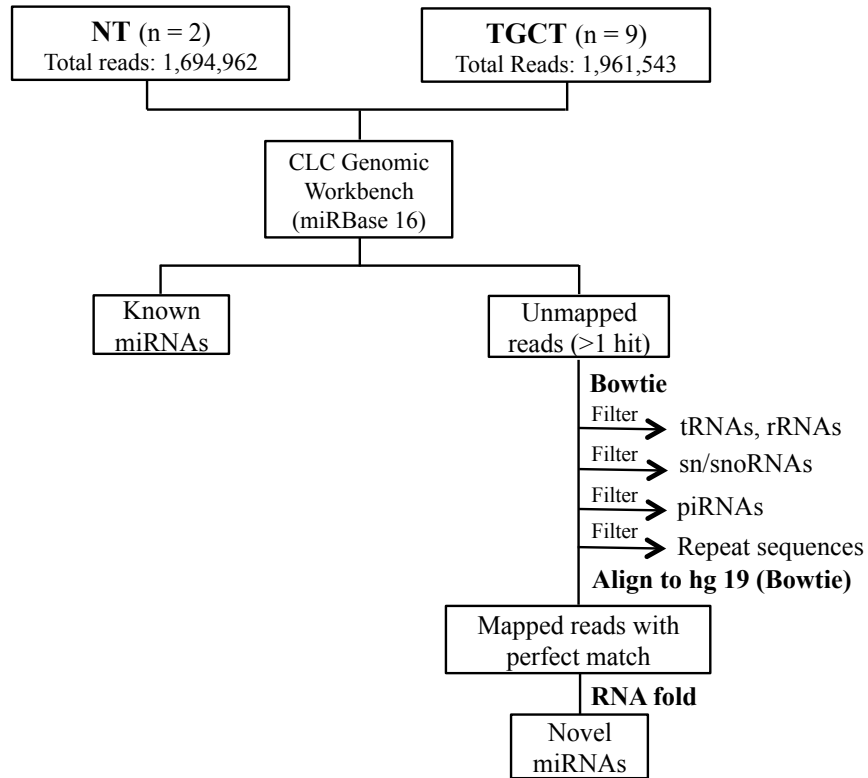
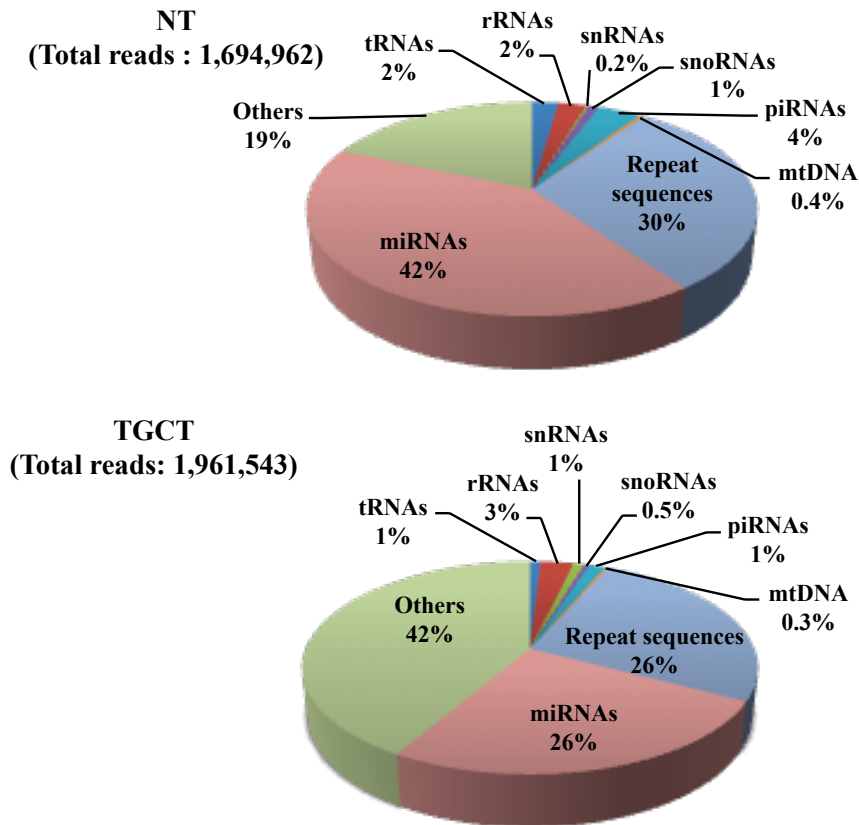


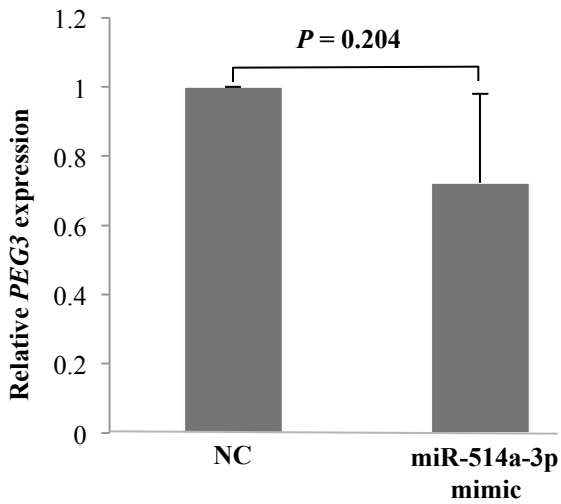
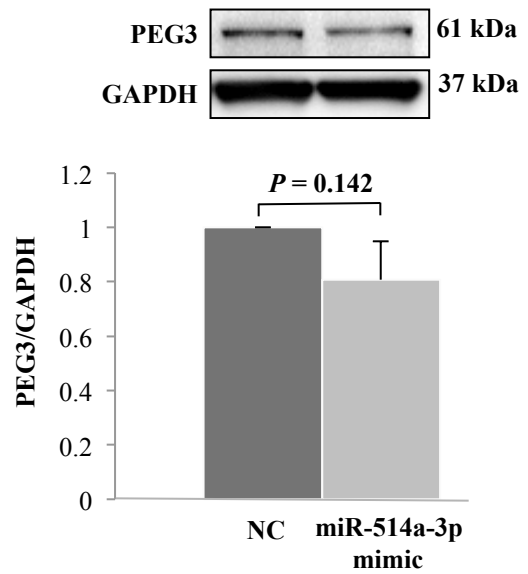
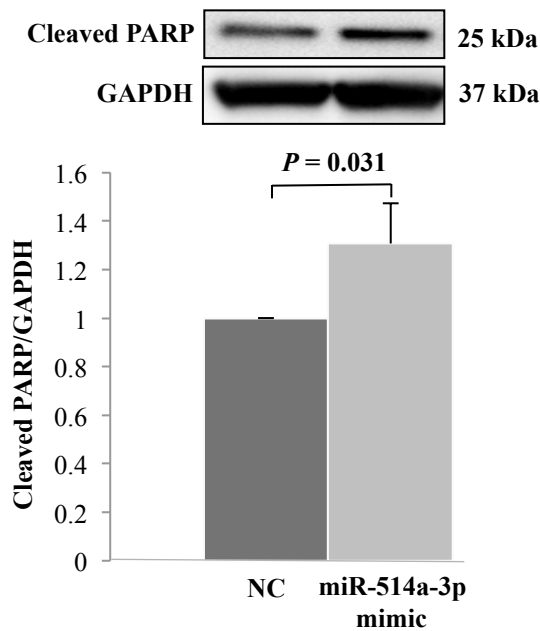
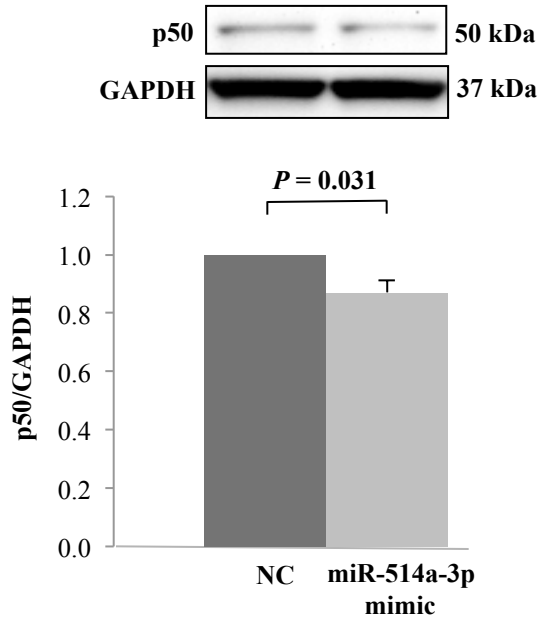
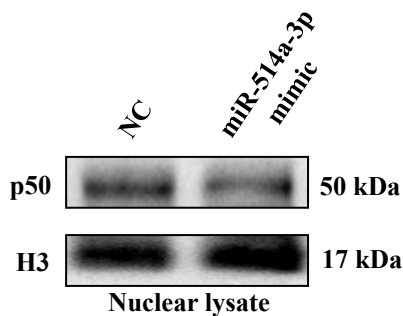
## **Supplementary Information**

### **Loss of miR-514a-3p regulation of PEG3 activates the NF-kappa B pathway in human testicular germ cell tumors**

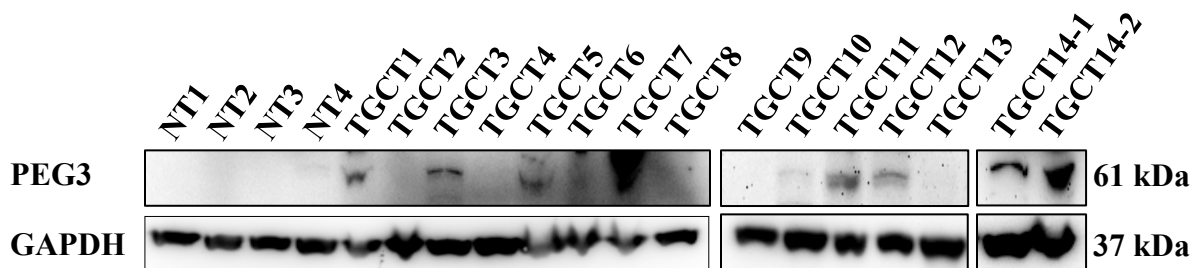
DM Özata, X Li, L Lee, J Liu, D Warsito, P Hajeri, I Hultman, O Fotouhi, S Marklund, L Ährlund-Richter, CC Juhlin, C Larsson and W-O Lui

**a****b**

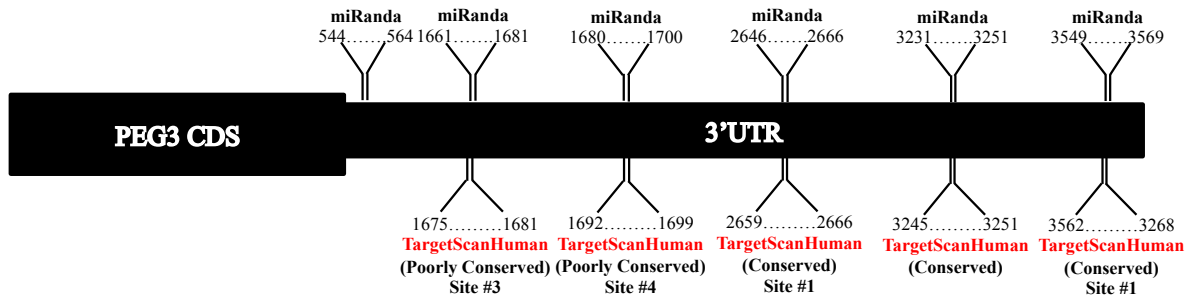
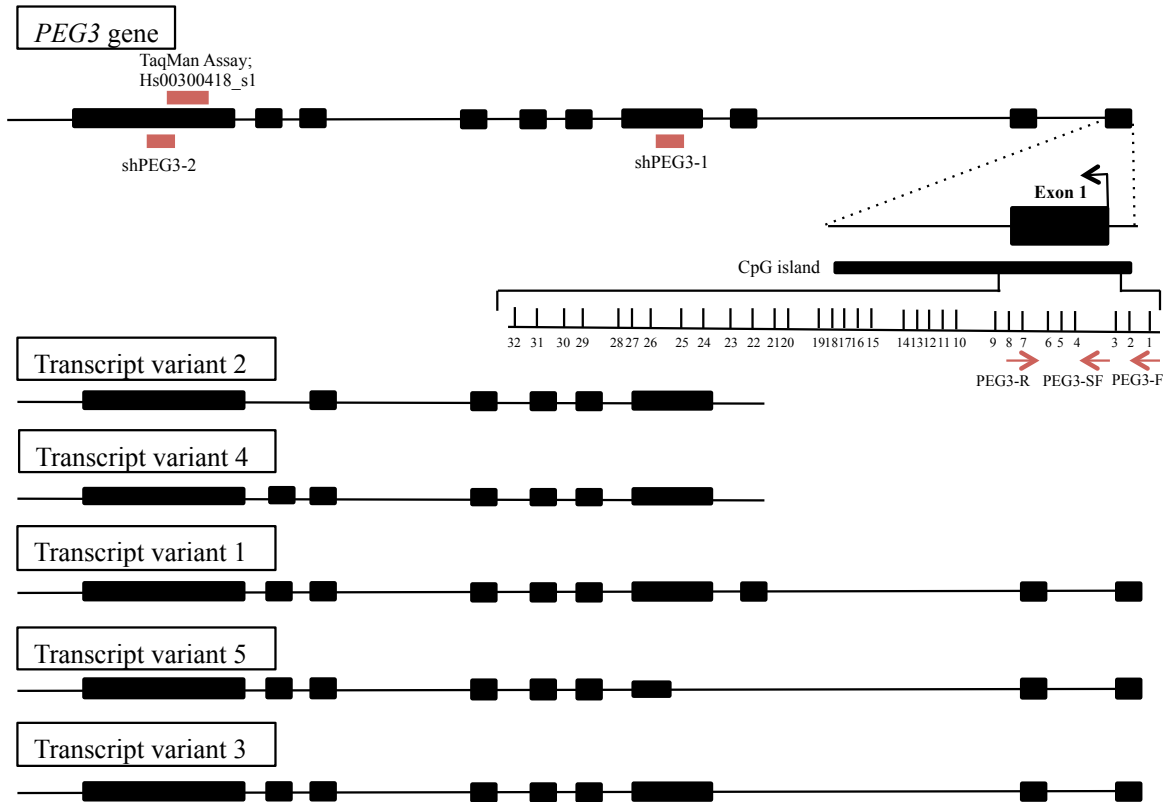
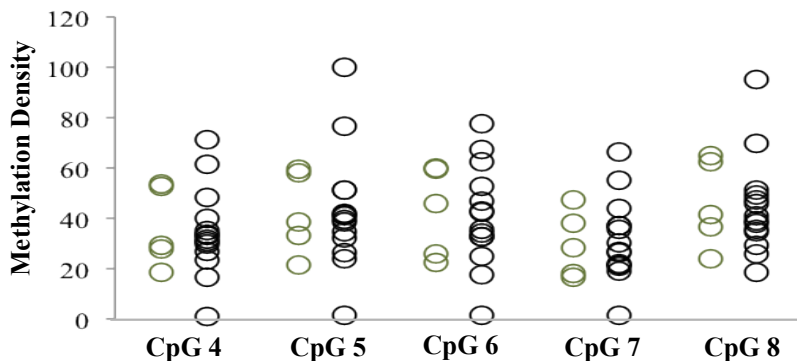
**Supplementary Figure 1.** sRNA sequencing data analysis and sRNA compositions in normal testes (NT) and testicular germ cell tumors (TGCTs). **(a)** Workflow of the sRNA-sequencing data analysis performed in the study. **(b)** Different sRNA compositions of cDNA libraries present in the NT and TGCTs.

