

Supplementary Appendix

Identifying Ratio-Based mitochondria-derived small RNA Biomarkers and Predicted Targets in Lung Cancer Patients

Supplementary Table S1. Random forest RF mean decrease of accuracy and mean decrease Gini score rank

Names	Cancer	Normal	MeanDecreaseAccuracy	MeanDecreaseGini
t00012442_to_t00014455	2.813203	3.884357	3.602012062	0.571343254
t00022458_to_t00024522	3.001672	3.111537	3.418629809	0.459544773
t00022458_to_t00024059	3.171826	2.694473	3.211095152	0.311141109
t00012442_to_t00015863	2.498038	3.002299	3.013482146	0.407522509
t00016493_to_t00024522	2.97388	2.872698	2.971718999	0.344113133
t00013071_to_t00014455	2.097736	2.240428	2.8415188	0.361319388
t00006414_to_t00012442	2.718658	2.823025	2.828277356	0.423314536
t00012442_to_t00029490	2.192006	2.52132	2.698881332	0.300067919
t00012442_to_t00022458	2.44021	2.042033	2.62199793	0.212277442
t00013071_to_t00022458	2.080687	2.149495	2.423408375	0.254696938
t00006887_to_t00012442	1.588041	2.330808	2.421929829	0.224876808
t00011350_to_t00014455	2.137712	2.105863	2.39653951	0.174247289
t00015863_to_t00028073	2.335878	2.357527	2.384112687	0.195484131
t00010700_to_t00012442	1.741763	2.488022	2.313886266	0.279656798
t00014455_to_t00024522	2.268199	2.299152	2.312357154	0.329009639
t00013048_to_t00022458	2.225821	2.157117	2.309112597	0.234587848
t00012442_to_t00013099	2.336763	1.807395	2.278217175	0.222568182
t00015863_to_t00020738	2.365117	2.020943	2.269489942	0.198870243
t00005497_to_t00022458	2.150656	2.269011	2.25767032	0.252517732
t00008082_to_t00014455	2.291091	2.057791	2.235313893	0.23373088

Supplementary Table S2. The mitochondria-derived RNA (mtRNA) signature

ID	Sequence	Length	Annotation
t00003437	TGAATCTGACAACAGAGGCTTACGACCCCTTA	32	mt_tRNA-His-GTG
t00004817	GAGAAAGCTCACAAGAAGCTGCTAAC	25	mt_tRNA-Ser-GCT_5_end
t00005497	GAAAAAGTCATGGAGGCCATGGGGTT	26	mt_tRNA-Ser-TGA_5_end
t00006199	AAGACTTTTTCTCTGACCA	19	mt_tRNA-Pro-TGG_CCA_end
t00006292	TAGGATGGGGTGTGATAGGTGGCACGGAGAATTT	34	mt_tRNA-Gln-TTG_5_end
t00006414	GTTTAGACGGGCTCAC	16	mt_tRNA-Phe-GAA
t00009731	CAGAGTGTAGCTTAACA	17	mt_tRNA-Val-TAC_5_end
t00011195	TGAATCTGACAACAGAGGCTTACGACCCCTTATTTACC	38	mt_tRNA-His-GTG_3_end
t00012442	GGTAAAATGGCTGAGTGAAGCATTGGACTGTA	32	mt_tRNA-Tyr-GTA_5_end
t00014475	TAAATACAGACCAAGAGCCTTC	22	mt_tRNA-Trp-TCA
t00015616	CACTGTAAAGCTAACT	16	mt_tRNA-Lys-TTT_5_end
t00020738	AGATTTCAACTTAACTTGACCGCTCTGA	28	mt_tRNA-Val-TAC_3_end
t00021234	TTTTCCAAGGACACCA	16	mt_tRNA-Thr-TGT_CCA_end
t00021504	AGTAAGGTCAGCTAAATAAGCTATCGGGCCCA	32	mt_tRNA-Met-CAT_5_end
t00024522	GTAAAGATGGCAGAGCCCGGTAATCGCATA	30	mt_tRNA-Leu-TAA_5_end

