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Supplementary methods

Flow cytometry

Flow cytometry was performed to determine cancer stem cell populations in six canine mammary carcinoma cell lines. FACS analysis was performed as previously reported in our laboratory ¹. Briefly, single cells were suspended and fixed in cell staining buffer (BioLegend). Cells were incubated with the manufacturer's recommended concentrations of CD44 (PE, Biolegend, 338807) and CD24 (APC, Biolegend, 311117) antibodies on ice for 20 min in the dark. Next, the cells were washed twice, and the cell pellet was resuspended in 0.3 ml of cell staining buffer. For cell cycle analysis, cells were resuspended and fixed with 70% EtOH. Before analysis, fixed cells were stained with a mixture of 50 µg/ml propidium iodide (Sigma–Aldrich, P4864), 0.1 mg/ml RNase A (Invitrogen, 12091021), and 0.05% Triton X 100 (Sigma–Aldrich, 93443) in PBS for 30 min at 37 °C. For apoptosis detection, the FITC Annexin V Apoptosis Detection kit with PI was used (Biolegend, 640932). Stained cells were protected from light and kept on ice before flow cytometric and fluorescence-activated cell sorting (FACS). Flow cytometry was performed on a BD Biosciences FACS Aria II installed at the National Center for Inter-University Research Facilities (NCIRF) at Seoul National University.

RNA isolation and qRT–PCR

RNA isolation and real-time quantitative RT–PCR were performed as previously described ². Briefly, total RNA was isolated from cells using TRIzol™ reagent (Invitrogen, 15596026) according to the manufacturer's instructions. For cDNA synthesis, 2 µg of RNA was carried out using 5X cDNA Synthesis Master Mix (CellSafe, CDS-200). Exosomal miRNA was isolated using the miRNeasy kit (Qiagen, 217084), and the miRCURY LNA RT kit (Qiagen, 339340) was used for cDNA synthesis according to the manufacturer's instructions. Exosomes were lysed by Qiazol, 10 ng of RNA was prepared for reverse transcription, and UniSp6 RNA spike-in was used as an internal control. Real-time PCR was carried out

using CFX Connect (Bio-Rad). We used the endogenous control A5B for cell-derived RNA and the UniSp6 spike-in control for miRNA. Primers and T_m for PCR are shown in Supplementary Table 1.

MTT assay

The MTT assay was performed as previously reported³. In brief, exosome-treated cells were washed with PBS and incubated with 5 mg/ml MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) solution (Invitrogen, M6494). After 1 hr at 37 °C incubation, the medium was removed carefully and washed once with PBS. Formazan crystals were dissolved in 200 µl of DMSO. Then, 100 µl of medium from each well was measured for light absorbance at 570 nm using an absorbance microplate reader (BioTek).

ALDEFLUOR assay

The ALDEFLUOR assay was performed to quantify ALDH activity in cells using an ALDEFLUOR kit (Stemcell Technologies, 01700) according to the manufacturer's instructions. The fluorescent substrate of ALDH, BODIPY-aminoacetaldehyde (BAAA), is converted into green fluorescence BODIPY-amino acetate (BAA) by ALDH, which is examined through a fluorescence microscope. CHMp and CHMm cells were incubated with 10 µl of activated ALDEFLUOR for 1 hr. The cells were washed with PBS and observed under a fluorescence microscope (Echo).

Mammosphere formation assay

CHMp and CHMm cells were seeded onto a 30 cm² petri dish for low attachment at 5,000 single cells. Mammosphere formation consisted of serum-free DMEM-F12 (HyClone, SH30261.01) supplemented with 1X B27 (Gibco, 17504044), 20 ng/ml recombinant epidermal growth factor (EGF; Invitrogen, PHG0311), 10 ng/ml recombinant basic fibroblast growth factor (bFGF; Peprotech, 100-18B) and 100 U/ml penicillin–streptomycin (Gibco, 15140-163). Cells were grown for seven days in a humidified incubator at 37 °C with

5% CO₂. The mammospheres were evaluated by counting the number and size of spheres under bright field microscopy (Echo).

Transwell assay

Cell migration and invasion were analyzed using an 8.0- μ m-pore polycarbonate membrane inserted in Transwell cell culture chambers (Corning, 3428) as previously reported by our laboratory ⁴. Cells (0.5×10^5) and exosomes were seeded into the upper chamber in serum-free RPMI, and 750 μ l of RPMI with 10% exosome-depleted FBS was added to the lower compartment. For the migration assay, the plate was incubated at 37 °C for 24 h. Unlike the migration assay, 100 μ l of diluted Matrigel (1 mg/ml, Corning)-coated upper chamber was used and incubated at 37 °C for 48 hr for the invasion assay. After the incubation period, the insert was removed, and the cells were fixed with 4% PFA for 2 min. Next, fixed cells at the insert membrane were permeabilized by incubation with ice-cold methanol for 10 min. The insert was washed twice with PBS and stained with 5% crystal violet for 10 min at room temperature. Cells in the upper chamber of the insert were gently washed with PBS several times to remove excess dye. Cells on the upper surface of the microporous membrane were removed with a cotton swab, and pictures were taken under an optical microscope.

Tube formation assay

To determine whether exosomes inhibit angiogenesis, a tube formation assay was performed as previously reported ³. Briefly, HUVECs were maintained with EBM™-2 Endothelial Cell Growth Basal Medium (Lonza, CC-3156) supplemented with 10% fetal bovine serum (FBS; Gibco, 1600044) and EGM™-2 Endothelial SingleQuots™ Kit (Lonza, CC-4176). HUVECs and exosomes were seeded together with EBM supplemented with 10% exosome-depleted FBS and EGM-SingleQuots for 24 h. After the incubation period, the cells were fixed with 4% paraformaldehyde and photographed under an optical microscope. The tube mesh size was measured using an ImageJ-angiogenesis analyzer and quantified from three microscopic

fields.

Intracellular ROS measurement

To measure cellular ROS levels, exosome-treated cells were washed with PBS and incubated with 100 μ M 2',7'-dichlorodihydrofluorescein diacetate (H2DCFDA)-containing exosome-free medium for 1 hour at 37 °C. Cellular ROS converted H2DCFDA to green fluorescent 2',7'-dichlorofluorescein (DCF). After incubation, the medium was removed, cells were washed with PBS, and green fluorescence was observed under a fluorescence microscope.

Immunofluorescence staining and confocal analysis

Exosome-treated cells were fixed with 4% paraformaldehyde for 10 min at RT, washed with PBS twice, incubated with 0.1% Triton X-100 in PBS for 10 min at RT for permeabilization and blocked with 5% BSA in PBS for 1 hr. Then, the cells were incubated with primary γ -H2A.X antibody (Abcam, ab11174) for 16 h at 4 °C, followed by incubation with fluorescently labeled secondary antibody (Abcam, ab150077). Fluorescence images were acquired using a confocal laser scanning microscope (Carl Zeiss) at NCIRF in Seoul National University.

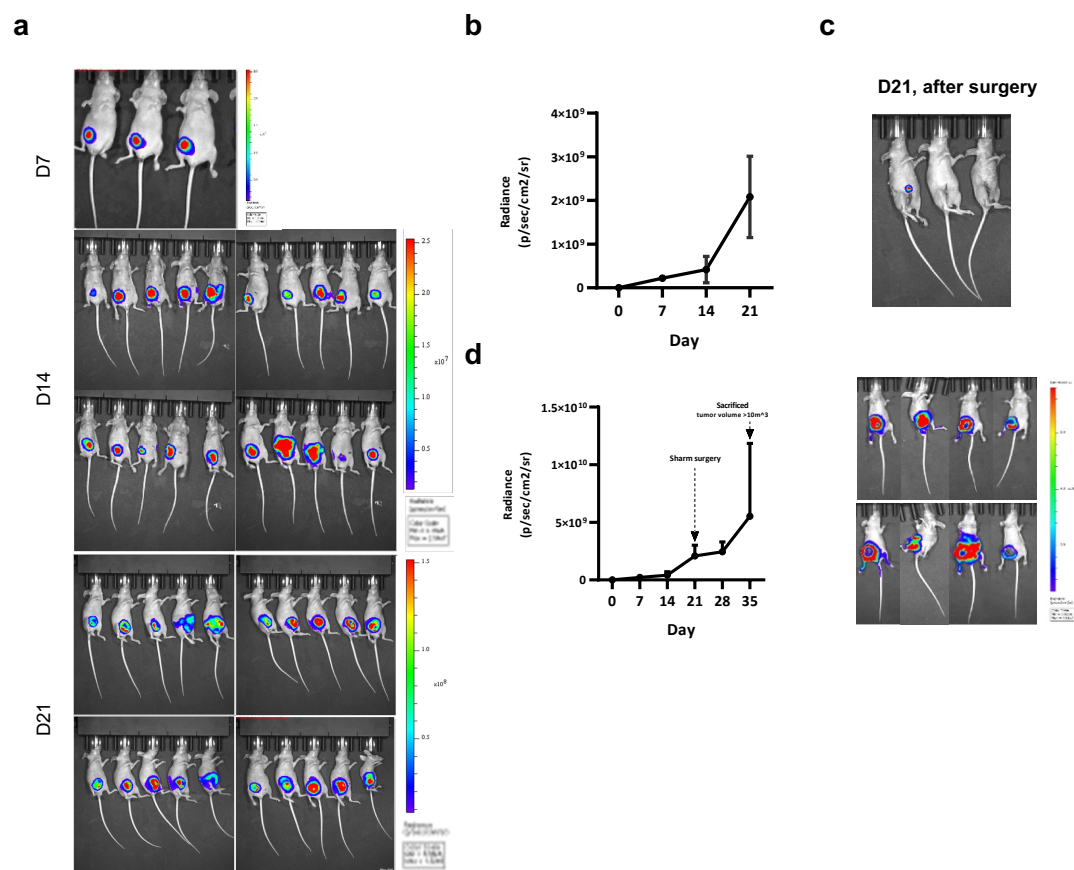
Immunoblot analysis

Immunoblot analysis was performed as previously reported⁵. Briefly, cells and exosomes were lysed in RIPA buffer with a protease inhibitor cocktail. The primary antibodies used in this study were CD44 (Abcam, 1:2,500), CD24 (Abcam, 1:2,000), ALDH1A1 (Abcam, 1:2,500), β -Actin (1:5,000), TSG101 (Abcam, 1:2,000), Alix (Abcam 1:2,000), p38 & pp38 (Cell Signaling Technology, 1:2,000), p44/42&pp44/42 (Cell Signaling Technology, 1:2,000), HACE1 (Abcam, 1:2,000), Rac1 (Merck, 1:2,500) and γ -H2A.X (Abcam, 1:3,000) antibody. Except γ -H2A.X, phosphor-p38 and p44/42 antibodies, 5% skim milk was used for blocking. BSA (5%) was used for γ -H2A.X, phosphor-p38 and p44/42 antibodies for

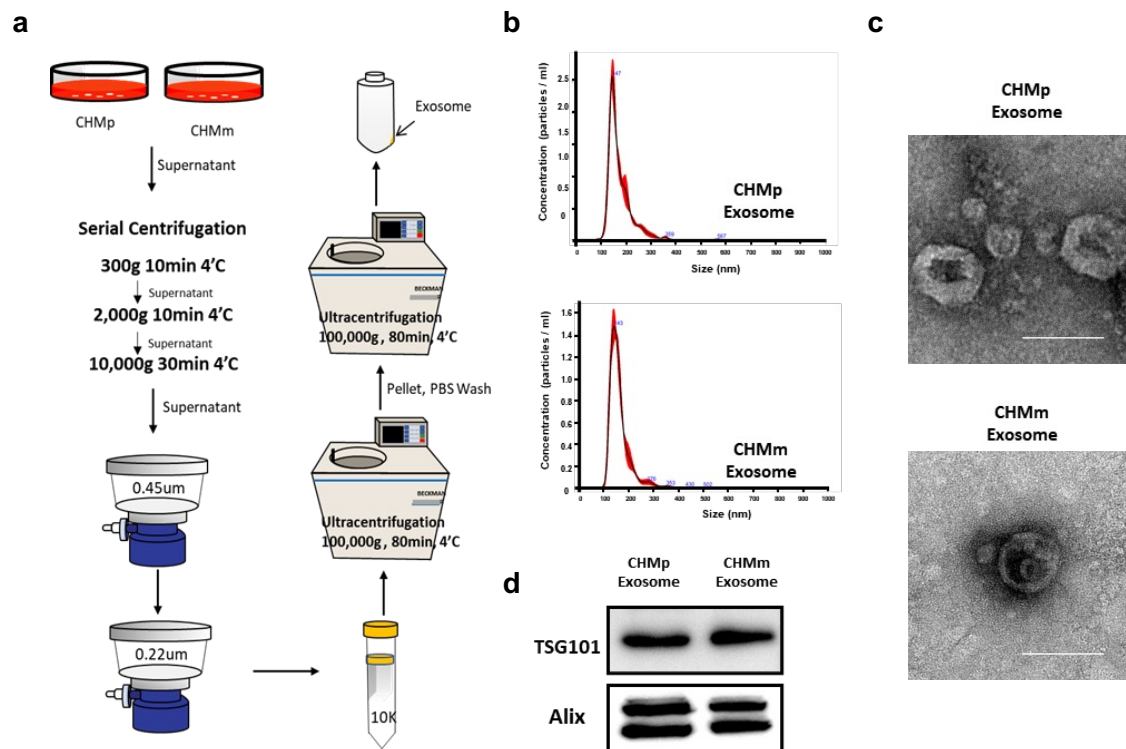
blocking. Chemiluminescent signals in blots were visualized using an enhanced chemiluminescent system (BIOMAX, BWP0200). Detailed information on the antibodies used is shown in Supplementary Table 1.

