

Supplemental information

Supplemental Table S1. The total miRNA reads in different mouse organ.

Organ	Total Reads	Organ	Total Reads
liver	11229987	cerebellum	8545137
cerebellum	8545137	lung	10647562
spleen	15241912	ovary	5167925
stomach	14164527	uterus	14299637
kidney	15662004	heart	13716920
esophagus	9854958	colon	10092683
intestine	14724510	pancreas	4492839

Supplemental Table S2. Normalized reads of kidney miRNAs (Top 50) and their expression profile in extra-renal tissues. Normalized miRNA reads = individual miRNA reads × 1,000,000 / total miRNA reads in each tissue.

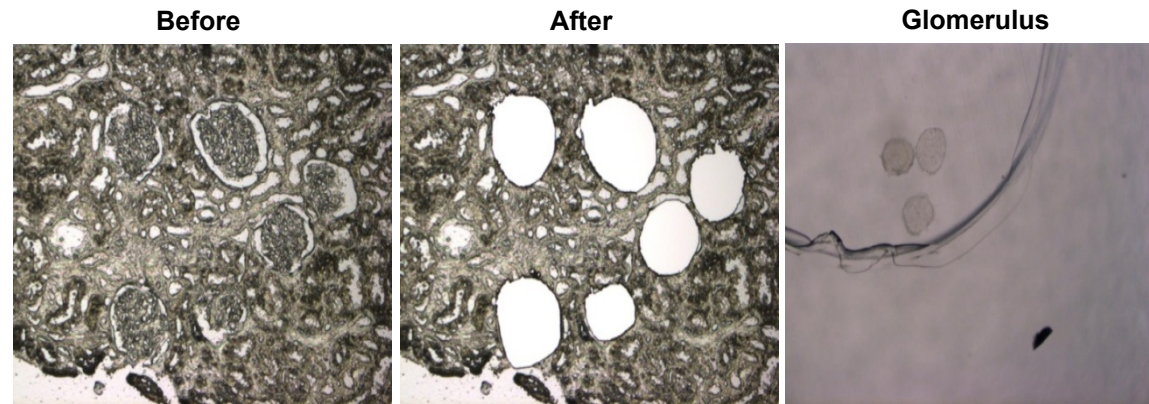
miRNA name	kidney	liver	cerebrum	spleen	stomach	esophagus	intestine	cerebellum	lung	ovary	uterus	heart	colon	pancreas
mmu-miR-378	300895.1	140674.3	23443.91	43509.83	147461.1	183085.9	98196.34	345122	18494.15	8628.17	208771.7	356230	3431.948	54155.71
mmu-miR-143	295578.9	61407.64	63206.79	517915.9	702295.1	228950.3	536008.7	45350.08	611239.1	871053.1	568385.2	214156.6	987029.3	40148.97
mmu-let-7c	44600.97	45873.84	166710.6	52061.31	14975.12	27567.57	12602.24	192279.4	50714.22	41056.05	16336.03	20681.12	2083.953	58714.34
mmu-let-7f	41814.22	67081.13	267438.7	172908.3	22190.62	42354.24	31622.36	16132.24	53797.69	30643.31	13393.2	11394.07	2274.401	94816.78
mmu-miR-30a	35190.85	14532.42	10437.57	1561.687	2662.838	1526.489	1822.755	11249.68	23887.77	429.6059	2124.951	8607.811	76.13362	2515.943
mmu-miR-30e	25252.08	4896.283	6967.342	2571.623	2341.921	693.9364	1829.352	4605.651	3495.974	310.4958	1219.965	5738.028	34.68988	624.5757
mmu-miR-10a	23048.35	2291.348	8.833571	1602.176	2793.749	4820.911	4606.549	88.13128	6547.009	135.3084	12583.91	332.454	52.56648	80.36838
mmu-miR-192	21818.81	48346.52	560.3746	581.3064	5398.892	1239.647	32985.22	1053.03	1538.333	42.34263	26134.58	378.0294	19.63369	483.8531
mmu-miR-21	18957.78	27628.7	2516.282	23232.47	11193.35	15342.18	16419.29	1661.711	15839.98	1443.619	25368.3	2141.69	569.6481	377.7356