**a****b****c****d****e**

**Supplementary Figure 2.** Evaluation of the functional consequences of miR-514a-3p overexpression in 2102Ep cells. Cells were transfected with miR-514a-3p mimic or negative control (NC) for 48 hours and evaluated for: (a) PEG3 mRNA expression by RT-qPCR; (b) PEG3 protein by Western blot analysis; (c) cleaved PARP by Western blot analysis; and (d-e) Western blot analysis of p50 expression from total protein lysate (d) and nuclear lysate (e). GAPDH and H3 were used as loading controls.



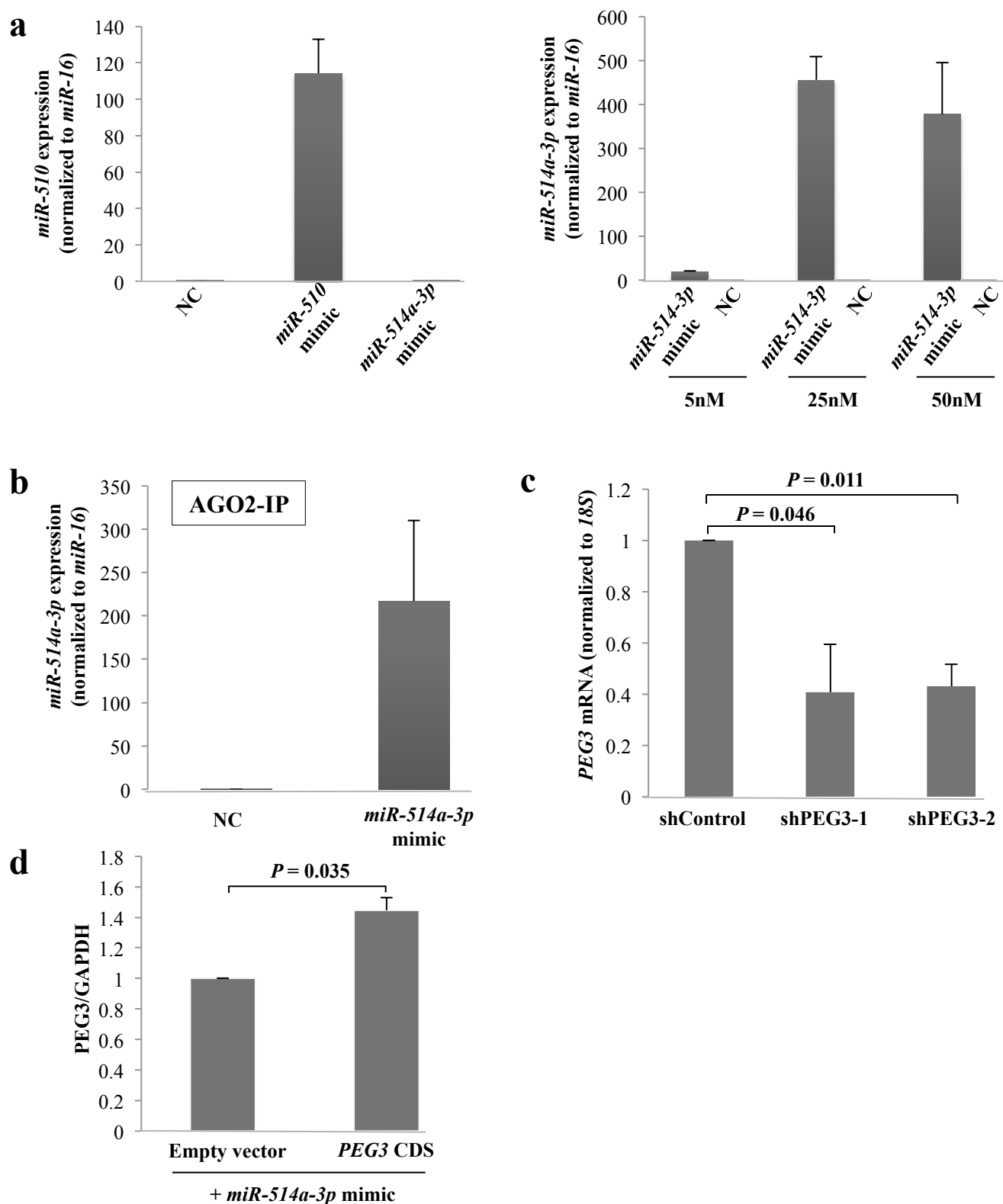
**Supplementary Figure 3.** Measurement of PEG3 protein expression in 4 NT and 15 TGCTs by Western blot analysis. GAPDH was used as a loading control.

**a****b****c**

**Supplementary Figure 4.** *PEG3* gene structure, *miR-514a-3p* target sites, shRNA design and methylation analysis. **(a)** Predicted *miR-514a-3p* binding sites in the 3'UTR of *PEG3* by TargetScanHuman and miRanda. Sites #1-4 were included in the *PEG3* 3' UTR reporter assays. **(b)** An illustration of the *PEG3* gene and its transcript variants. The location of the target sequence by the shRNAs and TaqMan gene expression assay is indicated with red boxes, and the Pyrosequencing primers are marked with arrows. **(c)** methylation density (in %) at five CpG sites of the *PEG3* promoter in NT (green empty circles,  $n=5$ ) and TGCTs (black empty circles,  $n=12$ ) determined by Pyrosequencing.



**Supplementary Figure 5.** RT-qPCR analysis of various endogenous controls in 5 NT and 15 TGCTs. (a) Comparison of miR-16 and *RNU6B* expression as endogenous control for miRNA quantification. (b) Comparison of *18S rRNA*, *GAPDH* and geomean of *18S rRNA* and *GAPDH* as endogenous control for mRNA quantification.



**Supplementary Figure 6.** Evaluation of miRNA, shRNA and PEG3 CDS transfection efficiencies. **(a)** Expressions of miR-510 and miR-514a-3p were quantified by RT-qPCR in cells transfected with miRNA mimic or NC for functional studies. **(b)** miR-514a-3p level was determined in cells transfected with miR-514a-3p mimic or NC for the AGO2 RNA co-immunoprecipitation experiment. **(c)** Evaluation of PEG3 silencing efficiency by RT-qPCR. **(d)** Assessment of PEG3 protein level in cells co-transfected with PEG3 CDS construct or vector control and miR-514a-3p mimic.

