

Supplementary Material

Circular RNA Expression Profile in Laryngeal Squamous Cell Carcinoma Revealed by Microarray

Yue Fan Xin Xia Yingying Zhu Wenwen Diao Xiaoli Zhu Zhiqiang Gao Xingming Chen

Department of Otolaryngology-Head and Neck Surgery, Peking Union Medical College Hospital, Peking Union Medical
College and Chinese Academy of Medical Sciences, Beijing, China

Table S1. The primers used in this study

Primers	Sequences
hsa_circ_0005534_Divergent_F	CACCATTTGGAAGGAACAGTACAG
hsa_circ_0005534_Divergent_R	GTGAGAGACCCTGAATCATAG
hsa_circ_0044519_Divergent_F	AGAGCATGACCGATGGATTCC
hsa_circ_0044519_Divergent_D	CAGCTTCCCCATCATCTCCAT
hsa_circ_0044518_Divergent_F	AGAGCATGACCGATGGATTCC
hsa_circ_0044518_Divergent_D	CACCAACAGCACCAGGGAAG
hsa_circ_0044520_Divergent_F	CTGGCAAAGATGGACTCAAC
hsa_circ_0044520_Divergent_D	CTTAGCACCAACAGCACCAG
hsa_circ_0044517_Divergent_F	AGAGCATGACCGATGGATTCC
hsa_circ_0044517_Divergent_D	GTTACCCGCTGTTACCCTTG
hsa_circ_0044529_Divergent_F	CTGGTGAATCTGGACGTGAG
hsa_circ_0044529_Divergent_D	TTCCACACGTCTCGGTCATG
hsa_circ_0065404_Divergent_F	CAGTTCATCGCATCTGGATC
hsa_circ_0065404_Divergent_D	CCAAGTCACGCAGCAACACT
hsa_circ_0044527_Divergent_F	CTAGTTATGCTGCAGACACTGC
hsa_circ_0044527_Divergent_D	GGCCTCGGACACCTGGGTC
hsa_circ_0044539_Divergent_F	CTGCTGGCGAGAAAGGATC
hsa_circ_0044539_Divergent_D	GTAGCACCATCATTTCACGAGC
hsa_circ_0029399_Divergent_F	ATCAGGAGGAGCCCAATGTG
hsa_circ_0029399_Divergent_R	CTGGTTGGCATCTTCATTTAC

Table S2. The differentially expressed circRNAs in laryngeal squamous cell carcinoma tissues and normal laryngeal tissues.

ProbeName	<i>p</i>	FC (abs)	Regulation	chr
hsa_circ_0004507	0.009996	2.231023	up	chr19
hsa_circ_0001883	0.009938	3.072945	up	chr9
hsa_circ_0022373	0.009857	3.888141	up	chr11
hsa_circ_0020377	0.009834	3.574084	up	chr10
hsa_circ_0076130	0.00983	2.173773	up	chr6
hsa_circ_0060211	0.009768	2.363412	up	chr20
hsa_circ_0075264	0.00973	3.578814	up	chr5
hsa_circ_0057440	0.009719	3.304656	up	chr2
hsa_circ_0091851	0.009674	3.031161	up	chrX
hsa_circ_0092012	0.009668	2.092444	up	chrX
hsa_circ_0005906	0.00958	2.417524	up	chr7
hsa_circ_0068107	0.009527	2.326383	up	chr3
hsa_circ_0060451	0.009496	3.084313	up	chr20
hsa_circ_0026420	0.009341	6.720497	up	chr12
hsa_circ_0043624	0.009328	5.770058	up	chr17
hsa_circ_0031907	0.009252	2.300064	up	chr14
hsa_circ_0043609	0.009238	8.70186	up	chr17
hsa_circ_0002974	0.009228	2.177556	up	chr7
hsa_circ_0091834	0.009175	2.473493	up	chrX
hsa_circ_0044554	0.009168	4.577672	up	chr17
hsa_circ_0075828	0.009164	3.807678	up	chr6
hsa_circ_0045481	0.009029	2.450796	up	chr17
hsa_circ_0001821	0.009024	2.681084	up	chr8
hsa_circ_0044540	0.008986	2.730403	up	chr17
hsa_circ_0044539	0.008961	3.078788	up	chr17
hsa_circ_0043758	0.008913	2.394811	up	chr17
hsa_circ_0030863	0.008757	6.30737	up	chr13
hsa_circ_0022590	0.008702	2.529154	up	chr11
hsa_circ_0056078	0.008692	2.132458	up	chr2
hsa_circ_0006086	0.00866	2.94115	up	chr8
hsa_circ_0085555	0.008584	2.303459	up	chr8
hsa_circ_0030869	0.00858	6.560928	up	chr13
hsa_circ_0031882	0.008563	2.862336	up	chr14
hsa_circ_0003313	0.008546	2.029735	up	chr13
hsa_circ_0044812	0.008478	3.395134	up	chr17
hsa_circ_0065446	0.008439	2.299186	up	chr3
hsa_circ_0002645	0.008432	2.30596	up	chr12
hsa_circ_0029393	0.008422	2.01423	up	chr12
hsa_circ_0051350	0.008414	2.675952	up	chr19

hsa_circ_0018522	0.008384	3.144871	up	chr10
hsa_circ_0051719	0.008373	2.214054	up	chr19
hsa_circ_0032324	0.008342	2.21883	up	chr14
hsa_circ_0043554	0.008268	2.422202	up	chr17
hsa_circ_0044537	0.008268	2.924186	up	chr17
hsa_circ_0020373	0.008258	2.225052	up	chr10
hsa_circ_0043615	0.008245	6.100886	up	chr17
hsa_circ_0068322	0.00813	2.174454	up	chr3
hsa_circ_0044544	0.008078	2.636803	up	chr17
hsa_circ_0072705	0.008074	2.480026	up	chr5
hsa_circ_0075961	0.008066	2.808236	up	chr6
hsa_circ_0030837	0.008033	2.375254	up	chr13
hsa_circ_0044533	0.008007	4.602061	up	chr17
hsa_circ_0085529	0.008004	2.100866	up	chr8
hsa_circ_0024111	0.007941	3.968299	up	chr11
hsa_circ_0060551	0.00794	4.159546	up	chr20
hsa_circ_0001944	0.007846	7.832311	up	chrX
hsa_circ_0071658	0.007824	2.133128	up	chr5
hsa_circ_0043630	0.00781	8.471244	up	chr17
hsa_circ_0051718	0.007723	2.020428	up	chr19
hsa_circ_0046824	0.007721	2.802672	up	chr18
hsa_circ_0044513	0.007701	5.762819	up	chr17
hsa_circ_0071680	0.007673	3.020333	up	chr5
hsa_circ_0023628	0.007634	3.120299	up	chr11
hsa_circ_0044538	0.007629	2.999109	up	chr17
hsa_circ_0043618	0.00762	5.13384	up	chr17
hsa_circ_0055671	0.007561	3.55388	up	chr2
hsa_circ_0034613	0.007559	2.49514	up	chr15
hsa_circ_0055669	0.007551	2.88766	up	chr2
hsa_circ_0032930	0.007474	3.143332	up	chr14
hsa_circ_0038130	0.007446	2.251013	up	chr16
hsa_circ_0043655	0.007441	2.175936	up	chr17
hsa_circ_0022394	0.007433	2.315723	up	chr11
hsa_circ_0082841	0.007422	2.945417	up	chr7
hsa_circ_0009884	0.007377	2.1096	up	chr1
hsa_circ_0040802	0.00737	5.349885	up	chr16
hsa_circ_0053890	0.007269	5.042295	up	chr2
hsa_circ_0059730	0.007226	2.575389	up	chr20
hsa_circ_0052607	0.007211	3.074985	up	chr2
hsa_circ_0049987	0.0072	3.932283	up	chr19
hsa_circ_0001032	0.007189	2.107469	up	chr2
hsa_circ_0044527	0.007166	4.55957	up	chr17
hsa_circ_0065404	0.007164	3.341924	up	chr3

hsa_circ_0084338	0.007114	2.020977	up	chr8
hsa_circ_0022581	0.007105	2.46721	up	chr11
hsa_circ_0068293	0.007054	2.347363	up	chr3
hsa_circ_0009098	0.007046	2.535964	up	chr20
hsa_circ_0065438	0.00702	3.317741	up	chr3
hsa_circ_0042694	0.007013	3.044423	up	chr17
hsa_circ_0085990	0.006897	2.45536	up	chr8
hsa_circ_0084097	0.006893	2.453028	up	chr8
hsa_circ_0077061	0.006822	7.52596	up	chr6
hsa_circ_0080264	0.006759	2.258724	up	chr7
hsa_circ_0069484	0.006755	2.105276	up	chr4
hsa_circ_0023370	0.006735	2.193572	up	chr11
hsa_circ_0079911	0.006728	5.206437	up	chr7
hsa_circ_0036696	0.006574	2.107713	up	chr15
hsa_circ_0030868	0.006555	3.806705	up	chr13
hsa_circ_0091534	0.00651	3.307443	up	chrX
hsa_circ_0012589	0.006476	2.121626	up	chr1
hsa_circ_0077062	0.006442	7.475181	up	chr6
hsa_circ_0077053	0.006381	2.404713	up	chr6
hsa_circ_0082843	0.006361	3.813462	up	chr7
hsa_circ_0025936	0.006228	5.513973	up	chr12
hsa_circ_0091536	0.006167	5.81552	up	chrX
hsa_circ_0008219	0.006167	2.416387	up	chr3
hsa_circ_0034550	0.006162	4.323649	up	chr15
hsa_circ_0035306	0.006134	2.195851	up	chr15
hsa_circ_0030876	0.006104	4.866105	up	chr13
hsa_circ_0005659	0.006099	2.876991	up	chr17
hsa_circ_0086441	0.006082	2.393882	up	chr9
hsa_circ_0024060	0.005997	3.301274	up	chr11
hsa_circ_0012588	0.005918	2.629245	up	chr1
hsa_circ_0030279	0.005874	3.339066	up	chr13
hsa_circ_0067172	0.005864	2.397495	up	chr3
hsa_circ_0045614	0.005839	2.011347	up	chr17
hsa_circ_0037538	0.005776	2.000493	up	chr16
hsa_circ_0065444	0.005741	2.504846	up	chr3
hsa_circ_0091547	0.005699	7.794535	up	chrX
hsa_circ_0025721	0.005583	3.118824	up	chr12
hsa_circ_0080527	0.005567	2.142465	up	chr7
hsa_circ_0025723	0.005529	2.760705	up	chr12
hsa_circ_0052603	0.005508	4.403049	up	chr2
hsa_circ_0045479	0.005421	2.135014	up	chr17
hsa_circ_0027446	0.005398	16.34489	up	chr12
hsa_circ_0008303	0.005377	2.368191	up	chr8