mmu-let-7b	18925.95	17242.46	47970.67	15203.67	2756.171	5142.922	3165.085	85734.03	19213.83	10970.81	4388.268	6191.383	605.7947	18149.2
mmu-let-7a	18246.64	40659.76	95305.64	56823.6	8690.582	16245.7	9011.384	26967.96	33953.52	22592.99	8248.898	10379.58	928.047	51664.22
mmu-miR-126-3p	12667.98	7823.999	5493.287	8763.454	6744.128	14681.64	4422.911	340.6149	27887.89	97.91733	954.0438	4449.755	36.56783	246.7125
mmu-miR-101a	11599.91	2937.273	9048.125	3511.939	3155.476	3607.711	1522.217	7929.896	6083.789	132.2027	1538.609	2518.604	125.3981	915.5026
mmu-let-7g	11380.21	14050.84	36395.06	16092.34	3462.055	3272.393	5138.125	5729.467	6197.625	4389.83	2290.595	2160.463	443.8159	13213.22
mmu-miR-10b	9658.632	11.19301	4.889997	114.7118	725.2163	2993.239	587.235	35.25251	107.0836	491.9033	3117.162	208.9441	153.3613	32.14735
mmu-miR-30d	9370.916	2612.456	3430.432	828.1336	823.3752	704.6342	1291.124	13356.88	10434.68	349.8208	1509.143	4651.408	37.09674	868.284
mmu-miR-24	8398.145	3432.747	3693.35	2896.871	2203.154	3073.916	1836.724	2465.79	9523.464	373.02	2033.687	2425.918	87.36254	1525.676
mmu-miR-26a	4736.966	1976.671	11744.27	3438.337	2196.152	3175.46	2001.601	2861.492	12542.6	366.0571	836.7181	1120.666	197.383	1847.367
mmu-miR-196b	4706.236	1.103269	0.376154	28.66165	1.422305	19.99401	4.608221	3.572706	8.536388	2.205345	1569.33	2.966934	75.08739	6.429471
mmu-miR-140*	3985.162	1148.424	726.0701	3281.812	696.6872	2821.233	928.2134	1655.12	3301.025	99.68437	834.8461	896.8607	14.69057	125.3747
mmu-miR-30a*	3279.785	1598.755	1231.106	517.0341	571.1713	1156.31	262.4222	5148.384	3737.745	44.98904	521.7446	1358.98	8.747453	220.287
mmu-miR-29a	3118.276	622.1137	7821.748	1183.971	1025.985	2420.973	619.1235	933.7862	1153.037	145.1162	393.1248	444.8499	74.94414	1596.329
mmu-miR-30c	2922.492	292.7659	1463.817	276.0721	339.8054	184.9899	305.8219	985.9341	885.8277	14.99635	174.7087	396.0313	3.147208	69.11681