**Supplementary Table 1.** Novel candidate miRNAs identified from human TGCTs and NT

Candidate miRNA	No. of reads	Size (nt)	Stem-loop structures of putative miRNA precursors (5'→3')	dG	Genomic location	Gene/intergenic	intron/exon/UTR
Candidate_1_5p	2	22	<pre>           A           UC UAGACCUCGGAACUCU UGGGGAUUUGAGU \ AAUCUGGGAGACUGGAGA ACACCCUAAUCGUCG           G           </pre>	-57.8	4p15.33	intergenic	
Candidate_2_5p	3	19	<pre>           CA-- CC G G G GGGCA GCUGU CGGA AGGGGA GU UGAGGDCUC \ CGACG GACU UUCACU GA UGUCCAGAC U UCUG CU A G GGUAC           </pre>	-44	22q13.33	PPP6R2	intron
Candidate_3_5p	3	24	<pre> AAACUA GA-- - AG C -- C-- AU GGG GC UGGG GCAG UC GGA GCAG U CAC CG ACCC CGUC AG CCU CGUU C ----- GAAC U A- A UC UUC CC           </pre>	-26.3	4p15.2	GPR125	intron
Candidate_4_5p	4	21	<pre>           C           G AG UAUUUUGCCAAACCCGACC CUUAGGUG \ AUAAAACCGUUGAGACUG GGAUCCAAAC           U           CAGU G UA           </pre>	-49.8	15q26.3	IGF1R	intron
Candidate_5_5p	5	22	<pre>           C           CUU CUUUGUCUUAAGGCUUCCUCCUCCUCCUCCU GAGA CCAAGAGAAUCCGAGGGGAGGAGACCG C- C           </pre>	-91.7	1q25.2	FAM163A	intron
Candidate_6_5p	2	20	<pre>           C           GUA GCUU AGUA UGGAGCACACAGGAAAGG A CGA UCAU ACCUCGUGGACUUCUCC C C CU AAUU           </pre>	-51.4	9p21.1	intergenic	
Candidate_7_5p	4	21	<pre>           A           C- G - UA CUUAGG UGGGG UCU UAGAGU UUC \ GGAUAC ACCCCC AAGG AUCCUA AG U ----- UC A C AG           </pre>	-35.3	1q21.1	NBPF9	intron
Candidate_8_5p	4	22	<pre>           A           CUUCU - ACUA AAGGCCACUUA GUAGUCUGAGGCCA GUA CAU \ UUCACAGAAAU CAUCAGACUCGGAU UAUU GUG U           C           AAUG           </pre>	-47.7	2q11.2	intergenic	
Candidate_9_5p	4	20	<pre>           A- - - - UA GGUUA GGAG GAGCGG GAU UAGUC GGGUCU \ UUUAGU UCUC UUCGUCU CG UUCAGG UCCUGACA AG GG A GAA - - GUGG           </pre>	-35.8	5q35.2	intergenic	
Candidate_10_5p	3	25	<pre>           C           G CACGU - - GG - - U GCUC CUUCU CU GAGG ACUGU AGA UUGGGUG U UGUG GCAAGA GG CUCU UGCGU UCU GGAUCCU U UCUCU U U U U C C C UA           </pre>	-38.1	7q22.1	BUD31	intron
Candidate_11_5p	4	25	<pre>           G           A C - AGA AA CU GCUGGC GGUAA GGA CCGGGG CUU GUU GC \ GG UGAUCC CCAU UCU GCUUUG GAA CCA CG A A U U UUGUGG A A A GG- UG           </pre>	-34.2	Yq11.221	UTY	intron
Candidate_12_5p	3	21	<pre>           G           C UG GUC GCCC CCGCC CAGCGU UC GGGC UGCC GAG A GC CCGG CCGC GCGG CCGCGC CG CCGG GCGG CUU U G - G- GCGG ACC C C AU G           </pre>	-61.9	14q32.33	BC172394	intron
Candidate_13_5p	2	25	<pre>           C           ACCUUU G GAG AGU EUG UC ACA GAGGGU GAGAGG UUCUCU U UUC UCAU UAC AG UGU CUAAGC UCUUUU ACAGAC U C C C UUUUA U C - GU---- A           </pre>	-30.5	20q13.13	SLC9A8	intron
Candidate_14_5p	2	22	<pre>           A           UUA AAUACAUCUCU UUAUUCACUACAAAGCUUAU \ UUAUGAAGGAA AAUAGAGUAAGUUUUCGAAAGU           C           CUCA           </pre>	-46.9	8q21.13	intergenic	
Candidate_15_3p	2	20	<pre>           UC- UU U - U - - - CCA ACC- UU GG CC GC UCUU CC CCA GC UCUGCA CUUCG CGC CC C UC GG CG AGGA GG GGU CG AGACUU GAGAC GCG GG C A UCA - - C A - U AAGG AG- GACC CU           </pre>	-34.9	3q21.3	intergenic	
Candidate_16_3p	3	22	<pre>           CA           UAGAC CAGUUAU GAGUUCUUAUCAGGAGGAGGG \ GUCAAUAA CUUACGAAUAGCGCCACUCUCU           CA           UAGCC           </pre>	-55.2	5q34	TENM2	intron
Candidate_17_3p	10	22	<pre>           U           AAA A UUCUUU GAA GAAAGACAU AGCCUGUCUA UA U GAGAAU CUU CUAUCUCUA UGGACAGAU GU U           C           G           </pre>	-45.4	17q24.2	ABCA6	intron
Candidate_18_3p	3	21	<pre>           CC U C           CCGC C UGU AU CA ACUUCUCUAGUUCUCCUCCUCCU UGUAUA A ACA UA GU UGAACAGAGUACAAAGAGGGGAGU ACAUAU U UA C A           </pre>	-61.3	15q21.1	GALK2	intron
Candidate_19_3p	2	24	<pre> AGGAA--- U- C - - - AG --- A- A G GGGAC GGG AGG CUGG CCU GUUU GAGUCG GG AG A UCUCUG CUU UCC GACC GGG UCAG UUGUGG CC UC U CUUUAACA UU U A A GU AAC GA^ G U           </pre>	-34.4	9q34.11	intergenic	
Candidate_20_3p	2	25	<pre>           UCAG GA- CU - - - - - G U U A- U UCCU GCU GCUCUG CC GCCU CUGG GCCU GUAA GG A AGGA UGA UGGGAC GG UGGA GAGC CGGA CAUU UC U CAG-- GAG AU CU UAUUCU - C - GC A           </pre>	-32.7	3p25.3	TATDN2	intron
Candidate_21_3p	2	26	<pre>           CUC A AC----- G - U ---- GA GA CCA CCGGUC CC GCGCGU C UGGG GC UGGG UGU \ GGU GGCCAG GG CCGGUA G ACUU CG ACCC ACA C CUC A AGAATA G G U GAGAC AA AG           </pre>	-40.6	16q24.1	intergenic	
Candidate_22_3p	3	22	<pre>           A           ACAAAU CAGU UCGGGCCAGUCAGUACUCCCC \ GUCU AAUUGGGUAGGCUUUGAGGGG           GA           GAUCAU           </pre>	-54	Xq28	ZNF275	intron
Candidate_23_3p	2	19	<pre>           AU           AU-- G UAUCUUAU CUAACAGCAGAAAAAU UCAACCC GAGU C AUGAGAANTA GAUUGCCUUUUUC AUGUUGG UUCA U           CC           CUUU U           </pre>	-47.3	5q23.1	COMMD10	intron
Candidate_24_3p	2	23	<pre>           CCA           A GCUCU AGGUCACGCUUAGGGGUAUCCAUAUUGGG A UCGAA UUCACGUGGAGAUCCUUAAGGUUAMCC U GUCU           </pre>	-68.3	1p32.3	TCEANC2	intron
Candidate_25_3p	2	20	<pre>           U           U- U UCCC-- UGCCUUUAUUUGGGAGUACACUCCUCAAUA ACAGU AAC G ACGGAAAUAAACCCUADGGGAGAGUUUA UDUCA UUG A CUCCAU U U           </pre>	69.4	6q25.1	intergenic	
Candidate_26_3p	3	21	<pre>           AU - GC- - C-- - - - GCUUUC UC A GCUCU CU UUCUGG GCU CCGC CU UCUGGG CAC UC G UWAGG GG AAGACUU UGG GGAGG GG GGACC GGG AC A -- A AUU G ACT A UUA ----- GA U           </pre>	-35.9	21q22.11	intergenic	
Candidate_27_3p	4	22	<pre>           U-- A           AU UAUC UCUUUCACAGAAUUCUCCAGUAUAUAGUA UGUUA A AUU AGAABAAGUUAUAGAGGUAUUAUUAUUAUUAU U AUU A AA           </pre>	-51.2	1p31.3	INADL	intron
Candidate_28_3p	5	22	<pre>           GA           CUU UCUCUGUAUUCUCCUACAGCAGCAUA UGAGC UGU C CGACACUGACGGGACUUGUCUUU AACGUC GAUA C A- C AAC           </pre>	-69.4	2q12.1	IL18RAP	intron
Candidate_29_3p	3	22	<pre>           A           A GA GGUACUUUUUAGGGGUCCAA GAGCAGUU U CU UACAGAAAAAUACACAGUUU GUCGCAU A A C AAU           </pre>	-48.8	1p21.3	intergenic	

dG = free energies of predicted secondary structures; UTR = Untranslated region



**Supplementary Table 2.** Statistical analysis of miRNA variations between TGCTs and NT

miRNA	Observation (no. of reads)				Expectation (no. of reads)				P-value #
	NT		TGCTs		NT		TGCT		
	Present	Absent	Present	Absent	Present	Absent	Present	Absent	
<b>Total reads</b>	702465		501743						
<b>Differentially expressed miRNAs between TGCTs and NT (P&lt;0.0001)</b>									
let-7a	68831	633634	32629	469114	59186	643279	42274	459469	< 0.0001
let-7b	120293	582172	20486	481257	82122	620343	58657	443086	< 0.0001
let-7c	56852	645613	11006	490737	39584	662881	28274	473469	< 0.0001
miR-127-3p	9454	693011	1843	499900	6590	695875	4707	497036	< 0.0001
miR-1323	141	702324	1742	500001	1098	701367	785	500958	< 0.0001
miR-142-3p	1014	701451	7070	494673	4716	697749	3368	498375	< 0.0001
miR-142-5p	485	701980	2065	499678	1488	700977	1062	500681	< 0.0001
miR-143	15020	687445	47799	453944	36645	665820	26174	475569	< 0.0001
miR-145	2839	699626	12428	489315	8906	693559	6361	495382	< 0.0001
miR-150	267	702198	2686	499057	1723	700742	1230	500513	< 0.0001
miR-202	13081	689384	124	501619	7703	694762	5502	496241	< 0.0001
miR-202*	31326	671139	3004	498739	20026	682439	14304	487439	< 0.0001
miR-21	17129	685336	68920	432823	50196	652269	35853	465890	< 0.0001
miR-223	281	702184	1855	499888	1246	701219	890	500853	< 0.0001
miR-23a	7866	694599	11600	490143	11355	691110	8111	493632	< 0.0001
miR-27a	881	701584	2522	499221	1985	700480	1418	500325	< 0.0001
miR-27b	1558	700907	3346	498397	2861	699604	2043	499700	< 0.0001
miR-302a	455	702010	1942	499801	1398	701067	999	500744	< 0.0001
miR-302b	303	702162	2755	498988	1784	700681	1274	500469	< 0.0001
miR-320a	17242	685223	2009	499734	11230	691235	8021	493722	< 0.0001
miR-335	6939	695526	24037	477706	18070	684395	12906	488837	< 0.0001
miR-374a	452	702013	2087	499656	1481	700984	1058	500685	< 0.0001

miR-424	10466	691999	1232	500511	6824	695641	4874	496869	< 0.0001
miR-451	587	701878	3009	498734	2098	700367	1498	500245	< 0.0001
miR-507	2470	699995	19	501724	1452	701013	1037	500706	< 0.0001
miR-508-3p	3188	699277	14	501729	1868	700597	1334	500409	< 0.0001
miR-510	12839	689626	128	501615	7564	694901	5403	496340	< 0.0001
miR-513b	22959	679506	64	501679	13430	689035	9593	492150	< 0.0001
miR-513c	3465	699000	32	501711	2040	700425	1457	500286	< 0.0001
miR-514	5104	697361	34	501709	2997	699468	2141	499602	< 0.0001
miR-514b-5p	5695	696770	65	501678	3360	699105	2400	499343	< 0.0001
miR-7	1129	701336	2860	498883	2327	700138	1662	500081	< 0.0001
miR-15b	4180	698285	6176	495567	6041	696424	4315	497428	< 0.0001
miR-182	689	701776	2010	499733	1574	700891	1125	500618	< 0.0001
miR-515-5p	69	702396	944	500799	591	701874	422	501321	< 0.0001
miR-144	92	702373	978	500765	624	701841	446	501297	< 0.0001
miR-373	606	701859	1782	499961	1393	701072	995	500748	< 0.0001
miR-15a	674	701791	1862	499881	1479	700986	1057	500686	< 0.0001
miR-367	102	702363	941	500802	608	701857	435	501308	< 0.0001
miR-509-3p	1392	701073	11	501732	818	701647	585	501158	< 0.0001
miR-19b	808	701657	1916	499827	1589	700876	1135	500608	< 0.0001
miR-424*	1890	700575	203	501540	1221	701244	872	500871	< 0.0001
miR-517a	76	702389	794	500949	508	701957	362	501381	< 0.0001
miR-423-5p	2396	700069	404	501339	1633	700832	1167	500576	< 0.0001
miR-1283	85	702380	764	500979	495	701970	354	501389	< 0.0001
miR-23b	3391	699074	4569	497174	4643	697822	3317	498426	< 0.0001
miR-136	2654	699811	547	501196	1867	700598	1334	500409	< 0.0001
miR-1	193	702272	938	500805	660	701805	471	501272	< 0.0001
miR-508-5p	1051	701414	10	501733	619	701846	442	501301	< 0.0001
miR-484	198	702267	890	500853	635	701830	453	501290	< 0.0001
miR-524-5p	43	702422	590	501153	369	702096	264	501479	< 0.0001
miR-503	1161	701304	63	501680	714	701751	510	501233	< 0.0001

miR-26a	24474	677991	22114	479629	27177	675288	19411	482332	< 0.0001
miR-518b	88	702377	655	501088	433	702032	310	501433	< 0.0001
miR-302d	374	702091	1091	500652	855	701610	610	501133	< 0.0001
miR-486-5p	256	702209	896	500847	672	701793	480	501263	< 0.0001
miR-519a	30	702435	509	501234	314	702151	225	501518	< 0.0001
miR-16	1309	701156	2171	499572	2030	700435	1450	500293	< 0.0001
miR-517c	19	702446	476	501267	289	702176	206	501537	< 0.0001
miR-526b	25	702440	485	501258	298	702167	212	501531	< 0.0001
miR-302a*	410	702055	1082	500661	870	701595	622	501121	< 0.0001
miR-125b	17132	685333	15857	485886	19244	683221	13745	487998	< 0.0001
miR-92a	1235	701230	2032	499711	1906	700559	1361	500382	< 0.0001
miR-520a-5p	27	702438	455	501288	281	702184	201	501542	< 0.0001
miR-302b*	645	701820	1333	500410	1154	701311	824	500919	< 0.0001
miR-193a-3p	123	702342	606	501137	425	702040	304	501439	< 0.0001
miR-107	878	701587	1568	500175	1427	701038	1019	500724	< 0.0001
miR-519c-3p	23	702442	396	501347	244	702221	175	501568	< 0.0001
miR-200c	173	702292	653	501090	482	701983	344	501399	< 0.0001
miR-96	154	702311	617	501126	450	702015	321	501422	< 0.0001
miR-512-3p	32	702433	402	501341	253	702212	181	501562	< 0.0001
miR-134	756	701709	31	501712	459	702006	328	501415	< 0.0001
miR-25	1120	701345	1739	500004	1668	700797	1191	500552	< 0.0001
miR-205	10	702455	326	501417	196	702269	140	501603	< 0.0001
miR-542-5p	748	701717	50	501693	466	701999	332	501411	< 0.0001
miR-19a	203	702262	636	501107	489	701976	350	501393	< 0.0001
miR-519b-3p	27	702438	346	501397	218	702247	155	501588	< 0.0001
miR-99a	3067	699398	1110	500633	2437	700028	1740	500003	< 0.0001
miR-155	474	701991	951	500792	831	701634	594	501149	< 0.0001
miR-520c-3p	23	702442	312	501431	195	702270	140	501603	< 0.0001
miR-218	112	702353	469	501274	339	702126	242	501501	< 0.0001
miR-25*	839	701626	114	501629	556	701909	397	501346	< 0.0001