Supplementary Table S3. A list of mtRNAs that FDR less than 0.001 when the unpaired student t-test was evaluated

mtRNA	p value	Fold change(Cancer/Normal)	log2FC	FDR
t00011350_to_t00014138	2.97E-09	0.240556559	-2.05555	4.57E-06
t00012442_to_t00027940	1.09E-08	0.098141613	-3.34899	8.43E-06

t00008082_to_t00014138	2.13E-08	0.174687982	-2.51715	1.09E-05
t00012442_to_t00027084	3.37E-08	0.100835035	-3.30993	1.30E-05
t00013048_to_t00014138	1.74E-07	0.207935196	-2.26579	4.54E-05
t00012442_to_t00024222	1.77E-07	0.05418495	-4.20596	4.54E-05
t00011350_to_t00026874	2.52E-07	0.172392307	-2.53623	5.17E-05
t00011350_to_t00015863	2.68E-07	0.043956405	-4.50778	5.17E-05
t00005497_to_t00022458	3.93E-07	0.073003354	-3.77589	6.72E-05
t00012442_to_t00017495	5.64E-07	0.113285421	-3.14197	7.49E-05
t00012442_to_t00028073	5.68E-07	0.116567682	-3.10076	7.49E-05
t00013071_to_t00014138	5.84E-07	0.302577617	-1.72462	7.49E-05
t00020112_to_t00022458	6.71E-07	0.101593964	-3.29911	7.94E-05
t00013071_to_t00026874	8.86E-07	0.207433074	-2.26928	9.74E-05
t00011350_to_t00014455	1.04E-06	0.067605323	-3.88672	0.000106
t00008082_to_t00009731	1.11E-06	0.08744513	-3.51548	0.000106
t00012442_to_t00020738	1.29E-06	0.112583955	-3.15093	0.000113
t00008082_to_t00026874	1.32E-06	0.115307157	-3.11645	0.000113
t00008082_to_t00015863	1.43E-06	0.028823983	-5.11659	0.000113
t00012442_to_t00030441	1.47E-06	0.139116996	-2.84563	0.000113
t00011350_to_t00013099	1.90E-06	0.069036755	-3.85649	0.00014
t00011350_to_t00021234	2.14E-06	0.162925758	-2.61771	0.00015
t00012442_to_t00014138	2.25E-06	0.057910914	-4.11002	0.000151
t00012442_to_t00024854	2.44E-06	0.109351464	-3.19296	0.000156
t00012442_to_t00026874	2.62E-06	0.031368381	-4.99455	0.000161
t00013048_to_t00015863	3.04E-06	0.037951298	-4.71971	0.000163
t00006292_to_t00024222	3.12E-06	0.10049151	-3.31485	0.000163
t00014475_to_t00015863	3.14E-06	0.105928158	-3.23884	0.000163
t00012442_to_t00014475	3.17E-06	0.13253642	-2.91554	0.000163

t00006292_to_t00011195	3.18E-06	0.221730495	-2.17312	0.000163
t00015295_to_t00015863	3.31E-06	0.134923409	-2.88979	0.000164
t00006292_to_t00006414	3.62E-06	0.016442251	-5.92645	0.000174
t00014138_to_t00022458	3.89E-06	0.169366715	-2.56178	0.000181
t00013048_to_t00026874	4.76E-06	0.145185941	-2.78403	0.000216
t00013048_to_t00022420	4.97E-06	0.126316116	-2.98489	0.000219
t00006414_to_t00012442	6.04E-06	14.98026231	3.904991	0.000258
t00003437_to_t00022458	6.85E-06	0.106119268	-3.23624	0.000285
t00008082_to_t00014455	7.07E-06	0.049480109	-4.33701	0.000286
t00011350_to_t00022420	7.68E-06	0.139137476	-2.84542	0.000297
t00027162_to_t00029490	7.70E-06	0.073378025	-3.76851	0.000297
t00008082_to_t00022420	8.35E-06	0.08257643	-3.59813	0.00031
t00005497_to_t00006414	8.45E-06	0.045340826	-4.46305	0.00031
t00013048_to_t00029490	1.08E-05	0.08709595	-3.52125	0.000387
t00004817_to_t00022458	1.11E-05	0.060812368	-4.03949	0.00039
t00006292_to_t00017015	1.25E-05	0.054134715	-4.2073	0.000421
t00017495_to_t00022458	1.26E-05	0.086579716	-3.52983	0.000421
t00008082_to_t00024222	1.30E-05	0.11961975	-3.06347	0.000427
t00013071_to_t00014455	1.35E-05	0.084377511	-3.567	0.000432
t00013071_to_t00013099	1.39E-05	0.073818412	-3.75988	0.000438
t00014138_to_t00015863	1.44E-05	0.163746611	-2.61046	0.000444
t00015616_to_t00015863	1.54E-05	0.106540317	-3.23053	0.000466
t00014005_to_t00014455	1.63E-05	0.29682123	-1.75233	0.000484
t00013071_to_t00021234	1.82E-05	0.213575681	-2.22718	0.000522
t00013048_to_t00013099	1.88E-05	0.051155564	-4.28897	0.000522
t00014475_to_t00022458	1.89E-05	0.099157626	-3.33413	0.000522
t00005497_to_t00006887	1.91E-05	0.11030274	-3.18046	0.000522

