. Gene clustering dendrogram and module delimitation based on topological overlap, with different colors representing different co-expression gene modules (D). The relationship between the module eigengenes and the traits (ASC *versus* BM-MSC) was then evaluated based on Wilcoxon rank test and was represented as a heatmap color-coded accordingly to the $-\text{LOG}_{10}(\text{FDR})$ (E). The genes upregulated in ASCs *versus* BM-MSCs in the module Blue (F) and Yellow (G) were analyzed using Ingenuity Pathway Analysis. Shown are the top twenty pathways in ASCs (dark blue and dark orange) and BM-MSCs (light blue and light orange) according to the p-value.

Figure 2. Paired ASC and BM-MSC differential gene expression pattern highlights tissue-specific functional pathways.

(A) Venn diagram of the genes differentially expressed between paired BM-MSC and ASC (n=14).

(B) Hierarchical clustering of paired ASCs and BM-MSCs performed on the 3291 differentially expressed genes. The relative level of gene expression is depicted according to the shown color scale.

(C) Ingenuity Pathway Analysis of the up- and down-regulated genes. Shown are the top twenty pathways in ASCs (top, red bars) and BM-MSCs (bottom, blue bars) according to the p-value.

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3 **Figure 3. Immune gene expression profile is imprinted by the tissue of origin in**
4 **mesenchymal stromal cells.**

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6 Expression of various immune-related genes identified as differentially expressed
7 between paired cultured ASCs and BM-MSCs using Affymetrix microarrays were
8 assessed by Q-PCR on sorted native ASCs (nASCs, n=10) and native BM-MSCs
9 (nBM-MSCs, n=7). **p<0.01, ***p<0.001.
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15 **Figure 4. ASCs and BM-MSCs differentially mediate immune cell adhesion and**
16 **survival**

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18 (A-C) VCAM-1 expression was assessed by flow cytometry on 7 paired cultured MSC
19 samples (A), on an independent series of BM-MSCs and ASCs (n=10 each) (B), and
20 on native BM-MSCs (nBM-MSCs) and ASCs (nASCs) (C, n=6 each).
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24 (D) The ability of MSC to support immune cells survival was assessed in a coculture
25 assay with resting T and B cells. Survival of CD45^{pos} lymphocytes was evaluated by
26 activated caspase-3 staining (n=7 independent experiments, each time with different
27 paired MSC samples).
28

29
30 (E) Purified B cells were labeled with CFSE and incubated for 2h on BM-MSC
31 confluent cell monolayer. BM-MSCs have been transduced 48h before by VCAM-1
32 targeting siRNA or control siRNA. Adhesion percentage was calculated by comparing
33 the residual fluorescence after adhesion with the fluorescence of the input (n=7
34 independent experiments). *p<0.05, **p<0.01, ***p<0.001.
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41 **Figure 5. ASCs and BM-MSCs have a distinct capacity to attract immune cells.**

42
43 (A) CXCL1 and CXCL16 concentrations were quantified in MSC supernatants by
44 ELISA and normalized by the number of cultured MSCs (n=6 paired MSC samples).
45

46 (B-C) *CXCL1* and *CXCL16* expression was quantified by Q-PCR (B) and ELISA (C)
47 in an independent series of BM-MSCs and ASCs (n=10 each).
48

49 (D). Neutrophil migration towards MSC conditioned medium was quantified by flow
50 cytometry. The percentage of neutrophil migration is calculated as the number of
51 DAPI^{neg}CD66b^{pos}CD16^{pos} viable neutrophils migrating in response to cell supernatant
52 divided by their initial number (n=10 independent experiments). *p<0.05, **p<0.01
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58 **Figure 6. ASCs and BM-MSCs display different immunomodulatory properties.**

59 (A-C) HLA-DR expression was assessed by flow cytometry on 7 paired cultured MSC
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3 samples (A), on an independent series of BM-MSCs and ASCs (n=10 each) (B), and
4 on native BM-MSCs (nBM-MSCs) and ASCs (nASCs) (C, n=6 each).

5
6 (D) Paired MSCs were exposed for 40 hours to increasing concentrations of IFN γ
7 before assessment of HLA-DR expression by flow cytometry. Data are represented
8 as median \pm standard deviation for each IFN γ concentration tested (n= 7 paired
9 ASCs and BM-MSCs).

10
11 (E) MSCs were cocultured with CFSE-labelled T and NK cells stimulated with anti-
12 CD3/anti-CD28 or IL-2; respectively. Inhibition of immune cell proliferation was
13 assessed by the CFSE dilution assay after normalization to 100% for the proliferation
14 obtained without MSCs (n=7 independent experiments with paired MSCs).

15
16 (F) IDO activity was calculated as the ratio of kynurenin and tryptophan
17 concentrations measured in the supernatant of MSCs 40h after exposure to
18 increasing doses of IFN γ . Data are represented as median \pm standard deviation for
19 each IFN γ concentration (n= 7 paired ASCs and BM-MSCs).

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21 (G) Half-maximal effective concentrations (EC50) of IFN γ to trigger IDO activity is
22 depicted for each of the 7 paired MSC. *p<0.05, **p<0.01
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Table 1: Immune-related genes differentially expressed in BM-MSC vs ASC
(Adjusted p-value < 0.05, | log₂ FC | >1)

Upregulated in	Gene Symbol	Log ₂ Fold Change*	Adjusted p value**
ASC	<i>PTGS1</i>	-3.26	6.82E-08
	<i>DPP4</i>	-3.15	2.30E-05
	<i>C3</i>	-3.03	1.35E-04
	<i>IL13RA2</i>	-2.42	7.92E-04
	<i>IL1B</i>	-2.38	1.91E-05
	<i>CD55</i>	-2.37	3.47E-08
	<i>TGFBR3</i>	-2.18	2.62E-05
	<i>IL20RB</i>	-1.97	4.65E-05
	<i>CFB</i>	-1.92	1.68E-03
	<i>TNFAIP6</i>	-1.91	2.76E-03
	<i>CXCL2</i>	-1.81	2.51E-04
	<i>ICAM1</i>	-1.80	5.98E-06
	<i>ITGA4</i>	-1.71	1.88E-05
	<i>PTGIS</i>	-1.69	6.77E-05
	<i>C2</i>	-1.59	1.38E-04
	<i>CXCL1</i>	-1.38	8.02E-04
	<i>CFD</i>	-1.27	1.19E-02
<i>IL1R1</i>	-1.19	1.53E-03	
BM-MSC	<i>VCAM1</i>	5.30	1.32E-05
	<i>ITGA3</i>	2.87	4.44E-06
	<i>TGFB2</i>	2.33	1.48E-05
	<i>ITGA8</i>	2.08	3.81E-04
	<i>CFH</i>	1.97	1.04E-04
	<i>ITGB2</i>	1.91	1.54E-04
	<i>CD74</i>	1.82	1.03E-03
	<i>STC2</i>	1.70	1.02E-03
	<i>CXCL16</i>	1.38	3.36E-05
	<i>ITGA11</i>	1.25	2.21E-04
	<i>PDCD1LG2</i>	1.20	2.06E-03
	<i>ITGA10</i>	1.14	4.90E-04
	<i>HLA-DRA</i>	1.05	3.32E-02

* Log₂ fold change of expression in BM-MSC/ASC

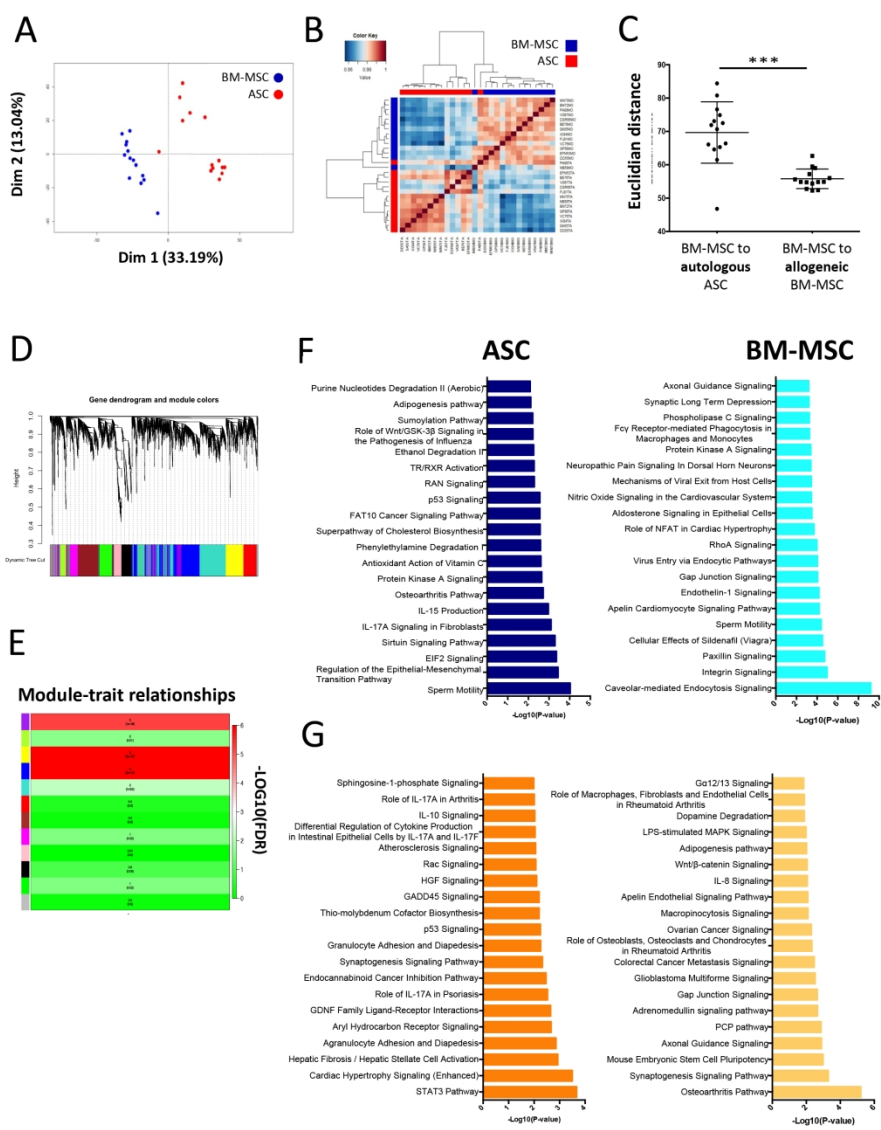


Figure 1. Paired ASC and BM-MSC transcriptomic analysis reveal tissue-specific signatures

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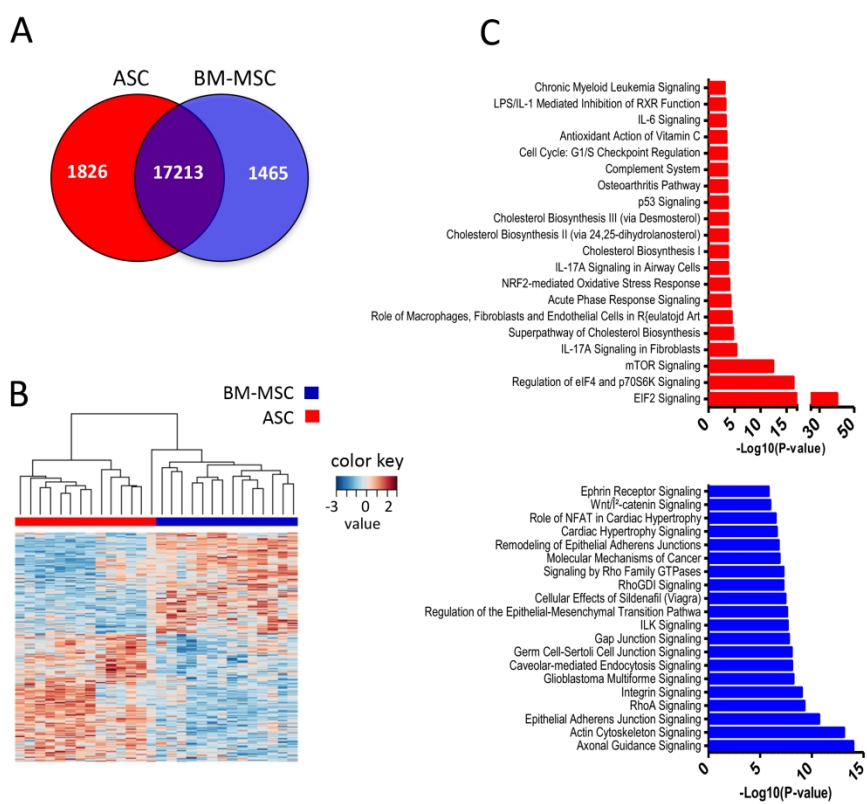


Figure 2. Paired ASC and BM-MSC differential gene expression pattern highlights tissue-specific functional pathways

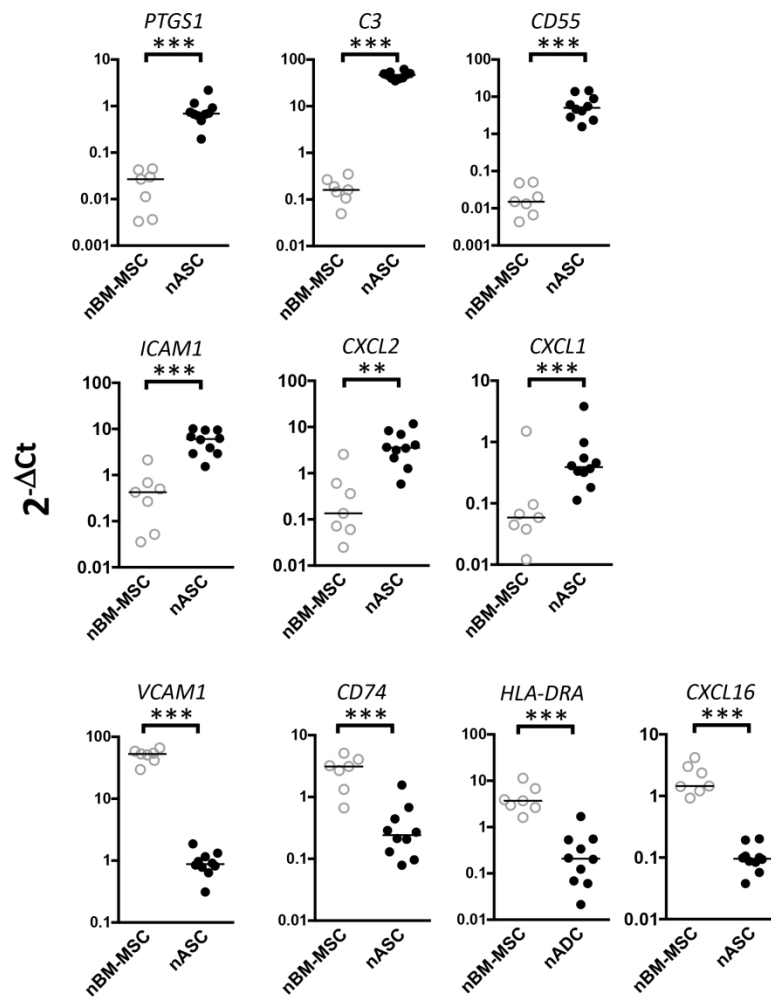


Figure 3. Immune gene expression profile is imprinted by the tissue of origin in mesenchymal stromal cells

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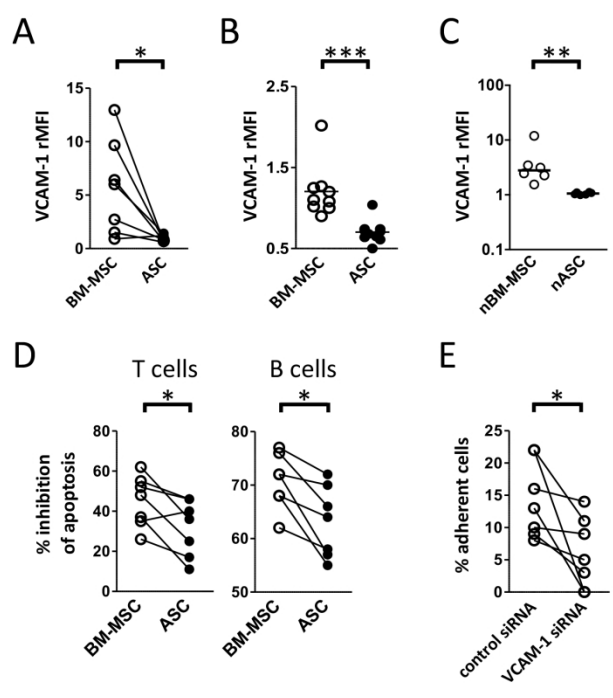


Figure 4. ASCs and BM-MSCs differentially mediate immune cell adhesion and survival

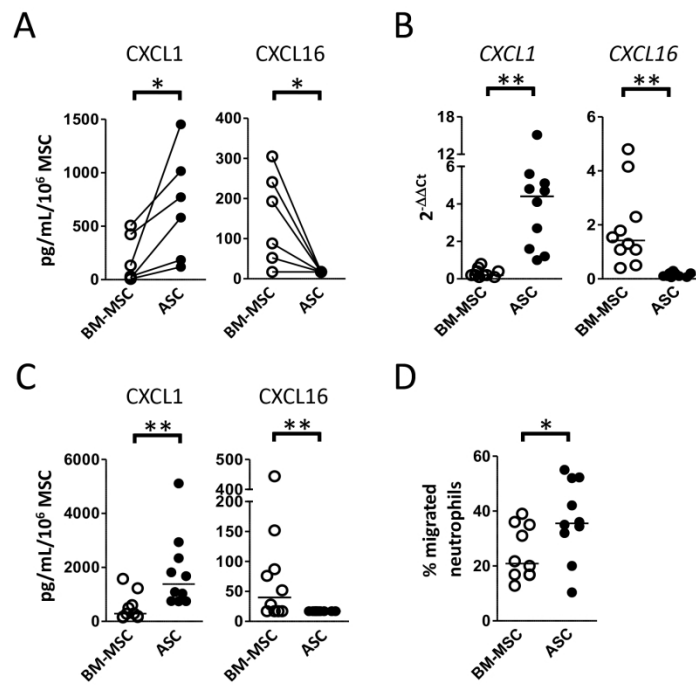


Figure 5. ASCs and BM-MSCs have a distinct capacity to attract immune cells

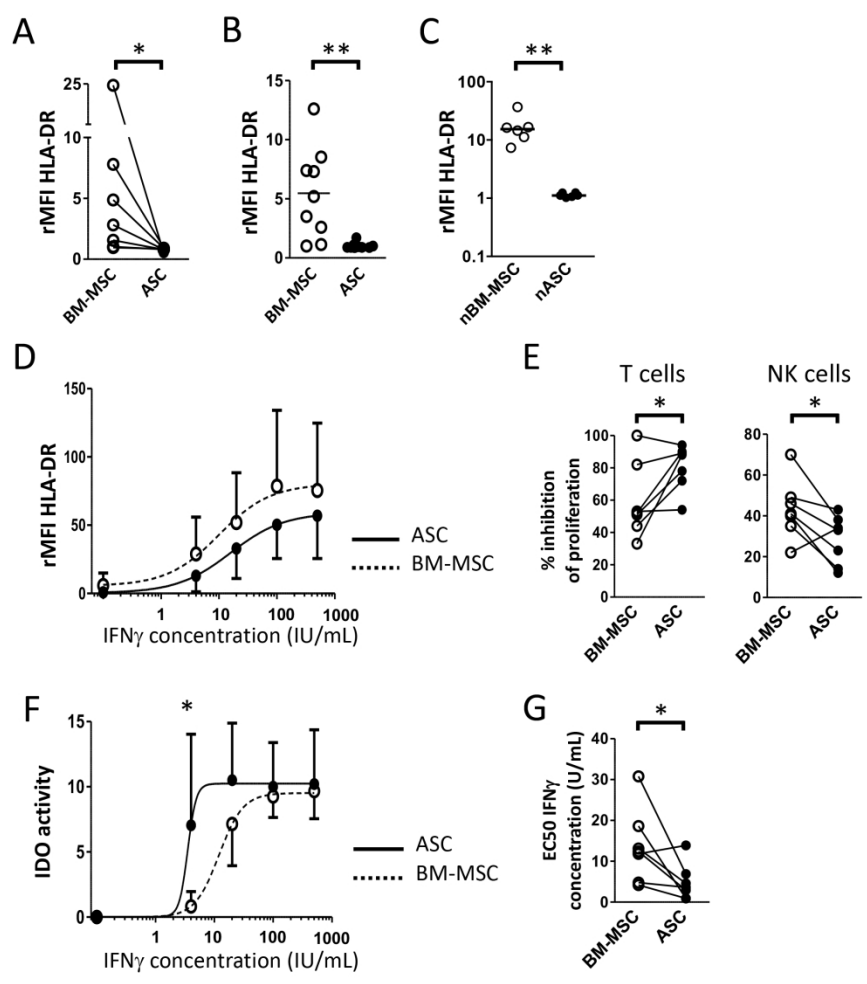


Figure 6. ASCs and BM-MSCs display different immunomodulatory properties

BM MSC_ASC

Table S1. List of genes differentially expressed between the 14 paired ASCs an

Gene Symbol	Log2 Fold Change in BM- MSCs/ASCs	Adjusted p-value	MSC UP
CD36	-5.39628285714286	1.26103666462117e-09	up in ASC
PI16	-5.27575142857143	1.03004749104242e-06	up in ASC
PLA2G2A	-5.04802285714286	9.77289232825313e-08	up in ASC
H19	-4.61801714285715	4.6886286214047e-07	up in ASC
GPRC5B	-4.57441142857143	1.17122636107078e-06	up in ASC
GPR133	-4.01120571428572	2.18913217476832e-08	up in ASC
SLC39A8	-3.75501357142857	2.8716212039366e-06	up in ASC
TNXB	-3.73648571428572	8.2012136729535e-06	up in ASC
STMN2	-3.62314	1.75506349745616e-06	up in ASC
TNXA	-3.56838714285714	8.96929695490821e-06	up in ASC
EPB41L3	-3.51376928571428	1.26103666462117e-09	up in ASC
MME	-3.44466857142857	2.62046956033406e-06	up in ASC
XPNPEP2	-3.44329285714286	4.10364620847664e-06	up in ASC
WNT2	-3.40413785714286	3.08771061875667e-06	up in ASC
LAMA2	-3.40401214285714	2.29972822779566e-08	up in ASC
ASPN	-3.39677928571429	1.44727324428933e-05	up in ASC
PDGFD	-3.36804928571429	2.85456411094559e-07	up in ASC
RDH10	-3.356935	9.77289232825313e-08	up in ASC
FBLN2	-3.32924285714286	1.37564733157726e-08	up in ASC
CLDN11	-3.269055	3.19243724052105e-06	up in ASC
PTGS1	-3.26222428571429	6.81727166269545e-08	up in ASC
KCND2	-3.21856357142857	7.03930984117721e-09	up in ASC
DPP4	-3.15317142857143	2.2994374240621e-05	up in ASC
ABCA9	-3.14905571428571	2.83015888096207e-06	up in ASC
GALNT12	-3.06164785714286	1.96031155309297e-07	up in ASC
C3	-3.02685928571429	0.00013492877808721	up in ASC
SEMA3D	-2.94961285714286	3.78225806068477e-08	up in ASC
APOD	-2.91169357142857	0.000406399699006292	up in ASC
TSHZ2	-2.86797714285714	1.11550852145582e-07	up in ASC
KIAA1324L	-2.82837285714286	1.75506349745616e-06	up in ASC
F3	-2.71826071428571	0.000308130773383987	up in ASC
CNTN3	-2.67346357142857	1.28869201419704e-07	up in ASC
EMILIN2	-2.61508357142857	1.25658060343769e-08	up in ASC
ZNF521	-2.551075	2.29972822779566e-08	up in ASC
ABCC9	-2.5272	1.04392523338981e-08	up in ASC
MYO1D	-2.49271285714286	1.44622544363504e-05	up in ASC
PDE1A	-2.48733142857143	6.25013537905141e-06	up in ASC
S100A4	-2.47065071428572	3.47999629393266e-05	up in ASC
IL13RA2	-2.42184428571429	0.000791786686951753	up in ASC
CPXM1	-2.40989285714286	0.00314508521563751	up in ASC
ABCA6	-2.40214285714286	0.000126337287155299	up in ASC
IL1B	-2.37757428571429	1.90974235155188e-05	up in ASC
CD55	-2.36392928571429	3.47170557523732e-08	up in ASC
ID1	-2.36306928571429	0.000161273813888733	up in ASC
GREM1	-2.36245	8.35389015227316e-06	up in ASC
SERPINB7	-2.34500071428572	1.04448029216193e-05	up in ASC
DPT	-2.33759214285714	3.6938466013939e-05	up in ASC
MFAP4	-2.28227142857143	4.6886286214047e-07	up in ASC
DKK1	-2.26754142857143	1.53331986280973e-05	up in ASC
ADH1B	-2.24181642857143	0.00339491797194586	up in ASC

		BMMSC_ASC	
1			
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3	CTSC	-2.221765	5.59754314021959e-05 up in ASC
4	EBF2	-2.21005785714286	3.796963591276e-06 up in ASC
5	OSR2	-2.19482	2.10038928041017e-05 up in ASC
6	TGFBR3	-2.17924642857143	2.61789704482416e-05 up in ASC
7	FBN2	-2.13828642857143	6.23680347656646e-05 up in ASC
8	DOK5	-2.06989857142857	1.79299948754593e-09 up in ASC
9	OAF	-2.06282928571429	7.06674371309446e-07 up in ASC
10	SERPINB2	-2.04807	0.0119171825653769 up in ASC
11	IRAK3	-2.03372642857143	1.15596657192217e-07 up in ASC
12	SGCG	-2.026655	6.95966055199295e-06 up in ASC
13	DOCK11	-2.02324785714286	1.61139979222825e-07 up in ASC
14	ADM	-2.00021857142857	9.77289232825313e-08 up in ASC
15	TNFSF10	-1.99981214285714	0.00357070555160344 up in ASC
16	PRKG1	-1.99889142857143	1.58747414007594e-06 up in ASC
17	MOXD1	-1.99142071428571	7.26818450303749e-06 up in ASC
18	CPE	-1.99060285714286	0.000113288397327595 up in ASC
19	SPON2	-1.971635	2.14875276215247e-05 up in ASC
20	IL20RB	-1.96724285714286	4.64805716132334e-05 up in ASC
21	CFB	-1.921035	0.00168433791522452 up in ASC
22	GPR126	-1.9176	3.63637572798295e-06 up in ASC
23	TNFAIP6	-1.91547785714286	0.0027659270565856 up in ASC
24	IFIT1	-1.901135	6.02241078396148e-07 up in ASC
25	F2R	-1.87842142857143	7.05854557149622e-05 up in ASC
26	TEK	-1.86582285714286	3.33524831905485e-06 up in ASC
27	PTPRD	-1.85494357142857	3.29051970739611e-05 up in ASC
28	SCARA5	-1.85043285714286	0.0186622970935895 up in ASC
29	POSTN	-1.84631285714286	0.00030668789310526 up in ASC
30	RHOJ	-1.844265	2.88601813824584e-06 up in ASC
31	ZIC1	-1.84351928571429	1.33842155925639e-06 up in ASC
32	ATF5	-1.83963214285714	0.000297753612062497 up in ASC
33	ACSL5	-1.83381142857143	1.00514292945606e-06 up in ASC
34	COL15A1	-1.82358785714286	0.00107344142801358 up in ASC
35	FIGF	-1.82035214285714	0.00201474203275271 up in ASC
36	CXCL2	-1.80986071428572	0.000251960328806198 up in ASC
37	ICAM1	-1.80035857142857	5.9803806225385e-06 up in ASC
38	PKDCC	-1.79568571428572	1.54763428467267e-06 up in ASC
39	CTSK	-1.79133571428571	0.0189532306699643 up in ASC
40	IFIT2	-1.77792857142857	4.6886286214047e-07 up in ASC
41	PCOLCE2	-1.76440714285714	2.66848642741027e-05 up in ASC
42	EPHA4	-1.75133214285714	3.07913461936299e-06 up in ASC
43	HSPB6	-1.74759357142857	2.88601813824584e-06 up in ASC
44	PAMR1	-1.74615357142857	0.000124553321842227 up in ASC
45	NCALD	-1.74206142857143	5.4824453937803e-07 up in ASC
46	LRRN4CL	-1.72323428571429	0.00225333626801982 up in ASC
47	ITGA4	-1.71371	1.87619924774387e-05 up in ASC
48	ASPA	-1.70771785714286	0.000785561269799807 up in ASC
49	ACVRL1	-1.69122642857143	1.31546824288047e-07 up in ASC
50	PTGIS	-1.68928214285714	6.76958788516782e-05 up in ASC
51	LIPA	-1.68868142857143	4.80744331380847e-10 up in ASC
52	RGS2	-1.684525	2.86323135544697e-05 up in ASC
53	SEMA3A	-1.66923285714286	0.000134780409366874 up in ASC
54	CDON	-1.66421357142857	0.00467506230354824 up in ASC
55	ARHGAP26	-1.65325142857143	2.97377242759402e-05 up in ASC
56	GPX3	-1.64621571428571	0.00209003357551985 up in ASC
57	FGL2	-1.64006	0.00235683796604514 up in ASC
58	PBX1	-1.62944642857143	2.92384956030814e-07 up in ASC
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BMMSC_ASC

