

**SUPPLEMENTARY MATERIAL**

**Supporting Table 1. The expression levels of 88 miRNAs of HC, CHB, LC, and HCC groups in the discovery set.**

miRNA	Average value in HC	Average value in CHB	Average value in LC	Average value in HCC	Change fold (Patients/HC)
hsa-let-7a-2-3p	405	4610	2588	662	5.33
hsa-let-7d-5p	2498	21293	15304	8307	5.50
hsa-let-7g-3p	3443	12270	6735	7283	2.50
hsa-miR-103a-3p	8509	3498	3856	3109	0.40
hsa-miR-1247-5p	414	16697	12440	3681	12.03
hsa-miR-1248	405	4879	3602	838	6.17
hsa-miR-126-3p	1306	13331	11640	2144	5.58
hsa-miR-130a-3p	11153	3562	1444	3957	0.27
hsa-miR-132-5p	1780	13949	9531	3249	4.45
hsa-miR-150-5p	1459	45079	37385	10436	17.98
hsa-miR-1537	2417	14258	6090	8928	4.29
hsa-miR-154-3p	2865	31662	22702	5106	6.03
hsa-miR-18b-5p	2035	11121	4390	4276	3.09
hsa-miR-194-3p	1255	8254	3054	1499	3.22
hsa-miR-199a-5p	8029	20463	13660	8748	2.28
hsa-miR-19b-1-5p	8566	3145	1822	3893	0.34
hsa-miR-221-3p	1201	12836	13183	1510	7.19
hsa-miR-23a-5p	625	10196	7067	1163	8.44
hsa-miR-25-5p	592	8282	3755	803	1.63
hsa-miR-2681-5p	481	15051	12339	2372	6.08
hsa-miR-30b-3p	1317	15181	13914	2884	16.95
hsa-miR-30c-1-3p	737	27879	28071	6565	6.69
hsa-miR-30d-3p	1985	11928	12472	4393	11.68
hsa-miR-3145-5p	756	1547	13551	27001	4.11
hsa-miR-3146	703	10723	9364	1159	2.26
hsa-miR-3153	513	14634	14254	3146	8.01
hsa-miR-3162-5p	692	11473	13051	3257	17.54
hsa-miR-3164	1380	9920	10684	2111	11.08
hsa-miR-3184-5p	529	4644	3127	1463	4.47
hsa-miR-3196	412	515	2294	4346	5.57
hsa-miR-34a-3p	928	7841	6115	1635	2.31
hsa-miR-3672	9561	1575	1360	4180	0.50
hsa-miR-3675-3p	4327	4987	4155	14690	4.71
hsa-miR-371b-5p	28252	970	636	15277	0.31
hsa-miR-374c-3p	488	16467	16424	3765	4.30
hsa-miR-378a-5p	11277	33246	36931	13305	2.27
hsa-miR-3908	1094	15529	14541	3373	11.09
hsa-miR-3935	537	14102	9829	3627	2.17
hsa-miR-4284	441	7075	6539	725	8.57
hsa-miR-431-3p	926	26394	21277	10260	15.13