miR-498	42	702423	325	501418	214	702251	153	501590	< 0.0001
miR-30b	1297	701168	1779	499964	1794	700671	1282	500461	< 0.0001
miR-141	10	702455	258	501485	156	702309	112	501631	< 0.0001
miR-494	701	701764	77	501666	454	702011	324	501419	< 0.0001
miR-302c	22	702443	275	501468	173	702292	124	501619	< 0.0001
miR-516a-5p	21	702444	269	501474	169	702296	121	501622	< 0.0001
miR-26b	5000	697465	5047	496696	5861	696604	4186	497557	< 0.0001
miR-365	434	702031	832	500911	739	701726	527	501216	< 0.0001
miR-30e	584	701881	993	500750	920	701545	657	501086	< 0.0001
miR-183	60	702405	326	501417	225	702240	161	501582	< 0.0001
miR-574-5p	1371	701094	386	501357	1025	701440	732	501011	< 0.0001
miR-374b	505	701960	885	500858	811	701654	579	501164	< 0.0001
miR-9*	19	702446	237	501506	149	702316	107	501636	< 0.0001
miR-146a	360	702105	712	501031	625	701840	447	501296	< 0.0001
miR-214	2060	700405	741	501002	1634	700831	1167	500576	< 0.0001
miR-335*	17	702448	224	501519	141	702324	100	501643	< 0.0001
miR-92a-1*	959	701506	220	501523	688	701777	491	501252	< 0.0001
miR-342-3p	182	702283	476	501267	384	702081	274	501469	< 0.0001
miR-506	381	702084	7	501736	226	702239	162	501581	< 0.0001
miR-376c	4493	697972	2119	499624	3857	698608	2755	498988	< 0.0001
miR-518e	15	702450	212	501531	132	702333	95	501648	< 0.0001
miR-520d-3p	20	702445	220	501523	140	702325	100	501643	< 0.0001
miR-30c	1333	701132	1671	500072	1752	700713	1252	500491	< 0.0001
miR-361-3p	46	702419	259	501484	178	702287	127	501616	< 0.0001
miR-10b*	427	702038	29	501714	266	702199	190	501553	< 0.0001
miR-28-5p	236	702229	521	501222	442	702023	315	501428	< 0.0001
miR-518a-3p	12	702453	190	501553	118	702347	84	501659	< 0.0001
hsa-let-7e	11516	690949	6529	495214	10526	691939	7519	494224	< 0.0001
miR-432	1324	701141	423	501320	1019	701446	728	501015	< 0.0001
hsa-let-7g	5204	697261	4937	496806	5916	696549	4225	497518	< 0.0001

miR-22	966	701499	1257	500486	1297	701168	926	500817	< 0.0001
miR-106b	125	702340	350	501393	277	702188	198	501545	< 0.0001
miR-151-5p	6511	695954	5976	495767	7284	695181	5203	496540	< 0.0001
miR-221	1000	701465	289	501454	752	701713	537	501206	< 0.0001
miR-199a-5p	2843	699622	1272	500471	2400	700065	1715	500028	< 0.0001
miR-372	446	702019	723	501020	682	701783	487	501256	< 0.0001
miR-518c	13	702452	166	501577	104	702361	75	501668	< 0.0001
miR-518f*	10	702455	158	501585	98	702367	70	501673	< 0.0001
miR-515-3p	27	702438	186	501557	124	702341	89	501654	< 0.0001
miR-516b	61	702404	237	501506	174	702291	124	501619	< 0.0001
miR-135b	250	702215	481	501262	426	702039	305	501438	< 0.0001
miR-140-3p	1023	701442	324	501419	786	701679	561	501182	< 0.0001
miR-509-3-5p	255	702210	4	501739	151	702314	108	501635	< 0.0001
miR-145*	240	702225	463	501280	410	702055	293	501450	< 0.0001
miR-339-3p	87	702378	266	501477	206	702259	147	501596	< 0.0001
miR-21*	54	702411	217	501526	158	702307	113	501630	< 0.0001
miR-483-5p	390	702075	56	501687	260	702205	186	501557	< 0.0001
miR-518f	15	702450	141	501602	91	702374	65	501678	< 0.0001
miR-519d	34	702431	175	501568	122	702343	87	501656	< 0.0001
miR-10a	94	702371	262	501481	208	702257	148	501595	< 0.0001
miR-148a	58	702407	208	501535	155	702310	111	501632	< 0.0001
miR-513a-3p	219	702246	4	501739	130	702335	93	501650	< 0.0001
miR-371-5p	1120	701345	403	501340	888	701577	635	501108	< 0.0001
miR-337-3p	387	702078	593	501150	572	701893	408	501335	< 0.0001
miR-299-3p	408	702057	73	501670	281	702184	200	501543	< 0.0001
miR-31	29	702436	155	501588	107	702358	77	501666	< 0.0001
miR-525-5p	19	702446	136	501607	90	702375	65	501678	< 0.0001
miR-127-5p	322	702143	48	501695	216	702249	154	501589	< 0.0001
miR-197	62	702403	196	501547	151	702314	107	501636	< 0.0001
miR-517*	14	702451	118	501625	77	702388	55	501688	< 0.0001

miR-340	155	702310	309	501434	271	702194	193	501550	< 0.0001
miR-186	1499	700966	645	501098	1251	701214	893	500850	< 0.0001
miR-512-5p	27	702438	137	501606	96	702369	68	501675	< 0.0001
miR-409-3p	357	702108	66	501677	247	702218	176	501567	< 0.0001
miR-371-3p	109	702356	246	501497	207	702258	148	501595	< 0.0001
miR-128	136	702329	277	501466	241	702224	172	501571	< 0.0001
miR-192	478	701987	635	501108	649	701816	464	501279	< 0.0001
miR-200b	9	702456	97	501646	62	702403	44	501699	< 0.0001
miR-9	78	702387	202	501541	163	702302	117	501626	< 0.0001
miR-23a*	164	702301	4	501739	98	702367	70	501673	< 0.0001
miR-664*	214	702251	20	501723	137	702328	97	501646	< 0.0001
miR-32	117	702348	247	501496	212	702253	152	501591	< 0.0001
miR-18a	78	702387	197	501546	160	702305	115	501628	< 0.0001
miR-126*	5166	697299	4513	497230	5646	696819	4033	497710	< 0.0001
miR-30d	1245	701220	1313	500430	1492	700973	1066	500677	< 0.0001
miR-324-5p	416	702049	106	501637	305	702160	217	501526	< 0.0001
miR-148b	51	702414	148	501595	116	702349	83	501660	< 0.0001
miR-450a	1274	701191	573	501170	1077	701388	770	500973	< 0.0001
miR-590-3p	49	702416	144	501599	113	702352	80	501663	< 0.0001
hsa-let-7d	4694	697771	2689	499054	4307	698158	3076	498667	< 0.0001
miR-34a	481	701984	151	501592	369	702096	263	501480	< 0.0001
miR-497	748	701717	289	501454	605	701860	432	501311	< 0.0001
miR-141*	5	702460	69	501674	43	702422	31	501712	< 0.0001
miR-526b*	5	702460	68	501675	43	702422	30	501713	< 0.0001
miR-10b	1491	700974	1472	500271	1728	700737	1235	500508	< 0.0001
miR-3613-5p	48	702417	135	501608	107	702358	76	501667	< 0.0001
miR-101	1129	701336	1155	500588	1332	701133	952	500791	< 0.0001
miR-130b	194	702271	300	501443	288	702177	206	501537	< 0.0001
miR-660	1027	701438	455	501288	865	701600	617	501126	< 0.0001
miR-29b-2*	178	702287	25	501718	118	702347	85	501658	< 0.0001

miR-193b*	184	702281	28	501715	124	702341	88	501655	< 0.0001
miR-345	29	702436	101	501642	76	702389	54	501689	< 0.0001
miR-378*	14	702451	77	501666	53	702412	38	501705	< 0.0001
miR-495	429	702036	522	501221	555	701910	396	501347	< 0.0001
miR-27b*	105	702360	196	501547	176	702289	125	501618	< 0.0001
miR-30a	463	702002	552	501191	592	701873	423	501320	< 0.0001
miR-181c	49	702416	127	501616	103	702362	73	501670	< 0.0001
miR-146b-5p	176	702289	271	501472	261	702204	186	501557	< 0.0001
miR-520a-3p	4	702461	56	501687	35	702430	25	501718	< 0.0001
miR-23c	18	702447	81	501662	58	702407	41	501702	< 0.0001
miR-411	339	702126	99	501644	256	702209	182	501561	< 0.0001
miR-126	4895	697570	4142	497601	5272	697193	3765	497978	< 0.0001
miR-375	7	702458	61	501682	40	702425	28	501715	< 0.0001
miR-523	8	702457	62	501681	41	702424	29	501714	< 0.0001
miR-154*	131	702334	218	501525	204	702261	145	501598	< 0.0001
miR-485-5p	165	702300	26	501717	111	702354	80	501663	< 0.0001
miR-2110	110	702355	7	501736	68	702397	49	501694	< 0.0001
miR-193b	392	702073	129	501614	304	702161	217	501526	< 0.0001
miR-1301	277	702188	74	501669	205	702260	146	501597	< 0.0001
miR-655	90	702375	170	501573	152	702313	108	501635	< 0.0001
miR-518c*	3	702462	49	501694	30	702435	22	501721	< 0.0001
miR-519e*	43	702422	108	501635	88	702377	63	501680	< 0.0001
miR-590-5p	28	702437	85	501658	66	702399	47	501696	< 0.0001
miR-30e*	1783	700682	1630	500113	1991	700474	1422	500321	< 0.0001
miR-99a*	137	702328	22	501721	93	702372	66	501677	< 0.0001
miR-548x	9	702456	54	501689	37	702428	26	501717	< 0.0001
miR-615-3p	12	702453	59	501684	41	702424	30	501713	< 0.0001
miR-24	1016	701449	992	500751	1171	701294	837	500906	< 0.0001
miR-152	179	702286	251	501492	251	702214	179	501564	< 0.0001
miR-744	315	702150	104	501639	244	702221	175	501568	< 0.0001

miR-29a	4952	697513	4096	497647	5278	697187	3770	497973	< 0.0001
miR-505	76	702389	141	501602	127	702338	90	501653	< 0.0001
miR-210	263	702202	79	501664	200	702265	142	501601	< 0.0001
miR-520g	7	702458	49	501694	33	702432	23	501720	< 0.0001
miR-185	1096	701369	1052	500691	1253	701212	895	500848	< 0.0001
miR-382	257	702208	78	501665	195	702270	140	501603	< 0.0001
miR-200a	2	702463	37	501706	23	702442	16	501727	< 0.0001
miR-302c*	2	702463	37	501706	23	702442	16	501727	< 0.0001
miR-1269	4	702461	41	501702	26	702439	19	501724	< 0.0001
miR-151-3p	740	701725	342	501401	631	701834	451	501292	< 0.0001
miR-654-3p	146	702319	210	501533	208	702257	148	501595	< 0.0001
miR-199b-5p	347	702118	401	501342	436	702029	312	501431	< 0.0001
miR-130b*	8	702457	46	501697	32	702433	22	501721	< 0.0001
miR-629	401	702064	157	501586	326	702139	232	501511	< 0.0001
miR-122	54	702411	108	501635	95	702370	67	501676	< 0.0001
miR-509-5p	71	702394	4	501739	44	702421	31	501712	< 0.0001
miR-7-1*	89	702376	146	501597	137	702328	98	501645	< 0.0001
miR-378c	29	702436	75	501668	61	702404	43	501700	< 0.0001
miR-129-5p	81	702384	8	501735	52	702413	37	501706	< 0.0001
miR-320b	231	702234	73	501670	177	702288	127	501616	< 0.0001
miR-135a	495	701970	521	501222	593	701872	423	501320	< 0.0001
miR-302d*	43	702422	91	501652	78	702387	56	501687	< 0.0001
miR-362-3p	56	702409	105	501638	94	702371	67	501676	< 0.0001
miR-487b	242	702223	81	501662	188	702277	135	501608	< 0.0001
miR-373*	181	702284	52	501691	136	702329	97	501646	< 0.0001
miR-18a*	17	702448	55	501688	42	702423	30	501713	< 0.0001
miR-542-3p	396	702069	166	501577	328	702137	234	501509	< 0.0001
miR-16-2*	60	702405	106	501637	97	702368	69	501674	< 0.0001
miR-133a	19	702446	56	501687	44	702421	31	501712	< 0.0001
miR-518d-3p	8	702457	39	501704	27	702438	20	501723	< 0.0001



miR-339-5p	39	702426	81	501662	70	702395	50	501693	< 0.0001
miR-125a-3p	151	702314	41	501702	112	702353	80	501663	< 0.0001
miR-380	54	702411	98	501645	89	702376	63	501680	< 0.0001
miR-1296	9	702456	40	501703	29	702436	20	501723	< 0.0001
miR-181b	231	702234	82	501661	183	702282	130	501613	< 0.0001
miR-125a-5p	3006	699459	1823	499920	2817	699648	2012	499731	< 0.0001
miR-521	4	702461	30	501713	20	702445	14	501729	< 0.0001
miR-1908	65	702400	7	501736	42	702423	30	501713	< 0.0001
miR-642b	6	702459	33	501710	23	702442	16	501727	< 0.0001
miR-411*	49	702416	89	501654	81	702384	57	501686	< 0.0001
miR-522	8	702457	36	501707	26	702439	18	501725	< 0.0001
miR-3609	4	702461	29	501714	19	702446	14	501729	< 0.0001
miR-493*	1089	701376	594	501149	982	701483	701	501042	< 0.0001
miR-184	127	702338	166	501577	171	702294	122	501621	< 0.0001
miR-874	138	702327	40	501703	104	702361	74	501669	< 0.0001
miR-517b	2	702463	23	501720	15	702450	10	501733	< 0.0001
miR-204	1198	701267	671	501072	1090	701375	779	500964	< 0.0001
miR-20a*	109	702356	146	501597	149	702316	106	501637	< 0.0001
miR-221*	5	702460	28	501715	19	702446	14	501729	< 0.0001
miR-222	580	701885	289	501454	507	701958	362	501381	< 0.0001
miR-520e	4	702461	26	501717	18	702447	12	501731	< 0.0001
miR-520d-5p	2	702463	22	501721	14	702451	10	501733	< 0.0001
miR-26b*	8	702457	32	501711	23	702442	17	501726	< 0.0001
miR-488	10	702455	35	501708	26	702439	19	501724	< 0.0001
miR-362-5p	93	702372	22	501721	67	702398	48	501695	< 0.0001
miR-20a	357	702108	365	501378	421	702044	301	501442	< 0.0001
miR-30b*	73	702392	14	501729	51	702414	36	501707	< 0.0001
miR-525-3p	2	702463	21	501722	13	702452	10	501733	< 0.0001
miR-642a	2	702463	21	501722	13	702452	10	501733	< 0.0001
miR-449a	45	702420	4	501739	29	702436	20	501723	< 0.0001