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3	LOC339524	-1.62433642857143	0.000391720034173944	up in ASC
4	PSG5	-1.61398142857143	0.00300644751152753	up in ASC
5	GFPT2	-1.61295928571429	1.56265247396999e-05	up in ASC
6	C2	-1.58976428571429	0.000137700255618607	up in ASC
7	SMPDL3A	-1.58728785714286	2.79970809065727e-05	up in ASC
8	FLRT2	-1.58281928571429	0.00030668789310526	up in ASC
9	TENM3	-1.58228428571429	9.98464834618136e-06	up in ASC
10	HTRA3	-1.57382357142857	0.000316448168010357	up in ASC
11	PEG10	-1.56203571428572	9.84604015356814e-05	up in ASC
12	GIPC2	-1.54454142857143	1.05626099810779e-06	up in ASC
13	KIAA1549L	-1.53977071428572	2.05009365053441e-07	up in ASC
14	ZFPM2	-1.52431357142857	8.1665966516004e-08	up in ASC
15	ARHGAP20	-1.52078642857143	7.76225492495605e-05	up in ASC
16	ANGPTL2	-1.51916642857143	0.00341821176148763	up in ASC
17	ARHGAP29	-1.51498142857143	1.17618277387232e-05	up in ASC
18	SPON1	-1.50645142857143	0.000767298838210192	up in ASC
19	CELF2	-1.50124857142857	6.35123331690089e-06	up in ASC
20	EVI2B	-1.484125	0.0143901032983557	up in ASC
21	VEPH1	-1.4835	0.000166982573691603	up in ASC
22	PCBP3	-1.47792428571429	3.47999629393266e-05	up in ASC
23	IFIT3	-1.47732928571429	1.33842155925639e-06	up in ASC
24	DNM1	-1.47236714285714	0.000158201606827228	up in ASC
25	TCF4	-1.46823285714286	3.91386431324889e-06	up in ASC
26	MEDAG	-1.464005	6.65366196341341e-06	up in ASC
27	ADAMTS15	-1.46199928571429	0.00304439256689202	up in ASC
28	TRH	-1.46115642857143	0.023030330812122	up in ASC
29	KLF4	-1.45841214285714	3.32416849762155e-05	up in ASC
30	SECTM1	-1.44671857142857	0.00209213005562063	up in ASC
31	MGST1	-1.43439928571429	8.42201919563482e-07	up in ASC
32	SLC9A9	-1.42685785714286	0.00444858805578067	up in ASC
33	TFPI2	-1.42205357142857	0.0168593936925093	up in ASC
34	LRRC32	-1.42012357142857	3.64201970780097e-05	up in ASC
35	CCND2	-1.41416571428571	0.000420799761546126	up in ASC
36	MXRA5	-1.40950357142857	0.00120193423648645	up in ASC
37	MARCH3	-1.40412285714286	2.12851047678775e-05	up in ASC
38	AHNAK2	-1.39889214285714	0.000310668234846609	up in ASC
39	SFRP4	-1.38748428571429	0.0225320484785374	up in ASC
40	CLEC2B	-1.38481357142857	6.56101249621041e-06	up in ASC
41	F10	-1.38451857142857	2.55594421981416e-05	up in ASC
42	PODN	-1.38393	0.00337126544826341	up in ASC
43	CXCL1	-1.37765357142857	0.000802193688014944	up in ASC
44	PLIN2	-1.37593357142857	1.17797632235701e-05	up in ASC
45	ID2	-1.37419214285714	0.000183680377673424	up in ASC
46	THBD	-1.36934071428571	0.000159906358442312	up in ASC
47	CLU	-1.36279	0.0175734059366226	up in ASC
48	OSBPL8	-1.35395857142857	3.80858413188587e-06	up in ASC
49	NFIA	-1.35223142857143	1.81278949263881e-07	up in ASC
50	GRK5	-1.34969285714286	3.53951702319286e-05	up in ASC
51	FAM65B	-1.34871071428571	6.95966055199295e-06	up in ASC
52	KCNK2	-1.34283142857143	0.000852881322897029	up in ASC
53	GALNT13	-1.33216642857143	0.00111449894692863	up in ASC
54	SRPX	-1.32827428571429	0.00463350202833022	up in ASC
55	PRICKLE2	-1.32824357142857	2.11721681581043e-05	up in ASC
56	MAPK13	-1.32702642857143	2.61789704482416e-05	up in ASC
57	RARRES2	-1.32418	0.000895373294033379	up in ASC
58	COLEC12	-1.32155071428571	0.0200164526282781	up in ASC
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3	DEPTOR	-1.32026714285714	0.00429349876065289 up in ASC
4	FZD4	-1.31703928571429	3.796963591276e-06 up in ASC
5	AK5	-1.31637285714286	0.000338524550853082 up in ASC
6	TMTC2	-1.31420357142857	1.33842155925639e-06 up in ASC
7	RRAD	-1.31402214285714	0.00411497153405644 up in ASC
8	MOCOS	-1.31183	0.00158976457051268 up in ASC
9	LACC1	-1.30328428571429	0.00636863920011217 up in ASC
10	CLIC2	-1.30238928571429	0.00576026679966089 up in ASC
11	TRIM2	-1.29363928571429	4.25347650122244e-07 up in ASC
12	GPC6	-1.29324571428571	0.00508142877612552 up in ASC
13	ARHGAP24	-1.29259428571429	4.44052009987685e-06 up in ASC
14	EGFL6	-1.28036642857143	0.0129923696546639 up in ASC
15	ROR2	-1.27628285714286	0.00110238536779823 up in ASC
16	AMPD3	-1.27544357142857	6.31158950324403e-05 up in ASC
17	CFD	-1.275355	0.0119529190824003 up in ASC
18	MX2	-1.27440357142857	0.000698056075478424 up in ASC
19	CAMK2N1	-1.27436714285714	0.000150652042610323 up in ASC
20	SCG5	-1.26718642857143	4.2794887985272e-06 up in ASC
21	LOC645166	-1.25779928571429	0.00360745255372438 up in ASC
22	C3orf55	-1.25538357142857	9.64780694930967e-06 up in ASC
23	SERPINF1	-1.24908142857143	0.00382782446731462 up in ASC
24	ANGPTL1	-1.23418214285714	6.06209050171406e-06 up in ASC
25	FBLN5	-1.23321142857143	5.47960662067932e-06 up in ASC
26	AOX1	-1.22856428571429	0.00263911930251506 up in ASC
27	COMP	-1.22608	0.0141486015383082 up in ASC
28	AKR1C2	-1.22188857142857	0.00904377516591698 up in ASC
29	TBX15	-1.21733071428571	5.27815346972667e-05 up in ASC
30	NAMPT	-1.207455	3.35911866897314e-05 up in ASC
31	GAS7	-1.20567428571429	2.08176589790215e-06 up in ASC
32	NPAS2	-1.20261928571429	9.84604015356814e-05 up in ASC
33	GEM	-1.20101357142857	0.0157817924522544 up in ASC
34	PTGFR	-1.19577071428572	0.00212117150073337 up in ASC
35	IER2	-1.19513571428571	1.75506349745616e-06 up in ASC
36	F2RL2	-1.193875	0.0356790500107969 up in ASC
37	IL1R1	-1.18695071428571	0.0015306603301956 up in ASC
38	THRB	-1.18645571428571	3.9636765605298e-06 up in ASC
39	SVEP1	-1.18337142857143	8.43676532030909e-05 up in ASC
40	MIR503HG	-1.17227357142857	0.00135558724071762 up in ASC
41	PSG7	-1.17137571428572	0.00173338884031492 up in ASC
42	C15orf61	-1.16708857142857	5.71641243781892e-05 up in ASC
43	RASSF2	-1.16608928571429	0.000608300216502543 up in ASC
44	INMT	-1.16605785714286	2.44423017385249e-05 up in ASC
45	MANBA	-1.16306071428572	6.80203539321826e-05 up in ASC
46	RUNX1T1	-1.15477357142857	5.74478450390971e-07 up in ASC
47	PLAGL1	-1.14891214285714	7.06674371309446e-07 up in ASC
48	NFKBIA	-1.14818928571429	0.001742920808594 up in ASC
49	TMEM204	-1.14308	1.8894135359589e-06 up in ASC
50	TMEM45A	-1.14005928571429	0.000135218031091024 up in ASC
51	MEIS2	-1.13789642857143	1.00682781892392e-05 up in ASC
52	ENOX1	-1.137465	3.80858413188587e-06 up in ASC
53	OSR1	-1.13548	0.00241997927228252 up in ASC
54	SLC2A5	-1.13180071428572	0.0169597720229562 up in ASC
55	HES1	-1.13136857142857	0.00713826341207731 up in ASC
56	PIP4K2A	-1.13095357142857	2.67978378583122e-06 up in ASC
57	FAM102B	-1.13091285714286	0.00111769731971507 up in ASC
58	FMO1	-1.12941642857143	0.00371307856752801 up in ASC
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3	RGCC	-1.12515142857143	0.00419533479888641	up in ASC
4	SIM1	-1.11521142857143	1.77180881571643e-05	up in ASC
5	LMO3	-1.11031214285714	0.000485884284810957	up in ASC
6	BMPER	-1.10576214285714	0.000866190470747666	up in ASC
7	NFIB	-1.10122642857143	1.68171082946714e-05	up in ASC
8	MSC	-1.09927357142857	0.00121651658037076	up in ASC
9	ALDH1A3	-1.09628071428571	0.00139636960677253	up in ASC
10	PROCR	-1.09604928571429	0.000357804537994488	up in ASC
11	NHSL1	-1.09603785714286	4.44052009987685e-06	up in ASC
12	BEX4	-1.09491928571429	4.19788179757301e-05	up in ASC
13	ZFP36	-1.09331642857143	0.000683725904637757	up in ASC
14	SASH1	-1.086715	4.74076823567839e-05	up in ASC
15	PLTP	-1.08029	0.0226853006335641	up in ASC
16	GCH1	-1.07657571428571	1.90974235155188e-05	up in ASC
17	ELFN1	-1.07568857142857	0.0027550643934945	up in ASC
18	PIK3IP1	-1.07495214285714	0.00135667504797265	up in ASC
19	SNORA28	-1.07391785714286	0.00388133684981159	up in ASC
20	XG	-1.07342	4.46711794036344e-05	up in ASC
21	HS3ST3B1	-1.06624571428571	0.000485884284810957	up in ASC
22	MYH2	-1.06468	0.00440697293341994	up in ASC
23	TMEM154	-1.05942785714286	9.87566057255049e-05	up in ASC
24	FAIM2	-1.05938785714286	0.00284463316885691	up in ASC
25	SBSN	-1.05538785714286	0.0127986526252902	up in ASC
26	L3MBTL3	-1.05494571428571	7.82592542956559e-06	up in ASC
27	ADA	-1.05387142857143	0.000118029239081963	up in ASC
28	MYC	-1.05103357142857	7.75696584646664e-05	up in ASC
29	LPXN	-1.04811785714286	0.00122609709067739	up in ASC
30	SLC24A6	-1.04281571428571	6.79684602311985e-06	up in ASC
31	SOD3	-1.04280714285714	3.26674233006005e-05	up in ASC
32	TLE1	-1.03763785714286	3.88859486398234e-05	up in ASC
33	LAMA4	-1.03398714285714	0.00325694578976244	up in ASC
34	PRR15	-1.03013071428571	0.000301531013463812	up in ASC
35	ETS2	-1.02898214285714	2.55594421981416e-05	up in ASC
36	MFAP5	-1.0253	0.000154319142814572	up in ASC
37	TRIM25	-1.02495571428571	5.47960662067932e-06	up in ASC
38	PTGFRN	-1.02395142857143	0.000889992470573248	up in ASC
39	DIRC1	-1.01967071428572	0.00282330774672993	up in ASC
40	GADD45B	-1.015865	0.00121651658037076	up in ASC
41	SFRP1	-1.010615	0.0282146185132338	up in ASC
42	SNORD113	-1.01042285714286	0.000137459691744442	up in ASC
43	DES	-1.01016357142857	0.0254621695276201	up in ASC
44	JUNB	-1.01014642857143	0.000625487566427813	up in ASC
45	REV3L	-1.00990142857143	0.000104263170701882	up in ASC
46	SRGAP1	-1.005335	1.15138592609975e-07	up in ASC
47	SOCS3	-1.00406071428571	0.00429919629650449	up in ASC
48	PHF17	-1.00386357142857	0.00022920464806118	up in ASC
49	SPOCK1	-0.999282142857144	5.27815346972667e-05	up in ASC
50	LDLR	-0.993447857142858	0.00288501234358149	up in ASC
51	INSIG1	-0.990853571428573	0.00432142473979418	up in ASC
52	GLI3	-0.985524285714287	0.00375453468492691	up in ASC
53	KLF3	-0.974468571428572	6.35123331690089e-06	up in ASC
54	CD34	-0.971577142857143	0.0240334277837186	up in ASC
55	SIRPA	-0.96962642857143	1.44727324428933e-05	up in ASC
56	CLGN	-0.966683571428572	0.000492165099917803	up in ASC
57	ROBO1	-0.965389285714287	0.000111267602501226	up in ASC
58	CYB5A	-0.956630000000001	0.00037718698108056	up in ASC
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3	SGK1	-0.954340000000001	0.0084239290349614 up in ASC
4	MAP3K8	-0.947565	0.00013654502941457 up in ASC
5	NDFIP2	-0.936962142857144	9.64780694930967e-06 up in ASC
6	GPC3	-0.935747857142858	0.00418763717628713 up in ASC
7	FAM20A	-0.934345714285715	0.00390993756376946 up in ASC
8	CTSL1	-0.931207142857144	0.00206177535811103 up in ASC
9	BCHE	-0.93097	0.00473740453377519 up in ASC
10	ADCY3	-0.929613571428573	0.00278263550999211 up in ASC
11	SH2D4A	-0.927810714285715	0.00107801728742291 up in ASC
12	TMEM88	-0.927721428571428	0.00039052997072018 up in ASC
13	ARHGEF3	-0.926652857142857	0.0350111233512884 up in ASC
14	SGCE	-0.926214285714286	3.22349412313321e-05 up in ASC
15	ADAM10	-0.923468571428573	2.65168638048625e-05 up in ASC
16	NID1	-0.918957142857143	0.00017081412240877 up in ASC
17	C1S	-0.918635714285715	0.00465826723231851 up in ASC
18	OTUD1	-0.918528571428572	0.00025771538102909 up in ASC
19	CDC42EP2	-0.916729285714286	4.55247073535214e-05 up in ASC
20	RECK	-0.916612857142858	3.98217501371235e-07 up in ASC
21	ITM2A	-0.916428571428572	0.00415687081597606 up in ASC
22	GUCY1A2	-0.91572	0.00458966500417532 up in ASC
23	PLCL2	-0.914480000000001	4.91862480103249e-05 up in ASC
24	PCDH18	-0.912065714285716	0.00278105558784855 up in ASC
25	KIAA1467	-0.91032	2.97237266610654e-05 up in ASC
26	CXCR7	-0.908408571428572	0.00034701216141760 up in ASC
27	ZEB1	-0.906569285714286	1.8380152091048e-05 up in ASC
28	ST3GAL5	-0.906432142857144	0.00049745386951473 up in ASC
29	DAAM1	-0.906320714285715	2.61789704482416e-05 up in ASC
30	KPNA2	-0.905060000000001	0.00273237578664008 up in ASC
31	ECM1	-0.899725714285715	0.00016829846448460 up in ASC
32	SAT1	-0.898322857142858	1.7979973705389e-05 up in ASC
33	IFI27	-0.894330714285716	0.00829206582493307 up in ASC
34	CLEC14A	-0.890364285714286	0.00847103659450832 up in ASC
35	HOXC8	-0.889992857142858	0.00044052834653643 up in ASC
36	JAK1	-0.889912142857144	1.16758851055226e-06 up in ASC
37	SLC43A3	-0.883415714285715	0.00644683994043272 up in ASC
38	KIT	-0.882863571428572	0.00135558724071762 up in ASC
39	MIR24-2	-0.881687857142857	0.0101794499031067 up in ASC
40	TCF7L2	-0.876175714285716	2.75921547795808e-05 up in ASC
41	CARHSP1	-0.874939285714286	0.00010687756035173 up in ASC
42	SPHK1	-0.873981428571429	0.00414769256749449 up in ASC
43	CYP19A1	-0.873141428571429	0.00279324216576266 up in ASC
44	NPR1	-0.870380714285715	0.00046178915924544 up in ASC
45	ANPEP	-0.866792857142857	0.00015119937456488 up in ASC
46	USP53	-0.865159285714287	0.0425569918211469 up in ASC
47	CNKS2	-0.864987142857144	0.00033970344163980 up in ASC
48	MSMO1	-0.864757142857144	0.00047914972506049 up in ASC
49	ATF3	-0.863776428571429	0.00043419684309985 up in ASC
50	TMTC1	-0.859984285714285	0.0036679769691224 up in ASC
51	SLC38A1	-0.859203571428573	0.0270101981357826 up in ASC
52	CCDC51	-0.859092857142858	0.00051756503532557 up in ASC
53	COL3A1	-0.858592857142858	1.61780393520458e-05 up in ASC
54	ZC3H12A	-0.855157857142858	0.00231335735480305 up in ASC
55	PPAPDC1A	-0.854443571428571	0.0381024121156307 up in ASC
56	FIBIN	-0.849595000000001	0.00344008470852958 up in ASC
57	MYH10	-0.846805000000001	0.0160372528643194 up in ASC
58	CTSH	-0.842566428571428	0.0106333151746371 up in ASC
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3	DFNA5	-0.842207857142858	0.00444913155171649	up in ASC
4	SNORD114	-0.836414285714286	5.71641243781892e-05	up in ASC
5	SH3D19	-0.835042142857144	1.0458338387964e-05	up in ASC
6	FMOD	-0.833417857142858	0.0018188763886145	up in ASC
7	KRT8	-0.833065714285714	0.0335262458182951	up in ASC
8	KCND3	-0.829983571428572	0.00178907206009697	up in ASC
9	PRRX1	-0.82925	0.000382218083776076	up in ASC
10	PLA2G5	-0.828751428571429	0.0145561484496372	up in ASC
11	EMX2	-0.826877857142857	2.32492601502069e-05	up in ASC
12	AASS	-0.823190000000001	3.23813628673418e-06	up in ASC
13	HSD17B14	-0.821715000000001	0.000193274448452493	up in ASC
14	PTPRB	-0.821146428571429	0.0283039078510412	up in ASC
15	KLHL2	-0.819451428571429	0.000205620485214877	up in ASC
16	TSPAN5	-0.818452142857143	0.00114286734964582	up in ASC
17	GFRA1	-0.816273571428573	0.0407165300005877	up in ASC
18	NFKBIZ	-0.814296428571428	0.00107344142801358	up in ASC
19	PRDM1	-0.813992142857143	0.00495549178883003	up in ASC
20	SLC27A3	-0.813442857142858	0.00963214385229256	up in ASC
21	ADRA2A	-0.810297857142857	3.29051970739611e-05	up in ASC
22	IGSF10	-0.807753571428572	0.0099403412718357	up in ASC
23	APOL3	-0.807668571428572	0.00664101947815907	up in ASC
24	ADAM12	-0.806783571428571	0.00122798608706184	up in ASC
25	ZNF436	-0.805299285714287	0.0441171029905364	up in ASC
26	FAM198B	-0.803661428571428	0.000158201606827228	up in ASC
27	FOXN3	-0.799961428571429	0.000137459691744442	up in ASC
28	ADH1C	-0.798897142857144	0.00833252706928246	up in ASC
29	CCDC69	-0.793531428571429	0.0304518424229819	up in ASC
30	PERP	-0.792833571428572	0.000616003340334583	up in ASC
31	LSAMP	-0.789148571428572	0.0289402583280397	up in ASC
32	IPO5	-0.789137857142858	1.41596952745788e-05	up in ASC
33	PHACTR2	-0.786019285714286	2.86048590483382e-05	up in ASC
34	FAM101B	-0.783565000000001	0.0225675315918725	up in ASC
35	VAT1	-0.782795000000001	1.68710413163349e-06	up in ASC
36	C11orf96	-0.782291428571429	0.00367024510184901	up in ASC
37	HSD3B7	-0.782177142857144	9.25845776300144e-05	up in ASC
38	BHMT2	-0.781144285714285	0.000362235997173565	up in ASC
39	SKP2	-0.780715	0.000143034483437358	up in ASC
40	SCRN1	-0.780112857142859	1.18281486234288e-05	up in ASC
41	HSPB8	-0.777120000000001	0.000484989746379345	up in ASC
42	TRANK1	-0.775358571428572	0.00391376164621777	up in ASC
43	FUT8	-0.774903571428572	7.19411261139464e-05	up in ASC
44	SERPING1	-0.774674285714287	0.033526031831002	up in ASC
45	NMI	-0.773333571428572	0.000175913033770113	up in ASC
46	PNRC1	-0.772888571428572	0.00113599885890731	up in ASC
47	IER3	-0.771386428571428	0.0103151475376783	up in ASC
48	ABHD4	-0.766545	0.00197130175459773	up in ASC
49	PSMG3	-0.765033571428572	7.23354355064945e-05	up in ASC
50	MCL1	-0.762521428571429	7.21040666792476e-05	up in ASC
51	DRAM1	-0.761510714285715	0.00458966500417532	up in ASC
52	APOL1	-0.761117142857143	0.016842276104443	up in ASC
53	ADH1A	-0.756088571428571	0.0256703975488116	up in ASC
54	RARRES1	-0.756040714285715	0.00774553968400783	up in ASC
55	XPC	-0.754557142857143	0.000113288397327595	up in ASC
56	STARD4	-0.753906428571429	0.00224721823904455	up in ASC
57	CACNB4	-0.752360714285715	0.00326969738670461	up in ASC
58	HMOX1	-0.749974285714286	0.0026897427596087	up in ASC
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3	CSF1	-0.748986428571429	0.0055798608551632	up in ASC
4	PDE3A	-0.748474285714286	0.000198044803490766	up in ASC
5	COBLL1	-0.746702857142858	0.00547559070139257	up in ASC
6	CARD6	-0.746403571428572	0.00023539109357941	up in ASC
7	C1R	-0.745630000000002	0.0219111495572216	up in ASC
8	AIF1L	-0.744080714285714	0.0170718916416179	up in ASC
9	TNNT3	-0.739762857142858	0.00742677144156541	up in ASC
10	BIN1	-0.738621428571429	0.00066034755453085	up in ASC
11	MBNL2	-0.73739142857143	0.00010773540112537	up in ASC
12	ADAMTSL4	-0.737198571428571	0.0178736971169606	up in ASC
13	MAN2A1	-0.733675714285715	0.000114196972093364	up in ASC
14	KLF11	-0.733177142857143	0.00126843896241062	up in ASC
15	BOC	-0.731488571428572	0.00385847197066384	up in ASC
16	LRCH2	-0.727957857142858	0.000137459691744442	up in ASC
17	FGF9	-0.726094285714286	0.0101713139565908	up in ASC
18	ELTD1	-0.725905	0.0226465048823655	up in ASC
19	CCNL1	-0.725256428571429	0.00127966042212544	up in ASC
20	MAP2K5	-0.72512642857143	0.00254923272225159	up in ASC
21	SNAI2	-0.720611428571429	0.00161853131829757	up in ASC
22	CDCA7L	-0.718425714285715	0.00627749774439156	up in ASC
23	ZHX2	-0.716500000000001	0.00010018181233861	up in ASC
24	MGLL	-0.714730714285715	0.00162506331761174	up in ASC
25	SSTR1	-0.713652857142857	1.90974235155188e-05	up in ASC
26	RBBP8	-0.713322142857144	0.000398552874429969	up in ASC
27	SH3PXD2A	-0.711953571428572	0.00341821176148763	up in ASC
28	ISLR	-0.709980714285714	0.00121651658037076	up in ASC
29	CHN1	-0.709606428571428	0.00481750107259376	up in ASC
30	EIF4A3	-0.708889285714287	0.000190388144896192	up in ASC
31	IFI16	-0.708222142857144	0.0026897427596087	up in ASC
32	BMP6	-0.706452142857143	0.0122200870119739	up in ASC
33	KCNJ15	-0.705764285714285	0.000947318504779624	up in ASC
34	SERPINB9	-0.705062142857143	5.73797748218996e-06	up in ASC
35	SFRP2	-0.704841428571429	0.0229153745994362	up in ASC
36	IRF1	-0.703852142857143	0.00444444799464359	up in ASC
37	EDA2R	-0.703845714285715	0.0022568887228799	up in ASC
38	SWAP70	-0.702938571428572	2.86323135544697e-05	up in ASC
39	C1QTNF1	-0.700822857142858	2.26732653623845e-05	up in ASC
40	TMEM97	-0.698642142857143	0.000866726656201762	up in ASC
41	FUCA2	-0.698586428571429	0.000135574978448793	up in ASC
42	ULBP1	-0.698342142857143	0.00119030881716711	up in ASC
43	CSTF2T	-0.698306428571429	0.000307396048150493	up in ASC
44	NRK	-0.697354285714286	0.00909890616091105	up in ASC
45	FADS1	-0.696461428571429	0.00847950427380798	up in ASC
46	CUTC	-0.693000714285715	0.00175385002741226	up in ASC
47	SLC35F2	-0.692292142857143	0.020742290758758	up in ASC
48	PGRMC2	-0.690785000000001	1.42844158128008e-06	up in ASC
49	FOSB	-0.68824642857143	0.0238042470862579	up in ASC
50	IGFBP3	-0.687407142857145	0.00182136975168594	up in ASC
51	HS3ST3A1	-0.683715	0.00121651658037076	up in ASC
52	DENND2A	-0.683390714285715	0.00953178212004114	up in ASC
53	ABCA1	-0.683236428571429	0.0190782198252027	up in ASC
54	PGM5P2	-0.68304	0.00193780181337267	up in ASC
55	RNF168	-0.681337857142858	9.71537436461977e-05	up in ASC
56	MBP	-0.681227857142858	0.000186034753698367	up in ASC
57	RMND5A	-0.679972857142858	0.00219661985066172	up in ASC
58	EPB41L4A	-0.678097857142857	0.00914340653538892	up in ASC
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3	MIR503	-0.676767142857143	0.00445065210586196	up in ASC
4	SYT15	-0.676263571428572	0.0254701408836453	up in ASC
5	GNG11	-0.675125000000001	0.0121668122529901	up in ASC
6	SOS1	-0.673019285714286	0.00534505475016872	up in ASC
7	MIR21	-0.671251428571429	0.0153315316539811	up in ASC
8	SEMA3C	-0.670643571428572	0.012724010482248	up in ASC
9	IL6ST	-0.669120714285716	0.0298967636701939	up in ASC
10	PTER	-0.668640000000001	0.00305007878036109	up in ASC
11	SLCO2A1	-0.667917142857143	0.00265235114298247	up in ASC
12	ANO4	-0.667643571428572	0.00206294650374361	up in ASC
13	NFIL3	-0.667324285714287	0.00258353652704136	up in ASC
14	HTR2B	-0.667008571428572	0.00733970920405063	up in ASC
15	TGFBR2	-0.66458	0.00834921587139266	up in ASC
16	TMEM119	-0.662847857142858	0.0308293473074558	up in ASC
17	SPRY2	-0.661184285714286	0.0477565268886327	up in ASC
18	PTK2B	-0.661022142857143	0.0026897427596087	up in ASC
19	YBX3	-0.660727857142858	8.12262785939326e-05	up in ASC
20	SDC1	-0.660637857142857	0.00868503356742502	up in ASC
21	PLK3	-0.660484285714286	0.000192736413843794	up in ASC
22	PMP22	-0.659962142857144	0.00574989231827327	up in ASC
23	SNORD30	-0.658609285714286	0.00239804259397576	up in ASC
24	ADH5	-0.657465000000002	7.71101023418462e-05	up in ASC
25	IL4R	-0.656755714285714	0.00068362829508033	up in ASC
26	FILIP1L	-0.654342142857143	4.32180316997851e-05	up in ASC
27	ACSL1	-0.653098571428572	0.00320973736567577	up in ASC
28	FAM3C	-0.650892857142859	0.00165847608204676	up in ASC
29	SNORD3B	-0.650120714285715	0.00260724588108077	up in ASC
30	MAN1A1	-0.648732857142857	0.00176912916974571	up in ASC
31	GNPDA1	-0.648415714285715	0.00342940930694623	up in ASC
32	ZFP36L1	-0.647085714285715	0.00998249132146325	up in ASC
33	GLCE	-0.646947142857143	0.00124487330440862	up in ASC
34	SLC25A45	-0.646781428571429	0.0275647181000382	up in ASC
35	BNIP3	-0.646628571428572	0.0152215581959305	up in ASC
36	DEK	-0.646510000000001	0.0102554241990857	up in ASC
37	WDR34	-0.646155714285715	0.00453813314828098	up in ASC
38	CCNY	-0.643145000000001	0.0226243234082296	up in ASC
39	FAM216A	-0.643108571428572	0.00271097638743778	up in ASC
40	ABT2	-0.642894285714286	0.00112782140679367	up in ASC
41	IMP4	-0.642878571428571	0.0119102758273784	up in ASC
42	NPRL4	-0.641799285714287	2.58951044866272e-05	up in ASC
43	SLC2A11	-0.641000000000001	0.00022257406508676	up in ASC
44	MED7	-0.638832857142858	0.000493132791570083	up in ASC
45	RPS27A	-0.636632142857143	0.000401215262982397	up in ASC
46	SEMA3E	-0.636332857142857	0.0189242747772483	up in ASC
47	YTHDF4	-0.636280714285715	1.47921786988246e-05	up in ASC
48	NOC4L	-0.635524285714286	0.00329942230646591	up in ASC
49	EED	-0.633875000000001	0.00833397013298927	up in ASC
50	SLC29A4	-0.632715714285715	0.000706609716370389	up in ASC
51	SMARCD3	-0.631077142857143	0.00971265142405427	up in ASC
52	MAPK4	-0.629994285714286	0.00453813314828098	up in ASC
53	UNKL	-0.629390714285715	0.000712469461069069	up in ASC
54	CEP77	-0.625836428571428	8.43138524229563e-05	up in ASC
55	CDK8	-0.625102142857143	0.0251152581801879	up in ASC
56	OAZ2	-0.625053571428572	0.00458966500417532	up in ASC
57	GTF2H3	-0.624985714285715	0.00656139667427301	up in ASC
58	ERCC9	-0.623535	6.65366196341341e-06	up in ASC
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3	PITPNA	-0.622493571428572	0.0371694317178692	up in ASC
4	C10orf91	-0.622219285714286	0.0421078197890687	up in ASC
5	TTC9	-0.621470714285714	0.00121637028038571	up in ASC
6	EMX2	-0.620993571428571	0.0066501429333459	up in ASC
7	RNA5SP37	-0.620462142857144	0.0118843287264657	up in ASC
8	RPL12P12	-0.619923571428572	0.00010134584458299	up in ASC
9	LSM7	-0.619669285714287	3.80858413188587e-06	up in ASC
10	COG3	-0.617917142857143	0.00380342359620407	up in ASC
11	RP11-112J1	-0.617730714285716	0.00029974431835561	up in ASC
12	SAMD4	-0.61676	0.00127861369623913	up in ASC
13	C1orf159	-0.616699285714286	0.00674310652251098	up in ASC
14	RPL7AP67	-0.614457142857143	0.00200549129119987	up in ASC
15	DHX9	-0.611620714285715	0.00397479893872269	up in ASC
16	RPP39	-0.611410714285714	0.000126390753820724	up in ASC
17	WIPI3	-0.609136428571429	0.00127966042212544	up in ASC
18	oct-05	-0.607883571428572	1.50700455805087e-05	up in ASC
19	RIOK4	-0.607607142857143	5.00329068023274e-05	up in ASC
20	ESF2	-0.606896428571429	0.0473181160510266	up in ASC
21	ZNF599	-0.604340000000001	0.00432762178147008	up in ASC
22	PSPC2	-0.603501428571429	0.0324340741201738	up in ASC
23	ABHD17C	-0.603103571428572	2.41552719598921e-05	up in ASC
24	HOXD11	-0.602840714285715	0.000986064097921167	up in ASC
25	BAG6	-0.602364285714286	0.0425569918211469	up in ASC
26	CBFA2T3	-0.601194285714287	0.000537693698032812	up in ASC
27	BUD32	-0.600253571428572	0.00114286734964582	up in ASC
28	RPF3	-0.599535	0.000434196843099853	up in ASC
29	LIMS2	-0.598173571428572	0.00636863920011217	up in ASC
30	UBA53	-0.598017142857144	0.00198797649424914	up in ASC
31	ARHGAP18	-0.594673571428572	0.00100097480294896	up in ASC
32	CCNK	-0.594211428571429	0.00121651658037076	up in ASC
33	PAPOLA	-0.592312857142856	0.0181986929230837	up in ASC
34	USP37	-0.592254285714287	0.0300970570803012	up in ASC
35	WNT5	-0.591270714285715	0.0170718916416179	up in ASC
36	NSUN5P3	-0.590290000000001	0.00320666203761047	up in ASC
37	USP33	-0.589946428571429	0.0173734589062516	up in ASC
38	RPL9	-0.589636428571429	0.00198472866954807	up in ASC
39	TRMT6	-0.589027142857144	0.000852881322897029	up in ASC
40	BRD3	-0.588542142857144	0.0013504137111674	up in ASC
41	TXNRD4	-0.587065	0.000224925277590328	up in ASC
42	RNA5SP49	-0.586914285714286	0.0201686302019454	up in ASC
43	MOB1A	-0.586892857142857	7.96948346358303e-05	up in ASC
44	DACT4	-0.586725000000001	0.00192913293536683	up in ASC
45	PON4	-0.585823571428572	0.000133872005032347	up in ASC
46	ZMYM5	-0.585621428571429	0.000328671235743397	up in ASC
47	RRP2	-0.584753571428571	0.00100317948242807	up in ASC
48	TMEM70	-0.583385714285715	0.00458966500417532	up in ASC
49	AK4	-0.583030000000001	0.0249708780555469	up in ASC
50	CCL12	-0.582463571428572	0.0274467060919603	up in ASC
51	TRPV4	-0.581207142857145	0.000684901173382374	up in ASC
52	EFCAB15	-0.580117857142857	0.000641796777170839	up in ASC
53	GBP5	-0.579850714285714	0.0078456540691582	up in ASC
54	LOC388693	-0.578826428571429	0.000167076087202399	up in ASC
55	ENGASE	-0.578353571428572	0.000540783729089533	up in ASC
56	HSPE2	-0.577522142857143	0.0104510067619933	up in ASC
57	SLC25A47	-0.574206428571429	0.000357804537994489	up in ASC
58	KAT6	-0.573688571428573	0.00260998610674053	up in ASC
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3	ANGEL3	-0.573343571428573	0.00171961172294284	up in ASC
4	RAB7A	-0.572690000000001	0.0152215581959305	up in ASC
5	RPS15	-0.570753571428572	0.00146903392147145	up in ASC
6	METTL21C	-0.569757142857144	0.000195640920997823	up in ASC
7	ZNF8	-0.569755714285714	0.0054121208157348	up in ASC
8	B3GNT9	-0.569240714285715	0.00110556736160901	up in ASC
9	MON3	-0.568297142857143	0.0089847717365267	up in ASC
10	RGPD12	-0.567957142857144	0.00246909560662667	up in ASC
11	RGPD10	-0.566076428571428	0.000696293932645706	up in ASC
12	SF3B2	-0.565712142857144	0.00237982687485825	up in ASC
13	RPS4X	-0.565353571428572	0.000148219087712147	up in ASC
14	RPL25	-0.564825714285715	7.96395294262589e-05	up in ASC
15	RGPD6	-0.564100714285715	0.000866614627279061	up in ASC
16	RTL2	-0.562857857142858	0.005663846023241	up in ASC
17	HTR7P2	-0.562668571428572	1.18281486234288e-05	up in ASC
18	CCAR2	-0.562367142857142	0.00121651658037076	up in ASC
19	G RTP2	-0.561792142857144	0.00128194857388494	up in ASC
20	TMEM231	-0.561383571428572	0.000388447707724664	up in ASC
21	PLA2G1B	-0.560844285714286	0.0115529952096526	up in ASC
22	FAM71E3	-0.559697142857143	0.000260629310071654	up in ASC
23	RPL37AP9	-0.559003571428572	8.28628166082901e-05	up in ASC
24	MTX2	-0.55687	0.0245989195234138	up in ASC
25	RPL15	-0.556823571428573	0.00158298705327752	up in ASC
26	TMEM249	-0.556449285714287	0.00297131719118137	up in ASC
27	ITGA10	-0.555223571428572	0.00545833495491513	up in ASC
28	RPL7	-0.553547857142857	0.00774553968400783	up in ASC
29	RPS14P4	-0.553122142857143	0.00327498536463103	up in ASC
30	ZIC5	-0.553010714285714	0.0103816179616917	up in ASC
31	FRMPD2	-0.552523571428572	0.00337542145080027	up in ASC
32	ZNF17	-0.552249285714287	0.00188922248544383	up in ASC
33	EEF1G	-0.552130000000001	0.00167730973928547	up in ASC
34	YBX2	-0.551634285714287	2.73819461657227e-06	up in ASC
35	ZBTB48	-0.551186428571429	0.00765506062046628	up in ASC
36	IL28	-0.550059285714287	0.00112763725547581	up in ASC
37	KCNQ4	-0.549326428571429	5.2852660272206e-05	up in ASC
38	MNX2	-0.548979285714287	0.00276739694267737	up in ASC
39	CARD9	-0.54851	0.037411357395803	up in ASC
40	VANGL2	-0.548004285714286	0.00201129097251646	up in ASC
41	GAK	-0.547811428571429	0.00196831997389207	up in ASC
42	MIR99A	-0.547565	0.00804802120719685	up in ASC
43	PRPH3	-0.547491428571428	0.00119011919438459	up in ASC
44	RPL13A	-0.546657857142858	5.00329068023274e-05	up in ASC
45	NUPR1L	-0.54662	0.00273044091138283	up in ASC
46	OGFR	-0.544569285714287	0.00148360270464355	up in ASC
47	RPL35A	-0.544516428571429	0.0138215139618864	up in ASC
48	GFOD2	-0.544461428571429	0.0095773319593475	up in ASC
49	NECAB3	-0.543871428571429	0.00418763717628713	up in ASC
50	CISH	-0.543585714285715	0.0112309486009592	up in ASC
51	THOC3	-0.543221428571429	0.00207800466691073	up in ASC
52	HOXD4	-0.542565714285715	0.000434196843099853	up in ASC
53	RPS26	-0.542364285714287	0.0188060552186376	up in ASC
54	RTN2	-0.542320714285715	0.00201474203275271	up in ASC
55	GLIS3-AS2	-0.539802857142857	0.00122532249927663	up in ASC
56	RNF126	-0.539383571428572	0.0047090882666233	up in ASC
57	PTRH3	-0.538775000000001	0.0317203754335784	up in ASC
58	TMEM184A	-0.538775	0.0042167576757356	up in ASC
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3	FLJ41734	-0.537518571428572	0.00409937974062103	up in ASC
4	CCL26	-0.537438571428572	0.0128976396194731	up in ASC
5	CDH10	-0.537412857142857	0.0259613146347305	up in ASC
6	DNM3OS	-0.537372857142858	0.0211957074150466	up in ASC
7	MGST2	-0.536786428571429	0.00833397013298927	up in ASC
8	TNFAIP2	-0.536719285714286	0.0232131959101442	up in ASC
9	BDKRB2	-0.536522142857144	0.0356367560811707	up in ASC
10	SNX5	-0.536148571428572	0.000516932687560987	up in ASC
11	FAM20B	-0.535906428571429	0.00117366232408914	up in ASC
12	RIN3	-0.535418571428571	0.000465827420958766	up in ASC
13	DAB2	-0.534364285714286	0.000663217402820697	up in ASC
14	C15orf41	-0.533490000000001	0.000698412833708087	up in ASC
15	SREBF1	-0.53296142857143	4.8365780991385e-05	up in ASC
16	SDPR	-0.531912857142858	0.00284463316885691	up in ASC
17	BCAT1	-0.530595714285716	0.00203978466148026	up in ASC
18	CD248	-0.529127857142858	0.0264690233163255	up in ASC
19	SFT2D2	-0.527933571428572	0.000116005212100215	up in ASC
20	TCEAL7	-0.526655	0.000193274448452493	up in ASC
21	RPL13	-0.526186428571428	0.0097646876917619	up in ASC
22	SAMD4B	-0.526047142857143	0.000162698868049197	up in ASC
23	RPL22L1	-0.52561	0.00608349874218169	up in ASC
24	TP53INP1	-0.524402142857144	0.0487565358120482	up in ASC
25	RNF122	-0.524199285714286	0.0315009370033968	up in ASC
26	CREG1	-0.523721428571429	0.0406743072234904	up in ASC
27	CD302	-0.522605	0.034683554558478	up in ASC
28	CYB5R2	-0.521252857142858	0.00408502006672916	up in ASC
29	SNORD60	-0.517368571428572	0.0037259214163808	up in ASC
30	SNX33	-0.516493571428572	0.00100097480294896	up in ASC
31	HOXA11	-0.515203571428572	0.000302047626783463	up in ASC
32	RASSF8	-0.514973571428571	0.000223836070752165	up in ASC
33	CXCL6	-0.514919285714286	0.0310689900372974	up in ASC
34	C7orf41	-0.514915714285714	0.00418763717628713	up in ASC
35	MN1	-0.514718571428572	1.82364780542637e-05	up in ASC
36	FRRS1	-0.514475714285714	0.0323920631753154	up in ASC
37	ADH5P4	-0.513829285714286	9.0299566556475e-05	up in ASC
38	GLUL	-0.513261428571429	0.00284468739042783	up in ASC
39	SNORA52	-0.512692857142858	0.000826577038190874	up in ASC
40	C6orf48	-0.512459285714287	0.0117402303408192	up in ASC
41	NDST2	-0.512014999999999	0.00403087420565018	up in ASC
42	IQCK	-0.512007142857143	0.00199902825020069	up in ASC
43	TMEM135	-0.511853571428572	0.0111479753331791	up in ASC
44	H1FX	-0.511752142857143	0.00210158707798652	up in ASC
45	PTGIR	-0.511645714285716	0.0361392949730698	up in ASC
46	PPP5C	-0.511526428571428	0.00023539109357941	up in ASC
47	RPL3	-0.510951428571429	0.00237149082293455	up in ASC
48	HIST1H1D	-0.510889285714286	0.000810109568073059	up in ASC
49	EEF1A1	-0.5106	0.00112782140679367	up in ASC
50	NHEJ1	-0.509913571428571	0.000619594539280747	up in ASC
51	SNORA71A	-0.509742857142857	0.00758110565304133	up in ASC
52	KLHL15	-0.508815714285715	0.0109870694006908	up in ASC
53	GCLM	-0.506892142857144	0.00518580467067252	up in ASC
54	GYPE	-0.506640000000001	0.000440528346536435	up in ASC
55	SLC50A1	-0.506549285714287	3.56187134101598e-05	up in ASC
56	SNORD78	-0.506409285714286	0.0157720763369693	up in ASC
57	MOSPD1	-0.505337857142858	0.00567108851080292	up in ASC
58	HOXC10	-0.50512	0.0211530546534399	up in ASC
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3	TIMP2	-0.504535714285715	0.000404239078387572	up in ASC
4	SNORD114	-0.503637857142857	0.0090872754698336	up in ASC
5	GSTM5	-0.503325000000001	0.0390639230515828	up in ASC
6	DUSP1	-0.502964285714287	0.00808995525648081	up in ASC
7	ZNF385D	-0.502710714285714	0.00121651658037076	up in ASC
8	TSPYL2	-0.502366428571429	0.00458966500417532	up in ASC
9	KDSR	-0.501750714285715	0.00570988434838434	up in ASC
10	NBLA00301	-0.501550714285714	0.000104263170701882	up in ASC
11	ALPK2	-0.501117857142858	0.0154334349501094	up in ASC
12	MAFF	-0.500727857142857	0.00845940951470165	up in ASC
13	APP	-0.499557142857141	0.000308130773383987	up in ASC
14	CCRL1	-0.498695714285714	0.00338103278032422	up in ASC
15	C17orf58	-0.497965000000001	0.00218270263318747	up in ASC
16	ZFAND1	-0.497125714285714	0.00098192870762003	up in ASC
17	RPL31	-0.496442857142859	7.71101023418462e-05	up in ASC
18	COLGALT1	-0.496360714285715	1.46668489885875e-05	up in ASC
19	GLIPR2	-0.495604285714286	0.0130902364422134	up in ASC
20	CMIP	-0.495094285714287	0.0437287308899432	up in ASC
21	SORCS2	-0.495015714285715	0.00229236010310513	up in ASC
22	BZW2	-0.494956428571429	0.00263911930251506	up in ASC
23	GGA2	-0.494342857142857	0.00652274838102399	up in ASC
24	PDZRN3	-0.494210000000001	0.0137782154637771	up in ASC
25	LPCAT1	-0.494193571428571	0.00045661929834942	up in ASC
26	TBC1D8	-0.494015714285715	0.0130358342246756	up in ASC
27	IDI1	-0.493961428571429	0.00135558724071762	up in ASC
28	LY6E	-0.493945714285717	0.00674310652251098	up in ASC
29	GDF10	-0.493737142857143	0.000658728501926127	up in ASC
30	DBN1	-0.492648571428573	0.000436047276410957	up in ASC
31	SNORD44	-0.491158571428571	0.00196719000200083	up in ASC
32	TMEM243	-0.490570714285714	0.00110556736160901	up in ASC
33	ARL15	-0.490145000000001	0.00458966500417532	up in ASC
34	SESN1	-0.489743571428572	0.000290857268496844	up in ASC
35	SNORA45	-0.489190714285714	0.00151797020548578	up in ASC
36	VDR	-0.487942857142859	0.00833397013298927	up in ASC
37	GGA3	-0.487698571428573	0.0010786794814715	up in ASC
38	DHCR7	-0.487440714285715	0.0319785966965354	up in ASC
39	SPG20	-0.487292142857143	0.000669980402860183	up in ASC
40	ARHGAP10	-0.486642142857143	0.00161574314983173	up in ASC
41	WTAP	-0.48644642857143	0.0041038458845851	up in ASC
42	DNMBP	-0.485984285714286	0.0157720763369693	up in ASC
43	PLS3	-0.484504285714287	3.88859486398234e-05	up in ASC
44	FKBP9L	-0.484309285714287	0.000514165397337297	up in ASC
45	SNORD52	-0.483947857142858	0.00122609709067739	up in ASC
46	WDR74	-0.483490714285716	0.000293673836984265	up in ASC
47	CILP	-0.483147142857143	0.0130902364422134	up in ASC
48	SNRPA1	-0.483144285714286	0.0185910633943269	up in ASC
49	GPR124	-0.482591428571429	0.00110363802170553	up in ASC
50	NRBF2	-0.481417857142857	0.0215671992134689	up in ASC
51	PPIF	-0.480609285714287	0.0084208598470791	up in ASC
52	CERS4	-0.479375714285715	0.00913045492730955	up in ASC
53	FMN2	-0.478875714285715	0.0333486835312394	up in ASC
54	TBX3	-0.478703571428571	0.00798154990775891	up in ASC
55	GLRX	-0.478298571428572	0.000847821713590714	up in ASC
56	PTPRH	-0.477514285714286	0.00028291619957344	up in ASC
57	METRNL	-0.477412857142857	0.00541786804669668	up in ASC
58	LOC375295	-0.476834285714286	0.00357040871237621	up in ASC
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		BMMSC_ASC	
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3	ZNF217	-0.476285714285714	0.00234680583185279 up in ASC
4	PLEKHM1	-0.475863571428572	0.0129386296718319 up in ASC
5	BNC2	-0.475743571428572	0.0036322474849844 up in ASC
6	BMPR1B	-0.475497857142857	0.000443361011307528 up in ASC
7	RAB3IL1	-0.472769285714285	0.00166440799190051 up in ASC
8	PHLPP1	-0.47275	0.000339703441639803 up in ASC
9	IL17RA	-0.472745	0.000584670333541106 up in ASC
10	HIST1H2BK	-0.472642142857144	0.0157720763369693 up in ASC
11	SLC16A7	-0.472422857142858	0.00204009636932772 up in ASC
12	ATP2B1	-0.471780714285715	0.00204009636932772 up in ASC
13	RPP40	-0.471042142857144	0.00717103571232023 up in ASC
14	LGI2	-0.470999285714286	0.0191269418073309 up in ASC
15	RALA	-0.470487142857144	0.000193274448452493 up in ASC
16	RPS2	-0.470452142857144	0.0139159381031764 up in ASC
17	ZNF704	-0.469007857142858	0.00411830042179962 up in ASC
18	RNF24	-0.46817	0.000212122343144771 up in ASC
19	TBC1D16	-0.467629285714287	0.000339703441639803 up in ASC
20	SNORD48	-0.467139285714286	0.00678311091099278 up in ASC
21	FAM156A	-0.466372857142858	0.00933667638032123 up in ASC
22	GABBR2	-0.465812857142857	0.026754514714899 up in ASC
23	DOK6	-0.465423571428572	0.00501099367408984 up in ASC
24	NAA38	-0.465230714285714	0.000223822720338192 up in ASC
25	HECTD3	-0.464201428571429	0.00209379523776157 up in ASC
26	GCNT4	-0.464152857142857	0.00983417542313268 up in ASC
27	TAF4B	-0.463972142857144	0.00300071747588125 up in ASC
28	NEDD1	-0.463443571428572	0.00980219842604108 up in ASC
29	AP2A2	-0.463252857142858	0.000568967442170377 up in ASC
30	CDC42EP4	-0.462591428571429	0.0375143227861486 up in ASC
31	EGR1	-0.46206	0.0189169917810225 up in ASC
32	MIR23A	-0.461943571428571	0.0258531654726607 up in ASC
33	RNF149	-0.461822142857144	0.00273237578664008 up in ASC
34	PARP12	-0.461777857142858	0.000431093144840653 up in ASC
35	SAMD12	-0.461525714285715	0.00100317948242807 up in ASC
36	CYP11A1	-0.460935714285715	0.000318811648973876 up in ASC
37	SNORA3	-0.46024142857143	0.0222037620514824 up in ASC
38	OTUD3	-0.459894285714286	0.018961962160769 up in ASC
39	TOB1	-0.458457857142857	0.000718425289560903 up in ASC
40	AVIL	-0.457805000000001	0.00421203330791112 up in ASC
41	BNC1	-0.457613571428572	0.00953178212004114 up in ASC
42	MGME1	-0.457273571428571	0.0335176766176023 up in ASC
43	RPS7	-0.456142857142858	0.00016908282222554 up in ASC
44	SYPL2	-0.456125714285714	0.00545932988763361 up in ASC
45	IFT80	-0.455800000000001	0.0166603279709136 up in ASC
46	EIF2AK3	-0.455765714285715	0.00628132918292547 up in ASC
47	ZBTB44	-0.455177142857143	0.00451119292208765 up in ASC
48	SNORD74	-0.454783571428571	0.00948539671324635 up in ASC
49	SPRED2	-0.453719285714286	0.00127966042212544 up in ASC
50	NCAM2	-0.453654285714286	0.0124034532734058 up in ASC
51	SHISA3	-0.451716428571429	0.0463221088593153 up in ASC
52	CTNS	-0.451392142857143	0.00973082100801025 up in ASC
53	IRS2	-0.451240714285715	0.00038165103121691 up in ASC
54	SCARNA6	-0.451202857142858	0.0219259957152549 up in ASC
55	ATP11A	-0.450345000000001	0.00858291750295332 up in ASC
56	STARD5	-0.450222857142857	0.012592878083495 up in ASC
57	HDAC9	-0.450081428571429	0.00408502006672916 up in ASC
58	WNK4	-0.449587857142857	0.0107949750540894 up in ASC
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3	RP11-220D	-0.449022142857143	0.00127712745024818	up in ASC
4	NEU1	-0.448801428571429	0.0136784770981578	up in ASC
5	RPL7	-0.448757142857142	2.97463259180235e-05	up in ASC
6	SNORD21	-0.44809	0.000928891634773552	up in ASC
7	ELOVL5	-0.446663571428571	1.02377495923698e-05	up in ASC
8	STXBP2	-0.446335714285715	0.0368662065903842	up in ASC
9	LMO4	-0.44549642857143	0.0190212651377584	up in ASC
10	SNORA48	-0.444980000000001	0.00976921493655814	up in ASC
11	RASA3	-0.444354285714286	0.00573571523003409	up in ASC
12	MARCH4	-0.443271428571428	0.0489181461345124	up in ASC
13	MTMR9LP	-0.442913571428572	0.0174142717878346	up in ASC
14	GZF1	-0.44291	0.003664216246458	up in ASC
15	CALHM2	-0.442827857142857	0.0159484046718616	up in ASC
16	SNORD45C	-0.442735	0.00219971224335867	up in ASC
17	LTV1	-0.44194	0.00371307856752801	up in ASC
18	FAP	-0.441900714285715	0.00973082100801025	up in ASC
19	CCDC25	-0.44128142857143	0.000197664600369663	up in ASC
20	AC079250.1	-0.441065714285716	0.00213416011125945	up in ASC
21	EPHX2	-0.440837857142858	0.00387226174470941	up in ASC
22	UST	-0.440743571428571	0.0367333107897084	up in ASC
23	SCARB1	-0.439709285714286	0.00175385002741226	up in ASC
24	KIAA0930	-0.439686428571429	0.0395781583844152	up in ASC
25	PLCD3	-0.439113571428571	0.0191209394688005	up in ASC
26	TNKS1BP1	-0.438686428571429	0.000891659546861583	up in ASC
27	PLAC9	-0.438070714285715	0.006355957084687	up in ASC
28	NR3C2	-0.437472857142858	0.00235758751529767	up in ASC
29	CHN2	-0.436210714285714	0.00386551450267089	up in ASC
30	HRH1	-0.435785	0.0155549927854685	up in ASC
31	PTCH1	-0.435468571428572	0.00103431675590565	up in ASC
32	RHOA	-0.434789285714286	0.0098608640051637	up in ASC
33	FOXO4	-0.434384285714286	0.00168978603220034	up in ASC
34	SLC35F6	-0.433515	0.0211957074150466	up in ASC
35	ZNF438	-0.432503571428572	0.00050444394351372	up in ASC
36	SHOX2	-0.431888571428572	0.00159307343430661	up in ASC
37	HOXC9	-0.43168	0.00070980628716469	up in ASC
38	RP11-282K	-0.431664285714286	0.00158976457051268	up in ASC
39	TSHZ3	-0.431262857142857	0.00229235945639376	up in ASC
40	EMP1	-0.431064285714286	0.00391841350221032	up in ASC
41	CCDC71L	-0.430924285714286	0.000167076087202395	up in ASC
42	NGF	-0.430587142857142	0.0252704250296195	up in ASC
43	ZNF589	-0.430583571428572	0.0038062314802441	up in ASC
44	MGC45800	-0.430040000000001	0.0182205175295526	up in ASC
45	CASP1	-0.428971428571429	0.0412048655284296	up in ASC
46	GLE1	-0.428395714285715	0.00116359223470375	up in ASC
47	ZBTB2	-0.428281428571428	0.0124339402688526	up in ASC
48	SRD5A3	-0.428126428571429	0.00048802883258077	up in ASC
49	POLH	-0.427652857142857	0.012911815124733	up in ASC
50	STAG1	-0.427583571428572	0.00898186207818286	up in ASC
51	CTB-13H5.1	-0.427450000000001	3.61980527058617e-05	up in ASC
52	DGAT2	-0.427254285714286	0.00319979694347413	up in ASC
53	DNAJB1	-0.426962857142858	0.00135667504797265	up in ASC
54	SNORA71C	-0.425935	0.00023539109357941	up in ASC
55	ATG14	-0.424718571428572	0.0200164526282781	up in ASC
56	SIAE	-0.424659285714286	0.0315484212786347	up in ASC
57	MIR1304	-0.423447857142858	0.000974791167809839	up in ASC
58	MAP7D3	-0.423429285714286	0.00160715322505849	up in ASC
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3	NABP1	-0.42289142857143	0.00025771538102909	up in ASC
4	FTL	-0.421992857142859	0.00761986018322436	up in ASC
5	TYMP	-0.421258571428572	0.00368138821320979	up in ASC
6	PLEKHM1P	-0.420708571428572	0.0302328663461681	up in ASC
7	RSL1D1	-0.420485000000001	0.00101945558139798	up in ASC
8	HMGCR	-0.420083571428571	0.0277539090361897	up in ASC
9	CCDC109B	-0.419822142857144	0.013024502721665	up in ASC
10	IRX1	-0.419605	0.00122443385532409	up in ASC
11	SMC6	-0.419340714285715	0.00212363372298484	up in ASC
12	METAP1	-0.419270714285715	0.00382782446731462	up in ASC
13	UBL3	-0.419219285714287	0.0075557840103614	up in ASC
14	PRDM2	-0.418543571428572	0.00045661929834942	up in ASC
15	HENMT1	-0.418538571428572	0.00661517459006755	up in ASC
16	AAED1	-0.418329285714286	0.0289992478504998	up in ASC
17	ARSK	-0.417640000000001	0.000693999662745003	up in ASC
18	NCOA3	-0.417383571428573	0.00108608585979432	up in ASC
19	PEPD	-0.417307142857146	0.00352969464613078	up in ASC
20	RARS2	-0.415801428571429	0.000263840495474619	up in ASC
21	TRIP10	-0.415047857142857	0.000560577373540289	up in ASC
22	C14orf159	-0.415022857142858	0.0242216786685107	up in ASC
23	RBMS3	-0.41460142857143	0.000696293932645706	up in ASC
24	MKI67IP	-0.413862857142858	0.00365833071769013	up in ASC
25	GPR153	-0.413751428571429	6.23680347656646e-05	up in ASC
26	ARHGAP12	-0.413708571428573	0.0104399546597129	up in ASC
27	ADAM32	-0.413182857142858	0.0107404994061401	up in ASC
28	SDCCAG8	-0.412905714285714	0.00382471131282411	up in ASC
29	WNT11	-0.412462857142858	0.00255473889174359	up in ASC
30	NXF1	-0.411813571428571	0.00161405670104878	up in ASC
31	DIEXF	-0.411327142857143	0.0261116030313631	up in ASC
32	USP33	-0.411170000000001	0.00182858305469359	up in ASC
33	PCNX	-0.410276428571429	0.0037259214163808	up in ASC
34	LGMN	-0.410106428571429	0.048900064329054	up in ASC
35	CCNG1	-0.409223571428572	0.0386127567747805	up in ASC
36	ADAM17	-0.408741428571429	0.012414293635248	up in ASC
37	SLIT2	-0.408544285714286	0.0413330144619879	up in ASC
38	APOL4	-0.408202142857142	0.0385411419644529	up in ASC
39	PCDH9	-0.407981428571429	0.00221752789040131	up in ASC
40	PLXNB1	-0.407405714285714	0.00553326730602939	up in ASC
41	HAND2	-0.407130714285715	0.000156031273515044	up in ASC
42	ST3GAL1	-0.406832857142858	0.0447687173673908	up in ASC
43	SNORD14E	-0.406673571428573	0.0315484212786347	up in ASC
44	UTP18	-0.406618571428571	0.00208430969134667	up in ASC
45	GLTSCR2	-0.406495714285716	0.0168717555356745	up in ASC
46	ATXN3	-0.405766428571429	0.00621872693424244	up in ASC
47	HS6ST1	-0.405650714285714	0.0372827184638498	up in ASC
48	HIST1H4F	-0.405065714285715	0.0166334801782176	up in ASC
49	PNRC2	-0.404810000000002	0.00713826341207731	up in ASC
50	PCID2	-0.404300714285715	0.0046832803463579	up in ASC
51	FOXL1	-0.404203571428571	0.00827782772792641	up in ASC
52	CHMP1B	-0.403586428571429	0.0333376489265947	up in ASC
53	ST7	-0.403287857142858	0.0128243741864222	up in ASC
54	GLB1L	-0.402921428571428	0.0143901032983557	up in ASC
55	RP11-592N1	-0.402617857142858	0.00341241370181886	up in ASC
56	FJX1	-0.401926428571428	0.000665806234389226	up in ASC
57	LAMC1	-0.401871428571429	0.00627624178706735	up in ASC
58	KAT2A	-0.401358571428572	0.0232117783549907	up in ASC
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4	KTI12	-0.40068	0.024482306021902	up in ASC
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6	IGFBP6	-0.399584285714287	0.0450360536357845	up in ASC
7	HIST1H3F	-0.399322857142858	0.0210564112264796	up in ASC
8	UBE2D1	-0.398875	0.0244002701617865	up in ASC
9	GLRXP3	-0.398642857142857	7.71101023418462e-05	up in ASC
10	ANKRD49	-0.398265000000001	0.0098608640051637	up in ASC
11	DYRK3	-0.397690714285714	0.00214686082393148	up in ASC
12	SMPD2	-0.397534285714286	0.00273237578664008	up in ASC
13	AC007969.5	-0.397246428571429	0.0112100161042608	up in ASC
14	NECAP2	-0.397245714285715	0.00010018181233861	up in ASC
15	SNORD36B	-0.397202142857143	0.0056275050733253	up in ASC
16	SMG6	-0.396544285714286	0.000308130773383987	up in ASC
17	OPHN1	-0.396351428571429	0.00157777179966645	up in ASC
18	TMEM30B	-0.396258571428571	0.00627327635743431	up in ASC
19	WARS2	-0.395676428571429	0.0208384787817212	up in ASC
20	F11R	-0.395652857142857	0.00550663430775415	up in ASC
21	UROD	-0.394670000000001	0.0221511122179343	up in ASC
22	PLEKHO2	-0.394512142857143	0.00947053704723665	up in ASC
23	FGF16	-0.394197857142857	0.00383997174697746	up in ASC
24	ADAT2	-0.393917142857143	0.00517501233427287	up in ASC
25	AKAP13	-0.393902142857143	0.00150655422916622	up in ASC
26	ARPC1B	-0.393843571428572	0.00045661929834942	up in ASC
27	SNORA68	-0.393299285714286	0.00802396076800502	up in ASC
28	RPS29	-0.393215714285715	0.00739180426352538	up in ASC
29	NT5C3A	-0.393175714285715	0.0144934797852069	up in ASC
30	GSTO1	-0.393114285714286	0.0118016019275632	up in ASC
31	CCDC136	-0.390849285714285	0.00721472894963908	up in ASC
32	RNF2	-0.389712142857143	0.00075245888275224	up in ASC
33	RPS10	-0.389542857142858	0.000696293932645706	up in ASC
34	GABARAPL1	-0.389264285714286	0.0208384787817212	up in ASC
35	TEX10	-0.38851142857143	0.00158718732350969	up in ASC
36	ROR1	-0.387298571428572	0.0190119284898866	up in ASC
37	KCNJ8	-0.386791428571429	0.00172213143662966	up in ASC
38	CDK5RAP3	-0.386325714285715	0.0232131959101442	up in ASC
39	TMEM220	-0.385757142857143	0.0181986929230837	up in ASC
40	A4GALT	-0.385464285714286	0.0157720763369693	up in ASC
41	PGRMC1	-0.385462857142858	0.00166890176724774	up in ASC
42	KNOP1	-0.385407142857144	0.00537509013877366	up in ASC
43	RP11-12M9	-0.385107142857143	0.00189458998177717	up in ASC
44	FAR2	-0.384822857142857	0.0131092841878587	up in ASC
45	RPS24	-0.384140000000001	0.00545477954521995	up in ASC
46	TAX1BP1	-0.382942857142857	0.0015244588888441	up in ASC
47	CDKN1A	-0.382232142857142	0.00291069367040199	up in ASC
48	KLHDC2	-0.381885714285715	0.00647722744587384	up in ASC
49	CD164	-0.381057142857143	0.00185661479850662	up in ASC
50	C15orf59	-0.380812857142857	0.0404677645750834	up in ASC
51	ANXA4	-0.380633571428571	0.00466685610914082	up in ASC
52	MMP14	-0.380244285714287	0.00672387763353373	up in ASC
53	DENND2D	-0.379748571428572	0.000405787504052133	up in ASC
54	TIMP4	-0.379107142857143	0.00121651658037076	up in ASC
55	EIF3E	-0.378948571428571	0.0373165580526206	up in ASC
56	RCC1	-0.378947142857143	0.00217655459560312	up in ASC
57	ASB13	-0.378729285714286	0.00326272495091352	up in ASC
58	HIST1H2BH	-0.378065000000001	0.0390429138418638	up in ASC
59	KATNAL1	-0.377725	0.00365743927505536	up in ASC