References

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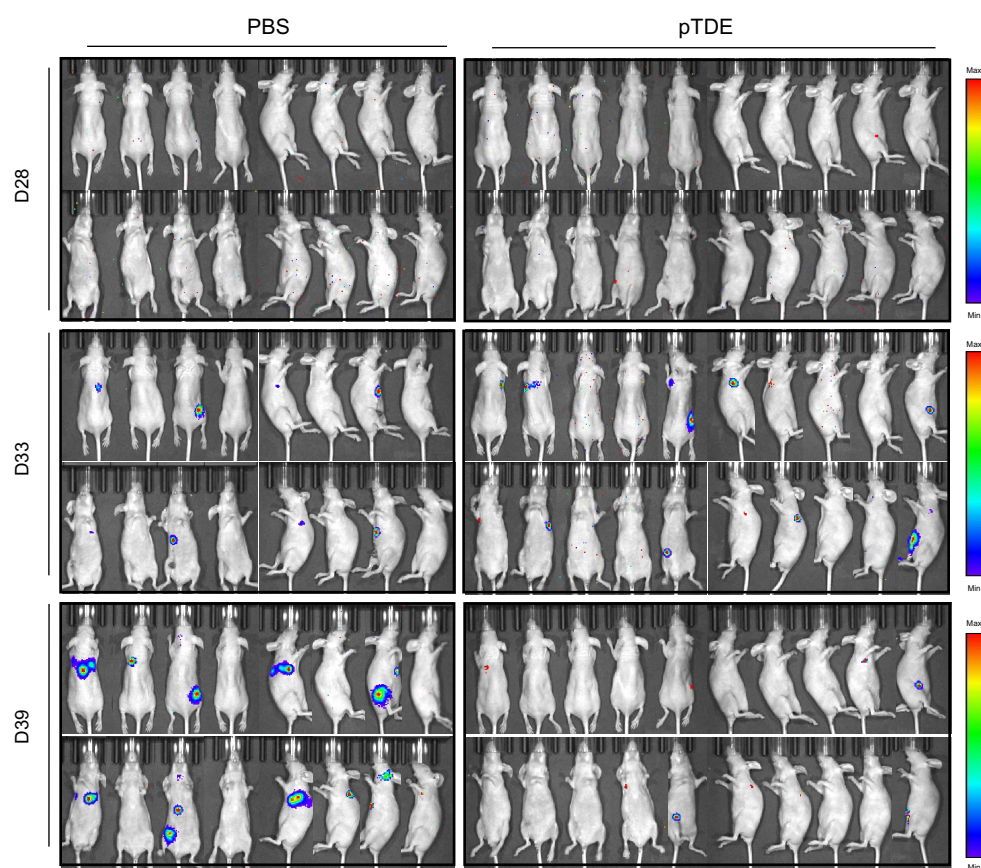


Supplementary Figure 1. Establishment of a metastasis mouse model. (a) Sequential bioluminescence images of the primary tumor growing nude mouse from day 14 to 21 using IVIS. (b) Bioluminescent intensity was analyzed using the IVIS imaging system. Over time, an increase in total flux intensity indicates growth of the primary tumor (imaged once a week, n=20). (c) Immediately after surgery, we confirmed that the primary tumors were not visible by IVIS, nor were metastases in secondary organs, such as the frequently metastasized lung. Representative bioluminescence images of primary tumor surgically resected mice. D21 bioluminescence images were acquired immediately after surgery. Left: primary tumor resident mouse, Middle & Right: primary tumor completely resected mouse. (d) Quantification of bioluminescence intensity and representative images of the sham group represent tumor growth (n=4). The dashed arrow indicates the day of surgery. Top : Day 28, Bottom : Day 35.

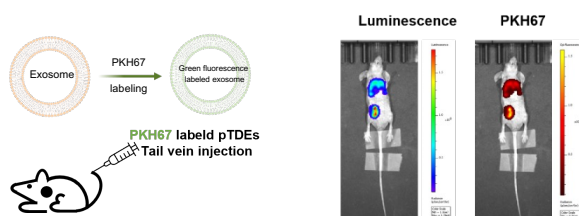


Supplementary Figure 2. Isolation and characterization of EVs. **(a)** Schematic illustration of EV isolation. Differential centrifugation, ultracentrifugation, and another ultracentrifugation were performed sequentially. **(b)** Nanoparticle tracking analysis (NTA) was used to analyze the size of EVs. Size distribution of pTDEs (top) and mTDEs (bottom). **(c)** Transmission electron microscopy (TEM) showed the external appearance of EVs. Top: pTDEs, Bottom: mDTes. Scale bar = 100 nm. The white arrows indicate cup-shaped EVs. **(d)** EV markers TST101 and Alix were identified by Western blot.

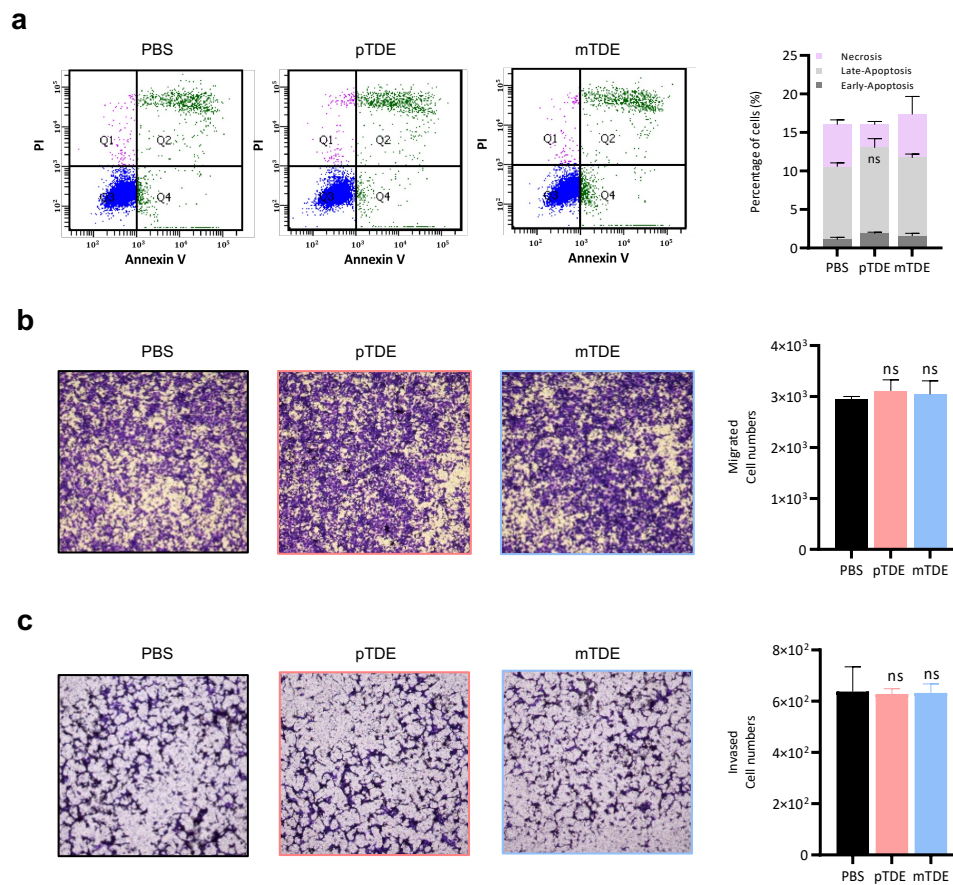
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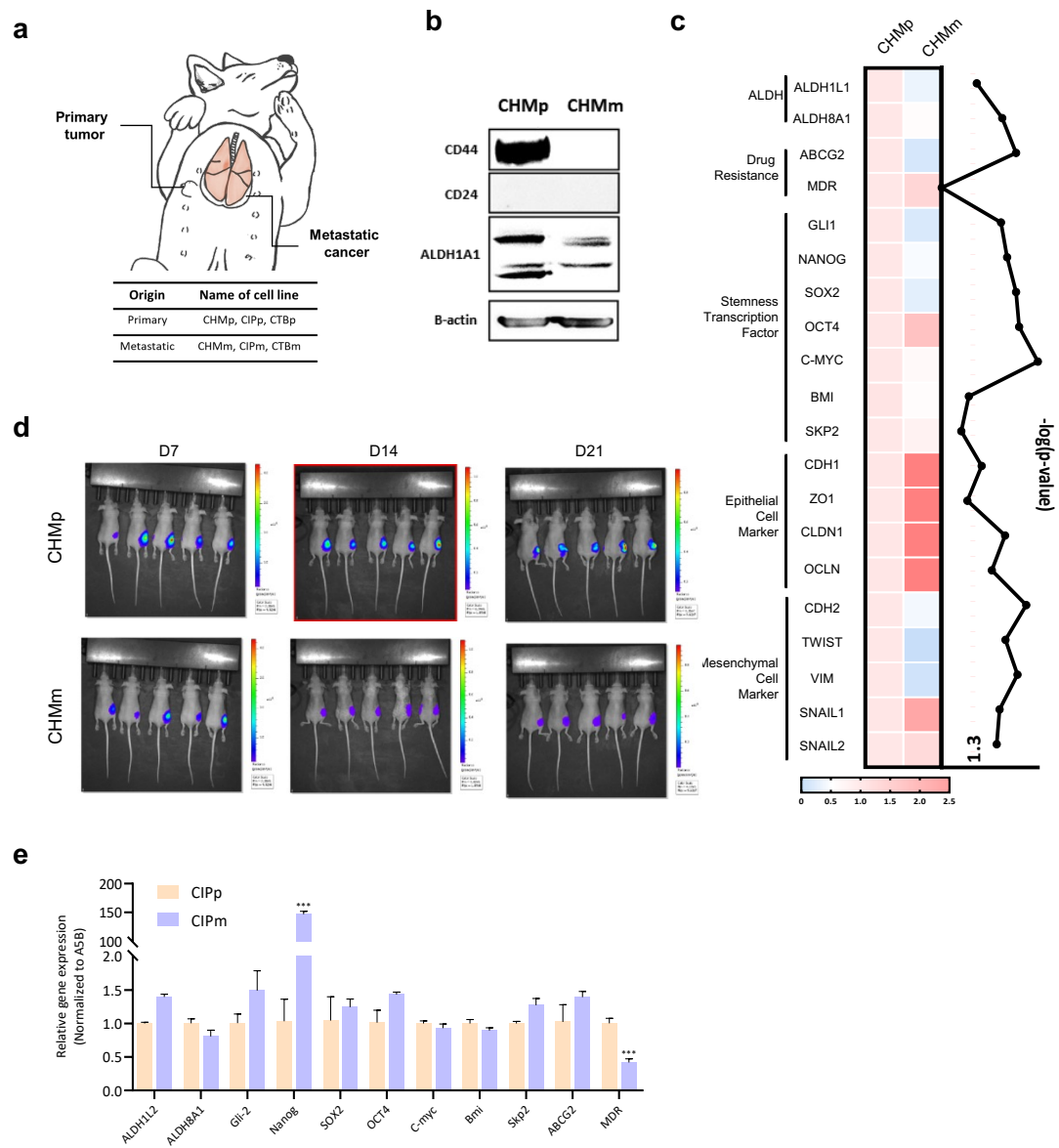
b



Supplementary Figure 3. EV injection to metastasis model. (a) Establishment of the PKH67-labeled EVs injection model. PKH67-labeled EVs were inoculated into mice via the tail vein and monitored by IVIS imaging. PKH67-labeled EVs accumulated at the primary site and metastases 48 h after injection. **(b)** Bioluminescence images of D28, D33 and D39. For each group of daily images, four mouse images were acquired at four positions (dorsal, ventral, right lateral and left lateral) to capture every possible signal from the mice.

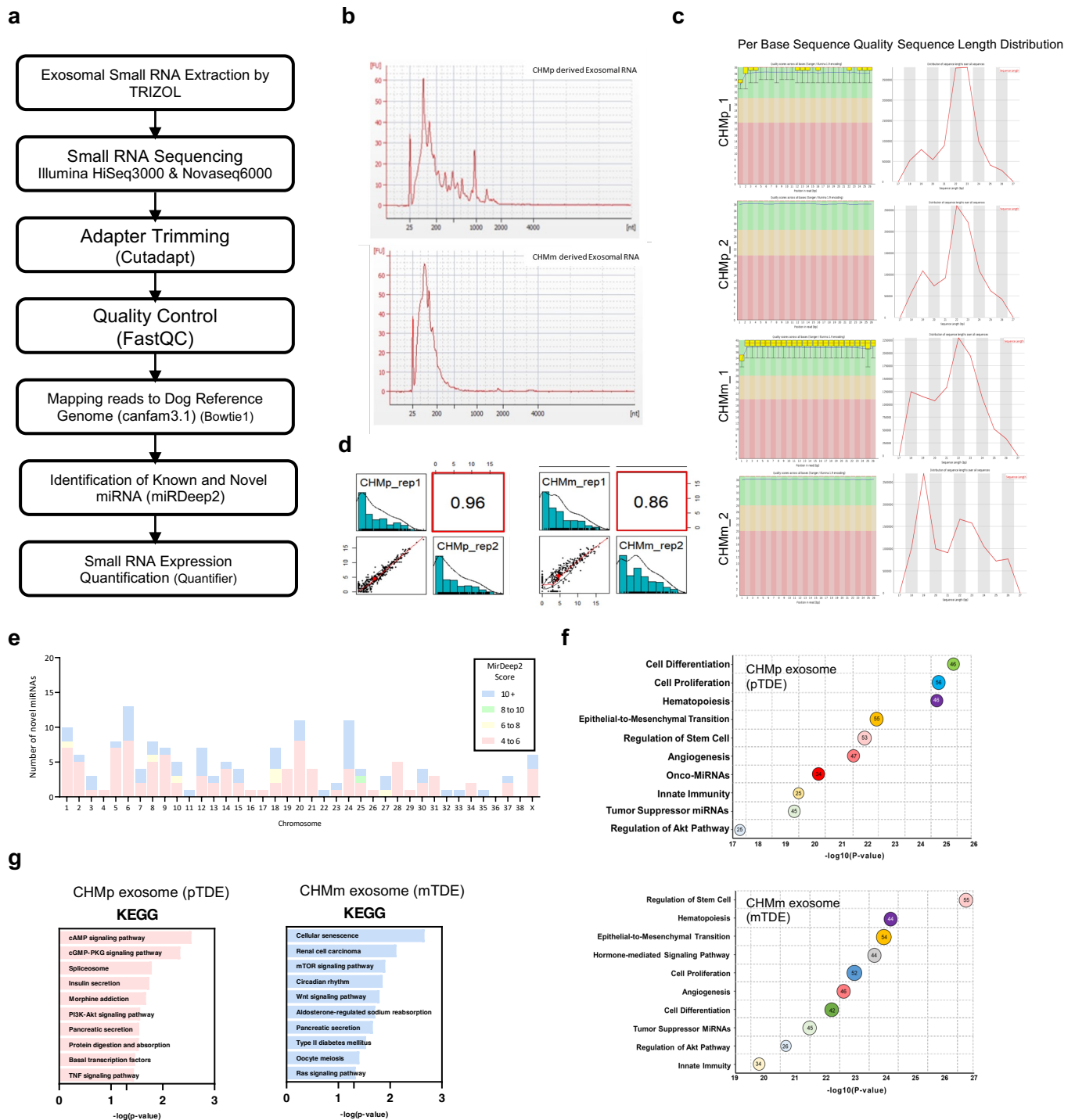


Supplementary Figure 4. pTDEs are not related to apoptosis or cell mobility. (a) EVs-treated cells were stained with Annexin V and PI to detect apoptosis. The upper left (necrosis), upper right (late apoptosis), and lower right (early apoptosis) were quantified by flow cytometry. **(b)** Trans-well migration assay with exosome-treated cells. Representative images of migrated cells were fixed and stained with crystal violet. The rate of migration was analyzed with ImageJ for quantification. There was no clear difference between groups. **(c)** Trans-well invasion assay in EVs-treated cells. Representative images of Matrigel-invaded cells were fixed and stained with crystal violet. The rate of invasion was analyzed with ImageJ for quantification. There was no clear difference between groups. All data are presented as the mean $\pm$ SEM (n=3). Two-way ANOVA and Tukey' HSD test was used to compare groups ; **P < 0.01, *** p < 0.001, and ns, not significant. Results are presented as mean $\pm$ SD.