miR-370	59	702406	9	501734	40	702425	28	501715	< 0.0001
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**Additional miRNAs detected (P>0.0001)**

miR-378	1544	700921	907	500836	1430	701035	1021	500722	0,0002
miR-524-3p	8	702457	30	501713	22	702443	16	501727	0,0002
miR-140-5p	933	701532	518	501225	846	701619	605	501138	0,0003
miR-425	75	702390	106	501637	106	702359	75	501668	0,0003
miR-323b-3p	78	702387	18	501725	56	702409	40	501703	0,0004
miR-369-3p	2217	700248	1825	499918	2358	700107	1684	500059	0,0004
miR-376b	591	701874	550	501193	666	701799	475	501268	0,0005
miR-664	19	702446	43	501700	36	702429	26	501717	0,0006
miR-124	54	702411	82	501661	79	702386	57	501686	0,0007
miR-31*	2	702463	18	501725	12	702453	8	501735	0,0007
miR-98	756	701709	680	501063	838	701627	598	501145	0,0007
miR-17*	513	701952	264	501479	453	702012	324	501419	0,0008
miR-425*	179	702286	199	501544	221	702244	157	501586	0,0009
miR-455-3p	75	702390	102	501641	103	702362	74	501669	0,0010
miR-1277	8	702457	27	501716	20	702445	15	501728	0,0012
miR-196b	2	702463	17	501726	11	702454	8	501735	0,0013
miR-194	24	702441	47	501696	41	702424	30	501713	0,0015
hsa-let-7f	24583	677882	16862	484881	24177	678288	17268	484475	0,0020
miR-383	42	702423	6	501737	28	702437	20	501723	0,0021
miR-505*	3	702462	18	501725	12	702453	9	501734	0,0021
miR-514b-3p	36	702429	4	501739	23	702442	17	501726	0,0024
miR-379	169	702296	68	501675	138	702327	99	501644	0,0025
miR-3180-3p	72	702393	19	501724	53	702412	38	501705	0,0028
miR-491-5p	41	702424	6	501737	27	702438	20	501723	0,0028
miR-409-5p	78	702387	22	501721	58	702407	42	501701	0,0031
miR-342-5p	50	702415	10	501733	35	702430	25	501718	0,0039
miR-32*	65	702400	87	501656	89	702376	63	501680	0,0044

miR-154	235	702230	107	501636	200	702265	142	501601	0,0044
miR-889	159	702306	65	501678	131	702334	93	501650	0,0053
hsa-let-7i	7560	694905	5771	495972	7777	694688	5554	496189	0,0055
miR-181a	2632	699833	1670	500073	2510	699955	1792	499951	0,0061
miR-299-5p	103	702362	121	501622	131	702334	93	501650	0,0071
miR-190b	35	702430	5	501738	23	702442	17	501726	0,0073
miR-196a	7	702458	22	501721	17	702448	12	501731	0,0074
miR-624*	2	702463	14	501729	9	702456	7	501736	0,0079
miR-454	90	702375	30	501713	70	702395	50	501693	0,0083
miR-30a*	546	701919	490	501253	604	701861	432	501311	0,0090
miR-532-3p	111	702354	127	501616	139	702326	99	501644	0,0095
miR-17	435	702030	231	501512	389	702076	277	501466	0,0096
miR-147b	7	702458	21	501722	16	702449	12	501731	0,0123
miR-493	357	702108	185	501558	316	702149	226	501517	0,0131
miR-200c*	2	702463	13	501730	9	702456	6	501737	0,0140
hsa-let-7b*	229	702236	109	501634	197	702268	141	501602	0,0150
miR-326	24	702441	41	501702	38	702427	27	501716	0,0155
miR-181a-2*	6	702459	19	501724	15	702450	10	501733	0,0164
miR-520f	4	702461	16	501727	12	702453	8	501735	0,0167
miR-548y	4	702461	16	501727	12	702453	8	501735	0,0167
miR-183*	43	702422	60	501683	60	702405	43	501700	0,0201
miR-135a*	28	702437	4	501739	19	702446	13	501730	0,0244
miR-329	44	702421	60	501683	61	702404	43	501700	0,0267
miR-1249	20	702445	35	501708	32	702433	23	501720	0,0274
miR-1468	35	702430	7	501736	25	702440	17	501726	0,0289
miR-95	207	702258	204	501539	240	702225	171	501572	0,0296
miR-548c-5p	11	702454	24	501719	20	702445	15	501728	0,0339
miR-504	3	702462	13	501730	9	702456	7	501736	0,0354
miR-576-3p	8	702457	20	501723	16	702449	12	501731	0,0371
miR-497*	58	702407	18	501725	44	702421	32	501711	0,0386

miR-20b	13	702452	26	501717	23	702442	16	501727	0,0399
miR-543	197	702268	95	501648	170	702295	122	501621	0,0401
miR-144*	2	702463	11	501732	8	702457	5	501738	0,0427
miR-301b	2	702463	11	501732	8	702457	5	501738	0,0427
miR-429	2	702463	11	501732	8	702457	5	501738	0,0427
miR-519e	2	702463	11	501732	8	702457	5	501738	0,0427
miR-551a	2	702463	11	501732	8	702457	5	501738	0,0427
miR-625*	2	702463	11	501732	8	702457	5	501738	0,0427
miR-363	26	702439	40	501703	39	702426	27	501716	0,0450
miR-942	10	702455	22	501721	19	702446	13	501730	0,0466
miR-582-5p	4	702461	14	501729	11	702454	7	501736	0,0466
miR-125b-1*	71	702394	25	501718	56	702409	40	501703	0,0469
miR-485-3p	33	702432	47	501696	47	702418	33	501710	0,0476
miR-376a*	65	702400	22	501721	51	702414	36	501707	0,0477
miR-550a*	12	702453	24	501719	21	702444	15	501728	0,0550
miR-455-5p	33	702432	46	501697	46	702419	33	501710	0,0632
miR-331-3p	67	702398	78	501665	85	702380	60	501683	0,0670
miR-1287	29	702436	6	501737	20	702445	15	501728	0,0702
miR-34c-3p	29	702436	6	501737	20	702445	15	501728	0,0702
miR-155*	2	702463	10	501733	7	702458	5	501738	0,0727
miR-556-5p	2	702463	10	501733	7	702458	5	501738	0,0727
miR-2114	7	702458	17	501726	14	702451	10	501733	0,0780
miR-34b*	26	702439	5	501738	18	702447	13	501730	0,0806
miR-15b*	36	702429	48	501695	49	702416	35	501708	0,0819
miR-29c	3474	698991	2301	499442	3369	699096	2406	499337	0,0945
miR-935	3	702462	11	501732	8	702457	6	501737	0,0974
miR-92b	235	702230	218	501525	264	702201	189	501554	0,1002
miR-532-5p	158	702307	77	501666	137	702328	98	501645	0,1049
miR-629*	6	702459	15	501728	12	702453	9	501734	0,1051
miR-652	188	702277	95	501648	165	702300	118	501625	0,1059

miR-101*	21	702444	32	501711	31	702434	22	501721	0,1059
miR-501-3p	23	702442	34	501709	33	702432	24	501719	0,1080
miR-296-5p	11	702454	21	501722	19	702446	13	501730	0,1092
miR-139-5p	51	702414	61	501682	65	702400	47	501696	0,1096
miR-486-3p	36	702429	10	501733	27	702438	19	501724	0,1110
miR-2355-5p	4	702461	12	501731	9	702456	7	501736	0,1202
miR-576-5p	4	702461	12	501731	9	702456	7	501736	0,1202
miR-598	4	702461	12	501731	9	702456	7	501736	0,1202
miR-106a	2	702463	9	501734	6	702459	5	501738	0,1210
miR-1270	2	702463	9	501734	6	702459	5	501738	0,1210
miR-191*	2	702463	9	501734	6	702459	5	501738	0,1210
miR-1912	2	702463	9	501734	6	702459	5	501738	0,1210
miR-100	1036	701429	837	500906	1093	701372	780	500963	0,1334
miR-671-5p	43	702422	14	501729	33	702432	24	501719	0,1434
miR-96*	47	702418	56	501687	60	702405	43	501700	0,1446
miR-1185	30	702435	8	501735	22	702443	16	501727	0,1560
miR-205*	6	702459	14	501729	12	702453	8	501735	0,1582
miR-149	45	702420	53	501690	57	702408	41	501702	0,1836
miR-187	27	702438	7	501736	20	702445	14	501729	0,1837
miR-3158	4	702461	11	501732	9	702456	6	501737	0,1855
miR-548e	4	702461	11	501732	9	702456	6	501737	0,1855
miR-3606	8	702457	16	501727	14	702451	10	501733	0,1867
miR-450b-5p	235	702230	128	501615	212	702253	151	501592	0,1899
miR-1251	2	702463	8	501735	6	702459	4	501739	0,1957
miR-200a*	2	702463	8	501735	6	702459	4	501739	0,1957
miR-3647-5p	2	702463	8	501735	6	702459	4	501739	0,1957
miR-548b-3p	2	702463	8	501735	6	702459	4	501739	0,1957
miR-29b-1*	47	702418	17	501726	37	702428	27	501716	0,1986
miR-214*	50	702415	57	501686	62	702403	45	501698	0,2045
miR-132	75	702390	79	501664	90	702375	64	501679	0,2083

miR-1228	5	702460	12	501731	10	702455	7	501736	0,2106
hsa-let-7d*	130	702335	125	501618	149	702316	106	501637	0,2248
hsa-let-7g*	30	702435	9	501734	23	702442	16	501727	0,2358
miR-99b	575	701890	474	501269	612	701853	437	501306	0,2530
miR-3614-5p	8	702457	15	501728	13	702452	10	501733	0,2627
miR-1255b	4	702461	10	501733	8	702457	6	501737	0,2769
miR-3660	4	702461	10	501733	8	702457	6	501737	0,2769
miR-323-3p	103	702362	50	501693	89	702376	64	501679	0,2788
hsa-let-7a*	186	702279	101	501642	167	702298	120	501623	0,2924
miR-30d*	5	702460	11	501732	9	702456	7	501736	0,3053
miR-106a*	2	702463	7	501736	5	702460	4	501739	0,3053
miR-138	2	702463	7	501736	5	702460	4	501739	0,3053
miR-148a*	2	702463	7	501736	5	702460	4	501739	0,3053
miR-2115*	2	702463	7	501736	5	702460	4	501739	0,3053
miR-3200-3p	2	702463	7	501736	5	702460	4	501739	0,3053
miR-3940	2	702463	7	501736	5	702460	4	501739	0,3053
miR-548a-3p	2	702463	7	501736	5	702460	4	501739	0,3053
miR-548i	2	702463	7	501736	5	702460	4	501739	0,3053
miR-579	2	702463	7	501736	5	702460	4	501739	0,3053
miR-891b	2	702463	7	501736	5	702460	4	501739	0,3053
miR-29b	2174	700291	1667	500076	2241	700224	1600	500143	0,3119
miR-19b-1*	6	702459	12	501731	11	702454	7	501736	0,3275
miR-33b	6	702459	12	501731	11	702454	7	501736	0,3275
miR-1247	49	702416	20	501723	40	702425	29	501714	0,3349
miR-93*	59	702406	62	501681	71	702394	50	501693	0,3351
miR-708	198	702267	110	501633	180	702285	128	501615	0,3438
miR-223*	7	702458	13	501730	12	702453	8	501735	0,3449
miR-487a	56	702409	24	501719	47	702418	33	501710	0,3450
miR-548d-5p	24	702441	30	501713	32	702433	22	501721	0,3686
miR-195*	39	702426	15	501728	32	702433	22	501721	0,3688