hsa_circ_0051358	0.005375	2.563383	up	chr19
hsa_circ_0064221	0.005372	2.561098	up	chr3
hsa_circ_0045036	0.005368	2.340985	up	chr17
hsa_circ_0029399	0.005327	2.734041	up	chr12
hsa_circ_0041850	0.005223	4.198134	up	chr17
hsa_circ_0054351	0.005165	2.257332	up	chr2
hsa_circ_0032917	0.005146	2.509973	up	chr14
hsa_circ_0022584	0.00512	2.61572	up	chr11
hsa_circ_0042695	0.005119	2.490671	up	chr17
hsa_circ_0056140	0.005082	2.308029	up	chr2
hsa_circ_0023818	0.005074	2.101318	up	chr11
hsa_circ_0038637	0.005054	3.476833	up	chr16
hsa_circ_0055670	0.005046	6.664591	up	chr2
hsa_circ_0009009	0.005044	2.467612	up	chr12
hsa_circ_0048675	0.005	2.502181	up	chr19
hsa_circ_0036695	0.004989	2.260958	up	chr15
hsa_circ_0038633	0.004933	4.366608	up	chr16
hsa_circ_0030862	0.004896	6.398261	up	chr13
hsa_circ_0016380	0.004887	2.636761	up	chr1
hsa_circ_0057366	0.004838	4.579884	up	chr2
hsa_circ_0056375	0.00481	2.383475	up	chr2
hsa_circ_0031283	0.004801	2.456261	up	chr14
hsa_circ_0002441	0.004735	2.26281	up	chr20
hsa_circ_0044027	0.004716	2.681967	up	chr17
hsa_circ_0008147	0.004716	2.281591	up	chr8
hsa_circ_0085997	0.004703	2.407788	up	chr8
hsa_circ_0052605	0.00467	4.199795	up	chr2
hsa_circ_0059715	0.004666	2.207486	up	chr20
hsa_circ_0027447	0.004647	14.14796	up	chr12
hsa_circ_0080803	0.004585	2.298187	up	chr7
hsa_circ_0004125	0.004557	3.561294	up	chr3
hsa_circ_0003209	0.004533	3.628258	up	chr20
hsa_circ_0085469	0.004516	4.60515	up	chr8
hsa_circ_0059728	0.004513	2.219648	up	chr20
hsa_circ_0021268	0.004468	2.179016	up	chr11
hsa_circ_0025047	0.004415	3.933019	up	chr12
hsa_circ_0090955	0.004411	2.982397	up	chrX
hsa_circ_0045872	0.004409	3.117609	up	chr17
hsa_circ_0088168	0.004341	3.427121	up	chr9
hsa_circ_0068392	0.004339	2.874488	up	chr3
hsa_circ_0080391	0.004315	2.326219	up	chr7
hsa_circ_0069491	0.004314	2.624152	up	chr4
hsa_circ_0032929	0.004277	2.227204	up	chr14

hsa_circ_0030860	0.004273	5.099069	up	chr13
hsa_circ_0002563	0.004256	3.48925	up	chr1
hsa_circ_0050699	0.004237	2.179189	up	chr19
hsa_circ_0044521	0.004167	3.512512	up	chr17
hsa_circ_0043628	0.004166	14.3382	up	chr17
hsa_circ_0053167	0.004109	3.145179	up	chr2
hsa_circ_0043611	0.004087	10.84251	up	chr17
hsa_circ_0072116	0.004076	3.33784	up	chr5
hsa_circ_0069486	0.004058	3.000697	up	chr4
hsa_circ_0059223	0.004008	2.147945	up	chr20
hsa_circ_0006290	0.003952	2.126307	up	chr13
hsa_circ_0044517	0.003848	7.854317	up	chr17
hsa_circ_0038056	0.003845	2.483544	up	chr16
hsa_circ_0060457	0.00382	2.531219	up	chr20
hsa_circ_0025041	0.003779	2.073729	up	chr12
hsa_circ_0070978	0.003769	2.165741	up	chr4
hsa_circ_0040795	0.003763	5.613094	up	chr16
hsa_circ_0059675	0.003754	2.76051	up	chr20
hsa_circ_0030872	0.003749	5.708268	up	chr13
hsa_circ_0051351	0.003729	2.859786	up	chr19
hsa_circ_0016384	0.003719	2.938153	up	chr1
hsa_circ_0040796	0.003635	6.717318	up	chr16
hsa_circ_0086003	0.003632	2.47068	up	chr8
hsa_circ_0060571	0.00363	6.049099	up	chr20
hsa_circ_0076541	0.003621	2.592463	up	chr6
hsa_circ_0010172	0.003621	4.086665	up	chr1
hsa_circ_0085540	0.003616	2.928501	up	chr8
hsa_circ_0029131	0.003578	2.382801	up	chr12
hsa_circ_0044520	0.003561	2.931335	up	chr17
hsa_circ_0052243	0.003504	2.587405	up	chr19
hsa_circ_0043949	0.003491	3.237113	up	chr17
hsa_circ_0006332	0.003439	4.058431	up	chr20
hsa_circ_0001135	0.003333	2.566304	up	chr20
hsa_circ_0091537	0.003303	7.798972	up	chrX
hsa_circ_0060466	0.003293	5.072971	up	chr20
hsa_circ_0052040	0.003288	3.649704	up	chr19
hsa_circ_0002979	0.00321	3.930623	up	chr19
hsa_circ_0065443	0.003208	2.424835	up	chr3
hsa_circ_0025932	0.0032	5.133982	up	chr12
hsa_circ_0056267	0.003198	2.67013	up	chr2
hsa_circ_0007080	0.00318	2.101971	up	chr3
hsa_circ_0036708	0.003125	2.011402	up	chr15
hsa_circ_0059729	0.003125	2.622459	up	chr20

hsa_circ_0065411	0.003096	3.022556	up	chr3
hsa_circ_0044515	0.003064	6.715279	up	chr17
hsa_circ_0037052	0.002969	2.17244	up	chr15
hsa_circ_0012170	0.002928	2.231597	up	chr1
hsa_circ_0030871	0.002871	4.237455	up	chr13
hsa_circ_0089780	0.00281	2.177274	up	chrX
hsa_circ_0016386	0.002808	2.470219	up	chr1
hsa_circ_0060550	0.002792	3.159543	up	chr20
hsa_circ_0091538	0.002781	3.390919	up	chrX
hsa_circ_0040797	0.002742	5.368018	up	chr16
hsa_circ_0069125	0.002736	2.808878	up	chr4
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hsa_circ_0083138	0.002713	4.02432	up	chr7
hsa_circ_0031913	0.002692	2.032805	up	chr14
hsa_circ_0060459	0.002598	2.339319	up	chr20
hsa_circ_0068230	0.002588	2.370367	up	chr3
hsa_circ_0068476	0.002585	3.599556	up	chr3
hsa_circ_0052436	0.002564	5.702784	up	chr2
hsa_circ_0030856	0.002552	9.016525	up	chr13
hsa_circ_0085512	0.002525	2.60284	up	chr8
hsa_circ_0025039	0.002515	3.386485	up	chr12
hsa_circ_0056036	0.002448	3.370549	up	chr2
hsa_circ_0034567	0.002443	2.11384	up	chr15
hsa_circ_0030853	0.002411	3.091232	up	chr13
hsa_circ_0071919	0.002399	2.768208	up	chr5
hsa_circ_0091541	0.002386	4.813982	up	chrX
hsa_circ_0044569	0.002348	4.992321	up	chr17
hsa_circ_0091549	0.002342	4.878367	up	chrX
hsa_circ_0012592	0.002227	3.423918	up	chr1
hsa_circ_0034694	0.002216	3.425456	up	chr15
hsa_circ_0022586	0.002203	2.308305	up	chr11
hsa_circ_0044559	0.002199	4.915536	up	chr17
hsa_circ_0041848	0.002188	2.820085	up	chr17
hsa_circ_0071981	0.002167	2.830776	up	chr5
hsa_circ_0060912	0.002152	4.455669	up	chr20
hsa_circ_0003090	0.002147	3.690638	up	chr19
hsa_circ_0017790	0.002112	5.88224	up	chr10
hsa_circ_0060447	0.00211	3.37005	up	chr20
hsa_circ_0002109	0.002105	7.879892	up	chr10
hsa_circ_0002036	0.002105	2.127057	up	chr7
hsa_circ_0046479	0.002094	2.214318	up	chr17
hsa_circ_0079875	0.00209	2.152659	up	chr7
hsa_circ_0043669	0.002072	2.298669	up	chr17