mmu-let-7d	2800.716	2154.629	10273.9	6052.135	1793.079	8309.475	1530.658	1175.544	2762.173	928.9713	833.5355	768.3642	59.74025	1594.678
mmu-miR-191	2595.405	627.1705	1443.655	2616.022	596.0141	2019.487	1469.665	616.8553	1323.08	136.9614	850.2143	348.4016	45.11115	408.3113

mmu-miR-101b	2365.435	14233.57	3334.461	2001.968	1049.286	2689.122	1185.317	1297.312	1779.481	54.23193	664.2769	753.2903	48.67074	307.5732
mmu-miR-152	2352.313	675.199	220.3559	601.1059	1857.867	2969.14	853.4314	107.4036	2313.967	75.75624	910.8927	601.279	28.79083	8783.457
mmu-miR-200b	2339.783	32.78286	20.3123	13.59697	1101.646	850.1473	2548.734	9.694441	477.3288	0.441069	2519.356	15.71586	3.746676	196.0989
mmu-miR-22	2237.135	988.114	724.4789	212.6221	234.4933	1686.365	257.2741	882.1996	523.4878	34.95008	207.4064	931.1282	13.53844	114.1231
mmu-miR-27b	2119.953	682.9182	901.8179	480.2442	625.4356	759.1073	584.9856	290.569	2642.154	55.75438	656.3621	704.5621	29.32652	478.7328
mmu-miR-196a	2061.796	0.31522	0.188077	26.78242	0.355576	12.37724	55.34543	0	1.904796	4.85176	605.1299	0.637492	2.547664	0
mmu-let-7i	2027.841	885.0076	8862.776	4430.181	738.8681	918.132	785.4695	3899.836	3146.192	779.5062	514.7722	1108.495	167.4828	1960.393
mmu-miR-146a	1979.769	1180.533	1298.449	7089.523	254.9467	168.3054	486.9395	425.7353	3865.644	52.64846	412.8388	557.0255	16.64143	42.02443
mmu-miR-103	1938.771	622.0747	2276.294	928.6818	582.0205	3102.914	1229.763	1106.968	1470.745	60.83141	1115.934	530.4955	21.09366	123.7914
mmu-miR-200a	1938.139	22.06539	12.03692	7.260645	810.4982	576.1914	1169.022	5.287877	289.3315	1.764276	1141.384	5.046197	1.498671	64.29471
mmu-miR-200c	1803.626	29.15783	31.78498	89.6164	2600.626	3806.744	7550.393	20.27019	2062.667	14.11421	4896.44	41.81135	10.04216	705.6344
mmu-miR-126-5p	1558.543	796.0835	689.3339	1168.524	828.2166	1288.047	494.3554	182.016	3363.221	19.40704	239.9295	1301.705	9.295107	67.50944
mmu-miR-194	1531.261	2124.451	74.4136	46.90147	170.044	63.8722	10206.14	77.55553	117.044	2.646414	1545.226	24.36592	1.049069	8.036838