miR-139-3p	37	702428	14	501729	30	702435	21	501722	0,3745
miR-374a*	129	702336	119	501624	145	702320	103	501640	0,3961
miR-3687	4	702461	9	501734	8	702457	5	501738	0,3974
miR-548o	4	702461	9	501734	8	702457	5	501738	0,3974
miR-760	16	702449	4	501739	12	702453	8	501735	0,4249
miR-340*	23	702442	28	501715	30	702435	21	501722	0,4516
miR-1264	2	702463	6	501737	5	702460	3	501740	0,4544
miR-1273e	2	702463	6	501737	5	702460	3	501740	0,4544
miR-146a*	2	702463	6	501737	5	702460	3	501740	0,4544
miR-18b	2	702463	6	501737	5	702460	3	501740	0,4544
miR-208a	2	702463	6	501737	5	702460	3	501740	0,4544
miR-20b*	2	702463	6	501737	5	702460	3	501740	0,4544
miR-217	2	702463	6	501737	5	702460	3	501740	0,4544
miR-218-1*	2	702463	6	501737	5	702460	3	501740	0,4544
miR-24-2*	2	702463	6	501737	5	702460	3	501740	0,4544
miR-3065-3p	2	702463	6	501737	5	702460	3	501740	0,4544
miR-338-5p	2	702463	6	501737	5	702460	3	501740	0,4544
miR-3620	2	702463	6	501737	5	702460	3	501740	0,4544
miR-4326	2	702463	6	501737	5	702460	3	501740	0,4544
miR-548c-3p	2	702463	6	501737	5	702460	3	501740	0,4544
miR-548p	2	702463	6	501737	5	702460	3	501740	0,4544
miR-643	2	702463	6	501737	5	702460	3	501740	0,4544
miR-550a	24	702441	8	501735	19	702446	13	501730	0,4544
miR-941	7	702458	12	501731	11	702454	8	501735	0,4612
miR-374b*	20	702445	25	501718	26	702439	19	501724	0,4670
miR-125b-2*	37	702428	15	501728	30	702435	22	501721	0,4754
miR-1303	37	702428	15	501728	30	702435	22	501721	0,4754
hsa-let-7e*	9	702456	14	501729	13	702452	10	501733	0,4794
miR-377*	16	702449	21	501722	22	702443	15	501728	0,4829
miR-544	15	702450	20	501723	20	702445	15	501728	0,4856

miR-153	11	702454	16	501727	16	702449	11	501732	0,4873
miR-548aa	12	702453	17	501726	17	702448	12	501731	0,4886
miR-22*	263	702202	156	501587	244	702221	175	501568	0,4947
miR-29c*	150	702315	133	501610	165	702300	118	501625	0,5074
miR-1179	3	702462	7	501736	6	702459	4	501739	0,5084
miR-19a*	3	702462	7	501736	6	702459	4	501739	0,5084
miR-3614-3p	3	702462	7	501736	6	702459	4	501739	0,5084
miR-539	3	702462	7	501736	6	702459	4	501739	0,5084
miR-559	3	702462	7	501736	6	702459	4	501739	0,5084
miR-30c-2*	24	702441	28	501715	30	702435	22	501721	0,5291
miR-367*	4	702461	8	501735	7	702458	5	501738	0,5435
miR-3688	4	702461	8	501735	7	702458	5	501738	0,5435
miR-625	34	702431	14	501729	28	702437	20	501723	0,5436
miR-93	300	702165	182	501561	281	702184	201	501542	0,5532
miR-410	39	702426	41	501702	47	702418	33	501710	0,5539
miR-501-5p	30	702435	33	501710	37	702428	26	501717	0,5618
miR-106b*	70	702395	67	501676	80	702385	57	501686	0,5655
miR-1307	51	702414	51	501692	60	702405	42	501701	0,5721
miR-876-5p	6	702459	10	501733	9	702456	7	501736	0,5820
miR-548n	14	702451	4	501739	11	702454	7	501736	0,5919
miR-502-5p	22	702443	8	501735	18	702447	12	501731	0,5958
miR-34c-5p	16	702449	5	501738	12	702453	9	501734	0,5996
miR-92b*	18	702447	6	501737	14	702451	10	501733	0,6018
miR-324-3p	55	702410	27	501716	48	702417	34	501709	0,6310
miR-1246	2	702463	5	501738	4	702461	3	501740	0,6355
miR-1276	2	702463	5	501738	4	702461	3	501740	0,6355
miR-1537	2	702463	5	501738	4	702461	3	501740	0,6355
miR-1972	2	702463	5	501738	4	702461	3	501740	0,6355
miR-3129	2	702463	5	501738	4	702461	3	501740	0,6355
miR-3133	2	702463	5	501738	4	702461	3	501740	0,6355



miR-3143	2	702463	5	501738	4	702461	3	501740	0,6355
miR-3148	2	702463	5	501738	4	702461	3	501740	0,6355
miR-3156	2	702463	5	501738	4	702461	3	501740	0,6355
miR-3166	2	702463	5	501738	4	702461	3	501740	0,6355
miR-3192	2	702463	5	501738	4	702461	3	501740	0,6355
miR-323b-5p	2	702463	5	501738	4	702461	3	501740	0,6355
miR-330-5p	2	702463	5	501738	4	702461	3	501740	0,6355
miR-33b*	2	702463	5	501738	4	702461	3	501740	0,6355
miR-365*	2	702463	5	501738	4	702461	3	501740	0,6355
miR-3667-3p	2	702463	5	501738	4	702461	3	501740	0,6355
miR-3667-5p	2	702463	5	501738	4	702461	3	501740	0,6355
miR-3684	2	702463	5	501738	4	702461	3	501740	0,6355
miR-3910	2	702463	5	501738	4	702461	3	501740	0,6355
miR-3944	2	702463	5	501738	4	702461	3	501740	0,6355
miR-412	2	702463	5	501738	4	702461	3	501740	0,6355
miR-454*	2	702463	5	501738	4	702461	3	501740	0,6355
miR-491-3p	2	702463	5	501738	4	702461	3	501740	0,6355
miR-499-3p	2	702463	5	501738	4	702461	3	501740	0,6355
miR-548a-5p	2	702463	5	501738	4	702461	3	501740	0,6355
miR-548d-3p	2	702463	5	501738	4	702461	3	501740	0,6355
miR-548g	2	702463	5	501738	4	702461	3	501740	0,6355
miR-548j	2	702463	5	501738	4	702461	3	501740	0,6355
miR-548m	2	702463	5	501738	4	702461	3	501740	0,6355
miR-549	2	702463	5	501738	4	702461	3	501740	0,6355
miR-552	2	702463	5	501738	4	702461	3	501740	0,6355
miR-616*	2	702463	5	501738	4	702461	3	501740	0,6355
miR-624	2	702463	5	501738	4	702461	3	501740	0,6355
miR-627	2	702463	5	501738	4	702461	3	501740	0,6355
miR-875-5p	2	702463	5	501738	4	702461	3	501740	0,6355
miR-877*	2	702463	5	501738	4	702461	3	501740	0,6355

miR-885-5p	2	702463	5	501738	4	702461	3	501740	0,6355
miR-628-5p	23	702442	9	501734	19	702446	13	501730	0,6601
miR-499-5p	48	702417	47	501696	55	702410	40	501703	0,6657
miR-1304	3	702462	6	501737	5	702460	4	501739	0,6781
miR-2113	3	702462	6	501737	5	702460	4	501739	0,6781
miR-377	220	702245	133	501610	206	702259	147	501596	0,6787
miR-369-5p	40	702425	40	501703	47	702418	33	501710	0,6833
miR-135b*	15	702450	5	501738	12	702453	8	501735	0,6834
miR-379*	33	702432	34	501709	39	702426	28	501715	0,6857
miR-548z	14	702451	17	501726	18	702447	13	501730	0,6966
miR-137	4	702461	7	501736	6	702459	5	501738	0,7018
miR-192*	4	702461	7	501736	6	702459	5	501738	0,7018
miR-548b-5p	4	702461	7	501736	6	702459	5	501738	0,7018
miR-589	4	702461	7	501736	6	702459	5	501738	0,7018
miR-33a*	65	702400	34	501709	58	702407	41	501702	0,7019
miR-181d	13	702452	16	501727	17	702448	12	501731	0,7033
miR-188-3p	12	702453	15	501728	16	702449	11	501732	0,7094
miR-3676	5	702460	8	501735	8	702457	5	501738	0,7151
miR-423-3p	24	702441	10	501733	20	702445	14	501729	0,7173
miR-296-3p	10	702455	13	501730	13	702452	10	501733	0,7195
miR-3613-3p	10	702455	13	501730	13	702452	10	501733	0,7195
miR-3180-5p	6	702459	9	501734	9	702456	6	501737	0,7221
miR-3117	8	702457	11	501732	11	702454	8	501735	0,7249
miR-665	56	702409	29	501714	50	702415	35	501708	0,7371
miR-190	68	702397	62	501681	76	702389	54	501689	0,7463
hsa-let-7i*	44	702421	42	501701	50	702415	36	501707	0,7688
miR-767-3p	52	702413	48	501695	58	702407	42	501701	0,7996
miR-3915	12	702453	14	501729	15	702450	11	501732	0,8111
miR-191	5855	696610	4077	497666	5794	696671	4138	497605	0,8147
miR-1178	2	702463	4	501739	4	702461	2	501741	0,8190

miR-1181	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1182	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1183	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1184	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1193	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1200	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1202	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1203	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1204	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1205	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1206	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1207-3p	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1207-5p	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1208	2	702463	4	501739	4	702461	2	501741	0,8190
miR-122*	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1224-5p	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1225-3p	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1225-5p	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1226	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1226*	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1227	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1229	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1231	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1233	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1234	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1236	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1237	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1238	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1244	2	702463	4	501739	4	702461	2	501741	0,8190
miR-1245	2	702463	4	501739	4	702461	2	501741	0,8190

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miR-148b*	2	702463	4	501739	4	702461	2	501741	0,8190
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miR-1911*	2	702463	4	501739	4	702461	2	501741	0,8190
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miR-449c*	2	702463	4	501739	4	702461	2	501741	0,8190
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miR-663b	2	702463	4	501739	4	702461	2	501741	0,8190
miR-676*	2	702463	4	501739	4	702461	2	501741	0,8190
miR-711	2	702463	4	501739	4	702461	2	501741	0,8190
miR-718	2	702463	4	501739	4	702461	2	501741	0,8190
miR-7-2*	2	702463	4	501739	4	702461	2	501741	0,8190
miR-720	2	702463	4	501739	4	702461	2	501741	0,8190
miR-759	2	702463	4	501739	4	702461	2	501741	0,8190
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miR-764	2	702463	4	501739	4	702461	2	501741	0,8190
miR-802	2	702463	4	501739	4	702461	2	501741	0,8190
miR-875-3p	2	702463	4	501739	4	702461	2	501741	0,8190
miR-885-3p	2	702463	4	501739	4	702461	2	501741	0,8190
miR-888*	2	702463	4	501739	4	702461	2	501741	0,8190
miR-892a	2	702463	4	501739	4	702461	2	501741	0,8190
miR-892b	2	702463	4	501739	4	702461	2	501741	0,8190
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miR-937	2	702463	4	501739	4	702461	2	501741	0,8190
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miR-943	2	702463	4	501739	4	702461	2	501741	0,8190
miR-887	17	702448	7	501736	14	702451	10	501733	0,8191
miR-421	95	702370	55	501688	88	702377	62	501681	0,8191
miR-212	10	702455	12	501731	13	702452	9	501734	0,8264
miR-450b-3p	10	702455	12	501731	13	702452	9	501734	0,8264
miR-34b	15	702450	6	501737	12	702453	9	501734	0,8299
miR-769-5p	29	702436	14	501729	25	702440	18	501725	0,8324
miR-27a*	9	702456	11	501732	12	702453	8	501735	0,8332
miR-146b-3p	3	702462	5	501738	5	702460	3	501740	0,8392
miR-16-1*	3	702462	5	501738	5	702460	3	501740	0,8392
miR-219-5p	3	702462	5	501738	5	702460	3	501740	0,8392
miR-3130-5p	3	702462	5	501738	5	702460	3	501740	0,8392
miR-374c	3	702462	5	501738	5	702460	3	501740	0,8392
miR-582-3p	3	702462	5	501738	5	702460	3	501740	0,8392
miR-769-3p	3	702462	5	501738	5	702460	3	501740	0,8392
miR-876-3p	3	702462	5	501738	5	702460	3	501740	0,8392
miR-92a-2*	3	702462	5	501738	5	702460	3	501740	0,8392
miR-105*	13	702452	5	501738	11	702454	7	501736	0,8392
miR-215	22	702443	10	501733	19	702446	13	501730	0,8392
hsa-let-7f-1*	105	702360	62	501681	97	702368	70	501673	0,8413
miR-19b-2*	4	702461	6	501737	6	702459	4	501739	0,8471
miR-216a	4	702461	6	501737	6	702459	4	501739	0,8471
miR-2278	4	702461	6	501737	6	702459	4	501739	0,8471
miR-3611	6	702459	8	501735	8	702457	6	501737	0,8477
miR-3615	6	702459	8	501735	8	702457	6	501737	0,8477
miR-431	6	702459	8	501735	8	702457	6	501737	0,8477
miR-592	6	702459	8	501735	8	702457	6	501737	0,8477
miR-143*	17	702448	18	501725	20	702445	15	501728	0,8490
miR-224	41	702424	38	501705	46	702419	33	501710	0,8535
miR-376a	1798	700667	1231	500512	1767	700698	1262	500481	0,8591