hsa_circ_0037519	0.002047	2.883858	up	chr16
hsa_circ_0050687	0.002034	2.393883	up	chr19
hsa_circ_0046290	0.002029	2.826135	up	chr17
hsa_circ_0091552	0.002019	3.356924	up	chrX
hsa_circ_0050678	0.002007	2.214042	up	chr19
hsa_circ_0040807	0.001991	2.590076	up	chr16
hsa_circ_0055446	0.001978	2.540321	up	chr2
hsa_circ_0044519	0.001977	8.488479	up	chr17
hsa_circ_0030858	0.001974	5.299582	up	chr13
hsa_circ_0007071	0.001968	2.061857	up	chr5
hsa_circ_0065428	0.001959	2.343295	up	chr3
hsa_circ_0085329	0.001943	2.631227	up	chr8
hsa_circ_0026141	0.00194	2.849962	up	chr12
hsa_circ_0020268	0.001916	3.127487	up	chr10
hsa_circ_0003312	0.001871	2.943211	up	chr19
hsa_circ_0068246	0.001841	2.302402	up	chr3
hsa_circ_0043614	0.001832	7.51719	up	chr17
hsa_circ_0060463	0.001791	4.681963	up	chr20
hsa_circ_0090486	0.001768	3.032758	up	chrX
hsa_circ_0028600	0.001763	2.539038	up	chr12
hsa_circ_0086023	0.001735	2.134383	up	chr8
hsa_circ_0044504	0.001699	7.086637	up	chr17
hsa_circ_0044529	0.001695	6.758188	up	chr17
hsa_circ_0060456	0.001685	4.126957	up	chr20
hsa_circ_0084389	0.001655	2.484093	up	chr8
hsa_circ_0051870	0.001649	2.739172	up	chr19
hsa_circ_0068060	0.001636	2.24227	up	chr3
hsa_circ_0044542	0.001628	5.250704	up	chr17
hsa_circ_0059329	0.001615	2.439797	up	chr20
hsa_circ_0043769	0.001606	2.70199	up	chr17
hsa_circ_0043702	0.001573	2.801777	up	chr17
hsa_circ_0085994	0.001555	2.264035	up	chr8
hsa_circ_0044551	0.001524	7.666409	up	chr17
hsa_circ_0053189	0.001506	2.358833	up	chr2
hsa_circ_0043687	0.001479	2.211514	up	chr17
hsa_circ_0045966	0.001466	2.746469	up	chr17
hsa_circ_0085535	0.001463	3.416929	up	chr8
hsa_circ_0056263	0.001458	2.455622	up	chr2
hsa_circ_0012019	0.001452	2.405613	up	chr1
hsa_circ_0005284	0.00144	2.060049	up	chr7
hsa_circ_0030854	0.001438	5.34391	up	chr13
hsa_circ_0036713	0.001431	4.26891	up	chr15
hsa_circ_0051666	0.001371	2.551928	up	chr19

hsa_circ_0078280	0.00135	2.720993	up	chr6
hsa_circ_0090478	0.001349	2.914261	up	chrX
hsa_circ_0014250	0.001302	2.870633	up	chr1
hsa_circ_0018880	0.001296	6.574662	up	chr10
hsa_circ_0068516	0.001259	3.203089	up	chr3
hsa_circ_0079294	0.001257	2.910728	up	chr7
hsa_circ_0028955	0.001233	2.184129	up	chr12
hsa_circ_0091546	0.001211	6.637549	up	chrX
hsa_circ_0068324	0.001197	2.608779	up	chr3
hsa_circ_0043610	0.001195	8.71151	up	chr17
hsa_circ_0052242	0.001179	2.761456	up	chr19
hsa_circ_0085461	0.001154	2.278991	up	chr8
hsa_circ_0045480	0.001137	2.691842	up	chr17
hsa_circ_0077068	0.001136	4.980315	up	chr6
hsa_circ_0060467	0.001134	4.755868	up	chr20
hsa_circ_0053724	0.001129	2.12146	up	chr2
hsa_circ_0038134	0.001117	2.194258	up	chr16
hsa_circ_0025035	0.0011	4.236119	up	chr12
hsa_circ_0059722	0.001089	2.838635	up	chr20
hsa_circ_0078297	0.00108	3.461756	up	chr6
hsa_circ_0057603	0.001073	3.49481	up	chr2
hsa_circ_0003181	0.001069	2.363281	up	chr3
hsa_circ_0022591	0.001066	2.281722	up	chr11
hsa_circ_0059721	0.001058	2.92774	up	chr20
hsa_circ_0015579	0.001013	2.81203	up	chr1
hsa_circ_0043543	0.001002	2.478755	up	chr17
hsa_circ_0030867	0.000988	5.670175	up	chr13
hsa_circ_0017787	0.000974	7.463153	up	chr10
hsa_circ_0022588	0.000965	2.136354	up	chr11
hsa_circ_0016385	0.000923	2.884575	up	chr1
hsa_circ_0079863	0.000898	2.618845	up	chr7
hsa_circ_0068563	0.000894	2.618171	up	chr3
hsa_circ_0038634	0.00089	4.1925	up	chr16
hsa_circ_0090483	0.000885	2.446172	up	chrX
hsa_circ_0077064	0.000863	2.943142	up	chr6
hsa_circ_0044518	0.000847	9.806976	up	chr17
hsa_circ_0044934	0.000845	2.254889	up	chr17
hsa_circ_0059713	0.00082	2.817254	up	chr20
hsa_circ_0044516	0.00082	10.66055	up	chr17
hsa_circ_0044514	0.000767	9.716545	up	chr17
hsa_circ_0043683	0.000759	3.96162	up	chr17
hsa_circ_0059717	0.000725	3.675015	up	chr20
hsa_circ_0055672	0.00067	3.274668	up	chr2

hsa_circ_0060458	0.0006	3.297453	up	chr20
hsa_circ_0030427	0.000561	2.219637	up	chr13
hsa_circ_0086002	0.000554	2.34365	up	chr8
hsa_circ_0040798	0.000551	4.461227	up	chr16
hsa_circ_0076317	0.00055	2.431815	up	chr6
hsa_circ_0035303	0.000542	2.382607	up	chr15
hsa_circ_0034618	0.000539	2.71823	up	chr15
hsa_circ_0005877	0.000517	2.730385	up	chr17
hsa_circ_0017789	0.000507	6.873522	up	chr10
hsa_circ_0085998	0.000501	2.000871	up	chr8
hsa_circ_0068325	0.000465	2.386018	up	chr3
hsa_circ_0085468	0.000463	3.053571	up	chr8
hsa_circ_0086019	0.000437	2.119988	up	chr8
hsa_circ_0012524	0.000393	3.19775	up	chr1
hsa_circ_0005534	0.00039	2.33557	up	chr12
hsa_circ_0008324	0.000386	3.133167	up	chr7
hsa_circ_0002931	0.000373	4.731263	up	chr22
hsa_circ_0043688	0.000369	2.848169	up	chr17
hsa_circ_0085473	0.000363	2.091446	up	chr8
hsa_circ_0001581	0.000357	2.727324	up	chr6
hsa_circ_0043542	0.000354	3.726209	up	chr17
hsa_circ_0060465	0.00035	3.584639	up	chr20
hsa_circ_0076765	0.000327	2.610194	up	chr6
hsa_circ_0004742	0.000315	2.701712	up	chr14
hsa_circ_0077067	0.000314	3.723494	up	chr6
hsa_circ_0018516	0.000305	4.202122	up	chr10
hsa_circ_0040793	0.000293	5.316876	up	chr16
hsa_circ_0006478	0.000281	2.116466	up	chr20
hsa_circ_0031282	0.000278	3.2445	up	chr14
hsa_circ_0043762	0.000266	2.602471	up	chr17
hsa_circ_0005260	0.000256	2.283519	up	chr5
hsa_circ_0061834	0.000249	2.516689	up	chr21
hsa_circ_0036928	0.000225	2.917746	up	chr15
hsa_circ_0051356	0.000192	3.186942	up	chr19
hsa_circ_0020506	0.000154	2.566752	up	chr10
hsa_circ_0066633	0.000153	5.725875	up	chr3
hsa_circ_0085028	0.000143	2.157622	up	chr8
hsa_circ_0007944	9.36E-05	3.379867	up	chr17
hsa_circ_0022589	6.77E-05	2.803088	up	chr11
hsa_circ_0075805	6.77E-05	2.464011	up	chr6
hsa_circ_0068622	6.16E-05	2.570093	up	chr3
hsa_circ_0044129	4.88E-05	3.754718	up	chr17
hsa_circ_0060143	3.06E-05	2.170363	up	chr20