<b>hsa-miR-4322</b>	504	11689	6945	1054	8.76
<b>hsa-miR-4329</b>	3599	37035	39209	11812	6.47
<b>hsa-miR-4418</b>	612	10967	9371	1956	10.69
<b>hsa-miR-4444</b>	673	10185	8032	1895	11.47
<b>hsa-miR-4446-3p</b>	1646	13211	11880	1929	9.99
<b>hsa-miR-4461</b>	524	9177	6991	856	8.21
<b>hsa-miR-4472</b>	492	12258	7935	1497	6.54
<b>hsa-miR-4474-3p</b>	501	16540	17177	2575	8.92
<b>hsa-miR-4476</b>	472	7507	5536	1044	12.12
<b>hsa-miR-4478</b>	779	9952	8633	5058	19.50
<b>hsa-miR-4482-5p</b>	484	939	1150	3148	8.25
<b>hsa-miR-4484</b>	616	5354	6011	1445	10.65
<b>hsa-miR-4495</b>	506	10578	11778	1843	2.24
<b>hsa-miR-449a</b>	524	10721	10284	1371	14.23
<b>hsa-miR-4502</b>	2749	15664	15244	18080	12.98
<b>hsa-miR-4507</b>	691	12581	11140	2335	11.46
<b>hsa-miR-4508</b>	535	15235	10249	5958	6.06
<b>hsa-miR-450a-5p</b>	515	13725	10434	5608	10.51
<b>hsa-miR-450b-5p</b>	465	10215	8594	1541	18.76
<b>hsa-miR-4515</b>	1217	14161	13311	3235	18.03
<b>hsa-miR-4516</b>	1285	24272	24816	6728	12.06
<b>hsa-miR-4522</b>	2999	16253	15327	3679	7.13
<b>hsa-miR-4640-3p</b>	2943	859	715	7431	7.18
<b>hsa-miR-4646-3p</b>	1020	9174	10260	1556	2.49
<b>hsa-miR-4652-3p</b>	31329	1984	1407	10945	0.25
<b>hsa-miR-4677-5p</b>	534	6339	3400	975	6.03
<b>hsa-miR-4706</b>	1296	16999	14658	1500	9.19
<b>hsa-miR-4715-5p</b>	583	10523	8492	816	5.44
<b>hsa-miR-4732-5p</b>	459	7080	5134	810	8.89
<b>hsa-miR-4739</b>	439	3576	4135	1773	8.95
<b>hsa-miR-4750</b>	570	11876	9776	1247	7.54
<b>hsa-miR-4793-5p</b>	931	12926	10451	2639	6.34
<b>hsa-miR-485-5p</b>	2126	13614	14122	2208	11.43
<b>hsa-miR-493-5p</b>	1865	7491	3836	6130	7.92
<b>hsa-miR-5092</b>	620	19903	19179	4477	3.81
<b>hsa-miR-5096</b>	3611	3844	11017	32195	3.20
<b>hsa-miR-526b-5p</b>	526	5882	4993	862	5.50
<b>hsa-miR-541-5p</b>	537	6991	6083	843	9.41
<b>hsa-miR-618</b>	645	30247	22644	4228	7.23
<b>hsa-miR-644b-3p</b>	513	40087	39141	8967	6.37
<b>hsa-miR-662</b>	812	12058	10642	2518	8.51
<b>hsa-miR-767-3p</b>	967	2975	2761	5681	7.33
<b>hsa-miR-767-5p</b>	5182	23261	23596	6076	4.64
<b>hsa-miR-769-5p</b>	5511	41482	40317	14841	8.16
<b>hsa-miR-876-3p</b>	28942	43483	39932	49376	8.64
<b>hsa-miR-876-5p</b>	10690	5379	4989	5926	0.41
<b>hsa-miR-888-3p</b>	3676	3140	1383	5827	2.91
<b>hsa-miR-891b</b>	961	563	7496	7773	5.37

**Supporting Table 2. The predicted result of 4 groups with 4 formulas of the 88-microRNA signature in the training set.**

Sample	Group	Predict value for HC	Predict value for CHB	Predict value for LC	Predict value for HCC	Sensitivity (%)
1	HC	4552	4178	4265	4284	100
2	HC	4504	4384	4489	4454	
3	HC	8463	6548	7801	8143	
4	HC	9632	7446	8975	9418	
5	HC	15401	12944	14413	15242	
6	HC	15665	12893	15566	15032	
7	HC	19610	15261	18812	18791	
8	HC	15262	12667	15218	14618	
9	HC	16200	13130	15917	15578	
10	HC	17159	13400	16289	16308	
11	HC	16710	13182	16015	16100	
12	HC	20816	16000	19704	20421	
13	HC	16563	13264	16109	15978	
14	HC	17101	13753	16696	16458	
15	HC	6141	4746	5464	5803	
16	HC	8651	6566	8010	8603	
17	HC	11657	9837	10276	10457	
18	HC	9224	7219	8768	9187	
19	HC	9043	6740	8198	8818	
20	HC	8516	6368	7752	8336	
21	HC	9360	7399	8877	9290	
22	HC	9070	6730	8305	8940	
23	HC	10033	7518	9285	9973	
24	HC	6583	5702	6537	6314	
25	HC	8398	6698	8111	8147	
26	HC	8290	7228	7697	7463	
27	HC	7132	5165	6150	6827	
28	HC	13480	11213	13006	13374	
29	HC	8834	6867	8483	8705	
30	HC	10678	8326	10122	10613	
31	CHB	8030	10835	9766	10648	100
32	CHB	10620	10656	9645	7998	
33	CHB	8032	10841	9768	10648	
34	CHB	3218	3534	3074	3498	
35	CHB	7273	7395	7206	6591	
36	CHB	3650	3720	3228	3715	
37	CHB	3645	3723	3226	3716	
38	CHB	3305	3593	3156	3592	