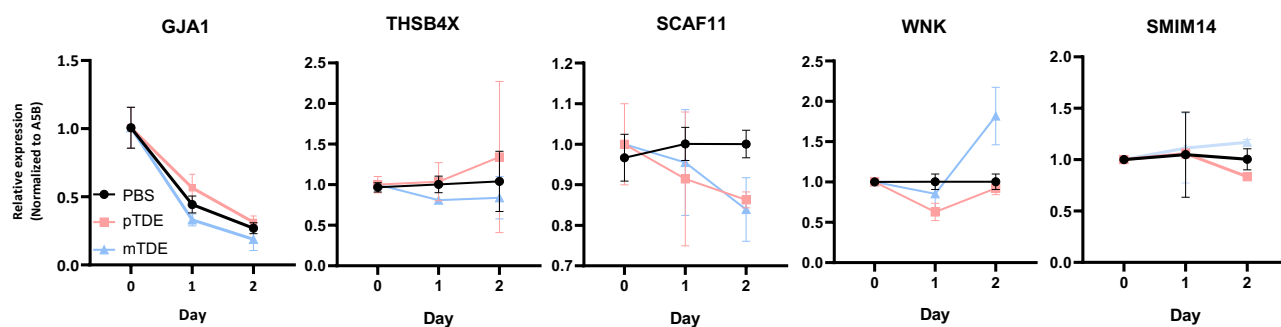
Supplementary Figure 5. Primary tumor cell possesses more cancer stemness than metastases. (a)

Graphical illustration of the primary tumor and metastases of canine mammary carcinoma. **(b)** Western blot for CD44, CD24, ALDH1A1, and β -Actin. CD44 and ALDH1A1 were significantly increased in CHMp cells. β -Actin was used as an internal control. **(c)** Relative mRNA expression of ALDH, drug resistance, stemness transcription factor, epithelial cell and mesenchymal cell markers were quantified by qRT-PCR for CHMp and CHMm cells. The results were analyzed using the $2^{-\Delta\Delta CT}$ method using A5B as a reference gene. The color bar indicates fold changes compared to CHMp cells. Statistical significance between cells was assessed using Student's t test. The back line indicates $-\log(p \text{ value})$. The red dotted line indicates $p < 0.005$. **(d)** Sequential bioluminescence images of the nude mice injected with CHMp and CHMm cells from day 7 to 21 using IVIS. **(e)** Gene expression of cancer stemness characteristics in CIPp and CIPm cells. ALDH (ALDH1L2 and ALDH8A1), stemness factors (Gli-2, Nanog, SOX2, OCT4, C-myc, and Bmi), and drug resistance (ABCG2 and MDR) genes were used for qRT-PCR. All data are presented as the mean $\pm$ SEM (n=3). Student's t-test was used to analyze the data; The statistical analysis is presented. **P < 0.01 and ***P < 0.001.

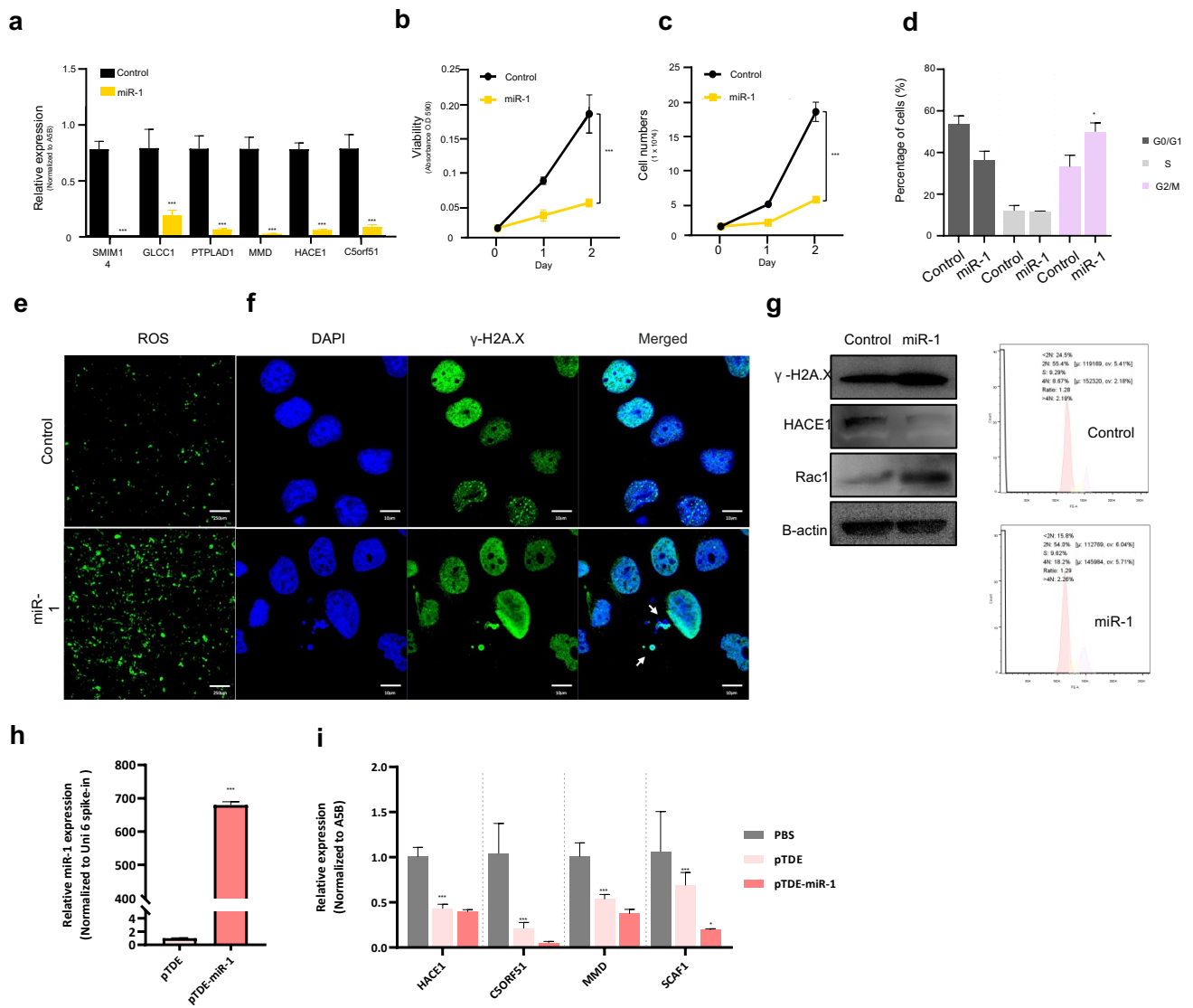


Supplementary Figure 6. Small RNA sequencing of primary and metastasis-derived exosomes. (a) Flow chart of the exosomal miRNA sequencing procedure. **(b)** Bioanalyzer electropherograms of isolated CHMp (top) and CHMm (bottom) exosomal miRNA. **(c)** Per base sequence quality (left) and sequence length distribution (right) from the EV miRNA sequencing dataset. Top two; CHMp replicates (n=2), Bottom two; CHMm replicates (n=2). **(d)** Pearson correlation between EV miRNA sequencing replicates. Left: CHMp replicates (n=2), Right: CHMm replicates (n=2). **(e)** Novel miRNAs identified by the miRDeep2 score were distributed across the canine chromosomes. **(f-g)** Small RNA expression profiling of pTDEs and mTDEs. **(f)** Comparison of miRNA expression between pTDEs and mTDEs. **(g)** Differential expression of miRNAs between pTDEs and mTDEs was functionally enriched by the TAM2.0 tool. The size of the bubble indicates the corresponding involved gene number. KEGG analysis of pTDE miRNAs (top) and mTDE miRNAs (bottom).

a



Supplementary Figure 7. Expression profiles of miR-1 target genes. (a) Endogenous mRNA expression of miR-1 target genes in CHMm cells with EVs treatment. All data are presented as the mean $\pm$ SEM (n=3). Unpaired Student's t test and two-way ANOVA were used to compare groups. **P < 0.01 and ***P < 0.001. ns not significant.



Supplementary Figure 8. miR-1 transfection into CHMm cells and pTDEs. (a-d) miR-1 overexpression in CHMm cells shows similar effects as pTDEs treatment. miR-1-transfected cells express lower levels of miR-1 target genes (a). miR-1 decreased viability (b) and proliferation rate (c) and increased G2/M phase cell cycle arrest (d) in CHMm cells. (d) (Top) Quantification of cell cycle states in CHMm cells treated with miR-1. (Bottom) Representative flow cytometry graph for each treated group. (e) Representative images showing cellular ROS levels. Brighter green fluorescence indicates high ROS. Scale bar, 250 μ m. (f) For measuring damaged DNA, γ -H2A.X (green) and DAPI (blue) stains were used. The white arrow indicates damaged DNA, which colocalized with γ -H2A.X and DAPI. Scale bar, 10 μ m. (g) Western blot for γ -H2A.X and miR-1 target genes. Downregulation of HACE1 and upregulation of Rac1 were shown by Western blotting. (h) Increased miR-1 levels in pTDE-miR-1 compared to pTDEs. Uni 6 spike-in was used as the control. (i) Expression changes in the mRNA levels of potential miR-1 target genes. C5orf51, MMD and SCAF1 were decreased with pTDE-miR-1 treatment. Ct (cycle of threshold) values are normalized to A5B gene expression within the same cDNA concentration. Unpaired Student's t test was used to compare groups. (* $p < 0.05$, *** $p < 0.001$).

Supplementary Table 1. Information of the PCR primers and antibodies used

Gene	Primer		Tm (°C)
	Primer sequence		
	Forward (5'→ 3')	Reverse (5'→ 3')	
ALDH1L2	CCCAGTTGTGGGTGTGTTCA	TCCGCCACCTCCTTTATGGT	61
ALDH8A1	GGTGGAAGTTGGCATTCCC	ATCTACCCCTCACCACACA	61
ABCG2	GGTATCCATAGCAACTCTCCTCA	GCAAAGCCGCATAACCAT	61
MDR	GAGGACTTGAATGAGAATGTTCTT	CGGGTAAAGATCCCTATAATCCTT	61
Gli-1	ACCTCCATGATAGGCAGTGG	ACTACCCCATGGTTCAGAG	61
Nanog	CTATAGAGGAGAGCACAGTGAAG	GTTTCGGATCTACTTTAGAGTGAGG	61
SOX2	AACCCCAAGATGCACAACCTC	CGGGGCCGGTATTTATAATC	61
OCT4	CTCTGCAGCCAATCAACCACAA	GGAGAGGGGGATGAGAAGTACAAT	61
C-myc	AATAGGAACTATGACCTCGAC	AGCAGCTCGAATTTCTTCCAG	61
Bmi	CACTGTGAATAATGACTTCTTGAT	AAGTTTACTTTCCTTTGATCGGTTT	61
Skp2	CCCCGAAAACGGCTGAAAAG	TTCAGGAGTTCAGGGAGGCA	61
ECAD	CCATCTTGGGCATTCTCGGA	ATACTGGGGCACACTCAGGA	61
ZO1	TCCAGTCAACCTCCCAAACC	GGTAGCCCGTTCATCCCTTT	61
Cludin-1	TGGAAGACGATGAGGTGCAG	GCCGTGGTGTGGGTAAAGAT	61
Occludin	CTCTCAGCCGGCGTATTCTT	TAGCCTCTATCCCAGGCGAG	61
NCAD	GTGAGCTGATAGCCCGGTTT	ACATCCCGTTTAGGGCGTTT	61
TWIST	GCTGCCTCCATTTACCTCATCC	AGGGGGTTGGTGCCATACA	61
VIM	AACGCCAGATGCGTGAAATG	TGGAAGAGGCAGAGCAATCC	61
SNAIL1	AAGGACTCCCAGACTCGCAA	TTCGGGAACAGGTCTTGAC	61
SNAIL2	GCCTGTCATACCACAACCAGA	CTTCAATGGCATGGGGGTCT	61
HACE1	CAAGGTGTTGTGCGTGAGTG	GATCTGTCCAGCAAACCGGA	61
C5orf51	TGACCAAAAGGAGAGAGTGGC	AGCTTGCTCCAGAAACACCA	61
PTPLAD1	GAAGCGCCCACTCTTTTGG	CATGTCGGCCAAGGTATGGA	61
GLCC11	GCGTCTCGTCAGCCTATCTC	CGAGCTGGTGTCTGTCAGAAA	61
MMD	AAGGAGCGGAGGATCAATGC	GGCTCTTCTCCACGACACA	61
GJA1	TAAGGATCGCGTGAAAGGCA	TCAAAAGGCTGTGCATGGGA	61
THSB4X	GTCTCTCATTTGCATAGGGGC	GATTCGCCTGCTTGCTTCTC	61
SCAF11	GTTGGGCGGTGAGAAAGACT	TGGATTGCGCTGGATGTTCA	61
WNK3	GACTGGACAAAGGAAGCAGTAGG	CCAGGAAATGAAGGGAGTGGG	61
SMIM14	TCGTGGCTTACAGTGACGTG	TGACTGTTGAAATCCGCCCA	61

Antibodies			
Antibodies	Company	Catalog No.	Application
CD44	Abcam	ab157107	Immunoblot (1:2500)
CD24	Abcam	ab202073	Immunoblot (1:2000)
ALDH1A1	Abcam	ab134188	Immunoblot (1:2500)
β-Actin	Sigma-Aldrich	A5441-.2ML	Immunoblot (1:5000)
TSG101	Abcam	ab225877	Immunoblot (1:2000)
Alix	Abcam	ab88388	Immunoblot (1:2000)
p38	Cell signaling Tech	8690S	Immunoblot (1:2000)
phospho-p38	Cell signaling Tech	4511S	Immunoblot (1:2000)
p44/42	Cell signaling Tech	4370S	Immunoblot (1:2000)
phospho-p44/42	Cell signaling Tech	4695S	Immunoblot (1:2000)
HACE1	Abcam	ab133637	Immunoblot (1:2000)
Rac1	Merck	05-389	Immunoblot (1:2500)
γ -H2A.X	Abcam	ab81299	ICC (1:200)