miR-130a	3059	699406	2254	499489	3099	699366	2214	499529	0,8676
miR-651	28	702437	27	501716	32	702433	23	501720	0,8702
miR-656	39	702426	36	501707	44	702421	31	501712	0,8718
miR-129-3p	26	702439	13	501730	23	702442	16	501727	0,8920
miR-422a	12	702453	13	501730	15	702450	10	501733	0,8945
miR-328	58	702407	33	501710	53	702412	38	501705	0,8954
miR-149*	12	702453	5	501738	10	702455	7	501736	0,9021
miR-26a-1*	10	702455	11	501732	12	702453	9	501734	0,9110
hsa-let-7c*	10	702455	4	501739	8	702457	6	501737	0,9117
miR-3605-5p	10	702455	4	501739	8	702457	6	501737	0,9117
miR-3916	10	702455	4	501739	8	702457	6	501737	0,9117
miR-670	10	702455	4	501739	8	702457	6	501737	0,9117
miR-765	10	702455	4	501739	8	702457	6	501737	0,9117
miR-34a*	35	702430	19	501724	32	702433	22	501721	0,9198
miR-26a-2*	93	702372	77	501666	99	702366	71	501672	0,9215
miR-628-3p	8	702457	9	501734	10	702455	7	501736	0,9261
miR-320c	15	702450	15	501728	18	702447	12	501731	0,9306
miR-301a	91	702374	75	501668	97	702368	69	501674	0,9325
miR-10a*	7	702458	8	501735	9	702456	6	501737	0,9330
miR-1255a	6	702459	7	501736	8	702457	5	501738	0,9393
miR-181c*	6	702459	7	501736	8	702457	5	501738	0,9393
miR-891a	6	702459	7	501736	8	702457	5	501738	0,9393
miR-766	23	702442	12	501731	20	702445	15	501728	0,9405
miR-380*	5	702460	6	501737	6	702459	5	501738	0,9449
miR-488*	5	702460	6	501737	6	702459	5	501738	0,9449
miR-28-3p	789	701676	537	501206	774	701691	552	501191	0,9456
miR-433	80	702385	49	501694	75	702390	54	501689	0,9489
miR-1250	4	702461	5	501738	5	702460	4	501739	0,9495
miR-2116	4	702461	5	501738	5	702460	4	501739	0,9495
miR-3179	4	702461	5	501738	5	702460	4	501739	0,9495

miR-3190	4	702461	5	501738	5	702460	4	501739	0,9495
miR-3199	4	702461	5	501738	5	702460	4	501739	0,9495
miR-3200-5p	4	702461	5	501738	5	702460	4	501739	0,9495
miR-3622a-5p	4	702461	5	501738	5	702460	4	501739	0,9495
miR-548q	4	702461	5	501738	5	702460	4	501739	0,9495
miR-616	4	702461	5	501738	5	702460	4	501739	0,9495
miR-100*	11	702454	5	501738	9	702456	7	501736	0,9496
miR-105	21	702444	11	501732	19	702446	13	501730	0,9513
miR-1224-3p	3	702462	4	501739	4	702461	3	501740	0,9526
miR-1254	3	702462	4	501739	4	702461	3	501740	0,9526
miR-1262	3	702462	4	501739	4	702461	3	501740	0,9526
miR-187*	3	702462	4	501739	4	702461	3	501740	0,9526
miR-194*	3	702462	4	501739	4	702461	3	501740	0,9526
miR-200b*	3	702462	4	501739	4	702461	3	501740	0,9526
miR-222*	3	702462	4	501739	4	702461	3	501740	0,9526
miR-2277-5p	3	702462	4	501739	4	702461	3	501740	0,9526
miR-3118	3	702462	4	501739	4	702461	3	501740	0,9526
miR-3125	3	702462	4	501739	4	702461	3	501740	0,9526
miR-3163	3	702462	4	501739	4	702461	3	501740	0,9526
miR-3177	3	702462	4	501739	4	702461	3	501740	0,9526
miR-3616-3p	3	702462	4	501739	4	702461	3	501740	0,9526
miR-3621	3	702462	4	501739	4	702461	3	501740	0,9526
miR-3622a-3p	3	702462	4	501739	4	702461	3	501740	0,9526
miR-3663-3p	3	702462	4	501739	4	702461	3	501740	0,9526
miR-3692*	3	702462	4	501739	4	702461	3	501740	0,9526
miR-3936	3	702462	4	501739	4	702461	3	501740	0,9526
miR-561	3	702462	4	501739	4	702461	3	501740	0,9526
miR-496	43	702422	25	501718	40	702425	28	501715	0,9547
miR-502-3p	69	702396	57	501686	74	702391	52	501691	0,9560
miR-3151	9	702456	4	501739	8	702457	5	501738	0,9591

miR-873	9	702456	4	501739	8	702457	5	501738	0,9591
miR-30c-1*	46	702419	39	501704	50	702415	35	501708	0,9606
miR-3612	14	702451	7	501736	12	702453	9	501734	0,9631
miR-1228*	10	702455	10	501733	12	702453	8	501735	0,9662
miR-23b*	9	702456	9	501734	11	702454	7	501736	0,9721
miR-1180	224	702241	172	501571	231	702234	165	501578	0,9725
miR-361-5p	532	701933	362	501381	522	701943	372	501371	0,9728
miR-545*	14	702451	13	501730	16	702449	11	501732	0,9767
miR-3913	8	702457	8	501735	9	702456	7	501736	0,9775
miR-511	8	702457	8	501735	9	702456	7	501736	0,9775
miR-641	10	702455	5	501738	9	702456	6	501737	0,9801
miR-181a*	47	702418	29	501714	44	702421	32	501711	0,9837
miR-668	8	702457	4	501739	7	702458	5	501738	0,9869
miR-195	3021	699444	2123	499620	3001	699464	2143	499600	0,9877
miR-1271	21	702444	18	501725	23	702442	16	501727	0,9883
miR-15a*	16	702449	14	501729	18	702447	12	501731	0,9892
miR-3130-3p	16	702449	14	501729	18	702447	12	501731	0,9892
hsa-let-7a-2*	19	702446	11	501732	18	702447	12	501731	0,9893
miR-489	5	702460	5	501738	6	702459	4	501739	0,9907
miR-744*	5	702460	5	501738	6	702459	4	501739	0,9907
miR-33a	43	702422	27	501716	41	702424	29	501714	0,9913
miR-1197	15	702450	13	501730	16	702449	12	501731	0,9922
miR-3184	10	702455	9	501734	11	702454	8	501735	0,9926
miR-193a-5p	134	702331	102	501641	138	702327	98	501645	0,9936
miR-940	36	702429	29	501714	38	702427	27	501716	0,9937
miR-124*	4	702461	4	501739	5	702460	3	501740	0,9939
miR-1243	4	702461	4	501739	5	702460	3	501740	0,9939
miR-1253	4	702461	4	501739	5	702460	3	501740	0,9939
miR-1258	4	702461	4	501739	5	702460	3	501740	0,9939
miR-1273d	4	702461	4	501739	5	702460	3	501740	0,9939

miR-129*	4	702461	4	501739	5	702460	3	501740	0,9939
miR-1295	4	702461	4	501739	5	702460	3	501740	0,9939
miR-1914*	4	702461	4	501739	5	702460	3	501740	0,9939
miR-211	4	702461	4	501739	5	702460	3	501740	0,9939
miR-3160	4	702461	4	501739	5	702460	3	501740	0,9939
miR-3175	4	702461	4	501739	5	702460	3	501740	0,9939
miR-3607-5p	4	702461	4	501739	5	702460	3	501740	0,9939
miR-363*	4	702461	4	501739	5	702460	3	501740	0,9939
miR-466	4	702461	4	501739	5	702460	3	501740	0,9939
miR-548k	4	702461	4	501739	5	702460	3	501740	0,9939
miR-551b	4	702461	4	501739	5	702460	3	501740	0,9939
miR-570	4	702461	4	501739	5	702460	3	501740	0,9939
miR-636	4	702461	4	501739	5	702460	3	501740	0,9939
miR-770-5p	4	702461	4	501739	5	702460	3	501740	0,9939
miR-888	4	702461	4	501739	5	702460	3	501740	0,9939
miR-186*	9	702456	5	501738	8	702457	6	501737	0,9951
miR-3154	9	702456	5	501738	8	702457	6	501737	0,9951
miR-548w	9	702456	8	501735	10	702455	7	501736	0,9952
miR-188-5p	43	702422	34	501709	45	702420	32	501711	0,9955
miR-381	297	702168	204	501539	292	702173	209	501534	0,9960
miR-584	12	702453	7	501736	11	702454	8	501735	0,9961
miR-2355-3p	18	702447	11	501732	17	702448	12	501731	0,9967
miR-1248	8	702457	7	501736	9	702456	6	501737	0,9972
miR-203	12	702453	10	501733	13	702452	9	501734	0,9980
miR-676	7	702458	4	501739	6	702459	5	501738	0,9981
miR-758	161	702304	120	501623	164	702301	117	501626	0,9981
miR-589*	10	702455	6	501737	9	702456	7	501736	0,9984
miR-1285	19	702446	12	501731	18	702447	13	501730	0,9985
miR-500a*	43	702422	33	501710	44	702421	32	501711	0,9989
miR-99b*	45	702420	30	501713	44	702421	31	501712	0,9991

hsa-let-7f-2*	19	702446	15	501728	20	702445	14	501729	0,9991
miR-767-5p	19	702446	15	501728	20	702445	14	501729	0,9991
miR-545	17	702448	11	501732	16	702449	12	501731	0,9995
miR-3679-5p	6	702459	5	501738	6	702459	5	501738	0,9995
miR-431*	6	702459	5	501738	6	702459	5	501738	0,9995
miR-890	6	702459	5	501738	6	702459	5	501738	0,9995
miR-337-5p	18	702447	14	501729	19	702446	13	501730	0,9996
miR-708*	10	702455	8	501735	11	702454	7	501736	0,9996
miR-944	11	702454	7	501736	11	702454	7	501736	0,9996
miR-483-3p	43	702422	29	501714	42	702423	30	501713	0,9996
miR-1299	8	702457	5	501738	8	702457	5	501738	0,9996
miR-150*	8	702457	5	501738	8	702457	5	501738	0,9996
miR-206	8	702457	5	501738	8	702457	5	501738	0,9996
miR-432*	8	702457	5	501738	8	702457	5	501738	0,9996
miR-132*	90	702375	62	501681	89	702376	63	501680	0,9997
miR-574-3p	969	701496	698	501045	972	701493	695	501048	0,9999
miR-1266	5	702460	4	501739	5	702460	4	501739	0,9999
miR-1267	5	702460	4	501739	5	702460	4	501739	0,9999
miR-3605-3p	5	702460	4	501739	5	702460	4	501739	0,9999
miR-3661	5	702460	4	501739	5	702460	4	501739	0,9999
miR-939	5	702460	4	501739	5	702460	4	501739	0,9999
miR-500a	38	702427	26	501717	37	702428	27	501716	0,9999
miR-331-5p	22	702443	15	501728	22	702443	15	501728	1,0000
miR-541*	6	702459	4	501739	6	702459	4	501739	1,0000
miR-654-5p	6	702459	4	501739	6	702459	4	501739	1,0000
miR-330-3p	16	702449	11	501732	16	702449	11	501732	1,0000
miR-671-3p	8	702457	6	501737	8	702457	6	501737	1,0000
miR-103-2*	15	702450	11	501732	15	702450	11	501732	1,0000
miR-877	37	702428	26	501717	37	702428	26	501717	1,0000
miR-136*	193	702272	137	501606	193	702272	137	501606	1,0000



miR-29a*	283	702182	203	501540	284	702181	202	501541	1,0000
miR-452	11	702454	8	501735	11	702454	8	501735	1,0000
miR-1294	7	702458	5	501738	7	702458	5	501738	1,0000
miR-3065-5p	7	702458	5	501738	7	702458	5	501738	1,0000

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# P-values were calculated using  $\chi^2$  test; P<0.0001 is considered as significant