39	CHB	5315	7438	5931	6374
40	CHB	2955	3785	2485	2844
41	CHB	4523	4565	3962	2986
42	CHB	6551	7600	6839	6490
43	CHB	6609	9424	7196	7883
44	CHB	5095	5694	5006	4309
45	CHB	4996	5182	4901	4293
46	CHB	7942	8617	7814	7439
47	CHB	2880	3766	3213	3014
48	CHB	3775	5248	3665	3795
49	CHB	1489	1827	692	653
50	CHB	3192	4205	2738	3390
51	CHB	13992	14170	14126	11647
52	CHB	14149	14313	14019	11523
53	CHB	19042	19168	18139	14635
54	CHB	8124	10642	9015	8189
55	CHB	5688	7949	7311	5784
56	CHB	5806	8147	7474	5916
57	CHB	5889	6766	6141	5218
58	CHB	-837	843	-732	-1497
59	CHB	-1603	-337	-1957	-2687
60	CHB	2599	3261	2861	3093
61	LC	3403	3593	5839	4162
62	LC	10686	9267	12490	11012
63	LC	5061	4702	6919	6564
64	LC	4941	4941	5928	4727
65	LC	310	1564	2233	402
66	LC	6524	6218	7446	6378
67	LC	5745	5345	6544	5374
68	LC	4132	4017	4407	3038
69	LC	4175	4072	5883	5050
70	LC	5008	5322	5516	4357
71	LC	4672	4954	5360	4108
72	LC	4421	4257	6142	5332
73	LC	3648	3989	5148	3377
74	LC	3788	3873	5010	3684
75	LC	3307	3824	3900	1988
76	LC	3665	3677	4493	2213
77	LC	5409	5433	5445	4569
78	LC	6663	5681	9574	8485
79	LC	5203	5085	6413	4692
80	LC	-3694	-4278	-2480	-5655
81	LC	-1628	-1021	591	-2288
82	LC	15924	12922	16188	16177

100

83	LC	14496	12149	14745	14630
84	LC	13017	11159	13235	13154
85	LC	12652	10431	12780	12373
86	LC	6354	7772	8623	6385
87	LC	9104	9612	11448	9356
88	LC	6255	8182	9009	6428
89	LC	8271	7746	8767	8268
90	LC	4638	4647	5454	4812
91	HCC	13410	10316	13160	13867
92	HCC	10013	9145	11110	11001
93	HCC	15483	12301	15487	16531
94	HCC	14641	10974	13978	15339
95	HCC	2706	2199	2831	2968
96	HCC	6307	5400	5988	6863
97	HCC	400	1686	212	2726
98	HCC	4614	3272	2818	6317
99	HCC	11349	9994	11160	12202
100	HCC	7670	6280	6390	8935
101	HCC	7343	5606	6421	9136
102	HCC	7370	6309	7256	8953
103	HCC	13666	11880	14194	14257
104	HCC	13948	11916	14356	14416
105	HCC	15522	13139	15882	16167
106	HCC	15822	13245	16093	16453
107	HCC	24717	18090	22489	25030
108	HCC	20723	16102	19479	20969
109	HCC	7471	7461	10112	8432
110	HCC	6215	7521	6031	8733
111	HCC	5789	4763	5717	6328
112	HCC	7495	7523	7411	8746
113	HCC	6778	5906	6927	7218
114	HCC	4645	5094	4124	5641
115	HCC	7581	6938	7086	8345
116	HCC	3207	2819	4524	4726
117	HCC	2854	2364	4123	4346
118	HCC	6013	6407	5765	7273
119	HCC	5992	5676	5771	6331
120	HCC	6398	5846	6258	6689
121	HCC	4723	4856	4453	5015
122	HCC	4264	4920	4055	5037
123	HCC	10174	9750	10384	11289
124	HCC	5104	5353	4732	5848
125	HCC	10239	8631	10287	10487
126	HCC	10079	10325	9886	12011

100

127	HCC	11982	10831	12217	<b>13024</b>
128	HCC	6397	6641	6407	<b>7133</b>
129	HCC	8151	8415	8210	<b>9563</b>
130	HCC	9516	8229	9740	<b>9766</b>
131	HCC	8488	7150	8559	<b>8714</b>
132	HCC	8264	6829	8237	<b>8698</b>
133	HCC	8324	6895	8139	<b>8518</b>
134	HCC	11699	9787	11747	<b>12082</b>
135	HCC	8348	7012	8407	<b>8620</b>
136	HCC	7299	6133	7399	<b>7768</b>
137	HCC	8693	7287	8682	<b>8936</b>
138	HCC	5657	5325	6015	<b>6270</b>
139	HCC	8687	7174	8593	<b>8883</b>
140	HCC	8777	6907	8285	<b>9091</b>
141	HCC	8933	7073	8493	<b>9272</b>
142	HCC	8545	6808	8129	<b>8887</b>
143	HCC	8816	7287	8779	<b>9035</b>
144	HCC	8442	6805	8130	<b>8775</b>
145	HCC	8700	6475	7905	<b>9013</b>
146	HCC	8200	6571	7845	<b>8487</b>
147	HCC	10033	9158	11021	<b>11130</b>
148	HCC	394	1682	209	<b>2721</b>
149	HCC	4614	3272	2818	<b>6317</b>
150	HCC	7215	5451	6244	<b>9039</b>