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3	PHYKPL	-0.37614642857143	0.00618884123681942	up in ASC
4	ST3GAL4	-0.376131428571428	0.000154149646771794	up in ASC
5	ATG7	-0.376095000000001	0.00404661567425995	up in ASC
6	AXIN2	-0.375748571428572	0.0101794499031067	up in ASC
7	WDR67	-0.375284285714286	0.0259585644605135	up in ASC
8	WDR75	-0.37525642857143	0.00861908399866451	up in ASC
9	CADPS2	-0.37522	0.0389446635880373	up in ASC
10	HEATR1	-0.375207857142857	0.00273237578664008	up in ASC
11	ZNF215	-0.375132142857143	0.00779083116796678	up in ASC
12	KHDRBS3	-0.375053571428572	0.00901061670040579	up in ASC
13	NUDT5	-0.374852857142858	0.000819354135559343	up in ASC
14	MOCS3	-0.374567142857144	0.0371679972906374	up in ASC
15	CECR1	-0.374412857142857	0.0235969505380006	up in ASC
16	OXNAD1	-0.374321428571429	0.00696476332076913	up in ASC
17	C2orf88	-0.374237142857143	0.00245700907096856	up in ASC
18	RNF212	-0.374002857142858	0.0157376946264464	up in ASC
19	RPL35P5	-0.373475	0.0150544609181704	up in ASC
20	IER5	-0.372955000000001	0.00299283236506915	up in ASC
21	PRKG2	-0.372644285714286	0.0294752699962034	up in ASC
22	MTMR10	-0.372383571428572	0.0191077685744263	up in ASC
23	AC144530.1	-0.372081428571429	0.00403944151747112	up in ASC
24	RPL7A	-0.371300714285714	0.00329942230646591	up in ASC
25	NKIRAS1	-0.371070714285715	0.0036679769691224	up in ASC
26	TIMM13	-0.370978571428571	0.00229513707764353	up in ASC
27	KCNS2	-0.37086	0.0157720763369693	up in ASC
28	COL4A3BP	-0.37048	0.00946143766674552	up in ASC
29	SCO1	-0.370169285714287	0.0239765506303464	up in ASC
30	RPS5	-0.370102142857144	0.0120169937237247	up in ASC
31	ACAD10	-0.369846428571429	0.00198824819835885	up in ASC
32	RABGEF1	-0.369715714285716	0.00032778144855644	up in ASC
33	FAM156B	-0.369439285714287	0.00966016605202553	up in ASC
34	TRAK1	-0.369057142857143	0.000958452141646348	up in ASC
35	FOS	-0.368842857142857	0.0376468812026216	up in ASC
36	FAM102A	-0.368734285714286	0.00520041326528301	up in ASC
37	MAB21L1	-0.368677857142858	0.0298365058294026	up in ASC
38	ELF1	-0.36833642857143	0.0288873660613564	up in ASC
39	FAM174B	-0.368298571428572	0.00396097253555887	up in ASC
40	USP44	-0.368207857142858	0.00164162049071859	up in ASC
41	VRK3	-0.367997142857143	0.00905080625645202	up in ASC
42	RPS13	-0.367700000000002	0.00301983250420121	up in ASC
43	SNORD38A	-0.36757142857143	0.00365290963828065	up in ASC
44	CIRH1A	-0.367284285714287	0.0017827507959915	up in ASC
45	CEBPB	-0.367180714285715	0.00321507790899755	up in ASC
46	LOC100129	-0.366748571428572	0.0223933710714311	up in ASC
47	SEPSECS	-0.366702142857143	0.00556770850863552	up in ASC
48	TNFRSF10E	-0.36570642857143	0.032491144568936	up in ASC
49	RPL28	-0.365626428571429	0.00102352538653188	up in ASC
50	DDB1	-0.365185714285715	0.0108089631055064	up in ASC
51	RALGDS	-0.365182142857143	0.0130857375795209	up in ASC
52	BDH2	-0.365090714285715	0.00904370287814578	up in ASC
53	PCMTD2	-0.364905714285715	0.0269486868552269	up in ASC
54	MIR155HG	-0.364504285714287	0.0237037663539496	up in ASC
55	SCLT1	-0.364402142857143	0.00376119042498576	up in ASC
56	HEBP1	-0.364089285714286	0.00864536361301904	up in ASC
57	MTRR	-0.363403571428571	0.00329942230646591	up in ASC
58	UBE2L6	-0.363162857142858	0.0117598870339456	up in ASC
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4	UBE2E2	-0.361845714285715	0.00835211924964047	up in ASC
5	C9orf41	-0.361715714285715	0.0146167419175661	up in ASC
6	BASP1	-0.361580000000001	0.0200052278169322	up in ASC
7	GNS	-0.361515714285716	0.0174679679359007	up in ASC
8	HIST3H2A	-0.361458571428572	0.00128104796259916	up in ASC
9	TXLNG	-0.361450714285715	0.00741128384530049	up in ASC
10	TRMT1	-0.360845714285715	0.00861908399866451	up in ASC
11	SNORD8	-0.360369285714286	0.021674683189354	up in ASC
12	DUSP14	-0.359880714285715	0.00432142473979418	up in ASC
13	CTD-2375G	-0.359285714285714	0.00074861164430409	up in ASC
14	ERI1	-0.359238571428572	0.0168228951340861	up in ASC
15	KIF26B	-0.357599285714286	0.0323669221650158	up in ASC
16	LSS	-0.356950714285715	0.0123650980175363	up in ASC
17	LINC00346	-0.356782142857143	0.0288873660613564	up in ASC
18	MICB	-0.356745	0.0190058598672656	up in ASC
19	FAM96A	-0.356666428571429	0.00279324216576266	up in ASC
20	SCARNA12	-0.356302142857144	0.0158828802900443	up in ASC
21	FAM45A	-0.355875	0.00254713767979444	up in ASC
22	RPS17	-0.355714285714287	0.00112782140679367	up in ASC
23	THG1L	-0.35540142857143	0.00164162049071859	up in ASC
24	RPS15AP1	-0.355316428571429	0.0109691915155838	up in ASC
25	LAP3	-0.355169285714286	0.0013744370299701	up in ASC
26	UMPS	-0.354363571428572	0.0206436724729534	up in ASC
27	RFX2	-0.354237142857143	0.0225675315918725	up in ASC
28	ELOVL2	-0.353322857142857	0.0191077685744263	up in ASC
29	TBC1D15	-0.353182142857143	0.00316418644035461	up in ASC
30	IMPDH2	-0.352237857142857	0.00601833539374287	up in ASC
31	SNHG3	-0.352028571428573	0.0456306925612349	up in ASC
32	RPL15	-0.35202142857143	0.00329942230646591	up in ASC
33	THOC5	-0.351678571428572	0.0186990660947979	up in ASC
34	DTX3L	-0.3516	0.0435501348206539	up in ASC
35	SLC15A3	-0.351194285714286	0.0224230573999274	up in ASC
36	EVA1B	-0.350522857142857	0.00247306178013014	up in ASC
37	ULK2	-0.35042	0.00242743329628017	up in ASC
38	USP31	-0.35027142857143	0.00658686104550326	up in ASC
39	UTP14A	-0.350151428571429	0.0206730566894023	up in ASC
40	PPWD1	-0.350102142857144	0.00263911930251506	up in ASC
41	sept-07	-0.34994142857143	0.00511881378273673	up in ASC
42	ZDHHC9	-0.349604285714286	0.00018000975136702	up in ASC
43	EIF1AX	-0.349393571428572	0.0116586925062304	up in ASC
44	HSD17B7	-0.349109285714286	0.030177670548646	up in ASC
45	KLHDC8B	-0.348678571428573	0.013472224005145	up in ASC
46	MESDC1	-0.348317857142858	0.00230539222148414	up in ASC
47	JUND	-0.348085714285715	0.0216607548504236	up in ASC
48	SNORA21	-0.347831428571429	0.0148937264873347	up in ASC
49	MICALL1	-0.347449285714286	0.0288798012162352	up in ASC
50	WASF1	-0.347271428571429	0.017787839562167	up in ASC
51	CXCL5	-0.347257857142858	0.000696293932645706	up in ASC
52	GYPC	-0.347235000000001	0.00360294579437489	up in ASC
53	NOL8	-0.347042857142858	0.00107447885050208	up in ASC
54	POR	-0.346817142857143	0.0144842903864698	up in ASC
55	HTR2A	-0.345921428571429	0.00714828338508801	up in ASC
56	POLR3C	-0.345435000000001	0.0193661379507066	up in ASC
57	SETD7	-0.345283571428572	0.000265272205950972	up in ASC
58	EIF5A2	-0.345205714285715	0.0160939474233649	up in ASC
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3	TBC1D23	-0.344952857142857	0.0298849930585487	up in ASC
4	TWIST1	-0.344470714285715	0.0264730424061061	up in ASC
5	FKBP11	-0.344448571428572	0.0336826448227356	up in ASC
6	PYCARD	-0.344405000000001	0.031183162317526	up in ASC
7	EFEMP1	-0.344328571428574	0.00396097253555887	up in ASC
8	ORC3	-0.343771428571429	0.0173069547260559	up in ASC
9	DDX18	-0.343747857142858	0.013426370467616	up in ASC
10	RRS1	-0.343392142857143	0.0236286159504926	up in ASC
11	NOVA1	-0.343370000000001	0.00788604524626886	up in ASC
12	SLC2A14	-0.343198571428572	0.00398037713271115	up in ASC
13	RPL36	-0.343138571428572	0.00908635117464182	up in ASC
14	RAB28	-0.342477142857144	0.00697370772700853	up in ASC
15	HIVEP2	-0.341477142857144	0.021030367072154	up in ASC
16	CES4A	-0.341126428571429	0.000503712711818316	up in ASC
17	CASP7	-0.340642142857143	0.00347503571329343	up in ASC
18	MIR22HG	-0.340287857142858	0.0154846994894021	up in ASC
19	ANKRD13A	-0.340092142857143	0.039409121725551	up in ASC
20	PREB	-0.340081428571428	0.0362880272782415	up in ASC
21	POLR3G	-0.339918571428571	0.031141755085933	up in ASC
22	EEF1B2P3	-0.339745000000001	0.000275021081878527	up in ASC
23	FRMPD4	-0.339566428571429	0.00801848998924218	up in ASC
24	ABCC2	-0.338315714285714	0.00117366232408914	up in ASC
25	ALDH9A1	-0.337999285714286	0.00643522774526977	up in ASC
26	AASDH	-0.337917142857143	0.0307733503825357	up in ASC
27	HNRNPF	-0.337746428571428	0.0014600752400777	up in ASC
28	COL16A1	-0.337664285714286	0.0461151603632563	up in ASC
29	COX15	-0.337498571428572	0.00328174309950242	up in ASC
30	OLFM1	-0.337005	0.000675089669131371	up in ASC
31	RPIA	-0.336785714285715	0.0456228517264823	up in ASC
32	RAP2B	-0.336492142857143	0.0268939250280978	up in ASC
33	PIGA	-0.33631	0.0110285772187584	up in ASC
34	EHMT2	-0.336011428571429	0.0137782154637771	up in ASC
35	FLJ31958	-0.335887857142857	0.00528106566869528	up in ASC
36	RPL17	-0.335772857142858	0.00273237578664008	up in ASC
37	RELB	-0.335722857142857	0.00966439842965216	up in ASC
38	RPS19	-0.33552642857143	0.000433056231060463	up in ASC
39	CXCL3	-0.334505000000001	0.0409298687960667	up in ASC
40	MAP1LC3C	-0.333399285714286	0.0191077685744263	up in ASC
41	PKD2	-0.333065714285715	0.0477467457300715	up in ASC
42	RPS4Y1	-0.332834285714286	0.00746570345604612	up in ASC
43	MFSD7	-0.33277142857143	0.00997676375901625	up in ASC
44	DDX56	-0.332493571428571	0.0103112392177622	up in ASC
45	ITSN1	-0.332347857142858	0.000398552874429969	up in ASC
46	DENND1A	-0.332234285714286	0.000314616857737778	up in ASC
47	TRAF7	-0.332163571428572	0.00731390286016393	up in ASC
48	UGP2	-0.331444285714286	0.00263063338536768	up in ASC
49	VWA8	-0.331260000000001	0.00631919786286258	up in ASC
50	GRIN2D	-0.33112	0.000147030896690095	up in ASC
51	KIFAP3	-0.331076428571428	0.0338023238146807	up in ASC
52	PPM1D	-0.33081	0.00971708005147037	up in ASC
53	SNORD104	-0.330682857142857	0.00860409132904429	up in ASC
54	WDR81	-0.330433571428572	0.0111206970555047	up in ASC
55	ALG5	-0.330327857142858	0.0159787117739407	up in ASC
56	APLN	-0.330325	0.00113599885890731	up in ASC
57	RPL18A	-0.330292857142858	0.00130712470750809	up in ASC
58	DYRK2	-0.329523571428572	0.00171763338001618	up in ASC
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3	GMPS	-0.329414285714286	0.0151289047998511	up in ASC
4	SREBF2	-0.32934142857143	0.0322803328873233	up in ASC
5	SNHG1	-0.329255714285714	0.00099149003881533	up in ASC
6	C16orf74	-0.328164285714286	0.00276677630545344	up in ASC
7	NDRG1	-0.327757857142858	0.01394797322584	up in ASC
8	ZNF740	-0.327582142857144	0.0288855344844347	up in ASC
9	LTBR	-0.327217857142859	0.0106074193829543	up in ASC
10	GSC	-0.327195	0.0209553527604513	up in ASC
11	RCC2	-0.326966428571429	0.00425519400212572	up in ASC
12	LGALS9B	-0.326927142857144	0.0063993791875831	up in ASC
13	OPTN	-0.326139285714287	0.00922959920258115	up in ASC
14	SNX6	-0.325970714285715	0.00435330202165516	up in ASC
15	C12orf57	-0.325432142857143	0.0114795722929732	up in ASC
16	HIATL1	-0.325254285714285	0.00740724958732341	up in ASC
17	PDCD11	-0.325106428571429	0.0292440587621902	up in ASC
18	CD46	-0.325068571428572	0.00352431954597122	up in ASC
19	WDR12	-0.325061428571429	0.0137114314450927	up in ASC
20	PPAP2C	-0.324808571428572	0.0136105603679796	up in ASC
21	PSMA5	-0.324698571428572	0.0108332417376659	up in ASC
22	ZNF516	-0.324612142857143	0.00369753466590432	up in ASC
23	ZNHIT6	-0.324610714285715	0.00254606630380399	up in ASC
24	IL1R2	-0.324354285714286	0.00650654193420812	up in ASC
25	RNF13	-0.324220714285715	0.0275879813554729	up in ASC
26	RPL10A	-0.324051428571429	0.00273237578664008	up in ASC
27	C9orf64	-0.32391857142857	0.00680973210886806	up in ASC
28	ERMP1	-0.32338	0.0387318412742024	up in ASC
29	CDK17	-0.323376428571429	0.00618865198567077	up in ASC
30	CYP26B1	-0.32332	0.039642906607688	up in ASC
31	AP3S1	-0.323052857142858	0.00194270959474704	up in ASC
32	ZFYVE9	-0.322929285714287	0.00122609709067739	up in ASC
33	TMEM41B	-0.322629285714286	0.0238042470862579	up in ASC
34	DPM1	-0.322562857142858	0.00816837483097393	up in ASC
35	SPG21	-0.322506428571429	0.0180868514516994	up in ASC
36	AARD	-0.322499285714286	0.00700076190433518	up in ASC
37	KIAA0226L	-0.322415	0.0370466754091867	up in ASC
38	RPS3AP47	-0.322135714285714	0.00404109219449077	up in ASC
39	TNFSF9	-0.321691428571429	0.036579899819935	up in ASC
40	NOP2	-0.321489285714286	0.0381320347224147	up in ASC
41	CDIPT	-0.321307857142857	0.00290707975689247	up in ASC
42	IGF2BP1	-0.320955	0.00176756864749837	up in ASC
43	TAOK3	-0.320836428571429	0.00801027832371866	up in ASC
44	NBPF3	-0.31973	0.0177400806451341	up in ASC
45	RP11-234A'	-0.319631428571429	0.00348167764703333	up in ASC
46	ATP8B4	-0.319300714285715	0.0436141555460906	up in ASC
47	RRN3	-0.319127857142859	0.0217631875247531	up in ASC
48	NOP14	-0.319109285714286	0.00429919629650449	up in ASC
49	HLX	-0.318817142857143	0.00202357316464977	up in ASC
50	FZD2	-0.318619285714287	0.0215671992134689	up in ASC
51	TBC1D9	-0.318580000000001	0.0170397998289269	up in ASC
52	LIAS	-0.318296428571429	0.0379922855210271	up in ASC
53	MTX2	-0.318225714285714	0.0042167576757356	up in ASC
54	DSE	-0.31803642857143	0.0144735700986699	up in ASC
55	FAM118B	-0.317561428571429	0.00348167764703333	up in ASC
56	SRSF5	-0.317450714285715	0.00666427932795026	up in ASC
57	ATP6V1C1	-0.317297142857144	0.0125074357261359	up in ASC
58	ABHD14A	-0.317245714285715	0.0357812149015486	up in ASC
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3	ELF4	-0.316777857142857	0.00801027832371866	up in ASC
4	COX11P1	-0.316117857142858	0.00121651658037076	up in ASC
5	TRUB2	-0.315941428571429	0.0202182573261374	up in ASC
6	PANX1	-0.315277857142859	0.00357537843713271	up in ASC
7	LOC541471	-0.315150000000001	0.0496817960078824	up in ASC
8	ARAP1	-0.314502142857143	0.00690416518614109	up in ASC
9	RCAN3	-0.314486428571428	0.0380731914486323	up in ASC
10	CTDSP2	-0.314383571428572	0.0041038458845851	up in ASC
11	RPS28	-0.314171428571429	0.000532572703405276	up in ASC
12	FBXL12	-0.313406428571429	0.00120008978293938	up in ASC
13	RAB9A	-0.31331	0.0430064628327851	up in ASC
14	HOXB9	-0.313095	0.00173116400552627	up in ASC
15	ST6GALNA	-0.313094285714286	0.00068075675027914	up in ASC
16	PIP5K1A	-0.312870000000002	0.00630640995170256	up in ASC
17	LOC440311	-0.31267	0.0456737946980798	up in ASC
18	ZNF330	-0.312535714285715	0.0241931435841271	up in ASC
19	FGGY	-0.312475000000001	0.0469993174105744	up in ASC
20	GEMIN4	-0.311966428571429	0.0235898469010332	up in ASC
21	SAR1A	-0.311842857142859	0.00016617105188718	up in ASC
22	ABL2	-0.311761428571428	0.0169098219142298	up in ASC
23	RPL36A	-0.311722857142858	0.000170120888362455	up in ASC
24	RPL35	-0.311717142857145	0.000658477954542967	up in ASC
25	ST6GALNA	-0.311717142857144	0.00225171796964724	up in ASC
26	RAD23B	-0.311569285714286	0.00272575208826679	up in ASC
27	CSNK1G3	-0.311257142857144	0.0114795722929732	up in ASC
28	AGTRAP	-0.311237142857142	0.013597484379961	up in ASC
29	DDI2	-0.310048571428572	0.0126511991088813	up in ASC
30	GNL3	-0.309900714285716	0.0193449111988887	up in ASC
31	SHQ1	-0.309547142857143	0.0157720763369693	up in ASC
32	HMGB1P10	-0.309254285714286	0.0403977009912746	up in ASC
33	PLEKHM2	-0.309088571428572	0.0320149626187307	up in ASC
34	ZADH2	-0.309061428571429	0.00621872693424244	up in ASC
35	RPL34P34	-0.308957142857144	0.00176912916974571	up in ASC
36	ZFY	-0.308930714285715	0.0157523016304055	up in ASC
37	ANXA2R	-0.308605714285715	0.00543001575728155	up in ASC
38	ZZZ3	-0.308458571428572	0.00296581692106794	up in ASC
39	C17orf76-A	-0.307884285714286	0.00776928270773058	up in ASC
40	MAML3	-0.307816428571429	0.00201704622438499	up in ASC
41	MRE11A	-0.307774285714286	0.0323459487440877	up in ASC
42	MDM2	-0.307755714285715	0.0437287308899432	up in ASC
43	RRN3P1	-0.307595714285715	0.0315484212786347	up in ASC
44	HIBCH	-0.306416428571428	0.00449487302151408	up in ASC
45	METTL13	-0.305954285714287	0.0189516544667335	up in ASC
46	EID3	-0.305902142857143	0.017502887877895	up in ASC
47	EN1	-0.305163571428572	0.00016617105188718	up in ASC
48	PABPC1	-0.304885714285715	0.00570850034905097	up in ASC
49	UBALD2	-0.304285	0.0308865936957678	up in ASC
50	SNX29	-0.304277142857144	0.0377119956651534	up in ASC
51	ALDH7A1	-0.303684285714286	0.0151670018509729	up in ASC
52	GNPTG	-0.303583571428572	0.0201215091969164	up in ASC
53	INPP1	-0.303529285714286	0.0398858215975049	up in ASC
54	CCIN	-0.303082142857143	0.0218058611467369	up in ASC
55	ANKRD13C	-0.302927142857143	0.00438693798776199	up in ASC
56	GUSBP5	-0.302688571428571	0.00220719837243044	up in ASC
57	DNPH1	-0.302015714285715	0.00114173582231566	up in ASC
58	EIF1AXP1	-0.301752142857143	0.042230144562291	up in ASC
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5	TMOD3	-0.301050000000001	0.00100726377167589	up in ASC
6	SRSF2	-0.301001428571429	0.00948496400801254	up in ASC
7	CSTB	-0.300429285714287	0.00180722512949832	up in ASC
8	FBXO10	-0.300187857142858	0.000323211105941232	up in ASC
9	RPS12	-0.299365714285716	0.00362598765257541	up in ASC
10	FBL	-0.29903	0.0276754737506607	up in ASC
11	PATL1	-0.298940000000002	0.00714828338508801	up in ASC
12	RP11-183G	-0.29841142857143	0.0216316587884405	up in ASC
13	SBF2	-0.298205714285715	0.0115118605723385	up in ASC
14	CCDC84	-0.29781	0.0150685069953555	up in ASC
15	FCHO2	-0.297447142857144	0.00739180426352538	up in ASC
16	RIPK1	-0.297224285714285	0.0164239650978393	up in ASC
17	AC026271.5	-0.297087142857143	0.0489924064328831	up in ASC
18	TNIP2	-0.296770000000001	0.0014095212514787	up in ASC
19	FAR1	-0.296334285714286	0.018892280919195	up in ASC
20	EIF3G	-0.295925000000001	0.00118618003970332	up in ASC
21	CCNH	-0.295901428571429	0.0191077685744263	up in ASC
22	WDR43	-0.295797142857144	0.0122200870119739	up in ASC
23	HIST2H2BF	-0.295680000000001	0.0331879595305748	up in ASC
24	NUP98	-0.295400714285715	0.00678311091099278	up in ASC
25	USP8	-0.29524	0.00639070911809157	up in ASC
26	RP11-134K	-0.294384285714287	0.00200295132033887	up in ASC
27	RNU5F-1	-0.294126428571429	0.0123661821861311	up in ASC
28	SC5D	-0.29357642857143	0.019512007174822	up in ASC
29	AFAP1L1	-0.293505	0.00384672158630331	up in ASC
30	GAL3ST4	-0.293472857142858	0.0349086684651547	up in ASC
31	PIK3C3	-0.293344285714287	0.00837294276325752	up in ASC
32	SLC5A6	-0.292792142857143	0.0322252088848307	up in ASC
33	RASSF5	-0.292329285714286	0.0301502798191543	up in ASC
34	SFR1	-0.292187142857142	0.0168676375807362	up in ASC
35	RPS2P5	-0.291855714285714	0.0334175938254466	up in ASC
36	ABAT	-0.291785000000001	0.021674683189354	up in ASC
37	MARK3	-0.291385	0.00238907444623354	up in ASC
38	SNHG17	-0.291342857142858	0.0424868763609423	up in ASC
39	LRRC16A	-0.291050000000001	0.0363987421097922	up in ASC
40	MDGA1	-0.290887857142857	0.0456306925612349	up in ASC
41	SERPINB6	-0.290860000000001	0.0126165612878257	up in ASC
42	RBM7	-0.290821428571429	0.0273781621577513	up in ASC
43	MRPS22	-0.289793571428571	0.00618865198567077	up in ASC
44	DIMT1	-0.289551428571429	0.0142120327972097	up in ASC
45	RPF2P1	-0.289320000000001	0.00870987766904617	up in ASC
46	C5orf22	-0.289139285714286	0.0240166031398801	up in ASC
47	EVC2	-0.289097857142857	0.0323313683700328	up in ASC
48	RPL39	-0.289095000000001	0.0012568769791863	up in ASC
49	PEX5	-0.288939285714286	0.0434178837140929	up in ASC
50	SLC13A3	-0.288468571428572	0.0030138513549752	up in ASC
51	TMEM65	-0.288461428571429	0.0148949936828893	up in ASC
52	MRPS35	-0.288162142857143	0.0158930580395421	up in ASC
53	REPS2	-0.288133571428572	0.015452727777046	up in ASC
54	MVD	-0.288063571428572	0.0344773394026853	up in ASC
55	SLC7A6	-0.28800714285715	0.00772570225609747	up in ASC
56	RPL29P11	-0.287664285714287	0.00045661929834942	up in ASC
57	OXA1L	-0.287485714285716	0.00822511131620012	up in ASC
58	BRE	-0.287157142857143	0.0175579636914792	up in ASC
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4	FKTN	-0.286915714285715	0.0428379781274285	up in ASC
5	TOMM40	-0.286599285714286	0.0206730566894023	up in ASC
6	PAXIP1	-0.286595000000001	0.0102198186566573	up in ASC
7	QTRTD1	-0.28605	0.0279547515390941	up in ASC
8	LOC100130	-0.285904285714286	0.00980790803533816	up in ASC
9	NUP54	-0.285750714285714	0.0149573498579268	up in ASC
10	FAM206A	-0.285631428571428	0.011899278238336	up in ASC
11	DCPS	-0.285537857142858	0.00424714969885139	up in ASC
12	ABCE1	-0.285287857142857	0.0467210502040535	up in ASC
13	POLR3B	-0.285076428571429	0.0432367117948606	up in ASC
14	EIF3D	-0.28490142857143	0.0343130696543644	up in ASC
15	MED29	-0.284762857142858	0.0234961990048102	up in ASC
16	RPL4P4	-0.284542857142857	0.00145760589099212	up in ASC
17	SUMF2	-0.284497857142859	0.0127242255279427	up in ASC
18	SNORD63	-0.284362142857144	0.0327997445403627	up in ASC
19	BMI1	-0.284090714285715	0.00885223818830218	up in ASC
20	RPL10AP6	-0.283552142857144	0.0108332417376659	up in ASC
21	ORMDL1	-0.283132142857144	0.0288873660613564	up in ASC
22	TXN	-0.283090714285714	0.0207102632341839	up in ASC
23	RPL35P1	-0.283077857142859	0.0135170649708688	up in ASC
24	TPP2	-0.283024285714286	0.0203652827287247	up in ASC
25	RPL13AP2C	-0.282409285714286	0.00247827052936573	up in ASC
26	GLB1	-0.28239642857143	0.0151289047998511	up in ASC
27	RPS3A	-0.282092857142858	0.00141271212447469	up in ASC
28	VASN	-0.281883571428571	0.00367232111788413	up in ASC
29	KSR1	-0.281755714285714	0.0450711713880211	up in ASC
30	TICAM1	-0.281747142857144	0.00211757843819654	up in ASC
31	BFAR	-0.281474285714286	0.018915511347128	up in ASC
32	GTPBP10	-0.281145714285715	0.0309707321588177	up in ASC
33	RAB13	-0.280932857142857	0.00326730698295216	up in ASC
34	C1QBP	-0.280745714285715	0.036973826731298	up in ASC
35	NUDCD1	-0.280737142857143	0.0211429304571192	up in ASC
36	IPO7	-0.280329285714286	0.0408538534997166	up in ASC
37	RPL21	-0.280114285714287	0.0195241892119858	up in ASC
38	CDK4	-0.280049285714286	0.0270100973246938	up in ASC
39	DNAJC13	-0.279868571428572	0.0101271734905406	up in ASC
40	SNORA50	-0.279849285714286	0.0296774183985823	up in ASC
41	RP4-612B1!	-0.279795000000001	0.02159100654018	up in ASC
42	H3F3B	-0.279690000000001	0.0370466754091867	up in ASC
43	ZBTB41	-0.279417142857144	0.0418830688087131	up in ASC
44	TBK1	-0.278548571428572	0.0140501453114947	up in ASC
45	IRF2BPL	-0.278155000000001	0.0340315413047503	up in ASC
46	KCNA1	-0.277827142857143	0.0118656676154649	up in ASC
47	RPL23A	-0.277797142857143	0.00915945724193735	up in ASC
48	SKIV2L2	-0.277706428571429	0.0228720736761699	up in ASC
49	RPLP1	-0.277635714285714	0.00064985856143593	up in ASC
50	IFIT5	-0.277629285714286	0.0181986929230837	up in ASC
51	PRMT7	-0.277215	0.0188509715193219	up in ASC
52	RPS27	-0.276778571428572	0.0171255376413854	up in ASC
53	AFF1	-0.276413571428572	0.0145953144626866	up in ASC
54	RPL21P28	-0.276357142857144	0.0180908759784573	up in ASC
55	TMEM18	-0.276097857142857	0.0172973280385884	up in ASC
56	SNORA27	-0.27603	0.00456131979416305	up in ASC
57	SUN1	-0.27598642857143	0.0307733503825357	up in ASC
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5	GCC2	-0.275295	0.0179368633362164	up in ASC
6	PRPF40A	-0.275243571428572	0.00149795161150176	up in ASC
7	RPS3AP25	-0.275178571428573	0.0102971866949789	up in ASC
8	CASS4	-0.274932857142858	0.00372652359137532	up in ASC
9	RP11-254B	-0.274697857142857	0.0381043937425162	up in ASC
10	MEPCE	-0.274683571428572	0.0364149190834875	up in ASC
11	B4GALT3	-0.274597142857143	0.0135753051868332	up in ASC
12	ZDHHC17	-0.274247142857143	0.0117252885234257	up in ASC
13	ABTB1	-0.274050000000001	0.0368346638248604	up in ASC
14	FAM117B	-0.273962142857142	0.0337475353340319	up in ASC
15	GUK1	-0.273602142857143	0.00391841350221032	up in ASC
16	SLU7	-0.2736	0.0200077817634509	up in ASC
17	TAF1B	-0.273013571428572	0.0229848602511532	up in ASC
18	MNT	-0.272871428571429	0.0133475776753067	up in ASC
19	WBSCR27	-0.272590714285714	0.00963524709895621	up in ASC
20	PRMT10	-0.272504285714286	0.00952430772462147	up in ASC
21	CDC40	-0.271980714285715	0.0115257138495358	up in ASC
22	FAM83G	-0.271732857142857	0.040440941511325	up in ASC
23	RPL26	-0.271525714285715	0.0092385230523788	up in ASC
24	RP5-827C2	-0.271344285714286	0.0120639223655673	up in ASC
25	RPL29	-0.271329285714287	0.00068362829508033	up in ASC
26	CPEB3	-0.271274285714286	0.0169600899181202	up in ASC
27	TXNDC12	-0.271007142857143	0.0362874138705798	up in ASC
28	RPL23AP2	-0.270842857142859	0.0101500325504452	up in ASC
29	CLDN12	-0.270383571428572	0.0132877067986746	up in ASC
30	GTF2E1	-0.269622142857143	0.0315029492830551	up in ASC
31	G3BP1	-0.269113571428571	0.00318962693576823	up in ASC
32	ECE1	-0.268750714285715	0.0425104180834217	up in ASC
33	MIA3	-0.268732142857143	0.00414769256749449	up in ASC
34	YPEL5	-0.268570714285714	0.00554258554625069	up in ASC
35	SP3	-0.268435714285714	0.0170345965702922	up in ASC
36	BET1	-0.268320000000001	0.0026897427596087	up in ASC
37	MREG	-0.267967857142857	0.00896892173907333	up in ASC
38	AQR	-0.267855000000002	0.00458966500417532	up in ASC
39	MRPL45	-0.267825714285715	0.0335472595799647	up in ASC
40	TFB2M	-0.267785	0.00788742081989586	up in ASC
41	ABHD14A-1	-0.267765000000001	0.0441171029905364	up in ASC
42	RMRP	-0.26732142857143	0.00666427932795026	up in ASC
43	CASP10	-0.26659	0.00169199674249408	up in ASC
44	TTC7A	-0.26643	0.0372827184638498	up in ASC
45	RRP12	-0.266113571428572	0.0178932211045889	up in ASC
46	FAM45B	-0.266108571428572	0.0101794499031067	up in ASC
47	MCMBP	-0.265679285714286	0.0242216786685107	up in ASC
48	CYP51A1	-0.265622142857144	0.0334175938254466	up in ASC
49	HIAT1	-0.265538571428572	0.0335771847248301	up in ASC
50	PTPRA	-0.265345	0.020391880465546	up in ASC
51	SLC35F5	-0.265220714285716	0.0105304294297693	up in ASC
52	PNPLA8	-0.265149285714286	0.027130917251362	up in ASC
53	NME7	-0.265018571428571	0.00551648860686056	up in ASC
54	PMS1	-0.264964285714286	0.00734816450240354	up in ASC
55	GPR89B	-0.26472	0.0441041598407527	up in ASC
56	WDFY1	-0.264633571428571	0.00864536361301904	up in ASC
57	RPS18P9	-0.264622142857144	0.00453813314828098	up in ASC
58	TRIM35	-0.26462	0.0185567343785177	up in ASC
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5	PALB2	-0.264229285714286	0.0244033356757334	up in ASC
6	DAZAP2	-0.264034285714287	0.0121276060200129	up in ASC
7	FER	-0.263296428571429	0.0374224307984116	up in ASC
8	GPR108	-0.263242142857143	0.0337475353340319	up in ASC
9	RP11-244J1	-0.262161428571429	0.0424868763609423	up in ASC
10	ERP44	-0.262086428571429	0.00430296014556672	up in ASC
11	CTR9	-0.261805714285714	0.00229420852356418	up in ASC
12	ACO1	-0.261760714285715	0.0375169349030304	up in ASC
13	MTF1	-0.261537142857144	0.00192491663333735	up in ASC
14	SUPV3L1	-0.26144642857143	0.0376468812026216	up in ASC
15	AACS	-0.261420714285715	0.0234286548635368	up in ASC
16	FTSJ3	-0.261219285714286	0.0242216786685107	up in ASC
17	LGALS9C	-0.260922857142857	0.0344664689810121	up in ASC
18	EDEM2	-0.260615000000001	0.0445794082431322	up in ASC
19	TMEM30A	-0.260158571428573	0.0141033025947077	up in ASC
20	RPLP2	-0.2601	0.00329942230646591	up in ASC
21	ATP6V1B2	-0.259967857142857	0.041684258384608	up in ASC
22	FAM149B1	-0.259921428571429	0.0479873584267211	up in ASC
23	ALG8	-0.25951142857143	0.0151289047998511	up in ASC
24	ADORA2B	-0.259482142857143	0.0392466103661446	up in ASC
25	HSPA1B	-0.258862857142857	0.0461825241535812	up in ASC
26	SLC35C2	-0.258757857142857	0.00722286275412118	up in ASC
27	EIF3M	-0.258023571428573	0.0200164526282781	up in ASC
28	ECI1	-0.257282857142858	0.0470190900775777	up in ASC
29	YES1	-0.257263571428572	0.00573413169537161	up in ASC
30	WDR36	-0.257073571428572	0.0397067827063034	up in ASC
31	RPS15	-0.256693571428572	0.0365016500316363	up in ASC
32	ARGLU1	-0.256532857142859	0.00888653312843051	up in ASC
33	PRMT3	-0.256526428571429	0.030177670548646	up in ASC
34	TRIO	-0.256433571428573	0.00634269536052876	up in ASC
35	RP11-681N	-0.256395714285715	0.0059832918031556	up in ASC
36	CCL8	-0.256345	0.0385790796531759	up in ASC
37	PDE10A	-0.256138571428571	0.0261562068457994	up in ASC
38	TMEM170A	-0.25586642857143	0.018851114967248	up in ASC
39	C17orf62	-0.255802142857144	0.0107147443507141	up in ASC
40	UXT	-0.255698571428572	0.00870987766904617	up in ASC
41	COX11	-0.255483571428572	0.0228720736761699	up in ASC
42	ATP6AP2	-0.255035714285716	0.00731390286016393	up in ASC
43	DNTTIP2	-0.254940714285715	0.0302411555893783	up in ASC
44	AGGF1	-0.254819285714286	0.00415229320991653	up in ASC
45	THAP10	-0.254512857142857	0.0419653671502883	up in ASC
46	SLC38A7	-0.253882142857144	0.0185534478579405	up in ASC
47	E2F4	-0.253815714285715	0.0126881329102482	up in ASC
48	ZBTB24	-0.253025000000001	0.0110418338075698	up in ASC
49	HABP4	-0.252866428571428	0.0390429138418638	up in ASC
50	CUL2	-0.252462857142857	0.0163825208316182	up in ASC
51	BRMS1L	-0.251589285714286	0.0467210502040535	up in ASC
52	MVP	-0.251377142857145	0.00665139298835486	up in ASC
53	ANP32B	-0.251017142857143	0.0416934657343044	up in ASC
54	RPS20	-0.250542857142858	0.0373165580526206	up in ASC
55	ABI1	-0.250074285714287	0.00385542421057464	up in ASC
56	FANCC	-0.250050714285715	0.027107048363143	up in ASC
57	CLPX	-0.249535714285715	0.00412571216112278	up in ASC
58	PCDH7	-0.249325	0.00206024567259451	up in ASC
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3	FBXW7	-0.248827857142858	0.0269486868552269	up in ASC
4	SNAPC4	-0.248504285714286	0.00870433491342069	up in ASC
5	GSTK1	-0.248365714285716	0.0465724017394554	up in ASC
6	TSPAN3	-0.247685714285714	0.0381043937425162	up in ASC
7	LARP7	-0.247052857142858	0.00681706449233175	up in ASC
8	CEBPD	-0.247050714285715	0.0296522141730026	up in ASC
9	NOP16	-0.246937857142857	0.0311104956650255	up in ASC
10	PIH1D1	-0.246750714285715	0.0139867011242919	up in ASC
11	TBC1D8B	-0.246415714285715	0.0285909714937155	up in ASC
12	DENND3	-0.246307142857143	0.0332815143860266	up in ASC
13	CNIH	-0.246248571428572	0.00601828610120871	up in ASC
14	RP11-466F5	-0.245862142857144	0.0261107066701092	up in ASC
15	RP11-452G1	-0.245807142857144	0.00695291959697313	up in ASC
16	C14orf119	-0.24576	0.0309707321588177	up in ASC
17	CCDC86	-0.245602857142857	0.024334309045776	up in ASC
18	AC016739.2	-0.245574285714287	0.00037331040639846	up in ASC
19	RPS18P12	-0.244905714285715	0.00774553968400783	up in ASC
20	ZNF76	-0.244884285714286	0.0230354359056382	up in ASC
21	RP3-423B2.1	-0.244871428571429	0.0259613146347305	up in ASC
22	RP11-555K1	-0.244728571428571	0.00636863920011217	up in ASC
23	PHB2	-0.244592857142858	0.0454176665496499	up in ASC
24	HIATL2	-0.244496428571429	0.00534505475016872	up in ASC
25	RBBP6	-0.244363571428571	0.0232117783549907	up in ASC
26	RP3-375P9.1	-0.244219285714287	0.00170081209432676	up in ASC
27	STAT6	-0.243818571428572	0.0278263148549399	up in ASC
28	ARFIP1	-0.243445000000001	0.0127398396135546	up in ASC
29	RPL34P6	-0.24307142857143	0.000714962646243865	up in ASC
30	PRMT6	-0.242887857142857	0.0375352860956062	up in ASC
31	PSMG1	-0.242652857142858	0.0444066484768297	up in ASC
32	PIWIL4	-0.242180714285715	0.0348230731297044	up in ASC
33	UBE2E1	-0.242168571428572	0.024792211684055	up in ASC
34	SHOC2	-0.24187	0.00899659622869989	up in ASC
35	GPR150	-0.241815714285714	0.00909890616091105	up in ASC
36	DERA	-0.241639285714287	0.0081303638487157	up in ASC
37	RPS15A	-0.241507142857147	0.00369106112936845	up in ASC
38	DNAJC1	-0.240995000000001	0.00908573096299014	up in ASC
39	C2orf81	-0.240995000000001	0.0338224971803694	up in ASC
40	APPBP2	-0.240462142857143	0.00371286034065166	up in ASC
41	MUT	-0.240256428571428	0.0482102827196066	up in ASC
42	CD81	-0.240221428571429	0.0313279380956108	up in ASC
43	ALG2	-0.240051428571428	0.0205028630901171	up in ASC
44	PPT2	-0.239912857142858	0.0182754522222526	up in ASC
45	THOC6	-0.239770714285716	0.0327449658429818	up in ASC
46	CTTN	-0.238884285714286	0.000869570848748634	up in ASC
47	GLMN	-0.238751428571429	0.00374865398674955	up in ASC
48	RPS16	-0.238664285714288	0.00443039119643926	up in ASC
49	SMAD5	-0.238369285714287	0.016698723071771	up in ASC
50	JAGN1	-0.238347142857143	0.0110438678989008	up in ASC
51	ORAI1	-0.238145	0.0173410787848221	up in ASC
52	RPS2P46	-0.238135714285715	0.00403474921786396	up in ASC
53	PRDX6	-0.237535714285715	0.0219768669764327	up in ASC
54	ARHGEF7	-0.237245714285715	0.0025407724219448	up in ASC
55	PEX3	-0.23715	0.0157720763369693	up in ASC
56	LOC728613	-0.23705642857143	0.00180722512949832	up in ASC
57	C12orf29	-0.236664285714286	0.0352372876122691	up in ASC
58	TYW1	-0.236623571428571	0.0397529555188409	up in ASC
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3	BAZ1A	-0.236525714285715	0.0181986929230837	up in ASC
4	NR2C1	-0.236094285714286	0.0222232293440269	up in ASC
5	PAIP2	-0.23602	0.0152535119113439	up in ASC
6	LOC648987	-0.234645	0.0268276801569288	up in ASC
7	HIBADH	-0.233955000000001	0.0131248834162035	up in ASC
8	WDR70	-0.233819285714287	0.038093484874175	up in ASC
9	RP11-587D	-0.233517142857144	0.0204540511797982	up in ASC
10	CNNM3	-0.233076428571429	0.00642254110313222	up in ASC
11	NUDT21	-0.232773571428572	0.0399410149697628	up in ASC
12	WDR45	-0.232690714285715	0.00261233068162495	up in ASC
13	ARFGEF1	-0.232567142857143	0.0114124252369195	up in ASC
14	IKBKE	-0.232504285714286	0.0192859581352109	up in ASC
15	RPL38	-0.232237142857144	0.00764614318775014	up in ASC
16	FAM149A	-0.232165	0.00268640434961783	up in ASC
17	CAND1	-0.232156428571428	0.0153817017989419	up in ASC
18	MGAT1	-0.232013571428572	0.00639070911809157	up in ASC
19	CCDC122	-0.231726428571429	0.0362055667442651	up in ASC
20	PAF1	-0.231588571428572	0.0375169349030304	up in ASC
21	AKT2	-0.231360714285715	0.0108138024038575	up in ASC
22	F8	-0.231004285714285	0.00110556736160901	up in ASC
23	GATA2	-0.230602857142858	0.0139159381031764	up in ASC
24	RP11-40H2	-0.230226428571429	0.0268105155347576	up in ASC
25	AFG3L2	-0.230170714285715	0.0193768200919162	up in ASC
26	EI24	-0.230123571428572	0.0303847156817789	up in ASC
27	RP11-526L	-0.229850714285714	0.00079120721027091	up in ASC
28	SNRNP40	-0.229798571428572	0.0415877544110562	up in ASC
29	RP11-280O	-0.229713571428571	0.0387487216616995	up in ASC
30	CUL4A	-0.229517857142858	0.0328893871741653	up in ASC
31	ERICH1	-0.229247142857143	0.0364060192519205	up in ASC
32	SMARCA5	-0.229076428571429	0.0258763998507471	up in ASC
33	PILRA	-0.228952142857143	0.040970692506833	up in ASC
34	TCF21	-0.228946428571429	0.0258344324996558	up in ASC
35	WASL	-0.228498571428572	0.0135561101028882	up in ASC
36	RPS6KA3	-0.228032857142857	0.0460329679516704	up in ASC
37	SNORD83B	-0.227892857142857	0.000300307301395906	up in ASC
38	EXOC1	-0.227862142857144	0.00458966500417532	up in ASC
39	ACAD8	-0.22779	0.0328420896033573	up in ASC
40	GNB2L1	-0.227735714285714	0.00761020492835783	up in ASC
41	SETX	-0.22735	0.0126881329102482	up in ASC
42	MSRB2	-0.226910000000001	0.0116470466304076	up in ASC
43	ADTRP	-0.226682142857143	0.00755669238779904	up in ASC
44	TBCC	-0.226587857142857	0.00458966500417532	up in ASC
45	DHTKD1	-0.226408571428571	0.0100532194114577	up in ASC
46	LPPR4	-0.226347857142857	0.00907215875017741	up in ASC
47	RP11-5106	-0.226161428571429	0.0107147443507141	up in ASC
48	ALG3	-0.226116428571428	0.0236599137513358	up in ASC
49	IL20RA	-0.225855	0.00787461532071133	up in ASC
50	PARK2	-0.22556	0.00875840090479863	up in ASC
51	MIR218-2	-0.224883571428572	0.0110984242086756	up in ASC
52	RPS18	-0.224307857142858	0.000209614813817154	up in ASC
53	PRDM4	-0.224130714285714	0.0323415954713551	up in ASC
54	SMIM10	-0.224082857142858	0.00845607309166013	up in ASC
55	CARS2	-0.22396	0.044304426413412	up in ASC
56	RPL9	-0.223900000000001	0.00700133351804711	up in ASC
57	PIGK	-0.223635714285715	0.0279547515390941	up in ASC
58	RPL18	-0.223550000000001	0.00835102870231992	up in ASC
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3	MOSPD2	-0.223382142857142	0.0456400532884335	up in ASC
4	PRDM8	-0.222413571428572	0.0220175990976081	up in ASC
5	UBN1	-0.222336428571428	0.0312382008192156	up in ASC
6	RPL11	-0.221764285714286	0.00483269048959597	up in ASC
7	STK10	-0.22166	0.0225675315918725	up in ASC
8	KLHDC3	-0.221022142857143	0.0229153745994362	up in ASC
9	RNF135	-0.220966428571429	0.03458826338127	up in ASC
10	RPLP0	-0.220778571428573	0.00175385002741226	up in ASC
11	RP11-120J4	-0.220554285714286	0.0368346638248604	up in ASC
12	HM13	-0.220064285714287	0.00845607309166013	up in ASC
13	GGPS1	-0.219912142857143	0.0177354370345024	up in ASC
14	EEF1B2P1	-0.219737857142858	0.012631266131818	up in ASC
15	TADA2A	-0.219663571428572	0.0131391191909141	up in ASC
16	RPL13AP25	-0.219537857142858	0.0181986929230837	up in ASC
17	FOXJ3	-0.219230714285714	0.0170345965702922	up in ASC
18	DDX3X	-0.218870714285715	0.00582364737781049	up in ASC
19	RRAS2	-0.218557857142858	0.0418081597456181	up in ASC
20	LENG8	-0.218533571428572	0.0377310651407424	up in ASC
21	RICTOR	-0.218473571428572	0.0106358570751468	up in ASC
22	POLR1C	-0.218426428571429	0.00613961983001559	up in ASC
23	COL18A1	-0.218405714285715	0.0103055322233708	up in ASC
24	RPL13AP6	-0.218238571428571	0.0138215139618864	up in ASC
25	APCDD1	-0.218065	0.011470348555069	up in ASC
26	KIAA0922	-0.218060714285714	0.0348919592623793	up in ASC
27	TAF12	-0.217887142857143	0.0336071297894761	up in ASC
28	TPRA1	-0.217379285714286	0.0208551352664108	up in ASC
29	SS18L2	-0.217195000000001	0.0133272612786098	up in ASC
30	HTRA4	-0.216893571428572	0.00948537038478154	up in ASC
31	GLT8D1	-0.216848571428572	0.0387378054840323	up in ASC
32	ANKS6	-0.216691428571429	0.0295499354583782	up in ASC
33	RBM47	-0.216335714285715	0.0282652344031053	up in ASC
34	SPNS1	-0.216135	0.0332779637055182	up in ASC
35	KHSRP	-0.215407142857144	0.00532728101671223	up in ASC
36	PDCD7	-0.215329285714286	0.0343938149274367	up in ASC
37	RP11-395L1	-0.215201428571429	0.0338224971803694	up in ASC
38	SEC23IP	-0.215057142857143	0.0301559009490689	up in ASC
39	IL1RL2	-0.215026428571428	0.039635928638004	up in ASC
40	TBC1D20	-0.214989285714287	0.0135126180492853	up in ASC
41	ANXA7	-0.214901428571428	0.0466063570294331	up in ASC
42	EIF3K	-0.214205	0.0323670220472134	up in ASC
43	HDAC5	-0.214003571428572	0.0351061047067924	up in ASC
44	RPL30	-0.213814285714287	0.00495549178883003	up in ASC
45	VPS4B	-0.213447857142857	0.00720150944017274	up in ASC
46	DAZAP2P1	-0.213055	0.0266972595493774	up in ASC
47	SNORA33	-0.212897857142858	0.0481965890482851	up in ASC
48	FAM86JP	-0.212861428571429	0.0127962312441215	up in ASC
49	LZTFL1	-0.212855000000001	0.0140501453114947	up in ASC
50	TRIL	-0.212793571428572	0.00948270306789558	up in ASC
51	NACA	-0.212721428571428	0.0144934797852069	up in ASC
52	CCDC80	-0.212007142857144	0.0190199564229925	up in ASC
53	ODF3B	-0.211965714285714	0.00720182494860917	up in ASC
54	YBX1P1	-0.211676428571429	0.0232676957765339	up in ASC
55	SPTLC1	-0.211504285714286	0.0249708780555469	up in ASC
56	ARID5B	-0.211242142857144	0.0348569010478935	up in ASC
57	RPS17P2	-0.210766428571429	0.00400473729648524	up in ASC
58	SNX13	-0.210643571428571	0.0409365287617977	up in ASC
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3	IRAK1	-0.210305714285715	0.0198507472158529	up in ASC
4	GOLPH3	-0.210146428571429	0.0256887976682981	up in ASC
5	TPD52L2	-0.20897	0.0402383200550994	up in ASC
6	ATP5D	-0.208932142857144	0.0371273254832112	up in ASC
7	PRPF19	-0.208902142857144	0.0310448943081137	up in ASC
8	RPL27	-0.208080714285715	0.0166287807582517	up in ASC
9	ZFC3H1	-0.208007142857144	0.0385695907745447	up in ASC
10	HEATR2	-0.208005714285714	0.0411062585358743	up in ASC
11	GOLGA7	-0.207705	0.0244620428805445	up in ASC
12	TAF9	-0.207475714285716	0.0400614781575792	up in ASC
13	LARP4B	-0.207475714285715	0.0348317748099509	up in ASC
14	RASL11B	-0.207206428571429	0.00695291959697313	up in ASC
15	HSPBAP1	-0.207042857142857	0.0179400759862037	up in ASC
16	TOR3A	-0.206950714285715	0.0451910675276248	up in ASC
17	NMT1	-0.206572142857144	0.0450508266057608	up in ASC
18	PTPN2	-0.205889285714286	0.0335472595799647	up in ASC
19	RPSA	-0.205764285714286	0.0484178400396258	up in ASC
20	SDHA	-0.205734999999999	0.0225253700764328	up in ASC
21	PSTPIP2	-0.205732857142858	0.0303847156817789	up in ASC
22	TIMM10B	-0.205177857142858	0.0477870724205494	up in ASC
23	MBOAT7	-0.203756428571429	0.0161459295813901	up in ASC
24	ZFAND2A	-0.20366642857143	0.0363858368416125	up in ASC
25	URI1	-0.203635	0.0425370227988454	up in ASC
26	RBM19	-0.203401428571429	0.0150532345671258	up in ASC
27	CCDC149	-0.203380000000001	0.0086503844661955	up in ASC
28	BLCAP	-0.203127857142858	0.0432172177919832	up in ASC
29	RPS3	-0.202942857142861	0.00542596888225983	up in ASC
30	TM2D3	-0.202682857142857	0.00717771167830246	up in ASC
31	SLC12A2	-0.202210000000001	0.0429470530942502	up in ASC
32	CDC123	-0.202115	0.010251425612789	up in ASC
33	MITD1	-0.202098571428572	0.02241668439177	up in ASC
34	ZCCHC9	-0.201751428571428	0.0264730424061061	up in ASC
35	C18orf8	-0.201306428571429	0.00776866225374795	up in ASC
36	RPS6	-0.200742857142857	0.00265374754367811	up in ASC
37	BAG3	-0.200525	0.0464712612373986	up in ASC
38	DNPEP	-0.200302857142858	0.0451910675276248	up in ASC
39	CCDC117	-0.200266428571429	0.0319785966965354	up in ASC
40	RPL12L3	-0.200185714285716	0.0117822786939927	up in ASC
41	SLITRK1	-0.199707857142858	0.0397090098928317	up in ASC
42	TRPV1	-0.199555000000001	0.0450508266057608	up in ASC
43	CNBP	-0.19952642857143	0.00437206141030078	up in ASC
44	EIF4EBP2	-0.199402857142857	0.0062278301690373	up in ASC
45	EIF3H	-0.199342857142857	0.00340088045487306	up in ASC
46	QRICH1	-0.199190714285715	0.0193633722124513	up in ASC
47	DCAF12	-0.198712857142858	0.0484178400396258	up in ASC
48	SMU1	-0.198095714285716	0.0258344324996558	up in ASC
49	HOXD9	-0.198041428571429	0.00656139667427301	up in ASC
50	PLD6	-0.197757857142858	0.0148310586648493	up in ASC
51	RPL37	-0.197567142857143	0.0229153745994362	up in ASC
52	RPL5	-0.197435714285715	0.0128403935382358	up in ASC
53	TNFSF4	-0.196847857142857	0.027873839492384	up in ASC
54	ZDHHC1	-0.19651	0.0426896098363111	up in ASC
55	AC009413.2	-0.196003571428572	0.022353799683482	up in ASC
56	TCEB2	-0.195892857142857	0.0367333107897084	up in ASC
57	GIT2	-0.195250714285716	0.00158298705327752	up in ASC
58	RP11-123J1	-0.195138571428572	0.0461736152471563	up in ASC
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3	RASAL2	-0.195035714285715	0.0458165926364533	up in ASC
4	WHAMM	-0.194664285714286	0.0248182489253573	up in ASC
5	LINC00634	-0.194650714285714	0.00369106112936845	up in ASC
6	RPS21	-0.194562857142857	0.0336417380735438	up in ASC
7	STAP2	-0.194448571428572	0.0282599870332801	up in ASC
8	WDR53	-0.193947142857143	0.0341729063381163	up in ASC
9	FBXO18	-0.193356428571429	0.0342573309768692	up in ASC
10	STX16	-0.19315142857143	0.0437313562340784	up in ASC
11	CIZ1	-0.192884285714287	0.0364983153939159	up in ASC
12	IK	-0.192630714285714	0.0368346638248604	up in ASC
13	C7orf43	-0.192472142857143	0.0425569918211469	up in ASC
14	FOXN2	-0.192398571428572	0.0177354370345024	up in ASC
15	POT1	-0.192188571428572	0.0030258778093305	up in ASC
16	SLC25A44	-0.192101428571429	0.029561267226691	up in ASC
17	BNIP2	-0.192090714285715	0.0216207416701801	up in ASC
18	DEK	-0.191570000000001	0.0457989207072279	up in ASC
19	WDR33	-0.19136642857143	0.0372920170395952	up in ASC
20	CCNY	-0.191137857142858	0.0333232404247083	up in ASC
21	FAM216A	-0.191085714285714	0.0392476608101247	up in ASC
22	ABT1	-0.190947142857144	0.0383685509352384	up in ASC
23	IMP3	-0.190891428571429	0.0169600899181202	up in ASC
24	NPRL3	-0.190126428571429	0.0266613484476898	up in ASC
25	SLC2A10	-0.189972857142858	0.0301253951293067	up in ASC
26	MED6	-0.188653571428572	0.036973826731298	up in ASC
27	RPS27A	-0.188311428571428	0.0371679972906374	up in ASC
28	SEMA3E	-0.187977857142858	0.0110916872845344	up in ASC
29	YTHDF3	-0.187740000000001	0.0133246599303458	up in ASC
30	NOC4L	-0.187670714285715	0.040970692506833	up in ASC
31	EED	-0.187583571428573	0.044989993518261	up in ASC
32	SLC29A3	-0.187159285714286	0.0432995959035011	up in ASC
33	SMARCD2	-0.186815714285715	0.0120313990289935	up in ASC
34	MAPK3	-0.186467857142858	0.039266937908079	up in ASC
35	UNKL	-0.186201428571429	0.0441041598407527	up in ASC
36	CEP76	-0.185545	0.0326096627205847	up in ASC
37	CDK7	-0.185175000000001	0.0226243234082296	up in ASC
38	OAZ1	-0.184621428571429	0.0482931636973317	up in ASC
39	GTF2H2	-0.184264285714287	0.0334175938254466	up in ASC
40	ERCC8	-0.183773571428572	0.0253725126295598	up in ASC
41	PITPNA	-0.183472142857145	0.00728056976610704	up in ASC
42	C10orf90	-0.183120714285714	0.00372746507027756	up in ASC
43	TTC8	-0.183086428571429	0.0325135395879156	up in ASC
44	EMX1	-0.182857142857143	0.0492214212403851	up in ASC
45	RNA5SP37f	-0.182701428571429	0.00776821566785756	up in ASC
46	RPL12P11	-0.182436428571429	0.0295371391184769	up in ASC
47	LSM6	-0.182423571428572	0.0320008694772362	up in ASC
48	COG2	-0.182179285714286	0.00652274838102399	up in ASC
49	RP11-112J1	-0.181905	0.0370423411866876	up in ASC
50	SAMD3	-0.181711428571429	0.0461151603632563	up in ASC
51	C1orf158	-0.181698571428572	0.038249393876447	up in ASC
52	RPL7AP66	-0.18137142857143	0.038853484266658	up in ASC
53	DHX8	-0.181224285714286	0.0297053928836429	up in ASC
54	RPP38	-0.180686428571429	0.0489924064328831	up in ASC
55	WIPI2	-0.180537142857144	0.0133226502917277	up in ASC
56	sept-05	-0.180514285714286	0.00342403166796068	up in ASC
57	RIOK3	-0.180479285714286	0.0376926492108056	up in ASC
58	ESF1	-0.180302142857144	0.0468833583015	up in ASC
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3	ZNF598	-0.180085714285714	0.00845607309166013 up in ASC
4	PSPC1	-0.180063571428571	0.041684258384608 up in ASC
5	ABHD17C	-0.179800000000001	0.0438922001315494 up in ASC
6	HOXD10	-0.179778571428572	0.0153303970562539 up in ASC
7	BAG5	-0.179772857142857	0.0361392949730698 up in ASC
8	CBFA2T2	-0.179575714285714	0.0339039400313124 up in ASC
9	BUD31	-0.179215000000001	0.043017702273509 up in ASC
10	RPF2	-0.177585714285715	0.0435004406332897 up in ASC
11	LIMS1	-0.177445	0.0273781621577513 up in ASC
12	UBA52	-0.17665	0.00412485539084079 up in ASC
13	ARHGAP17	-0.175660714285715	0.00545833495491513 up in ASC
14	CCNK	-0.174451428571429	0.033428675731611 up in ASC
15	PAPOLA	-0.174433571428572	0.0285244003203384 up in ASC
16	USP36	-0.174314285714286	0.0211957074150466 up in ASC
17	WNT4	-0.174056428571429	0.0377976057589813 up in ASC
18	NSUN5P2	-0.173943571428572	0.039642906607688 up in ASC
19	USP32	-0.173462857142857	0.0279547515390941 up in ASC
20	RPL8	-0.173385714285715	0.0127242255279427 up in ASC
21	TRMT5	-0.173130000000001	0.0148568805356016 up in ASC
22	BRD2	-0.172032857142857	0.04453219646803 up in ASC
23	TXNRD3	-0.171726428571429	0.0276685548444033 up in ASC
24	RNA5SP49'	-0.171641428571429	0.0107769303014141 up in ASC
25	MOB1A	-0.170855	0.0173945876461881 up in ASC
26	DACT3	-0.170149285714286	0.0327449658429818 up in ASC
27	PON3	-0.170077857142858	0.0232131959101442 up in ASC
28	ZMYM4	-0.170052857142858	0.0269360316450895 up in ASC
29	RRP1	-0.169072142857143	0.0435501348206539 up in ASC
30	TMEM69	-0.169060714285715	0.0452478854879227 up in ASC
31	AK3	-0.16846642857143	0.0279547515390941 up in ASC
32	CCL11	-0.167872857142857	0.012088219902363 up in ASC
33	TRPV3	-0.167810714285715	0.03458826338127 up in ASC
34	EFCAB14	-0.167773571428572	0.0161613389946427 up in ASC
35	GBP4	-0.167592857142857	0.0304956540680026 up in ASC
36	LOC388692	-0.167367857142858	0.0217144872116809 up in ASC
37	ENGASE	-0.166704285714286	0.00466918452558048 up in ASC
38	HSPE1	-0.166520714285715	0.0465210839729608 up in ASC
39	SLC25A46	-0.165192142857143	0.0255981511551822 up in ASC
40	KAT5	-0.164100000000001	0.0222232293440269 up in ASC
41	ANGEL2	-0.163814285714287	0.0335176766176023 up in ASC
42	RAB7A	-0.163685714285716	0.0378081070228048 up in ASC
43	RPS14	-0.1635	0.0412246731711496 up in ASC
44	METTTL21C	-0.162496428571429	0.0483220867807559 up in ASC
45	ZNF7	-0.162199285714286	0.0340802944108148 up in ASC
46	B3GNT8	-0.161696428571429	0.0349843197225274 up in ASC
47	MON2	-0.160758571428572	0.0461825876782381 up in ASC
48	RGPD8	-0.160270714285715	0.0250647227054823 up in ASC
49	RGPD6	-0.159944285714287	0.0288268061674221 up in ASC
50	SF3B1	-0.158627142857143	0.0263873364988731 up in ASC
51	RPS4X	-0.157607142857144	0.0261640373943468 up in ASC
52	RPL24	-0.157564285714288	0.0181986929230837 up in ASC
53	RGPD5	-0.157501428571428	0.0348070262650936 up in ASC
54	RTL1	-0.157425714285715	0.0191010189837611 up in ASC
55	HTR7P1	-0.157220714285714	0.0203443933362514 up in ASC
56	CCAR1	-0.156857857142857	0.0456228517264823 up in ASC
57	G RTP1	-0.156775	0.0377527416650066 up in ASC
58	TMEM230	-0.156583571428572	0.0144735700986699 up in ASC
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3	PLA2G1B	-0.156332857142857	0.0381024121156307	up in ASC
4	FAM71E2	-0.154024285714286	0.0428890859963928	up in ASC
5	RPL37AP8	-0.153583571428572	0.026949835379325	up in ASC
6	MTX1	-0.153553571428572	0.0230041168303101	up in ASC
7	RPL14	-0.153195	0.0239851104934871	up in ASC
8	TMEM248	-0.152865000000001	0.038756477901894	up in ASC
9	ITGA9	-0.152749285714286	0.0474193965013027	up in ASC
10	RPL6	-0.151785714285716	0.0368346638248604	up in ASC
11	RPS14P3	-0.151631428571429	0.0309593106800611	up in ASC
12	ZIC4	-0.151535	0.0109711421967453	up in ASC
13	FRMPD1	-0.150854285714286	0.021030367072154	up in ASC
14	ZNF16	-0.150330714285715	0.0132482333821939	up in ASC
15	EEF1G	-0.148935714285714	0.00736722206210153	up in ASC
16	YBX1	-0.148542857142858	0.0337853715122364	up in ASC
17	ZBTB47	-0.147678571428573	0.0451023206751895	up in ASC
18	IL27	-0.146028571428572	0.018961962160769	up in ASC
19	KCNQ3	-0.146002857142857	0.0464752017132234	up in ASC
20	MNX1	-0.145657857142857	0.0346255425185747	up in ASC
21	CARD8	-0.144855714285715	0.0424401348575133	up in ASC
22	VANGL1	-0.144077857142857	0.0247593248767307	up in ASC
23	GAK	-0.143410714285715	0.0290346670148301	up in ASC
24	MIR99A	-0.142846428571429	0.0178932211045889	up in ASC
25	PRPH2	-0.142524285714286	0.0461736152471563	up in ASC
26	RPL13A	-0.141007142857145	0.0122439414398256	up in ASC
27	NUPR1L	-0.139736428571429	0.047629141561158	up in ASC
28	OGFR	-0.138018571428572	0.0416876980353706	up in ASC
29	RPL35A	-0.137435714285713	0.0286918965538694	up in ASC
30	GFOD1	-0.136969285714286	0.0118983780254195	up in ASC
31	NECAB2	-0.136707857142857	0.0370023899847295	up in ASC
32	CISH	-0.136312142857144	0.0469708130649822	up in ASC
33	THOC2	-0.133073571428572	0.0423785520394863	up in ASC
34	HOXD3	-0.131308571428572	0.0441182005098631	up in ASC
35	RPS25	-0.129021428571431	0.0231277583166076	up in ASC
36	RTN1	-0.126105714285714	0.0208384787817212	up in ASC
37	GLIS3-AS1	-0.125458571428571	0.0281145860804434	up in ASC
38	RNF125	-0.123245714285715	0.0249113462444168	up in ASC
39	PTRH2	-0.122993571428572	0.0482102827196066	up in ASC
40	TMEM184A	-0.116203571428572	0.0213672854184024	up in ASC
41	FLJ41733	-0.110957857142858	0.039702200055723	up in ASC
42	CCL25	-0.110342142857143	0.0411940463085207	up in ASC
43	PKD2L1	0.100322857142857	0.0439238352622611	up in BM-ASC
44	OR51C1P	0.103027857142857	0.0249033365665276	up in BM-ASC
45	GNAT2	0.106885	0.0400422191881557	up in BM-ASC
46	PALD1	0.108422142857142	0.04688626885593	up in BM-ASC
47	MUSK	0.110039999999999	0.0284923132088132	up in BM-ASC
48	MYL6B	0.113922142857142	0.0308320785026333	up in BM-ASC
49	CLSTN2	0.117654285714286	0.00959197702155991	up in BM-ASC
50	PAQR6	0.117952857142857	0.0437313562340784	up in BM-ASC
51	LOC645769	0.120010714285714	0.0404666704724701	up in BM-ASC
52	CAPS2	0.123838571428571	0.0477562444803826	up in BM-ASC
53	LY6G6D	0.124266428571428	0.039642906607688	up in BM-ASC
54	FAM184A	0.124702142857143	0.0437287308899432	up in BM-ASC
55	PABPC1L2I	0.126253571428572	0.0389164889018211	up in BM-ASC
56	ZMYND15	0.129109285714285	0.0248702526031994	up in BM-ASC
57	ISG20	0.130132857142857	0.0117861144733411	up in BM-ASC
58	TMEM190	0.130137142857143	0.02159100654018	up in BM-ASC
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3	NLRP3	0.130675714285714	0.0368346638248604	up in BM-MS
4	AQP4-AS1	0.131617857142857	0.0348230731297044	up in BM-MS
5	ADAM20	0.133894285714285	0.0482931636973317	up in BM-MS
6	ITGB1BP2	0.134111428571429	0.0419898860693788	up in BM-MS
7	CSNK1E	0.134439285714286	0.0387228214478465	up in BM-MS
8	MYF5	0.134487857142857	0.0173785276508233	up in BM-MS
9	SFI1	0.137727857142856	0.0323313683700328	up in BM-MS
10	CLMN	0.137800714285714	0.0438085219399627	up in BM-MS
11	ZNF180	0.138465	0.0267074244531016	up in BM-MS
12	CLHC1	0.138499285714285	0.0435709218726492	up in BM-MS
13	KRT35	0.138629285714285	0.0291426664226109	up in BM-MS
14	GBF1	0.138781428571428	0.0489262484916971	up in BM-MS
15	MTERFD2	0.138862142857143	0.0349001222525958	up in BM-MS
16	PBX3	0.138989285714286	0.0378293215179679	up in BM-MS
17	FAM222A	0.140060714285714	0.00867421689107413	up in BM-MS
18	SLC24A5	0.142218571428571	0.0140501453114947	up in BM-MS
19	LST1	0.142847142857143	0.0265271122696968	up in BM-MS
20	ZNF630	0.143340714285714	0.020392442533915	up in BM-MS
21	ALS2CR12	0.143645714285714	0.0233597142309361	up in BM-MS
22	HAVCR2	0.14377	0.0342573309768692	up in BM-MS
23	ZBTB7B	0.144174285714285	0.0249708780555469	up in BM-MS
24	OR5E2	0.144930714285714	0.0291779642217186	up in BM-MS
25	UBQLN4	0.146913571428571	0.0448753559468533	up in BM-MS
26	AP2B1	0.146922142857142	0.0315484212786347	up in BM-MS
27	FLJ42875	0.14787	0.0325135395879156	up in BM-MS
28	MORF4L1	0.148095714285714	0.0461151603632563	up in BM-MS
29	REP15	0.148631428571429	0.0375169349030304	up in BM-MS
30	CYP2G2P	0.148664285714286	0.0341176930478046	up in BM-MS
31	CSTL1	0.149114285714285	0.0219441559574063	up in BM-MS
32	CAPZA2	0.152199285714286	0.0292201808965366	up in BM-MS
33	AGPAT1	0.152549999999999	0.0325903973505337	up in BM-MS
34	CHD7	0.153213571428571	0.017077424383336	up in BM-MS
35	PPARD	0.153270714285713	0.0470190900775777	up in BM-MS
36	BCAS2	0.154047857142856	0.0486654324164401	up in BM-MS
37	RAET1E	0.156082857142857	0.0334175938254466	up in BM-MS
38	BACH2	0.15644	0.0154750715321468	up in BM-MS
39	MAP2	0.157067857142857	0.0257921911108264	up in BM-MS
40	ZNF471	0.157763571428572	0.0263392947128221	up in BM-MS
41	TSPAN7	0.157878571428571	0.0214517684005722	up in BM-MS
42	CIB2	0.158096428571428	0.0434695231820755	up in BM-MS
43	KIAA1522	0.159111428571429	0.0173069547260559	up in BM-MS
44	AP1G1	0.159900714285715	0.02073236714347	up in BM-MS
45	LRRC73	0.159920714285714	0.0432515427935826	up in BM-MS
46	TFEB	0.160312142857142	0.0267074244531016	up in BM-MS
47	MIR194-2	0.160897857142856	0.0495719884225965	up in BM-MS
48	RASSF7	0.161017857142857	0.0417390296908199	up in BM-MS
49	FUNDC1	0.1612	0.00898186207818286	up in BM-MS
50	DLK2	0.162058571428571	0.0168749511310201	up in BM-MS
51	SNAPC3	0.162201428571428	0.0480084205792174	up in BM-MS
52	TCEAL1	0.162441428571428	0.0349820154964407	up in BM-MS
53	PTPN1	0.162466428571428	0.0495416876105872	up in BM-MS
54	EFHC2	0.162679285714286	0.0118032937941775	up in BM-MS
55	HLA-DMB	0.163917142857142	0.00866022137454577	up in BM-MS
56	PRKAR1A	0.164071428571429	0.0305445361658585	up in BM-MS
57	ARHGEF18	0.164152857142857	0.0134330455880556	up in BM-MS
58	EGFLAM	0.164327857142857	0.0350910872325999	up in BM-MS
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3	LINC00888	0.164409285714285	0.0241810004668387 up in BM-MSC
4	RGL3	0.164567142857142	0.00478272877722067 up in BM-MSC
5	AMDHD1	0.165522142857143	0.00522010777310032 up in BM-MSC
6	HR	0.165671428571428	0.00700260777531879 up in BM-MSC
7	TP53BP1	0.166139285714284	0.0458701424320511 up in BM-MSC
8	KISS1	0.166199285714286	0.0231315042280108 up in BM-MSC
9	TNFSF12	0.166387857142857	0.039635928638004 up in BM-MSC
10	NINL	0.16651	0.0276644678657781 up in BM-MSC
11	PMM1	0.166739999999999	0.0441171029905364 up in BM-MSC
12	HK1	0.166962142857143	0.0185567343785177 up in BM-MSC
13	ZNF785	0.167397857142857	0.0200052278169322 up in BM-MSC
14	SH2B3	0.167854285714285	0.0298088982527505 up in BM-MSC
15	HDAC6	0.169376428571428	0.0290456116145228 up in BM-MSC
16	BPI	0.169511428571429	0.00634058374361168 up in BM-MSC
17	C5orf15	0.169571428571428	0.0300044942980838 up in BM-MSC
18	ERLIN2	0.170061428571428	0.00837294276325752 up in BM-MSC
19	ENDOV	0.170644285714285	0.0210802867583693 up in BM-MSC
20	RNA5SP51	0.170654285714286	0.0122916823711811 up in BM-MSC
21	MYCNOS	0.170927142857143	0.0425569918211469 up in BM-MSC
22	KPNA6	0.170987142857143	0.0371679972906374 up in BM-MSC
23	EGF	0.171286428571428	0.0201598247078257 up in BM-MSC
24	HHEX	0.171709285714285	0.0225425481760816 up in BM-MSC
25	ANKFN1	0.171752142857142	0.0496817960078824 up in BM-MSC
26	CNN2P8	0.17187	0.0111479753331791 up in BM-MSC
27	C3orf18	0.171927857142856	0.0195668283283126 up in BM-MSC
28	LY6G5C	0.172066428571429	0.0348428222753632 up in BM-MSC
29	MIR451A	0.17243	0.00498310025817771 up in BM-MSC
30	ZNF821	0.172657857142857	0.0314749713866446 up in BM-MSC
31	METTL5	0.173012142857142	0.0211957074150466 up in BM-MSC
32	ASH1L	0.173660714285714	0.0346484270742655 up in BM-MSC
33	ARMC2	0.174132857142857	0.0175084941503084 up in BM-MSC
34	GJA5	0.174632857142857	0.0252475600141448 up in BM-MSC
35	LURAP1	0.174976428571428	0.0289523211335781 up in BM-MSC
36	LEF1	0.175013571428571	0.00744061217766068 up in BM-MSC
37	DNAJC5	0.175896428571428	0.0307733503825357 up in BM-MSC
38	HOXA-AS2	0.176780714285714	0.049603141949242 up in BM-MSC
39	TBX4	0.177192857142857	0.0481965890482851 up in BM-MSC
40	ARRDC2	0.177841428571428	0.0429667996928981 up in BM-MSC
41	FUT5	0.177917857142857	0.0454197493236905 up in BM-MSC
42	GARNL3	0.178169999999999	0.020525634119514 up in BM-MSC
43	TTC3	0.17847	0.040586715436905 up in BM-MSC
44	OR10A3	0.178698571428571	0.0404419589424041 up in BM-MSC
45	USP47	0.179346428571428	0.0339900101414627 up in BM-MSC
46	TM4SF4	0.179537142857142	0.0396132360193916 up in BM-MSC
47	NKX2-6	0.179758571428571	0.00132978165178963 up in BM-MSC
48	PPFIA4	0.179841428571429	0.0163021298925452 up in BM-MSC
49	RHBDF2	0.180051428571428	0.0140898871628091 up in BM-MSC
50	OR2G2	0.180619999999999	0.015593141274926 up in BM-MSC
51	RP11-569H	0.181377142857142	0.0179368633362164 up in BM-MSC
52	TSPAN1	0.181436428571428	0.0233494554443433 up in BM-MSC
53	TMIE	0.181712142857143	0.0426289207726899 up in BM-MSC
54	PADI1	0.182015	0.0148868799510703 up in BM-MSC
55	SBDS	0.182215714285713	0.042159494145034 up in BM-MSC
56	CCDC24	0.182715	0.0376649260724992 up in BM-MSC
57	CCDC170	0.183041428571429	0.0288873660613564 up in BM-MSC
58	HECTD2	0.184528571428572	0.0232131959101442 up in BM-MSC
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3	FNDC3A	0.184795714285714	0.0478351001341122	up in BM-MS
4	RP11-722P	0.185067142857143	0.0230622175879246	up in BM-MS
5	RXRA	0.185399285714286	0.0310689900372974	up in BM-MS
6	INSRR	0.187254285714286	0.0400422191881557	up in BM-MS
7	HOXA3	0.187386428571428	0.0225857680069905	up in BM-MS
8	ARHGEF12	0.188178571428571	0.0302411555893783	up in BM-MS
9	ZG16B	0.188690714285714	0.0368346638248604	up in BM-MS
10	WDR6	0.189272857142856	0.0170718916416179	up in BM-MS
11	TMEM38A	0.189865714285713	0.00953178212004114	up in BM-MS
12	FAM199X	0.190087857142857	0.0346044737659649	up in BM-MS
13	TADA3	0.190272142857142	0.0161764801062343	up in BM-MS
14	MGRN1	0.190922142857143	0.0107584580430642	up in BM-MS
15	CDKL3	0.191204285714285	0.0333376489265947	up in BM-MS
16	TMSB10	0.191464285714285	0.0414587895136727	up in BM-MS
17	NLRC5	0.191632142857143	0.0427936226728051	up in BM-MS
18	sept-04	0.192260714285714	0.0335472595799647	up in BM-MS
19	KCTD21	0.192294999999999	0.0359893363362009	up in BM-MS
20	ZNF614	0.192381428571428	0.0461736152471563	up in BM-MS
21	HIVEP3	0.192922857142857	0.0036679769691224	up in BM-MS
22	STARD8	0.193159285714285	0.0390429138418638	up in BM-MS
23	TMEM123	0.193244285714286	0.0453209803829892	up in BM-MS
24	ADO	0.193535714285714	0.0106446525814341	up in BM-MS
25	APOPT1	0.193596428571428	0.0179947780914844	up in BM-MS
26	C20orf197	0.193657857142857	0.0330123486132873	up in BM-MS
27	SFXN3	0.194248571428571	0.00931500691795241	up in BM-MS
28	SOX9	0.194323571428571	0.0474840042308644	up in BM-MS
29	CELSR2	0.194492857142857	0.0108509550925371	up in BM-MS
30	WDR66	0.194810714285714	0.0208384787817212	up in BM-MS
31	ADRBK1	0.194874285714286	0.0289992478504998	up in BM-MS
32	ANKRD13D	0.195384285714285	0.0102971866949789	up in BM-MS
33	TMEM251	0.195864285714286	0.00870987766904617	up in BM-MS
34	LMF1	0.197135714285715	0.0394888133399266	up in BM-MS
35	SLC35A4	0.197334999999999	0.00652274838102399	up in BM-MS
36	SLC25A11	0.197764285714285	0.00689306914885167	up in BM-MS
37	SPAG7	0.198119285714285	0.00953178212004114	up in BM-MS
38	KIF3A	0.198747142857142	0.0148949936828893	up in BM-MS
39	RNF121	0.198758571428571	0.0472897480071694	up in BM-MS
40	LRSAM1	0.199166428571428	0.0231389776968823	up in BM-MS
41	PCGF2	0.199928571428572	0.0389496053775391	up in BM-MS
42	ZNF185	0.200121428571428	0.0395172208736788	up in BM-MS
43	SNTG2	0.200232857142857	0.0074110709875678	up in BM-MS
44	MORN3	0.200520714285714	0.025401905890791	up in BM-MS
45	NDUFB8	0.200672142857142	0.0193290472613344	up in BM-MS
46	TIA1	0.200839285714284	0.0413545255912889	up in BM-MS
47	MED20	0.200875714285715	0.0164608303797235	up in BM-MS
48	CTBP1-AS2	0.201209285714286	0.0481965890482851	up in BM-MS
49	C12orf39	0.201371428571428	0.0279081131457571	up in BM-MS
50	MPP4	0.201878571428571	0.0183469392573988	up in BM-MS
51	ALDH5A1	0.201959285714286	0.00250713407152973	up in BM-MS
52	CC2D1B	0.201985714285714	0.00725241034059665	up in BM-MS
53	TMEM179	0.201998571428571	0.0398858215975049	up in BM-MS
54	SSR4P1	0.202127857142857	0.0171769544833529	up in BM-MS
55	OLFM4	0.202158571428572	0.0382827417012446	up in BM-MS
56	ADSSL1	0.202168571428571	0.0240166031398801	up in BM-MS
57	POM121L1F	0.202587857142857	0.0111745076430825	up in BM-MS
58	ZC3H7A	0.202937142857142	0.0447687173673908	up in BM-MS
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4	SNAPIN	0.204887142857141	0.0240796157165123	up in BM-MS
5	FN1	0.205699999999999	0.00276781315963078	up in BM-MS
6	SLC9A5	0.207089999999999	0.0358965341044699	up in BM-MS
7	FHDC1	0.207222857142857	0.0294834405557973	up in BM-MS
8	LOC80154	0.207424285714286	0.0219157819026578	up in BM-MS
9	SAMD5	0.207727142857143	0.0164608303797235	up in BM-MS
10	CETN2	0.207902142857142	0.0204540511797982	up in BM-MS
11	FLJ00418	0.208083571428572	0.0112786807933513	up in BM-MS
12	CS	0.208467142857142	0.011899278238336	up in BM-MS
13	KIF1B	0.208472857142857	0.0278617712559325	up in BM-MS
14	FLRT3	0.208647142857143	0.0279547515390941	up in BM-MS
15	SLC7A2	0.208787857142857	0.0381024121156307	up in BM-MS
16	LZTR1	0.209210714285715	0.0314024488982377	up in BM-MS
17	IDNK	0.209327857142857	0.0375710694796358	up in BM-MS
18	SNN	0.209796428571429	0.0242463239131712	up in BM-MS
19	ARHGAP42	0.21025	0.0447242442299693	up in BM-MS
20	SNX11	0.210283571428572	0.00185661479850662	up in BM-MS
21	ZFP69	0.210327142857143	0.0135879643441066	up in BM-MS
22	FKBP10	0.210448571428571	0.0030431096412338	up in BM-MS
23	RNF11	0.210616428571428	0.0213494442383611	up in BM-MS
24	NNT	0.210719285714286	0.0123027668852074	up in BM-MS
25	EFNB3	0.210989285714285	0.0116349937839289	up in BM-MS
26	SH3BGR1	0.211299999999999	0.0369530688015641	up in BM-MS
27	CAMK1	0.211409285714285	0.029461064484115	up in BM-MS
28	POU6F1	0.211796428571429	0.0138761223224038	up in BM-MS
29	DLG5	0.211820714285714	0.0386127567747805	up in BM-MS
30	DNMT3A	0.212302142857143	0.012414293635248	up in BM-MS
31	CDK6	0.212723571428571	0.0315037176226136	up in BM-MS
32	CAMTA2	0.212742857142857	0.0267885373811712	up in BM-MS
33	GAPDH	0.212771428571429	0.0239498294212283	up in BM-MS
34	MOCS2	0.213026428571428	0.00320280626608935	up in BM-MS
35	IFITM2	0.213368571428571	0.0414492161992233	up in BM-MS
36	USP34	0.213454285714286	0.0173750717100831	up in BM-MS
37	RCE1	0.213947857142856	0.0151289047998511	up in BM-MS
38	SFMBT1	0.214110714285714	0.0282652344031053	up in BM-MS
39	C5AR1	0.214177857142857	0.0461151603632563	up in BM-MS
40	LRRRC37A3	0.214616428571429	0.0235964970277256	up in BM-MS
41	FAM117A	0.21497	0.021720836950776	up in BM-MS
42	SMUG1	0.215012142857142	0.0274553828531116	up in BM-MS
43	C21orf59	0.215285714285714	0.0181986929230837	up in BM-MS
44	ADRBK2	0.215462857142857	0.00372652359137532	up in BM-MS
45	NTRK1	0.215655714285714	0.0410327328982812	up in BM-MS
46	RNF215	0.215738571428571	0.00507389438072238	up in BM-MS
47	SHF	0.216083571428572	0.0236310793143675	up in BM-MS
48	SDSL	0.2164	0.02159100654018	up in BM-MS
49	ARID1A	0.216509999999999	0.0183878464014139	up in BM-MS
50	DNAJC24	0.216685000000001	0.0102971866949789	up in BM-MS
51	LOC100132	0.217203571428571	0.0125945724625049	up in BM-MS
52	AKT1	0.217264285714286	0.0195892228197674	up in BM-MS
53	MANF	0.217282142857143	0.0400422191881557	up in BM-MS
54	GAS8	0.217524285714285	0.0373714730398472	up in BM-MS
55	UNC13B	0.217806428571428	0.0164608303797235	up in BM-MS
56	ATP7A	0.217879285714285	0.0232131959101442	up in BM-MS
57	LAMA5	0.218326428571428	0.0441041598407527	up in BM-MS
58	DNAJA4	0.218564285714286	0.0165555143684326	up in BM-MS
59	PRSS35	0.21865	0.00447285576571303	up in BM-MS