hsa_circ_0085554	2.76E-05	3.847964	up	chr8
hsa_circ_0056758	2.16E-05	4.821486	up	chr2
hsa_circ_0087826	1.10E-05	3.536299	up	chr9
hsa_circ_0037362	9.81E-05	120.6578	down	chr16
hsa_circ_0020763	4.69E-05	112.8373	down	chr11
hsa_circ_0037361	7.42E-05	111.1938	down	chr16
hsa_circ_0077886	0.00021	96.22428	down	chr6
hsa_circ_0077887	0.000101	52.24938	down	chr6
hsa_circ_0020758	2.21E-05	35.56346	down	chr11
hsa_circ_0077884	2.08E-05	32.02531	down	chr6
hsa_circ_0084765	0.000924	29.39419	down	chr8
hsa_circ_0020754	4.57E-05	26.61796	down	chr11
hsa_circ_0020753	3.33E-05	25.48917	down	chr11
hsa_circ_0020752	2.44E-05	25.22054	down	chr11
hsa_circ_0020759	2.29E-05	23.46734	down	chr11
hsa_circ_0020762	1.20E-05	22.92479	down	chr11
hsa_circ_0020757	1.44E-05	22.36039	down	chr11
hsa_circ_0077885	0.000817	21.30502	down	chr6
hsa_circ_0020755	1.33E-05	21.07262	down	chr11
hsa_circ_0020756	2.62E-05	20.11217	down	chr11
hsa_circ_0020760	0.000121	18.56631	down	chr11
hsa_circ_0049099	0.00054	16.56318	down	chr19
hsa_circ_0072309	0.000189	16.09082	down	chr5
hsa_circ_0036663	0.000723	13.31364	down	chr15
hsa_circ_0049101	0.000928	12.87498	down	chr19
hsa_circ_0071582	6.92E-06	12.46765	down	chr4
hsa_circ_0056768	9.44E-05	12.00331	down	chr2
hsa_circ_0087115	0.000722	11.83089	down	chr9
hsa_circ_0049091	0.000979	11.38378	down	chr19
hsa_circ_0087112	0.000953	11.32756	down	chr9
hsa_circ_0049105	0.00098	11.24432	down	chr19
hsa_circ_0078005	0.000821	10.65221	down	chr6
hsa_circ_0049117	0.00094	8.755884	down	chr19
hsa_circ_0007107	0.000198	8.744261	down	chr4
hsa_circ_0035431	0.000195	8.273112	down	chr15
hsa_circ_0021480	0.000182	7.644775	down	chr11
hsa_circ_0070840	0.000911	7.610734	down	chr4
hsa_circ_0049098	0.000896	7.329499	down	chr19
hsa_circ_0078460	9.40E-05	7.29989	down	chr6
hsa_circ_0013047	9.02E-05	6.971422	down	chr1
hsa_circ_0012389	0.000617	6.735068	down	chr1
hsa_circ_0089104	0.000477	6.704028	down	chr9
hsa_circ_0054993	0.000372	6.648123	down	chr2

hsa_circ_0049132	0.000605	6.621306	down	chr19
hsa_circ_0021482	5.51E-05	6.594565	down	chr11
hsa_circ_0025632	0.000166	6.588449	down	chr12
hsa_circ_0021481	0.000485	6.54314	down	chr11
hsa_circ_0067877	0.000398	6.392902	down	chr3
hsa_circ_0064974	0.000828	6.368941	down	chr3
hsa_circ_0065754	0.000334	6.291313	down	chr3
hsa_circ_0027790	0.000329	6.128055	down	chr12
hsa_circ_0056931	8.86E-05	5.946067	down	chr2
hsa_circ_0054994	0.000843	5.8689	down	chr2
hsa_circ_0066977	0.000962	5.73582	down	chr3
hsa_circ_0083770	0.000998	5.678439	down	chr8
hsa_circ_0078315	0.000777	5.415628	down	chr6
hsa_circ_0074494	0.000796	5.355501	down	chr5
hsa_circ_0020761	0.000131	5.325006	down	chr11
hsa_circ_0089100	0.000662	5.296088	down	chr9
hsa_circ_0078065	0.000781	5.16795	down	chr6
hsa_circ_0007756	0.000825	5.163778	down	chr2
hsa_circ_0056933	0.00042	4.928805	down	chr2
hsa_circ_0004754	0.000118	4.714602	down	chr4
hsa_circ_0025633	0.000486	4.43091	down	chr12
hsa_circ_0019290	0.000344	4.334308	down	chr10
hsa_circ_0002787	0.000836	4.329695	down	chr2
hsa_circ_0017553	0.000628	4.303619	down	chr10
hsa_circ_0021596	0.000913	4.278863	down	chr11
hsa_circ_0058204	0.000988	4.156281	down	chr2
hsa_circ_0034319	0.000493	4.049239	down	chr15
hsa_circ_0047602	3.50E-05	3.984095	down	chr18
hsa_circ_0071583	0.000773	3.981821	down	chr4
hsa_circ_0009745	0.000326	3.947357	down	chr1
hsa_circ_0000892	0.000516	3.866219	down	chr19
hsa_circ_0023606	0.000809	3.823586	down	chr11
hsa_circ_0021294	0.000207	3.818789	down	chr11
hsa_circ_0024302	0.000882	3.707007	down	chr11
hsa_circ_0071000	2.31E-05	3.649157	down	chr4
hsa_circ_0045569	0.000261	3.623581	down	chr17
hsa_circ_0006242	0.000714	3.569082	down	chr18
hsa_circ_0070838	0.000569	3.55344	down	chr4
hsa_circ_0088709	0.000217	3.540976	down	chr9
hsa_circ_0035432	0.000874	3.479822	down	chr15
hsa_circ_0078319	0.000769	3.465206	down	chr6
hsa_circ_0074811	0.000931	3.443744	down	chr5
hsa_circ_0002894	0.000808	3.338478	down	chr6

hsa_circ_0064971	0.000778	3.317551	down	chr3
hsa_circ_0058209	0.000485	3.142586	down	chr2
hsa_circ_0029751	0.000737	3.135708	down	chr13
hsa_circ_0039742	0.000149	3.126228	down	chr16
hsa_circ_0064565	0.000716	2.963425	down	chr3
hsa_circ_0013439	0.000352	2.896418	down	chr1
hsa_circ_0002249	0.000609	2.780774	down	chr2
hsa_circ_0067183	0.000918	2.779036	down	chr3
hsa_circ_0029761	0.000798	2.766362	down	chr13
hsa_circ_0072568	0.00021	2.751521	down	chr5
hsa_circ_0013618	0.000959	2.732079	down	chr1
hsa_circ_0074169	0.00021	2.705749	down	chr5
hsa_circ_0039748	9.75E-05	2.683351	down	chr16
hsa_circ_0047391	0.000417	2.671756	down	chr18
hsa_circ_0004679	0.000999	2.599801	down	chr7
hsa_circ_0013664	0.000372	2.588511	down	chr1
hsa_circ_0065750	0.000752	2.566374	down	chr3
hsa_circ_0029745	0.000704	2.559493	down	chr13
hsa_circ_0038763	0.000448	2.554287	down	chr16
hsa_circ_0072567	0.000399	2.532395	down	chr5
hsa_circ_0035113	0.00032	2.5035	down	chr15
hsa_circ_0026540	0.000712	2.486144	down	chr12
hsa_circ_0013607	0.000942	2.460098	down	chr1
hsa_circ_0058885	0.000718	2.453656	down	chr2
hsa_circ_0013620	0.00079	2.422025	down	chr1
hsa_circ_0047486	0.000106	2.420201	down	chr18
hsa_circ_0035114	0.000904	2.370029	down	chr15
hsa_circ_0064975	0.000167	2.350509	down	chr3
hsa_circ_0065110	0.000528	2.325743	down	chr3
hsa_circ_0013623	0.000269	2.286007	down	chr1
hsa_circ_0078439	4.49E-06	2.127338	down	chr6
hsa_circ_0064866	0.000544	2.100951	down	chr3
hsa_circ_0013446	0.000804	2.080466	down	chr1
hsa_circ_0050746	0.000283	2.070232	down	chr19
hsa_circ_0069805	0.000463	2.046558	down	chr4
hsa_circ_0028408	0.000371	2.018989	down	chr12
hsa_circ_0074258	0.000559	2.01398	down	chr5

Abbreviation: FC, Fold changes; abs, absolute value, chr, chromosome.

Table S3. The most significant circRNA–miRNA interacting couples (Top 20)