Supplementary Table 2. Identified EV miRNA lists

pTDE	novel known	60 247							
pTDE(307)	pTDE rep1	pTDE rep2	mDE rep1	mDE rep2	logFC	logCPM	LR	PValue	FDR
cfa-mir-1-1	2956	2224	0	0	5.483026667	11.092913	15.41382608	8.63542E-05	0.009686058
cfa-mir-1-2	2956	2224	0	0	5.483026667	11.092913	15.41382608	8.63542E-05	0.009686058
cfa-mir-889	2520	2026	0	0	5.299177004	10.98915202	13.52739526	0.000235106	0.019778303
cfa_novel_141	2524	1920	0	0	5.267192962	10.97169098	13.22306842	0.000276525	0.020677891
cfa-mir-455	1934	2186	0	0	5.161428804	10.91520568	12.26344553	0.000461918	0.03108707
cfa-mir-200c	1985	1418	6744	5954	-1.858316279	12.30083992	11.84179045	0.000579161	0.034971391
cfa_novel_26	1168	1901	0	0	4.750901914	10.71428917	9.139084955	0.002502062	0.120277697
cfa-mir-376a-1	1895	944	0	0	4.641388263	10.66560277	8.445253613	0.003659974	0.132642781
cfa-mir-376a-2	1895	944	0	0	4.641388263	10.66560277	8.445253613	0.003659974	0.132642781
cfa-mir-376a-3	1895	944	0	0	4.641388263	10.66560277	8.445253613	0.003659974	0.132642781
cfa-mir-328	1098	1379	0	0	4.454057808	10.58704518	7.373943155	0.006617567	0.222681128
cfa_novel_75	1122	1245	0	0	4.391583761	10.56215502	7.046499769	0.00794203	0.254523141
cfa_novel_35	1754	558	0	0	4.35743361	10.54882256	6.873413768	0.008748737	0.260181282
cfa-mir-410	1626	675	0	0	4.350915872	10.54629982	6.840842451	0.008909681	0.260181282
cfa_novel_115	763	1491	0	0	4.32492038	10.53630747	6.712388273	0.009574541	0.260181282
cfa-mir-375	586	1456	4120	3291	-1.789885604	11.7082333	6.662438547	0.009846608	0.260181282
cfa_novel_63	870	1245	0	0	4.237637302	10.50356331	6.297634363	0.012089921	0.260181282
cfa_novel_146	1660	414	0	0	4.209040992	10.49310349	6.167116573	0.013014656	0.260181282
cfa-mir-224	1122	944	0	0	4.205367585	10.49176937	6.150537328	0.013137218	0.260181282
cfa-mir-205	2187	2463	5996	4976	-1.208698385	12.25618627	5.419804496	0.019909589	0.260181282
cfa_novel_57	903	777	0	0	3.924663945	10.39609908	5.000729128	0.025336643	0.260181282
cfa-mir-32	1251	414	0	0	3.911506771	10.39191223	4.952130255	0.026058541	0.260181282
cfa_novel_77	965	675	0	0	3.891337733	10.38554451	4.878486708	0.02719345	0.260181282
cfa_novel_87	965	675	0	0	3.891337733	10.38554451	4.878486708	0.02719345	0.260181282
cfa_novel_74	1073	558	0	0	3.883882798	10.38320625	4.851525925	0.027621686	0.260181282
cfa-mir-8908a-1-3p	763	865	0	0	3.882300026	10.38271087	4.845819737	0.027713217	0.260181282
cfa-mir-8908a-2-3p	763	865	0	0	3.882300026	10.38271087	4.845819737	0.027713217	0.260181282
cfa-mir-8908a-3-3p	763	865	0	0	3.882300026	10.38271087	4.845819737	0.027713217	0.260181282
cfa-mir-8908a-4-3p	763	865	0	0	3.882300026	10.38271087	4.845819737	0.027713217	0.260181282
cfa-mir-219-1-5p	836	675	0	0	3.781110812	10.35180887	4.493706498	0.034019842	0.260181282
cfa-mir-133a	3665	4162	0	2902	1.305563179	11.82281858	4.492510621	0.034043646	0.260181282
cfa-mir-133c	3665	4162	0	2902	1.305563179	11.82281858	4.492510621	0.034043646	0.260181282
cfa-mir-33a	763	675	0	0	3.715687568	10.33262222	4.278848892	0.038589474	0.266533903
cfa-mir-204	4162	4565	1346	2360	1.184150445	11.97081334	4.274474269	0.038688931	0.266533903
cfa-mir-542	2039	2327	1346	0	1.706620828	11.17782182	3.871464166	0.049113658	0.293330238
cfa-mir-124-1	353	944	0	0	3.581231629	10.29508948	3.866719319	0.049252706	0.293330238
cfa-mir-124-2	353	944	0	0	3.581231629	10.29508948	3.866719319	0.049252706	0.293330238
cfa-mir-124-3	353	944	0	0	3.581231629	10.29508948	3.866719319	0.049252706	0.293330238
cfa_novel_7	1344	1194	3983	2617	-1.319053766	11.66351896	3.777084012	0.051959137	0.302387126
cfa-mir-338	994	239	0	0	3.511331941	10.27655929	3.667167471	0.055494419	0.306379084
cfa-mir-211	723	490	0	0	3.489828368	10.27099065	3.607697856	0.057512682	0.306379084
cfa-mir-1185	965	239	0	0	3.480055719	10.26848017	3.580962495	0.058445279	0.307294318
cfa_novel_139	477	675	0	0	3.423275567	10.25414229	3.429159506	0.064054692	0.322823564
cfa-mir-487a	680	414	0	0	3.35551754	10.23757824	3.255654684	0.071177508	0.345151452
cfa_novel_42	353	414	1764	1389	-1.872749982	10.92355275	3.202046875	0.073546169	0.348567408
cfa_novel_43	353	414	1764	1389	-1.872749982	10.92355275	3.202046875	0.073546169	0.348567408
cfa-mir-450b	3926	4307	2903	1361	0.964550216	11.96438535	2.885156891	0.089399298	0.404288902
cfa-mir-329b	2439	1948	1457	220	1.395118595	11.23425346	2.875323245	0.089946913	0.404288902
cfa_novel_70	353	239	2214	510	-1.939226708	10.78586864	2.861733508	0.090709694	0.404288902
cfa-mir-146b	2530	2581	0	2112	1.140761506	11.42728267	2.413007959	0.120330954	0.525861895
cfa_novel_138	1146	414	1780	2145	-1.27849283	11.19539379	2.247951114	0.133791442	0.568741453
cfa-mir-203	2626	3002	4823	4819	-0.764244898	12.22809786	2.241295778	0.134368337	0.568741453
cfa-mir-323	2620	2364	0	2137	1.088843154	11.41475305	2.183356905	0.139509877	0.58681342
cfa_novel_10	2389	2585	2455	0	1.079998733	11.41505299	2.150640788	0.142510401	0.588401838
cfa_novel_11	2389	2585	2455	0	1.079998733	11.41505299	2.150640788	0.142510401	0.588401838
cfa-mir-34a	1565	1749	3177	3250	-0.93191374	11.7355873	2.128008605	0.144628546	0.593506166
cfa-mir-190b	2052	1796	0	1577	1.138390017	11.16947829	1.843552454	0.174535148	0.703366195
cfa-mir-1844	1485	1140	2766	2301	-0.910203545	11.49283894	1.620161771	0.203069232	0.785434445
cfa_novel_16	2472	2173	542	1768	0.92405596	11.38697383	1.553870194	0.212565004	0.812819588
cfa_novel_24	680	1314	1780	2120	-0.935045169	11.25429496	1.3415337	0.246763678	0.922621975
cfa-mir-212	2176	1749	2159	0	0.922682926	11.23343514	1.323844499	0.249903247	0.924428832
cfa_novel_32	534	1871	0	915	1.205596153	10.79381955	1.323336517	0.249994127	0.924428832
cfa-mir-138a	198	239	0	0	2.231912036	10.03678433	1.303438565	0.253586084	0.932587075
cfa-mir-369	3145	3149	2001	1969	0.650117992	11.76572203	1.124426963	0.288967207	1
cfa-mir-424	1895	2260	0	2206	0.789639095	11.31712374	1.068665985	0.301246963	1
cfa-mir-199-1	4415	4028	2520	3204	0.539597594	12.12421288	1.066898279	0.301647104	1
cfa-mir-199-2	4415	4028	2520	3204	0.539597594	12.12421288	1.066898279	0.301647104	1
cfa-mir-199-3	4415	4028	2520	3204	0.539597594	12.12421288	1.066898279	0.301647104	1
cfa-mir-503	3461	2788	2280	1768	0.6235112	11.7661118	1.03616983	0.308713944	1
cfa-mir-8903	994	1140	1712	2077	-0.803717952	11.25696104	1.00907052	0.315125617	1
cfa-mir-350	1590	2186	0	2010	0.783388612	11.23285619	0.964231748	0.32612299	1
cfa_novel_5	2493	2364	3859	3334	-0.548366741	11.95406586	0.931692591	0.334423492	1
cfa-mir-543	1552	1749	0	1737	0.794400784	11.1145148	0.872340425	0.350308194	1
cfa-mir-1843	836	1140	1676	1783	-0.775001676	11.17923399	0.866894767	0.351816405	1
cfa-mir-130b	3002	2364	2090	1442	0.604337777	11.61435311	0.84697659	0.357409055	1
cfa-mir-592	3056	2243	1712	1721	0.608082936	11.60039043	0.846140692	0.357646415	1
cfa_novel_126	763	1245	1657	1811	-0.757218152	11.18613459	0.835253576	0.360757788	1
cfa_novel_61	2019	2186	0	2420	0.679226239	11.35682125	0.82926163	0.362486123	1
cfa-mir-129-1	2593	2295	1553	1654	0.587162294	11.52640954	0.736034874	0.390934017	1

cfa-mir-129-2	2593	2295	1553	1654	0.587162294	11.52640954	0.736034874	0.390934017	1
cfa-mir-195	1232	1194	0	1233	0.826713599	10.86719091	0.707035644	0.400429666	1
cfa-mir-342	1361	1861	3032	1901	-0.574342327	11.54052953	0.699117163	0.403080499	1
cfa_novel_3	3897	2997	3650	1442	0.469787102	11.92150619	0.680585668	0.409385125	1
cfa-mir-126	1073	2463	0	2059	0.659801414	11.20647975	0.670485584	0.412882362	1
cfa_novel_15	1837	1456	2239	2635	-0.557750728	11.55389192	0.668713602	0.413500464	1
cfa-mir-505	1394	1738	2390	2319	-0.569490649	11.510516	0.668078048	0.413722491	1
cfa-mir-615	903	944	1457	1617	-0.704038753	11.09629211	0.658302349	0.417159918	1
cfa_novel_18	1326	1379	2605	1577	-0.583836256	11.37823487	0.615750358	0.432630877	1
cfa-mir-30a	5529	5901	4651	4396	0.336229767	12.5570539	0.596031118	0.440096354	1
cfa_novel_39	723	239	0	1721	-0.856592952	10.6908702	0.584385138	0.444598602	1
cfa-mir-324	1378	2463	2404	2969	-0.480716762	11.67557622	0.560335727	0.454125005	1
cfa_novel_46	935	617	1507	1116	-0.701385752	10.95972529	0.559217206	0.454575814	1
cfa_novel_40	198	558	1637	0	-0.910532723	10.57332667	0.555423131	0.456110233	1
cfa-mir-8884	2710	2961	2319	1811	0.458281757	11.71701951	0.539186401	0.462770104	1
cfa-mir-432	903	1632	2100	1721	-0.560212529	11.30996755	0.53007609	0.466574871	1
cfa-mir-1301	3298	3169	3256	1654	0.420243888	11.86903363	0.520766192	0.470515029	1
cfa-mir-6529	2611	2317	3986	2653	-0.402053339	11.90171722	0.483528463	0.4868284	1
cfa-mir-127	1212	2477	1939	3087	-0.45504299	11.62332198	0.479111196	0.488825185	1
cfa-mir-345	1590	906	1676	0	0.635842707	10.92824141	0.45598128	0.499508141	1
cfa-mir-140	5184	5450	3904	4645	0.302645298	12.48279651	0.45512191	0.499912623	1
cfa-mir-218-1	3808	4315	2509	3783	0.343651895	12.15046476	0.445369507	0.504542144	1
cfa_novel_150	106	1292	0	2129	-0.65438327	10.86952538	0.438646094	0.507776653	1
cfa-mir-155a	6508	6810	5780	5328	0.263182027	12.77516759	0.434779636	0.509652925	1
cfa-mir-450a	3434	3475	2605	2717	0.367246697	11.95967707	0.43141125	0.511297281	1
cfa-mir-218-2	3749	4223	2509	3690	0.339017911	12.13057662	0.426231069	0.513844124	1
cfa-mir-143	3309	4521	2264	3799	0.339510911	12.11029924	0.420155103	0.516859661	1
cfa-mir-1306	2962	2441	3561	3378	-0.351883567	11.97928221	0.397717378	0.528270459	1
cfa_novel_79	1290	1379	1637	2095	-0.477537518	11.3229261	0.392834878	0.530813021	1
cfa-mir-340	3774	3548	3069	2723	0.337713166	12.03475309	0.389656134	0.532480208	1
cfa_novel_130	1308	1140	0	1491	0.586438989	10.92517158	0.387431256	0.533652742	1
cfa_novel_36	680	675	1404	783	-0.619703163	10.83534662	0.378197192	0.538569652	1
cfa-mir-7-1	5868	5684	5012	4648	0.258643563	12.60096788	0.365790555	0.545307765	1
cfa-mir-7-2	5864	5675	5010	4650	0.257036826	12.6002926	0.361071718	0.547911632	1
cfa-mir-7-3	5863	5675	5011	4653	0.256266848	12.60046865	0.358965401	0.549081387	1
cfa-mir-15a	3722	2826	2690	2469	0.34058796	11.91001248	0.355433909	0.551053127	1
cfa-mir-382	1879	2205	1284	1689	0.430487513	11.39998472	0.35182643	0.553081049	1
cfa-mir-433	586	558	0	1721	-0.631549719	10.72842411	0.341717702	0.558839406	1
cfa-mir-409	2785	3058	1747	2742	0.351069933	11.78424058	0.337441871	0.561309557	1
cfa_novel_17	1122	2159	1964	2394	-0.405135273	11.48740499	0.33472304	0.562891137	1
cfa-mir-1468	1073	1930	0	1980	0.485280347	11.11198331	0.330172003	0.565557824	1
cfa-mir-499	2857	2132	2130	1721	0.373110408	11.61301026	0.325305858	0.568436331	1
cfa-mir-16-1	6069	6104	5317	5041	0.233080934	12.67601105	0.315434663	0.574364249	1
cfa-mir-16-2	6069	6104	5321	5041	0.232544899	12.67624095	0.314044195	0.575209044	1
cfa-mir-3958	2326	1850	1053	2020	0.398766347	11.43043847	0.311441455	0.576796995	1
cfa-mir-379	3164	2948	1530	3210	0.325444871	11.84099244	0.305327916	0.580561415	1
cfa-mir-196a-2	4726	4950	4274	3854	0.253198841	12.38934101	0.295407687	0.586775815	1
cfa_novel_85	1499	2132	1575	1158	0.409665545	11.29770044	0.28744053	0.591865387	1
cfa-mir-1271	4581	4907	4546	3478	0.251216068	12.36682387	0.285482508	0.593130097	1
cfa-mir-17	1626	1245	2239	1617	-0.396134836	11.35719855	0.281470911	0.595738747	1
cfa-mir-196a-1	4635	4825	4203	3767	0.249161963	12.36422642	0.280240373	0.596543711	1
cfa-mir-150	1344	2153	2120	2377	-0.357260383	11.52931258	0.271863864	0.602084208	1
cfa-mir-331	3357	3567	4339	4008	-0.261539079	12.21834589	0.270818753	0.602783074	1
cfa-mir-664	836	675	322	613	0.601932049	10.60253742	0.266938458	0.605392914	1
cfa_novel_23	1425	1337	0	1864	0.450621743	11.05197031	0.2665794	0.605635624	1
cfa-mir-9-1	5274	5036	4746	4070	0.230377403	12.47440056	0.26216872	0.608634115	1
cfa-mir-9-2	5274	5036	4746	4070	0.230377403	12.47440056	0.26216872	0.608634115	1
cfa-mir-9-3	5274	5036	4746	4070	0.230377403	12.47440056	0.26216872	0.608634115	1
cfa_novel_22	1326	1358	0	1811	0.450878672	11.02920011	0.260067848	0.610073546	1
cfa_novel_25	1326	1358	0	1811	0.450878672	11.02920011	0.260067848	0.610073546	1
cfa-mir-196b	4345	4313	3926	3371	0.250354912	12.25950066	0.259437725	0.610506709	1
cfa-mir-130a	2202	2009	1842	1442	0.359082793	11.45085889	0.257930751	0.611545333	1
cfa-mir-30c-1	5435	6071	5157	4772	0.21417486	12.61466037	0.253683241	0.614493452	1
cfa-mir-30c-2	5435	6071	5157	4772	0.21417486	12.61466037	0.253683241	0.614493452	1
cfa-mir-26a-2	6446	6299	5955	5153	0.203279729	12.74535631	0.253503321	0.614619013	1
cfa-mir-26a-1	6445	6299	5955	5153	0.20319729	12.74531938	0.253290485	0.614767616	1
cfa-mir-132	4160	4130	3408	3541	0.249038366	12.20961855	0.246228671	0.619743195	1
cfa-mir-494	3323	3006	2509	2653	0.285413436	11.89303438	0.246130147	0.619813239	1
cfa-mir-500	2417	2539	2913	1158	0.317697846	11.62489508	0.238790031	0.625081387	1
cfa-let-7a-1	8223	8325	7881	6882	0.169907591	13.09060751	0.231560498	0.630369149	1
cfa-let-7a-2	8225	8329	7886	6887	0.169477462	13.09122005	0.230497765	0.631154989	1
cfa_novel_148	5994	5060	7024	5709	-0.192309149	12.74725864	0.225568953	0.634829028	1
cfa-mir-582	2796	2088	1842	2059	0.310310778	11.6124881	0.225204901	0.635102344	1
cfa-mir-30e	3765	4055	3133	3430	0.244515523	12.14426324	0.224644527	0.635523583	1
cfa-mir-101-1	3434	2906	2785	2474	0.269510512	11.90057453	0.220983231	0.638291765	1
cfa-mir-101-2	3434	2906	2785	2474	0.269510512	11.90057453	0.220983231	0.638291765	1
cfa-let-7f	7302	7223	6887	6019	0.175505591	12.921564	0.216891105	0.641419019	1
cfa-mir-708	4087	3389	2834	3425	0.242874288	12.09350029	0.212270343	0.644993722	1
cfa-mir-210	3668	3356	2370	3445	0.249982184	12.020769	0.211231492	0.645803881	1
cfa-mir-486-3p	3364	4168	4352	4453	-0.222723954	12.29857521	0.210371589	0.646476312	1
cfa-mir-374a	3756	3881	3238	3217	0.238731828	12.11943459	0.209685789	0.647013791	1
cfa-mir-380	2805	2837	2222	2404	0.276108891	11.77339696	0.206963934	0.649157521	1
cfa_novel_80	2651	1660	2461	2794	-0.285530575	11.70904831	0.206429456	0.649580471	1
cfa_novel_131	1565	1194	1404	2086	-0.345134984	11.30161479	0.202533669	0.652683467	1
cfa-mir-223	1854	2635	2774	2687	-0.274074962	11.74716911	0.197070064	0.657096273	1
cfa-mir-21	9177	8888	8822	7576	0.14595711	13.21464488	0.187825773	0.664732402	1
cfa-mir-497	935	330	0	1672	-0.460610565	10.74102619	0.187349598	0.66513174	1