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MYH11	0.219030714285714	0.0181448749410964	up in BM-MS
FBXO27	0.219052857142857	0.00643148655756119	up in BM-MS
MRPL14	0.219262142857142	0.00316304028833399	up in BM-MS
RBPMS2	0.21938857142857	0.0225939928469197	up in BM-MS
AKIP1	0.219406428571429	0.00812183886178482	up in BM-MS
CTNNA1	0.220024285714285	0.0125443751873143	up in BM-MS
FAM115C	0.220177142857143	0.00451975651795509	up in BM-MS
HSP90B1	0.220221428571429	0.0266868106604131	up in BM-MS
EIF2AK4	0.220568571428571	0.0112830750783911	up in BM-MS
GALNT18	0.220669285714286	0.00121651658037076	up in BM-MS
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MECOM	0.220932857142857	0.0275968387681898	up in BM-MS
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SMARCD3	0.222905	0.0241778692330508	up in BM-MS
MAP2K6	0.223093571428571	0.0344773394026853	up in BM-MS
SLC26A10	0.223342857142857	0.0175851782210086	up in BM-MS
RIMS3	0.223439285714285	0.00829206582493307	up in BM-MS
SCRN2	0.223860714285714	0.00658726404460311	up in BM-MS
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R3HDM1	0.226009285714285	0.0306829164496303	up in BM-MS
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DCAF15	0.226645714285713	0.0287589486272605	up in BM-MS
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HLA-A	0.226921428571426	0.0307733503825357	up in BM-MS
HLA-C	0.2271	0.0298789435303647	up in BM-MS
ANXA2P2	0.22717857142857	0.0280031272406962	up in BM-MS
MARCKS	0.227892142857143	0.0276346572027904	up in BM-MS
PPP2R5B	0.228365	0.0103055322233708	up in BM-MS
FAM114A1	0.228606428571429	0.0104702189637834	up in BM-MS
CGNL1	0.229125714285714	0.0229059572196931	up in BM-MS
EIF2B2	0.229285714285715	0.0174977165814757	up in BM-MS
RNA5SP22	0.229605714285714	0.00463534874947975	up in BM-MS
RPTN	0.230477142857143	0.0435616994806412	up in BM-MS
WDTC1	0.230851428571427	0.00352969464613078	up in BM-MS
SHC1	0.231322142857142	0.0432215817601352	up in BM-MS
ACOT4	0.231794285714285	0.00371980800744841	up in BM-MS
QSOX1	0.232245714285713	0.0195196379692009	up in BM-MS
CDRT4	0.232278571428571	0.0112866995385385	up in BM-MS
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ERBB2	0.232566428571429	0.00304974711843321	up in BM-MS
LRRC37A4I	0.233267857142857	0.0384495662518138	up in BM-MS
MIER2	0.233349285714286	0.0422969953435276	up in BM-MS
POTEJ	0.233675	0.0441171029905364	up in BM-MS
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MORN4	0.234299285714286	0.044304426413412	up in BM-MS
CLSTN1	0.23431	0.0101964359627315	up in BM-MS
MAP3K14	0.234492857142856	0.00700133351804711	up in BM-MS
TMEM25	0.234504285714286	0.0072546680969976	up in BM-MS
LINGO1	0.234616428571428	0.00984461375620611	up in BM-MS