Upregulated circRNAs				
miRNAs	MREs	Corresponding circular RNAs	Gene Symbol	Chromosomal Location
hsa-miR-1273h-5p	47	hsa_circ_0005534	<i>ERC1</i>	chr12:1107489-1137738
hsa-miR-6780a-5p	44	hsa_circ_0005534	<i>ERC1</i>	chr12:1107489-1137738
hsa-miR-4726-5p	40	hsa_circ_0044519	<i>COL1A1</i>	chr17:48263677-48275146
hsa-miR-4726-5p	39	hsa_circ_0044519	<i>COL1A1</i>	chr17:48263677-48275146
hsa-miR-7851-3p	39	hsa_circ_0005534	<i>ERC1</i>	chr12:1107489-1137738
hsa-miR-4726-5p	38	hsa_circ_0044518	<i>COL1A1</i>	chr17:48263677-48273560
hsa-miR-4726-5p	36	hsa_circ_0044520	<i>COL1A1</i>	chr17:48264375-48273337
hsa-miR-3192-5p	36	hsa_circ_0005534	<i>ERC1</i>	chr12:1107489-1137738
hsa-miR-4640-5p	35	hsa_circ_0044519	<i>COL1A1</i>	chr17:48263677-48275146
hsa-miR-4726-5p	34	hsa_circ_0044517	<i>COL1A1</i>	chr17:48263677-48263677
hsa-miR-1233-5p	34	hsa_circ_0005534	<i>ERC1</i>	chr12:1107489-1137738
hsa-miR-665	34	hsa_circ_0005534	<i>ERC1</i>	chr12:1107489-1137738
hsa-miR-4640-5p	33	hsa_circ_0044518	<i>COL1A1</i>	chr17:48263677-48273560
hsa-miR-4640-5p	33	hsa_circ_0044529	<i>COL1A1</i>	chr17:48266102-48277308
hsa-miR-5787	33	hsa_circ_0005534	<i>ERC1</i>	chr12:1107489-1137738
hsa-miR-4640-5p	31	hsa_circ_0044520	<i>COL1A1</i>	chr17:48264375-48273337
hsa-miR-615-5p	31	hsa_circ_0065404	<i>COL7A1</i>	chr3:48602842-48630132
hsa-miR-4726-5p	30	hsa_circ_0044527	<i>COL1A1</i>	chr17:48266102-48273560
hsa-miR-4726-5p	30	hsa_circ_0044539	<i>COL1A1</i>	chr17:48266737-48273728
hsa-miR-4739	30	hsa_circ_0029399	<i>GLT1D1</i>	chr12:129373183-129411699
Downregulated circRNAs				
miRNAs	MREs	Corresponding circular RNAs	Gene Symbol	Chromosomal Location
hsa-miR-619-5p	37	hsa_circ_0013047	<i>LPHN2</i>	chr1:82227495-82372915
hsa-miR-4632-5p	23	hsa_circ_0020761	-	chr11:1213089-1222366
hsa-miR-1303	23	hsa_circ_0013047	<i>LPHN2</i>	chr1:82227495-82372915
hsa-miR-4632-5p	23	hsa_circ_0020761	-	chr11:1213089-1222366
hsa-miR-5095	22	hsa_circ_0013047	<i>LPHN2</i>	chr1:82227495-82372915
hsa-miR-4632-5p	22	hsa_circ_0020760	-	chr11:1213089-1222366
hsa-miR-4763-3p	21	hsa_circ_0020762	-	chr11:1213089-1222366
hsa-miR-4425	21	hsa_circ_0013047	<i>LPHN2</i>	chr1:82227495-82372915
hsa-miR-4739	21	hsa_circ_0013047	<i>LPHN2</i>	chr1:82227495-82372915
hsa-miR-4763-3p	21	hsa_circ_0020762	-	chr11:1213089-1222366
hsa-miR-3159	20	hsa_circ_0013047	<i>LPHN2</i>	chr1:82227495-82372915
hsa-miR-5787	20	hsa_circ_0013047	<i>LPHN2</i>	chr1:82227495-82372915
hsa-miR-4763-3p	20	hsa_circ_0020760	-	chr11:1213089-1222366
hsa-miR-4632-5p	19	hsa_circ_0020759	-	chr11:1213089-1222366
hsa-miR-1273g-3p	18	hsa_circ_0013047	<i>LPHN2</i>	chr1:82227495-82372915

hsa-miR-6780a-5p	18	hsa_circ_0013047	<i>LPHN2</i>	chr1:82227495-82372915
hsa-miR-6855-5p	18	hsa_circ_0013047	<i>LPHN2</i>	chr1:82227495-82372915
hsa-miR-6756-5p	17	hsa_circ_0020762	-	chr11:1213089-1222366
hsa-miR-1304-3p	17	hsa_circ_0013047	<i>LPHN2</i>	chr1:82227495-82372915
hsa-miR-4763-3p	17	hsa_circ_0020759	-	chr11:1213089-1222366

Table S4. The target miRNAs captured by multiple circRNAs (Top 20)

Upregulated circRNAs		Downregulated circRNAs	
Captured miRNA	Interacted circRNA counts	Captured miRNA	Interacted circRNA counts
hsa-miR-4726-5p	26	hsa-miR-6756-5p	10
hsa-miR-4640-5p	22	hsa-miR-4763-3p	9
hsa-miR-6798-5p	22	hsa-miR-6803-5p	7
hsa-miR-328-5p	19	hsa-miR-6893-5p	6
hsa-miR-615-5p	18	hsa-miR-637	6
hsa-miR-665	15	hsa-miR-5787	6
hsa-miR-6762-5p	15	hsa-miR-5001-5p	6
hsa-miR-661	14	hsa-miR-4728-5p	6
hsa-miR-4530	13	hsa-miR-6791-5p	5
hsa-miR-6753-5p	13	hsa-miR-6735-5p	5
hsa-miR-3619-5p	12	hsa-miR-6722-3p	5
hsa-miR-4733-3p	12	hsa-miR-6721-5p	5
hsa-miR-6132	12	hsa-miR-4685-5p	5
hsa-miR-637	12	hsa-miR-4667-3p	5
hsa-miR-6852-5p	12	hsa-miR-4632-5p	5
hsa-miR-1343-3p	11	hsa-miR-6879-5p	4
hsa-miR-6781-5p	11	hsa-miR-6810-3p	4
hsa-miR-6836-5p	11	hsa-miR-6782-5p	4
hsa-miR-6791-5p	10	hsa-miR-6775-5p	4
hsa-miR-744-5p	8	hsa-miR-6743-5p	4

Table S5. Functional annotation analysis of hsa-miR-4726-5p

Term	Count	%	P Value	List Total	Pop Hits	Pop Total	Fold Enrichment	Bonferroni	Benjamini	FDR
Tobacco Use Disorder	985	22.02594	4.96E-31	3170	3034	12971	1.328418	3.26E-27	3.26E-27	9.71E-28
Body Mass Index	165	3.689624	5.75E-07	3170	479	12971	1.409492	0.003773	0.001888	0.001126
Stroke	178	3.980322	6.21E-06	3170	542	12971	1.343801	0.039979	0.013508	0.012157
Cholesterol, HDL	144	3.220036	2.90E-05	3170	434	12971	1.357647	0.173645	0.046564	0.056819
Cholesterol	141	3.152952	4.59E-05	3170	427	12971	1.351156	0.260364	0.058536	0.089831
Schizophrenia	238	5.322004	8.69E-05	3170	785	12971	1.240571	0.434937	0.090751	0.16995
Blood Pressure	148	3.309481	1.52E-04	3170	462	12971	1.310792	0.631757	0.133	0.297247
Carotid Artery Diseases	35	0.782648	1.56E-04	3170	78	12971	1.836063	0.64197	0.120492	0.305603
Hip	119	2.661002	2.03E-04	3170	361	12971	1.34882	0.736153	0.137606	0.396243
Cholesterol, LDL	153	3.421288	2.11E-04	3170	483	12971	1.29616	0.749933	0.129426	0.412162
Celiac Disease	99	2.213775	2.76E-04	3170	293	12971	1.382553	0.836461	0.151775	0.538108
Echocardiography	125	2.79517	3.16E-04	3170	386	12971	1.325064	0.874673	0.158921	0.616951
Bone Density	78	1.744186	4.12E-04	3170	223	12971	1.431212	0.93313	0.187856	0.80281
Alcoholism	158	3.533095	4.72E-04	3170	509	12971	1.270146	0.955029	0.198726	0.920011
Coronary Artery Disease	158	3.533095	5.20E-04	3170	510	12971	1.267655	0.967283	0.203869	1.013893
Insulin	68	1.520572	5.82E-04	3170	191	12971	1.456766	0.978175	0.21262	1.133231
schizophrenia autism	18	0.402504	0.001094	3170	34	12971	2.166246	0.999245	0.344826	2.119289
Bipolar Disorder	127	2.839893	0.001409	3170	407	12971	1.276802	0.999905	0.402381	2.72348
Lipids	57	1.274597	0.002294	3170	162	12971	1.439707	1	0.548031	4.396616
Lipoproteins, VLDL	56	1.252236	0.002454	3170	159	12971	1.441136	1	0.553913	4.697018
Depression	55	1.229875	0.002626	3170	156	12971	1.442621	1	0.560729	5.017548

Breast Neoplasms	13	0.290698	0.003762	3170	23	12971	2.312755	1	0.675566	7.113814
Body Height	168	3.756708	0.004051	3170	571	12971	1.203892	1	0.686401	7.640126
Triglycerides	132	2.951699	0.004168	3170	437	12971	1.235966	1	0.681252	7.851462
Mouth Neoplasms Precancerous Conditions	11	0.245975	0.004511	3170	18	12971	2.500543	1	0.695197	8.47042
Myocardial Infarction	158	3.533095	0.004776	3170	536	12971	1.206164	1	0.701757	8.947495
Attention Deficit Disorder with Hyperactivity	52	1.162791	0.005104	3170	150	12971	1.41849	1	0.712092	9.532237
Hemoglobins	83	1.855993	0.005222	3170	260	12971	1.306228	1	0.707286	9.742677
Memory	12	0.268336	0.005289	3170	21	12971	2.33817	1	0.699252	9.861829
Hematocrit	41	0.916816	0.005728	3170	113	12971	1.484635	1	0.715816	10.63768
Leukemia, Myeloid, Acute Precursor Cell Lymphoblastic Leukemia- Lymphoma	8	0.178891	0.006577	3170	11	12971	2.975853	1	0.753044	12.11936
Alcohol Drinking	16	0.357782	0.006678	3170	33	12971	1.983902	1	0.747326	12.2936
Glucose	77	1.721825	0.006986	3170	241	12971	1.307338	1	0.752352	12.8248
Natriuretic Peptide, Brain	12	0.268336	0.00827	3170	22	12971	2.23189	1	0.799064	15.00576
Narcolepsy	69	1.542934	0.008546	3170	214	12971	1.319318	1	0.800331	15.46698
Osteoporosis	56	1.252236	0.008906	3170	168	12971	1.363933	1	0.804572	16.0654
Cell Adhesion Molecules	26	0.581395	0.010281	3170	66	12971	1.61192	1	0.840397	18.31695
monocyte chemoattractant protein 1 (66-77)	32	0.715564	0.010446	3170	86	12971	1.52253	1	0.83725	18.58255
Fatty Liver	10	0.223614	0.01055	3170	17	12971	2.40694	1	0.832489	18.75007
Sleep	24	0.536673	0.011535	3170	60	12971	1.636719	1	0.851268	20.31879