mmu-miR-99b	1508.042	348.1629	740.8424	366.9123	556.1341	1381.878	340.5442	5749.686	3465.856	112.9137	608.6135	532.31	11.5406	73.93891
mmu-miR-429	1424.992	18.91319	14.10576	5.356383	444.0208	371.8889	619.5913	1.762626	186.7755	0.882138	460.0023	1.730125	0.299734	9.644206
mmu-miR-30e*	1413.344	488.1168	844.2875	784.2915	570.1806	556.3223	288.6637	3991.354	556.8747	36.16766	496.2332	1570.824	4.146054	70.74204
mmu-let-7e	1293.728	430.7654	10634.54	1089.644	261.9014	678.7964	386.8666	1513.911	1053.232	899.3292	266.523	240.6459	35.82414	1140.667
mmu-miR-148b	1143.354	514.8343	415.9355	402.7163	192.9456	1072.014	666.43	709.8405	589.3368	21.50447	498.7122	217.6584	3.042134	1587.455
mmu-miR-148a	1096.337	17833.88	1011.938	1797.229	10524.89	5235.107	6145.767	302.0721	2493.072	407.2244	8078.43	2036.365	110.761	625587
mmu-miR-151-3p	1079.534	194.4906	551.7403	274.4794	139.1488	636.8807	423.016	5019.744	2640.164	165.5216	695.2274	748.0538	66.43329	80.37297
mmu-miR-872	1065.323	202.3711	989.2869	364.4407	253.7401	627.2449	229.6334	682.1638	849.7793	22.05345	305.3393	117.3604	3.605456	9.644206
mmu-miR-181a	1055.062	40.66336	1341.101	823.7656	316.0227	773.4937	357.2645	3044.261	748.7049	49.0027	299.3666	173.3665	22.51197	32.14735
mmu-miR-182	972.3412	444.4673	59.94649	92.38819	1093.708	823.7876	1788.059	351.6599	1757.298	22.05769	2293.8	22.6358	7.793087	1618.082
mmu-miR-26b	902.8946	628.7315	732.8905	1138.498	408.4454	595.2563	467.796	94.88092	1231.799	44.82853	164.8103	142.2054	31.63373	310.6451
mmu-miR-93	886.7549	398.4489	353.8657	1003.915	378.5104	1077.778	820.469	64.34124	581.8447	14.99635	432.0833	192.0444	6.744018	35.36209

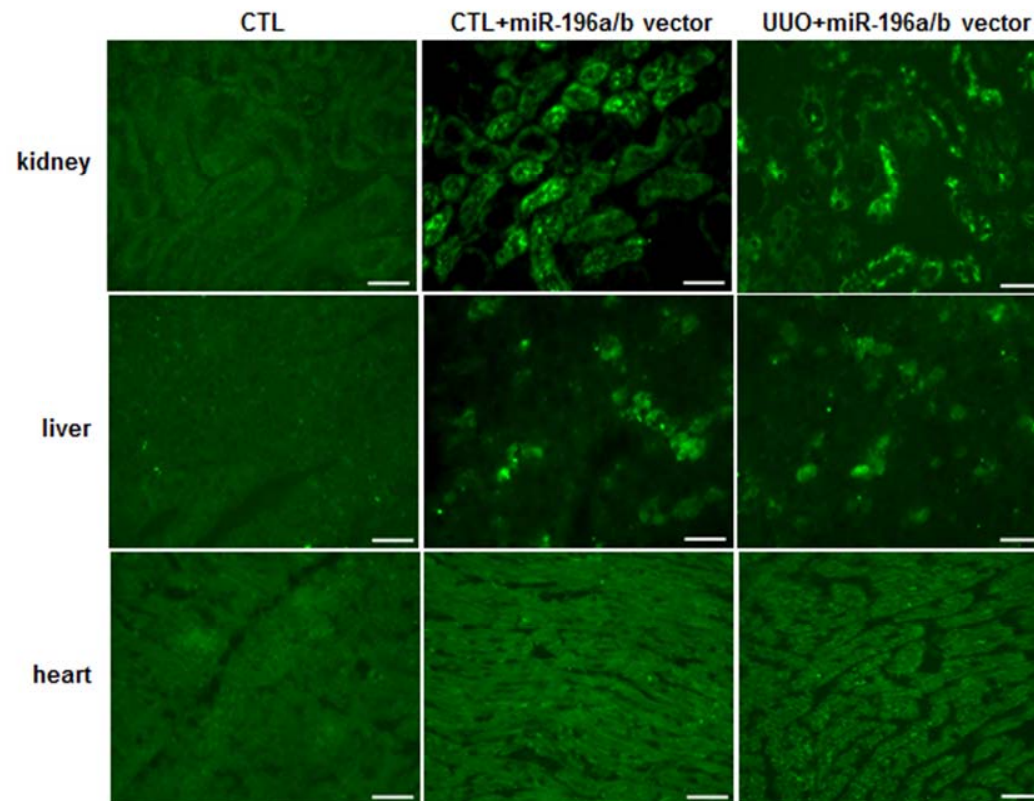
Supplemental Table S3. Distribution of miRNAs in kidney and extra-renal tissues listed in Supplemental Table S2. Percentage of a miRNA in individual tissue = reads of certain miRNA in individual tissue / total reads of the same miRNA in 14 tissues.