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7	AIG1	0.235342142857142	0.0270101981357826	up in BM-MSC
8	NDUFA4	0.235886428571427	0.00760558888552325	up in BM-MSC
9	AFF2	0.236142857142857	0.018892280919195	up in BM-MSC
10	P2RY2	0.236336428571429	0.0044178901857557	up in BM-MSC
11	PCDHB9	0.236339285714285	0.0183878464014139	up in BM-MSC
12	CCDC134	0.236427142857143	0.0250167062002012	up in BM-MSC
13	LY75	0.23652	0.0315484212786347	up in BM-MSC
14	SOGA3	0.236855714285715	0.0103074057945198	up in BM-MSC
15	FAM219A	0.237047857142857	0.0410487181694254	up in BM-MSC
16	PNMA1	0.237268571428571	0.0322803328873233	up in BM-MSC
17	ITSN2	0.237307142857143	0.0101240580219787	up in BM-MSC
18	AUTS2	0.2375	0.0222232293440269	up in BM-MSC
19	ZFP3	0.237855	0.0429792973346029	up in BM-MSC
20	CCDC68	0.23791	0.0235964970277256	up in BM-MSC
21	PHKB	0.237945714285714	0.00861908399866451	up in BM-MSC
22	PRKAR2B	0.238049999999999	0.038093484874175	up in BM-MSC
23	VSTM2L	0.238134285714285	0.0128443367516127	up in BM-MSC
24	ZNF85	0.238155714285713	0.0237731439141908	up in BM-MSC
25	GTF2F2	0.238667857142857	0.0438350243589663	up in BM-MSC
26	ZNF793	0.239359285714285	0.0260726129592465	up in BM-MSC
27	AC008103.5	0.239737857142857	0.0434724713577144	up in BM-MSC
28	AGPAT3	0.239978571428571	0.00522338269413886	up in BM-MSC
29	JRK	0.240430714285714	0.0226243234082296	up in BM-MSC
30	ZNF14	0.240677142857143	0.0181986929230837	up in BM-MSC
31	RUNX3	0.240777857142856	0.00446086814367898	up in BM-MSC
32	AC073958.2	0.240842142857142	0.00457733962184504	up in BM-MSC
33	XKR8	0.240873571428571	0.00857014308808877	up in BM-MSC
34	DPYSL4	0.241132857142858	0.00490898868221559	up in BM-MSC
35	C9orf89	0.241588571428571	0.00636863920011217	up in BM-MSC
36	CUL4B	0.242149285714286	0.0204263288865793	up in BM-MSC
37	RTKN	0.24236	0.00166440799190051	up in BM-MSC
38	sept-09	0.242611428571429	0.0312971014595155	up in BM-MSC
39	ZCCHC11	0.242762142857143	0.0359034502716417	up in BM-MSC
40	NDUFS7	0.242998571428571	0.0066501429333459	up in BM-MSC
41	ZNF542	0.243007857142856	0.0189169917810225	up in BM-MSC
42	HEXIM1	0.243520714285713	0.00366012910346578	up in BM-MSC
43	TANGO2	0.243527142857142	0.0311195227543108	up in BM-MSC
44	RGP1	0.243701428571428	0.0170345965702922	up in BM-MSC
45	C5orf42	0.244701428571428	0.00946143766674552	up in BM-MSC
46	PIGO	0.244739285714285	0.00664101947815907	up in BM-MSC
47	ZNF667	0.244797142857143	0.0182754522222526	up in BM-MSC
48	PIM2	0.246223571428571	0.00386369188751794	up in BM-MSC
49	ZNF395	0.247335714285715	0.0158164782414063	up in BM-MSC
50	PAQR7	0.247369285714286	0.00801027832371866	up in BM-MSC
51	SNORD115	0.247554285714286	0.0046560072790421	up in BM-MSC
52	REM1	0.247724285714285	0.0318114414015423	up in BM-MSC
53	FMNL3	0.247731428571428	0.0109130890695414	up in BM-MSC
54	ARF3	0.247770714285713	0.0156332898655012	up in BM-MSC
55	SNX7	0.24805	0.0450508266057608	up in BM-MSC
56	DYNC1LI2	0.248297857142856	0.0462305292343499	up in BM-MSC
57	C9orf142	0.248327857142856	0.01321531922065	up in BM-MSC
58	LOC100130	0.249499999999999	0.0367333107897084	up in BM-MSC
59	ATF6	0.249901428571429	0.0156698134535885	up in BM-MSC