cfa-mir-487b	2787	3122	2334	2586	0.253995867	11.83051666	0.184444506	0.6675812	1
cfa-mir-122	3621	3274	4149	3902	-0.21734931	12.1931879	0.183506934	0.668376599	1
cfa-mir-421	2202	1646	3089	1689	-0.276330648	11.59016244	0.173137614	0.677338234	1
cfa-mir-362	3589	3591	2797	3306	0.222386762	12.05594108	0.172360753	0.678022198	1
cfa-mir-365-1	4807	5136	4587	4163	0.186734166	12.44874683	0.168736836	0.68123687	1
cfa-mir-365-2	4807	5136	4587	4163	0.186734166	12.44874683	0.168736836	0.68123687	1
cfa-let-7e	5401	5623	5307	4498	0.175005807	12.57848103	0.164574168	0.684979636	1
cfa_novel_123	1073	777	0	1268	0.419641279	10.7646242	0.16335398	0.686087175	1
cfa_novel_31	1682	414	1676	0	0.395728133	10.85549799	0.163209846	0.68621832	1
cfa-mir-106b	4447	3685	3353	3677	0.202206891	12.20549915	0.161827807	0.687479245	1
cfa-mir-26b	5634	5439	5104	4734	0.172376193	12.58498401	0.160500225	0.688696389	1
cfa-let-7g	6642	6551	6279	5587	0.157083836	12.80830673	0.159069003	0.690015114	1
cfa-mir-29a	6989	6693	6025	6261	0.151937921	12.85615986	0.154489791	0.694281154	1
cfa-mir-411	3033	2446	1747	2819	0.234579394	11.75702468	0.147250412	0.701176934	1
cfa-mir-1839	3003	2987	3572	3367	-0.205441909	12.02865607	0.142574604	0.705734805	1
cfa-mir-874	3639	3831	3491	3059	0.192890623	12.11209817	0.136078091	0.712211477	1
cfa-mir-194	3106	3032	2468	2794	0.211842086	11.88677993	0.134948327	0.713355623	1
cfa-mir-1307	3457	3078	3450	3995	-0.191778415	12.1205297	0.134498217	0.713812977	1
cfa-mir-8859b	3551	4063	4316	4314	-0.1780481	12.29056764	0.133805012	0.71451904	1
cfa_novel_129	4625	4137	2823	4814	0.170633564	12.30507494	0.125228015	0.723432034	1
cfa-mir-214	477	1080	1457	613	-0.346722223	10.84687366	0.122515581	0.726321994	1
cfa-mir-23b	3003	2642	3226	3237	-0.191553763	11.95693159	0.116527665	0.732831465	1
cfa-mir-10a	2611	2970	3520	2909	-0.190833321	11.9442727	0.114381311	0.735210169	1
cfa-mir-8865	106	1140	0	1536	-0.363018592	10.70567481	0.111683573	0.738235493	1
cfa-mir-149	4416	4652	4418	3744	0.157646815	12.35101506	0.111025115	0.738980062	1
cfa-let-7b	6858	7000	7176	5626	0.125135636	12.88422415	0.107101542	0.743468431	1
cfa-mir-148a	5400	5256	5189	4498	0.14263299	12.55065306	0.106904074	0.743696714	1
cfa-mir-92b	4710	5122	5727	5166	-0.141133325	12.5789654	0.106497869	0.744167043	1
cfa-mir-15b	5858	5699	5302	5213	0.135640181	12.65304693	0.104923563	0.745999306	1
cfa_novel_33	1704	2009	1952	2366	-0.220312113	11.53296078	0.104497233	0.746498104	1
cfa-mir-1838	1999	1314	1457	1332	0.242719926	11.26470871	0.097827345	0.754452649	1
cfa-mir-142	1724	2173	1812	2649	-0.207197627	11.57552611	0.096315338	0.756296998	1
cfa-mir-93	5956	6012	5681	5306	0.125343728	12.70066039	0.093044061	0.760342355	1
cfa_novel_20	1271	2017	1284	2479	-0.217252473	11.41535241	0.09061112	0.763401675	1
cfa-mir-495	2213	1901	2341	2377	-0.19367392	11.62395769	0.088138653	0.766556945	1
cfa-mir-25	5550	6198	5732	5099	0.121706797	12.67940437	0.086256738	0.768990995	1
cfa-mir-299	1471	1632	0	2474	0.223644644	11.21297508	0.078673056	0.779103762	1
cfa-mir-574	4543	4808	4706	3894	0.128387682	12.39962359	0.076629753	0.781917712	1
cfa-mir-30b	5505	5940	5161	5380	0.115597987	12.64980886	0.076005053	0.78278607	1
cfa-mir-125a	5545	5041	5715	4127	0.119276677	12.55252842	0.074865971	0.784379378	1
cfa-mir-29b-1	3035	2472	2355	2533	0.164565843	11.787898	0.074551547	0.784821474	1
cfa-mir-29b-2	3035	2472	2355	2533	0.164565843	11.787898	0.074551547	0.784821474	1
cfa-mir-133b	870	823	0	1925	-0.261461836	10.87990835	0.072904301	0.787154127	1
cfa-mir-660	2681	2199	2370	3057	-0.161967396	11.78746345	0.071745265	0.788812421	1
cfa-mir-20a	5233	4227	4094	4552	0.122821128	12.41539345	0.071037091	0.789832719	1
cfa-mir-145	1326	2963	1977	2814	-0.170512967	11.65821047	0.070605948	0.790456555	1
cfa-mir-19a	4737	4120	3772	4296	0.126383125	12.33579627	0.070461581	0.790665901	1
cfa-mir-222	7178	7264	6962	6556	0.097485484	12.9487272	0.068325895	0.793790053	1
cfa-mir-454	3325	3736	2986	3390	0.138443404	12.06970228	0.067605796	0.794855176	1
cfa-mir-20b	198	675	0	613	0.361004512	10.37148139	0.066910496	0.79588938	1
cfa-mir-18a	3592	2943	2712	3172	0.141017804	11.98214801	0.065032225	0.798712158	1
cfa-mir-192	2902	2902	2397	2797	0.149320139	11.84958856	0.064875073	0.798950293	1
cfa_novel_6	3283	2717	3790	2875	-0.135918118	12.00028735	0.061056721	0.804833478	1
cfa-mir-98	4998	5077	5123	4261	0.10993549	12.49666383	0.060794979	0.805243828	1
cfa-mir-28	5406	5431	5432	4680	0.105953168	12.58691529	0.060722249	0.805358016	1
cfa_novel_14	2863	3054	3188	3318	-0.136177067	11.98514975	0.060487987	0.805726314	1
cfa-mir-182	6527	6972	6713	5984	0.093217655	12.86523782	0.058549528	0.808803334	1
cfa-mir-23a	4083	3787	4524	4047	-0.116279089	12.30124522	0.057706542	0.810158268	1
cfa-let-7c	3693	3636	3807	2960	0.12507159	12.11717675	0.057458797	0.810558458	1
cfa_novel_143	4793	4044	4810	4738	-0.109728307	12.43545291	0.057389674	0.810670276	1
cfa_novel_28	1903	2437	2046	1851	0.15563313	11.54755285	0.053334738	0.817358969	1
cfa-mir-125b-1	6780	6497	7108	5476	0.089002827	12.84601772	0.05257843	0.818635855	1
cfa-mir-125b-2	6777	6496	7107	5476	0.088779189	12.84583152	0.052306829	0.81909676	1
cfa-mir-10b	6262	7138	6639	6011	0.087286691	12.8586907	0.051072202	0.821207955	1
cfa-mir-7180	1971	2369	1431	2404	0.149981098	11.54958975	0.049627529	0.823712674	1
cfa_novel_4	2886	2872	3306	3004	-0.124942562	11.95034355	0.049414456	0.824085314	1
cfa-mir-103-1	5856	5684	5506	5321	0.092477734	12.66978948	0.049413326	0.824087292	1
cfa-mir-103-2	5908	5729	5552	5374	0.091511792	12.68067064	0.048805595	0.825154815	1
cfa_novel_27	1660	777	0	1980	0.195088748	11.0204342	0.048433682	0.825811548	1
cfa-mir-184	2339	4181	2992	4013	-0.114674707	12.08499316	0.046787205	0.828751179	1
cfa-mir-181d	4264	4272	4252	3755	0.096871775	12.30481082	0.040343215	0.840811013	1
cfa_novel_12	2304	2515	2663	2598	-0.122371301	11.75836613	0.039944025	0.841590064	1
cfa_novel_13	2304	2515	2663	2598	-0.122371301	11.75836613	0.039944025	0.841590064	1
cfa-mir-532	3548	4160	3517	3662	0.099159286	12.18537632	0.038258184	0.844925613	1
cfa-mir-590	3190	2180	2635	2331	0.115511474	11.77925705	0.036440137	0.848609425	1
cfa-mir-96	3786	3668	3608	3378	0.095291236	12.14847683	0.034246188	0.853184126	1
cfa-mir-221	6542	6401	6315	6019	0.071070407	12.82208374	0.032898696	0.856069335	1
cfa-mir-502	2988	3132	3018	2704	0.100521493	11.92591006	0.031451417	0.859237035	1
cfa-mir-151	6115	5777	6314	5099	0.068754655	12.71744246	0.028357333	0.866271475	1
cfa-mir-92a-1	6997	7229	7332	6354	0.062410716	12.94541857	0.027923205	0.867289495	1
cfa-mir-92a-2	6997	7229	7332	6354	0.062409805	12.94541784	0.027922374	0.867291451	1
cfa-mir-27b	6486	6068	6581	5481	0.065871037	12.78621398	0.027476207	0.868346231	1
cfa-mir-1296	2176	3331	2187	2904	0.098146344	11.81335681	0.027126539	0.869179043	1
cfa-mir-99a-1	6632	7154	7016	6243	0.061383693	12.90604003	0.026199002	0.87141527	1
cfa-mir-99a-2	6632	7154	7016	6243	0.061383693	12.90604003	0.026199002	0.87141527	1
cfa-mir-1343	3533	3410	3829	3555	-0.083666745	12.14220508	0.0261744	0.871475131	1
cfa-mir-190a	1290	558	0	1936	-0.152820595	10.909987	0.025953063	0.872014999	1