arrhythmogenic right ventricular cardiomyopathy/dysplasia	5	0.111807	0.014315	3170	5	12971	4.091798	1	0.900788	24.59385
Insulin Resistance	53	1.185152	0.018074	3170	163	12971	1.330462	1	0.942336	30.02822
Colorectal Cancer	124	2.772809	0.018601	3170	426	12971	1.19104	1	0.943231	30.75956
hypertension	197	4.405188	0.01936	3170	705	12971	1.143382	1	0.946017	31.80032
Erythrocytes	32	0.715564	0.020768	3170	90	12971	1.454862	1	0.953303	33.69273
anorexia nervosa	17	0.380143	0.021144	3170	40	12971	1.739014	1	0.952753	34.18986
Thyrotropin	20	0.447227	0.02265	3170	50	12971	1.636719	1	0.959345	36.14372
Adiponectin	19	0.424866	0.024055	3170	47	12971	1.654131	1	0.964306	37.9168
diabetes, type 2; obesity	10	0.223614	0.024808	3170	19	12971	2.153578	1	0.96555	38.84792
pancreatic cancer	24	0.536673	0.026007	3170	64	12971	1.534424	1	0.968649	40.30299
epithelial ovarian cancer	54	1.207513	0.026603	3170	170	12971	1.299748	1	0.968991	41.01403
Socioeconomic Factors	26	0.581395	0.027026	3170	71	12971	1.498405	1	0.968622	41.5143
Platelet Count	40	0.894454	0.027613	3170	120	12971	1.363933	1	0.968917	42.20074
hematological parameters	7	0.15653	0.030753	3170	11	12971	2.603872	1	0.977637	45.74758
Obesity	107	2.392665	0.031192	3170	369	12971	1.186511	1	0.977299	46.22624
Scleroderma, Systemic	14	0.313059	0.031517	3170	32	12971	1.790162	1	0.97665	46.57863
myocardial infarct; atherosclerosis, coronary	13	0.290698	0.032905	3170	29	12971	1.834254	1	0.978859	48.05763
Lymphedema	12	0.268336	0.034125	3170	26	12971	1.888522	1	0.980415	49.32514
Acute-Phase Serum Amyloid A	5	0.111807	0.034644	3170	6	12971	3.409832	1	0.980282	49.85607
Aortic Aneurysm, Abdominal	11	0.245975	0.035061	3170	23	12971	1.956947	1	0.979921	50.27809
mental retardation	11	0.245975	0.035061	3170	23	12971	1.956947	1	0.979921	50.27809
Weight Gain	43	0.961538	0.036488	3170	133	12971	1.322912	1	0.981747	51.69832
Osteoarthritis	24	0.536673	0.037124	3170	66	12971	1.487927	1	0.981845	52.31839

Waist Circumference	75	1.677102	0.03739	3170	251	12971	1.222649	1	0.981202	52.57592
Exercise Test	40	0.894454	0.040159	3170	123	12971	1.330666	1	0.985119	55.17682
lymphoma	25	0.559034	0.040685	3170	70	12971	1.461356	1	0.984979	55.65467
Bone Mineral Density	117	2.616279	0.040741	3170	411	12971	1.164818	1	0.984086	55.70576
Iron	77	1.721825	0.042305	3170	260	12971	1.211802	1	0.985574	57.09804
Monocytes	24	0.536673	0.04385	3170	67	12971	1.465719	1	0.986864	58.433
Leukemia, Lymphocytic, Chronic, B-Cell	64	1.431127	0.044376	3170	212	12971	1.23526	1	0.986726	58.87835
slow transit constipation	6	0.134168	0.044576	3170	9	12971	2.727865	1	0.986155	59.04632
Body Weights and Measures	46	1.028623	0.046139	3170	146	12971	1.289197	1	0.987363	60.33887
Apolipoproteins C	10	0.223614	0.049063	3170	21	12971	1.948475	1	0.989853	62.65261
autism	102	2.280859	0.050229	3170	357	12971	1.169085	1	0.990324	63.53862
Thyroid Neoplasms	8	0.178891	0.050494	3170	15	12971	2.182292	1	0.98995	63.73734
Hepatitis C, Chronic Liver Cirrhosis	24	0.536673	0.051423	3170	68	12971	1.444164	1	0.990192	64.42551
Parkinson Disease	64	1.431127	0.052708	3170	214	12971	1.223715	1	0.99073	65.35752
Arteries	49	1.095707	0.056396	3170	159	12971	1.260994	1	0.992938	67.90457
schizophrenia bipolar disorder	22	0.49195	0.059959	3170	62	12971	1.451928	1	0.994528	70.19564
abdominal aortic aneurysm	14	0.313059	0.064317	3170	35	12971	1.636719	1	0.996029	72.78732
Brain										
Neoplasms Glioma Meningeal Neoplasms Meningioma	5	0.111807	0.065376	3170	7	12971	2.922713	1	0.996123	73.38424
plasma eosinophil count	5	0.111807	0.065376	3170	7	12971	2.922713	1	0.996123	73.38424
rectal cancer	5	0.111807	0.065376	3170	7	12971	2.922713	1	0.996123	73.38424
Neurofibromatosis 1 Syndrome	5	0.111807	0.065376	3170	7	12971	2.922713	1	0.996123	73.38424

Diabetes Mellitus, Type 2 Obesity	10	0.223614	0.065578	3170	22	12971	1.859908	1	0.995919	73.4963
Forced Vital Capacity	22	0.49195	0.069954	3170	63	12971	1.428882	1	0.997004	75.82371
Carcinoma, Non-Small-Cell Lung Lung Neoplasms Neoplasm of lung	8	0.178891	0.071371	3170	16	12971	2.045899	1	0.997152	76.53436
menarche (age at onset)	6	0.134168	0.071585	3170	10	12971	2.455079	1	0.997001	76.64008
bipolar schizoaffective disorder	6	0.134168	0.071585	3170	10	12971	2.455079	1	0.997001	76.64008
obesity asthma	15	0.33542	0.073092	3170	39	12971	1.573769	1	0.997168	77.37127
epilepsy	23	0.514311	0.074902	3170	67	12971	1.404647	1	0.997388	78.22109
diabetic nephropathy	17	0.380143	0.07512	3170	46	12971	1.512186	1	0.997253	78.32119
C-Reactive Protein	47	1.050984	0.077711	3170	155	12971	1.240739	1	0.997618	79.47962
Coronary Disease Coronary heart disease Myocardial Infarction	29	0.648479	0.079731	3170	89	12971	1.333283	1	0.997831	80.34209
height	67	1.498211	0.082351	3170	231	12971	1.186799	1	0.998115	81.40912
gamma-Glutamylcyclotransferase	10	0.223614	0.085196	3170	23	12971	1.779043	1	0.998386	82.50564
Heart Failure	107	2.392665	0.085432	3170	385	12971	1.137201	1	0.998301	82.5939
Bulimia	54	1.207513	0.090218	3170	183	12971	1.207416	1	0.998744	84.29293
Mental Competency	24	0.536673	0.091002	3170	72	12971	1.363933	1	0.99873	84.55578
Parkinson's disease	43	0.961538	0.092476	3170	142	12971	1.239066	1	0.998782	85.03879
Amyotrophic Lateral Sclerosis	22	0.49195	0.093205	3170	65	12971	1.384916	1	0.998764	85.27249
Creatinine	48	1.073345	0.094684	3170	161	12971	1.219915	1	0.998814	85.73568
hippocampal atrophy	8	0.178891	0.096621	3170	17	12971	1.925552	1	0.9989	86.32125
Acute Coronary Syndrome Inflammation	8	0.178891	0.096621	3170	17	12971	1.925552	1	0.9989	86.32125

Chromosome Aberrations Chromosome abnormality Chronic Lymphocytic Leukemia Leukemia, Lymphocytic, Chronic, B-Cell	4	0.089445	0.09757	3170	5	12971	3.273438	1	0.998901	86.5999
Atherosclerosis Carotid Artery Diseases	4	0.089445	0.09757	3170	5	12971	3.273438	1	0.998901	86.5999
breast cancer colorectal cancer stomach cancer	4	0.089445	0.09757	3170	5	12971	3.273438	1	0.998901	86.5999
Carcinoma, Squamous Cell Mouth Neoplasms Neoplasm Metastasis Squamous cell carcinoma	4	0.089445	0.09757	3170	5	12971	3.273438	1	0.998901	86.5999
Brain Neoplasms	4	0.089445	0.09757	3170	5	12971	3.273438	1	0.998901	86.5999
Asthma Myocardial Infarction	4	0.089445	0.09757	3170	5	12971	3.273438	1	0.998901	86.5999
Bone Neoplasms Gastrointestinal Diseases Hematologic Diseases Kidney Diseases Osteosarcoma	4	0.089445	0.09757	3170	5	12971	3.273438	1	0.998901	86.5999
Carcinoma, Papillary DNA Damage Neoplasms, Radiation-Induced thyroid neoplasm Thyroid Neoplasms	4	0.089445	0.09757	3170	5	12971	3.273438	1	0.998901	86.5999
Arsenic Poisoning Cardiovascular Diseases	4	0.089445	0.09757	3170	5	12971	3.273438	1	0.998901	86.5999