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3	CYP27C1	0.250055	0.0176488075304026 up in BM-MS
4	LOC729737	0.250392142857143	0.0477081664112787 up in BM-MS
5	PRKCH	0.250569999999999	0.0439780640369177 up in BM-MS
6	LGALS1	0.250664285714286	0.0131219807086191 up in BM-MS
7	ARMCX3	0.251309285714286	0.0478598758075217 up in BM-MS
8	SHFM1	0.251594999999999	0.0112309486009592 up in BM-MS
9	RBFOX2	0.251792142857142	0.00678214000119898 up in BM-MS
10	DECR2	0.251881428571428	0.028880223374385 up in BM-MS
11	AES	0.252216428571428	0.00997995269166109 up in BM-MS
12	TMEM136	0.252625	0.0271534945769667 up in BM-MS
13	SHANK2-AS1	0.253532857142857	0.0231416523146502 up in BM-MS
14	ZNF780B	0.254424285714286	0.0373165580526206 up in BM-MS
15	CASKIN2	0.255132857142857	0.00027461021047703 up in BM-MS
16	FUOM	0.255393571428571	0.00598933050183496 up in BM-MS
17	PDP2	0.255467857142857	0.0190045279102242 up in BM-MS
18	MSR1	0.25555	0.00730346170712814 up in BM-MS
19	CSPG4P1Y	0.255632857142857	0.00100428265861223 up in BM-MS
20	ACTR2	0.255957142857143	0.0130358342246756 up in BM-MS
21	MUS81	0.256050714285715	0.012911815124733 up in BM-MS
22	PPP6C	0.256076428571428	0.0284543860569139 up in BM-MS
23	PAFAH1B2	0.256314999999999	0.0157001661152533 up in BM-MS
24	ZNF334	0.2565	0.0330063044161202 up in BM-MS
25	CCND3	0.256750714285714	0.0270256874198008 up in BM-MS
26	LPPR2	0.256790714285714	0.0236222040032561 up in BM-MS
27	TSC22D3	0.257150714285714	0.00179870028077337 up in BM-MS
28	TRAPPC9	0.257162857142857	0.0157988644120415 up in BM-MS
29	APBA2	0.257163571428571	0.0385174154124057 up in BM-MS
30	WDR78	0.25746	0.0385737201964024 up in BM-MS
31	LETM2	0.257545714285714	0.0169600899181202 up in BM-MS
32	NCF2	0.257826428571428	0.0112830750783911 up in BM-MS
33	SPECC1L	0.257919285714285	0.0135522696165359 up in BM-MS
34	MOP-1	0.258192142857143	0.00232597625535588 up in BM-MS
35	CREB3L2	0.258201428571428	0.0191988849158614 up in BM-MS
36	ST8SIA1	0.259208571428571	0.0185084172643238 up in BM-MS
37	C5orf24	0.259690714285714	0.00898365052377641 up in BM-MS
38	DNAJC22	0.260180714285714	0.00504511079178957 up in BM-MS
39	VEZF1	0.260192857142858	0.0490391183193387 up in BM-MS
40	USP5	0.260537857142858	0.0361831441196984 up in BM-MS
41	KIAA1737	0.261132857142857	0.0228720736761699 up in BM-MS
42	FOXP1	0.261429285714284	0.00855538361054788 up in BM-MS
43	PRELID2	0.261459285714285	0.00984461375620611 up in BM-MS
44	PRPSAP2	0.262166428571429	0.0348835915194361 up in BM-MS
45	TNRC18P3	0.262572857142857	0.0264764036438605 up in BM-MS
46	STX7	0.263432857142856	0.0261088222050098 up in BM-MS
47	ZC4H2	0.264627142857143	0.0152475047404356 up in BM-MS
48	REEP2	0.264665	0.00490898868221559 up in BM-MS
49	CACNB3	0.264974285714285	0.00736614752534538 up in BM-MS
50	LDHA	0.265128571428574	0.0381024121156307 up in BM-MS
51	INF2	0.265223571428572	0.0448753559468533 up in BM-MS
52	ZIK1	0.265249285714286	0.0241778692330508 up in BM-MS
53	SOX11	0.265275	0.00187965540699636 up in BM-MS
54	TTC13	0.265761428571428	0.0341176930478046 up in BM-MS
55	HLA-J	0.266085714285714	0.0356790500107969 up in BM-MS
56	LOC644936	0.266434999999999	0.0171016953965526 up in BM-MS
57	MAP3K13	0.26724	0.00415229320991653 up in BM-MS
58	HN1L	0.267253571428571	0.0297724145682564 up in BM-MS
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BMMSC_ASC

LAMA3	0.268597857142857	0.0435004406332897	up in BM-MSC
HCST	0.269202857142857	0.0108138024038575	up in BM-MSC
KLHL7	0.269843571428571	0.0108332417376659	up in BM-MSC
FAM27C	0.269869285714285	0.043747868413815	up in BM-MSC
HAGH	0.270402857142857	0.0236072545214619	up in BM-MSC
CERS2	0.27048357142857	0.00424124019893558	up in BM-MSC
ABCD1	0.270511428571428	0.0139680737620831	up in BM-MSC
COMMD7	0.270607857142857	0.0175326919728621	up in BM-MSC
FHL3	0.271068571428571	0.0254701408836453	up in BM-MSC
TEC	0.271147	0.000439838696052275	up in BM-MSC
C5AR2	0.272022857142857	0.0192641837799134	up in BM-MSC
LEPREL2	0.272026428571428	0.00484054122039884	up in BM-MSC
ELOVL3	0.27245	0.00905449827103259	up in BM-MSC
IPO13	0.272810714285714	0.00730346170712814	up in BM-MSC
RP11-466L1	0.272963571428571	0.0493408080901711	up in BM-MSC
ZNF626	0.273394999999999	0.0165274884497178	up in BM-MSC
SPATA20	0.2738	0.00425519400212572	up in BM-MSC
PLCG1	0.274039999999999	0.0220380037962556	up in BM-MSC
LANCL3	0.274115	0.0128976396194731	up in BM-MSC
NACC1	0.274120714285714	0.0283176889068155	up in BM-MSC
PAGR1	0.274910714285714	0.0168593936925093	up in BM-MSC
IQGAP1	0.275074999999999	0.00121651658037076	up in BM-MSC
TMEM245	0.275102142857142	0.0256389014430876	up in BM-MSC
REEP4	0.275156428571428	0.0386127567747805	up in BM-MSC
FAM27A	0.275400714285715	0.0260994671564117	up in BM-MSC
NUDT3	0.275750714285713	0.00814686554531933	up in BM-MSC
POLB	0.275827142857142	0.0391112886361546	up in BM-MSC
NRM	0.276149285714285	0.0273098496559856	up in BM-MSC
OSBPL10	0.276397857142857	0.0315990161205481	up in BM-MSC
P4HTM	0.276403571428571	0.0259997811454717	up in BM-MSC
KIF5B	0.276832857142857	0.0127395240351961	up in BM-MSC
HTR7	0.276997857142857	0.0059468381861895	up in BM-MSC
WNK1	0.277134999999999	0.00342455795151095	up in BM-MSC
PAFAH1B3	0.277634999999999	0.0228720736761699	up in BM-MSC
UPRT	0.277924285714286	0.00590505756111192	up in BM-MSC
GTF2I	0.278165714285714	0.00451975651795509	up in BM-MSC
CD2AP	0.278173571428571	0.00602268644306121	up in BM-MSC
SLC39A13	0.278507142857142	0.0079788170464947	up in BM-MSC
PICK1	0.279047142857143	0.0187349189127352	up in BM-MSC
PINK1	0.280114285714285	0.00959197702155991	up in BM-MSC
MTMR4	0.280270714285714	0.0368004482800704	up in BM-MSC
THBS1	0.281642857142855	0.00867814181188804	up in BM-MSC
POTEKP	0.282112857142857	0.0170025975352382	up in BM-MSC
FGF1	0.282197857142857	0.0072546680969976	up in BM-MSC
RP13-516M	0.282407142857143	0.0290221466721525	up in BM-MSC
KCNS3	0.282476428571428	0.00929750477705115	up in BM-MSC
SLC41A1	0.282667142857142	0.00551648860686056	up in BM-MSC
CCDC85C	0.283427857142857	0.0102537526132735	up in BM-MSC
CLIP2	0.283499285714285	0.00802682068783504	up in BM-MSC
MARC1	0.283567857142857	0.00913045492730955	up in BM-MSC
NAGK	0.283633571428571	0.0399984103866232	up in BM-MSC
SLC2A8	0.283894285714286	0.00309924525308327	up in BM-MSC
RSPH3	0.283899285714285	0.00572501881797219	up in BM-MSC
WWP2	0.284637857142857	0.0241583167577552	up in BM-MSC
STXBP1	0.284721428571428	0.0227857714972011	up in BM-MSC
PRDM16	0.284814285714286	0.00296581692106794	up in BM-MSC

		BMSC_ASC	
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3	ARSG	0.28485	0.00336425657087227 up in BM-MS
4	COPRS	0.285223571428571	0.021030367072154 up in BM-MS
5	SYNJ1	0.285348571428571	0.00273237578664008 up in BM-MS
6	PPP1R13B	0.285608571428571	0.00012431712398323 up in BM-MS
7	SPANXA2-C	0.286401428571428	0.0457402857187494 up in BM-MS
8	SELT	0.286432857142856	0.00261388353688864 up in BM-MS
9	C7orf50	0.286617857142856	0.0170718916416179 up in BM-MS
10	FGFRL1	0.286625714285714	0.0183634824400033 up in BM-MS
11	MLLN	0.286938571428571	0.0232117783549907 up in BM-MS
12	STAMPB	0.287284285714285	0.00277658476783306 up in BM-MS
13	KRT86	0.287464285714286	0.00204009636932772 up in BM-MS
14	ADAMTS9	0.287588571428572	0.0311917609670408 up in BM-MS
15	GPI	0.288403571428571	0.0267378894228202 up in BM-MS
16	ZDHHC13	0.289066428571428	0.0365798999819935 up in BM-MS
17	ACOT13	0.289292857142856	0.0100600533623446 up in BM-MS
18	NINJ1	0.289339285714285	0.0245860056423123 up in BM-MS
19	BICD1	0.289771428571429	0.0488990457206995 up in BM-MS
20	ACTBP7	0.290008571428571	0.0154978485738443 up in BM-MS
21	KIAA1715	0.290139285714285	0.0169098219142298 up in BM-MS
22	SLC25A37	0.290592142857142	0.0493794663274411 up in BM-MS
23	RAB34	0.290849285714287	0.0111517261212039 up in BM-MS
24	SPRYD7	0.291618571428571	0.0137462963918738 up in BM-MS
25	NAT14	0.292011428571429	0.0016384610005351 up in BM-MS
26	DOPEY1	0.292253571428571	0.0219259957152549 up in BM-MS
27	COL7A1	0.292430714285714	0.00277877738214961 up in BM-MS
28	ANKEF1	0.292755	0.00265374754367811 up in BM-MS
29	BBX	0.293802857142857	0.0271367634919855 up in BM-MS
30	KIF3C	0.294114285714286	0.0164608303797235 up in BM-MS
31	JPH2	0.294149285714285	0.00744321696676397 up in BM-MS
32	H2AFY2	0.294199999999999	0.0114124252369195 up in BM-MS
33	ROGDI	0.294357142857142	0.00761136335358736 up in BM-MS
34	IGFBP1	0.294842857142856	0.0226243234082296 up in BM-MS
35	GNAQ	0.295164999999999	0.0177634295968941 up in BM-MS
36	NLRP1	0.295215714285714	0.00059757984510577 up in BM-MS
37	TMEM246	0.295267142857143	9.20890219714208e-05 up in BM-MS
38	RNF5P1	0.295826428571428	0.00117464453226081 up in BM-MS
39	OBFC1	0.29585	0.0115257138495358 up in BM-MS
40	C4orf22	0.295997857142857	0.00833252706928246 up in BM-MS
41	MORC4	0.296046428571428	0.0307235752696704 up in BM-MS
42	ZNF625-ZN	0.296276428571428	0.0375286057382028 up in BM-MS
43	ARHGDI	0.296516428571427	0.0248182489253573 up in BM-MS
44	MYO5A	0.29716	0.0367333107897084 up in BM-MS
45	KANK2	0.29724	0.0300263022720785 up in BM-MS
46	NXNL2	0.297652857142857	0.00814686554531933 up in BM-MS
47	HAAO	0.297863571428572	0.00338103278032422 up in BM-MS
48	YIPF2	0.297880714285714	0.0244687151959693 up in BM-MS
49	CNN3	0.298118571428571	0.00740611414917279 up in BM-MS
50	HUS1	0.298254285714285	0.00038654174866763 up in BM-MS
51	KRTAP2-4	0.298422857142857	0.0232606045275659 up in BM-MS
52	MAGED1	0.298683571428571	0.026824738740036 up in BM-MS
53	ASB5	0.299047142857143	0.00387016127162122 up in BM-MS
54	TNFRSF25	0.300072142857143	0.00106828762444403 up in BM-MS
55	RCN3	0.300282142857142	0.0244033356757334 up in BM-MS
56	TEAD3	0.300562142857142	0.00765506062046628 up in BM-MS
57	WDR47	0.301287142857143	0.0110916872845344 up in BM-MS
58	FRYL	0.30141	0.0231277583166076 up in BM-MS
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BMMSC_ASC

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3	EHD1	0.301992142857142	0.0434124379606277 up in BM-MS
4	RAF1	0.302650714285713	0.00893778475028449 up in BM-MS
5	CELSR1	0.302655	0.000629080869124199 up in BM-MS
6	CAPZB	0.304342857142857	0.00045661929834942 up in BM-MS
7	ZNF772	0.304675	0.00342403166796068 up in BM-MS
8	CERCAM	0.304888571428571	0.0029125094073919 up in BM-MS
9	ASPHD1	0.304906428571429	0.0361392949730698 up in BM-MS
10	PYGB	0.306302142857142	0.0287701018351129 up in BM-MS
11	RASA2	0.306392142857142	0.0270256874198008 up in BM-MS
12	NLRX1	0.306665714285714	0.00132858506982709 up in BM-MS
13	PRKACA	0.306897857142857	0.0067701991809827 up in BM-MS
14	NPR2	0.306979999999999	0.0219895197922037 up in BM-MS
15	ING2	0.307459285714286	0.0204688432765815 up in BM-MS
16	CBX6	0.30757	0.0340398917509093 up in BM-MS
17	TRPM4	0.307595	0.0119102758273784 up in BM-MS
18	EXD2	0.307723571428572	0.0469794482277454 up in BM-MS
19	DOLPP1	0.307884285714286	0.00799707624068462 up in BM-MS
20	RWDD4	0.308306428571427	0.0246205663495419 up in BM-MS
21	TTC9	0.308457857142857	0.0311104956650255 up in BM-MS
22	RNF5	0.308497857142857	0.000698056075478424 up in BM-MS
23	MYPN	0.308691428571428	0.0478598758075217 up in BM-MS
24	ABR	0.308972142857142	0.0224088123904531 up in BM-MS
25	VCL	0.309344285714285	0.000492879089216956 up in BM-MS
26	GLIS2	0.309447142857142	0.0190350251219888 up in BM-MS
27	CCS	0.309534285714286	0.00209379523776157 up in BM-MS
28	CADM1	0.30963	0.00174640207703748 up in BM-MS
29	RDX	0.310027142857143	0.00147603782012316 up in BM-MS
30	CHRNE	0.310259285714286	0.00437206141030078 up in BM-MS
31	CDC42SE2	0.310268571428571	0.00380443250602695 up in BM-MS
32	CILP2	0.310507142857142	0.0327449658429818 up in BM-MS
33	OSBPL5	0.310586428571429	0.00980790803533816 up in BM-MS
34	MAPKAPK3	0.310920714285715	0.0498074006354365 up in BM-MS
35	TSPYL5	0.312005	0.0175084941503084 up in BM-MS
36	TECR	0.31205	0.0465444812680021 up in BM-MS
37	IPP	0.312315	0.0191209394688005 up in BM-MS
38	BTN2A1	0.312509999999999	0.00401834037171248 up in BM-MS
39	DDHD2	0.313135714285713	0.00329942230646591 up in BM-MS
40	DMXL2	0.313215714285714	0.0035940671487353 up in BM-MS
41	PLEKHF2	0.313498571428571	0.0194503515938695 up in BM-MS
42	SPIN1	0.314757142857143	0.00194117175723978 up in BM-MS
43	SLC35E4	0.316416428571428	0.000721293603496625 up in BM-MS
44	CEP170B	0.316795714285714	0.0301326949285447 up in BM-MS
45	GDNF	0.317129285714285	0.0419898860693788 up in BM-MS
46	PRRX2	0.317707142857142	0.00504527714154921 up in BM-MS
47	SOX6	0.317834285714286	0.000323211105941232 up in BM-MS
48	ANXA6	0.317878571428572	0.0102846778301338 up in BM-MS
49	SERGEF	0.318165	0.0195196379692009 up in BM-MS
50	SACS	0.318487857142857	0.0461151603632563 up in BM-MS
51	XYLT2	0.318905714285714	0.00242743329628017 up in BM-MS
52	TRAK2	0.319015	0.0396132360193916 up in BM-MS
53	TNRC6C	0.319142142857143	0.0103183698190621 up in BM-MS
54	CYP20A1	0.319358571428571	0.016036406481316 up in BM-MS
55	LASP1	0.319619999999999	0.0114795722929732 up in BM-MS
56	REPIN1	0.319888571428571	0.00652274838102399 up in BM-MS
57	KIRREL	0.319947142857143	0.0223502402371649 up in BM-MS
58	GNAI2	0.321024999999999	0.00050229314481185 up in BM-MS
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BMMSC_ASC

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4	PHF10	0.321228571428571	0.02159100654018	up in BM-MSC
5	LPP	0.321319999999999	0.00676058490621049	up in BM-MSC
6	AC027612.1	0.321472857142856	0.00339491797194586	up in BM-MSC
7	SLC38A3	0.321483571428572	0.000976138345384659	up in BM-MSC
8	DDR1	0.321711428571429	0.0411971255673774	up in BM-MSC
9	CTTNBP2N	0.322087142857143	0.0280220079122438	up in BM-MSC
10	POMGNT1	0.322521428571428	0.00699312998350066	up in BM-MSC
11	TMEM106A	0.322952142857143	0.0260577033179706	up in BM-MSC
12	CAPN2	0.323122142857143	0.00258222796097119	up in BM-MSC
13	FBXO16	0.323217857142857	0.0042167576757356	up in BM-MSC
14	CBL	0.323381428571427	0.00121651658037076	up in BM-MSC
15	TNFAIP8	0.324652857142857	0.026997322436328	up in BM-MSC
16	POTEM	0.324866428571428	0.0214286045952154	up in BM-MSC
17	EPDR1	0.324893571428571	0.0225253700764328	up in BM-MSC
18	CHD4	0.325483571428571	0.000305634962514656	up in BM-MSC
19	PLEKHA6	0.325567857142857	0.0150358354375107	up in BM-MSC
20	KIAA0895	0.325669999999999	0.000573981408623529	up in BM-MSC
21	NACC2	0.326677857142857	0.00256536377643587	up in BM-MSC
22	MARC2	0.328473571428572	0.0177073924400316	up in BM-MSC
23	CALM3	0.328665714285713	0.000170928496845029	up in BM-MSC
24	FAM213B	0.328687857142857	0.00690660070153944	up in BM-MSC
25	MAPRE3	0.328738571428571	0.0231277583166076	up in BM-MSC
26	PNPLA3	0.329003571428572	0.0493597806245868	up in BM-MSC
27	VAMP5	0.329871428571428	0.0042167576757356	up in BM-MSC
28	ACTBP2	0.331549999999999	0.00689012837403434	up in BM-MSC
29	SUSD5	0.33177	0.0034609326811357	up in BM-MSC
30	SDR42E1	0.332207857142857	0.00521461438789678	up in BM-MSC
31	BACE1	0.332455	0.0148310586648493	up in BM-MSC
32	DAB2IP	0.332457142857143	0.00265374754367811	up in BM-MSC
33	ANKRD20A	0.333490714285714	0.0353191719805518	up in BM-MSC
34	HRAS	0.335526428571428	0.00166890176724774	up in BM-MSC
35	STOML1	0.336091428571429	0.00121651658037076	up in BM-MSC
36	RGL1	0.337440714285714	0.033428675731611	up in BM-MSC
37	CH17-12M2	0.337476428571428	0.00732330305899029	up in BM-MSC
38	HEY2	0.337584285714286	0.0192362251428574	up in BM-MSC
39	CHD9	0.337784285714286	0.000714962646243869	up in BM-MSC
40	CYP2R1	0.338223571428571	0.0225253700764328	up in BM-MSC
41	ZDHHC21	0.338617857142856	0.036306711078966	up in BM-MSC
42	ATF7IP2	0.339372142857143	0.000889992470573248	up in BM-MSC
43	PPFIBP1	0.339391428571428	0.00437206141030078	up in BM-MSC
44	TUBB2B	0.339595714285715	0.0046565146437536	up in BM-MSC
45	FOXC1	0.339628571428571	0.000124928138437899	up in BM-MSC
46	KLC2	0.339724999999999	0.00117959654185465	up in BM-MSC
47	NOL3	0.339952142857142	0.000840006020454557	up in BM-MSC
48	DUSP18	0.339953571428571	0.00530998405994255	up in BM-MSC
49	NFATC2	0.340312857142857	0.0219262692542604	up in BM-MSC
50	SLC30A4	0.340329285714286	0.0231622489739396	up in BM-MSC
51	SHISA4	0.340755	0.023281233299956	up in BM-MSC
52	ARL3	0.34148357142857	0.00180722512949832	up in BM-MSC
53	SEMA4C	0.342496428571428	0.00473740453377519	up in BM-MSC
54	ZMYM3	0.342503571428571	0.000174193602649429	up in BM-MSC
55	MRPL23	0.343112142857143	0.0244692209897339	up in BM-MSC
56	APC	0.343135714285714	0.000190079808774299	up in BM-MSC
57	SEC14L2	0.343150714285714	0.0285068966037203	up in BM-MSC
58	CAP1	0.343414285714285	0.0173069547260559	up in BM-MSC
59	IGSF8	0.344674285714286	0.000748611644304099	up in BM-MSC

BMMSC_ASC

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4	FOXC2	0.344747857142857	0.000575069294937704	up in BM-MS
5	C11orf80	0.344804285714285	0.00130297289978621	up in BM-MS
6	ACTG1P1	0.344949999999999	0.00110556736160901	up in BM-MS
7	IDS	0.344954285714285	0.0385284892628696	up in BM-MS
8	TENM4	0.345775	0.0431337708374088	up in BM-MS
9	EHD3	0.346536428571428	0.0194018806673828	up in BM-MS
10	PHLDB2	0.346549285714286	0.00485169277135377	up in BM-MS
11	CCDC167	0.347687142857143	0.0133149789086113	up in BM-MS
12	IGF1R	0.347797142857142	0.0380731914486323	up in BM-MS
13	DEPDC7	0.347895	0.000409728807795361	up in BM-MS
14	ANKRD52	0.348458571428571	0.0244033356757334	up in BM-MS
15	MOB1B	0.34876	0.00892600741411038	up in BM-MS
16	PYGO1	0.349141428571428	0.000252057992654	up in BM-MS
17	PITPNM3	0.349562857142857	0.00368757819949075	up in BM-MS
18	SCYL2	0.349711428571428	0.00159228011205857	up in BM-MS
19	OR7E162P	0.349759285714286	0.00588183260680438	up in BM-MS
20	POTEI	0.35075	0.0121877161293061	up in BM-MS
21	PAK3	0.351	0.0157720763369693	up in BM-MS
22	UBR3	0.351106428571429	0.0492421993004061	up in BM-MS
23	KIF1C	0.351304999999999	0.00386551450267089	up in BM-MS
24	FPR1	0.351385000000001	0.00371307856752801	up in BM-MS
25	BCAM	0.351517857142857	0.0104453158921786	up in BM-MS
26	BAIAP2-AS	0.351542142857142	0.00013026755921829	up in BM-MS
27	TSPYL4	0.351559999999999	0.00113374920938591	up in BM-MS
28	CD151	0.351714285714285	0.00130726395286556	up in BM-MS
29	KMT2E	0.351827857142858	7.71101023418462e-05	up in BM-MS
30	STK39	0.352837857142857	0.00757798528015785	up in BM-MS
31	MEF2A	0.353215714285715	0.0135467599670657	up in BM-MS
32	DIP2C	0.353943571428571	0.00048644877451119	up in BM-MS
33	PMVK	0.354274285714286	1.44622544363504e-05	up in BM-MS
34	ANXA2P1	0.354285714285713	0.0295499354583782	up in BM-MS
35	C10orf54	0.354907857142856	0.00657668635608692	up in BM-MS
36	SCAPER	0.355745714285714	0.0218360364354105	up in BM-MS
37	STBD1	0.355918571428571	0.000161775960243684	up in BM-MS
38	TMEM56	0.356710714285714	0.0303847156817789	up in BM-MS
39	ABCA3	0.357152857142857	0.00054274308417099	up in BM-MS
40	RAB36	0.357615714285713	0.000779383895441214	up in BM-MS
41	RAMP1	0.357745	0.00590505756111192	up in BM-MS
42	SLC22A17	0.359077857142857	0.00113696193065349	up in BM-MS
43	PLA2G15	0.360041428571428	0.00794340352115063	up in BM-MS
44	SGPL1	0.360878571428571	0.0412015969599339	up in BM-MS
45	APLP1	0.361607142857143	0.00408577751939102	up in BM-MS
46	OXR1	0.362066428571429	0.00438693798776199	up in BM-MS
47	TRAM1	0.362657142857142	3.56187134101598e-05	up in BM-MS
48	HIPK2	0.363177857142857	0.0066380257141545	up in BM-MS
49	CDC42EP1	0.363367857142857	0.0301559009490689	up in BM-MS
50	ACTA2-AS1	0.363568571428571	0.0122439414398256	up in BM-MS
51	ROS1	0.364937142857142	0.00446908506982642	up in BM-MS
52	STIM1	0.365305714285713	0.0461736152471563	up in BM-MS
53	PTMS	0.36531357142857	0.037561804635718	up in BM-MS
54	TBC1D12	0.366002142857143	0.0225253700764328	up in BM-MS
55	BACE2	0.366222142857142	0.00739180426352538	up in BM-MS
56	ABHD2	0.366245	0.0349820154964407	up in BM-MS
57	ACTA1	0.366955714285714	0.00206024567259451	up in BM-MS
58	DOCK9	0.367037857142857	0.00483301021692352	up in BM-MS
59	PHF19	0.367107142857142	0.00508137246032573	up in BM-MS