cfa-mir-148b	4323	4563	4260	4181	0.073980003	12.36171896	0.02465536	0.875228887	1
cfa-mir-30d	7168	7360	7716	6347	0.055867767	12.9750431	0.022892071	0.879738077	1
cfa_novel_2	3763	3429	3981	3633	-0.076715073	12.17939353	0.022713055	0.880205661	1
cfa-mir-381	1734	1975	1404	2000	0.103573382	11.41362471	0.020728073	0.885522206	1
cfa_novel_38	586	675	0	1332	-0.15893075	10.65866064	0.020260114	0.886813012	1
cfa-mir-330	1819	1491	1899	1672	-0.100211685	11.37777913	0.018651198	0.891371174	1
cfa-mir-135b	4552	4706	4656	4242	0.06095002	12.41611386	0.017495369	0.894770686	1
cfa-mir-1842	3329	2727	2712	3019	0.072399386	11.92501473	0.016298318	0.898414196	1
cfa-mir-29c-1	1919	1456	1346	2199	-0.091686852	11.39268441	0.015851756	0.899808109	1
cfa-mir-29c-2	1919	1456	1346	2199	-0.091686852	11.39268441	0.015851756	0.899808109	1
cfa-mir-485	1903	865	0	2404	0.103742281	11.15090448	0.015838446	0.899849961	1
cfa-mir-378	6043	5648	5264	5987	0.048574492	12.70519876	0.014014184	0.905765369	1
cfa-mir-8859a	6283	6464	6221	6139	0.044766656	12.81481297	0.012974761	0.909311667	1
cfa-mir-8890	870	675	0	1332	0.111152785	10.71801657	0.010812312	0.917183419	1
cfa-mir-197	4279	4570	4790	4390	-0.048063044	12.40967763	0.010800591	0.917228159	1
cfa-mir-146a	2432	2714	2149	2738	0.061365882	11.75536468	0.010059157	0.920109849	1
cfa-mir-191	6011	6020	6320	5437	0.040080811	12.74466087	0.00984247	0.920972151	1
cfa-mir-128-1	5016	5226	5437	4560	0.043011797	12.54545115	0.009673083	0.921652921	1
cfa-mir-128-2	5016	5226	5437	4560	0.043011797	12.54545115	0.009673083	0.921652921	1
cfa-mir-339-1	5109	5436	5170	5122	0.034985499	12.58446913	0.006602606	0.935238032	1
cfa-mir-27a	5746	5021	5836	4749	0.033894329	12.61019885	0.006325911	0.936606662	1
cfa-mir-24-1	6575	6423	6739	6048	0.028582957	12.84657896	0.005421093	0.941306335	1
cfa-mir-24-2	6575	6423	6739	6048	0.028582957	12.84657896	0.005421093	0.941306335	1
cfa-mir-19b-1	2825	1901	2480	2404	-0.04538494	11.70713595	0.005254456	0.942213854	1
cfa-mir-19b-2	2825	1901	2480	2404	-0.04538494	11.70713595	0.005254456	0.942213854	1
cfa_novel_1	3778	3863	3845	3624	0.035225874	12.20165068	0.004891261	0.944243364	1
cfa-mir-22	5255	5439	5482	5437	-0.029155713	12.63034806	0.004750973	0.945047483	1
cfa_novel_9	2218	2635	2363	2349	0.042250356	11.7016682	0.004538454	0.946288706	1
cfa-mir-451	3443	4373	3472	4464	-0.0331302	12.25708842	0.004526238	0.94636093	1
cfa-mir-181b-2	5152	4924	5463	4480	0.028189117	12.53196153	0.004109051	0.948889104	1
cfa-mir-134	416	1140	0	1389	0.06612764	10.73413606	0.00390893	0.950147591	1
cfa-mir-185	4373	4190	4234	4174	0.026682108	12.33811426	0.003143495	0.955288527	1
cfa-mir-181b-1	5085	4840	5422	4401	0.024521064	12.51532388	0.003067652	0.95583064	1
cfa-mir-107	3019	3069	3152	3066	-0.028682322	11.97158816	0.002660115	0.958866301	1
cfa-mir-181a-1	4988	4688	5091	4471	0.022971902	12.48535409	0.002627777	0.959116871	1
cfa-mir-181a-2	4988	4688	5091	4471	0.022971902	12.48535409	0.002627777	0.959116871	1
cfa-mir-181c	3317	3024	2852	3332	0.027916915	11.99357524	0.002571518	0.959556498	1
cfa-mir-183	6047	6409	6713	5645	0.019757435	12.7925644	0.002491787	0.960187893	1
cfa-let-7d	4141	3809	5218	2994	-0.020043895	12.27103675	0.001676586	0.967338842	1
cfa-mir-361	3664	3991	3908	3675	0.016576892	12.21174026	0.001092079	0.97363741	1
cfa-mir-652	3616	4021	3903	3671	0.01501071	12.20968315	0.0008939	0.976148277	1
cfa-mir-152	3274	2779	3346	2814	-0.016512365	11.96026628	0.000873195	0.976426047	1
cfa-mir-2387	994	1796	2341	613	-0.022929181	11.19904985	0.000813383	0.977247523	1
cfa-mir-335	1895	2026	1215	2660	-0.018311604	11.50965264	0.000710587	0.978733438	1
cfa-mir-106a	2673	1398	1483	2562	-0.016575582	11.54527628	0.000602551	0.980416365	1
cfa-mir-671	2581	2349	2492	2394	0.014575146	11.72812278	0.000553143	0.981236294	1
cfa-mir-423a	5078	4994	5419	4768	-0.010036839	12.54849003	0.000527534	0.981675717	1
cfa-mir-374b	3916	4148	3674	4287	0.011133918	12.27437253	0.000519073	0.981823236	1
cfa-mir-320	5663	5654	5712	5546	0.00884393	12.68287848	0.000456137	0.982960592	1
cfa-mir-425	4219	5017	4481	4682	0.009546128	12.43567386	0.000435738	0.983345896	1
cfa-mir-99b	5306	5807	6103	5031	0.006636556	12.66150028	0.000252525	0.987321325	1
cfa-mir-186	5663	5561	5864	5348	0.005839891	12.67400118	0.000197484	0.988787773	1
cfa-mir-193a	4779	4161	4701	4241	0.004435341	12.39858259	9.125E-05	0.992378336	1
cfa-mir-1249	3634	3704	3238	4064	-0.003820316	12.17145777	5.60478E-05	0.994026684	1

<i>novel miRNA</i>	omosome loca	Sequence	Conservation
cfa_novel_1	_cfa_1;chr24_	uguccaaccugagagug	
cfa_novel_2	_cfa_2;chr5_	ggcuagggcuaaasa-miR-744-5p	
cfa_novel_3	_cfa_3;chr18_	ugacucauacuggaaa	
cfa_novel_4	_cfa_4;chr8_	cuuggccuucggcgcuuu	
cfa_novel_5	_cfa_5;chr2_	gauaugggacugagacca	
cfa_novel_6	_cfa_6;chr37_	uugcuguuuggesa-miR-2355-3p	
cfa_novel_7	_cfa_7;chr18_	acaggcgacacucggg	
cfa_novel_9	_cfa_9;chrX_	ugcuaccugggusa-miR-500a-5p	
cfa_novel_10	_cfa_10;chr24_	ucuuaggccugccucuc	
cfa_novel_11	_cfa_11;chr24_	ggcaggccaaagacuga	
cfa_novel_12	_cfa_12;chr24_	cucgggagccagucca	
cfa_novel_13	_cfa_13;chr24_	uggcguccgaggucag	
cfa_novel_14	_cfa_14;chr15_	ccggggcucgccgcg	
cfa_novel_15	_cfa_15;chr17_	gcucagacacagccaag	
cfa_novel_16	_cfa_16;chr1_	iaccgcuuccgcu hsa-miR-935	
cfa_novel_17	_cfa_17;chr22_	aaaaaaagcccaasa-miR-3613-3p	
cfa_novel_18	_cfa_18;chr14_	agcugccuuuuccuuuu	
cfa_novel_19	_cfa_20;chr18_	ggcagagacacagcea	
cfa_novel_22	_cfa_22;chr6_	cuggcaucaugcugcca	
cfa_novel_23	_cfa_23;chr12_	gugcuugggucu hsa-miR-2113	
cfa_novel_24	_cfa_24;chr10_	ggccgaccgcgaggucg	
cfa_novel_25	_cfa_25;chr6_	gcaugaugccaggcgag	
cfa_novel_26	_cfa_26;chr24_	ccuccuccagcc chr24_19542	
cfa_novel_27	_cfa_27;chr8_	gaucagagaacaucauu	
cfa_novel_28	_cfa_28;chr8_	gccuccguugccuc	
cfa_novel_31	_cfa_31;chr15_	gaugacaaaauuuucgg	
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cfa_novel_33	_cfa_33;chr9_	icucgcccucucuc	
cfa_novel_35	_cfa_35;chr20_	aggcugaccuuuuuagu	
cfa_novel_36	_cfa_36;chr3_	gcuauggaaguauuuu	
cfa_novel_38	_cfa_38;chr3_	guaggcgagcucugcg	