miRNA name	kidney	liver	cerebrum	spleen	stomach	esophagus	intestine	cerebellum	lung	ovary	uterus	heart	colon	pancreas
mmu-miR-378	15.57%	7.28%	1.21%	2.25%	7.63%	9.48%	5.08%	17.86%	0.96%	0.45%	10.81%	18.44%	0.18%	2.80%
mmu-miR-143	5.15%	1.07%	1.10%	9.02%	12.23%	3.99%	9.33%	0.79%	10.64%	15.17%	9.90%	3.73%	17.19%	0.70%
mmu-let-7c	5.98%	6.15%	22.34%	6.98%	2.01%	3.69%	1.69%	25.77%	6.80%	5.50%	2.19%	2.77%	0.28%	7.87%
mmu-let-7f	4.82%	7.73%	30.82%	19.92%	2.56%	4.88%	3.64%	1.86%	6.20%	3.53%	1.54%	1.31%	0.26%	10.93%
mmu-miR-30a	30.17%	12.46%	8.95%	1.34%	2.28%	1.31%	1.56%	9.65%	20.48%	0.37%	1.82%	7.38%	0.07%	2.16%
mmu-miR-30e	41.68%	8.08%	11.50%	4.24%	3.87%	1.15%	3.02%	7.60%	5.77%	0.51%	2.01%	9.47%	0.06%	1.03%
mmu-miR-10a	39.07%	3.88%	0.01%	2.72%	4.74%	8.17%	7.81%	0.15%	11.10%	0.23%	21.33%	0.56%	0.09%	0.14%
mmu-miR-192	15.52%	34.39%	0.40%	0.41%	3.84%	0.88%	23.46%	0.75%	1.09%	0.03%	18.59%	0.27%	0.01%	0.34%
mmu-miR-21	11.65%	16.98%	1.55%	14.28%	6.88%	9.43%	10.09%	1.02%	9.74%	0.89%	15.59%	1.32%	0.35%	0.23%
mmu-let-7b	7.40%	6.74%	18.76%	5.95%	1.08%	2.01%	1.24%	33.53%	7.52%	4.29%	1.72%	2.42%	0.24%	7.10%
mmu-let-7a	4.56%	10.17%	23.84%	14.22%	2.17%	4.06%	2.25%	6.75%	8.49%	5.65%	2.06%	2.60%	0.23%	12.93%
mmu-miR-126-3p	13.39%	8.27%	5.81%	9.26%	7.13%	15.52%	4.67%	0.36%	29.48%	0.10%	1.01%	4.70%	0.04%	0.26%
mmu-miR-101a	21.23%	5.38%	16.56%	6.43%	5.78%	6.60%	2.79%	14.52%	11.14%	0.24%	2.82%	4.61%	0.23%	1.68%
mmu-let-7g	9.16%	11.31%	29.30%	12.96%	2.79%	2.63%	4.14%	4.61%	4.99%	3.53%	1.84%	1.74%	0.36%	10.64%
mmu-miR-10b	52.95%	0.06%	0.03%	0.63%	3.98%	16.41%	3.22%	0.19%	0.59%	2.70%	17.09%	1.15%	0.84%	0.18%
mmu-miR-30d	18.64%	5.20%	6.82%	1.65%	1.64%	1.40%	2.57%	26.57%	20.76%	0.70%	3.00%	9.25%	0.07%	1.73%
mmu-miR-24	19.10%	7.81%	8.40%	6.59%	5.01%	6.99%	4.18%	5.61%	21.66%	0.85%	4.63%	5.52%	0.20%	3.47%
mmu-miR-26a	9.66%	4.03%	23.95%	7.01%	4.48%	6.48%	4.08%	5.83%	25.58%	0.75%	1.71%	2.29%	0.40%	3.77%
mmu-miR-196b	73.19%	0.02%	0.01%	0.45%	0.02%	0.31%	0.07%	0.06%	0.13%	0.03%	24.40%	0.05%	1.17%	0.10%