BMMSC_ASC

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4	ADAMTS2	0.367238571428572	0.00510251936634243 up in BM-MSC
5	KCTD11	0.367701428571428	0.0398781767234439 up in BM-MSC
6	CRIP1P4	0.367792142857143	0.00325717293336753 up in BM-MSC
7	FNDC4	0.368272142857142	0.0199858503771664 up in BM-MSC
8	LOC101060	0.368460714285713	0.00029579524861296 up in BM-MSC
9	EPHA3	0.369182857142857	0.00113374920938591 up in BM-MSC
10	PTRF	0.369754999999999	0.00156413234699377 up in BM-MSC
11	MTMR2	0.369873571428572	0.0115529952096526 up in BM-MSC
12	BTN2A2	0.370289285714285	0.000509393890406756 up in BM-MSC
13	MOCS1	0.370407142857144	0.000456489898038817 up in BM-MSC
14	GOPC	0.370889999999999	0.0105395598220948 up in BM-MSC
15	FAT1	0.371286428571428	0.0309906478808062 up in BM-MSC
16	DUSP7	0.371622142857142	0.00453292136208982 up in BM-MSC
17	CNTNAP2	0.372498571428571	0.0136049469607914 up in BM-MSC
18	EXOC6	0.372762142857143	0.006355957084687 up in BM-MSC
19	ARHGEF6	0.372932142857142	0.00326730698295216 up in BM-MSC
20	PER2	0.372972142857143	0.00799866180563482 up in BM-MSC
21	ZNF439	0.373116428571428	0.0349431697917318 up in BM-MSC
22	YPEL1	0.373556428571428	0.00260306401652606 up in BM-MSC
23	BGLAP	0.374096428571428	0.0301854565616819 up in BM-MSC
24	ARHGAP5	0.3751	0.00296581692106794 up in BM-MSC
25	C15orf52	0.377178571428571	0.000391720034173944 up in BM-MSC
26	ERBB2IP	0.378797142857142	0.00577735864557648 up in BM-MSC
27	KIAA1377	0.378897857142857	0.0315484212786347 up in BM-MSC
28	NOTCH1	0.379207142857143	0.00200115224147188 up in BM-MSC
29	QPCTL	0.379234285714286	0.000599573350579636 up in BM-MSC
30	PKM	0.38012857142857	0.000841081933084925 up in BM-MSC
31	IQSEC1	0.380954285714286	0.0242463239131712 up in BM-MSC
32	SVIP	0.381176428571428	0.00439124250918444 up in BM-MSC
33	ABI2	0.381906428571428	0.000158201606827228 up in BM-MSC
34	KRT23	0.381969285714285	0.00431588539562736 up in BM-MSC
35	UBXN2B	0.382186428571428	0.0280929875596825 up in BM-MSC
36	AMN1	0.382969285714286	0.00151396857971911 up in BM-MSC
37	GDI1	0.383075714285714	0.00110363802170553 up in BM-MSC
38	SNTB1	0.383324999999999	0.0255299546301601 up in BM-MSC
39	SLC9A3R1	0.384959999999999	0.00300319105038136 up in BM-MSC
40	DDO	0.385662142857143	0.00362683040996667 up in BM-MSC
41	C7orf69	0.386395	0.00256536377643587 up in BM-MSC
42	SLC38A2	0.386721428571428	0.00300319105038136 up in BM-MSC
43	IL11RA	0.386955	0.0469258255276536 up in BM-MSC
44	TBC1D24	0.387308571428572	0.00158869854475027 up in BM-MSC
45	LCLAT1	0.388616428571428	0.0041038458845851 up in BM-MSC
46	ZNF827	0.389067857142857	0.00346209137407867 up in BM-MSC
47	IDSP1	0.390023571428571	0.00983417542313268 up in BM-MSC
48	CFL1	0.390057142857142	0.00820942901086597 up in BM-MSC
49	HLCS	0.390085714285714	0.0344773394026853 up in BM-MSC
50	TCEAL6	0.390887857142856	0.000776661937691705 up in BM-MSC
51	CTNND1	0.391337857142856	3.40639898282221e-05 up in BM-MSC
52	BCL9	0.391710714285714	0.000122884586615046 up in BM-MSC
53	TET2	0.391976428571429	0.00369718360005018 up in BM-MSC
54	ORAI2	0.392319285714286	0.00574524282847242 up in BM-MSC
55	ACOT2	0.392378571428571	0.0317199729220278 up in BM-MSC
56	ADAMTS7	0.392411428571428	0.00190658235272213 up in BM-MSC
57	TRAM1L1	0.392581428571428	0.00034279654678136 up in BM-MSC
58	SESTD1	0.393974285714284	0.01394797322584 up in BM-MSC
59	CCNJL	0.394022857142857	0.000955835373498178 up in BM-MSC

BMMSC_ASC

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4	DTWD2	0.394197857142857	0.00388133684981159 up in BM-MSC
5	SETBP1	0.394347142857143	0.0238786604568739 up in BM-MSC
6	KLHL3	0.395167142857142	0.00976921493655814 up in BM-MSC
7	ANKRD36B	0.396060714285714	0.00663142613237117 up in BM-MSC
8	ADCK2	0.396093571428572	0.0164608303797235 up in BM-MSC
9	INHBB	0.396412142857143	4.46711794036344e-05 up in BM-MSC
10	TCEAL3	0.397821428571428	0.00460691057312845 up in BM-MSC
11	HERC1	0.397902142857143	0.00427705750582711 up in BM-MSC
12	RARA	0.397925714285714	0.00173338884031492 up in BM-MSC
13	FRZB	0.398924285714286	0.0464752017132234 up in BM-MSC
14	FAM212B	0.399137857142857	0.0181986929230837 up in BM-MSC
15	TM7SF3	0.399241428571429	0.00098285852590033 up in BM-MSC
16	DNASE1L1	0.399857857142856	0.00877021930529549 up in BM-MSC
17	EXTL2	0.400344999999999	0.00952026830812511 up in BM-MSC
18	YWHAH	0.400538571428571	0.00110556736160901 up in BM-MSC
19	PYGL	0.400744285714284	0.00329942230646591 up in BM-MSC
20	MYADM	0.400790714285713	0.00777254777544498 up in BM-MSC
21	ATP6V0E2	0.402170714285714	0.00102568066943117 up in BM-MSC
22	BAI2	0.402570714285714	6.97790025530654e-05 up in BM-MSC
23	ARMCX2	0.403019999999999	0.0082625510909665 up in BM-MSC
24	IFFO2	0.403605714285714	0.0210840518020928 up in BM-MSC
25	EPHB4	0.403622142857142	0.00624143726274634 up in BM-MSC
26	DOPEY2	0.405199285714285	0.00262526556554841 up in BM-MSC
27	FZD7	0.405492142857142	0.00801027832371866 up in BM-MSC
28	SKA2	0.405857142857143	0.0217526874133778 up in BM-MSC
29	ARHGEF10	0.405995714285714	0.00503216718783175 up in BM-MSC
30	P2RX6	0.40618	0.00185661479850662 up in BM-MSC
31	ACTG1	0.407114285714284	0.00039855287442996 up in BM-MSC
32	VASP	0.407152857142857	0.0209562856685666 up in BM-MSC
33	CERS6	0.407206428571428	0.0357287527779883 up in BM-MSC
34	MARVELD2	0.407517142857143	0.031183162317526 up in BM-MSC
35	FAM151B	0.407817142857143	0.00171549974390333 up in BM-MSC
36	GALM	0.408120714285714	0.0418081597456181 up in BM-MSC
37	UGCG	0.408257857142857	0.0284923132088132 up in BM-MSC
38	CCL28	0.408474285714285	0.00043659792503078 up in BM-MSC
39	WFDC1	0.409512142857143	0.00914962606109778 up in BM-MSC
40	TSPO	0.412344999999999	0.00396097253555887 up in BM-MSC
41	FAM189A2	0.412605714285714	0.00458966500417532 up in BM-MSC
42	TMEM171	0.413046428571429	0.0154132154719189 up in BM-MSC
43	ENPP4	0.413955714285714	0.00859011787808138 up in BM-MSC
44	PAFAH2	0.414022142857142	0.00032643611594958 up in BM-MSC
45	TALDO1	0.414657857142856	0.00092497568149025 up in BM-MSC
46	SPEG	0.414743571428572	0.00130297289978621 up in BM-MSC
47	ARHGAP23	0.415552857142858	0.00681706449233175 up in BM-MSC
48	XYLT1	0.415692857142858	0.00891009578015331 up in BM-MSC
49	ERMN	0.415864285714285	0.00701855162948475 up in BM-MSC
50	C9orf3	0.416052142857142	0.00061134211798742 up in BM-MSC
51	DLEU1	0.416207857142857	0.0447687173673908 up in BM-MSC
52	OSTF1	0.416386428571429	0.00292406345962886 up in BM-MSC
53	VAMP2	0.416435714285713	0.00835102870231992 up in BM-MSC
54	DLX6	0.416577142857143	0.0009122089409321 up in BM-MSC
55	SYT11	0.416837142857142	0.00775272576590632 up in BM-MSC
56	ITGB5	0.416997142857143	0.00501099367408984 up in BM-MSC
57	CCDC14	0.417051428571428	0.0101185068423585 up in BM-MSC
58	CALM2	0.417207857142856	0.00060345316596648 up in BM-MSC
59	RABGAP1	0.418010714285714	6.18109748016993e-05 up in BM-MSC

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4	SMAP2	0.418141428571429	0.0123798613248576	up in BM-MS
5	NEK6	0.418811428571429	0.0170025975352382	up in BM-MS
6	C10orf107	0.419451428571428	0.00235455218580908	up in BM-MS
7	BCAR1	0.419921428571428	0.00369443871163542	up in BM-MS
8	KGFLP2	0.420567142857143	0.000234205204460937	up in BM-MS
9	PREX1	0.420595714285714	9.51212245871735e-05	up in BM-MS
10	PLEKHG2	0.420713571428571	0.00458966500417532	up in BM-MS
11	LIMK2	0.421932857142857	0.0040931855481975	up in BM-MS
12	PIEZO1	0.422441428571427	0.000357804537994485	up in BM-MS
13	ZNF699	0.422756428571428	8.78678788913861e-05	up in BM-MS
14	LPGAT1	0.422927142857143	0.00622354738059137	up in BM-MS
15	CAPS	0.42381357142857	0.00105533779114995	up in BM-MS
16	LOC441956	0.424953571428572	0.0362203804255128	up in BM-MS
17	ARHGAP5	0.425265714285714	0.000289612351211062	up in BM-MS
18	PIK3R3	0.426633571428571	0.000391720034173944	up in BM-MS
19	CPPED1	0.427705714285715	0.0322547187987626	up in BM-MS
20	DLX1	0.428107142857142	0.000367232196723857	up in BM-MS
21	VWA1	0.429353571428571	0.000575151688560637	up in BM-MS
22	TOM1L2	0.42994	0.0056513675872864	up in BM-MS
23	PALMD	0.430326428571428	0.0327449658429818	up in BM-MS
24	SEC14L1	0.431499285714286	0.000391720034173944	up in BM-MS
25	CYLD	0.432868571428571	0.00736099799675224	up in BM-MS
26	PPP1R12B	0.432997142857142	0.00545833495491513	up in BM-MS
27	RASGEF1B	0.433237142857143	0.00118356594890877	up in BM-MS
28	HDAC11	0.433524285714285	0.00176912916974571	up in BM-MS
29	ILK	0.434882142857142	9.9491519834403e-05	up in BM-MS
30	PPIP5K1	0.435257857142857	0.00835102870231992	up in BM-MS
31	ARG2	0.435537142857143	0.0301326949285447	up in BM-MS
32	HINT3	0.436569999999999	0.0133226502917277	up in BM-MS
33	CDO1	0.437795714285714	0.0220778308973199	up in BM-MS
34	DLX3	0.438073571428571	0.0102537526132735	up in BM-MS
35	SCMH1	0.438971428571429	0.00360294579437489	up in BM-MS
36	CDH15	0.439732142857143	0.0017128807097505	up in BM-MS
37	LHFP	0.440605714285714	0.00740611414917279	up in BM-MS
38	FAM115A	0.441280714285714	0.0385695907745447	up in BM-MS
39	CMTM8	0.442148571428572	0.00891009578015331	up in BM-MS
40	SMO	0.442641428571429	0.000121923133453863	up in BM-MS
41	TMEM150A	0.443373571428571	0.00672800968191328	up in BM-MS
42	MYO1C	0.443410714285713	0.00528871501252111	up in BM-MS
43	PFN1P2	0.445548571428571	0.0186222397133245	up in BM-MS
44	ITPR1	0.446020714285714	0.0023236821305341	up in BM-MS
45	AMOTL2	0.448215714285714	0.0191281361664552	up in BM-MS
46	TP63	0.448661428571429	0.0233657975993565	up in BM-MS
47	SEPW1	0.449142142857143	0.0120279449315661	up in BM-MS
48	LAMP5	0.449671428571429	0.0495210728264397	up in BM-MS
49	CCND1	0.449994999999999	0.0304956540680026	up in BM-MS
50	MDK	0.451389285714286	0.000949052600150255	up in BM-MS
51	MAN2A2	0.451867857142857	0.00204009636932772	up in BM-MS
52	SIPA1L2	0.452832857142857	0.00652708350633692	up in BM-MS
53	SGK223	0.452888571428571	0.000274100958357885	up in BM-MS
54	EPG5	0.453643571428571	0.00838232203912472	up in BM-MS
55	PPP1R12A	0.454202857142856	0.00739180426352538	up in BM-MS
56	ZNF671	0.455902857142858	0.000742969712413864	up in BM-MS
57	EFS	0.45637	0.000283722532205614	up in BM-MS
58	COX17	0.457064285714286	0.00263063338536768	up in BM-MS
59	GALNT7	0.457931428571428	0.00237982687485825	up in BM-MS

BMMSC_ASC

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3	TIMP3	0.457957142857143	0.0267074244531016 up in BM-MSC
4	B4GALNT1	0.458141428571429	0.00218567708952756 up in BM-MSC
5	HPS5	0.459127142857143	0.0119100825887143 up in BM-MSC
6	PREPL	0.459374285714286	0.0474840042308644 up in BM-MSC
7	GPD1L	0.459522142857143	0.0252303011867968 up in BM-MSC
8	RNA5SP50C	0.460637857142857	0.0175084941503084 up in BM-MSC
9	CDIP1	0.461552857142857	0.00275545163538314 up in BM-MSC
10	ADORA1	0.465230714285714	0.00316418644035461 up in BM-MSC
11	ABHD5	0.465234999999999	0.00778842743888372 up in BM-MSC
12	COX17P1	0.465743571428572	0.00200295132033887 up in BM-MSC
13	MAGED4B	0.466822142857143	0.0151219260275682 up in BM-MSC
14	PRKD1	0.46693	0.0246660995484471 up in BM-MSC
15	FAT4	0.467648571428571	0.00829206582493307 up in BM-MSC
16	ANP32AP1	0.468167857142857	0.000168826051480895 up in BM-MSC
17	DIRAS1	0.468355714285714	0.00135737266560589 up in BM-MSC
18	DGKA	0.468762142857143	0.00326730698295216 up in BM-MSC
19	NLGN4Y	0.469055	0.00630640995170256 up in BM-MSC
20	YEATS2	0.469161428571427	0.000399442096479918 up in BM-MSC
21	ICAM2	0.469287857142857	0.0315484212786347 up in BM-MSC
22	LRP12	0.469292142857143	0.00501099367408984 up in BM-MSC
23	MIOS	0.47164	0.00369106112936845 up in BM-MSC
24	PLEKHG5	0.473200714285713	0.000181871059361794 up in BM-MSC
25	ZNF664	0.474119285714286	0.000728977837457821 up in BM-MSC
26	NPTN	0.474645714285713	9.88400758763647e-06 up in BM-MSC
27	TGFB11I	0.477352142857143	0.00265374754367811 up in BM-MSC
28	CNN2	0.478004999999999	0.00456131979416305 up in BM-MSC
29	CCNYL1	0.478367857142857	0.00904370287814578 up in BM-MSC
30	FAM13C	0.478966428571429	0.00474261803686907 up in BM-MSC
31	TMEM108	0.479237142857142	0.00419297885319916 up in BM-MSC
32	SMPD1	0.479266428571428	0.00253736254955126 up in BM-MSC
33	SYNGR2	0.480101428571428	0.00857319359568151 up in BM-MSC
34	FZD6	0.480155	0.0348317748099509 up in BM-MSC
35	CFHR1	0.482253571428572	0.0133246599303458 up in BM-MSC
36	COX20	0.484457142857142	0.000750052260829828 up in BM-MSC
37	PFKFB4	0.484585714285714	0.00508137246032573 up in BM-MSC
38	SERINC5	0.484668571428572	0.00371980800744841 up in BM-MSC
39	FZD3	0.484715	0.00113239087838769 up in BM-MSC
40	TBC1D10A	0.485302142857143	7.87703616770544e-05 up in BM-MSC
41	AVPI1	0.486864285714285	0.00446908506982642 up in BM-MSC
42	PDIA5	0.48742	0.0369648373350557 up in BM-MSC
43	SMCO4	0.487461428571428	0.0132756651657295 up in BM-MSC
44	GHR	0.487505714285714	0.0276501240334561 up in BM-MSC
45	FAM129B	0.488999285714285	0.000697723389938607 up in BM-MSC
46	MNS1	0.492053571428571	0.0166254835181886 up in BM-MSC
47	LOC100506	0.493112142857142	0.00158328796954533 up in BM-MSC
48	PLEC	0.493254999999998	0.00018000975136702 up in BM-MSC
49	EOGT	0.493357857142857	0.0145267674392603 up in BM-MSC
50	FLJ39632	0.494505714285714	0.0271367634919855 up in BM-MSC
51	WDR1	0.494752142857142	0.00692086024693774 up in BM-MSC
52	CCDC88A	0.496788571428572	0.000400034310464613 up in BM-MSC
53	CAMSAP1	0.498885	0.00102352538653188 up in BM-MSC
54	RHOD	0.499424285714285	0.00212931552858781 up in BM-MSC
55	RASL11A	0.50056	0.0448386119574047 up in BM-MSC
56	SV2A	0.500732857142857	0.00061599747375017 up in BM-MSC
57	MSN	0.501083571428571	0.00473740453377519 up in BM-MSC
58	FAM63A	0.501126428571428	0.00817739016156216 up in BM-MSC
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3	CASP6	0.501148571428572	0.00368944645188984 up in BM-MS
4	CYB5R1	0.502270714285714	0.00096735042660546 up in BM-MS
5	PLCD4	0.503273571428571	0.00086945892884246 up in BM-MS
6	MPP7	0.505177142857142	0.00013272063055055 up in BM-MS
7	FAM101A	0.505273571428571	0.00557760248965742 up in BM-MS
8	RARG	0.505906428571429	0.00408502006672916 up in BM-MS
9	KIF13B	0.506846428571428	0.00032321110594123 up in BM-MS
10	SLC24A3	0.507384285714285	0.0348476989838942 up in BM-MS
11	PHACTR4	0.508004285714285	0.00258353652704136 up in BM-MS
12	C4orf3	0.509502142857142	0.00065626760062179 up in BM-MS
13	HSPB1	0.509514285714285	0.00794805747268727 up in BM-MS
14	BOK	0.510370714285715	0.00781639575390771 up in BM-MS
15	PIGM	0.510942142857142	0.00024484069557248 up in BM-MS
16	MPP6	0.511206428571428	0.00124487330440862 up in BM-MS
17	AKAP6	0.511738571428572	0.006355957084687 up in BM-MS
18	SIX1	0.511764999999999	0.0251104024316055 up in BM-MS
19	RFFL	0.513227142857142	0.00011590970676099 up in BM-MS
20	GSE1	0.514034285714285	3.26674233006005e-05 up in BM-MS
21	SH3RF3	0.514446428571428	0.00658741220807134 up in BM-MS
22	SAMD9L	0.515094999999999	0.00102663205530752 up in BM-MS
23	TCTA	0.51576	9.87566057255049e-05 up in BM-MS
24	P2RY6	0.516916428571428	9.24082243471159e-05 up in BM-MS
25	TPST2	0.516958571428571	0.00181165275517677 up in BM-MS
26	RNA5SP38	0.517242142857143	0.0309707321588177 up in BM-MS
27	FLOT2	0.518404999999999	1.87619924774387e-05 up in BM-MS
28	ZFH3	0.51941	3.796963591276e-06 up in BM-MS
29	SUN2	0.520309285714286	7.82592542956559e-06 up in BM-MS
30	TANC1	0.521417142857142	0.00586042089513993 up in BM-MS
31	ATP13A2	0.521634285714285	0.00745706251336071 up in BM-MS
32	PHKA1	0.52221	0.00071496264624386 up in BM-MS
33	HOXA2	0.522511428571429	0.00010694993348396 up in BM-MS
34	LN2	0.52289	0.00193725327227323 up in BM-MS
35	ATP8B1	0.523647857142856	0.0340563364781659 up in BM-MS
36	MLPH	0.523778571428571	0.00166162608121804 up in BM-MS
37	WWTR1	0.524102142857143	0.0130000916657117 up in BM-MS
38	MGAT5	0.524719285714286	0.00011166457631985 up in BM-MS
39	CTS2	0.526133571428569	1.44727324428933e-05 up in BM-MS
40	LINC00839	0.526185714285714	0.00016707608720239 up in BM-MS
41	ACSF2	0.527032857142857	0.00016131160000552 up in BM-MS
42	RNF182	0.527651428571428	0.00911263032290267 up in BM-MS
43	FKBP5	0.5283	0.0230622175879246 up in BM-MS
44	TRPS1	0.529569285714285	0.00616702821180261 up in BM-MS
45	CRELD1	0.529774285714286	2.7861343820553e-06 up in BM-MS
46	MAST3	0.530087142857143	0.00070037371869990 up in BM-MS
47	TLN1	0.530380714285713	0.00053756771605115 up in BM-MS
48	TPM4	0.531190714285714	0.00011230426722182 up in BM-MS
49	RAB30	0.532417142857143	0.00200295132033887 up in BM-MS
50	CHST3	0.532942857142857	0.00014531803707333 up in BM-MS
51	CPEB2	0.533458571428571	0.00117676077420282 up in BM-MS
52	TTC12	0.53375	0.00043419684309985 up in BM-MS
53	C1orf51	0.533820714285714	0.0339830590722876 up in BM-MS
54	GALNT2	0.535472142857142	1.39827622887397e-05 up in BM-MS
55	LOC220077	0.536079285714286	0.00151396857971911 up in BM-MS
56	ST6GALNA	0.536738571428572	0.00659408204362061 up in BM-MS
57	ACTN4	0.537757142857143	0.00854756019853743 up in BM-MS
58	ZNF423	0.538197857142857	0.00570091314803437 up in BM-MS
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BMMSC_ASC

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3	CST6	0.540217857142857	0.00405361283800075 up in BM-MS
4	PDLIM7	0.540449999999999	0.0378679618170154 up in BM-MS
5	ETV6	0.540522857142857	0.00011802923908196 up in BM-MS
6	PEAR1	0.541585	0.0437307784412413 up in BM-MS
7	LOC101060	0.544018571428571	4.91244091597281e-05 up in BM-MS
8	HOMER2	0.544111428571428	0.00094511336669765 up in BM-MS
9	PLXNB2	0.546210714285714	0.00045459641189914 up in BM-MS
10	DMPK	0.547177857142857	0.0012176785801904 up in BM-MS
11	KCNN4	0.547317857142857	0.00397193853876038 up in BM-MS
12	ALX1	0.547564285714285	0.0160897344305335 up in BM-MS
13	SGCB	0.548972142857142	0.00045459641189914 up in BM-MS
14	FGF7	0.549134285714285	0.00182655376549419 up in BM-MS
15	SLC16A3	0.550369285714285	0.00208150643825439 up in BM-MS
16	NEDD4	0.550429285714286	0.00096056746574537 up in BM-MS
17	TGFB1	0.550714999999999	0.00121651658037076 up in BM-MS
18	NFE2L3	0.551063571428571	6.97790025530654e-05 up in BM-MS
19	THBS2	0.552471428571428	0.00998249132146325 up in BM-MS
20	TGFBRAP1	0.553055714285714	0.00013733962357622 up in BM-MS
21	FGF7P2	0.556947857142858	0.00012234904702743 up in BM-MS
22	ADCY7	0.558296428571428	0.00246192580739378 up in BM-MS
23	TBC1D1	0.560015714285714	0.00100097480294896 up in BM-MS
24	SYNM	0.560349285714286	3.51289935881184e-05 up in BM-MS
25	SLC25A4	0.560814999999999	0.012446781806439 up in BM-MS
26	PACSIN3	0.561870714285715	0.00045698183137608 up in BM-MS
27	HLA-DPB1	0.562589285714286	0.0385457083778393 up in BM-MS
28	LOC124685	0.563892142857143	0.00080219368801494 up in BM-MS
29	KRT17	0.565565	0.00215607675706317 up in BM-MS
30	PARP8	0.565662857142856	0.00037718698108056 up in BM-MS
31	AK1	0.569737142857143	8.80054389119844e-05 up in BM-MS
32	MSRB1	0.570460714285714	0.00026062931007165 up in BM-MS
33	CDK5RAP2	0.570793571428572	0.00012234904702743 up in BM-MS
34	CTC-298B1	0.573608571428572	0.00067141778611481 up in BM-MS
35	MYL6	0.573678571428571	0.00075876306961300 up in BM-MS
36	PRKCD	0.573923571428571	0.00058167273990500 up in BM-MS
37	NXPH3	0.575710714285714	9.84604015356814e-05 up in BM-MS
38	TCEA3	0.576891428571428	0.0323920631753154 up in BM-MS
39	GPC4	0.577144285714286	0.0435706283292651 up in BM-MS
40	CDKL5	0.579435	3.82606949393304e-06 up in BM-MS
41	IFI44L	0.581275	0.0202606500661981 up in BM-MS
42	KGFLP1	0.581554285714285	0.00022631800520438 up in BM-MS
43	PGM2L1	0.582350714285714	0.00552722141254692 up in BM-MS
44	STK17A	0.582488571428572	0.00042622350302664 up in BM-MS
45	TRAF5	0.58272	0.00062548756642781 up in BM-MS
46	RBMS2	0.587222857142857	4.75488055087924e-05 up in BM-MS
47	KRTAP2-3	0.587659285714286	0.0178574672204854 up in BM-MS
48	TACC1	0.58783	0.00019112692263345 up in BM-MS
49	JAM2	0.588852142857142	0.0106205060557575 up in BM-MS
50	DNALI1	0.589008571428571	0.00636863920011217 up in BM-MS
51	ITGAV	0.592132857142857	0.00018219814047835 up in BM-MS
52	ST5	0.594211428571428	0.00114266661055251 up in BM-MS
53	ABCA2	0.594657857142857	4.32180316997851e-05 up in BM-MS
54	SEZ6L2	0.594944285714286	0.00023588826667648 up in BM-MS
55	GSAP	0.597257857142857	0.0101816275103721 up in BM-MS
56	C1orf110	0.597575	0.0135297563691756 up in BM-MS
57	PON2	0.598207857142857	0.00035780453799448 up in BM-MS
58	PHF20	0.598262857142857	0.00016617105188718 up in BM-MS
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BMMSC_ASC

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4	ALS2CR11	0.598696428571428	1.69941151401276e-05 up in BM-MSC
5	DYNLT3	0.598984999999999	0.000137700255618607 up in BM-MSC
6	FLNB	0.598988571428573	0.00155969815543725 up in BM-MSC
7	RTN4RL1	0.599537857142857	0.00273264132469719 up in BM-MSC
8	TRIB2	0.602351428571429	0.0022010883034249 up in BM-MSC
9	TSC22D1	0.602553571428571	0.000458738395179969 up in BM-MSC
10	RILPL2	0.603240714285714	0.00657482758831809 up in BM-MSC
11	ZNF608	0.604700714285714	0.0163021298925452 up in BM-MSC
12	TP53I11	0.604844285714286	0.00369106112936845 up in BM-MSC
13	NHS	0.611438571428571	2.86420692235752e-05 up in BM-MSC
14	ACP6	0.612136428571428	4.32180316997851e-05 up in BM-MSC
15	LDLRAP1	0.613197142857143	0.000303229948085367 up in BM-MSC
16	EMILIN1	0.614667857142856	0.00201129097251646 up in BM-MSC
17	ESYT1	0.61502857142857	0.000388783916608013 up in BM-MSC
18	FOXD1	0.615399285714286	0.00147657699622857 up in BM-MSC
19	KCNT2	0.616974285714286	0.000619846886450363 up in BM-MSC
20	RAB27B	0.618387857142857	0.0233657975993565 up in BM-MSC
21	INS-IGF2	0.619036428571429	2.99634564909909e-06 up in BM-MSC
22	C14orf37	0.621049999999999	0.00337559854764263 up in BM-MSC
23	RGS5	0.621202142857143	0.0145904915506042 up in BM-MSC
24	CLTCL1	0.621287142857142	0.00601430912258096 up in BM-MSC
25	CTSD	0.627215	0.00164162049071859 up in BM-MSC
26	ID4	0.63297	0.0168970421469398 up in BM-MSC
27	SHOX	0.634127142857143	0.0159330248542792 up in BM-MSC
28	MAP3K5	0.634695	0.00836441166768448 up in BM-MSC
29	ACSS3	0.635159285714285	0.0461825241535812 up in BM-MSC
30	NMRK1	0.638667142857143	0.000124317123983233 up in BM-MSC
31	CD200	0.639447857142857	0.0423540241558884 up in BM-MSC
32	RNF141	0.640069285714286	7.5086043003926e-05 up in BM-MSC
33	PLCD1	0.640084285714286	0.00215154839923372 up in BM-MSC
34	DYSF	0.640769285714286	0.00581467255852791 up in BM-MSC
35	PRR16	0.642869285714284	0.00100001781066981 up in BM-MSC
36	MAP1B	0.644183571428571	4.8365780991385e-05 up in BM-MSC
37	KIAA1549	0.646414999999999	0.000584394438271744 up in BM-MSC
38	ABCA7	0.64887	0.00265374754367811 up in BM-MSC
39	KCNQ5	0.649295714285714	0.0116747421895897 up in BM-MSC
40	MT1M	0.650117142857142	0.00971758860131347 up in BM-MSC
41	EDNRA	0.654097857142857	0.000434196843099853 up in BM-MSC
42	ATP10A	0.658494285714284	0.0188938965907982 up in BM-MSC
43	TMEM130	0.659634285714286	0.0033441994332434 up in BM-MSC
44	RASSF3	0.660906428571428	0.000821676169356272 up in BM-MSC
45	SLC44A2	0.661909285714285	0.000869661943571637 up in BM-MSC
46	WISP3	0.662765	0.00381498625926281 up in BM-MSC
47	C10orf10	0.664817857142857	0.0201643736058608 up in BM-MSC
48	JUP	0.670915714285715	0.00033686735075765 up in BM-MSC
49	FADS3	0.671218571428571	0.0112728737261332 up in BM-MSC
50	EXTL1	0.671231428571428	0.000869458928842462 up in BM-MSC
51	COLGALT2	0.671278571428572	0.00182858305469359 up in BM-MSC
52	NCS1	0.674444285714285	3.42948492709289e-05 up in BM-MSC
53	RAB23	0.675667142857142	0.00253736254955126 up in BM-MSC
54	SAP30L-AS	0.677865714285714	0.000150985154813649 up in BM-MSC
55	EMB	0.678723571428571	0.000198044803490766 up in BM-MSC
56	MGC57346	0.680520714285713	0.00368391660263345 up in BM-MSC
57	TNFSF15	0.680989285714286	0.0416934657343044 up in BM-MSC
58	FLNA	0.68223857142857	0.000841081933084923 up in BM-MSC
59	ALDH3A2	0.684541428571428	0.00776928270773058 up in BM-MSC

BMMSC_ASC

ADAMTS1	0.6886171428571428	0.0201704502241743	up in BM-MS
CRYAB	0.690312857142858	0.000312146652146904	up in BM-MS
ALDH3B1	0.691102857142857	0.000137700255618607	up in BM-MS
LBP	0.693006428571428	0.0315009370033968	up in BM-MS
IVNS1ABP	0.693545714285714	0.00273237578664008	up in BM-MS
LOC101060	0.693860714285713	0.00647722744587384	up in BM-MS
RASA1	0.694635714285715	3.80858413188587e-06	up in BM-MS
SIX2	0.695214999999999	5.70304224975793e-05	up in BM-MS
JAZF1	0.695472142857142	0.00036241143690528	up in BM-MS
CLCN4	0.697144285714286	0.00016886615130161	up in BM-MS
DTX3	0.698374285714286	2.85047061076737e-06	up in BM-MS
TBL1XR1	0.701378571428572	0.00010134584458299	up in BM-MS
CTNNB1	0.702707142857141	4.28025376078035e-05	up in BM-MS
MSRB3	0.706217857142856	6.76958788516782e-05	up in BM-MS
LOXL1	0.707186428571427	0.00045661929834942	up in BM-MS
DOK1	0.707645714285715	0.00317424005227439	up in BM-MS
CCDC92	0.708844285714285	0.000493132791570083	up in BM-MS
LYN	0.709699285714285	0.0190119284898866	up in BM-MS
ISM1	0.711552857142857	0.0183137524153069	up in BM-MS
PTPLB	0.715107142857142	0.000248722780748796	up in BM-MS
MOK	0.716585714285713	0.00285376084929388	up in BM-MS
CBLB	0.716711428571428	0.0006678541426549	up in BM-MS
CSPG4P8	0.719867857142857	0.000558726910885732	up in BM-MS
IBSP	0.721691428571428	0.0435501348206539	up in BM-MS
UBASH3B	0.725003571428571	0.00430919581161898	up in BM-MS
SDC3	0.726921428571429	5.47187811687852e-05	up in BM-MS
KRT81	0.727875	0.0437313562340784	up in BM-MS
SYT12	0.72988	0.000118002774133635	up in BM-MS
PLP2	0.730484999999999	0.00115037882981148	up in BM-MS
PSEN2	0.731412857142858	0.000661329357697631	up in BM-MS
DCLK2	0.733272142857142	0.000161311600005528	up in BM-MS
ENO2	0.734307142857143	0.000128213254996164	up in BM-MS
ARHGEF17	0.734900714285714	9.36551613147644e-05	up in BM-MS
SPCS3	0.73493	0.000688953563033424	up in BM-MS
FAM69A	0.73745857142857	0.00034279654678136	up in BM-MS
HECW2	0.739042142857143	0.0205444630835225	up in BM-MS
CACNA2D1	0.740879999999999	0.00778683925797924	up in BM-MS
INO80C	0.748446428571428	4.28025376078035e-05	up in BM-MS
DAAM2	0.749916428571428	0.000126501006900148	up in BM-MS
CHSY3	0.753157142857143	0.000221255790324683	up in BM-MS
PFN2	0.754707857142857	0.000116954114717881	up in BM-MS
VEGFC	0.757094285714287	0.000252057992654	up in BM-MS
FCHSD2	0.757959285714285	5.59754314021959e-05	up in BM-MS
INA	0.760702857142857	0.00998249132146325	up in BM-MS
ABLIM1	0.760830714285714	0.00760558888552325	up in BM-MS
AS3MT	0.763292142857143	1.90974235155188e-05	up in BM-MS
ARVCF	0.764431428571428	6.19339461660031e-06	up in BM-MS
TUBA4A	0.767214285714285	1.90364311565959e-05	up in BM-MS
SDC4	0.76791	0.0140574092263916	up in BM-MS
PCBP4	0.76843	6.80203539321826e-05	up in BM-MS
KCNMB1	0.769660714285715	1.90974235155188e-05	up in BM-MS
GTF2IRD1	0.77088	3.07221417435954e-05	up in BM-MS
KRT16P3	0.773554285714286	0.000846742373428674	up in BM-MS
LFNG	0.773624285714286	0.000421155465741008	up in BM-MS
EVA1C	0.774324285714285	3.4645422372773e-05	up in BM-MS
NLGN4X	0.776786428571428	0.00152624024331646	up in BM-MS