cfa_novel_39	_cfa_39;chr35_ccaccuucucgcuguc
cfa_novel_40	_cfa_40;chr6_ :acccaggucucagcucu
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cfa_novel_43	_cfa_43;chr7_ ggggcggcgggcggggaa
cfa_novel_46	_cfa_46;chr33_ ucgggaccucgcagacc
cfa_novel_57	_cfa_57;chr25_cucaccggagccgaggug
cfa_novel_61	_cfa_61;chr8_ :cgggcgggacugucc
cfa_novel_63	_cfa_63;chr10;cgggggggcggggc
cfa_novel_70	_cfa_70;chr8_ gggaggaggcggg
cfa_novel_74	_cfa_74;chr24_ ggggcggcccgccc
cfa_novel_75	_cfa_75;chr21_ ugggcgggaggagg
cfa_novel_77	_cfa_77;chr9_ :uggagcugcaggagc
cfa_novel_79	_cfa_79;chr26_ ucugaggugaccugg
cfa_novel_80	_cfa_80;chrX_ ?cagaggcuuggagcag
cfa_novel_85	_cfa_85;chr2_ gggggcgggcggcg
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cfa_novel_115	cfa_115;chr21_ ugggcgggaggagg
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cfa_novel_126	cfa_126;chr1_ :cuugaguccugauggggu
cfa_novel_129	_cfa_129;chr1_ :ccccccccaccccc
cfa_novel_130	_cfa_130;chr31_ :cacaguggggucugug
cfa_novel_131	cfa_131;chr8_ :acaugguuaccusa-miR-655-3p:
cfa_novel_138	cfa_138;chr16_ ugggaggaggaa;sa-miR-7107-5p
cfa_novel_139	_cfa_139;chr1_ guuccaccagacagcac
cfa_novel_141	_cfa_141;chr8_ uuauacagucaacisa-miR-656-3p
cfa_novel_143	: _cfa_143;chr1_ aguccucaucacugcca
cfa_novel_146	cfa_146;chr34_ :gaugaggccugacgauu
cfa_novel_148	_cfa_148;chr19_ :cucugcuucacuuga
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mTDE	novel	42
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mDE(249)	pTDE_rep1	pTDE_rep2	mDE_rep1	mDE_rep2	logFC	logCPM	LR	PValue	FDR
cfa-mir-429	0	0	5251	5016	-6.452109	11.81779	29.40859431	5.86171E-08	3.94493E-05
cfa-mir-200b	0	0	4871	4033	-6.242246	11.66408	25.38124373	4.7047E-07	0.000158313
cfa-mir-200a	0	0	3966	3423	-5.979065	11.48008	21.09222286	4.37701E-06	0.000981909
cfa-mir-141	0	0	3056	2684	-5.62206	11.2473	16.39398835	5.14481E-05	0.00865615
cfa-mir-95	0	1080	4337	4493	-2.899616	11.77395	14.40404359	0.000147485	0.014179656
cfa-mir-200c	1985	1418	6744	5954	-1.858316	12.30084	11.84179045	0.000579161	0.034971391
cfa-mir-147	0	0	2159	1936	-5.147621	10.97016	11.70429147	0.000623561	0.034971391
cfa-mir-676	0	0	1404	1913	-4.872444	10.82703	9.612828624	0.001932228	0.100029953
cfa_novel_136	0	0	1553	1389	-4.686432	10.73769	8.408882671	0.003733921	0.132642781
cfa_novel_8	1251	0	3310	3315	-2.302385	11.53438	8.403620673	0.003744744	0.132642781
cfa-mir-375	586	1456	4120	3291	-1.789886	11.70823	6.662438547	0.009846608	0.260181282
cfa-mir-205	2187	2463	5996	4976	-1.208698	12.25619	5.419804496	0.019909589	0.260181282
cfa_novel_19	836	0	1457	2713	-2.199165	11.13634	5.247208285	0.021982011	0.260181282
cfa_novel_82	836	0	1553	2325	-2.087917	11.08124	4.561486257	0.032698686	0.260181282
cfa-mir-204	4162	4565	1346	2360	1.18415	11.97081	4.274474269	0.038688931	0.266533903
cfa_novel_7	1344	1194	3983	2617	-1.319054	11.66352	3.777084012	0.051959137	0.302387126
cfa_novel_90	0	239	842	1268	-2.654717	10.60628	3.624947737	0.05691936	0.306379084
cfa_novel_88	870	0	1747	1654	-1.831743	10.99131	3.342280328	0.067520974	0.331690622
cfa_novel_89	0	944	1926	1577	-1.75677	11.01993	3.222679606	0.072624654	0.348567408
cfa_novel_42	353	414	1764	1389	-1.87275	10.92355	3.202046875	0.073546169	0.348567408
cfa_novel_43	353	414	1764	1389	-1.87275	10.92355	3.202046875	0.073546169	0.348567408
cfa-mir-450b	3926	4307	2903	1361	0.96455	11.96439	2.885156891	0.089399298	0.404288902
cfa-mir-329b	2439	1948	1457	220	1.395119	11.23425	2.875323245	0.089946913	0.404288902
cfa_novel_70	353	239	2214	510	-1.939227	10.78587	2.861733508	0.090709694	0.404288902
cfa_novel_138	1146	414	1780	2145	-1.278493	11.19539	2.24795114	0.133791442	0.568741453
cfa-mir-203	2626	3002	4823	4819	-0.764245	12.2281	2.241295778	0.134638337	0.568741453
cfa-mir-34a	1565	1749	3177	3250	-0.931914	11.73559	2.128008605	0.144628546	0.593506166
cfa_novel_66	586	0	542	1597	-1.727572	10.69684	2.104928774	0.14682518	0.598868764
cfa-mir-1840	1098	0	1315	1491	-1.273734	10.92197	1.641936397	0.200059994	0.778268068
cfa-mir-1844	1485	1140	2766	2301	-0.910204	11.49284	1.620161771	0.203069232	0.785434445
cfa_novel_16	2472	2173	542	1768	0.924056	11.38697	1.553870194	0.212565004	0.812819588
cfa-mir-1841	0	944	1053	1332	-1.244042	10.81118	1.373033103	0.241291438	0.907201885
cfa_novel_24	680	1314	1780	2120	-0.935045	11.25429	1.3415337	0.246763678	0.922621975
cfa_novel_29	1378	0	2239	783	-1.026284	10.99052	1.196296046	0.274063238	0.975897139
cfa-mir-369	3145	3149	2001	1969	0.650118	11.76572	1.124426963	0.288967207	1
cfa-mir-199-1	4415	4028	2520	3204	0.539598	12.12421	1.066898279	0.301647104	1
cfa-mir-199-2	4415	4028	2520	3204	0.539598	12.12421	1.066898279	0.301647104	1
cfa-mir-199-3	4415	4028	2520	3204	0.539598	12.12421	1.066898279	0.301647104	1
cfa-mir-503	3461	2788	2280	1768	0.623511	11.76611	1.03616983	0.308713944	1
cfa-mir-8903	994	1140	1712	2077	-0.803718	11.25696	1.00907052	0.315125617	1
cfa_novel_5	2493	2364	3859	3334	-0.548367	11.95407	0.931692591	0.334423492	1
cfa-mir-1843	836	1140	1676	1783	-0.775002	11.17923	0.866894767	0.351816405	1
cfa-mir-130b	3002	2364	2090	1442	0.604338	11.61435	0.84697659	0.357409055	1
cfa-mir-592	3056	2243	1712	1721	0.608083	11.60039	0.846140692	0.357646415	1
cfa_novel_126	763	1245	1657	1811	-0.757218	11.18613	0.835253576	0.360757788	1
cfa-mir-129-1	2593	2295	1553	1654	0.587162	11.52641	0.736034874	0.390934017	1
cfa-mir-129-2	2593	2295	1553	1654	0.587162	11.52641	0.736034874	0.390934017	1
cfa-mir-342	1361	1861	3032	1901	-0.574342	11.54053	0.699117163	0.403808499	1
cfa_novel_3	3897	2997	3650	1442	0.469787	11.92151	0.680585668	0.409385125	1
cfa_novel_15	1837	1456	2239	2635	-0.557751	11.55389	0.668713602	0.413500464	1
cfa-mir-505	1394	1738	2390	2319	-0.569491	11.51052	0.668078048	0.413722491	1
cfa-mir-615	903	944	1457	1617	-0.704039	11.09629	0.658302349	0.417159918	1
cfa_novel_18	1326	1379	2605	1577	-0.583836	11.37823	0.615750358	0.432630877	1
cfa-mir-30a	5529	5901	4651	4396	0.33623	12.55705	0.596031118	0.440096354	1
cfa-mir-324	1378	2463	2404	2969	-0.480717	11.67558	0.560335727	0.454125005	1
cfa_novel_46	935	617	1507	1116	-0.701386	10.95973	0.559217206	0.454575814	1
cfa-mir-8884	2710	2961	2319	1811	0.458282	11.71702	0.539186401	0.462770104	1
cfa-mir-432	903	1632	2100	1721	-0.560213	11.30997	0.53007609	0.466574871	1
cfa-mir-1301	3298	3169	3256	1654	0.420244	11.86903	0.520766192	0.470515029	1
cfa-mir-6529	2611	2317	3986	2653	-0.402053	11.90172	0.483528463	0.4868284	1
cfa-mir-127	1212	2477	1939	3087	-0.455043	11.62332	0.479111196	0.488825185	1
cfa-mir-140	5184	5450	3904	4645	0.302645	12.4828	0.45512191	0.499912623	1
cfa-mir-218-1	3808	4315	2509	3783	0.343652	12.15046	0.445369507	0.504542144	1
cfa-mir-155	6508	6810	5780	5328	0.263182	12.77517	0.434779636	0.509652925	1
cfa-mir-450a	3434	3475	2605	2717	0.367247	11.95967	0.43141125	0.511297281	1
cfa-mir-218-2	3749	4223	2509	3690	0.339018	12.13058	0.426231069	0.513844124	1
cfa-mir-143	3309	4521	2264	3799	0.339511	12.1103	0.420155103	0.516859661	1
cfa-mir-1306	2962	2441	3561	3378	-0.351884	11.97928	0.397717378	0.528270459	1
cfa_novel_79	1290	1379	1637	2095	-0.477538	11.32293	0.392834878	0.530813021	1
cfa-mir-340	3774	3548	3069	2723	0.337713	12.03475	0.389656134	0.532480208	1
cfa_novel_36	680	675	1404	783	-0.619703	10.83535	0.378197192	0.538569652	1
cfa-mir-7-1	5868	5684	5012	4648	0.258644	12.60097	0.365790555	0.545307765	1
cfa-mir-7-2	5864	5675	5010	4650	0.257037	12.60029	0.361071718	0.547911632	1
cfa-mir-7-3	5863	5675	5011	4653	0.256267	12.60047	0.358965401	0.549081387	1
cfa-mir-15a	3722	2826	2690	2469	0.340588	11.91001	0.355433909	0.551053127	1
cfa-mir-382	1879	2205	1284	1689	0.430488	11.39998	0.35182643	0.553081049	1
cfa-mir-409	2785	3058	1747	2742	0.35107	11.78424	0.337441871	0.561309557	1
cfa_novel_19	1122	2159	1964	2394	-0.405135	11.4874	0.33472304	0.562891137	1
cfa-mir-499	2857	2132	2130	1721	0.37311	11.61301	0.325305858	0.568436331	1
cfa-mir-16-1	6069	6104	5317	5041	0.233081	12.67601	0.315434663	0.574364249	1
cfa-mir-16-2	6069	6104	5321	5041	0.232545	12.67624	0.314044195	0.575209044	1
cfa-mir-3958	2326	1850	1053	2020	0.398766	11.43044	0.311441455	0.576796995	1
cfa-mir-379	3164	2948	1530	3210	0.325445	11.84099	0.305327916	0.580561415	1
cfa-mir-196a-2	4726	4950	4274	3854	0.253199	12.38934	0.295407687	0.586775815	1
cfa_novel_85	1499	2132	1575	1158	0.409666	11.2977	0.28744053	0.591865387	1
cfa-mir-1271	4581	4907	4546	3478	0.251216	12.36682	0.285482508	0.593130097	1
cfa-mir-17	1626	1245	2239	1617	-0.396135	11.3572	0.281470911	0.595738747	1
cfa-mir-196a-1	4635	4825	4203	3767	0.249162	12.36423	0.280240373	0.596543711	1
cfa-mir-150	1344	2153	2120	2377	-0.35726	11.52931	0.271863864	0.602084208	1
cfa-mir-331	3357	3567	4339	4008	-0.261539	12.21835	0.270818753	0.602783074	1
cfa-mir-664	836	675	322	613	0.601932	10.60254	0.266938458	0.605392914	1
cfa-mir-9-1	5274	5036	4746	4070	0.230377	12.4744	0.26216872	0.608634115	1
cfa-mir-9-2	5274	5036	4746	4070	0.230377	12.4744	0.26216872	0.608634115	1
cfa-mir-9-3	5274	5036	4746	4070	0.230377	12.4744	0.26216872	0.608634115	1
cfa-mir-196b	4345	4313	3926	3371	0.250355	12.2595	0.259437725	0.610506709	1
cfa-mir-130a	2202	2009	1842	1442	0.359083	11.45086	0.257930751	0.611545333	1

cfa-mir-30c-1	5435	6071	5157	4772	0.214175	12.61466	0.253683241	0.614493452	1
cfa-mir-30c-2	5435	6071	5157	4772	0.214175	12.61466	0.253683241	0.614493452	1
cfa-mir-26a-2	6446	6299	5955	5153	0.20328	12.74536	0.253503321	0.614619013	1
cfa-mir-26a-1	6445	6299	5955	5153	0.203197	12.74532	0.253290485	0.614767616	1
cfa-mir-132	4160	4130	3408	3541	0.249038	12.20962	0.246228671	0.619743195	1
cfa-mir-494	3323	3006	2509	2653	0.285413	11.89303	0.246130147	0.619813239	1
cfa-mir-500	2417	2539	2913	1158	0.317698	11.6249	0.238790031	0.625081387	1
cfa-let-7a-1	8223	8325	7881	6882	0.169908	13.09061	0.231560498	0.630369149	1
cfa-let-7a-2	8225	8329	7886	6887	0.169477	13.09122	0.230497765	0.631154989	1
cfa_novel_148	5994	5060	7024	5709	-0.192309	12.74726	0.225568953	0.634829028	1
cfa-mir-582	2796	2088	1842	2059	0.310311	11.61249	0.225204901	0.635102344	1
cfa-mir-30e	3765	4055	3133	3430	0.244516	12.14426	0.224644527	0.635523583	1
cfa-mir-101-1	3434	2906	2785	2474	0.269511	11.90057	0.220983231	0.638291765	1
cfa-mir-101-2	3434	2906	2785	2474	0.269511	11.90057	0.220983231	0.638291765	1
cfa-let-7f	7302	7223	6887	6019	0.175506	12.92156	0.216891105	0.641419019	1
cfa-mir-708	4087	3389	2834	3425	0.242874	12.0935	0.212270343	0.644993722	1
cfa-mir-210	3668	3356	2370	3445	0.249982	12.02077	0.211231492	0.645803881	1
cfa-mir-486-3p	3364	4168	4352	4453	-0.222724	12.29858	0.210371589	0.646476312	1
cfa-mir-374a	3756	3881	3238	3217	0.238732	12.11943	0.209685789	0.647013791	1
cfa-mir-380	2805	2837	2222	2404	0.276109	11.7734	0.206963934	0.649157521	1
cfa_novel_80	2651	1660	2461	2794	-0.285531	11.70905	0.206429456	0.649580471	1
cfa_novel_131	1565	1194	1404	2086	-0.345135	11.30161	0.202533669	0.652683467	1
cfa-mir-223	1854	2635	2774	2687	-0.274075	11.74717	0.197070064	0.657096273	1
cfa-mir-21	9177	8888	8822	7576	0.145957	13.21464	0.187825773	0.664732402	1
cfa-mir-487b	2787	3122	2334	2586	0.253996	11.83052	0.184444506	0.6675812	1
cfa-mir-122	3621	3274	4149	3902	-0.217349	12.19319	0.183506934	0.668376599	1
cfa-mir-421	2202	1646	3089	1689	-0.276331	11.59016	0.173137614	0.677338234	1
cfa-mir-362	3589	3591	2797	3306	0.222387	12.05594	0.172360753	0.678022198	1
cfa-mir-365-1	4807	5136	4587	4163	0.186734	12.44875	0.168736836	0.68123687	1
cfa-mir-365-2	4807	5136	4587	4163	0.186734	12.44875	0.168736836	0.68123687	1
cfa-let-7e	5401	5623	5307	4498	0.175006	12.57848	0.164574168	0.684979636	1
cfa-mir-106b	4447	3685	3353	3677	0.202207	12.2055	0.161827807	0.687479245	1
cfa-mir-26b	5634	5439	5104	4734	0.172376	12.58498	0.160500225	0.688696389	1
cfa-let-7g	6642	6551	6279	5587	0.157084	12.80831	0.159069003	0.690015114	1
cfa-mir-29a	6989	6693	6025	6261	0.151938	12.85616	0.154489791	0.694281154	1
cfa-mir-411	3033	2446	1747	2819	0.234579	11.75702	0.147250412	0.701176934	1
cfa-mir-1839	3003	2987	3572	3367	-0.205442	12.02866	0.142574604	0.705734805	1
cfa-mir-874	3639	3831	3491	3059	0.192891	12.1121	0.136078091	0.712211477	1
cfa-mir-194	3106	3032	2468	2794	0.211842	11.88678	0.134948327	0.713355623	1
cfa-mir-1307	3457	3078	3450	3995	-0.191778	12.12053	0.134498217	0.713812977	1
cfa-mir-8859b	3551	4063	4316	4314	-0.178048	12.29057	0.133805012	0.71451904	1
cfa_novel_129	4625	2823	2823	4814	0.170634	12.30507	0.125228015	0.723432034	1
cfa-mir-214	477	1080	1457	613	-0.346722	10.84687	0.122515581	0.726321994	1
cfa-mir-23b	3003	2642	3226	3237	-0.191554	11.95693	0.116527665	0.732831465	1
cfa-mir-10a	2611	2970	3520	2909	-0.190833	11.94427	0.114381311	0.735210169	1
cfa-mir-149	4416	4652	4418	3744	0.157647	12.35102	0.111025115	0.738980062	1
cfa-let-7b	6858	7000	7176	5626	0.125136	12.88422	0.107101542	0.743468431	1
cfa-mir-148a	5400	5256	5189	4498	0.142633	12.55065	0.106904074	0.743696714	1
cfa-mir-92b	4710	5122	5727	5166	-0.141133	12.57897	0.106497869	0.744167043	1
cfa-mir-15b	5858	5699	5302	5213	0.13564	12.65305	0.104923563	0.745999306	1
cfa_novel_33	1704	2009	1952	2366	-0.220312	11.53296	0.104497233	0.746498104	1
cfa-mir-1838	1999	1314	1457	1332	0.24272	11.26471	0.097827345	0.754452649	1
cfa-mir-142	1724	2173	1812	2649	-0.207198	11.57553	0.096315338	0.756296998	1
cfa-mir-93	5956	6012	5681	5306	0.125344	12.70066	0.093044061	0.760342355	1
cfa_novel_40	1271	2017	1284	2479	-0.217252	11.41535	0.09061112	0.763401675	1
cfa-mir-495	2213	1901	2341	2377	-0.193674	11.62396	0.088138653	0.766556945	1
cfa-mir-25	5550	6198	5732	5099	0.121707	12.6794	0.086256738	0.768990995	1
cfa-mir-574	4543	4808	4706	3894	0.128388	12.39962	0.076629753	0.781917712	1
cfa-mir-30b	5505	5940	5161	5380	0.115598	12.64981	0.076005053	0.78278607	1
cfa-mir-125a	5545	5041	5715	4127	0.119277	12.55253	0.074865971	0.784379378	1
cfa-mir-29b-1	3035	2472	2355	2533	0.164566	11.7879	0.074551547	0.784821474	1
cfa-mir-29b-2	3035	2472	2355	2533	0.164566	11.7879	0.074551547	0.784821474	1
cfa-mir-660	2681	2199	2370	3057	-0.161967	11.78746	0.071745265	0.788812421	1
cfa-mir-20a	5233	4227	4094	4552	0.122821	12.41539	0.071037091	0.789832719	1
cfa-mir-145	1326	2963	1977	2814	-0.170513	11.65821	0.070605948	0.790456555	1
cfa-mir-19a	4737	4120	3772	4296	0.126383	12.3358	0.070461581	0.790665901	1
cfa-mir-222	7178	7264	6962	6556	0.097485	12.94873	0.068325895	0.793790053	1
cfa-mir-454	3325	3736	2986	3390	0.138443	12.0697	0.067605796	0.794855176	1
cfa-mir-18a	3592	2943	2712	3172	0.141018	11.98215	0.065032225	0.798712158	1
cfa-mir-192	2902	2902	2397	2797	0.14932	11.84959	0.064875073	0.798950293	1
cfa_novel_6	3283	2717	3790	2875	-0.135918	12.00029	0.061056721	0.804833478	1
cfa-mir-98	4998	5077	5123	4261	0.109935	12.49666	0.060794979	0.805243828	1
cfa-mir-28	5406	5431	5432	4680	0.105953	12.58692	0.060722249	0.805358016	1
cfa_novel_14	2863	3054	3188	3318	-0.136177	11.98515	0.060487987	0.805726314	1
cfa-mir-182	6527	6972	6713	5984	0.093218	12.86524	0.058549528	0.808803334	1
cfa-mir-23a	4083	3787	4524	4047	-0.116279	12.30125	0.057706542	0.810158268	1
cfa-let-7c	3693	3636	3807	2960	0.125072	12.11718	0.057458797	0.810558458	1
cfa_novel_143	4793	4044	4810	4738	-0.109728	12.43545	0.057389674	0.810670276	1
cfa_novel_28	1903	2437	2046	1851	0.155633	11.54755	0.053334738	0.817358969	1
cfa-mir-125b-1	6780	6497	7108	5476	0.089003	12.84602	0.05257843	0.818635855	1
cfa-mir-125b-2	6777	6496	7107	5476	0.088779	12.84583	0.052306829	0.819099676	1
cfa-mir-10b	6262	7138	6639	6011	0.087287	12.85869	0.051072202	0.821207955	1
cfa-mir-7180	1971	2369	1431	2404	0.149981	11.54959	0.049627529	0.823712674	1
cfa_novel_4	2886	2872	3306	3004	-0.124943	11.95034	0.049414456	0.824085314	1
cfa-mir-103-1	5856	5684	5506	5321	0.092478	12.66979	0.049413326	0.824087292	1
cfa-mir-103-2	5908	5729	5552	5374	0.091512	12.68067	0.048805595	0.825154815	1
cfa-mir-184	2339	4181	2992	4013	-0.114675	12.08499	0.046787205	0.828751179	1
cfa-mir-181d	4264	4272	4252	3755	0.096872	12.30481	0.040343215	0.840811013	1
cfa_novel_12	2304	2515	2663	2598	-0.122371	11.75837	0.039944025	0.841590064	1
cfa_novel_13	2304	2515	2663	2598	-0.122371	11.75837	0.039944025	0.841590064	1
cfa-mir-532	3548	4160	3517	3662	0.099159	12.18538	0.038258184	0.844925613	1
cfa-mir-590	3190	2180	2635	2331	0.115511	11.77926	0.036440137	0.848609425	1
cfa-mir-96	3786	3668	3608	3378	0.095291	12.14848	0.034246188	0.853184126	1
cfa-mir-221	6542	6401	6315	6019	0.071107	12.82208	0.032898696	0.856069335	1
cfa-mir-502	2988	3132	3018	2704	0.100521	11.92591	0.031451417	0.859237035	1
cfa-mir-151	6115	5777	6314	5099	0.068755	12.71744	0.028357333	0.866271475	1
cfa-mir-92a-1	6997	7229	7332	6354	0.062411	12.94542	0.027923205	0.867289495	1
cfa-mir-92a-2	6997	7229	7332	6354	0.062411	12.94542	0.027923205	0.867289495	1
cfa-mir-27b	6486	6068	6581	5481	0.065871	12.78621	0.027476207	0.868346231	1
cfa-mir-1296	2176	3331	2187	2904	0.098146	11.81336	0.027126539	0.869179043	1
cfa-mir-99a-1	6632	7154	7016	6243	0.061384	12.90604	0.026199002	0.87141527	1
cfa-mir-99a-2	6632	7154	7016	6243	0.061384	12.90604	0.026199002	0.87141527	1
cfa-mir-1343	3533	3410	3829	3555	-0.083667	12.14221	0.0261744	0.871475131	1
cfa-mir-148b	4323	4563	4260	4181	0.07398	12.36172	0.02465536	0.875228887	1