t00013071_to_t00017015	1.93E-05	0.153491294	-2.70377	0.000522
t00012442_to_t00022458	2.00E-05	0.009529647	-6.71336	0.000524
t00012442_to_t00024402	2.05E-05	0.045201078	-4.4675	0.000524
t00006292_to_t00027084	2.06E-05	0.202084607	-2.30697	0.000524
t00006887_to_t00012442	2.10E-05	13.39195674	3.743295	0.000524
t00011350_to_t00017015	2.14E-05	0.087609703	-3.51277	0.000524
t00011350_to_t00029490	2.15E-05	0.090839872	-3.46053	0.000524
t00013071_to_t00022420	2.27E-05	0.179867998	-2.47499	0.000539
t00012442_to_t00015882	2.28E-05	0.136685548	-2.87107	0.000539
t00007033_to_t00015863	2.33E-05	0.10935623	-3.19289	0.000545
t00012442_to_t00015616	2.42E-05	0.141288009	-2.82329	0.000554
t00004817_to_t00006414	2.46E-05	0.033452719	-4.90173	0.000554
t00021504_to_t00022458	2.49E-05	0.063409043	-3.97917	0.000554
t00011350_to_t00022458	2.52E-05	0.039754782	-4.65273	0.000554
t00016527_to_t00022458	2.63E-05	0.116231585	-3.10493	0.000571
t00014475_to_t00026874	2.85E-05	0.299845866	-1.73771	0.000609
t00008082_to_t00029490	2.97E-05	0.046877331	-4.41497	0.000619
t00009667_to_t00022458	2.98E-05	0.11015551	-3.18239	0.000619
t00014005_to_t00022458	3.07E-05	0.162364107	-2.6227	0.000631
t00008082_to_t00021234	3.13E-05	0.093883134	-3.41299	0.000633
t00004817_to_t00015863	3.17E-05	0.062571983	-3.99834	0.000633
t00013071_to_t00015863	3.26E-05	0.052508413	-4.25131	0.000638
t00024059_to_t00024222	3.27E-05	0.290526969	-1.78326	0.000638
t00006292_to_t00015863	3.49E-05	0.034163909	-4.87138	0.00067
t00006292_to_t00007970	3.53E-05	0.065492798	-3.93252	0.00067
t00011567_to_t00024222	3.58E-05	0.195053546	-2.35806	0.000672
t00014455_to_t00027940	3.64E-05	3.950317716	1.981969	0.000675

t00013048_to_t00024222	3.77E-05	0.190693704	-2.39067	0.000692
t00012442_to_t00013099	4.00E-05	0.014076036	-6.15062	0.000724
t00004817_to_t00026874	4.04E-05	0.194658355	-2.36098	0.000724
t00019661_to_t00022458	4.24E-05	0.158450594	-2.6579	0.00074
t00013048_to_t00017015	4.26E-05	0.101831899	-3.29574	0.00074
t00007033_to_t00026874	4.27E-05	0.287344874	-1.79914	0.00074
t00024522_to_t00027084	4.35E-05	0.248267472	-2.01003	0.000744
t00006292_to_t00006887	4.40E-05	0.055224491	-4.17855	0.000745
t00024522_to_t00029490	4.50E-05	0.047239922	-4.40385	0.000753
t00015882_to_t00022458	4.73E-05	0.081398534	-3.61885	0.000783
t00003437_to_t00006414	4.91E-05	0.049516765	-4.33594	0.000805
t00008082_to_t00009667	4.99E-05	0.285633825	-1.80776	0.000809
t00012442_to_t00014455	5.38E-05	0.01358393	-6.20196	0.000863
t00006292_to_t00022458	5.45E-05	0.037372026	-4.7419	0.000863
t00004817_to_t00007970	5.49E-05	0.216209921	-2.2095	0.000863
t00009667_to_t00015863	5.70E-05	0.124685079	-3.00364	0.000881
t00008082_to_t00013099	5.72E-05	0.044038662	-4.50509	0.000881
t00011567_to_t00017015	5.86E-05	0.093594824	-3.41743	0.000893
t00012442_to_t00022420	5.97E-05	0.025494092	-5.29369	0.000901
t00008082_to_t00030441	6.57E-05	0.280740507	-1.83269	0.000982
t00012442_to_t00016527	6.64E-05	0.083885669	-3.57543	0.000984