**Supplementary Table 3.** Sequencing-based SAM results for differentially expressed miRNAs between TGCTs and NT

<b>miRNA</b>	<b>Score (d)</b>	<b>Fold change (log2)</b>	<b>FDR (q-value)</b>
<b>Over-expressed miRNAs in TGCTs</b>			
miR-223	1,2	2,0	72,4
miR-15a	1,2	1,8	72,4
miR-21	1,1	2,1	72,8
miR-92a	1,0	1,8	75,0
miR-15b	0,9	1,7	75,0
miR-27a	0,9	1,8	75,0
miR-142-3p	0,9	2,2	77,7
miR-19b	0,9	1,7	77,7
miR-25	0,9	1,8	77,7
miR-96	0,9	2,0	77,7
miR-374a	0,8	1,9	82,3
miR-302b*	0,8	1,9	82,3
miR-372	0,8	2,0	82,3
miR-302b	0,8	2,2	82,3
miR-183	0,8	1,7	82,3
miR-367	0,8	2,1	82,3
miR-142-5p	0,8	2,0	82,3
miR-182	0,8	2,1	82,3
miR-515-5p	0,8	2,0	82,3
miR-19a	0,8	1,9	82,3
miR-7	0,7	1,8	82,5
miR-16	0,7	1,6	82,5
miR-302a	0,7	2,2	83,3
<b>Under-expressed miRNAs in TGCTs</b>			
miR-202	-8,3	0,0	0,0
miR-507	-6,3	0,1	0,0
miR-510	-5,3	0,0	0,0
miR-513c	-4,1	0,1	0,0
miR-514	-4,1	0,0	0,0
miR-424*	-3,9	0,1	0,0
miR-508-5p	-3,8	0,1	0,0
miR-513b	-2,7	0,0	0,0
miR-542-5p	-2,5	0,2	0,0
miR-508-3p	-2,5	0,0	0,0
miR-202*	-2,5	0,1	0,0
miR-134	-2,5	0,2	0,0
miR-503	-2,5	0,2	0,0
miR-509-3p	-2,4	0,1	0,0
miR-424	-2,3	0,2	6,2
miR-506	-2,0	0,2	18,7
miR-129-5p	-1,9	0,1	18,7
miR-193b*	-1,9	0,2	18,7
miR-204	-1,9	0,2	18,7
miR-483-5p	-1,9	0,3	18,7

miR-99a*	-1,7	0,2	26,7
miR-509-3-5p	-1,6	0,3	32,5
hsa-let-7b	-1,6	0,2	32,5
miR-494	-1,5	0,4	36,0
hsa-let-7c	-1,5	0,2	36,0
miR-513a-3p	-1,5	0,3	36,0
miR-10b*	-1,4	0,3	41,6
miR-324-5p	-1,3	0,5	50,1
miR-23a*	-1,3	0,3	50,1
miR-25*	-1,3	0,5	50,1
miR-29b-2*	-1,2	0,4	50,1
miR-542-3p	-1,2	0,5	50,1
miR-485-5p	-1,2	0,4	50,1
miR-210	-1,2	0,4	50,1
miR-411	-1,2	0,5	50,1
miR-487b	-1,1	0,5	50,1
miR-2110	-1,1	0,3	50,1
miR-874	-1,1	0,4	56,1
miR-320a	-1,0	0,4	56,1
miR-214	-1,0	0,4	56,1
miR-140-3p	-1,0	0,5	56,1
miR-99a	-1,0	0,4	56,1
miR-151-3p	-1,0	0,5	56,1
miR-509-5p	-1,0	0,4	56,1
miR-664*	-1,0	0,4	56,1
miR-423-5p	-1,0	0,5	56,1
miR-1908	-0,9	0,4	56,1
miR-362-5p	-0,9	0,4	56,1
miR-127-3p	-0,9	0,6	56,1
miR-449a	-0,9	0,4	56,1
miR-514b-5p	-0,9	0,4	56,1
miR-409-3p	-0,9	0,6	56,1
miR-574-5p	-0,8	0,6	56,1
miR-744	-0,8	0,6	56,1
miR-199a-5p	-0,8	0,6	56,1
miR-450a	-0,8	0,6	56,1
miR-193b	-0,8	0,6	56,1
miR-370	-0,8	0,5	56,1
miR-125a-3p	-0,7	0,5	61,9
miR-221	-0,7	0,7	61,9
miR-299-3p	-0,7	0,6	61,9
miR-133a	-0,7	0,5	61,9
miR-1296	-0,6	0,5	61,9
miR-642a	-0,6	0,5	61,9
miR-525-3p	-0,6	0,6	61,9
miR-517b	-0,6	0,6	61,9
miR-200a	-0,6	0,6	61,9
miR-520d-5p	-0,6	0,6	61,9
miR-197	-0,5	0,7	64,9
miR-520e	-0,5	0,6	64,9
hsa-let-7a	-0,5	0,6	64,9
miR-127-5p	-0,5	0,7	64,9

miR-181b	-0,5	0,7	64,9
miR-642b	-0,5	0,6	64,9
miR-362-3p	-0,5	0,7	64,9
miR-521	-0,5	0,6	64,9
miR-375	-0,5	0,6	64,9
miR-1301	-0,5	0,7	64,9
miR-345	-0,5	0,7	64,9
miR-373*	-0,5	0,7	64,9
miR-522	-0,4	0,7	64,9
miR-339-5p	-0,4	0,7	64,9
miR-497	-0,4	0,7	64,9
hsa-let-7e	-0,4	0,7	64,9
miR-302c*	-0,4	0,7	64,9
miR-518d-3p	-0,4	0,7	68,5
miR-660	-0,4	0,8	68,5
miR-125b	-0,4	0,7	68,5
miR-135a	-0,3	0,7	68,5
miR-26b*	-0,3	0,8	70,9
miR-28-5p	-0,3	0,8	70,9
miR-615-3p	-0,3	0,7	70,9
miR-152	-0,3	0,8	70,9
miR-130b*	-0,3	0,8	70,9
miR-92a-1*	-0,3	0,8	70,9
miR-382	-0,3	0,8	70,9
miR-488	-0,3	0,8	70,9
miR-125a-5p	-0,3	0,8	70,9
miR-1269	-0,2	0,8	70,9
miR-520g	-0,2	0,8	72,4
miR-30b*	-0,2	0,8	72,4
miR-411*	-0,2	0,9	72,4
miR-548x	-0,2	0,8	72,4
miR-523	-0,2	0,9	72,4
miR-520a-3p	-0,2	0,9	72,4

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FDR = False discovery rate

**Supplementary Table 4.** Results from immunohistochemical analysis of p50 and PEG3 in TGCTs, non-germ cell testicular tumors, and testicular non-tumor tissues

Immunohistochemical marker Sample type	(n =)	Immunohistochemistry [Number (%)]			
		Negative	Weak	Intermediate	Strong
<b>p50 staining</b>					
<b>TGCTs</b>	<b>96</b>	<b>2 (2.1)</b>	<b>11 (11.5)</b>	<b>8 (8.3)</b>	<b>75 (78.1)</b>
Seminoma (classic, multinodular, anaplastic)	66	2 (3.0)	7 (10.6)	7 (10.6)	50 (75.8)
Embryonal carcinoma	17	0	2 (11.8)	1 (5.9)	14 (82.4)
Yolk sac tumor	7	0	0	0	7 (100)
Mixed germ cell tumor	1	0	0	0	1 (100)
Teratoma	2	0	1 (50)	0	1 (50)
Choriocarcinoma	1	0	0	0	1 (100)
IGCNU	2	0	1 (50)	0	1 (50)
<b>Non-germ cell testicular tumors</b>	<b>8</b>	<b>0</b>	<b>4 (50)</b>	<b>0</b>	<b>4 (50)</b>
Testis adenomatoid tumor	1	0	0	0	1 (100)
Testis fibrous pseudotumor	1	0	0	0	1 (100)
Leydig cell tumor	1	0	0	0	1 (100)
Testis liposarcoma	3	0	3 (100)	0	0
Testis papillary serous	1	0	1 (100)	0	0
Testis adenocarcinoma	1	0	0	0	1 (100)
<b>Testicular non-tumor tissues</b>	<b>25</b>	<b>1 (4)</b>	<b>8 (32)</b>	<b>3 (12)</b>	<b>13 (52)</b>
<b>PEG3 staining</b>					
<b>TGCTs</b>	<b>96</b>	<b>4 (4.2)</b>	<b>2 (2.1)</b>	<b>10 (10.4)</b>	<b>80 (83.3)</b>
Seminoma (classic, multinodular, anaplastic)	63	3 (4.8)	2 (3.2)	8 (12.7)	50 (79.4)
Embryonal carcinoma	18	0	0	0	18 (100)
Yolk sac tumor	7	0	0	2 (28.6)	5 (71.4)
Mixed germ cell tumor	1	0	0	0	1 (100)
Teratoma	4	1 (25)	0	0	3 (75)
Choriocarcinoma	1	0	0	0	1 (100)
IGCNU	2	0	0	0	2 (100)
<b>Non-germ cell testicular tumors</b>	<b>8</b>	<b>0</b>	<b>5 (62.5)</b>	<b>0</b>	<b>3 (37.5)</b>
Testis adenomatoid tumor	1	0	1 (100)	0	0
Testis fibrous pseudotumor	1	0	1 (100)	0	0
Leydig cell tumor	1	0	0	0	1 (100)
Testis liposarcoma	3	0	2 (66.7)	0	1 (33.3)
Testis papillary serous	1	0	1 (100)	0	0
Testis adenocarcinoma	1	0	0	0	1 (100)
<b>Testicular non-tumor tissues</b>	<b>25</b>	<b>0</b>	<b>12 (48)</b>	<b>3 (12)</b>	<b>10 (40)</b>

IGCNU = intratubular germ cell neoplasia unclassified

Negative = All nuclei scored as having intensity 0

Weak = A mixture of nuclei scored as having intensity 0 and 1+, 2+ or 3+

Intermediate = All nuclei scored as intensity 1+ or a mixture of nuclei scored as 1+ and 2+ or 3+

Strong = A mixture of nuclei scored as having intensity 2+, 3+ or a mixture of nuclei with 2+ and 3+

**Supplementary Table 5.** Genotypes of the 2102Ep and TCam-2 cell lines  
for short tandem repeat (STR) markers

<b>Locus</b>	<b>2102Ep</b>		<b>TCam-2</b>		
	<b>Publication</b>	<b>This study</b>	<b>Reference (17)</b>	<b>This study</b>	<b>Reference (17)</b>
<i>AMEL</i>		X, Y	X, Y	X, Y	X, Y
<i>D8S1179</i>		14, 15	-	14, 17	-
<i>D21S11</i>		28, 29	-	30	-
<i>D7S820</i>		7	7, 13	8, 11	8, 11
<i>CSF1PO</i>		11, 12	11, 12	9, 11	9, 11
<i>D3S1358</i>		16	-	16, 17	-
<i>TH01</i>		9, 9.3	9, 9.3	6, 9	6, 9
<i>D13S317</i>		8	8	8, 12	8, 12
<i>D16S539</i>		11, 12	11, 12	9	9
<i>D2S1338</i>		17, 20	-	23	-
<i>D19S433</i>		13, 14	-	15	-
<i>vWA</i>		16, 17, 18	13, 16, 18	18, 19	18, 19
<i>TPOX</i>		8, 11	8, 11	9	9
<i>D18S51</i>		15	-	13	-
<i>D5S818</i>		11	11	11, 12	11, 12
<i>FGA</i>		22	-	25	-

Reference (17) Palmer *et al.* 2010.

**Supplementary Table 6.** List of the oligonucleotides used in the study

<b>Purpose, Name</b>	<b>Oligonucleotide Sequences (5' to 3')</b>
<b>Small RNA cloning</b>	
3'-adaptor ("Linker-1"; IDT)	/5rApp/CTGTAGGCACCATCAAT/3ddC
5'-adaptor	ACGCTCTTCCGATCTv
RT	ATTGATGGTGCCTACAG
Amp_F	GATACGGCGACCACCGAGATCTACACTCTTCCCTACACGACGCTCTTCCGATCT
Amp_R	CAAGCAGAAGACGGCATAACGAGCTCTTCCGATCTATTGATGGTGCCTACAG
<b>PEG3 3'UTR luciferase reporter constructs</b>	
WT_sense	TTTATGATTATAACTGTGTCAAAtagtATTCTATCTGTAATAGTGTCAACtagtTAGGGCTTGGAAGTATG TCAAAGtagtTCAAAGATGCAGGGAGTGTCAA
WT_antisense	TTTGACACTCCCTGCATCTTTGAactaCTTTGACATACTTCCAAGCCCTAactaGTTGACACTATTACAG ATAGAATactaTTTGACACAGTTATAATCATAAA
MUT_sense	TTTATGATTATAACTGTGCGAAAtagtATTCTATCTGTAATAGTGTTACtagtTAGGGCTTGGAAGTATTGA AAGtagtTCAAAGATGCAGGGAGTGTGCGAA
MUT_antisense	TTCGCACTCCCTGCATCTTTGAactaCTTTCAATACTTCCAAGCCCTAactaGTAACACTATTACAGATA GAATactaTTCGCACAGTTATAATCATAAA
<b>shRNA constructs</b>	
shPEG3-1_sense	GATCTGCCTAATCTATGTGGAATTTGTCGAAAAATTCCACATAGATTAGGTTTTTTTTGGTAC
shPEG3-1_antisense	CAAAAAACCTAATCTATGTGGAATTTTTTCGACAAATTCCACATAGATTAGGCA
shPEG3-2_sense	GATCTGGCTCTAACCCCTATGAAAACCCGAATTTTCATAGGGGTTAGAGCTATTTTTGGTAC
shPEG3-2_antisense	CAAAAATAGCTCTAACCCCTATGAAAATTCGGGTTTTTCATAGGGGTTAGAGCCA
<b>PEG3 CDS construct</b>	
PEG3-F	ATGCTGCCTCCAAAGCACTTGTC
PEG3-R	TCAGCCAGTGTGGGTATTCTGGT
<b>PEG3 Pyrosequencing*</b>	
PEG-SF	TGTCTTCTAGGCTGCTTGGTTCGTGCC
PEG3-F	CTCACAACACAATCCAGGAC
PEG3-R	TAGACCTCGACTGGTGCTTG

v = barcodes with triple RNA molecules: aaa, ggg, ccc or uuu; \* Primers were used in Ref. 40