Glomerulosclerosis, Focal Segmental	4	0.089445	0.09757	3170	5	12971	3.273438	1	0.998901	86.5999
Arrhythmogenic Right Ventricular Dysplasia Death, Sudden, Cardiac Sudden Cardiac Death	4	0.089445	0.09757	3170	5	12971	3.273438	1	0.998901	86.5999
intrauterine growth restriction	4	0.089445	0.09757	3170	5	12971	3.273438	1	0.998901	86.5999
Sleep Disorders	11	0.245975	0.099793	3170	27	12971	1.667029	1	0.998999	87.2315
Arthritis, Rheumatoid Rheumatoid Arthritis Anti-TNF Response	11	0.245975	0.099793	3170	27	12971	1.667029	1	0.998999	87.2315

Table S6. Functional annotation analysis of has-miR-4640-5p

Term	Count	%	P Value	List Total	Pop Hits	Pop Total	Fold Enrichment	Bonferroni	Benjamini	FDR
Tobacco Use Disorder	787	17.71326	7.20E-06	2979	3034	12971	1.129437	0.046393	0.046393	0.014093
Type 2 Diabetes edema rosiglitazone	583	13.12176	1.19E-05	2979	2198	12971	1.154899	0.075478	0.038479	0.023281
Schizophrenia	230	5.176682	1.87E-05	2979	785	12971	1.275737	0.116154	0.040322	0.036626
Type 2 diabetes	108	2.43079	0.001568	2979	360	12971	1.306244	0.999968	0.924998	3.027196
Alzheimer's disease	254	5.716858	0.003382	2979	950	12971	1.164161	1	0.988585	6.419844
anorexia nervosa	18	0.405132	0.004665	2979	40	12971	1.959366	1	0.994173	8.752199
coronary spastic angina	18	0.405132	0.004665	2979	40	12971	1.959366	1	0.994173	8.752199
Alzheimer's Disease	98	2.205717	0.004843	2979	333	12971	1.2814	1	0.989729	9.070416
cognitive function	15	0.33761	0.007303	2979	32	12971	2.041006	1	0.997639	13.37381
Leukemia, Myeloid Myeloid Leukemia	11	0.24758	0.007402	2979	20	12971	2.39478	1	0.995704	13.54338
Bone Mineral Density	116	2.610849	0.009202	2979	411	12971	1.228907	1	0.997764	16.56251
Breast Neoplasms Mammary Neoplasms	15	0.33761	0.01005	2979	33	12971	1.979157	1	0.99767	17.94978
Parkinson's disease	46	1.035336	0.010227	2979	142	12971	1.410498	1	0.996501	18.23666
Fractures, Spontaneous Osteoporosis, Postmenopausal	5	0.112537	0.011326	2979	5	12971	4.354146	1	0.996925	19.99703
hypertension	188	4.231375	0.012635	2979	705	12971	1.161106	1	0.997512	22.04697
Fractures, Bone	13	0.292595	0.015243	2979	28	12971	2.021568	1	0.998841	25.98181

financial and psychological risk attitudes	9	0.202566	0.016345	2979	16	12971	2.449207	1	0.998886	27.58763
Bipolar Disorder	113	2.543327	0.016634	2979	407	12971	1.208891	1	0.998518	28.00346
Hyperuricemia	6	0.135044	0.018951	2979	8	12971	3.265609	1	0.999104	31.25438
Brill-Symmers disease Lymphoma, Follicular	6	0.135044	0.018951	2979	8	12971	3.265609	1	0.999104	31.25438
Apoplexy Cerebral Hemorrhage Cerebral Hemorrhages Intracranial Hemorrhages Stroke Subarachnoid Hemorrhage	44	0.990322	0.020589	2979	140	12971	1.368446	1	0.999275	33.4678
null	242	5.44677	0.020819	2979	936	12971	1.125751	1	0.999036	33.7738
Cleft Lip Cleft Palate	109	2.453297	0.022048	2979	395	12971	1.201524	1	0.999096	35.38334
LDL cholesterol	15	0.33761	0.023252	2979	36	12971	1.814227	1	0.999141	36.92303
Migraine with Aura	11	0.24758	0.023266	2979	23	12971	2.082418	1	0.998838	36.94174
Cleft Lip Cleft Palate	11	0.24758	0.023266	2979	23	12971	2.082418	1	0.998838	36.94174
Socioeconomic Factors	25	0.562683	0.024213	2979	71	12971	1.53315	1	0.998821	38.12856
schizophrenia; bipolar disorder	10	0.225073	0.024246	2979	20	12971	2.177073	1	0.998469	38.16858
Carcinoma, Squamous Cell Esophageal Neoplasms Oesophageal neoplasm Squamous cell carcinoma	10	0.225073	0.024246	2979	20	12971	2.177073	1	0.998469	38.16858
Restless Legs Syndrome	9	0.202566	0.024767	2979	17	12971	2.305136	1	0.998285	38.8127
metabolic syndrome	50	1.125366	0.026375	2979	165	12971	1.319438	1	0.99855	40.75909

Chronic renal failure Kidney Failure, Chronic	233	5.244204	0.027366	2979	905	12971	1.121012	1	0.998559	41.92902
soft tissue sarcoma	5	0.112537	0.027801	2979	6	12971	3.628455	1	0.998369	42.43525
non-small cell lung cancer	5	0.112537	0.027801	2979	6	12971	3.628455	1	0.998369	42.43525
Memory Disorders	5	0.112537	0.027801	2979	6	12971	3.628455	1	0.998369	42.43525
Diabetes Mellitus	48	1.080351	0.028331	2979	158	12971	1.322778	1	0.998209	43.04672
dementia	23	0.517668	0.029645	2979	65	12971	1.540698	1	0.998353	44.53636
Leiomyoma Uterine Neoplasms	12	0.270088	0.029653	2979	27	12971	1.935176	1	0.997991	44.54537
Stroke	144	3.241053	0.031491	2979	542	12971	1.156821	1	0.998341	46.56764
schizophrenia autism	14	0.315102	0.03257	2979	34	12971	1.792884	1	0.998387	47.72065
bipolar disorder schizophrenia	10	0.225073	0.033982	2979	21	12971	2.073403	1	0.998528	49.19589
weight loss	10	0.225073	0.033982	2979	21	12971	2.073403	1	0.998528	49.19589
Arrhythmias, Cardiac Death, Sudden, Cardiac	7	0.157551	0.036994	2979	12	12971	2.539918	1	0.999005	52.20976
Myelodysplastic Syndromes	7	0.157551	0.036994	2979	12	12971	2.539918	1	0.999005	52.20976
schizophrenia; schizoaffective disorder; bipolar disorder	8	0.180059	0.037003	2979	15	12971	2.322211	1	0.998803	52.21899
Thyroid Neoplasms	8	0.180059	0.037003	2979	15	12971	2.322211	1	0.998803	52.21899
Adenocarcinoma Esophageal Neoplasms Heartburn	4	0.090029	0.040048	2979	4	12971	4.354146	1	0.999176	55.0924
Infertility, Male Varicocele	4	0.090029	0.040048	2979	4	12971	4.354146	1	0.999176	55.0924
cholesterol; cholesterol, HDL; cholesterol, LDL	4	0.090029	0.040048	2979	4	12971	4.354146	1	0.999176	55.0924
leukemia; lung cancer; oropharyngolaryngeal cancers; laryngeal cancer; bladder cancer	4	0.090029	0.040048	2979	4	12971	4.354146	1	0.999176	55.0924

liver injury, drug-induced	4	0.090029	0.040048	2979	4	12971	4.354146	1	0.999176	55.0924
chromosome damage DNA damage	4	0.090029	0.040048	2979	4	12971	4.354146	1	0.999176	55.0924
Bone Diseases Osteoporosis	4	0.090029	0.040048	2979	4	12971	4.354146	1	0.999176	55.0924
Lipoproteins, LDL	20	0.450146	0.040347	2979	56	12971	1.555052	1	0.999062	55.36574
epilepsy	23	0.517668	0.041276	2979	67	12971	1.494707	1	0.999048	56.20474
autism	97	2.18321	0.043835	2979	357	12971	1.183059	1	0.999267	58.43876
plasma HDL cholesterol (HDL-C) levels	70	1.575512	0.044474	2979	249	12971	1.224057	1	0.999216	58.97947
Forced Expiratory Volume	28	0.630205	0.044609	2979	86	12971	1.417629	1	0.999094	59.09222
Carcinoma, Renal Cell Kidney Neoplasms	17	0.382624	0.045949	2979	46	12971	1.609141	1	0.999139	60.20189
Chromosome Aberrations Chromosome abnormality	10	0.225073	0.046105	2979	22	12971	1.979157	1	0.999017	60.32884
Death, Sudden, Cardiac	15	0.33761	0.046356	2979	39	12971	1.674671	1	0.9989	60.53289
Obesity POF - Premature ovarian failure POLYCYSTIC OVARIAN SYNDROME Polycystic Ovary Syndrome Primary Ovarian Insufficiency Puberty, Delayed Puberty, Precocious Thrombophilia Tobac co Use Disorder	70	1.575512	0.048029	2979	250	12971	1.219161	1	0.999006	61.86716
myocardial infarct	37	0.832771	0.049798	2979	121	12971	1.331433	1	0.999111	63.23197