mmu-miR-140*	19.43%	5.60%	3.54%	16.00%	3.40%	13.75%	4.52%	8.07%	16.09%	0.49%	4.07%	4.37%	0.07%	0.61%
mmu-miR-30a*	16.68%	8.13%	6.26%	2.63%	2.91%	5.88%	1.33%	26.19%	19.01%	0.23%	2.65%	6.91%	0.04%	1.12%
mmu-miR-29a	14.47%	2.89%	36.29%	5.49%	4.76%	11.23%	2.87%	4.33%	5.35%	0.67%	1.82%	2.06%	0.35%	7.41%
mmu-miR-30c	35.14%	3.52%	17.60%	3.32%	4.09%	2.22%	3.68%	11.86%	10.65%	0.18%	2.10%	4.76%	0.04%	0.83%
mmu-let-7d	6.82%	5.25%	25.04%	14.75%	4.37%	20.25%	3.73%	2.86%	6.73%	2.26%	2.03%	1.87%	0.15%	3.89%
mmu-miR-191	17.19%	4.15%	9.56%	17.33%	3.95%	13.38%	9.74%	4.09%	8.76%	0.91%	5.63%	2.31%	0.30%	2.70%

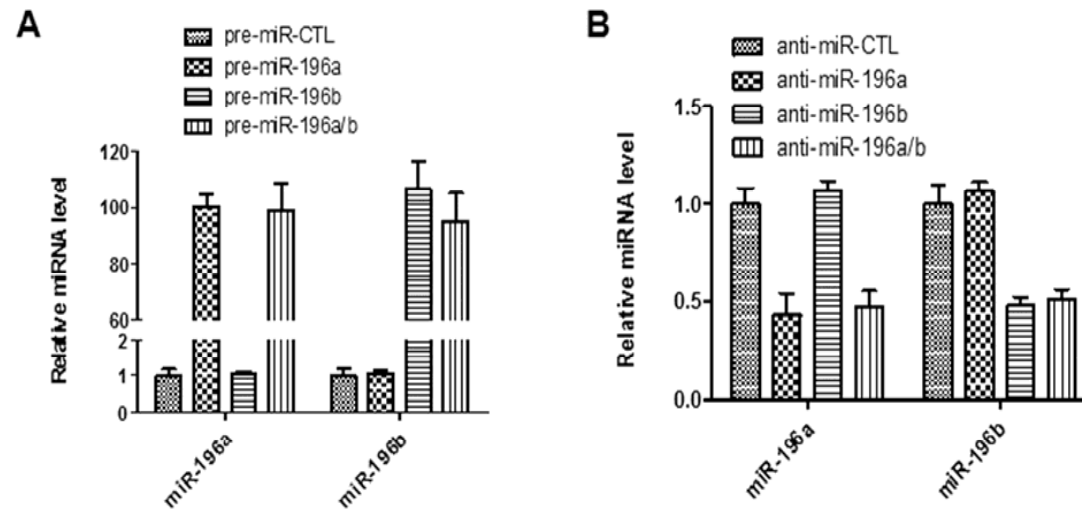
mmu-miR-101b	7.45%	44.81%	10.50%	6.30%	3.30%	8.47%	3.73%	4.08%	5.60%	0.17%	2.09%	2.37%	0.15%	0.97%
mmu-miR-152	10.52%	3.02%	0.99%	2.69%	8.31%	13.28%	3.82%	0.48%	10.35%	0.34%	4.08%	2.69%	0.13%	39.30%
mmu-miR-200b	23.10%	0.32%	0.20%	0.13%	10.88%	8.39%	25.16%	0.10%	4.71%	0.00%	24.87%	0.16%	0.04%	1.94%
mmu-miR-22	24.73%	10.92%	8.01%	2.35%	2.59%	18.64%	2.84%	9.75%	5.79%	0.39%	2.29%	10.29%	0.15%	1.26%
mmu-miR-27b	19.25%	6.20%	8.19%	4.36%	5.68%	6.89%	5.31%	2.64%	23.99%	0.51%	5.96%	6.40%	0.27%	4.35%
mmu-miR-196a	74.37%	0.01%	0.01%	0.97%	0.01%	0.45%	2.00%	0.00%	0.07%	0.18%	21.83%	0.02%	0.09%	0.00%
mmu-let-7i	6.71%	2.93%	29.32%	14.66%	2.44%	3.04%	2.60%	12.90%	10.41%	2.58%	1.70%	3.67%	0.55%	6.49%
mmu-miR-146a	11.10%	6.62%	7.28%	39.76%	1.43%	0.94%	2.73%	2.39%	21.68%	0.30%	2.32%	3.12%	0.09%	0.24%
mmu-miR-103	12.83%	4.12%	15.06%	6.15%	3.85%	20.53%	8.14%	7.33%	9.73%	0.40%	7.39%	3.51%	0.14%	0.82%
mmu-miR-200a	32.07%	0.37%	0.20%	0.12%	13.41%	9.53%	19.34%	0.09%	4.79%	0.03%	18.89%	0.08%	0.02%	1.06%
mmu-miR-200c	7.62%	0.12%	0.13%	0.38%	10.99%	16.09%	31.91%	0.09%	8.72%	0.06%	20.69%	0.18%	0.04%	2.98%
mmu-miR-126-5p	12.98%	6.63%	5.74%	9.73%	6.90%	10.73%	4.12%	1.52%	28.01%	0.16%	2.00%	10.84%	0.08%	0.56%
mmu-miR-194	9.57%	13.28%	0.47%	0.29%	1.06%	0.40%	63.82%	0.48%	0.73%	0.02%	9.66%	0.15%	0.01%	0.05%
mmu-miR-99b	9.55%	2.20%	4.69%	2.32%	3.52%	8.75%	2.16%	36.40%	21.94%	0.71%	3.85%	3.37%	0.07%	0.47%