**Supporting Table 3. The predicted result of 4 groups with 4 formulas of the 88-microRNA signature in the validation set.**

Sample	Group	Predict value for HC	Predict value for CHB	Predict value for LC	Predict value for HCC	Accuracy (%)
1	HC	<b>7044</b>	5069	5610	6491	<b>100</b>
2	HC	<b>7066</b>	4706	5285	6398	
3	HC	<b>7093</b>	5076	5629	6538	
4	HC	<b>7072</b>	4709	5290	6404	
5	HC	<b>7226</b>	5016	5606	6654	
6	HC	<b>6286</b>	4154	4524	5603	
7	HC	<b>5586</b>	3958	4128	4957	
8	HC	<b>6262</b>	4693	5172	5805	
9	HC	<b>17889</b>	15450	18354	17390	
10	HC	<b>7044</b>	5069	5610	6491	
11	HC	<b>21047</b>	16678	20381	19461	
12	HC	<b>21892</b>	17031	20741	19931	
13	HC	<b>19236</b>	15373	18707	17828	

14	CHB	11605	15419	13445	12608	
15	CHB	15076	17851	15616	16084	
16	CHB	5069	7044	5610	6491	
17	CHB	4706	7066	5285	6398	
18	CHB	5076	7093	5629	6538	
19	CHB	4709	7072	5290	6404	
20	CHB	5016	7226	5606	6654	
21	CHB	13557	12197	14499	14023	80
22	CHB	15860	16371	16223	13315	
23	CHB	16839	17482	16989	13885	
24	CHB	16148	16713	16646	13660	
25	CHB	17134	17769	17215	14029	
26	CHB	13663	12150	14461	14049	
27	CHB	12435	10845	12782	12730	
28	CHB	18529	19499	18946	15517	
29	LC	15420	14404	16653	15935	
30	LC	16483	15971	18473	17256	
31	LC	14931	13816	16098	15491	
32	LC	15428	14168	16677	16053	
33	LC	16747	15859	18395	17363	
34	LC	15533	15132	17574	16449	
35	LC	16107	14771	17534	16723	
36	LC	13777	15485	17987	14604	
37	LC	13741	15445	17937	14559	
38	LC	8681	11819	13062	9468	
39	LC	12508	13591	15930	13976	
40	LC	13387	13848	15855	14256	
41	LC	2983	3131	4284	3766	
42	LC	16857	14217	17405	17684	93.4
43	LC	14805	528	15416	15253	
44	HCC	15688	12699	15663	16662	
45	HCC	17843	15853	19076	19571	
46	HCC	19323	16484	20004	20806	
47	HCC	18556	15138	18499	19666	
48	HCC	18612	15160	18482	19556	
49	HCC	18760	15803	19196	19919	
50	HCC	20100	16522	20302	21222	
51	HCC	19042	15695	19162	20184	
52	HCC	18647	15154	18482	19675	
53	HCC	19023	15259	18746	19791	
54	HCC	19308	15930	19507	20620	
55	HCC	17903	14715	17790	18620	

56	HCC	17166	14242	17294	<b>18021</b>
57	HCC	20114	17136	21035	<b>21489</b>
58	HCC	18941	15653	19108	<b>20107</b>
59	HCC	20871	17311	21280	<b>22247</b>
60	HCC	17506	14956	18059	<b>18644</b>
61	HCC	16130	13704	16695	<b>16736</b>
62	HCC	15218	12848	15514	<b>15547</b>
63	HCC	16059	13553	16513	<b>16584</b>

**Supporting Table 4. HCC diagnostic efficiency of 88-microRNA and AFP on 213 subjects.**

		HCC case N (%)	Non-HCC case N (%)	Total cases
<b>Signature prediction</b>	<b>Cancer</b>	80 (100)	1 (0.8)	81
	<b>Non-cancer</b>	0 (0.0)	132 (99.2)	132
<b>AFP prediction</b>	<b>Cancer</b>	51 (63.8)	21 (15.8)	72
	<b>Non-cancer</b>	29 (36.2)	112 (84.2)	141
<b>Total cases</b>		80	133	213