Coronary Artery Disease Myocardial Infarction	12	0.270088	0.050157	2979	29	12971	1.801715	1	0.999025	63.50257
smoking	32	0.720234	0.050289	2979	102	12971	1.366006	1	0.998901	63.60233
thyroid cancer	38	0.855278	0.05067	2979	125	12971	1.32366	1	0.998807	63.88707
Dyskinesia, Drug-Induced	8	0.180059	0.053071	2979	16	12971	2.177073	1	0.999015	65.63444
risperidone-induced extrapyramidal symptoms	5	0.112537	0.053193	2979	7	12971	3.110104	1	0.998896	65.72129
t-PA and PAI-1 levels	5	0.112537	0.053193	2979	7	12971	3.110104	1	0.998896	65.72129
tardive dyskinesia	11	0.24758	0.055257	2979	26	12971	1.842139	1	0.999041	67.15543
Diabetes Mellitus, Type 2	14	0.315102	0.063153	2979	37	12971	1.647515	1	0.999603	72.13439
lymphoma	23	0.517668	0.064503	2979	70	12971	1.430648	1	0.999614	72.91077
Hepatitis C Remission, Spontaneous	34	0.765249	0.065731	2979	112	12971	1.321794	1	0.99962	73.59848
Coronary Disease Hyperlipoproteinemia Type II	9	0.202566	0.066703	2979	20	12971	1.959366	1	0.999613	74.13164
brain aneurysm	8	0.180059	0.072883	2979	17	12971	2.04901	1	0.99979	77.28826
oral cancer	14	0.315102	0.076559	2979	38	12971	1.604159	1	0.999844	78.98831
migraine	14	0.315102	0.076559	2979	38	12971	1.604159	1	0.999844	78.98831
Hypospadias	10	0.225073	0.078136	2979	24	12971	1.814227	1	0.99985	79.68033
QT interval	12	0.270088	0.078513	2979	31	12971	1.685476	1	0.999835	79.84231
DNA Damage	7	0.157551	0.07903	2979	14	12971	2.177073	1	0.999821	80.06276
Hypercholesterolemia LDLC levels	54	1.215395	0.080921	2979	193	12971	1.218258	1	0.999834	80.84926
Birth Weight	15	0.33761	0.081991	2979	42	12971	1.555052	1	0.999832	81.28148

Overweight	4	0.090029	0.08313	2979	5	12971	3.483317	1	0.99983	81.73129
Balkan Nephropathy	4	0.090029	0.08313	2979	5	12971	3.483317	1	0.99983	81.73129
Carcinoma, Papillary DNA Damage Neoplasms, Radiation- Induced thyroid neoplasm Thyroid Neoplasms	4	0.090029	0.08313	2979	5	12971	3.483317	1	0.99983	81.73129
prostate carcinoma	4	0.090029	0.08313	2979	5	12971	3.483317	1	0.99983	81.73129
leukemia; leukemia, myelodysplastic (TRLIMDS)	4	0.090029	0.08313	2979	5	12971	3.483317	1	0.99983	81.73129
DNA Damage Infertility, Male	4	0.090029	0.08313	2979	5	12971	3.483317	1	0.99983	81.73129
Cryptorchidism Hypospadias	4	0.090029	0.08313	2979	5	12971	3.483317	1	0.99983	81.73129
fertility	4	0.090029	0.08313	2979	5	12971	3.483317	1	0.99983	81.73129
drug hypersensitivity leukemia	4	0.090029	0.08313	2979	5	12971	3.483317	1	0.99983	81.73129
hyperandrogenism; premature pubarche	4	0.090029	0.08313	2979	5	12971	3.483317	1	0.99983	81.73129
hip dislocation, congenital	4	0.090029	0.08313	2979	5	12971	3.483317	1	0.99983	81.73129
smoking genotoxic effects	4	0.090029	0.08313	2979	5	12971	3.483317	1	0.99983	81.73129
affective disorder	6	0.135044	0.08445	2979	11	12971	2.374989	1	0.999832	82.23947
Rectal Neoplasms	6	0.135044	0.08445	2979	11	12971	2.374989	1	0.999832	82.23947
several psychiatric disorders	80	1.800585	0.086723	2979	299	12971	1.164989	1	0.99985	83.0834
azoospermia oligospermia	5	0.112537	0.087436	2979	8	12971	2.721341	1	0.999842	83.34019
bipolar disorder; depression	5	0.112537	0.087436	2979	8	12971	2.721341	1	0.999842	83.34019
Hallucinations	5	0.112537	0.087436	2979	8	12971	2.721341	1	0.999842	83.34019
Obesity	97	2.18321	0.089181	2979	369	12971	1.144586	1	0.999851	83.95349
Bulimia	51	1.147873	0.0943	2979	183	12971	1.21345	1	0.9999	85.63045

Fractures, Bone Osteoporosis	8	0.180059	0.09648	2979	18	12971	1.935176	1	0.999909	86.29318
pulmonary function	8	0.180059	0.09648	2979	18	12971	1.935176	1	0.999909	86.29318
Diabetes mellitus HIV										
Infections [X]Human immunodeficiency virus disease	10	0.225073	0.098193	2979	25	12971	1.741658	1	0.999913	86.79327

Figure S1. Mapping network of circRNA–miRNA interactions of LSCC. The network map included the top 10 ranked upregulated and top 5 ranked downregulated candidate circRNAs (represented as red and green nodes) in the analysis of circRNA–miRNA network prediction. Blue nodes around the red and green ones were the predicted miRNAs that interacted with the related circRNAs.

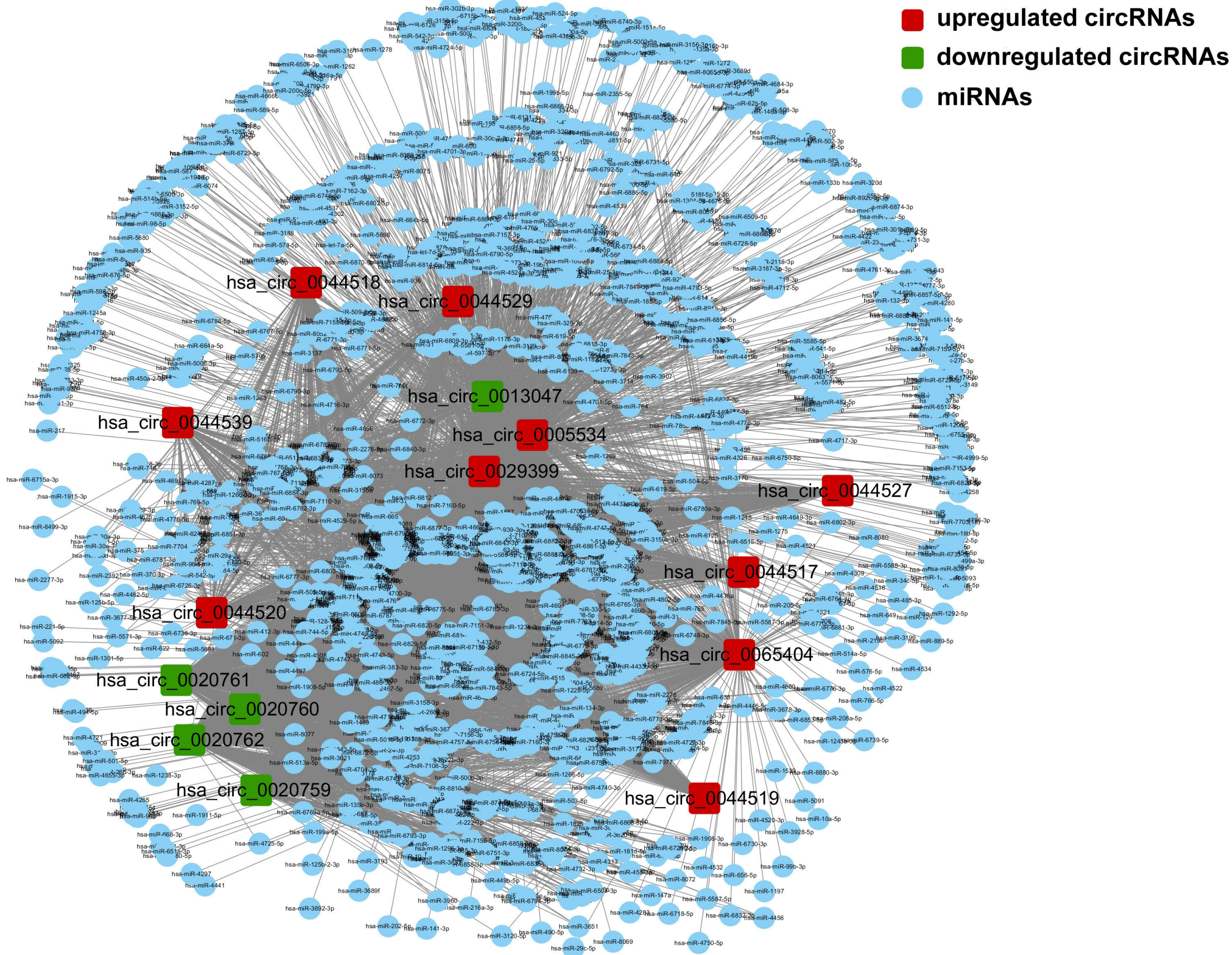


Figure S2. Relative expression level of hsa_circ_0065404 and hsa_circ_0044519 in 30 LSCC tissues and paired normal control tissues in the validation cohort.