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4	KRTAP1-3	0.778231428571428	0.00068749194439025	up in BM-MS
5	DGKI	0.781268571428571	0.000161311600005528	up in BM-MS
6	ALDH1B1	0.782505714285714	0.0282146185132338	up in BM-MS
7	SLC17A9	0.784844285714285	0.00164162049071859	up in BM-MS
8	TMC7	0.785093571428571	8.59183802264891e-06	up in BM-MS
9	DSTNP2	0.786140714285714	2.7635035192751e-06	up in BM-MS
10	EYA1	0.788362142857142	0.0151670018509729	up in BM-MS
11	PSD3	0.789582857142857	3.26674233006005e-05	up in BM-MS
12	RBP4	0.792231428571429	0.0419898860693788	up in BM-MS
13	NEGR1	0.793439285714286	0.00443039119643926	up in BM-MS
14	ALDH4A1	0.797536428571428	1.04448029216193e-05	up in BM-MS
15	OCIAD2	0.798736428571428	0.00543833381669953	up in BM-MS
16	ARHGEF25	0.799975	1.34207438042478e-05	up in BM-MS
17	TES	0.800567142857142	0.00168978603220034	up in BM-MS
18	PC	0.806691428571429	0.000152775365143268	up in BM-MS
19	ZNF667-AS	0.80891	0.00784479880440541	up in BM-MS
20	CPNE2	0.809749285714285	0.00018081018788636	up in BM-MS
21	HLA-DMA	0.809938571428571	0.00262463309799409	up in BM-MS
22	SEMA3F	0.810987857142858	0.000174029084530956	up in BM-MS
23	GLRB	0.812354285714285	2.55594421981416e-05	up in BM-MS
24	JAG1	0.812924999999999	0.022324794807764	up in BM-MS
25	KIAA1217	0.813137857142856	8.43138524229563e-05	up in BM-MS
26	NOTCH2	0.818652857142857	9.98464834618136e-06	up in BM-MS
27	P4HA3	0.818865714285714	0.0371273254832112	up in BM-MS
28	RANBP3L	0.823669285714286	0.00185661479850662	up in BM-MS
29	ATP1B1	0.82401	0.0407165300005877	up in BM-MS
30	SLC1A4	0.826400714285715	0.0110291459429272	up in BM-MS
31	CYP1B1	0.826805714285713	0.00504527714154921	up in BM-MS
32	LOC388022	0.828311428571428	0.000585870106373672	up in BM-MS
33	NLRP10	0.831172142857143	0.00644152627311729	up in BM-MS
34	INSIG2	0.833236428571428	0.00117366232408914	up in BM-MS
35	EML4	0.833739999999999	1.50700455805087e-05	up in BM-MS
36	E2F5	0.834443571428571	5.18876216517652e-05	up in BM-MS
37	PDE1C	0.834777857142856	0.0244002701617865	up in BM-MS
38	LGALS1	0.836722142857143	6.06209050171406e-06	up in BM-MS
39	MAP1A	0.840242142857143	3.78158948014332e-05	up in BM-MS
40	PIK3CB	0.841412857142857	0.00013588523585674	up in BM-MS
41	FAM180A	0.842115714285715	0.00845607309166013	up in BM-MS
42	CRIP1	0.842231428571428	0.00127861369623913	up in BM-MS
43	FAM26E	0.84496	6.54433250260398e-05	up in BM-MS
44	KIAA1462	0.845230714285714	0.0152215581959305	up in BM-MS
45	ACOT7	0.845966428571428	0.00173338884031492	up in BM-MS
46	BGN	0.846939285714285	0.00256536377643587	up in BM-MS
47	ANKRD29	0.848007142857143	0.0178736971169606	up in BM-MS
48	GJA1	0.848545714285715	0.00017174383395868	up in BM-MS
49	GALNT10	0.849187857142857	2.91860392308105e-05	up in BM-MS
50	SEMA6D	0.850266428571429	0.00128492231322986	up in BM-MS
51	PRSS23	0.852244285714285	0.00031789602773899	up in BM-MS
52	DYNC111	0.852824285714285	4.8365780991385e-05	up in BM-MS
53	DOCK10	0.855802857142857	0.00015814647371921	up in BM-MS
54	LOXL3	0.855805000000001	0.0287795066288736	up in BM-MS
55	EPHX1	0.856239285714285	0.00482854294893342	up in BM-MS
56	SLC2A12	0.859675	0.0287037154127271	up in BM-MS
57	FGF5	0.861002142857143	0.00474261803686907	up in BM-MS
58	EPAS1	0.863556428571428	0.00404489677517383	up in BM-MS
59	HEPH	0.864003571428572	0.0151219260275682	up in BM-MS

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3	MTSS1	0.864044285714285	0.0447175456808423	up in BM-MSC
4	CXXC5	0.867432142857143	2.7681051090313e-05	up in BM-MSC
5	LAPTM5	0.869152142857142	0.0486982637109549	up in BM-MSC
6	CD24	0.86929	0.00897730026745486	up in BM-MSC
7	NEDD4L	0.869384285714285	0.00012431712398323	up in BM-MSC
8	GAP43	0.871434285714286	0.00229513707764353	up in BM-MSC
9	SLC29A1	0.872405714285714	8.53391962697422e-06	up in BM-MSC
10	C1GALT1	0.874616428571427	0.00058649613515212	up in BM-MSC
11	FRMD4B	0.87642	0.00138039627827137	up in BM-MSC
12	NETO2	0.877046428571428	0.00122609709067739	up in BM-MSC
13	ANKRD6	0.880801428571428	0.00318962693576823	up in BM-MSC
14	MST4	0.882735714285714	0.00067141778611481	up in BM-MSC
15	FHL2	0.883949999999999	0.00016269886804919	up in BM-MSC
16	HRCT1	0.884922142857142	0.00014415652574628	up in BM-MSC
17	CCBE1	0.886812857142857	0.00357040871237621	up in BM-MSC
18	KCTD20	0.892256428571428	0.00048644877451119	up in BM-MSC
19	ACTG2	0.894327142857143	0.0141132701204515	up in BM-MSC
20	PTGER4	0.894965714285714	0.00016131160000552	up in BM-MSC
21	PTPRK	0.897540714285713	9.32809553434164e-05	up in BM-MSC
22	TSPAN15	0.900920714285714	0.00473011086295125	up in BM-MSC
23	PAWR	0.901034285714285	0.00045813997674991	up in BM-MSC
24	KIAA1671	0.901345714285714	0.00026062931007165	up in BM-MSC
25	WNT5B	0.902650714285714	0.00014983836103496	up in BM-MSC
26	RAI14	0.906305714285714	0.00016707608720239	up in BM-MSC
27	PLCE1	0.907532142857143	0.00030813077338398	up in BM-MSC
28	ANKH	0.911759285714286	0.00103244291474265	up in BM-MSC
29	ITM2C	0.914243571428572	6.23680347656646e-05	up in BM-MSC
30	THBS3	0.916217857142857	0.00012994992040599	up in BM-MSC
31	SIDT2	0.920184285714286	4.74076823567839e-05	up in BM-MSC
32	HGF	0.921682142857143	0.0391224802357119	up in BM-MSC
33	SMAGP	0.922544285714286	1.17122636107078e-06	up in BM-MSC
34	PLA2G16	0.922548571428571	0.00079120721027091	up in BM-MSC
35	PIP4K2C	0.922991428571428	1.90974235155188e-05	up in BM-MSC
36	ARHGAP22	0.923632142857143	2.86420692235752e-05	up in BM-MSC
37	PTPN14	0.924532857142856	1.53351070322214e-05	up in BM-MSC
38	ESM1	0.925581428571428	0.0112967764124583	up in BM-MSC
39	MYH9	0.926033571428572	7.9278001863549e-05	up in BM-MSC
40	DCBLD1	0.926453571428571	0.00038483452254816	up in BM-MSC
41	EPHA2	0.929859285714285	0.00047936065252696	up in BM-MSC
42	IL26	0.930551428571428	0.03353455257802	up in BM-MSC
43	IFI44	0.932509285714285	0.00044059274922403	up in BM-MSC
44	TPM2	0.93365	0.00089231106806591	up in BM-MSC
45	DNAJC6	0.934233571428571	6.85689185474569e-05	up in BM-MSC
46	STEAP1B	0.940080714285714	0.00190658235272213	up in BM-MSC
47	ACTN1	0.945665714285714	0.00086672665620176	up in BM-MSC
48	EMP2	0.94617857142857	0.00070037371869990	up in BM-MSC
49	B3GALNT1	0.946642142857143	0.00031214665214690	up in BM-MSC
50	HOXA5	0.952143571428571	0.00070154245675831	up in BM-MSC
51	CMTM4	0.952694285714285	5.9997354167352e-05	up in BM-MSC
52	WLS	0.954175714285714	0.00221752789040131	up in BM-MSC
53	LMO7	0.95629	9.35275976611031e-05	up in BM-MSC
54	MEST	0.958134285714285	0.0166254835181886	up in BM-MSC
55	CPXM2	0.958648571428572	0.00130712470750809	up in BM-MSC
56	IGFBP4	0.964814285714286	3.97780134890554e-07	up in BM-MSC
57	PCGF5	0.967002857142856	3.31278065462231e-06	up in BM-MSC
58	NEDD9	0.967907857142856	0.00369753466590432	up in BM-MSC
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3	CD97	0.969152142857143	2.14752331417284e-05	up in BM-MS
4	TGFBFR1	0.979768571428571	0.00025771538102909	up in BM-MS
5	PLK2	0.982854285714285	1.96194332223236e-05	up in BM-MS
6	BDNF	0.989001428571428	0.00132549342984332	up in BM-MS
7	SLC6A6	0.989917142857144	0.00028658047667929	up in BM-MS
8	IRX3	0.995121428571428	0.00192260143576348	up in BM-MS
9	EFHD1	0.998574285714285	0.00012492813843789	up in BM-MS
10	DIXDC1	1.00053571428571	7.06674371309446e-07	up in BM-MS
11	C5orf30	1.00492071428571	6.93129000955843e-05	up in BM-MS
12	NEO1	1.00796	5.00506043131397e-05	up in BM-MS
13	CMKLR1	1.011935	0.0242216786685107	up in BM-MS
14	ARHGAP31	1.01703428571429	0.00025377357108481	up in BM-MS
15	CES1	1.01867642857143	8.26970590028039e-05	up in BM-MS
16	KLF12	1.02919785714286	9.75705720981519e-07	up in BM-MS
17	DSTN	1.03364428571428	1.28869201419704e-07	up in BM-MS
18	MYL9	1.03643857142857	1.90974235155188e-05	up in BM-MS
19	ARNTL2	1.03882357142857	3.24970736868797e-05	up in BM-MS
20	DOCK5	1.03895214285714	9.84604015356814e-05	up in BM-MS
21	SLC22A3	1.04571642857143	0.0132429191759076	up in BM-MS
22	DPYSL3	1.0466	1.41596952745788e-05	up in BM-MS
23	MYEF2	1.04737642857143	1.98995016156191e-05	up in BM-MS
24	GPT2	1.04835285714286	0.00016752407505987	up in BM-MS
25	HLA-DRA	1.05291714285714	0.0332575864487029	up in BM-MS
26	KRT14	1.05685642857143	0.0212412566203411	up in BM-MS
27	ABCC3	1.05980142857143	0.00015820160682722	up in BM-MS
28	GMDS	1.06509857142857	1.50700455805087e-05	up in BM-MS
29	CTGF	1.08252785714286	0.00128104796259916	up in BM-MS
30	FZD5	1.09333142857143	0.00033061853122032	up in BM-MS
31	MATN2	1.103315	0.00312326089325311	up in BM-MS
32	STK38L	1.10513928571429	0.00021613697638617	up in BM-MS
33	CTNNAL1	1.10573	9.64780694930967e-06	up in BM-MS
34	TPD52L1	1.10649714285714	0.00090174337550238	up in BM-MS
35	PDGFA	1.10686714285714	1.69915338292609e-05	up in BM-MS
36	SERPIN1	1.10798	0.00014907057798553	up in BM-MS
37	PLXNA3	1.10810928571429	1.15315954504315e-05	up in BM-MS
38	LYPD1	1.10816785714286	0.00573571523003409	up in BM-MS
39	CDC42EP3	1.10854	0.00057639707030021	up in BM-MS
40	PMEPA1	1.11437285714286	2.55594421981416e-05	up in BM-MS
41	ADCY4	1.11507214285714	0.00012762213290085	up in BM-MS
42	ADARB1	1.11798571428571	1.04448029216193e-05	up in BM-MS
43	SORBS2	1.12654714285714	0.00023813685088323	up in BM-MS
44	LIN7A	1.13203071428571	1.17122636107078e-06	up in BM-MS
45	TRIM16	1.13485571428571	0.00012821325499616	up in BM-MS
46	SLC2A1	1.13570428571428	0.00943204021955349	up in BM-MS
47	ALCAM	1.13702428571429	0.00012110267682242	up in BM-MS
48	ITGA10	1.14262428571429	0.00048970447028479	up in BM-MS
49	SLC9A3R2	1.14495928571429	2.13696007933268e-06	up in BM-MS
50	SCUBE1	1.14582857142857	0.00393029079375359	up in BM-MS
51	TRIM16L	1.14829571428571	3.31802810540514e-05	up in BM-MS
52	FUCA1	1.15013428571429	0.00019407117725483	up in BM-MS
53	MFGE8	1.15060071428571	1.58747414007594e-06	up in BM-MS
54	PALLD	1.15203142857143	4.44052009987685e-06	up in BM-MS
55	FBXL2	1.15699428571429	2.9726879881323e-06	up in BM-MS
56	TIAM2	1.15989928571429	1.07341299064141e-05	up in BM-MS
57	CNTNAP3B	1.16459571428571	0.010228132679774	up in BM-MS
58	GCNT1	1.16577285714286	3.12644576842339e-05	up in BM-MS
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3	EPHB2	1.17125928571429	1.55551944064011e-05 up in BM-MSC
4	PAPSS1	1.17337785714286	9.77289232825313e-08 up in BM-MSC
5	ENDOD1	1.17638571428571	0.00010796376394865 up in BM-MSC
6	C7orf10	1.18205	1.68710413163349e-06 up in BM-MSC
7	GALNT5	1.18316571428571	0.00027343177435437 up in BM-MSC
8	GMFG	1.18989928571429	0.00034347008393314 up in BM-MSC
9	PDLIM1	1.19328928571429	0.00115037882981148 up in BM-MSC
10	PODNL1	1.19544142857143	0.00046845449995822 up in BM-MSC
11	PDCD1LG2	1.20048714285714	0.00206177535811103 up in BM-MSC
12	CSRP1	1.20394428571429	0.00034511494897955 up in BM-MSC
13	TOM1L1	1.20454571428571	1.58747414007594e-06 up in BM-MSC
14	TM4SF20	1.20469285714286	0.00641872646209833 up in BM-MSC
15	LIF	1.20620571428571	0.00224512675742919 up in BM-MSC
16	CNTNAP3	1.20737857142857	0.00800707065499342 up in BM-MSC
17	LYPD6B	1.21030428571428	0.00012821325499616 up in BM-MSC
18	HBEGF	1.21035285714286	0.00206803934014005 up in BM-MSC
19	DSP	1.21080357142857	0.00037388858136940 up in BM-MSC
20	RAPH1	1.21233785714286	0.00056517079382378 up in BM-MSC
21	TBC1D19	1.21533285714286	1.44622544363504e-05 up in BM-MSC
22	NAP1L3	1.21755071428571	2.69444687642101e-06 up in BM-MSC
23	MLLT11	1.22236071428571	2.73803935976764e-05 up in BM-MSC
24	ARHGEF28	1.22248357142857	3.47999629393266e-05 up in BM-MSC
25	MTSS1L	1.23048428571429	1.47921786988246e-05 up in BM-MSC
26	C1orf54	1.23268357142857	0.00014705049283136 up in BM-MSC
27	ITGA11	1.24946928571429	0.00022084393639387 up in BM-MSC
28	COL4A2	1.26177285714286	0.00068075675027914 up in BM-MSC
29	RUNX2	1.26994285714286	0.00015277536514326 up in BM-MSC
30	LITAF	1.27263142857143	3.26674233006005e-05 up in BM-MSC
31	RNF150	1.27623857142857	2.67978378583122e-06 up in BM-MSC
32	CD82	1.29041642857143	0.00016376793569062 up in BM-MSC
33	ENPP1	1.301305	0.0208381320343795 up in BM-MSC
34	SCUBE3	1.31134428571428	0.00443310135433789 up in BM-MSC
35	BPGM	1.31220214285714	1.47921786988246e-05 up in BM-MSC
36	HPCAL1	1.31384	9.77289232825313e-08 up in BM-MSC
37	NOTCH3	1.31681285714286	6.65366196341341e-06 up in BM-MSC
38	HK2	1.31779857142857	1.15373596861505e-05 up in BM-MSC
39	BAIAP2L1	1.31917571428571	3.56187134101598e-05 up in BM-MSC
40	NET1	1.31999428571428	0.00043116139268692 up in BM-MSC
41	TINAGL1	1.32759571428571	0.0154846994894021 up in BM-MSC
42	SLC16A4	1.33687714285714	3.4645422372773e-05 up in BM-MSC
43	EFNB2	1.36246571428571	1.03131729284292e-06 up in BM-MSC
44	SERINC2	1.36458	0.00032681732895152 up in BM-MSC
45	C11orf87	1.36996428571429	0.0110038019550039 up in BM-MSC
46	GAS6	1.37264642857143	5.29584770906679e-05 up in BM-MSC
47	TOX	1.37833571428571	0.00012348469799791 up in BM-MSC
48	CXCL16	1.38294642857143	3.35916414782268e-05 up in BM-MSC
49	SPOCD1	1.38595928571428	1.12539978418742e-05 up in BM-MSC
50	FST	1.38803642857143	0.00288124721284662 up in BM-MSC
51	LBH	1.40227142857143	0.00013082267342233 up in BM-MSC
52	ITGBL1	1.403575	2.13696007933268e-06 up in BM-MSC
53	GDF6	1.40848214285714	0.00038844770772466 up in BM-MSC
54	EPGN	1.42292571428571	0.00092178095365393 up in BM-MSC
55	GPR21	1.42475928571429	1.26030776857358e-05 up in BM-MSC
56	ADIRF-AS1	1.42863142857143	0.00049216509991780 up in BM-MSC
57	VAMP8	1.43531214285714	0.00013387200503234 up in BM-MSC
58	EZR	1.43915642857143	1.47921786988246e-05 up in BM-MSC
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3	AHR	1.44212928571429	1.16979720267013e-05 up in BM-MS
4	NRG1	1.44663857142857	0.00396097253555887 up in BM-MS
5	COL4A1	1.44689785714286	0.00317142398519166 up in BM-MS
6	GLIPR1	1.44839642857143	0.000112662488497287 up in BM-MS
7	CRIP2	1.45924357142857	1.51946974616926e-05 up in BM-MS
8	CAP2	1.46005214285714	0.00015287921829699 up in BM-MS
9	DBC1	1.46894857142857	0.000498586228941966 up in BM-MS
10	WISP1	1.47385285714286	3.63637572798295e-06 up in BM-MS
11	FMO3	1.48081642857143	0.00372079364945994 up in BM-MS
12	IGFBP7	1.48518642857143	3.10709557824433e-05 up in BM-MS
13	CNN1	1.49185928571429	0.00548618490589355 up in BM-MS
14	PDLIM5	1.49873357142857	4.88275227864542e-07 up in BM-MS
15	LTBP2	1.50074714285714	1.26030776857358e-05 up in BM-MS
16	KRT34	1.50937	0.000503712711818316 up in BM-MS
17	HIP1	1.51014785714286	4.25347650122244e-07 up in BM-MS
18	CRISPLD1	1.53277714285714	7.19243279142233e-05 up in BM-MS
19	TLE4	1.53527642857143	8.96929695490821e-06 up in BM-MS
20	ENC1	1.53616642857143	0.000300082133434637 up in BM-MS
21	PLOD2	1.55741714285714	0.000124309239361904 up in BM-MS
22	WNT5A	1.57048214285714	0.00105758771100406 up in BM-MS
23	ENAH	1.57278857142857	2.27679733557573e-06 up in BM-MS
24	SLC4A4	1.577435	1.82791131881535e-05 up in BM-MS
25	SRGN	1.58443214285714	3.38606720806061e-06 up in BM-MS
26	MID1	1.58944357142857	1.45192046189392e-06 up in BM-MS
27	MYBL1	1.59491214285714	0.000138141145125783 up in BM-MS
28	TAGLN	1.61741785714286	0.000754234669854534 up in BM-MS
29	SIPA1L1	1.62138285714286	2.29972822779566e-08 up in BM-MS
30	GDF5	1.64721928571429	0.00163583703703419 up in BM-MS
31	PDGFC	1.65209714285714	5.2852660272206e-05 up in BM-MS
32	KCNH1	1.66658642857143	4.44052009987685e-06 up in BM-MS
33	RDH5	1.66717571428571	0.000131202703063076 up in BM-MS
34	KRT16	1.67135714285714	0.000387125156461984 up in BM-MS
35	KCNMA1	1.67810714285714	1.03004749104242e-06 up in BM-MS
36	STC2	1.69894857142857	0.00102340515486254 up in BM-MS
37	ST6GAL1	1.70226428571429	1.18908516693645e-05 up in BM-MS
38	PRR5L	1.71148571428571	1.15138592609975e-07 up in BM-MS
39	ENTPD1	1.71217642857143	0.00299255248512652 up in BM-MS
40	DOCK4	1.71856785714286	5.63673097753e-09 up in BM-MS
41	SATB2	1.71978714285714	3.07772477942452e-09 up in BM-MS
42	TGM2	1.72055714285714	0.0108332417376659 up in BM-MS
43	ANGPT1	1.72100428571429	0.00288564218454661 up in BM-MS
44	CD4	1.72897428571429	3.52423296416294e-06 up in BM-MS
45	SEMA3B	1.74117214285714	7.3236594819386e-05 up in BM-MS
46	ERRF1	1.74515	6.65366196341341e-06 up in BM-MS
47	CCKAR	1.74733428571429	0.0126203168141288 up in BM-MS
48	RAVER2	1.76073	3.38606720806061e-06 up in BM-MS
49	CPA4	1.81886428571429	5.9997354167352e-05 up in BM-MS
50	STK17B	1.82017142857143	2.18070257887892e-05 up in BM-MS
51	CD74	1.82402142857143	0.00102663205530752 up in BM-MS
52	LMOD1	1.83003571428571	3.97780134890554e-07 up in BM-MS
53	HAS2	1.83306571428572	0.0263873364988731 up in BM-MS
54	PRUNE2	1.84602071428571	0.000392159089165762 up in BM-MS
55	ARSJ	1.866835	2.01331703566676e-06 up in BM-MS
56	ITGB2	1.91138857142857	0.000154319142814572 up in BM-MS
57	ACTA2	1.9288	1.58747414007594e-06 up in BM-MS
58	INHBA	1.93840071428571	0.000252057992654 up in BM-MS
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3	PTN	1.95590928571429	3.70571330934594e-05 up in BM-MSC
4	TNC	1.95686571428571	0.000503712711818316 up in BM-MSC
5	MCAM	1.96245714285714	0.000120876581668069 up in BM-MSC
6	MYLK	1.96538071428571	0.000362235997173569 up in BM-MSC
7	CFH	1.96705928571429	0.000104263170701882 up in BM-MSC
8	HAPLN1	1.96907642857143	0.0292632921917005 up in BM-MSC
9	PLEKHA2	1.97851571428571	4.32180316997851e-05 up in BM-MSC
10	KLHL13	1.98025928571429	2.89648090648622e-05 up in BM-MSC
11	RGS4	1.98350214285714	0.000161273813888733 up in BM-MSC
12	CSPG4	1.99059285714286	8.84468582391279e-06 up in BM-MSC
13	SORT1	2.00050071428571	1.54763428467267e-06 up in BM-MSC
14	PLCB4	2.00994642857143	0.000137700255618607 up in BM-MSC
15	PIEZO2	2.02890142857143	0.000152775365143268 up in BM-MSC
16	EYA2	2.03480142857143	1.4928082774605e-08 up in BM-MSC
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18	ANKRD1	2.056405	0.0084130637900879 up in BM-MSC
19	ITGA8	2.07703571428571	0.00038124498040249 up in BM-MSC
20	TNFRSF19	2.08737571428571	0.000326436115949582 up in BM-MSC
21	BEX1	2.09915785714286	0.00263911930251506 up in BM-MSC
22	PPP1R3C	2.131615	3.22349412313321e-05 up in BM-MSC
23	FNDC1	2.17742214285714	1.13464433864636e-05 up in BM-MSC
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25	KRTAP1-4	2.25125857142857	4.8365780991385e-05 up in BM-MSC
26	TGFB2	2.33447785714286	1.47921786988246e-05 up in BM-MSC
27	SMOC1	2.39738642857143	2.45513343908808e-05 up in BM-MSC
28	GALNT1	2.44627642857143	4.80882369861359e-08 up in BM-MSC
29	PENK	2.46686357142857	0.00451217394163358 up in BM-MSC
30	KIAA1644	2.46892428571429	2.29972822779566e-08 up in BM-MSC
31	MET	2.47829928571429	1.4469254149361e-07 up in BM-MSC
32	LTBP1	2.52069214285714	1.92314251927926e-05 up in BM-MSC
33	KRTAP1-1	2.53630857142857	5.9997354167352e-05 up in BM-MSC
34	FLG	2.66280785714286	0.000367203399281806 up in BM-MSC
35	IFITM10	2.66469428571429	4.80882369861359e-08 up in BM-MSC
36	TM4SF1	2.74804714285714	4.8365780991385e-05 up in BM-MSC
37	CDH6	2.77983142857143	0.000188860703729257 up in BM-MSC
38	KRTAP1-5	2.81784928571428	2.14752331417284e-05 up in BM-MSC
39	ITGA7	2.81893	2.61789704482416e-05 up in BM-MSC
40	IGF2	2.84775571428571	3.3433904034958e-05 up in BM-MSC
41	ITGA3	2.86564571428571	4.44052009987685e-06 up in BM-MSC
42	TNS3	2.87899857142857	3.52423296416294e-06 up in BM-MSC
43	DLX5	2.88506642857143	6.44479687963732e-09 up in BM-MSC
44	TSPAN18	3.00600714285714	2.30054739189195e-07 up in BM-MSC
45	ACAN	3.02825714285714	0.000177397971051879 up in BM-MSC
46	NPR3	3.46963142857143	1.79896489468195e-06 up in BM-MSC
47	PDE5A	3.78460928571429	1.87619924774387e-05 up in BM-MSC
48	IGFBP2	3.942535	3.33524831905485e-06 up in BM-MSC
49	EDIL3	4.23347142857143	1.00335073611069e-05 up in BM-MSC
50	VCAM1	5.30279357142857	1.32404884401917e-05 up in BM-MSC
51	SLC14A1	5.40159928571428	1.41467096064428e-06 up in BM-MSC
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BMMSC_ASC

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For Peer Review

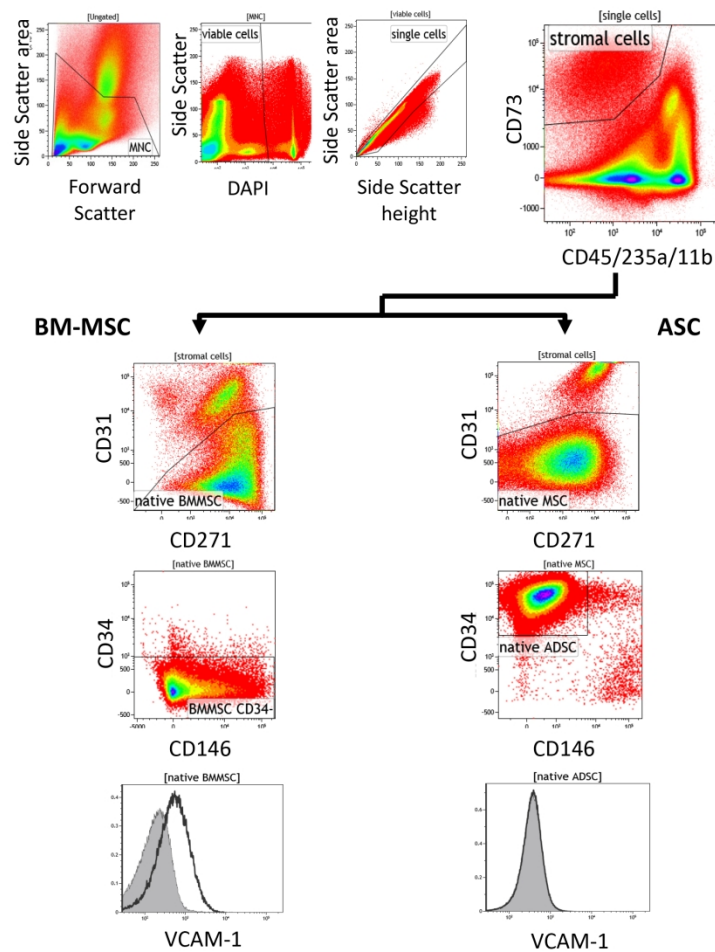


Figure S1. Gating strategy for the phenotypic analysis of native MSCs in stromal vascular fraction and bone marrow aspirates.

Dead cells and doublets were gated out from mononuclear cells. Stromal compartment was selected as CD73^{pos} events that were CD45^{neg}/CD245a^{neg}/CD11^b^{neg}. CD31^{pos} endothelial cells were then excluded from analysis. Finally, native BM-MSCs were visualized as CD34^{neg}CD271^{pos} cells and native ASCs as CD34^{pos}CD146^{neg} cells and VCAM-1 expression was analyzed on both MSC subsets. Shaded grey histogram represents isotypic control and black line depicts VCAM-1. MNC : mononuclear cells, DAPI : 4',6-diamidino-2-phenylindole

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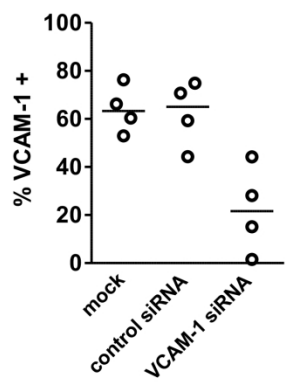


Figure S2. Control of VCAM-1 silencing effectiveness.
BM-MSCs were transfected with siRNA for VCAM-1 or a control siRNA or mock-transfected. Expression of VCAM-1 was assessed 48 hours later by flow cytometry before use in adhesion assays. Results are depicted as the percentage of VCAM-1^{POS} cells as compared to an isotypic control antibody. Bars represented the medians.

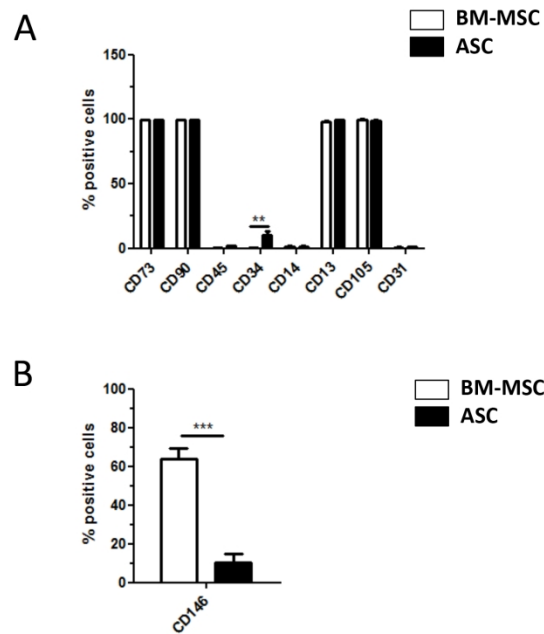


Figure S3. Immunophenotypic characterization of paired BM-MSCs and ASCs.

(A) Paired BM-MSCs and ASCs were assessed by flow cytometry for the expression of standard MSC markers.

(B) Paired BM-MSCs and ASCs were assessed by flow cytometry for the expression of CD146.

Histograms represent mean \pm SEM (n=14, **P < 0.01, ***P < 0.001)

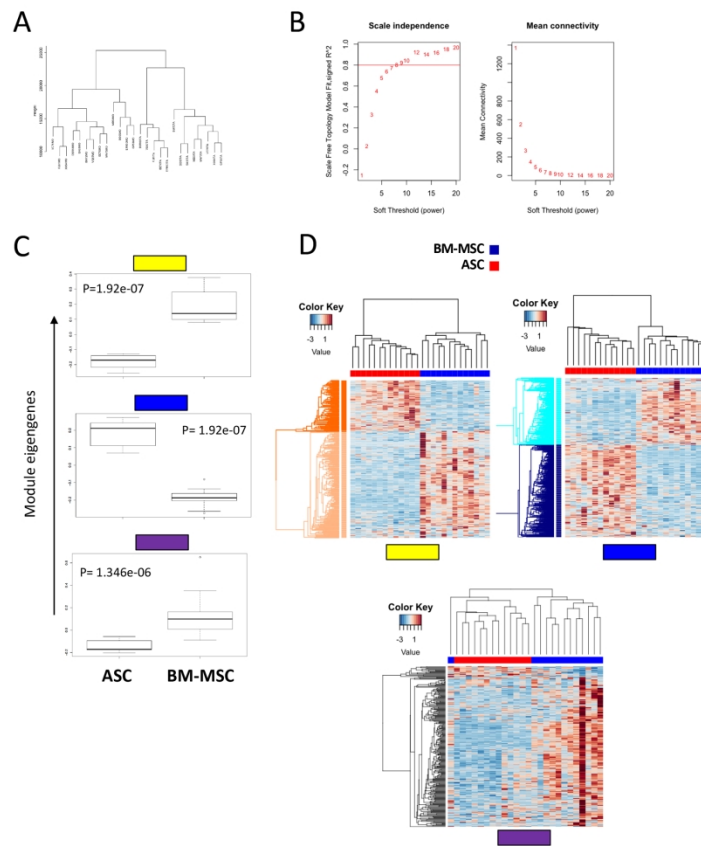


Figure S4. WGCNA analysis

- (A) Sample clustering dendrogram based on the Euclidean distance using the 25% most variable genes
- (B) Selection of the soft-thresholding power based on the evolution of the scale free topology index in function of the soft threshold (left) and the analysis of the mean connectivity evolution in function of the soft threshold (right)
- (C) Module eigengenes for each cell type in relevant modules with p-value calculated based on a Wilcoxon rank test comparison
- (D) Heatplot of gene expression in the modules Yellow, Blue, and Purple. For modules Yellow and Blue, a tree cut function was applied for the gene dendrograms, highlighting two clusters associated with increased expression in ASCs versus BM-MScs and colored as followed: dark blue and dark orange for ASCs, and light blue and light orange for BM-MSc.

190x254mm (300 x 300 DPI)

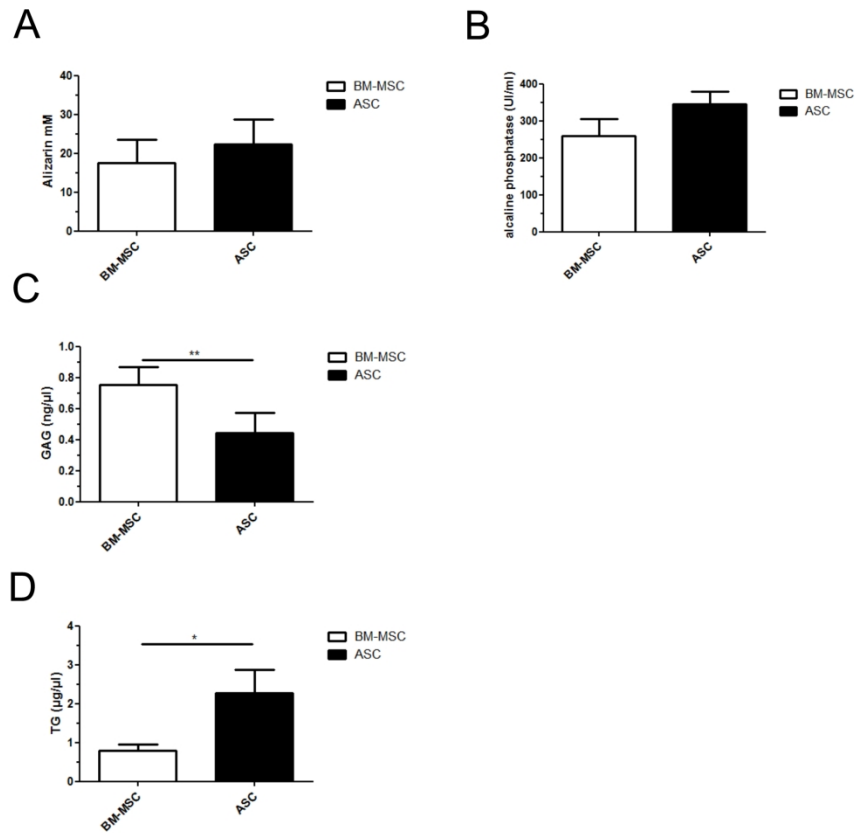


Figure S5. Differentiation assays on paired BM-MSCs and ASCs

(A-B) Osteogenic differentiation was assessed by Red Alizarin (A) and alkaline phosphatase (B) quantification (osteogenic conditions relative to untreated controls).

(C) Chondrogenic differentiation was assessed by glycosaminoglycan (GAG) quantification (chondrogenic conditions relative to untreated controls).

(D) Adipogenic differentiation was assessed by triglycerides (TG) quantification (adipogenic conditions relative to untreated controls).

All histograms represented mean \pm SEM (n=9, *P < 0.05, **P < 0.01)