mmu-miR-429	40.03%	0.53%	0.40%	0.15%	12.47%	10.45%	17.40%	0.05%	5.25%	0.02%	12.92%	0.05%	0.01%	0.27%
mmu-miR-30e*	12.11%	4.18%	7.23%	6.72%	4.89%	4.77%	2.47%	34.20%	4.77%	0.31%	4.25%	13.46%	0.04%	0.61%
mmu-let-7e	6.49%	2.16%	53.37%	5.47%	1.31%	3.41%	1.94%	7.60%	5.29%	4.51%	1.34%	1.21%	0.18%	5.72%
mmu-miR-148b	14.23%	6.41%	5.18%	5.01%	2.40%	13.34%	8.29%	8.83%	7.33%	0.27%	6.21%	2.71%	0.04%	19.75%
mmu-miR-148a	0.16%	2.61%	0.15%	0.26%	1.54%	0.77%	0.90%	0.04%	0.37%	0.06%	1.18%	0.30%	0.02%	91.64%
mmu-miR-151-3p	8.49%	1.53%	4.34%	2.16%	1.09%	5.01%	3.33%	39.48%	20.76%	1.30%	5.47%	5.88%	0.52%	0.63%
mmu-miR-872	18.62%	3.54%	17.29%	6.37%	4.43%	10.96%	4.01%	11.92%	14.85%	0.39%	5.34%	2.05%	0.06%	0.17%
mmu-miR-181a	11.62%	0.45%	14.78%	9.08%	3.48%	8.52%	3.94%	33.54%	8.25%	0.54%	3.30%	1.91%	0.25%	0.35%
mmu-miR-182	8.57%	3.92%	0.53%	0.81%	9.64%	7.26%	15.76%	3.10%	15.49%	0.19%	20.21%	0.20%	0.07%	14.26%
mmu-miR-26b	13.09%	9.12%	10.63%	16.51%	5.92%	8.63%	6.78%	1.38%	17.86%	0.65%	2.39%	2.06%	0.46%	4.51%
mmu-miR-93	14.19%	6.38%	5.66%	16.07%	6.06%	17.25%	13.13%	1.03%	9.31%	0.24%	6.92%	3.07%	0.11%	0.57%



Supplemental Figure S1. Diagram of separation of glomerulus and renal tubular. Before, the kidney section before separation. After, the remained part of kidney after glomerulus removed. Glomerulus, glomerulus isolated from the section of kidney.



Supplemental Figure S2. Injection of GFP-miR-196a- and GFP-miR-196b-expressing plasmids leads to effective delivery of miR-196a and miR-196b into the mouse kidney. CTL, normal mice; CTL+miR-196a/b vector, mice injected with GFP and miR-196a/b-expressing plasmids; UUO+miR-196a/b vector, UUO mice injected with GFP and miR-196a/b-expressing plasmids. Scale bar, 40 μ m.



Supplemental Figure S3. Relative expression of miR-196a and miR-196b. A) Effective expression of exogenous miR-196a and miR-196b in HK2 cells transfected with pre-miR-196a and pre-miR-196b. B) Effective inhibition of endogenous miR-196a and miR-196b in HK2 cells by transfection with anti-miR-196a and anti-miR-196b, respectively.