cfa-mir-30d	7168	7360	7716	6347	0.055868	12.97504	0.022892071	0.879738077	1
cfa_novel_2	3763	3429	3981	3633	-0.076715	12.17939	0.022713055	0.880205661	1
cfa-mir-381	1734	1975	1404	2000	0.103573	11.41362	0.020728073	0.885522206	1
cfa-mir-330	1819	1491	1899	1672	-0.100212	11.37778	0.018651198	0.891371174	1
cfa-mir-135b	4552	4706	4656	4242	0.06095	12.41611	0.017495369	0.894770686	1
cfa-mir-1842	3329	2727	2712	3019	0.072399	11.92501	0.016298318	0.898414196	1
cfa-mir-29c-1	1919	1456	1346	2199	-0.091687	11.39268	0.015851756	0.899808109	1
cfa-mir-29c-2	1919	1456	1346	2199	-0.091687	11.39268	0.015851756	0.899808109	1
cfa-mir-378	6043	5648	5264	5987	0.048574	12.7052	0.014014184	0.905765369	1
cfa-mir-8859a	6283	6464	6221	6139	0.044767	12.81481	0.012974761	0.909311667	1
cfa-mir-197	4279	4570	4790	4390	-0.048063	12.40968	0.010800591	0.917228159	1
cfa-mir-146a	2432	2714	2149	2738	0.061366	11.75536	0.010059157	0.920109849	1
cfa-mir-191	6011	6020	6320	5437	0.040081	12.74466	0.00984247	0.920972151	1
cfa-mir-128-1	5016	5226	5437	4560	0.043012	12.54545	0.009673083	0.921652921	1
cfa-mir-128-2	5016	5226	5437	4560	0.043012	12.54545	0.009673083	0.921652921	1
cfa-mir-339-1	5109	5436	5170	5122	0.034985	12.58447	0.006602606	0.935238032	1
cfa-mir-27a	5746	5021	5836	4749	0.033894	12.6102	0.006325911	0.93660662	1
cfa-mir-24-1	6575	6423	6739	6048	0.028583	12.84658	0.005421093	0.941306335	1
cfa-mir-24-2	6575	6423	6739	6048	0.028583	12.84658	0.005421093	0.941306335	1
cfa-mir-19b-1	2825	1901	2480	2404	-0.045385	11.70714	0.005254456	0.942213854	1
cfa-mir-19b-2	2825	1901	2480	2404	-0.045385	11.70714	0.005254456	0.942213854	1
cfa_novel_1	3778	3863	3845	3624	0.035226	12.20165	0.004891261	0.944243364	1
cfa-mir-22	5255	5439	5482	5437	-0.029156	12.63035	0.004750973	0.945047483	1
cfa_novel_9	2218	2635	2363	2349	0.04225	11.70167	0.004538454	0.946288706	1
cfa-mir-451	3443	4373	3472	4464	-0.03313	12.25709	0.004526238	0.94636093	1
cfa-mir-181b-2	5152	4924	5463	4480	0.028189	12.53196	0.004109051	0.948889104	1
cfa-mir-185	4373	4190	4234	4174	0.026682	12.33811	0.003143495	0.955288527	1
cfa-mir-181b-1	5085	4840	5422	4401	0.024521	12.51532	0.003067652	0.95583064	1
cfa-mir-107	3019	3069	3152	3066	-0.028682	11.97159	0.002660115	0.958866301	1
cfa-mir-181a-1	4988	4688	5091	4471	0.022972	12.48535	0.002627777	0.959116871	1
cfa-mir-181a-2	4988	4688	5091	4471	0.022972	12.48535	0.002627777	0.959116871	1
cfa-mir-181c	3317	3024	2852	3332	0.027917	11.99358	0.002571518	0.959556498	1
cfa-mir-183	6047	6409	6713	5645	0.019757	12.79726	0.002491787	0.960187893	1
cfa-let-7d	4141	3809	5218	2994	-0.020044	12.27104	0.001676586	0.967338842	1
cfa-mir-361	3664	3991	3908	3675	0.016577	12.21174	0.001092079	0.97363741	1
cfa-mir-652	3616	4021	3903	3671	0.015011	12.20968	0.0008939	0.976148277	1
cfa-mir-152	3274	2779	3346	2814	-0.016512	11.96027	0.000873195	0.976426047	1
cfa-mir-2387	994	1796	2341	613	-0.022929	11.19905	0.000813383	0.977247523	1
cfa-mir-335	1895	2026	1215	2660	-0.018312	11.50965	0.000710587	0.978733438	1
cfa-mir-106a	2673	1398	1483	2562	-0.016576	11.54528	0.000602551	0.980416365	1
cfa-mir-671	2581	2349	2492	2394	0.014575	11.72812	0.000553143	0.981236294	1
cfa-mir-423a	5078	4994	5419	4768	-0.010037	12.54849	0.000527534	0.981675717	1
cfa-mir-374b	3916	4148	3674	4287	0.011134	12.27437	0.000519073	0.981823236	1
cfa-mir-320	5663	5654	5712	5546	0.008844	12.68288	0.000456137	0.982960592	1
cfa-mir-425	4219	5017	4481	4682	0.009546	12.43567	0.000435738	0.983345896	1
cfa-mir-99b	5306	5807	6103	5031	0.006637	12.6615	0.000252525	0.987321325	1
cfa-mir-186	5663	5561	5864	5348	0.00584	12.674	0.000197484	0.988787773	1
cfa-mir-193a	4779	4161	4701	4241	0.004435	12.39858	9.125E-05	0.992378336	1
cfa-mir-1249	3634	3704	3238	4064	-0.00382	12.17146	5.60478E-05	0.994026684	1

novel miRNA	Chromosome location	Sequence	Conservation
cfa_novel_1	>novel_cfa_1;chr24_20109	aggacuguccaaccugagagug	hsa-miR-744-5p
cfa-novel_2	>novel_cfa_2;chr5_31872	ugcggggcgaggccuacacga	
cfa-novel_3	>novel_cfa_3;chr18_13008	aguuuagacucaucgga	
cfa-novel_4	>novel_cfa_4;chr8_36994	uuacggcuugccuucgcgcuuu	hsa-miR-2355-3p
cfa-novel_5	>novel_cfa_5;chr2_14165	augcggauuaggacugagacca	
cfa-novel_6	>novel_cfa_6;chr37_29578	ugucuuugcuguuugagauaa	
cfa-novel_7	>novel_cfa_7;chr18_11933	ucccacacggcgacucggg	hsa-miR-3907
cfa-novel_8	>novel_cfa_8;chr10_3674	ugagccaccaggcgcccuug	
cfa-novel_9	>novel_cfa_9;chrX_40822	uaauccuugcuaccgggugagagu	
cfa-novel_12	>novel_cfa_12;chr24_19417	cugaccucgggacgcagucca	hsa-miR-500a-5p
cfa-novel_13	>novel_cfa_13;chr24_19873	uggacugggcuccgagguacg	
cfa-novel_14	>novel_cfa_14;chr15_9120	uccccggggcuccgcg	
cfa-novel_15	>novel_cfa_15;chr17_11319	ggugcucagacacagccaag	hsa-miR-935
cfa-novel_16	>novel_cfa_16;chr1_1852	caguuaaccguuuccguaccgc	
cfa-novel_17	>novel_cfa_17;chr22_17659	acaaaaaaaagcccaaccu	
cfa-novel_18	>novel_cfa_18;chr14_8264	ucugagcugccuuuuccuuuu	hsa-miR-3613-3p
cfa-novel_19	>novel_cfa_19;chr11_4198	uuugcaccucugagaguggaagaac	
cfa-novel_20	>novel_cfa_20;chr18_12467	gagaggcgagacacagggca	
cfa-novel_24	>novel_cfa_24;chr10_3325	cccaggcgccgaccgcgagguug	hsa-miR-655-3p:
cfa-novel_28	>novel_cfa_28;chr8_37611	auggccuuccguugccuc	
cfa-novel_29	>novel_cfa_29;chr6_33536	cucccgucguuacucga	
cfa-novel_33	>novel_cfa_33;chr9_39770	ugucucugccucucuc	hsa-miR-7107-5p
cfa-novel_36	>novel_cfa_36;chr3_25350	uggaggcucauggaaguauuuu	
cfa-novel_42	>novel_cfa_42;chr7_35931	uucccgcgcgcgcgcgcuuu	
cfa-novel_43	>novel_cfa_43;chr7_36761	aaagcggggcgcgggcggggaa	hsa-miR-655-3p:
cfa-novel_46	>novel_cfa_46;chr33_27466	uuggucugggaccucgcagacc	
cfa-novel_66	>novel_cfa_66;chr5_32095	ucacuguuccaggcccccuaa	
cfa-novel_70	>novel_cfa_70;chr8_37538	cggggggaggaggcgcg	hsa-miR-7107-5p
cfa-novel_79	>novel_cfa_79;chr26_21004	uggccucugaggguaccugg	
cfa-novel_80	>novel_cfa_80;chrX_41656	accagcagaggcuuggagcag	
cfa-novel_82	>novel_cfa_82;chr30_25812	ggcagacagcuccuggggguc	hsa-miR-7107-5p
cfa-novel_85	>novel_cfa_85;chr2_15043	gugggaggggcgcgcg	
cfa-novel_88	>novel_cfa_88;chr20_16379	uccagggggucagguacaga	
cfa-novel_89	>novel_cfa_89;chr9_39239	ucccaaggcgacacagcuc	hsa-miR-655-3p:
cfa-novel_90	>novel_cfa_90;chr4_31130	uccggggucugcucuccucagug	
cfa-novel_126	>novel_cfa_126;chr15_9183	guccucuuaguccgaugggu	
cfa-novel_129	>novel_cfa_129;chr14_8268	uuuuccccccaccccc	hsa-miR-655-3p:
cfa-novel_131	>novel_cfa_131;chr8_37463	auaaaucauguuuaccucuuu	
cfa-novel_136	>novel_cfa_136;chr20_15797	ucuuuacagagcguuuuuuu	
cfa-novel_138	>novel_cfa_138;chr16_10252	acuggcuggggaggaggagguugc	hsa-miR-7107-5p
cfa-novel_143	>novel_cfa_143;chr1_823	gggagaaguccucaucagggcca	
cfa-novel_148	>novel_cfa_148;chr19_13418	cucccucugcuuacuuu	

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Supplementary Table 5. Dog MGT and human BC patient information

Clinicopathological data of dog MGT patients

General information	n
Healthy	6
MGT patients	9
Age (Years)	
≤ 10	5
>10	10
Cancer type	
Adeno carcinoma	4
Complex carcinoma	3
Aggressive mammary carcinoma	2
Breed	
Maltese	3
Dachshund	3
Poodle	3
Others	6

Clinicopathological data of human breast cancer patients

General information	n
Healthy	9
BC patients	33
Age (Years)	
≤ 45	16
>45	26
Clinical Stage	
0	10
I	
A	9
II	
A	9
B	1
III	4